National Institute for Health and Care Excellence

Final

Perioperative care in adults

[B] Evidence review for enhanced recovery programmes

NICE guideline NG180

Evidence reviews underpinning recommendations 1.2.1 and 1.2.2 and research recommendation in the NICE guideline

August 2020

Final

This evidence review was developed by the National Guideline Centre

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1 Postoperative management and recovery

1.1 Review question: What is the clinical and cost effectiveness of enhanced recovery programmes for adults having major surgery?

1.2 Introduction

Enhanced recovery is a multimodal approach optimising patients' physiological and psychological states across preoperative, intraoperative and postoperative domains of care. The aim of enhanced recovery programmes (ERP) or enhanced recovery after surgery (ERAS) is for patients to return to their baseline function as quickly as possible and to reduce the incidence of postoperative complications. There are self-evident patient-centred and fiscal benefits if an expeditious and uncomplicated recovery can be achieved.

There are national variations in the delivery of enhanced recovery programmes. There is therefore a lack of standardisation of practice allowing outcomes to be objectively compared on a national scale. Furthermore, there is also a question as to the cost effectiveness of these programmes when compared to 'traditional' care.

1.3 PICO table

For full details see the review protocol in appendix A.

Table 1: PICO characteristics of review question

Population	Adults 18 years and over having major surgery.
Intervention	Enhanced recovery programmes (ERP)/ERAS (enhanced recovery after surgery)
Comparison	No enhanced recovery programme (standard care)
Outcomes	Critical outcomes: • health-related quality of life • mortality • patient, family and carer experience of care • adverse events and complications (Clavien-Dindo, postoperative morbidity score (POMS)) • patient and staff adherence Important outcomes: • length of hospital stay • unplanned intensive care unit admission • length of stay in intensive care unit • hospital readmission • psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) • pain
Study design	Randomised controlled trials (RCTs), systematic reviews of RCTs. Observational studies if no RCT evidence is identified.

1.4 Clinical evidence

1.4.1 Included studies

Seventy six randomly controlled trials were included in the review;[1, 5, 6, 21, 26, 27, 38, 41, 43, 46, 52-55, 59, 61, 64, 65, 67, 69, 70, 74, 79, 80, 82, 84, 87, 88, 90, 98, 101, 103, 105, 107, 109, 112, 116, 120, 122, 124, 129, 132, 133, 138, 140-142, 154, 157, 158, 161, 165, 169-171, 173, 181-184, 187, 189, 191, 193-197, 200, 211, 212, 215, 221-223, 227] these are summarised in Table 2 below. Evidence from these studies is summarised in the clinical evidence summary below (Table 4).

See also the study selection flow chart in appendix C, study evidence tables in appendix D, forest plots in appendix E and GRADE tables in appendix F.

1.4.2 Excluded studies

See the excluded studies list in appendix I.

1.4.3 Summary of clinical studies included in the evidence review

Table 2: Common enhanced recovery components from pre, peri and postoperative period

Preoperative protocol	Number of studies
Shortened fasting period	30
Carbohydrate loading (liquids)	21
Written information / counselling	28
No bowel preparation	24
Pre-assessment by specialist	16
Other	41

Perioperative protocol	Number of studies
Epidural catheter	24
Carbohydrate loading (liquids)	20
Altered surgical technique	18
Intraoperative warming	18
Prophylactic antibiotics	15
Other	33

Postoperative protocol	Number of studies
Enforced mobilization	62
Early introduction of diet	66
No / early removal of Nasogastric tube	41
No / early removal of surgical drains	32
Restricted fluids regimen	32
Other	109

Table 3: Summary of studies included in the evidence review

Study	Intervention and comparison	Population	Outcomes	Comments
Abdikarim 2015[1]	ERP During the postoperative period, fluid intake was from post-operative day (POD) 1 or POD 2 in the ERP group, patients were advised to begin cautiously and increase intake according to tolerance. Furthermore, they were encouraged to take full semi-liquid diet on POD 2, and normal food as soon as possible after surgery. In the conventional group, postoperative oral intake was restricted. In the ERP group, patients were encouraged to mobilize early from POD 1, and meet daily targets for mobilization. N=30 Standard Care: The conventional group received traditional postoperative care including bed rest. Urinary bladder drainage was routinely used in the conventional group, but limited to POD 1 N=31	Only those diagnosed with advanced gastric cancer were enrolled into the study after undergoing a diagnostic workup consisting of endoscopy with biopsy, total body CT scan, and endoscopic ultrasound in selected patients. Inclusion criteria were as follows: diagnosis of advanced gastric cancer, elective laparoscopic surgery and age under 75 years. Age male 63 +/- 12 female 62 +/- 11 China	• Mortality • Complications • Length of hospital stay Readmission	
Alito 2016[5]	ERP: Preoperative fasting 6-8 h fast for solid; carbohydrate drink (12%maltodextrin), 200mL up to 2 h before surgery. Preoperative nutrition - Immune supplement 600 mL/day for 5 days prior to surgery; Aesthesia - Spinal blockage; Antibiotic prophylaxis - Kefazolin: 2 g during anaesthesia induction followed by 1 g every 8 h for 48 h. Drains and catheters Not used; Intravenous fluids - Intra-operative: 5 to 10 mL of crystalloids/kg/h; Antithrombotic prophylaxis - 20 mg of enoxaparin immediately post-operative (6 h after anaesthetic block) and 40 mg/day from the 1st until the 35th post-operative day. Use of medium leg	Adult patients (18–80 y/o) who had hip osteoarthrosis and were candidates for elective THA (total hip arthroplasty). Age (mean) – ERP 57 +/- 12; Standard care 58 +/- 17 Brazil	• Complications • Length of hospital stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	compression stockings; Early Feeding - Diet at will starting 2–4 h after surgery; Mobilization -Sit up and walk the same day as surgery. N=17 Standard care: Fasting 6–8 h fast prior to surgery. Spinal blockage. Kefazolin: 2 g during anaesthesia induction followed by 1 g every 8 h for 48 h. Intra-operative: 5 to 10 mL of crystalloids/kg/h. Postoperative course: 0.9 % saline solution, 30 to 40 mL/kg/day, until the 2nd postoperative day. 20 mg of enoxaparin immediately post-operative (6 h after anaesthetic block) and 40 mg/day from the 1st until the 35th post-operative day. Use of medium leg compression stockings. Diet at will starting 6 h after surgery. Sit up and walk on the 1st postoperative day. N=19			
Anderson 2003[6]	ERP: Written preoperative information, pre-assessment by surgical registrar or anaesthetist, prebiotics and probiotics for 7 days, no bowel preparation, oral carbohydrate loading; during maintenance of anaesthesia, 80% oxygen was administered and IV morphine avoided (otherwise anaesthetic agents used were the same in both groups), transverse incision, epidural catheter inserted for postoperative pain relief, prophylactic antibiotics - cefuroxime and metronidazole; No nasogastric tubes or drains, free fluids on day of operation, light diet day 1 and full diet day 2, epidural catheter removed 24-36h after surgery, walk the length of the ward with physiotherapist; Ibuprofen, Paracetamol and	Patients who lived independently at home and required left or right hemicolectomy. Age: (Median)Optimization Group 64 (55-68); Control Group 68 (65-75) UK	• Mortality • Postoperative complications • Length of hospital stay • Readmission • Postoperative pain scores(at rest, movement and coughing)	

Study	Intervention and comparison	Population	Outcomes	Comments
	Morphine as rescue analgesia. N=14 Standard Care: No extra information, standard pre-assessment clinic, bowel preparation, fast from midnight prior to surgery; intraoperatively IV morphine titrated according to response (otherwise anaesthetic agents used were the same in both groups), midline or paramedian incision; prophylactic IV cefuroxime and metronidazole; Nasogastric tubes or drains according to surgeons preference, fluids and diet introduced in stepwise manner, patient controlled analgesia (1mg morphine); chest physiotherapy and ward mobilization by nurses. N=11			
Bu 2015[21]	ERP: Preoperative: Inform patients and their families of perioperative management measures and the likely scenario; Semi-fluid meals were administered until 6 h before surgery, and carbohydrate drinks (commonly 500 ml of a 5 % glucose solution) or same amount of water (for diabetes patients) were administered until 2 h before initiation of anaesthesia; No routine postoperative nasogastric tube; Routine transurethral bladder drainage after anaesthesia, Remove within 24 h after surgery; Mechanical bowel preparation should not be used routinely; Routine prophylaxis with intravenous antibiotics should be administered 30–60 min before surgery; Additional doses should be given if the operation time is more than 3 h; Intraoperative: Endotracheal intubation and intravenous general anaesthesia compound (using drugs with a short half-life); Intraoperative rehydration capacity is 1500 ml or less. The total fluid volume is 2500 ml or less on the day of surgery; Intraoperative input liquid	Inclusion criteria :a diagnosis of GC by a preoperative gastroscope pathological biopsy, tumour, node, metastasis (TNM) (TNM classification system of the National Comprehensive Cancer Network (NCCN) 2010 Clinical Practice Guidelines for GC50) staging of I–III for the period of the postoperative pathological diagnosis, American Society of Anaesthesiology (ASA) score grades I–III, age ≥45 and ≤90 years, no emergency surgery, no preoperative radiotherapy or chemotherapy, receipt	• Complications • Postoperative length of hospital stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	and abdominal cavity flushing fluid are used after heating the operating room to 23 to 25 °C. Incision size As far as possible to narrow the incision; Drainage tube No routine placement intraoperatively (usage rate was 9 %, remove 1 day after surgery); Postoperative: Encourage patients to ambulate 1 day postoperatively; Oral feeding is initiated at 24 h after surgery, following a stepwise program from warm clear water to a carbohydrate drink and, finally, to semi-fluid meals and normal food; Epidural analgesia pump 24–48 h, no use of opioid drugs. N=128 Standard care. N=128	of open gastric cancer radical surgery, and no preoperative complete digestive tract obstruction or digestive tract perforation. Age: (Mean) 45 - 74 years old FTS1 33/31, CC1 35/29; 75-89 years old FTS2 37/27, CC-2 40/24 China		
Chen Hu 2012[26]	ERP: Preoperative: Health instruction, information, and discussion about FTS except for schedule of surgery and informed consent; no routine bowel preparation; Oral nutritional supplements (e.g., TPF) were given for 5–7 days to patients at severe nutritional risk; Feed semi-fluid meal until 6 h before surgery, and carbohydrate drink (commonly 250–500 ml 10 % glucose solution) until 2 h before surgery; Nasogastric decompression only if necessary and to be removed as early as possible after surgery. •Intraoperative: Minimally invasive incision (epigastrium midline incision, ODG about 10–15 cm, not over umbilicus; LADG about 5–8 cm); abdominal cavity drain not used as routine treatment but removed as early as possible if necessary; restrictive fluid infusion regimen with Ringer's lactate 20 ml/kg in the first hour, then followed at the rate of 6 ml/kg/h. •Postoperation: Non-opioid analgesic by intramuscular injection or	Patients aged 25–75 years old, male or female; undergoing Laparoscopy-assisted radical distal gasterectomy for gastric cancer with adiagnosis confirmed by endoscopic biopsy. Age: (Median) FTS Laparoscopic: 59(49-71); FTS Open: 64(40-71); Trad Laparoscopic: 62.5(45-72); Trad Open: 64.5(49-75) China	• Complications Grade I (Clavien –Dindo) • Complications Grade II (Clavien –Dindo) • Complications Grade III 3a (Clavien – Dindo) • Postoperative hospital stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	PCA, oral cyclooxygenase inhibitor; Oral diet was initiated 6–8 h after surgery, following a stepwise program from warm clear water to carbohydrate drink to TPF, then to semi-fluids to normal food. Adhere to the premise of eating little and often. During first 1–2 days, the appropriate intravenous nutritional infusion was administered; Urine catheter for 6-24h and to be removed as early as possible; Encourage patient mobilization on bed after anaesthesia recovery and out of bed 8–12 h after surgery; acceleration of enterocinesia on first or second day after operation, accelerant administered via anus. N=44 Standard care. N=44			
Chen 2016[27]	ERP: Preoperative: Patients were educated systematically by the oesophageal clinical nurse consultant; Day before surgery: Last drink 2 h and diet 6 h; Fructose and protein loading; Day Of Surgery: No routine use of nasogastric tube; No Pre-anaesthetic medication; General anaesthesia + Epidural; Maintaining normothermia; Autologous blood transfusion or limit allogenic blood transfusion; No routine use of drains; Early postoperative care: Patient sent to floor; Analgesia Epidural PCA Enteral nutrition: Jejunostomy tube feeding anaesthesia; before operation POD1 Jejunostomy tube feeding 500 mL (starting at 20 mL/h); Early postoperative mobilization program (>2 h out of bed);Physical therapy and nebulizers; Remove urine catheter; Head of bed put at 30°; Supply albumin; Chest tube to suction; Promoted to lung recruitment POD2 Jejunostomy tube feeding	Patients aged ≥18 and ≤75 years, American Society of Anaesthesiologists (ASA) grade I/II, body mass index (BMI) 18.5–27.5 kg/m2,resectable oesophageal cancer undergoing Esophagectomy China	• Post-operative length of stay • Mortality • Complications • Hospital readmission • Pain (numeric rating scale (0-10)	

Study	Intervention and comparison	Population	Outcomes	Comments
	1000 mL (40 mL/h); Chest tube to suction; Expand mobilization (>4 h out of bed);Continue physical therapy and nebulizers; Continue supply albumin; POD3 Jejunostomy tube feeding 1500 mL (60–80 mL/h); Remove chest tube; Remove epidural catheter; Expand mobilization (>6 h out of bed); Continue physical therapy and nebulizers; Continue supply albumin; POD4 Gastrografin opacification of upper gastrointestine; If swallow shows no leak, advance patient to oral drink; Jejunostomy tube feeding 1500 mL (60–80 mL/h); Continue physical therapy and nebulizers; Education on aspiration precaution; Education on chewing and swallowing POD5 Jejunostomy tube feeding 1500 mL (60–80 mL/h); Advance patient to a full liquid diet; Continue aspiration precautions; Continue physical therapy and nebulizers POD6 Increase liquid diet; Decrease jejunostomy tube feeding (500 ml or 1000 ml); Continue aspiration precautions; Continue physical therapy and nebulizers; POD7 Remove jejunostomy tube; Full liquid diet; Discharge home on soft diet and liquid diet; Continue aspiration precautions; N=138 Standard Care: POD1 Total parenteral nutrition; Bed rest; Gastrointestinal decompression; Closed thoracic drainage; POD2 Nasojejunal tube feeding 500 mL (starting at 20 mL/h); Remove urine catheter; With help, sit in the chair 2 times during the day for at least 30 min each time; Gastrointestinal decompression; Closed thoracic drainage POD3 Nasojejunal tube feeding 1000 mL (40 mL/h); Sit in the chair 3 times for at least 30–60 min each time.; With help, walk twice in the hallway.; Do deep breathing exercise; Remove nasogastric tube; Closed thoracic drainage; POD4 Nasojejunal tube			

Study	Intervention and comparison	Population	Outcomes	Comments
	feeding 1000 mL (40 mL/h); Sit in the chair 3 times today for at least 30–60 min each time.; Walk the length of the hallway 3 times; Continue to do breathing exercises; Closed thoracic drainage; POD5 Nasojejunal tube feeding 1500 mL (60–80 mL/h); Walk the length of the hallway 4–5 times. Sit in the chair 3 times today for at least 30–60 min; Continue to do breathing exercises; POD6 Nasojejunal tube feeding 1500 mL (60–80 mL/h); Remove chest tube;Walk the length of the hallway 4–5 times. Sit in the chair 3 times today for at least 30–60 min; Continue to do breathing exercises; POD7 Gastrografin opacification of upper gastrointestine; If swallow shows no leak, advance patient to oral drink; Nasojejunal tube feeding 1500 mL (60–80 mL/h);Expand mobilization (>4 h out of bed); Continue to do breathing exercises; POD8 Increase liquid diet; Decrease Jejunostomy tube feeding (500 ml or 1000 ml); Expand mobilization (>6 h out of bed); Continue to do breathing exercises; POD9 Remove Nasojejunal tube; Full liquid diet; Expand mobilization (>6 h out of bed); Continue to do breathing exercises; POD 10-11 Soft diet and liquid diet; Nearly out of bed; Observe whether there is delayed anastomotic leakage; POD12 Discharge home on soft diet and liquid diet N=138			
Delaney 2003[38]	ERP: Patients were seen by the Colorectal Nurse Manager and given information. CREAD patients received supporting written information documenting the expected postoperative milestones. Orogastric tubes placed during anaesthesia were removed before extubation.	Any patients scheduled for elective segmental intestinal or rectal resection by laparotomy, including patients undergoing reoperation or pelvic surgery and those with comorbidities, were	• Length of hospital stay • Readmissions • Pain score (VAS) – day 2	

Study	Intervention and comparison	Population	Outcomes	Comments
	Patients were permitted to walk and were offered liquids as desired on the evening of surgery. Analgesia was supplemented with 30 mg of intravenous ketorolac every six hours as needed. On Postoperative Day (POD) 1, patients were encouraged to walk at least one circuit of the nursing floor (approximately 60 meters) up to five times, to sit out of bed between walks, and to do regular incentive spirometry. They were allowed non-carbonated liquids ad libitum and were offered solid food that evening if tolerating oral fluids, without waiting for signs of intestinal function. Oral analgesia (oxycodone) was started on POD 2 if either liquids or diet was being tolerated, and the patient-controlled anaesthesia was discontinued. A wall chart was placed opposite the bed emphasizing the walking, incentive spirometry, and above dietary allowance of the CREAD program. Oxycodone (5 mg) was used because it has been the standard oral analgesic at this institution in recent times, and patients were prescribed to take one to two tablets every four to six hours as needed. N=31 Standard care N=33	eligible for inclusion in the study. Age (mean) ERP: 50.6 ± 16.9; Standard care: 41.9 ± 13.3 USA	• Pain score (VAS) – Discharge/Day 10 • Pain score (VAS) – Day 30	
Deng 2017[41]	ERP: Day before surgery: Normal oral nutrition until 10 pm; No pre-anaesthetic medication; Day of surgery: Preoperative information given to patient, including daily milestones; Elastomeric analgesia pump: (flurbiprofen 300mg, tramadol 60 mg in 100-ml saline solution).Warm i.v.fluids, and upper and lower air-warming device; Avoidance of excessive i.v.fluid; First night in ICU (intensive care unit) Day 1-2: Patient sent back to surgical ward; Removal of naso-gastric tube if<200ml; Patient	Patients undergoing pancreaticoduodenectomy Age: (mean) ERP 54.5±12.7 (33-84) standard 51.3±15.0 (37-78) China	• Mortality • Hospital readmission • Complications • Length of hospital stay • Stay in ICU	

Study	Intervention and comparison	Population	Outcomes	Comments
	mobilized at least 4 times a day; Day 2: Continue mobilization minimum 4 times per day; Sip of warm water at rate≤30ml/h; Metoclopramide os to prevent nausea and vomiting Day 3: Urinary catheters removed; Stop elastomeric pump; Clear oral liquid; Enhanced mobilization; Day 4: Soft solid diet; Day 5: Dietary increase on daily basis; Medical oncology and radiation oncology consults(if appropriate); Day 7-10: Removal of drainage tubes if no pancreatic/biliary fistula and <200ml; Discharge: Absence of fever for more than 48h; Day 8-11: Able to take solid food; Passage of normal stools; Adequate mobilization; Acceptance of discharge by the patient N=76 Standard Care: The conventional perioperative parameters included routine perioperative bowel preparation with regular oral antibiotics and no oral intake for 12 hours before surgery. The naso-gastric tube was kept in place until day 7 after surgery with no scheduled early mobilization. The oral liquid intake was resumed from day 7 and a stepwise oral intake recovery was allowed with only water for the first two days followed by resumption of liquid diet during the next 4 days. Later, mashed hard food intake was allowed. N=83			
Dickson 2017[43]	ERP: Standardized preoperative counselling, including a one page scripted discussion of expectations with emphasis on the benefits of decreasing narcotic use as well postoperative expectations with regards to early ambulation, eating, and criteria for discharge. Allowed regular diet until 6 hours before	All patients with a planned laparotomy on the gynaecology oncology service AGE: (mean) ERP 55.4 (52.3-58.5); Standard	• Complications • Length of hospital stay • ICU admission	

Study	Intervention and comparison	Population	Outcomes	Comments
	surgery and allowed clear liquids until 2 hours before surgery. Routine mechanical bowel preparation discouraged unless planned bowel resection. perioperative anaesthesia included either placement of spinal block with 16mg isobaric tetracaine with 0.2mg epinephrine was and 0.1mg preservative free hydromorphone given at level L3-4 or a T12 epidural using 0.125% bupivacaine at a rate of 8 - 12ml per hour. Also received bilateral transversus abdominis plane infiltration with liposomal bupivicaine. IV fluids was restricted to 1cc/kg per hour and phenylephrine was used to maintain blood pressure. Encouraged to ambulate within 2 hours after surgery and offered a regular diet immediately. Pain management included oral acetaminophen and ibuprofen followed by narcotic medications as needed as well as epidural use if this was used prior. Foley catheter removed when patient able to ambulate. Referred to physical therapy during their hospital stay. N=56 Standard care N=56	care 56.0 (52.8-59.2) USA		
Dong 2017[46]	ERP: Preoperative education: Concept of FTS; Diet: took 1000 ml of 10% glucose orally at the night before operation; took 200 ml of 10% glucose orally 2 h before operation; Preoperative sedation to improve sleep; Indwelling catheter after anaesthesia; Intraoperative warming; Postoperative analgesia: Patient-controlled epidural analgesia—oral use of nonsteroidal analgesic painkillers for 48 h; Postoperative amount of fluid: Fast intravenous infusion of 250 ml saline within 1 h: the rest were	Patients diagnosed with primary pulmonary adenocarcinoma or squamous cell carcinoma via biopsies guided by video bronchoscopy or CT scan and never received chemotherapy or radiotherapy; Surgery: Lung cancer associated Pneumonectomy	• Complications • Post-operative length of stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	the same as the conservative group; Diet 6 h postoperatively: 400 ml liquid form; Measures to promote bowel movements: Chewing gum; Early extubation of urinary catheter: 12 h postoperatively; Early exercise: Active bed activities of the lower limbs; N=17 Standard Care: Preoperative education :Concept of standard manner Preoperative diet: Fasting for 6 h Preoperative sedation to improve sleep; Indwelling catheter after anaesthesia; No intraoperative warming; Patient-controlled epidural analgesia; Total postoperative intravenous infusion volume within 24 h should be <1500 ml, with a intravenous infusion rate of 20–30 ml min; if hypotension appeared or urine volume was <20 ml/h, vasoconstrictors were used; Diet 6h postoperatively: small amount of water; No measures to promote bowel movements; Early extubation of urinary catheter - 24 h postoperatively; Early exercise following patients will; N=18	Age: Mean (range) FTS 55.1 (44-65); conventional 56.6 (50-65) China		
Fei 2015[52]	ERP: Preoperative management: 1. Detailed information	Inclusion criteria: SDPD-PV for PHT; (2) not combined with hepatic	• Complications Grade I (Clavien –Dindo)	

Study	Intervention and comparison	Population	Outcomes	Comments
	given to the patient regarding the therapeutic course, preoperative patient education focusing on recovery expectations 2. Preoperative respiratory physiotherapy; 3. Avoidance oral fluid intake 12 hours before operation; Intraoperative management: 1. Keep warm temperature in the operating room, warm normal saline to wash the abdominal cavity, and drip administration at a controlled temperature; 2. Ultrasound knife and reabsorbable clips were used for dissection and vessel ligation 3. Antibiotic prophylaxis 4. Anaesthetic protocol: insertion of epidural catheter (level T8-T9) 5. Adjusted hydration: replacement of blood loss and imperceptible loss at the rate of 6-8 mL/kg/h 6. Control infusion fluid, especially excessive crystalloid solution Postoperative: 1. Catheter with local anaesthetics in continued perfusion, and removal of epidural analgesia 48 hours postoperatively 2. Respiratory physiotherapy and atomizing inhalation of Ambroxol during the first 72 hours; 3. Removal of the abdominal drains after 48 hours if no more bloody fluid is observed; 4. Discontinuation of gastric decompression by 8 a.m. the day after surgery 5. Patients are encouraged to drink immediately after recovery from anesthesia. After flatus and oral tolerance is reached, a gradual transition from semi-liquid diet to soft diet/low fiber solid food 6. Removal of foley catheter on the third postoperative day 7. Intravenous injection furosemide (20mg /q.d) .during the first 72 hours. Thereafter, change to oral furosemide (20mg b.i.d.). 8. Prokinetic and somatostatin 9. Mobility, as much as possible from the first postoperative day (moving patients to a chair). 10. An emphasis on minimization of intravenous fluids to keep patients	tumor; (3) without severe cardiopulmonary disease; (4) Child-Pugh score <10. Surgery: Devascularisation for cirrhotic portal hypertension Age: Mean FTS 46.3 years +/- 6.9; Non-FTS 44.9 years +/-8.1 China	• Complications Grade II (Clavien –Dindo) • Complications Grade III (Clavien –Dindo) • Length of hospital stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	at their baseline weight. 11. Supplement plasma or human albumin on the basis of liver function and albumin values discretionarily to maintain concentration of serum albumin not less than 30g/L N=63 Standard care N=62			
Feng 2013[53]	ERP: Diet before surgery: Intake of 1000 mL 14% carbohydrate drink 12 h before and 350 mL 14% carbohydrate drink 3 h before surgery. anaesthesia: Tracheal intubation and general anaesthesia; Thermal insulation of the body and extremities, body temperature was maintained at 36 ℃; Operation procedure: Standard laparotomy approach; No routine use of abdominal drainage tube; Analgesia after operation: Infiltration of surgical wounds with ropivacaine at the end of surgery and 24 h after surgery. Oral intake of 200 mg celecoxib twice daily; Mobilization after operation: Encourage patients to mobilize out of bed; Diet after operation: Encourage patients to mobilize out of bed Oral intake of 500-1000 mL glucose saline on the day of surgery. Intake of 2000-3000 mL liquid food containing 1000 kcal to 1200 kcal per day from the 1st day after surgery; Intravenous nutrition after operation: Infusion of parenteral nutrition iv if oral intake is not adequate. Appropriate level of iv fluid intake based on the volume of liquid intake and output, and physiological need; Removal of nasogastric tube within 24 h after surgery; Removal of urine catheter	Inclusion criteria: 1) diagnosis of gastric cancer based on clinical symptoms, imaging and pathology; (2) age between 18 and 75 years; (3) no preoperative radiotherapy or chemotherapy; (4) no distant metastasis; (5) no history of primary diabetes mellitus, bowel obstruction, severe cardiopulmonary diseases, and immune related diseases; (6) no pregnancy or breast feeding; (7) an American Society of Anaesthesiologists (ASA) score of Ⅰ or Ⅱ; (8) undergoing elective standard D2 total gastrectomy; and (9) written informed consent was obtained from the patient and the family.	• Mortality • Complications • Post-operative length of stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	within 24 h after surgery; Standard use of antibiotics before and once after surgery; Infusion of parenteral nutrition iv if oral intake is not adequate. Appropriate level of iv fluid intake based on the volume of liquid intake and output, and physiological need Removal of nasogastric tube within 24 h after surgery; Removal of urine catheter within 24 h after surgery; Standard use of antibiotics before and once after surgery; N=61 Standard care N=61	Surgery – radical total gasterectomy Age: (mean) Fast track 54.98 +/-11.35; Conventional 55.79 +/-10.06 China		
Feng 2014[54]	ERP: Normal meal until 10pm the day before surgery, 250ml of 5% carbohydrate drink 2 hours before surgery, no bowel preparation, tracheal intubation and general anaesthesia; thermal insulation of the body and extremities, body temperature maintained at 36C, laparoscopic anterior resection with total mesorectal excision, no routine use of abdominal drainage tube; wound infiltration with ropivacaine at the end of 24 hours of operation, 200mg celecoxib twice a day, movement out of bed for 1 hour night of surgery and 4 hours per day after 24 hours of surgery, oral intake of 250ml glucose saline mixed with water of 30-50mL every 1 - 2 hours on postoperative day 1, appropriate level of IV fluid intake based on the volume of liquid intake and output; removal of nasogastric and urine tubes on postoperative day 1. N=60 Standard Care:	patients diagnosed with rectal cancer based on clinical symptoms, imaging, and pathological evidence, with no findings of tumor invasion to adjacent organs, local or distant metastasis; aged 18 - 75 years; in the absence of preoperative radiotherapy or chemotherapy; ASA status of I or II Surgery: Radical anterior resection with total mesorectal excision, rectal cancer patients Age: mean Conventional group 56.31 ± 11.52; Fast track 53.95 ± 11.95	• Complications • Post-operative length of stay • Readmission • Postoperative pain (VAS scale)	

Study	Intervention and comparison	Population	Outcomes	Comments
	Normal meal until 10pm the day before surgery, routine bowel preparation; tracheal intubation and general anaesthesia, no thermal insulation, room temperature maintained at 22C; laparoscopic anterior resection with mesorectal excision, use of abdominal drainage tube; standard use of patient-controlled analgetic pump, encourage movement out of bed; IV infusion of glucose saline and amino acid injection at the end of the surgery, IV infusion parenteral nutrition before oral intake, appropriate level of IV fluid infusion based on the volume of liquid intake and output as well as physiological need; removal of NG tube after flatus and removal of urinary catheter on the 3rd day after operation N=60	China		
Feng 2016[55]	ERP: Preoperative Preoperative assessment, detailed discussions with the patient and the patient's family about FTS management. Free diet, but with the limitation of fiber; a solid-food fast 6 h before surgery and the consumption of liquid food only (no milk or beverages containing fat); nil by mouth 2 h before surgery; 250 ml of carbohydrate-rich drink 2–3 h prior to surgery • No mechanical bowel preparation; only oral intestinal cleaner 12 h preoperation. No need for liquid stool. Single-dose antibiotic prophylaxis. No routine use of nasogastric tube or urinary catheter Intraoperative. Continuous epidural anaesthesia; Right-sided colon resection via a T6–T7 level catheter; sigmoidectomy with a T9–T10 level catheter; rectectomy viaaL1–L4 level catheter If general anaesthesia is used, an adequate dose is	Age between 18 and 70 years; a histological diagnosis of CRC with enteroscopy, followed by colorectal surgery; no radiotherapy or chemotherapy treatment; no severe diarrhoea, liver, and kidney function failure or cardiopulmonary insufficiency; an American Society of Anaesthesiologists (ASA) grade of I–III; a body mass index (BMI) between 18.5 and 30; and an abdominal CT examination that found no obvious lymph node or distant metastasis.	• Complications • Post-operative length of stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	administered with the first injection. Minimally invasive techniques. Hypothermia prevention; the intraoperative core temperature is maintained at 36± 0.5 °C. Postoperative: Postoperative day 1: For non-hypovolemia patients, give fluids at most up to1500 ml/kg · day. If a nasogastric tube was placed, remove it after 12 h. Remove urinary catheter for patients who underwent colon and upper rectal segment surgery. If drainage tube was placed, remove it after 24 h. Early oral feeding of water or tea at 12 h:, oral feeding of emulsion (Fresubin®), 50 % of total dose over 24 h (total energy: 25–30 kcal/kg · day). Mobilization of patient in the evening (2 h of sitting up or standing). Regular pain control with a patient-controlled analgesia (PCA) pump administering 96 ml/2 ml/h of opioid-sparing multimodal analgesia, including oral paracetamol, non-steroidal anti-inflammatory drugs, gabapentanoids. No regular parenteral nutrition support postoperative day 2: Fluid restriction to 1000 ml/kg · day. Remove urinary catheter for patients who underwent rectal lower segment surgery. Mobilization of patient in the ward (4–6h out of bed). Urinary catheter kept in place for 1–3days. Normal diet or emulsion (100 %of total dose over 48 h; total energy of 25–30 kcal/kg · day) Postoperative days 3–5: Fluid restriction to 500 ml/day. Discharge criteria: Stable vital signs, alert and oriented state of consciousness, absence of complications or symptoms, autonomous walking, possibility of solid diet consumption, no fluid transfusion, successful first flatus, spontaneous diuresis, self-sufficiency in basic daily activities N=121	Surgery: Colorectal surgery Age mean FST 58.12 +/- 11.04; Traditional 58.31 +/- 10.89 China		

Study	Intervention and comparison	Population	Outcomes	Comments
	Standard care N=120			
Forsmo 2016[59]	ERP: ERP group received preoperative counselling, feeding, carbohydrate feeding, no bowel preparation, no premedication and no antimicrobial prophylaxis. Intraoperatively, patients were given total intravenous anaesthesia, were fluid restricted, measures were taken to prevent hypothermia with minimally invasive incisions and epidural anaesthesia. Post operatively, there was no routine use of NG tubes, no use of drains for colon surgery, enforced postoperative mobilization and feeding, no systemic morphine use, with standard laxatives and early removal of urinary catheter. All patients were allowed to drink clear liquids up to 2 hours before surgery. Bowel preparation did not include enema. All patients also received thromboembolic prophylaxis, preoperative antibiotics and prevention of hypothermia. In both groups, patients were encouraged to mobilize early starting immediately after surgery and were allowed to eat and drink if they wanted to. N=162 Standard Care: Patients within the standard care group were given antimicrobial prophylaxis. Intraoperatively had gas induction for anaesthesia with mechanisms to prevent hypothermia and epidural anaesthesia. Postoperatively also had no routine use of NG tubes and drains for colon surgery. All patients were	Adult patients above 18 years scheduled for malignant or benign diseases, with or without stoma. Patients with rectal cancer who had had pelvic radiation were also included. Surgery: Colorectal surgery Age median ERP 65 (23-89) & Standard care 66 (19-93) Norway	• Mortality • Length of hospital stay • Admissions to ICU • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	allowed to drink clear liquids up to 2 hours before surgery. Bowel preparation did not include enema. All patients also received thromboembolic prophylaxis, preoperative antibiotics and prevention of hypothermia. In both groups, patients were encouraged to mobilize early starting immediately after surgery and were allowed to eat and drink if they wanted to. N=162			
Fransen 2018[61]	Enhanced recovery: In the fast-track protocol (FP), no tourniquet was used during the operation. Omitting the tourniquet was assumed to reduce pain, bleeding and swelling after surgery, thereby leading to a possible faster activation of muscle function and performance. The operation was performed through a subvastus approach, a patella-in-place balancer was used, and patients received intra-operative local infiltration analgesia (LIA). All patients received a patella component. The risk for infection was minimized by not using pain pumps, wound drains or bladder catheters. The post-operative protocol focused on rapid mobilization under guidance of a physiotherapist. Postoperatively patients received paracetamol 1000 mg four times a day, diclofenac 50 mg three times a day (unless they had an allergy for non-steroidical anti- inflammatory drugs) and oral oxynorm 5 mg only when needed. Patients in the FP were told to expect being discharged from the hospital 2 days after surgery. N=25	Patients were eligible for inclusion if they required a primary unilateral TKA, had American Society of Anaesthesiologists (ASA) status I or II, and were willing and able to comply with the scheduled postoperative clinical and radiographic evaluations and with the rehabilitation program. Surgery: total knee arthroscopy Age – mean (SD): Enhanced recovery: 64 (9); standard care: 61 (7) Netherlands	• Length of stay • Postoperative pain scores • Quality of life (SF 12)	Postoperative pain scores and SF12 scores reported as mean difference from baseline

Study	Intervention and comparison	Population	Outcomes	Comments
	Standard care: The regular protocol (RP) group underwent the regular hospital TKA protocol, which included the use of a tourniquet, wound drains and bladder catheter. The operation was per- formed through a midline approach. All patients received a patella component. Mobilization was started the first day after surgery, and patients were told beforehand that the average discharge was 4 days after surgery. Similar to the FP, postoperatively patients received identical doses of paracetamol and diclofenac. Contrary to the FP group, patients started with a patient-controlled analgesia (PCA) pump with intravenous morphine. Patients in both groups reduced opioid use as soon as pain allowed this. N=25			
Frees 2018[64]	ERP: Counselled by trained ward staff and instructed how to complete the diary and questionnaires. Two nutritional drinks were taken by the patients the evening before surgery. No preoperative bowel preparation was initiated. Intraoperative fluids were limited by real time targeting of cardiac output using vascular pressure of Doppler monitoring. Low molecular weight heparin was prescribed for 4 weeks and compression stockings were prescribed for the time of hospital stay. Epidural analgesia was used if not contraindicated. First post-operative day, patients received two nutritional drinks daily for 7 days and were advised to have 30-60ml clear fluids per hour. Metoclopramide was prescribed until first bowel movement. Chewing gum was prescribed for	Patients with previously diagnosed bladder cancer with an indication for radical cystectomy. In addition, patients were required to complete a QoL questionnaire, study subject diary, and subject experience and satisfaction questionnaires. Surgery: radical cystectomy Age mean total 68.33; ERP - 65.75 (49-86),	• Complications • Length of hospital stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	first 7 days and patients were instructed to chew a new piece every 2 - 3 hours. Second postoperative day, patients were allowed a light diet (clear fluids including gelatine based food) as tolerated. Daily diary served as a retrospective measurement tool to assess how well patients followed each protocol. N=15 Standard Care: Preoperative bowel preparation, patients fasted from midnight prior to the day of surgery and until the first incident of flatulence. Compression of stockings and low molecular weight heparin was prescribed only for the duration of the hospital stay. NG tubes were not routinely placed perioperatively. Customarily pro-motility agents were not used and nor were patients advised to chew gum. Patients did not receive nutritional counselling. Diet was initiated with clear fluids on the first day after flatulence and then escalated from a soft to a full diet on the following days as tolerated. Pain was managed with epidural anaesthesia unless contraindicated. N=15	standard 70.4 (51-84) Canada		
Fujikuni 2016[65]	ERP: Patients in both groups were managed perioperatively using equivalent standardized clinical pathway protocols except for perioperative nutrition and intravenous fluid. STANDARD CARE Preoperative: 2 days before the surgery Normal diet + water; Intraoperative+1 day	Consecutive patients who underwent gastrectomy at the Department of Gastroenterological and Transplant Surgery Age: 40 patients were assigned to each of the	• Quality of life • Complications • Length of hospital stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	after the surgery: No oral intake; Postoperative: 2 days after the surgery till 8 day of surgery- Water; 3rd day after the surgery - 8th day after the surgery - Liquid diet (3 steps up to a soft diet every 2d); In the EG, intravenous fluid was restricted to a minimal daily requirement during the first 3 postoperative days. Additional intravenous fluid was administered when patient showed poor oral intake of water or food. The CG received intravenous fluid for 1 wk postoperatively. Regarding perioperative oral nutrition, patients in the EG received 875 mL of carbohydrate-rich (157 g). fluid until 2 h before the surgery. On POD 1, the patients commenced oral intake with water and oral rehydration solution. On POD 2, patients began to consume a liquid diet. In the CG, patients were allowed to drink water until the day before the surgery. On POD 2, these patients commenced oral intake beginning with water; liquid diets were offered on POD 3 N=40 Standard care N=40	conventional treatment group (CG) and the ERP group (EG). Patients were assigned according to the stratified randomization method by age (< 70 vs ≥ 70) and surgical approach (abdominal vs laparoscopic surgery). All patients completed their treatment. <70 years ERP=29 Standard= 28; >/=70 years ERP 11, Standard=12 Japan		
Gatt 2005[67]	ERP: 7 - 14 days probiotic and prebiotic to be taken daily. patients were admitted a day before surgery and were allowed to eat and drink freely until midnight. Carbohydrate drink administered night before surgery and 3-4 hours preoperatively. Patients did not receive bowel preparation. In perioperative period, patients were maintained on a high inspired oxygen concentration (80%). Patients received epidural analgesia through a catheter, with bupivacaine and fentanyl to cover the intraoperative period and up to 36 hours after operation.	Patients requiring elective colorectal surgery and living independently at home Age Median control 67 (60-73) & optimized 67 (59-76) UK	• Mortality • Complications • Post-operative length of stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	Transverse abdominal decisions were performed whenever possible. No drains left at the end of the procedure and any nasogastric tubes placed during surgery were removed on completion of the operation. Patients were allowed fluids immediately after surgery, and diet was introduced as tolerated. Followed structured mobilization plan involving sitting out of bed on the day of surgery and walking the length of the walk on the first postoperative day. N=19 Standard Care: Patients were admitted one day prior to surgery, received bowel preparation and fasted from midnight. The protocol for anaesthesia and postoperative pain was epidural analgesia through a catheter, with bupivacaine and fentanyl to cover the intraoperative period and up to 36 hours after operation. Vertical (midline or paramedian) incisions were used and nasogastric tubes and abdominal drains were placed according to the surgeons preference. After surgery, patients had oral fluids and diet introduced in a traditional stepwise manner. All received postoperative chest physiotherapy and were mobilized by nursing staff. N=20			
Gonenc 2014[69]	ERP: Preoperative: placement of a nasogastric tube, the administration of crystalloids for fluid replacement, intravenous antibiotherapy with cefuroxime (1,500 mg every 12 hours),	Patients with a perforated ulcer less than 10 mm in size who underwent laparoscopic Graham patch repair	• Mortality • Complications • Length of hospital	

Study	Intervention and comparison	Population	Outcomes	Comments
	intravenous pain relief with tramadol (100 mg every 6 hours), and intravenous acid-reducing therapy with pantoprazole (40 mg every 12 hours). Patients older than 45 years and who had risk factors for venous thrombosis received subcutaneous thromboprophylaxis with enoxaparin. Intraoperative: All of the surgical procedures were performed under general anaesthesia; The gastric content was aspirated via the nasogastric tube by the anaesthesiologist at the end of the procedure, and the nasogastric tube was withdrawn in the operating room immediately after the patient had recovered from anaesthesia. Postoperative: POD 0: Nil by mouth; No nasogastric decompression; Removal of the urinary catheter; Diclofenac (75 mg every 12 hours IM); Pantoprazole (40 mg every 12 hours IV); Metoclopramide (10 mg every 8 hours IV). POD 1: Liquids; Diclofenac (75 mg on demand IM); Pantoprazole (40 mg every 12 hours IV); Metoclopramide (10 mg every 8 hours IV). POD2: Soft food; Acetaminophen (500 mg on demand PO); Pantoprazole (40 mg every 12 hours PO). POD 3: Normal food; Acetaminophen (500 mg on demand PO); Pantoprazole (40 mg every 12 hours PO); Moxifloxacin (400 mg daily PO); Discharge. N=26 Standard Care: Preoperative: placement of a nasogastric tube, the administration of crystalloids for fluid replacement, intravenous antibiotherapy with cefuroxime (1,500 mg every 12 hours), intravenous pain relief with tramadol (100 mg every 6 hours), and intravenous acid-reducing therapy with pantoprazole (40 mg	Age (mean) ERP: 35.4 ± 13.2 years (range 18-66); Control: 37.8 ± 14.3 (range 18-71) Turkey	stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	every 12 hours). Patients older than 45 years and who had risk factors for venous thrombosis received subcutaneous thromboprophylaxis with enoxaparin. Intraoperative: patients left the operating room with their nasogastric tube in place. Postoperative: The urinary catheter was removed on postoperative day 1. Postoperative pain was managed with tramadol (100 mg every 6 hours intravenously). Intravenous metoclopramide (10 mg every 8 hours) was administered for the first 2 postoperative days. The intravenous acid-reducing therapy with pantoprazole (40 mg every 12 hours) was continued throughout the hospital stay. The nasogastric tube was not withdrawn until the drainage was less than 300 mL/d. Oral intake of liquids was started after active bowel movements had begun. The sub hepatic drain was withdrawn 12 hours after the initiation of oral intake. After the oral feeding had been initiated, tramadol was switched to oral acetaminophen. Patients were discharged only after showing complete tolerance to oral feeding and the passage of wind or stool in the absence of any postoperative complications. N=36			
Gralla 2007[70]	ERP: Preoperatively: Preoperative diagnostics; informed consent; breakfast; lunch; soup for dinner; two enema at night; drinking until 24:00; advised discharge POD3. Intraoperatively(surgical/analgetic): Cefuroxim/metronidazol; 12 mmHg pneumoperitoneum; 37°C, scrotal jockstrap; Piritramid, metamizol, parecoxib, 200 mg	Patients up to ASA III were included in the study; localized prostate cancer Age: (mean) Conventional: 62.27 ± 7.01; Fast Track: 61.80 ±	• Mortality • Complications • Post-operative length of stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	erythromycin. •Postoperatively Operation day: 1,500 ml i.v. volume; 2 h postoperatively tea/water; 4 h postoperatively yoghurt; 200 mg Erythromycin; 40 mg parecoxib; walking in patients room and ward. POD1: No i.v. volume; “light” hospital diet; 120 mg etoricoxib; mobilization out of bed at least 8 h. POD2: No i.v. volume; normal nutricion; 120 mg Etoricoxib; bed just for sleeping POD3: debriefing and discharge. POD5: ambulatory micturating cysto-urethrogram N=25 Standard Care: Preoperatively: Preoperative diagnostics; informed consent; breakfast, no further oral nutrition; 3,000 ml Klean prep, advised discharge 6–8 postoperative day. Intraoperatively (surgical/analgetic): Cefuroxim/metronidazol 15 mmHg; pneumoperitoneum 18°C; Piritramid, metamizol, PCA-device. Postoperatively Operation day: 2,500 ml i.v. volume; no oral nutricion; PCA, metamizol; mobilization: upright position. •POD1: 2,000 ml i.v. volume; 600 ml tea/water 24 h; PCA; metamizol; mobilization in patients room •POD2: 500 ml i.v. volume; tea/water; PCA, metamizol; mobilization on ward. POD3: No i.v. volume; tea/soup; PCA; metamizol; mobilization on the ward. POD4: No i.v. volume; light hospital diet; metamizol; mobilisation on the ward. POD5: No i.v. volume; normal nutrition; metamizol; mobilization on the ward; Micturating Cysto-urethrogram for anastomosis tightness. POD6: debriefing & discharge N=25	4.75 Germany		

Study	Intervention and comparison	Population	Outcomes	Comments
He 2015[74]	ERP: Patients in the ERP group underwent conventional perioperative care combined with enhanced rehabilitation nursing. Pre-surgery education was provided (details about rehabilitation time of each stage, suggestions to promote rehabilitation, suggestions about early oral feeding and out of bed); preoperative preparation (reducing the fasting time from conventional 12-2h, preoperative glucose administration, antibiotic prophylaxis and prevention of hypothermia); postoperative rehabilitation programs (early oral intake and deambulation without using laxatives, control of infusion volume, enteroplegia) to promote the recovery of intestinal function. Patients received antibiotics and antithrombotic prophylaxis before surgery. All patients received the same standardized anaesthesia. Gastric tube or drainage tube will not be routinely indwelled. Urine catheter was removed at POD 1 and fluid infusion restricted to <2500mL/day. Water intake began at 4h after surgery and liquid diet restored at 12 h after surgery. Patients were encouraged to do ambulation and stretch gradually. N=50 Standard care N=49	Inclusion criteria: all lesions <10cm and benign and malignant liver lesions suitable for laparoscopy were included Surgery: left or right hemicolectomy Age (mean) ERP 56.3 ± 16.3; traditional 60.4 ± 20.7 China	• Mortality • Complications • Length of hospital stay • Readmission	
Ionescu 2009[79]	ERP: Preoperatively: Information of surgical procedure, expected length and daily milestones for recovery; No bowel preparation except fluids for the last 18 h; Carbohydrate fluids load 3 h before operation. Day of surgery: Mobilized in bed (turning, sitting in bed);	Patients with colorectal neoplasm needing open colorectal surgery Age (mean) FT: 60.94 ± 9.9; Conventional: 63.1 ± 12.19	• Complications • Length of hospital stay • Admission to HDU	

Study	Intervention and comparison	Population	Outcomes	Comments
	Fluids if tolerated (no NG tube unless severe PONV); Multimodal analgesia; Prokinetics: Metoclopramide. Postoperative day 1: Mobilized out of bed (walking); Fluids; Solid food (yogurt, cheese); Remove bladder catheter; Multimodal analgesia; Discharge on the surgical ward (if possible). Postoperative day 2: Solid food (normal feeding); Multimodal analgesia (NSAID, paracetamol, weak opioids if needed); Discharge on the surgical ward; Remove epidural catheter (if present) N=48 Standard Care: Preoperatively: Patient information; Mechanical bowel preparation; No fluids morning of operation. Day of surgery: Mobilized in bed; Nasogastric tube, nil by mouth; Multimodal analgesia. Postoperative day 1: Mobilized out of bed; Nil by mouth; Nasogastric tube; Bladder catheter in place; Multimodal analgesia; Discharge on the surgical ward (if possible). Postoperative day 2: If bowel passage, remove nasogastric tube, fluids orally (if not, maintain nasogastric tube); Multimodal analgesia (NSAID, paracetamol, weak opioids if needed); Discharge on the surgical ward; Remove epidural catheter (if present); Remove bladder catheter N=48	Romania	• Readmission	
Jensen 2015[80]	ERP: preoperative (2 weeks before surgery): pre-habilitation (exercise programme - information about standard goals for patient involvement	All patients scheduled for radical cystectomy owing to localized muscle invasive bladder cancer or high risk non muscle	• Mortality • Complications Grade I (Clavien –Dindo)	

Study	Intervention and comparison	Population	Outcomes	Comments
	concerning mobilization, exercise training and urinary diversion; step training on a step trainer (15 mins per session); six different muscle strength and endurance exercises; telephone call after 1 week to check adherance); perioperative: infection prophylaxis (single doses); mini laparotomy or robot assisted radical cystectomy; standardized anaesthesia and analgesia throughout surgery; Postoperative: post-habilitation (exercise programme and enhanced mobilization - increasing scheduled time out of bed and walking distance; physical therapy twice per day for 7 days; discharged home with home training exercise programme) N=50 Standard Care: Preoperative: nutritional screening and counselling (oral supplements where recommended); patient education (lifestyle issues, alcohol, smoking and postoperative care); counselling on choice of urinary diversion. Evening before surgery - emptying of rectal ampulla and fasting from midnight. Carbohydrate loading 4h before surgery. Intraoperative: infection prophylaxis (single doses); mini laparotomy or robot assisted radical cystectomy; standardized anaesthesia and analgesia throughout surgery. Postoperative: first 72h, sub-fascial pain buster providing continuous infusion of bupivacaine, supplemented with oral paracetamol; prevention of nausea; thromboembolism prophylaxis (compression stockings and Fragmin injections); early oral intake with oral supplements; standard mobilization supervised by physiotherapist; and early removal of	invasive bladder cancer Age (mean) Intervention: 69 (66-72 95% CI) range (46-85); Standard 71 (68-73 95% CI) range (47-91) Denmark	• Complications Grade II (Clavien –Dindo) • Complications Grade III (Clavien –Dindo) • Complications Grade IV (Clavien –Dindo) • Complications Grade V (Clavien –Dindo) • Length of hospital stay • Readmission • Pain	

Study	Intervention and comparison	Population	Outcomes	Comments
	IV and urinary catheters. N=57			
Jia 2014[82]	ERP: Preoperative preparation: Oral purgatives; No mechanical enema; Normal meal until 6 h before surgery; Normal carbohydrate drink until 2 h before surgery; No nasogastric tube insertion; No antibiotics. anaesthesia: Thoracic epidural. •Pain control: Ropivacaine2mg/ml via PCEA for 48 h; Opium-derived agents were excluded; No routine drainage tube placement. Postoperative management: water was allowed from 6 h post-operation, liquid diet in the morning and semiliquid diet at noon and evening of the first and second postoperative days, regular diet on POD 3; Urinary catheter withdrawal on POD 1–2; Out-of-bed mobilization on POD 1. N=120 Standard Care: Preoperative preparation: Liquid diet for 3 days; Mechanical enema(1time/day) for 3 consecutive days; Fasting at 8 h; Drink deprivation 4 h before surgery; Routine nasogastric tube insertion; Oral antibiotics administration for 3 days. Anaesthesia: general. Pain control: Fentanyl0.25 mg/ml; Midazolam0. 5 mg/ml; Nefopam1.0 mg/ml; via PCIA for 48 h; routine drainage tube placement. Postoperative management: liquid diet intake after recovery of bowel movement; Urinary catheter withdrawal at 3 to 5 days; Out-of-bed mobilization at 3 to 5 days.	Colorectal cancer; aged 70-88 Surgery: Colorectal surgery for colorectal carcinoma Age (mean) FTS: 75.66±4.18; Traditional: 74.78±4.01 China	• Complications • Length of hospital stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	N=120			
Jones 2013[84]	ERP: Before surgery: Information and education, including mobilization and dietary goals; Oral nutritional supplements; Carbohydrate drink. During Surgery: Standard anaesthetic protocol and surgical management; Thoracic epidural for postop. analgesia; All patients extubated and taken to level 2 HDU. POD 0: Eat and drink normally; Oral nutritional supplements; Goal-directed fluid therapy for 6h to optimize stroke volume; LiDCO rapid colloid boluses; Chest physiotherapy. POD1: Physiotherapy/mobilization twice daily; Stop i.v. maintenance fluid; Oral nutritional supplements; Eat and drink normally. POD2: Diamorphine 3mg via epidural; Epidural removed in the morning, or stopped and capped off if INR≥1·5; Regular oral analgesics and oral morphine as needed; Physiotherapy/mobilization twice daily; Urinary catheter removed 4h after epidural; Removal of surgical drains (if appropriate); CVC removed; Blinded assessment of discharge criteria. POD3+4: Physiotherapy/mobilization twice daily; Home if meets blinded assessment of discharge criteria; Blinded assessment of discharge criteria N=50 Standard Care: Before surgery: followed normal preoperative starvation guidelines of nil by mouth from midnight. During Surgery: Standard anaesthetic protocol and	Patients undergoing open liver resection Age (median) ERP: 64 (27-83); Standard care 67 (27-84) UK	• Mortality • Quality of life (EQ-5D) • Complications • Readmission • Length of hospital stay • Pain (VAS)	

Study	Intervention and comparison	Population	Outcomes	Comments
	surgical management; Thoracic epidural for postop. analgesia; all patients extubated and taken to level 2 HDU. POD0: Eat and drink normally; Fluid resuscitation to standard markers: CVP, urine output, lactate, mixed venous saturations; Fluid therapy at discretion of intensive care team. POD1: Physiotherapy once daily; Fluid therapy at discretion of intensive care team; Eat and drink normally. POD2: Epidural managed by acute pain team; Physiotherapy once daily; Removal of surgical drains (if appropriate); CVC removed at discretion of surgical team; Blinded assessment of discharge criteria. POD3+4: Epidural managed by acute pain team- usually removed on POD 3 or 4; Urinary catheter removed 12 h after epidural in accordance with current guidelines; Blinded assessment of discharge criteria. N=54			
Kapritsou 2017[87]	ERP: Preoperative: information about FT protocol given; no pre-anaesthetic medication; no bowel preparation. Day of surgery: mobilization after 4h after surgery; oral fluids intake (0.5L) 6h after operation; NG tube removal as early as possible after surgery; administration of paracetamol and avoidance of opioid drugs. POD 1: patients hydric diet (tea, soup, gelatin); removal of urinary drainage; paracetamol after numeric VAS; progressive mobilization at least 8 times out of bed. POD 2-3: normal diet. POD 4-6 discharge N=29 Standard Care:	Cancer patients who were eligible for surgical treatment and underwent hepatectomy or pancreatectomy up to 2 months after cancer diagnosis; ASA I-III; > 18 years of age; and normal level of consciousness and communication Age (mean) Fast track 58.48 (11.74); Conventional 63.00 (11.68)	• Complications • Post-operative length of stay • Pain	

Study	Intervention and comparison	Population	Outcomes	Comments
	Preoperative: information about protocol given to patient; no pre-anaesthetic medication; no bowel preparation. Day of surgery: no mobilization scheme; no oral intake scheme; no plan regarding NG tube after surgery; administration of opioid drug. POD 1: oral intake after mobilization; no plan regarding urinary drainage after surgery; continuation of opioid administration after evaluation with VAS; mobilization after POD1. POD 2-3: Continue as on POD1. POD 4-6: resumption of normal meals; mobilization of patient; PO analgesia administration N=34	Greece		
Khoo 2007[88]	ERP: Bowel preparation and intravenous fluid restriction: All patients were admitted the morning prior to surgery for standard bowel preparation with sodium dihydrogen phosphate given on admission and 12 hours later; allowed oral fluids up to 3 hours before surgery. Multimodal arm patients received no supplementary intravenous fluids until 3 hours before surgery but were encouraged to make up the loss through oral rehydration; Postoperatively, patients were allowed free oral fluids immediately after the operation. Intravenous fluids were discontinued when the patient was able to tolerate 200 mL of water over 30 minutes. Diet: nasogastric tubes were removed in the recovery room; diet was allowed immediately after the operation; received regular domperidone, magnesium hydroxide 8%, and liquid protein/calorie supplements from admission. Thoracic epidurals and pain relief: A thoracic epidural was attempted in the anaesthetic room in all patients; patient controlled analgesia	Colorectal cancer (colonic and rectal) Surgery: Colorectal resection for cancer Age (median) Multimodal: 69.3 (46.3-87.7); Control: 73.0 (46.4-84.6) UK	• Mortality • Complications • Length of hospital stay • Readmissions	

Study	Intervention and comparison	Population	Outcomes	Comments
	with morphine and cyclizine was used if a thoracic epidural was not possible. In the multimodal arm, the infusion rate was not adjusted unless there were features of narcotization, and epidurals were discontinued 48 hours postoperatively. Oral paracetamol (1 g every 6 hours) and ibuprofen (400 mg every 6 hours) were given from the immediate postoperative period. Mobilization: mobilization was encouraged from the night of the operation. Patients were encouraged to meet predefined mobility targets over the postoperative days. Urinary catheters were removed 24 hours postoperatively following colonic resection and at 72 hours after TME. N=41 Standard Care: •Bowel preparation and IV fluid restriction: All patients were admitted the morning prior to surgery for standard bowel preparation with sodium dihydrogen phosphate dihydrate given on admission and 12 hours later; allowed oral fluids up to 3 hours before surgery; and control arm patients received 125 mL/h of intravenous fluid starting from 2200 hours on the night of admission. The anaesthetist was free to follow the normal intraoperative fluid practice. Postoperatively, patients in the control arm were allowed 30 mL/h of oral fluids. This was increased stepwise (30 mL/h to 60 mL/h to free oral fluids) every 12 hours unless there was nausea. Sufficient supplementary intravenous fluids were given to maintain a urine output of at least 0.5 mL/kg per hour and a systolic blood pressure of □90 mm Hg. • Diet: Nasogastric			

Study	Intervention and comparison	Population	Outcomes	Comments
	tubes were inserted; nasogastric tubes were removed the following morning unless there was > 200 mL of free drainage overnight. Diet was commenced only on signs of returning bowel motility. In the multimodal arm, diet was allowed immediately after the operation. •Thoracic epidurals and pain relief: A thoracic epidural was attempted in the anaesthetic room in all patients; Patient controlled analgesia with morphine and cyclizine was used if a thoracic epidural was not possible; In the control arm, the epidural infusion rate was titrated against pain and narcotization, and removed when the rate was <1 mL/h; oral paracetamol (1 g every 6 hours) and ibuprofen (400 mg every 6 hours) were given from the immediate postoperative period given as required in the control arm. •Mobilization: patients were sat out and assisted to mobilize on the first postoperative day, but not normally aggressively mobilized until discontinuation of the thoracic epidural. Urinary catheters were removed following epidural. catheter removal N=40			
Kim 2012[90]	ERP: Day before the surgery: Preoperative education Normal meal at dinner; Oral carbohydrate-rich beverage at 10:00 p.m. (soybean drink; carbohydrate 3 %, 200 ml) IV carbohydrate loading: H/D 1,000 cc (125 cc/h); No bowel preparation The day of surgery: Apply intermittent pneumatic compressor; Tracheal intubation with general anaesthesia; Insertion of Foley catheter; No nasogastric tube drainage; Minimal invasive	Patients were included if they were diagnosed with gastric cancer that could be treated with laparoscopic distal gastrectomy. Specifically, eligibility criteria included pathologic confirmation of gastric adenocarcinoma; a pre-operative cancer stage of T1N0M0, T1N1M0, or T2N0M0; and	• Quality of life • Complications • Length of hospital stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	surgery; LAPD catheter insertion to preperitoneal layer Routine use of abdominal drain (closed drainage); Ambulation at evening as possible; Alert for thermostasis; POD1 Keep NPO; Continue local anesthetics perfusion (LAPD); Ketorolac tromethamine 15 mg IV q 8–24 h after surgery; Paracetamol 1 g IV q 6–72 h after surgery; Training and removal of Foley catheter 24 h after surgery; O2 inhalation 3 l/min until 8:00 a.m. Continue ambulation; POD2 Keep paracetamol 1 g IV q 6–72 h after surgery; Keep LAPD just until ending of the local; anaesthetics perfusion; SOW 48 h after surgery; Clear liquid diet at dinner; POD3: Clear liquid diet at breakfast; Full liquid diet at lunch and dinner; POD4: Soft diet at breakfast and lunch; Check discharge criteria; N=24 Standard Care: The day before surgery: Liquid diet at dinner; Midnight NPO; No bowel preparation; The day of surgery: Apply intermittent pneumatic compressor; Tracheal intubation with general anaesthesia; Insertion of Foley catheter; No nasogastric tube drainage; Minimal invasive surgery; IV PCA; Routine use of abdominal drain (closed drainage); POD1 Keep NPO; Keep IV PCA; No routine additional analgesics except IV PCA; Training and removal of Foley catheter 24 h after surgery; O2 inhalation 3 l/min until 8:00 a.m.; Ambulation 24 h after surgery;	location of the lesion in the lower half of the stomach. Age (mean) FTS 52.64 ± 11.57; Conventional 57.45 ± 14.54 South Korea		

Study	Intervention and comparison	Population	Outcomes	Comments
	POD2 Keep IV PCA just until ending of the analgesics infusion; SOW after flatus; POD3: Diet build-up; three steps (clear liquid–full liquid–soft diet), one step a day, from the day after start day of SOW; POD4: Check discharge criteria after soft diet intake; N=23			
Larsen 2008[98]	ERP: All patients, with a relative, were invited to an information day on the Friday before their week of surgery. The purpose of the information day was to inform the patients (in groups) of the accelerated path, and also to prepare the patients for surgery through individual consultations with the surgeon, anaesthetist, and nurse. Final blood tests, heart EKG, and radiographs were taken. All patients were hospitalized in the new accelerated unit on the day of surgery. The patients used their own clothes during the whole stay. Health Care staff worked to achieve written preset daily goals regarding: (1) information, (2) pain relief, (3) nausea control, (4) nutrition, (5) mobilization, and (6) elimination. (1) Information about the information day focused on partial goals during the hospital stay, the discharge planned for the fourth postoperative day, how to relieve pain, mobilization strategies, and how to get help. (2) Pain relief consisted of Oxycontin/Oxynorm and Paracetamol. (3) Zofran was used for control of nausea. (4) A nutrition screening was performed on the information day, and the patient ate according to this result in combination with a daily intake of two protein beverages, with a total fluid consumption of at least 2	Patients undergoing elective primary total hip arthroplasty, total knee arthroplasty, or unicompartmental knee arthroplasty Age (mean) Accelerated Intervention: 64 (10.8); Current Intervention 66 (9.2) Denmark	• Quality of life • Mortality • Length of hospital stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	liters. (5) Mobilization started on the day of surgery. On the first postoperative day, the goal was 4 h out of bed including training with a physiotherapist and an occupational therapist. Our aim was more than 8 h of mobilization per day for the rest of the hospital stay. (6) For elimination, we used Magnesia. Patients also followed a scheme with the above-mentioned preset goals for nutrition, fluid consumption, and mobilization. N=45 Standard care N=45			
Lee 2011[101]	ERP: Before admission: operative risk assessment; preoperative: counselling with patient and family, written informed consent, mechanical bowel preparation, preoperative fasting at least 8 hours, no nasogastric tube; Day of surgery: sit in chair for >1 hour, sips of water <1L; Postoperative day 1: sit in chair for >3 hours, ward ambulation >400m, semifluid diet >1L, continuous infusion of PCA, remove urinary catheter; postoperative day 2: ward ambulation >600m, soft blend diet or regular diet, remove PCA and use laxatives routinely. N=46 Standard Care: before admission: operative risk assessment, counselling with patient and family, written informed	Patients receiving laparoscopic colon resection for colonic tumour. Age (mean) rehabilitation program 61.9 ± 11.2; 60.6 ± 0.0 China	• Mortality • Complications • Length of hospital stay • Readmission • Pain score (VAS)	

Study	Intervention and comparison	Population	Outcomes	Comments
	consent, mechanical bowel preparation, preoperative fasting at least 8 hours, no nasogastric tube; day of surgery: bed rest and nil by mouth; postoperative day 1: sit in chair for >1hour, mobilize in bed, nil by mouth till flatus, continuous infusion of PCA, urinary catheter in place; operative day 2: ward ambulation >400m, sips of water if bowel passage, remove PCA if relief of pain, use laxative if necessary, remove urinary catheter N=54			
Lemanu 2013[103]	ERP: Preoperative: Formal standardized preoperative education; Formal goal-setting session; Tour of the ward; Clear oral fluids up to 2 h before surgery; Carbohydrate drinks ×2. Intraoperative: 8 mg i.v. dexamethasone at induction of anaesthesia; standardized anaesthesia; Intraperitoneal local anaesthetic; Avoidance of prophylactic nasogastric tubes and abdominal drains. •Postoperative: Early instigation of oral intake; Mobilization 2 h after return to ward; Standardized multimodal analgesia and antiemesis; Standardized multimodal thromboprophylaxis. Post discharge: Telephone call 1 day and 1 week after discharge; 2 week follow up in clinic. N=53 Standard Care: Preoperative: advice given by bariatric surgeon. Intraoperative & postoperative: Care decided by anaesthetist and bariatric surgeon. Post discharge:	Patients had to have their operation at the elective surgery hospital, Manukau Surgery Centre Surgery: Laparoscopic sleeve surgery Age (mean) ERP: 43.5 ± 6.9; Standard care: 43.9 ± 6.0 New Zealand	• Complications • Length of hospital stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	2 week follow up in clinic N=53			
Li 2014[105]	ERP: Preoperative: pre-operative assessment, counselling and FT management education; free diet, but limitation of fibers; fast solid food before 6 h and liquid food (without milk or beverage with fat) before2 h nil by mouth; patients are not received mechanical bowel preparation, only oral intestinal cleaner 12 h pre-operation can be accepted, but no need of liquid stool; receive single-dose antibiotic prophylaxis, (1.5 g cefuroxim, Zinacef, and 0.5 g metronidazol, Clont) at induction of anaesthesia. •Intraoperative: continuous epidural anesthesia; right-sided colon resection via a T6-T7 level catheter; sigmoidectomy with a 9-T10 level catheter; rectectomy via a L1-L4 level catheter; if chosen general anaesthesia, enough dose in first injection; minimally invasive techniques; prevention of hypothermia, keeping the intra-operative core temperature at 36 ±0.5C. •Postoperative: POD1: for non-hypovolemia patients, give fluid restriction to 1500 ml/kg/d; with or without nasogastric tube in after 12 h; remove urinary catheter for patients received colon and upper segment of rectum surgery; without or remove drainage tube in 24h; early oral feeding of water or tea at 12 h, use of EN emulsion (Fresubin®), 50% of total dose in 24 h (Total energy: 25-30 kcal/kg·d); early activities mobilized in bed at 6 h, spend 2 h out of bed on the day of surgery and 6 h per day until discharge; regular pain control by a PCA (patient-controlled analgesia) pump 96 ml/2 ml/hr, opioid-sparing multimodal analgesia, including oral paracetamol,	18 years of age; histologically diagnosed with colorectal cancer by enteroscope and underwent colorectal surgery Age (mean) Fast track: 57.7 ± 12.0; Traditional: 60.0 ± 12.8 China	• Complications • Post-operative length of stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	non-steroidal anti-inflammatory drugs, gabapentanoids; no regular parenteral nutrition support. POD2: fluid restriction to 1000 ml/kg·d; remove urinary catheter for rectal lower segment; walk around ward in 24h~48 h, and go to bathroom; keeping urinary catheter in for 1-3 days; 100% total dose of EN in 48 h. (Total energy was 25-30 kcal/kg·d). POD 3-5: fluid restriction to 500 ml/d; discharge with criteria: oral drug analgesia, solid diet and no fluid transfusion N=219 Standard care N=245			
Li 2018[107]	ERP: Patients in the ERP group received a detailed explanation of their perioperative care and a health manual. 5 day preoperatively patients without contraindications received recombinant human erythropoeitin injection. Preoperative bowel preparation and preoperative sedative use were not administered. Preoperative fasting was reduced to 6 hours with light meals. Patients received a carbohydrate solution containing 25g of glucose 2 hour before surgery and prophylactic antibiotics were administered within 60 minutes of surgical incision. Intraoperative management included fast track cardiac anaesthesia; optimization of cardiopulmonary bypass through strict fluid management; lung protection strategies; goal directed fluid management; cerebral oxygen saturation monitor and bispectral index monitor; blood conservation measures and ropivacaine	Age between 18 - 70 years of age; had a body mass index of 15-30kg/m²; receiving elective heart valve surgery Age (mean) Control group 52.2 ± 10.4 (23.0-69.0); ERP group 51.0 ± 10.1 (25.0-69.0) China	• Mortality • Complications • Length of hospital stay • Admission to ICU • Length of stay at ICU • Readmission • Pain scores (VAS)	

Study	Intervention and comparison	Population	Outcomes	Comments
	infiltration at incision site. A postoperative bundle included multimodal postoperative analgesia; nausea and vomiting prevention; EPO therapy; early oral intake after tracheal extubation; early removal of drainage tube and early mobilization as soon as possible. N=113 Standard care N=113			
Li 2019[109]	ERP: •Preoperative: preoperative education through face to face communication, written notice and multimedia. Preoperative education includes anaesthesia and surgical procedure, encouragement or early postoperative feeding and activity, promotion of pain management and respiratory therapy, pre-setting discharge criteria, and notification of follow up and readmission pathway. The education continues through the entire process of the perioperative period until the patient is discharged. The ERP group did not require regular bowel preparation. Fasted for 6 hours before surgery, and water and clear liquid food was banned 2 hours before surgery. •Intraoperative: temperature monitoring and heat preservation were carried out in the ERP group. Fluid management was focused on the needs of the patient and avoided excessive fluid intake mainly as oral water supplementation to prevent gastrointestinal edema. Postoperative: multimodal analgesia, including intraoperative local anesthesia with ropivacaine infiltration and 50mg intramuscular	Patients aged 55 - 65 years old, with the preoperative diagnosis of colorectal malignant tumours by fiberoptic electron colonoscopy and histopathology and undergoing elective laparoscopic radical resection of colorectal cancer. Age – mean (SD): ERP: 56.2 (5.5); standard care: 55.3 (5.3) China	• Complications • Pain scores	

Study	Intervention and comparison	Population	Outcomes	Comments
	injection of tramadol after surgery. Patients were encouraged to move out of the bed. N=100 Standard care: Preoperative: general preoperative presurgery education. Mechanical bowel preparation and oral administration of antibacterials to clear intestinal bacteria. This group were fasted for 12 hours before surgery and water was banned 6 hours before surgery. Intraoperative: No special heat preservation measures were taken. Glucose saline and amino acid were administered IV on the day of surgery, which was reasonably controlled according to the patients physiological requirements, intake and output. Postoperative: Analgesic pump IV and the patients in this group got out of bed at the time of the patients will. N=100			
Liang 2018[112]	ERP: 400ml oral carbohydrate solution 2 hours before surgery. Nutritionists would provide nutritional support based on nutritional risk screening tool (NRS2002). Patients who had chronic respiratory disease or a long history of smoking would receive respiratory care before surgery. Nurse navigators to provide more information about perioperative care. Patients and their families received a checklist about rehabilitation plan, daily mobilization and nutritional goals. Received 0.75% ropivacaine for local anaesthesia. 5mg Dexamethasone IV was used before vascular exclusion. Fluid management	Partial hepatectomy or half liver resection, body mass index of between 18 and 35, if patients were diagnosed with tumors; tumors either in the right or left lobe, Child-Pugh class A/B liver functional status, ASA grades I-III, no major concomitant surgical procedures (bowel or bile duct resection)	• Complications • Readmission • Length of hospital stay	Length of hospital stay was reported as median

Study	Intervention and comparison	Population	Outcomes	Comments
	followed by goal-directed fluid therapy. Abdominal cavity drainage tubes avoided. Water or liquids given 6 hours after surgery. Titrating regimen of feeding commenced from POD 1. Intravenous fluids stopped as soon as adequate intake was achieved. Received 40mg ParecoxibNa per 12 hour injection and tramadol 50-100mg twice a day orally. Patient controlled intravenous anaesthesia used. Post-operative nausea and vomiting prophylaxis followed with metoclopramide and then ondansetron. Patients advised to mobilize from POD 1, urinary catheter removed POD1 and abdominal drains as soon as possible N=60 Standard care N=66	Age (range) 16-85 China		
Lin 2018[116]	ERP: Surgery preparation: preoperative day 3 normal diet; preoperative day 2 normal diet; preoperative day 1 normal breakfast, fluid diet, laxatives and unrestricted clear fluids; 2 hours prior to surgery: Nil per os, IV antibiotics; intraoperative: non-NGT; Postoperative: clear fluids <500ml as tolerated after 2 hours of surgery, mobilization as possible; POD 1: clear fluids as tolerated, protein drinks and light diet, mobilization as possible, ambulation, prokinetic agents, pain medication using mainly non opioids (opioids only for breakthrough); POD 2 (~discharge)@ rectal laxative if needed, fluid diet after gradual return of feeding, regular / light diet after bowel movement, mobilization as possible, prokinetic agents, similar pain medication with non-	Inclusion criteria: curative goal (clinical stage Ta-T4a/N0-2/Mo); age > 18 years; ASA I-II; Karnofsky score > 70 Surgery: radical cystectomy with ileal urinary diversion Age (mean) ERP: 62.9 ± 10.1; CRAS: 63.3 ± 10.3 China	• Mortality • Reoperation • Complications • Post-operative length of stay	Post-operative length of stay was reported as median

Study	Intervention and comparison	Population	Outcomes	Comments
	opioids; After discharge: audited for outcomes for 30 days N=145 Standard Care: Surgery preparation: preop day 3 & preop day 2 fluid diet, oral bowel preparation, oral antibiotics; preop day 1 clear fluid diet, unrestricted clear fluids, 2 enemas, oral bowel preparation and oral antibiotics; 2 hours before surgery: NPO, NGT, IV antibiotics; •Intraoperative: NGT; Postoperative: no fluids, mobilization as possible; POD 1: clear fluids as tolerated, NGT, mobilization, pain medication using non opioids (or opioids for breakthrough); POD 2 (~ discharge): NGT until fluid tolerance, fluid diet after gradual return of feeding, rectal laxative if needed, regular/light diet after bowel movement, mobilization as possible, pain medication using non opioids N=145			
Liu 2010[122]	ERP: Patients allowed normal diet up to and including the evening meal. A glucose drink given the night before surgery and a carbohydrate drink given 3 - 4 hours preoperatively. Patients did not receive bowel preparation. Minimal abdominal incisions were made and none across umbilicus. Abdominal drains or nasogastric tubes were not placed unless required (abdominal contamination or confirmed gastric retention). Clear guidelines set out for postoperative early diet and enforced mobilization	Recently diagnosed with gastric cancer and living independently at home Surgery: Gastrectomy for gastric cancer Age (mean) Optimized group 60.7+/-9.7 Control group 61.9+/-8.3	• Complications • Post-operative length of stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	program. N=33 Standard Care: Day before surgery, patients received gastrointestinal preparation and were fasted from midnight. The lengths of incision were determined according to the surgeons preference (usually across the umbilicus). Nasogastric tubes were placed preoperatively and usually remained until flatus occurred after operation and no gastric retention presented. Intraabdominal drains were placed during surgery and maintained until the day before discharge home. Postoperatively patients had no oral intake until bowel flatus or obvious GI movement occurred. Patients mobilized at their will and usually lay in bed for about 2 days after surgery. N=30	China		
Liu 2016[120]	ERP: Preoperative: great importance given to preoperative education; Fasting for 6 h; water deprivation for 2 h; no bowel preparation; No routine gastric tube or pull the gastric tube as soon as possible after surgery. •Intraoperative: Intraoperative transfusion capacity is 1,500 mL or less; intraoperative insulation routinely; Incision processing as small as possible. •Postoperative: Nonsteroidal anti-inflammatory drug intravenously after surgery twice daily; Urine tube unplugged within 48h; off bed activity and diet commenced one	Inclusion criteria: a diagnosis of Gastric Cancer by a preoperative pathological biopsy using a gastroscope; age ≥60 years; conforming with surgical indications and having no surgical contraindications according to “Japanese gastric cancer treatment statute”; and good	• Complications • Post-operative length of stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	day after surgery N=42 Standard Care: Intraoperative: routine education preoperatively; Fasting for 12 h; water deprivation for 4 h; Oral laxatives; Preoperative routine use of nasogastric tube. Intraoperative: No routine intraoperative insulation; no control of intraoperative transfusion capacity; No special emphasis on creating a narrow incision. Postoperative: No anti-inflammatory drug given routinely; urine tube unplugged after 3-5 days postoperativelyl; diet restarted after recovery of intestinal function; mobilization not encouraged. N=42	compliance Surgery: Laparoscopic radical gasterectomy for gastric cancer Age (mean) FTS: 68.5 ± 4.6; Conventional: 69.5 ± 5.4 China		
Lu 2014[124]	ERP: In Fast-track (FT) group, shorten anesthetic time and controlled central venous pressure (CVP) was less than 5mmHg and hypothermic and fluid overload were avoided. Precision liver resection was performed on patients in the FT group; on the basis of complete resection of tumor, hepatic portal occlusion time was shortened as much as possible and no surgical drainage was used. After operation, for patients in FT group, early mobilization on postoperative day 1 was encourages, enteral nutrition was given and meanwhile IV infusion was limited and urinary catheter was removed first day postoperatively. N=135	First diagnosed and pathological examination confirmed; preoperative assessment suggested no existing physical illnesses; A or B Child-Pugh grade, no metastasis and limited partial liver resection; no preoperative or intraoperative transcatheter hepatic arterial hemoembolization or radiofrequency ablation performed; the tumor was completely resected. Surgery: Hepatectomy for liver cancer	• Mortality • Complications • Length of hospital stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	Standard Care: Conventional anaesthetic and surgical procedures were followed. Operation methods included i) simple lobectomy ii) lobectomy and cholecystectomy iii) simple left liver resection iv) simple right liver resection v) left liver resection with cholecystectomy. No early mobilization, routine use of surgical drains and patients followed a traditional process of enteral nutrition and removal of urinary catheter. N=162	Age (mean) Fast track 54.0 ± 11.4; non fast track 52.6 ± 11.3 China		
Magheli 2011[129]	ERP: Patients received an accelerated oral nutrition and mobilization management with an adapted opioid free analgetic treatment that incorporated high dose COX2 inhibitors postoperatively. Patients were subject to highly encouraged postoperative mobilization and early discharge from the hospital. N= 25 Standard Care: protocols not specified in article N=25	Radical Prostatectomy Mean age (SD): ERP 61.8 ± 4.7; Standard care 61.9 ± 7.0 Germany	• Postoperative length of stay	
Mari 2014[133]	ERP: •Preoperative: fiber free diet for 4 - 5 days; day before surgery: free diet; with maltodestrine drinks and clisma fleet bowel preparation the evening	Patients undergoing Total laparoscopic high anterior resection (HAR); ASA I - III; aged between 18 - 85; BMI < 30; no intestinal	• Major complications • Length of hospital stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	before surgery. •Intraoperatively: NG tubes removed after surgery; urinary catheter in situ; fluid administration 10mL/kg/h; •Postoperative: analgesia - paracetamol with wound infiltration naroprine; antibiotic therapy: short term cephazoline & metronidazole; Mobilization: 5h after surgery patient sits out of bed, free walking from day 1; Oral intake: 5h after surgery oral semi fluid diet; Fluid administration: 100mL/h for 20h in continuous parenteral infusion with protein loaded drink; Day 1-3: removal of bladder catheter; semi-solid diet/ fiber free diet; mobilization at least 100m; paracetamol. N= 26 Standard Care: •Preoperative: fiber free diet 4-5 days; Day before surgery: fasting from dinner (glucosalina) and osmotic laxative for bowel preparation. •Intraoperatively : NG tube; central line; and bladder catheter kept in situ; fluid administration: 15 mL/kg/h. •Postoperative: analgesia: Morfyn + NSAID; 2fL + metoclopramyd; Antibiotic therapy: short term cephazoline + metronidazole; fluid administration of 100mL/l for 48h in continuous parenteral infusion. •Day 1-5: step wise introduction of mobilization and fiber free diet; removal of NG tube; stop opioids and parenteral fluid management. N=26	diversion. Median age (range): 66 (29-83) Italy	• Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
Mari 2016[132]	ERP: •preoperative: no bowel preparation, 200mL maltodextrin intake 6 and 2 hours before surgery; •Intraoperatively: 5-20mL/kg/h during surgery, NG tube to be removed after intubation, no drainage tube; •Analgesia: combined spinal analgesia with opioid and oral NSAIDS after surgery; •Postoperative: 1500mL/d until 24h after surgery, fluid meal 6h after surgery then solid meal 24h after surgery, mobilization 6h after surgery. Had to walk 100m the day after surgery. N=70 Standard Care: •Preoperative: laxative 2 days before surgery and cleaning enema 1 day before surgery, fasting after midnight before surgery; •Intraoperative: no restriction in fluid management during surgery, to keep NG tube until 24h after surgery, drainage tube according to surgeons preference; Analgesia: IV opioid unti after surgery then oral NSAIDSs; •Postoperative: 2000mL/d until 48h after surgery, fluid meal 48h after surgery then solid meal, mobilization on POD 1 and then at least 100m walk on POD 2. N=70	Adults aged 18 - 80; ASA I - III; autonomous for mobilization and walking; eligible for laparoscopic colorectal surgery. Median age: ERP 64 (42-83); Standard 67 (39-87) Italy	• Length of hospital stay	
Mingjie 2017[138]	ERP: •Preoperative: Educated to ensure they were ready	Adults with a preoperative cancer of stage T2, T3, T4a, any N, M0 without	• Mortality • Postoperative length	

Study	Intervention and comparison	Population	Outcomes	Comments
	to participate in the ERP program pre-operatively. Allowed to take normal meal until 6 hours before the operation and then drink carbohydrate drinks until 2 hours before the operation. Mechanical bowel preparation and nasogastric tube were avoided. •Intraoperative anesthetic guidelines included nonopioid analgesia after induction, need-based vasoactive drug administration, restriction of IV fluids and intra-peritoneal ropivacaine infusion. •Postoperatively provided with specific instructions for nonopioid pain control, early drain removal, early oral diet and early mobilization. N = 76 Standard Care: •Preoperative: No solid foods at dinner the before day surgery, no liquids 12 hours before surgery. Routine bowel preparation and NG tube placement on the day of surgery. •Intraoperative: routine use of anaesthetic medication, no fluid restriction and routine use of abdominal drainage tubes and placement of catheters. •Postoperatively patient not advised to get out of bed until 24 - 48 hours after surgery, IV fluids not restricted, intramuscular opioid analgesics, parenteral nutrition until flatus and drain removal prior to discharge. N = 76	digestive obstruction confirmed CT scan, treatable with Laparoscopic gastrectomy; Aged ≥18 but ≤75; pathologic confirmation of gastric adenocarcinoma by endoscopic biopsy; normal hematological, renal, hepatic, and cardiac parameters; ASA score <III without severe systemic disease; no history of treatment with neoadjuvant chemotherapy and or radiotherapy. Mean age (range): ERP 61 (40-75), Conventional 63 (35-75) China	of stay • Readmission	
Muehling 2008[141]	ERP: •Preoperative: The introduced fast track regimen	All patients who were admitted with suspected lung neoplasms and had	• Mortality	

Study	Intervention and comparison	Population	Outcomes	Comments
	includes preoperative patient education identical to the conservative management; preoperative fasting is limited to 2 h preoperatively. •Intraoperative: pain control was realized using a preoperatively inserted thoracic epidural catheter. Patients received 10 ml of ropivacaine 1%. •Postoperatively: administration of ropivacaine 0.2% and sufentanil (2 mg/ml) in a patient controlled manner (PCEA) accompanied by NSAIDs; Enteral feeding and ambulation started on the evening of the operation N=30 Standard Care: •Preoperative: patient education, preoperative fasting for 6 hrs. •Intraoperative: pain control is usually achieved by application of intercostal nerve blockade intraoperatively using 5 ml of ropivacaine 0.75%. •Postoperative: administration of i.v. opioids (piritramide) in a patient controlled manner (PCA). Patients also receive medication with NSAIDs (diclofenac75 mg twice daily + metamizole 1g i.v. four times daily). Enteral feeding and ambulation start from the first postoperative day, i.v. fluids are restricted to 1000 ml/24 h. N=28	the indication of lung resection (wedge or anatomic resection). Median age (range): ERP: 67 (45-81); Standard Care: 64 (24-83) Germany	• Complications • Length of stay • Length of stay in ICU	
Muehling 2009[140]	ERP: Preoperative: patient education; preoperative fasting is limited to 2 h preoperatively and bowel washout is not performed. Intraoperative: General anesthesia was supplemented by a preoperatively inserted epidural catheter which was placed in the	All patients admitted with indications for the elective open repair of an infrarenal aortic aneurysm were eligible for the study. An indication for	• Mortality • Complications • Postoperative length	

Study	Intervention and comparison	Population	Outcomes	Comments
	intervertebral spaces at the level between T7 and T10 with the loss-of-resistance technique. Patients received 10 ml of ropivacaine 1% preoperatively. Postoperatively: administration of ropivacaine 0.2% and sufentanil (2 lg/ml) in a patient-controlled manner (PCEA) accompanied by NSAIDs. Enteral feeding and ambulation were begun on the evening of the operation; the nasogastric tube was removed at the end of the operation. Intravenous fluids were restricted to 1,000 ml/24 h, and patients were allowed to drink up to 2,000 ml/24 h. Mobilization from POD 1 N=50 Standard care: Preoperative: patient education; fasting for 6 h; and bowel washout. Postoperative: pain control achieved by i.v. opioids (piritramide) in a patient-controlled manner. Patients receive nonsteroidal anti-inflammatory drugs (NSAIDs; diclophenac 75 mg twice daily metamizole 1 g i.v. four times daily); The naso-gastric tube is removed if secretions amount to less than 300 ml/24 h; Enteral feeding starts from the POD 2 after onset of bowel movements; i.v. fluids (cristalloids) in the early postoperative period are set to 3,000 ml/24 h; Mobilization from evening of operation. N = 51	aneurysmectomy if the diameter exceeds 5.5 cm or if the aneurysm shows a rapid increase in diameter of more than 0.5 cm within 6 months. Median age (range): ERP: 67 (40-81); Standard care 68 (52-84) Germany	of stay • Length of stay in ICU	
Muller 2009[142]	ERP: Preoperative: no bowel preparation; allowed to drink clear fluids until 4 hours before surgery;	Patients older than 18 years of age who were undergoing open elective colonic	• Complications • Length of stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	received thromboprophylaxis and perioperative antibiotics. Intraoperative: Surgery was performed through a median laparotomy and the anastomosis was either hand sewn or a stapler technique; No nasogastric tubes or intra-abdominal drains used; All anesthetic procedures and agents standardized; Patients received a restricted fluid regimen with a preoperative loading of Ringer's lactate solution at 1 mL/kg/h nothing by mouth and an intraoperative substitution of 5 mL/kg/h; An epidural catheter with ropivacaine 0.33% or bupivacaine 0.25% was placed at thoracic level 6–9 preoperatively and removed on POD2. Postoperatively: All fluids were discontinued at day 1 after surgery unless medical reason to do otherwise; Encouraged to early mobilization starting immediately after surgery; Patients were allowed to start drinking immediately after surgery; Two additional protein drinks were given for the first 3 days, and patients were invited to resume oral nutrition on day 1 after surgery.. As additional analgesics, only paracetamol was given intravenously. N=76 Standard Care: Preoperative: no bowel preparation; allowed to drink clear fluids until 4 hours before surgery; patients received thromboprophylaxis and perioperative antibiotics. Intraoperative: Surgery was performed through a median laparotomy and the anastomosis was either hand sewn or a stapler technique was used. No nasogastric tubes or intra-abdominal drains were	resection with a primary anastomosis. Median age (range): ERP: 62 (27-91); Standard Care: 59 (39-89) Switzerland	• Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	used postoperatively. All anesthetic procedures and agents were standardized. The group received Ringer's lactate at 2 mL and 10 mL/kg/h for preoperative loading and intraoperative substitution, respectively. An epidural catheter with ropivacaine 0.33% or bupivacaine 0.25% was placed at thoracic level 6–9 preoperatively and removed on the second postoperative day. As additional analgesics, only paracetamol was given intravenously. A failure of epidural analgesia was defined as the need for supplemental intravenous opioids. Postoperatively: The patients received 2000 mL of Ringer's lactate per 24 hours until day 3 after surgery. Additional fluid or vasopressors were given when the mean arterial pressure was less than 60 mm Hg or urine output was less than 0.5 mL/kg/h. All patients were encouraged to early mobilization starting immediately after surgery in both groups. Patients were allowed to start drinking on day 2 and started increasing oral nutrition on day 2, with possible full oral nutrition by day 4. N= 75			
Petersen 2006[154]	ERP: Preoperative: standard goals for mobilization and energy intake were described. Verbal and written supplementary information was standardized. Postoperatively: After surgery, transfer and walking techniques required were taught; post-operative mobilization: aggressive and progressive structured mobilization plans; post-operative nutrition: early and aggressive fluid and diet re-introduction; post-operative rehabilitation: early aggressive rehabilitation and early introduction to exercise programme.	Patients scheduled for elective primary unilateral total hip replacement and peri-operative epidural analgesia. Median age (IQR): ERP 55 (28-84); Standard Care 58 (26-81) Denmark	• Length of stay • Readmission • VAS pain scores	

Study	Intervention and comparison	Population	Outcomes	Comments
	N=34 Standard Care: Received none of the optimization package. Postoperatively: After surgery, mobilization, oral fluid and diet were re-introduced in a traditional step wise manner. Treating team responded to the will of the patient in providing post-operative care and no attempt was made to enforce mobilization or to encourage patients to eat and drink despite lack of appetite. N=36			
Pimenta 2015[157]	ERP: Preoperative: received less intravenous fluids and had a short time of preoperative fasting. They received 400 mL of a beverage containing water plus 50 g (12.5 %) of maltodextrin 6 h before the operation and an extra 200 mL of this beverage containing water plus 25 g of maltodextrin (12.5 %) 3 h before the operation. Intraoperative: They received 1 to 1.5 L of crystalloid fluids (ringer lactate) in the intraoperative period and 8 mg of intravenous dexamethasone at the beginning of the anesthesia. Postoperative: programmed to receive 2 L of Ringer's lactate and 1 to 2 L in the first day of the postoperative period. The venous hydration was suspended as soon as they started to drink liquids. Given 4–8 mg ondansetron after the surgery as prophylaxis for nausea and vomiting. Analgesia was done with intravenous dipyrone and ketorolac and,	Patients were between 18 and 45 years of age who had an initial body mass index (BMI) equal to or greater than 40 kg/m2 to be a candidate for the sleeve procedure through laparoscopy. Median age (range): ERP: 39.0 (33–45); Standard Care: 32.0 (26–38) Brazil	• Postoperative length of stay • Length of hospital stay • Length of stay in ICU	

Study	Intervention and comparison	Population	Outcomes	Comments
	if necessary, low doses of morphine. All individuals received the same antimicrobial prophylaxis (cefazolin 1–2 g every 8 h). After the surgery, all the patients were sent to the ICU. They were discharged from ICU to the infirmary (at the discretion of the intensivist) if they were clinically stable (usually 24 to 48 h after surgery). Postoperatively, all patients were stimulated to early mobilization and allowed to initiate feeding 24 h after the operation. N=21 Standard care: Preoperative: fasting for at least 8 h; receiving 1 to 2 L of Ringer's lactate in the intraoperative period, summing up to 3 to 4 L of crystalloid fluids during the day of surgery. •Intraoperative: during induction, antibiotic prophylaxis (cefazolin 3 g/day for 2 days) administrated and intravenous 8-mg dexamethasone for nausea and vomiting prevention. Postoperative: during POD1, they received 2 to 3 L, and finally, 1 to 2 L were given in the POD2. Postoperative analgesia was done with intravenous dipyrone, tramadol hydrochloride, and morphine. The prophylaxis of nausea and vomiting was with 10mg metoclopramide at the end of the surgery. After the surgery, all the patients were sent to the ICU. They were discharged from ICU to the infirmary (at the discretion of the intensivist) if they were clinically stable (usually 24 to 48 h after surgery). Postoperatively, all patients were stimulated to early mobilization and allowed to initiate feeding 24 h after the operation.			

Study	Intervention and comparison	Population	Outcomes	Comments
	N= 20			
Qi 2018[161]	ERP: Preoperative: information about ERP education, assess nutritional status by NRS 2002 and give enteral nutrition, no routine bowel preparation, oral carbohydrates 400ml 2 hours before operation. Intraoperative: Middle thoracic epidural anaesthesia (local anaesthetic + low dose opioid) combined tracheal intubation and general anaesthesia. Target oriented fluid infusion and low central venous pressure, wear stretch hose, routine medical insulation blanket and heated transfusion, no NG tube or removed as soon as possible. Minimal use of abdominal drain. Postoperatively: Adopt preventive, timely and multimodal analgesia. Drinking at 6 hours, 24 hours feeding fluid and gradual transition to normal diet. 12 hours after surgery - mobilize at least 4 times out of bed. 24 hours after surgery mobilization 4 times daily. After 48 hours of surgery to discharge - normal mobilization. Remove catheter 12 hours after surgery. Early removal of abdominal drain. N=80 Standard Care: Preoperative: preoperative education in standard manner. Routine bowel preparation. Intraoperative: Routine tracheal intubation and general anaesthesia. Standard mode of fluid therapy. Routine NG tube and abdominal drains. Postoperatively: On demand analgesia. Can only eat after anal exhausts. No mobilization plan.	Patients aged 18 – 70 years indicated for a partial hepatectomy, no mental health disease, no physical activity disorder, no serious heart, lung brain or renal dysfunction, no history of malignancy, Child-Pugh class A/B liver function and complete data, informed consent and cooperation. Mean age (SD): ERP 53.7 ± 9.8; Standard care 55.4 ± 9.2 China	• Complications • Length of hospital stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	Remove catheter after mobilization. Leave hospital as per standard time. N=80			
Ren 2012[165]	ERP: Preoperative: Take only fluids on the day before surgery; Take 400 ml nutritional supplements before midnight or 6 h before surgery and another 200 ml 2 h before surgery. •Intraoperative: Continuous epidural anaesthesia combined with general endotracheal anaesthesia; Intubation with rapid sequence induction; Restrictive intraoperative fluid protocol (4 ml/kg/h) and warmed fluid; A combination of dexamethasone and tropisetron to minimize postoperative nausea and vomiting; Active warming with a warmer coat and warmed fluid; No nasogastric intubation, drainage tube if necessary. Postoperative: Patient-controlled analgesia and oral NSAIDs; Urinary catheter for the duration of thoracic epidural analgesia and early removal; Ileus prophylaxis and gastrointestinal motility promotion - Infusion of raw rhubarb 10 g five times a day after surgery, injection of neostigmine 0.5 mg at each Zusanli acupoint daily after surgery; Restrictive IV fluid protocol (1500 ml/day); Drank 500 ml water starting at 6 h after surgery on the day of surgery and took 500 ml nutritional supplements and 1,000 ml water daily; Clear liquid diet after the first postoperative flatus; Out of bed for 2 h on the first day after surgery and 4–6 h each day thereafter. N=342 Standard Care: Preoperative: Gentamicin 80,000 U, Metronidazole	Patients aged between 20 and 80 years (inclusive); single colorectal lesion; and medically eligible for radical colorectal surgery. Median age (range): ERP: 59 (24-78); Standard care: 61 (21-80) China	• Postoperative length of stay • Complications	

Study	Intervention and comparison	Population	Outcomes	Comments
	0.4 g; If obstructed, cleaning enema if not obstructed, take polyethylene glycol; Take only semifluid 2 days before surgery; Fluids on the day before surgery; Fasting after midnight. Intraoperative: Continuous epidural anaesthesia combined with general endotracheal anaesthesia; intubation after general induction; Liberal intraoperative IV fluid protocol; A combination of dexamethasone and tropisetron to minimize postoperative nausea and vomiting; Intraoperative temperature not monitored; NG intubation and drainage tubes if necessary. Postoperative: Patient-controlled analgesia; Use urinary catheter for the duration of thoracic epidural analgesia and early removal; No ileus prophylaxis and gastrointestinal motility promotion; liberal IV fluids protocol (2,000-2,500 ml/day); Clear liquid diet started after the first postoperative flatus; mobilization as tolerated by individual patients. N=334			
Ruiz-Tovar 2019[169]	ERP: Preoperative: Provision of verbal and written information to patients regarding the ERP; preoperative nutritional, cardiologic, anemia, and comorbidity optimization; blood tests; polisomnographic study to control and or diagnosis of SAHS - start CPAP at least 4 - 6 weeks before surgery; (day before surgery) low residue diet; dietary supplements; thromboprophylaxis; fasting 6 hour solid food and 2 hours for clear liquid; avoid anxiolytic drugs. Intraoperative: placement of compression stocking or intermittent pneumatic compression according to thromboembolic risk;	Patients were included if BMI >40kg/m² or > 35kg/m² with the presence of co-morbidities associated to obesity Surgery: Roux Y gastric bypass Age – mean (SD): ERP: 45.3 (11.7); standard care: 44.8 (10.8)	• Length of stay • Complications • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	peripheral catheter placement; antibiotic prophylaxis 1 hour before surgical incision; (intraoperative) administration of antireflux prophylaxis; rapid sequence of orotracheal intubation; haemodynamic optimization; remifentanil perfusion; deep neuromuscular block; active heating; no NG tube; prophylaxis of nausea and vomiting; multimodal postoperative analgesia with port site infiltration. Postoperative: liquid diet; active mobilization; start oral analgesia; analytic evaluation of C reaction protein and or procalcitonin; maintenance of thromboprophylaxis for 28 days postoperatively; telephone monitoring for 48 hours; outpatient follow up after 15 days; nutritional recommendations given N= 50 Standard care: Preoperative: Provision of verbal and written information to patients regarding the ERP; preoperative nutritional, cardiologic, anemia, and comorbidity optimization; blood tests; polisomnographic study to control and or diagnosis of SAHS - start CPAP at least 4 - 6 weeks before surgery; (day before surgery) low residue diet; dietary supplements; thromboprophylaxis; fasting 12 hours; avoid anxiolytic drugs. Intraoperative: placement of compression stockings or intermittent pneumatic compression; peripheral catheter placement; antibioptic placement 1 hour before surgical incision; central and bladder catheter placement; administration of antireflux prophylaxis; rapid sequence orotracheal intubation; fluid management based on weight; remifentanil infusion; deep neuromuscular block; active heating;			

Study	Intervention and comparison	Population	Outcomes	Comments
	NG tube placement; IV analgesia and morphine as required, fasting for at least 24 hours after surgery; Postoperative: oral intake of water and chamomile infusions; sit patient in seat for 24 hours after surgery; IV analgesia (POD 1); liquid diet; active mobilization; IV analgesia (POD 2): active mobilization; start oral analgesia (POD 3); maintenance of thromboprophylaxis for 28 days postoperatively; telephone monitoring for 48 hours; outpatient follow up after 15 days; nutritional recommendations given N= 50			
Scioscia 2017[170]	ERP: Preoperative: low residue diet for bowel preparation. Postoperative: prompt removal of NG tube after surgery, early oral fluid intake, resumption of oral semi-liquid feeding within 24 hours, no postoperative antibiotic therapy, early mobilization and discharge from the hospital as soon as bowel function was restored. N= 62 Standard care: Preoperative: osmotic medications (sodium phosphate) were used to clear the lumen of stool and leave gas only. Postoperative: The NG tube was removed soon after surgery, and oral fluids were allowed for 24 hours but no earlier than 8 hours from surgery.	Patients aged > 18 years with preoperative evidence of bowel endometriosis (ultrasound, MRI or double contrast barium enema); primary laparoscopic approach; and obtained informed consent Mean age (SD): ERP: 35.2 ± 4.4; Standard care: 35.6 ± 5.8 Italy	• Complications • Length of stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	Antibiotic therapy was discontinued after 72 hours if no sign of infection was detected N= 165			
Serclova 2009[171]	ERP: Preoperative: educated on perioperative anaesthesia and analgesic care. PCA training was provided and taught how to use visual analogue scale for pain. Also instructed by the physiotherapist, dietician and surgeon. Intraoperative: Thoracic epidural inserted prior to surgery. Only underwent bowel preparation if having rectal surgery. Normal oral intake during the day before surgery until 2pm and a light dinner preoperatively. Then advised to increase fluid intake and carbohydrate cocktail intake. Fluid intake stopped 2 - 4 hours pre-surgery. Postoperative: Analgesia included the PCA pump supplemented with IV paracetamol and diclofenac. After stabilization patients encouraged to exercise in bed and out of it. A semi solid and solid diet was offered to patients from the day of surgery according to tolerance. NG tube inserted during surgery only at surgeons request. Intraabdominal drains selectively inserted into patients with extensive intraabdominal procedure and potential diffuse bleeding (removed day after surgery). Urinary catheter inserted only if necessary due to the type of surgery. N=53 Standard care: Preoperative: Educated in the standard manner.	Patients 18 - 70 years and were scored ASA I or II listed for open intestinal resection. Median age (IQR): ERP: 33.0 (20-66); Standard care: 36.0 (18-68) Czech Republic	• Mortality • Complications • Postoperative length of stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	Orthograde mechanical bowel preparation and an enteral feeding tube was inserted if they agreed. Fasted from midnight before surgery. Intraoperative: The type of anaesthesia and analgesia care was determined by the anaesthesiologist. •Postoperatively: analgesia comprised continuous epidural analgesia by local anaesthetics combined with morphine or subcutaneous morphine. Both methods supplemented by bolus of metamizol or diclofenac. Insertion of NGT, intraabdominal drains and urinary catheter was routine. Postoperative oral intake and rehabilitation proceeded in the standard manner on the day of surgery. N=52			
Shetiwy 2017[173]	ERP: •Preoperative: counselling done by ERP team; Carbohydrate-rich drinks on the day before surgery; Drinking is encouraged until 4 hours preoperatively (morning of surgery). Mechanical bowel preparation only for rectal/rectosigmoid malignancy. •Intraoperative: fluid management (avoidance of sodium/fluid overload); Preference for transverse incisions over longitudinal incisions; Mandatory warming of patient and IV fluids; •Postoperative: Nasogastric tube removal on the day of surgery (POD 0) except for patients with PONV; Oral sips within 24 hours of surgery; Then, resume full diet on POD 3 with IV fluid restricted to a minimum; Forcing patients to get out of bed for 2 hours postoperatively (on POD 0) and on the morning of POD 1; Opiates not allowed (in combination with epidural); Epidurals for 48 hours only, start oral	Patients with presence of a pathologically confirmed colorectal carcinoma amenable for elective surgery and no severe physical disability (ASA I–III). Mean age (SD): ERP: 48.54 ± 12.29; Conventional: 53.63 ± 11.5 Egypt	• Complications • Postoperative length of stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	analgesia early regular doses (acetaminophen + NSAIDs) after 48 hours; allowed oral / rectal laxatives to stimulate gut motility. N=35 Standard care: •Preoperative: counseling done by surgeons; Drinks on the 2 days before surgery; Fasting from the night of surgery; routine mechanical bowel preparation. •Intraoperative: routine perioperative fluid management; Type of incision used according to surgeon's preference; warming of patient and IV fluids not mandatory. •Postoperatively: NG tube removal only when peristalsis occurs; oral nutrition not before 3 days PO once peristalsis occurs; Patients gets out of bed on POD 1; Opiates allowed unless contraindicated ± IV (together with epidural); late start of oral analgesia once patient starts oral intake; oral / rectal laxatives allowed for stimulation of gut motility (unless refused) and NSAIDs (motion or flatus) N=35			
Takagi 2019[181]	ERP: •Preoperative: counselling; assessment and guidance of mobilization; immunonutrition; no bowel preparation; fasting and carbohydrate loading. •Intraoperative: no premedication. Maintenance: total intravenous anesthesia; fluid restriction (goal directed therapy), using forced-air warming. Analgesia: epidural analgesia. •Postoperatively: no nasogastric tube; early oral intake; enteral tube feeding; synbiotics; early	Patients 20 - 80 years of age undergoing pancreaticoduodenectomy. Mean age (SD): ERP group 67.8 ± 9.7; Control group 66.8 ± 9.3 Japan	• Mortality • Complications • Length of hospital stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	removal or urinary catheter and drains at low risk; fluid restriction; strict glycemic control; standardized multimodal analgesia; anti-thrombotic prophylaxis; early scheduled mobilization. After discharge: telephone call. N=40 Standard care: •Preoperative: advice given by surgeon; no immunonutrition; bowel preparation; fasting and carbohydrate loading •Intraoperative: no premedication; total intravenous anesthesia; conventional fluid management; using forced-air warming. Analgesia: epidural analgesia •Postoperatively: nasogastric tube removal on postoperative day 1; care according to surgeon's preference; ward mobilization by nurses. After discharge: no phone call. N=40			
Tanaka 2017[182]	ERP: •Preoperatively: no bowel preparation; Intake of normal diet on the day before surgery; Intake of 250 ml oral carbohydrate solution on the night before surgery and 2 h before anaesthesia. •Intraoperatively: antibiotics before skin incision, every 3 h during surgery and one administration after surgery; Use of 1 abdominal drainage tube in patients undergoing total gastrectomy or proximal gastrectomy. •Postoperatively: Start to drink water and intake of 500 ml oral carbohydrate solution on POD 1; Start a	Patients histologically confirmed adenocarcinoma of the stomach for which curative gastrectomy was planned without simultaneous resection of other organs except for the gallbladder, no involvement of the duodenum or esophagus, age 20–85 years, sufficient oral intake, an	• Mortality • Complications Grade II (Clavien –Dindo) • Complications Grade III (Clavien –Dindo) • Postoperative length of stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	liquid diet on POD 2 and 4 steps leading to regular food intake on POD 6; Epidural analgesia for 3 days after open surgery; Acetaminophen twice daily orally until POD 5; End of parenteral nutrition on POD 4; and encouraged to walk by themselves after POD 1 N=73 Standard Care: •Pre-operatively: Oral laxative (24 mg sennoside AB on the night before surgery); Intake of normal diet on the day before surgery; No intake of food and drink after dinner on the day before surgery. •Intraoperative: antibiotics before skin incision and every 3 h during surgery, one administration after surgery; routine use of 1 abdominal drain; •Postoperatively: Start to drink water on POD 1; Start a liquid diet on POD 3 and 5 steps leading to regular food intake on POD 8; Epidural analgesia for 3 days after open surgery; Parenteral nutrition until POD 5; and encouraged to walk by themselves after POD 1 N=75	ASA score of less than 4, and no prior chemotherapy or radiotherapy for any malignancy. Median age (range): ERP: 68 (29-85); Standard Care: 67 (44-85) Japan	• Readmission	
Tang 2015[183]	ERP: •Preoperative: patient education about surgery management; no bowel preparation, pre-operative liquids containing carbohydrates only until 2 h and solid food 6 h before operation. •Intraoperative: General anaesthesia and Foley catheter are used in all cases; F12 drain is placed	Patients indicated for retroperitoneal laparoscopic adrenalectomy with adrenal tumor <6 cm in diameter; no history of extensive operation on abdominal; ASAscore:	• Complications • Postoperative length of stay • Pain scores	

Study	Intervention and comparison	Population	Outcomes	Comments
	in all cases, the skin wound is closed in a subcuticular (3-0 monocryl), intravenous fluid restricted to <30 ml/kg in order to avoid fluid overload. •Postoperative preparation: FT group: 40 mg parecoxib sodium IV injection is administered immediately after surgery, then 20 mg parecoxib sodium parecoxib sodium IV injection is administered at 12 h and 24 h after surgery. Postoperative feeding is served according to the patients' appetite . Patients are encouraged to ambulate as soon as possible after surgery. On day 1, the Foley catheter and drain are removed. Fluid infusion is withdrawn as soon as the patient is able to take oral nutrition. N=50 Standard care: •Preoperative: routine bowel preparation with soapsuds, pre-operative fast solid food before 2h and liquid food before 6 h. •Intraoperative: a F28 drain is placed in all cases, the skin wound is closed with non-resorbable silk thread (3-0), and intravenous fluid ≥3000 ml. •Postoperative: Analgesia is not routinely administrated, but if patient can't tolerate the pain, 40 mg parecoxib sodium IV injection is administered as a rescue medication. Oral intake is allowed after passage of gas. The drain is removed if the total drainage fluid is less than 10 ml in 24 h. The Foley catheter is removed when patients begin to take off-bed activities. Stitches are taken out in 7 days after surgery. Fluid infusion is withdrawn as soon as the patient is able to take oral nutrition.	degree I-III; no active gastrointestinal bleeding or peptic ulceration; and self-care function prior to hospitalization. Mean age (SD): ERP 49.34 ± 10.18; Standard Care: 47.70 ± 10.95 China		

Study	Intervention and comparison	Population	Outcomes	Comments
	N=50			
Taupyk 2015[184]	ERP: •Preoperative: No mechanical bowel preparation; Pre-operative fasting for 2 h for liquids and for 6 h for solid food; Enteral nutrition 24 h prior to surgery and 500 ml of 10% glucose solution 3 h prior to surgery; Intravenous antibiotics 30 min prior to surgery. •Intraoperative: Colloidal fluid consumption limited to 500 ml and crystalloid fluid consumption limited to 150ml; vasoactive drugs may be used when necessary. •Postoperative: Continuous epidural analgesia (up to 48 h post-surgery); At 6 h post-surgery, the patient can consume a liquid diet, with restoration of a solid diet at 24 h post-surgery; No nasogastric tube used, and if used, removed at the end of the surgery; No drainage tube; Removed on the first post-operative day; Ambulation started on the first post-operative day N=31 Standard care: •Preoperative: Mechanical bowel preparation; Pre-operative fasting for 24 h prior to surgery; Semi-liquid diet initiated 72 h prior to surgery, and fasting prescribed on the morning of surgery; Orally administered metronidazole and amikacin 72 h prior to surgery, and intravenous antibiotics 30 min prior to surgery. •Intraoperative: Sufficient fluid administered according to urine volume. •Postoperative: Intermittent injection of meperidine;	Patients aged ≤ 75 years; Good nutrition and no systemic infection; Indicated for elective laparoscopic surgery for colorectal cancer. Mean age (SD): ERP: 58.5 ± 8.4; Standard Care: 57.4 ± 10.1 China	• Complications • Length of stay • Postoperative length of stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	Fluid diet fed after the passage of first flatus, 3-4 days post-surgery; Remove NG tube after 3-4 days; Remove drainage tube at 3-5 days; Remove urinary catheter at 3-4 days; Ambulation started at 3-4 days post-surgery; ambulation cannot start until full recovery of physical strength. N=39			
Vlug 2011[191] (Van Bree 2011[187]; Veenhof 2012[189])	ERP •Preoperative: discussion on placement of thoracic epidural catheter for management of perioperative analgesia plus discussion of the program; preadmission counseling and guided tour of the surgical ward. •Day of admission: routine food intake; enema bowel preparation; 4 units of carbohydrate loaded liquids; last meal 6h before operation; lorazepam evening before operation as preanesthetic; 2 units of carbohydrate loaded liquids 2 hours before surgery; •Intraoperative: no paranaesthesia: placement of thoracic epidural (until POD 2); combined with balanced general anesthesia; restricted per-operative fluid infusion regimen; use of vasopressor drugs to manage mean drop in BP; forced body heating; removal of NG tube before extubation; prophylactic use of ondansetron. •Surgical management: minimal invasive incisions/laparoscopy; suprapubic urine catheter; infiltration of surgical wounds with bupivacaine; no standard use of abdominal drains. •Postoperative: use of epidural catheter including paracetamol; oral drinks 2h after surgery supplemented with 2 units carbohydrate liquids; IV infusion Ringers lactate; mobilization on the	Patients aged 40 - 80 years; ASA grade I-III; undergoing elective segmental colectomy for histologically confirmed adenocarcinoma or adenoma; without evidence of metastatic disease. Mean age (SD): ERP: 66.96 ± 9.51; Standard Care: 67.05 ± 8.10 Netherlands	• Mortality • Complications • Length of stay • Postoperative length of stay • Readmission	Parent trial of Veenhof and Van Bree

Study	Intervention and comparison	Population	Outcomes	Comments
	evening of surgery; first semi solid food intake in the evening. POD 1: oral intake >2L; normal diet; stop IV fluids; start laxatives; close suprapubic urine catheter and remove; increase mobilization. POD 2: remove epidural and add diclofenac; remove IV cannula; continue paracetamol; normal diet; increase mobilization; plan discharge until criteria fulfilled. N=209 Standard care: •Preoperative: open discussion about different possibilities for management of perioperative analgesia •Day of admission: routine oral intake; enema bowel preparation; last meal at midnight; lorazepam or temazepam as preanesthetic medication; preoperative fasting; lorazepam or midazolam as preanesthetic medication •Intraoperative: placement of thoracic epidural or lower level PCA pump; combined with balanced general anesthesia; standard preoperative fluid infusion regimen; fluid challenge for drop in BP; forced body heating; removal of NGT before extubation; ondansetron, dexamethasone or droperidol for PONV (anesthesiologist choice) •Surgical management: median laparotomy/laproscopy; urine catheter according to surgeon; no infiltration of surgical wounds with local anesthetic; no standard use of abdominal drains •Postoperative: Epidural or PCA morphine to which paracetamol and or diclofenac added; small amount of water orally; IV infusion of Ringer's lactate; no mobilization scheme; POD 1: diet increased on daily basis; IV fluid administration until adequate oral intake; mobilization according to surgeon •POD			

Study	Intervention and comparison	Population	Outcomes	Comments
	2: epidural removed according to anesthesiologist; continue as POD 1 until discharge criteria fulfilled. N=218			
Wang 2010[193]	ERP: •Preoperative: information about protocol; Normal meal until 6 h before surgery; Normal carbohydrate drink until 2 h before surgery; No pre-anesthetic medication; No bowel preparation. •Intraoperative: Mid-thoracic epidural anesthesia and analgesia (T7–10, depending on resection); Combined tracheal intubation and general anesthesia; No routine nasogastric tube drainage; if used, remove as early as possible after surgery; Restricted fluid regimen during surgery (Ringer's lactate 20 mL/kg in the first hour, followed by 6 mL/kg/h); Vasopressor drugs if the mean arterial pressure is <60 mmHg or urine output is <0.5 mL/kg/h; Minimally invasive incision; infiltration of surgical wounds with bupivacaine; No routine use of abdominal drains; •Postoperatively: Patients transferred to anesthesia recovery room; Oral intake of a little clear water as soon as effects of anesthesia disappear+i.v. infusion of Ringers lactate 2.0 L (avoid excessive i.v. fluids); Mobilization on bed in the evening. POD1: Continue epidural analgesia with local anesthetic + 1,000 mg paracetamol every 6 h; Patients drink at least 0.5 L liquid (follow a stepwise plan from water to other liquids to semi-fluids to normal food) +i.v. infusion of Ringer's lactate (appropriate level of i.v. fluid intake based on the volumes of liquid intake and output, and physiological need by the attending surgeon); Remove urine catheter as early as possible; Patients mobilize out of bed at least four times	Patients aged <80 years who were not receiving preoperative chemotherapy and radiotherapy listed for gastrectomy for Gastric Cancer. Mean age (SD): ERP: 58.76±9.66; Standard Care: 56.87±9.16 China	• Mortality • Complications • Postoperative length of stay • Readmission • Pain scores	Postoperative length of stay given as a median.

Study	Intervention and comparison	Population	Outcomes	Comments
	per day. POD2: Patients drink at least 1 L liquid+others as above (patients gradually resume eating a normal diet; the daily increase in oral intake after surgery is managed by the attending surgeon). POD3: Stop epidural analgesia; Continue mobilization. POD4: Continue until fulfils discharge criteria. N=47 Standard care: •Preoperative: Normal meal until midnight; No intake of oral carbohydrate drink on the day of surgery; Pre-anesthetic medication; Routine bowel preparation. •Intraoperative: Tracheal intubation and general anesthesia; Routine nasogastric tube drainage; Standard fluid regimen during surgery (Ringer's lactate 20 mL/kg in the first hour, followed by 10–12 mL/kg/h); Additional fluid infusion as the first choice for management if the mean arterial pressure is <60 mmHg or urine output is <0.5 mL/kg/h; Standard laparotomy approach; No infiltration of surgical wounds with bupivacaine; Standard use of abdominal drains; •Postoperatively: Patients transferred to anesthesia recovery room; Fasting until normal bowel sounds are heard; I.V. infusion of about 2.5–3.0 L of Ringer's lactate by the attending surgeon; Bed rest. POD1: Continuous i.v. infusion of morphine or PCA-morphine; Oral intake is initiated if normal bowel sounds are heard (follow a stepwise plan from water to other liquids to semi-fluids to normal food) +i.v. infusion of about 2.5–3.0 L of Ringer's lactate by the attending surgeon until adequate oral intake; Encourage patients to mobilize out of bed. POD2:			

Study	Intervention and comparison	Population	Outcomes	Comments
	continue as POD1 and to gradually resume eating a normal diet. POD3+4: continue as POD1 until discharge criteria fulfilled N=47			
Wang 2011[195]	ERP: •Preoperative: Patients and their relatives were informed about the surgical procedure and postoperative course; day before surgery: 4 units of carbohydrate liquids; last meal 6h before operation. •Intraoperative: 2 units of carbohydrate liquid before surgery; general anesthesia; epidural catheter; Surgical management: minimal invasive incision; infiltration of surgical wounds with Bupivacaine; no surgical drains unless necessary. •Postoperative: Use of epidural catheter; First oral drink 2 h after surgery; IV infusion of Ringers lactate 1.5 L/d; Mobilization in the evening (> 2 h out of bed); POD1: Oral intake > 2 L (including 4 units carbohydrate liquids); Semi-solid food intake; Stop IV fluid administration; remove urine catheter; Expand mobilization (> 6 h out of bed); POD2: Remove epidural add Diclofenac 3 × 50 mg/d; Normal diet; expand mobilization (> 8 h); Plan discharge; POD3: Continue as on day 2 till discharge criteria fulfilled. N=115 Standard care: •Preoperative: Patients were educated in the standard manner; day before surgery: Two oral sachets of fleet bowel preparation; Last meal at midnight.	Patients eligible if suitable for resection of colorectal cancer Median age (range): ERP: 57 (38-69); Standard Care: 55 (40-67) China	• Mortality • Complications • Postoperative length of stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	•Intraoperative: pre-operative fasting; routine placement of NG tube; preanesthetic oral diazepam; general anesthesia; Surgical management: Median laparotomy approach; Routine placement usually discarded the day before discharge. •Postoperative: Analgesia by bolus administration of diclofenac or morphine; No oral application scheme; IV infusion of Ringers lactate 2.5 L/d; No mobilization scheme; POD1: Diet increased on daily basis; IV fluid administration (2.5 L/d) till adequate oral fluid intake; Mobilization according to attending surgeon; POD ≥2: Continue as on day 1 till discharge criteria fulfilled N=115			
Wang 2012[200]	ERP: •Preoperative: bowel prep with two bags of polyethylene glycol-electrolyte powder 1 day before surgery, no administration of intestinal antibiotics, no mechanical bowel irrigation; Diet control - oral consumption of non-residue nutrison 1 day before surgery, oral consumption of 500ml 10% glucose solution 3 hours before surgery. •Intraoperative: Nasogastric tube - routinely placed and removed after surgery; Anaesthesia - general endotracheal anaesthesia together with continuous epidural anaesthesia; Restricted fluid replacement - colloidal fluid consumption limited to 500ml and crystalloid fluid consumption limited to 1500ml, vasoactive drugs may be used when necessary; •Postoperative: analgesia - continuous epidural analgesia (up to 48 hours post op), early food intake - water was given after patients returned to consciousness, fluid diet given on POD 1 with	Patients ≥ 65 years with a diagnosis of colorectal cancer and undergoing laparoscopic colorectal resection. Median age (range): ERP 71 (65-81); Standard care 72 (65-82) China	• Mortality • Complications • Length of hospital stay	Period of measure for length of stay unclear and results given as median; Mortality reported in unclear measurement

Study	Intervention and comparison	Population	Outcomes	Comments
	incremental amounts given in the following days, on POD 3 normal diet resumed and edible oil orally administered to facilitate defecation; Early mobilization - ambulation on POD 1; urinary catheter - removed POD 1; drainage tube - removed POD 3. N= 40 Standard care: •Preoperative: bowel preparation - daily oral administration of 30ml of 33% magnesium sulphate (once) as well as amikacin and metronidazole (three times a day) 3 days before surgery; bowel irrigation performed on the night before surgery; Diet control - semi liquid initiated 3 days before surgery and fasting prescribed on the morning of surgery. •Intraoperative: Nasogastric tube - routinely placed and removed after passage of flatus; Anaesthesia - general endotracheal anaesthesia; restricted fluid replacement - sufficient fluid was given according to urine volume; •Postoperative: Analgesia - intermittent injection of meperidine; Early food intake - fluid diet was fed after passage of first flatus; Early mobilization - ambulation was not started until full recovery of physical strength; Urinary catheter - removed on POD 3-4; Drainage tube - removed on POD 6-7. N= 38			
Wang 2012[196]	ERP: •Preoperative: patient education, no bowel	Patients listed for laparoscopic colonic resection with no pre-	• Mortality	

Study	Intervention and comparison	Population	Outcomes	Comments
	preparation, no preoperative fasting but carbohydrate containing liquids until 2 hours before surgery. •Intraoperative: analgesia with routine oral non-steroidal anti-inflammatory medications and minimization of opioid pain management, avoidance of perioperative fluid overload, no routine use of NG tubes •Postoperative: early feeding and enforced ambulation on the day of surgery. N=54 Standard Care: •Preoperative: routine bowel preparation •Postoperative: NGT use and diet advancement from clears to soft diet according to surgeon preference. N= 53	operative chemotherapy or radiotherapy, no previous abdominal surgery, absence of distant metastases, ASA I - III and informed consent Median age (range): 55 years (33 - 65) China	• Complications • Readmission • Postoperative length of stay	
Wang 2012[194]	ERP: •Preoperative: No bowel preparation was performed; 100 g of glucose in 1,000 mL of water (glucose injection 10 %) orally administered at 10 p.m. on the evening before operation; a further 50 g of carbohydrate in 500 mL of water given 3–4 h before operation; Intake of clear fluids until 2 h before initiation of anesthesia and a 6-h fast for solid food; •Intraoperative: General anesthesia; Epidural catheter with bupivacaine; no surgical drains unless needed; •Postoperative: Use of epidural catheter 0.125 %	Patients for elective colonic resection with no disease of the immune system; no pre-operative radiotherapy or chemotherapy; no history of operation on abdominal and distant metastases; ASA: I–III; and self-care function prior to hospitalization. Median age (range): ERP: 57.2 ± 18.1 / 55.7 ±	• Mortality • Complications • Readmission • Postoperative length of stay	Four armed study with combined results for ERP and Standard care as protocol does not stratify by type of surgery

Study	Intervention and comparison	Population	Outcomes	Comments
	bupivacaine with fentanyl; discard abdominal drains on POD 1; remove urinary catheter within 24 hours; start to eat and drink early (free fluids on the day of operation followed by a regular diet as tolerated); encourage patients to ambulate early. N=84 Standard care: •Preoperative: Mechanical bowel preparation; no carbohydrate loading; fasted from midnight before operation day; •Intraoperative: general anaesthesia; routine placement of surgical drain; •Postoperative: analgesia by bolus administration of diclofenac or morphine; abdominal cavity drain removed the day before discharge; urine catheter in situ for 3 days; no eating and drinking until bowel venting; mobilization at patients will. N=-86	17.3; Standard care: 55.4 ± 16.8 / 56.1 ± 14.6 China		
Wang 2015[197]	ERP: •Preoperative: Combined parenteral nutrition (PN) and EN were administered from the early preoperative stage (5-7 days) to support treatment. Patients did not fast the day before surgery, did not undergo coloclysis on the evening before surgery, or receive conventional indwelling stomach tube. On the morning of surgery. Patients were administered 500 mL of EN emulsion 12 hrs before surgery, and 300-500 mL of EN emulsion 2 hrs before surgery •Intraoperative: General anesthesia and epidural anesthesia at T6-8. Before induction of anesthesia,	Patients with oesophageal cancer undergoing radical resection Age: <60: 7 ≥60: 103 China	• Complications • Postoperative length of stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	10 mg of dexamethasone and short-acting propofol and remifentanil were administered as sedative and analgesic drugs. Surgery was performed immediately after successful anesthesia; the anesthesia time was minimized as much as possible. Intraoperatively, the infusion rate was controlled at a fluid volume of ≤1500 mL (500 mL of colloid with 1000 mL of balanced salt solution), and vasoactive drugs were used based on heart rate and blood pressure. The infusion liquid was heated using the infusion warmer and other methods to maintain the patients' body temperature at approximately 36°C during surgery. The damage control surgical approach was used. •Postoperative: began physical activity in bed on the day of surgery; allowed to stand bedside the bed with little movement 1 day after surgery. The optimized nutritional support program involving administered to control the fluid profile included: EN infusion through a nasojejunal feeding tube immediately after surgery,6 hrs after surgery; dose increased to nearly 1000 mL depending on patient tolerance at 36-48 hrs after surgery; and dose further increased to >1000 mL at 72 hrs after surgery. The volume of intravenous fluids was correspondingly decreased. The stomach tube was disconnected after exsufflation, and the patients fed a liquid diet. The feeding tube removed after the patients could consume approximately 2000-2500 mL of the liquid diet, after which they were fed a semi-liquid diet, followed by a normal diet. If the volume of fluid drained from the chest was <200 mL/day, lung function was good, and plasma protein levels were within the normal range, the chest tube was removed. Postoperative placement of an epidural catheter was performed for continuous infusion of the analgesia for 48 hrs.			

Study	Intervention and comparison	Population	Outcomes	Comments
	N=90 Standard care: •Preoperative: conventional preoperative management and no targeted nutritional support; eat in the afternoon on the day before surgery, have liquid food in the night before surgery, undergo coloclysis in the evening before surgery and gastric tube or catheter placement in the morning of surgery, fast for 6 h before surgery, and could not drink water for 2 hrs before surgery. •Intraoperative: general anaesthesia was administered, the volume of fluid was not controlled, no insulation measures were taken, and dexamethasone was not used. The incision length and the use of double-lumen endotracheal intubation and one-lung ventilation without enteral feeding tube placement were decided by the surgeon. •Postoperative: performed activities in bed before drainage tube removal, and out of bed after removal. The indications for removal of the chest drainage tube were drainage volume <100 mL/day, and good lung function on chest radiography. Postoperative nutrition included PN. In patients with no anastomotic fistula on esophagography on postoperative day 7, the stomach tube was disconnected to allow liquid diet consumption. On postoperative day 10, the nasojejunal feeding tube was removed and a semi-liquid diet was started. N=90			

Study	Intervention and comparison	Population	Outcomes	Comments
Yang 2012[212]	ERP: •Preoperative: Normal meals until 10pm the day before surgery; 2 hours before surgery drink 250ml of 5% carbohydrate; •Intraoperative: no routine NG tube drainage; •Postoperative: removal of urine and venous catheters as early as possible; oral feeding started 6-12 hours after surgery, following a stepwise plan from liquid nutrition to normal diet (Ensure was mixed with water and used for oral nutrition, slowly increased amounts up to 200ml) every 2 - 3 hours, plus semi-fluids according to tolerance; Mobilization encouraged beginning the night of the operation and had predefined mobility targets. N=35 Standard care: •Preoperative: Normal meal until 10pm the day before surgery; •Intraoperative: routine use of nasogastric tube drainage; •Postoperative: oral feeding initiated on return to normal gastrointestinal function and followed a stepwise plan from oral liquid nutrition (Ensure) to a normal diet; patients sat up and were assisted to mobilize on the first postoperative day, but not aggressively encouraged to mobilize until discontinuation of the thoracic epidural anaesthesia; urinary catheters were removed following epidural catheter removal. N=35	Patients ≥ 18 and ≤ 80 years; no preoperative chemotherapy and radiotherapy; ASA I-II; BMI 17.5-27.5 kg/m2; preoperative serum albumin ≥ 30 g/L for colorectal resection for colorectal carcinoma. Mean age (SD): ERP: 57.2 ± 11.7; Standard Care: 59.5 ± 12.1 China	• Complications • Length of stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
Yang 2012[211]	ERP: •Preoperative: normal meal until 10 p.m. the day before surgery; Routine bowel preparation was done with gentamicin and metronidazole; Polyethylene glycol electrolyte powder was used as a laxative. Day of surgery: drink 250 ml of 5 % carbohydrate 2 h before surgery; prophylactic use of antibiotics; avoidance of long-acting opioids; •Intraoperative: maintenance of normothermia with an upper-body forced-air heating cover; a midline incision of minimal length; intraoperative and postoperative fluid restriction; no routine use of abdominal drains; the combination of continuous epidural mid-thoracic local anesthetics plus nonsteroidal anti-inflammatory drugs (NSAIDs) to control postoperative •Postoperative: no routine nasogastric tube drainage; early as possible removal of urine and venous catheters (urinary catheter: removed when the patient became conscious and could be mobilized out of bed; deep venous catheter: removed when vital signs were stable); oral feeding started 6–12h after surgery, following a stepwise plan from oral liquid nutrition to normal diet. Mobilization was encouraged from the night of the operation. Patients were encouraged to meet predefined mobility targets over the postoperative days. N=35 Standard care: •Preoperative: normal meal until 10 p.m. the day before surgery; routine bowel preparation was done	Patients eligible if ≥18 and ≤80 years, no preoperative chemotherapy or radiotherapy, ASA grade I/II, BMI 17.5–27.5 kg/m2, preoperative serum albumin ≥30 g/l. All of the patients underwent elective open colorectal resection with combined tracheal intubation and general anesthesia. Mean age (SD): ERP: 57.2 ± 11.70; Standard Care: 59.5 ± 12.10 China	• Complications • Postoperative length of stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	with gentamicin and metronidazole; Polyethylene glycol electrolyte powder was used as a laxative. •Intraoperative: prophylactic use of antibiotics; avoidance of long-acting opioids; maintenance of normothermia with an upper-body forced-air heating cover; a midline incision of minimal length; intraoperative and postoperative fluid restriction; no routine use of abdominal drains; the combination of continuous epidural mid-thoracic local anesthetics plus nonsteroidal anti-inflammatory drugs (NSAIDs) to control postoperative pain. •Postoperative: routine use of nasogastric tube drainage, and oral intake initiated on return to normal gastrointestinal function (bowel sounds or flatus) following a stepwise plan from oral liquid nutrition to a normal diet. Patients were sat up and assisted to mobilize on POD 1, but they were not aggressively mobilized until discontinuation of the thoracic epidural. Urinary catheters were removed following epidural catheter removal. N=35			
Yilmaz 2018[215]	ERP: •Preoperative: Counselling before hospital admission; Fluid, and carbohydrate loading; Avoiding prolongation of fasting period; Avoiding bowel preparation or its application only in selective cases; Application of antibiotic prophylaxis; Application of thromboprophylaxis; Avoiding premedication. •Perioperative: Use of short-acting anesthetic agents; Application of midthoracal, epidural anesthesia/analgesia; Refraining from using drains; Refraining from salt, and water overload; Maintenance of normothermia (heating the body, and use of warmed up intravenous fluids.	Inclusion criteria for patients not specified Surgery: abdominal hysterectomy: Age – mean (SD): ERP: 47.9 ± 7.36; Standard care: 48.3 ± 5.84	• Total complications • Postoperative length of stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	•Postoperative: Application of midthoracal, epidural anesthesia/analgesia; Refraining from use of nasogastric tube; Prevention of nausea, and vomiting; Refraining from salt, and water overload; Earlier removal of catheters; Initiation of oral intake at an early period; Use of nonopioid oral analgesics/NSAIDs; Early mobilization; Adherence to the protocol, and auditing results N=30 Standard care: Patients were admitted the day before their operation. In the operating room all patients received a urinary catheter. Thirty minutes before the first incision, cefoperazone (1000 mg) was given intravenously. Patients were operated under general anesthesia. Postoperatively, oral intake was prohibited, and standard intravenous fluid was set at 2–2.5 L/24 h. Patients received 4000 mg of paracetamol (in four separate doses of 1000 mg). If necessary, diclofenac 150 mg in three doses of 50 mg and morphine substitutes were also given. Discharge was arranged when the following criteria were met: there are no remaining lines or catheters, solid food is tolerated, there has been the passage of stool, pain is controlled using oral analgesics only and the patient is able to restart basic daily activities and self-care. N=32	Turkey		
Zhang 2018[221]	ERP: •Preoperative: Patients received preoperative education exercise and nutrient support for	Patients with primary esophageal carcinoma, having never received any surgical treatment before	• Complications • Length of hospital	

Study	Intervention and comparison	Population	Outcomes	Comments
	maintaining the functions of organs before the operation, rational drug administration before operation, ameliorating the patient tension and fear and other aspects conducive patients to cooperating for surgery physically and emotionally. Two to three days preoperatively patients were required to take a liquid diet that mainly consisted of enteral nutritional suspension, and the evening before surgery, patients only took 500ml of carbohydrate solution without any bowel preparation and received the energy mixture via IV the next morning on the day of surgery. •Intraoperative: Patients received combined IV-inhalation anaesthesia with anaesthetics of rapid metabolism and short half-life. Heat preservation was carried out through infusion and flushing with warm liquid and heating bed; •Postoperative: analgesia was performed by application of self-controlled analgesic pump in combination with non-steroidal anti-inflammatory drugs. After the operation, patients were transferred to the wards, were administered subcutaneous low molecular weight heparin sodium every night and an antithrombotic pressure pump for one week, and immediately after the recovery of anaesthesia, patients were required to use the ankle pump for exercise. Early enteral nutrition was provided to patients in this group. Patients received intraoperative intubation of drainage tube in certain cases and left bed for removal of urethral catheter in an early stage after operation and extubation of chest drainage tube 2 or 3 days after operation. N=57	this study and with no other malignant tumors. Mean age (SD): ERP: 66.89 ± 13.45 Standard care 67.01 ± 12.78 China	stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	Standard care: •Preoperative: received routine introduction of the notice of admission. They had to complete routine fasting overnight. •Intraoperative: conventional anaesthesia with no special measures for heat preservation and opioid drugs for analgesia. •Postoperative: routine subcutaneous injections of low molecular weight heparin sodium were administered every night for one week, routine nutritional support was provided and patients mobilized out of bed after one week. N=57			
Zhao 2014[222]	ERP: •Preoperative: educated systematically by the esophageal clinical nurse consultant; day before surgery: Last drink 2 h and diet 6 h before operation; fructose and protein loading; •Intraoperative: No routine use of NG tube; no preanesthetic; general anesthesia + epidural anesthesia; early extubation; maintaining normothermia; autologous blood transfusion or limit allogenic blood transfusion •Postoperative: no routine use of drains; patient sent to floor; epidural PCA; and jejunostomy tube feeding N=41 Standard care: •Preoperative: educated in the standard manner; day before surgery: last drink and diet at midnight; no fructose or protein loading. •Intraoperative: routine use of NG tube; Diazepam	Patients undergoing esophagectomy for esophageal cancer Median age (range): ERP: 55.14 ± 10.65; Standard care: 57.86 ± 11.34 China	• Complications • Postoperative length of stay • Readmission	

Study	Intervention and comparison	Population	Outcomes	Comments
	10mg; general anesthesia; late extubation; routine placement of abdominal tube (removed POD 3); routine placement of cervical tube (removed POD 2). •Postoperative: patient send to ICU; analgesia by morphine or vein PCA; nasojejunal tube feeding. N=39			
Zhao 2018[223]	ERP: •Preoperative: patient education, no bowel preparation, a normal diet until 6 h before surgery; Liquid intake until 2 h before surgery, preoperative carbohydrate loading before surgery (100 g glucose/1000 ml water taken orally at 10 p.m. on the evening before the surgery and 50 g glucose/500 ml water taken 2–3 h preoperatively). •Intraoperative: Analgesia with nonsteroidal anti-inflammatory drugs, minimization of opioid pain management, avoidance of perioperative fluid overload, no routine use of nasogastric tubes, no abdominal drains unless required, early removal of bladder catheters. •Postoperative: Liquid diet on recovery from anesthesia, semi-liquid diet on return of bowel function (stool or repeated flatus), tolerated liquid diet, and forced ambulation on the day of surgery. N=57 Standard care: •Preoperative: gastrointestinal preparation before surgery and fasted from midnight. Nasogastric tubes were placed preoperatively and usually	Patients undergoing total or distal gastrectomy for locally advanced gastric cancer, who received neoadjuvant chemotherapy with locally advanced gastric cancer; >18 and <75 years; ASA I–III; Participants can objectively describe the symptoms and actively cooperate; Written informed consent Mean age (SD): ERP: 60.8 ± 9.4; Standard care: 59.8 ± 7.9 China	• Complications • Postoperative length of stay	

Study	Intervention and comparison	Population	Outcomes	Comments
	remained until flatus occurred and no gastric retention presented after surgery. •Intraoperative: Intra-abdominal drains were placed during surgery, and in most cases, were maintained until the day before discharge. •Postoperative: not allowed oral intake until bowel flatus or obvious gastrointestinal movement occurred. The patients mobilized at will and usually remained in bed for approximately 2 days after surgery. N=57			
Zhu 2018[227]	ERP: •Preoperative: Multidisciplinary patient information; No bowel preparation; No fasting, fluids until 2 h before surgery, solids until 6 h; Orally take 1000mL+500mL 5% glucose solution the night; before and on the morning of surgery; •Intraoperative: Laparoscopic standardized technique; Fluid restriction (max 1500 mL); Prevention of deep vein thrombosis: stretch socks; Infusion heating; No abdominal drainage; •Postoperative: No nasogastric tube removal at awakening; Early mobilization 2 h after surgery; Early diet intake, fluids in postoperative day 0, and soft food in postoperative day 1; Opioid-free analgesia; Urinary catheter removal on postoperative day 1 N=16 Standard care: •Preoperative: Patient information; Mechanical	Patients were eligible if they were between 14 and 70 years of age, had histologically proven CD with disease localized to the terminal ileum with or without cecum involvement Surgery: Ileocecal resection Age –Median (IQR): ERP: 31.5 (29.25, 43.50); Standard care: 29.5 (26.25, 43.50) China	• Pain score • Postoperative length of stay • Total complications	

Study	Intervention and comparison	Population	Outcomes	Comments
	bowel preparation; Fasting since midnight before operation; No 5% glucose solution; •Intraoperative: Laparoscopic standardized technique; Fluid overload (over 1500mL); No stretch socks; No infusion heating; Abdominal drainage; •Postoperative: Nasogastric tube removal after passing flatus; Mobilization from postoperative day 1; Fluids and solids intake after first passage of stools; Opioid-free analgesia; Urinary catheter removal on postoperative day 2/3 N=16			

See appendix D for full evidence tables.

1.4.4 Quality assessment of clinical studies included in the evidence review

Table 4: Clinical evidence summary: ERP compared to standard care

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with Standard care	Risk difference with ERP (95% CI)
Mortality	3703 (28 studies)	⨁⊖⊖⊖ VERY LOW1,2 due to risk of bias, imprecision	Peto OR 0.93 (0.49 to 1.76)	Moderate	
				1 per 1000	0 fewer per 1000 (from 5 fewer to 8 more)
Quality of life (EQ-5D; 3 months)	87 (1 study) 3 months	⨁⨁⊖⊖ LOW1,2 due to risk of bias, imprecision		The mean quality of life (eq-5d; 3 months) in the control groups was 0.26	The mean quality of life (eq-5d; 3 months) in the intervention groups was 0.16 higher (0.03 to 0.29 higher)

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with Standard care	Risk difference with ERP (95% CI)
Quality of life (EORTC-QLQ; 2 weeks)	44 (1 study) 2 weeks	⨁⨁⨁⊖ MODERATE2 due to imprecision		The mean quality of life (eortc-qlq; 2 weeks) in the control groups was 9.28	The mean quality of life (EORTC-QLQ; 2 weeks) in the intervention groups was 0.38 lower (1.82 lower to 1.06 higher)
Quality of life score (cleveland clinic global) day 30	64 (1 study)	⨁⨁⊖⊖ LOW1,2 due to risk of bias, imprecision		The mean quality of life score (cleveland clinic global) day 30 in the control groups was 7.6	The mean quality of life score (cleveland clinic global) day 30 in the intervention groups was 0.1 lower (0.87 lower to 0.67 higher)
SF 12 (physical) - 2 weeks	49 (1 study)	⨁⊖⊖⊖ VERY LOW1,2 due to risk of bias, imprecision		The mean sf 12 (physical) - 2 weeks in the control groups was -0.2	The mean sf 12 (physical) - 2 weeks in the intervention groups was 0 higher (2.55 lower to 2.55 higher)
SF 12 (physical) - 6 weeks	49 (1 study)	⨁⨁⊖⊖ LOW1 due to risk of bias		The mean sf 12 (physical) - 6 weeks in the control groups was 6	The mean sf 12 (physical) - 6 weeks in the intervention groups was 5.6 lower (9.87 to 1.33 lower)
SF 12 (physical) - 12 weeks	49 (1 study)	⨁⊖⊖⊖ VERY LOW1,2 due to risk of bias, imprecision		The mean sf 12 (physical) - 12 weeks in the control groups was 7.4	The mean sf 12 (physical) - 12 weeks in the intervention groups was 2.1 lower (6.6 lower to 2.4 higher)
SF 12 (mental) - 2 weeks	49 (1 study)	⨁⊖⊖⊖ VERY LOW1,2 due to risk of bias, imprecision		The mean sf 12 (mental) - 2 weeks in the control groups was 0	The mean sf 12 (mental) - 2 weeks in the intervention groups was 0.6 higher (3.04 lower to 4.24 higher)
SF 12 (mental) - 6 weeks	49 (1 study)	⨁⊖⊖⊖ VERY LOW1,2 due to risk of bias, imprecision		The mean sf 12 (mental) - 6 weeks in the control groups was -2.4	The mean sf 12 (mental) - 6 weeks in the intervention groups was 3.4 higher (0.6 lower to 7.4 higher)

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with Standard care	Risk difference with ERP (95% CI)
SF 12 (mental) - 12 weeks	49 (1 study)	⨁⊖⊖⊖ VERY LOW1,2 due to risk of bias, imprecision		The mean sf 12 (mental) - 12 weeks in the control groups was -0.7	The mean sf 12 (mental) - 12 weeks in the intervention groups was 0.1 higher (3.09 lower to 3.29 higher)
Total complications	7459 (57 studies)	⨁⨁⊖⊖ LOW1,2 due to risk of bias, inconsistency	RR 0.65 (0.57 to 0.75)	Moderate	
				262 per 1000	92 fewer per 1000 (from 68 fewer to 113 fewer)
Complications Grade I (Clavien-Dindo)	300 (3 studies) 3 months	⨁⊖⊖⊖ VERY LOW1,2,3 due to risk of bias, inconsistency, imprecision	RR 0.84 (0.37 to 1.95)	Moderate	
				263 per 1000	42 fewer per 1000 (from 166 fewer to 250 more)
Complications Grade II (Clavien-Dindo)	522 (5 studies) 3 months	⨁⊖⊖⊖ VERY LOW1,2 due to risk of bias, imprecision	RR 0.98 (0.66 to 1.45)	Moderate	
				116 per 1000	2 fewer per 1000 (from 39 fewer to 52 more)
Complications Grade IIIa (Clavien-Dindo)	442 (4 studies) 3 months	⨁⊖⊖⊖ VERY LOW1,2 due to risk of bias, imprecision	RR 0.67 (0.38 to 1.19)	Moderate	
				125 per 1000	41 fewer per 1000 (from 78 fewer to 24 more)
Complications Grade IV (Clavien-Dindo)	100 (1 study) 3 months	⨁⊖⊖⊖ VERY LOW1,2 due to risk of bias, imprecision	RR 0.56 (0.05 to 6.02)	Moderate	
				38 per 1000	17 fewer per 1000 (from 36 fewer to 191 more)
Complications Grade V (Clavien-Dindo)	100 (1 study) 3 months	⨁⊖⊖⊖ VERY LOW1,2 due to risk of bias, imprecision	RR 0.85 (0.2 to 3.59)	Moderate	
				76 per 1000	11 fewer per 1000 (from 61 fewer to 197 more)
Patient satisfaction with	64	⨁⊖⊖⊖		The mean patient satisfaction with	The mean patient satisfaction with

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with Standard care	Risk difference with ERP (95% CI)
hospital stay 30 days	(1 study) 30 days	VERY LOW1,2 due to risk of bias, imprecision		hospital stay 30 days in the control groups was 8.4	hospital stay 30 days in the intervention groups was 0.2 lower (1.15 lower to 0.75 higher)
Length of hospital stay	1621 (18 studies)	⊕⊖⊖⊖ VERY LOW1,3 due to risk of bias, inconsistency		The mean length of hospital stay in the control groups was 12.21 days	The mean length of hospital stay in the intervention groups was 3.15 lower (3.94 to 2.37 lower)
Postoperative length of stay	3815 (25 studies)	⊕⊖⊖⊖ VERY LOW1,3 due to risk of bias, inconsistency		The mean postoperative length of stay in the control groups was 9.4 days	The mean postoperative length of stay in the intervention groups was 3.02 lower (3.63 to 2.42 lower)
ICU admission	569 (3 studies)	⊕⊖⊖⊖ VERY LOW1,2 due to risk of bias, imprecision	Peto OR 3.95 (0.78 to 19.88)	Moderate	
				3 per 1000	10 more per 1000 (from 1 fewer to 61 more)
Readmission	5159 (43 studies)	⊕⊕⊖⊖ LOW1,2 due to risk of bias, imprecision	Peto OR 1.09 (0.85 to 1.39)	Moderate	
				21 per 1000	2 more per 1000 (from 3 fewer to 8 more)
Pain score VAS (days 1 - 3)	467 (5 studies) 1 days	⊕⊕⊖⊖ LOW1,2 due to risk of bias, imprecision		The mean pain score vas (days 1 - 3) in the control groups was 4.383	The mean pain score vas (days 1 - 3) in the intervention groups was 0.60 lower (1.25 lower to 0.06 higher)
Pain score VAS (days >3-10)	687 (5 studies) 5 days	⊕⊖⊖⊖ VERY LOW1,3 due to risk of bias, inconsistency		The mean pain score vas (days >3-10) in the control groups was 4.414	The mean pain score vas (days >3-10) in the intervention groups was 0.51 lower (1.94 lower to 0.93 higher)
Pain score VAS (day	164	⊕⊕⊕⊖		The mean pain score vas (day	The mean pain score vas (day >10)

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with Standard care	Risk difference with ERP (95% CI)
>10)	(2 studies)	MODERATE1 due to risk of bias		>10) in the control groups was 1.003	in the intervention groups was 0.08 lower (0.54 lower to 0.39 higher)
Pain score (mean difference) - 2 weeks	49 (1 study)	⨁⊖⊖⊖ VERY LOW1,2 due to risk of bias, imprecision		The mean pain score (mean difference) - 2 weeks in the control groups was -18.5	The mean pain score (mean difference) - 2 weeks in the intervention groups was 3.5 higher (14.31 lower to 21.31 higher)
Pain score (mean difference) - 6 weeks	49 (1 study)	⨁⊖⊖⊖ VERY LOW1,2 due to risk of bias, imprecision		The mean pain score (mean difference) - 6 weeks in the control groups was -23.3	The mean pain score (mean difference) - 6 weeks in the intervention groups was 9.3 higher (5.94 lower to 24.54 higher)
Pain score (mean difference) - 12 weeks	49 (1 study)	⨁⊖⊖⊖ VERY LOW1,2 due to risk of bias, imprecision		The mean pain score (mean difference) - 12 weeks in the control groups was -20.5	The mean pain score (mean difference) - 12 weeks in the intervention groups was 0.6 lower (15.09 lower to 13.89 higher)
VAS > 3 (day 1)	32 (1 study)	⨁⨁⊖⊖ LOW1,2 due to imprecision	RR 0.25 (0.03 to 2)	Moderate	
				250 per 1000	188 fewer per 1000 (from 243 fewer to 250 more)

1 Downgraded by 1 increment if the majority of the evidence was at high risk of bias, and downgraded by 2 increments if the majority of the evidence was at very high risk of bias
2 Downgraded by 1 increment if the confidence interval crossed one MID or by 2 increments if the confidence interval crossed both MIDs
3 Downgraded by 1 or 2 increments because: The point estimate varies widely across studies, unexplained by subgroup analysis. The confidence intervals across studies show minimal or no overlap, unexplained by subgroup analysis Heterogeneity, I2=50%, p=0.04, unexplained by subgroup analysis.

Table 5: Evidence not suitable for GRADE analysis: ERP compared to standard care

Outcome	Study (no. of participants)	Risk of bias	Comparison results	Intervention results	*P* value
Quality of life (EQ-5D)	Jones 2013 (104)	High	Median AUC 37.2	Median AUC 35.6	0.002
Total complications	Deng 2017 (159)	Low	76/76	87/83	n/a
	Forsmo 2016 (307)	High	194/154	198/153	n/a
	Shetiwy 2017 (70)	High	16/35	44/35	n/a
	Takagi 2019 (74)	High	19/37	39/37	n/a
Length of hospital stay	Alito 2016 (36)	Low	Median (range) 6 (3-8)	Median (range) 3 (2-5)	p <0.01
	Chen Hu 2012 (88)	High	Median (range) Laparoscopic 7.5 (6-11) Open 8.75 (7-14)	Median (range) Laparoscopic 7 (5.5 -10) Open 7.5 (6-11)	n/a
	Dickson 2017 (112)	High	Median (CI) 3 (2.0-3.0)	Median (range) 3 (2.0-3.0)	0.36
	Forsmo 2016 (324)	High	Median (range) 8 (2-48)	Median (range) 5 (2-50)	P<0.001
	Frees 2018 (23)	High	Mean (range) 7.39 (5-11)	Mean (range) 6.1 (5-7)	0.020

Outcome	Study (no. of participants)	Risk of bias	Comparison results	Intervention results	*P* value
	Fujikuni 2016 (80)	Low	Mean (range) 10.4 (7-23)	Mean (range) 9.8 (6-20)	0.724
	He 2015 (99)	High	Median (range) 10 (7-15)	Median (range) 6 (4-8)	n/a
	Jensen 2015 (107)	High	Median (range) 8 (4-55)	Median (range) 8 (3-30)	n/a
	Jones 2013 (104)	High	Median (range) 7 (6-8)	Median (range) 4 (3-5)	<0.001
	Khoo 2007 (81)	High	Median (range) 7 (4-63)	Median (range) 5 (3-37)	<0.001
	Lee 2011 (100)	High	Median (range) 9 (8-10)	Median (range) 7 (6-8)	n/a
	Lemanu 2013 (106)	High	Median (range) 2 (2-3)	Median (range) 1 (1-3)	n/a
	Li 2018 (226)	High	Median (range) 8.7 (6.6-18.8)	Median (range) 8.6 (5.7-14.2)	0.07
	Liang 2018 (126)	High	Median (range) 8 (6-11)	Median (range) 5 (1-24)	<0.001
	Lin 2018 (290)	Low	Median 17	Median 15	0.26

Outcome	Study (no. of participants)	Risk of bias	Comparison results	Intervention results	*P* value
	Lu 2014 (297)	High	Median (range) 13 (11-15)	Median (range) 10 (9-12)	<0.001
	Muehling 2008 (59)	High	Median (range) 11 (7-34)	Median (range) 11 (8-33)	n/a
	Muller 2009 (156)	High	Median (range) 6 (6-30)	Median (range) 5 (2-30)	<0.0001
	Scioscia 2017 (227)	High	Median (range) 7 (4-33)	Median (range) 3 (3-12)	< 0.001
	Vlug 2011 (427)	Low	Median (IQR) Laparoscopy & Standard care: 6 (4.5-9.5) Open & Standard care: 7 (6-13)	Median (IQR) Laparoscopy & FT: 5 (4-8) Open & FT: 7 (5-11)	<0.001
	Wang 2012 (78)	High	Median (range) 7.0 (6-8)	Median (range) 5.5 (5-6)	n/a
Postoperative Length of stay	Vlug 2011 (427)	Low	Median (range) Laparoscopy and standard care 6 (4-8.5) Open & standard care 7 (6-10.5)	Median (range) Laparoscopy & FT 5 (4-7) Open & FT: 6 (4.5 – 10)	<0.001
	Gatt 2005 (39)	High	Mean (range) 7.5 (6-10)	Mean (range) 5 (4-9)	0.027
	Muehling 2009 (101)	High	Median (range) 11 (8-45)	Median (range) 10 (6-49)	n/a

Outcome	Study (no. of participants)	Risk of bias	Comparison results	Intervention results	*P* value
	Pimenta 2015 (41)	High	Median (range) 3 (2-3)	Median (range) 2 (2)	0.02
	Petersen 2006 (79)	High	Median (range) 8 (1-10)	Median (range) 7 (1-9)	0.019
	Tanaka 2017 (148)	High	Median (range) 10 (9-11.5)	Median (range) 9 (8-10)	0.037
	Wang 2010 (94)	High	Median (range) 8 (7-8)	Median (range) 6 (7-8)	<0.001
	Wang 2012 (99)	High	Median (range) 5 (3-48)	Median (range) 4 (2-12)	0.01
	Yilmaz 2018 (62)	High	Median (range) 3.0 (1.75)	Median (range) 2.0 (1.0)	0.010
Pain (VAS)	Petersen 2006 (79)	High	Median (range) 48 hours post operatively 1.2 (0-4.1) Median (range) 4 days postoperatively 1.0 (0-5.5)	Median (range) 48 hours post operatively 1.8 (0-5.5) Median (range) 4 days postoperatively 1.0 (0-5)	n/a
	Serclova 2009 (105)	High	Median (range) Post-operative days (0-5): median 3.2, 2.4, 1.8, 1.6, 1.2, 0.8 points	Median (range) (Post-operative days 0-5): 1.6, 1.0, 0.6, 0.3, 0.0 , 0.0 points	<0.001
	Tang 2015 (100)	High	There is no significant difference with regard to resting pain between the two groups at 2 h after surgery.		>0.05

Outcome	Study (no. of participants)	Risk of bias	Comparison results	Intervention results	*P* value
			The level of resting pain is lower than conventional group at 12 h and 24 h after surgery.		<0.01
	Wang 2010 (94)	High	Patients receiving FTS experienced significantly less pain than those in the conventional surgery group from day 1 to day 5 after surgery.		<0.05
Stay in ICU	Li 2018 (226)	High	Median (range) 22.0 (13.4 – 212.3)	Median (range) 20.9 (13.5 – 69.3)	<0.001
	Muehling 2008 (59)	High	Median (range) 1(1-12)	Median (range) 1 (1-33)	n/a
	Muehling 2009 (101)	High	Median (range) 32 (12-293)	Median (range) 20 (14-336)	n/a

See appendix F for full GRADE tables.

1.5 Economic evidence

1.5.1 Included studies

Five health economic studies with the relevant comparison were included in this review.[97, 103, 170, 182, 191] These are summarised in the health economic evidence profiles below (Table 6 - Table 10) and the health economic evidence tables in Appendix H:.

1.5.2 Excluded studies

No relevant health economic studies were excluded due to assessment of limited applicability or methodological limitations.

See also the health economic study selection flow chart in Appendix G:.

1.5.3 Summary of studies included in the economic evidence review

Table 6: Health economic evidence profile: Enhanced recovery programme (ERP) versus standard care

Study	Applicability	Limitations	Other comments	Incremental cost[(c)]	Incremental effects	Cost effectiveness	Uncertainty
Larsen 2009[97] (Denmark)	Partially applicable[(a)]	Potentially serious limitations [(b)]	• Population: People undergoing elective primary total hip arthroplasty, total knee arthroplasty, or unicompartmental knee arthroplasty • Intervention 1: Standard care • Intervention 2: ERP • Cost-utility analysis • Within trial analysis of RCT (Larsen 2008[98]) • Follow-up: 1 year • Participants from the RCT were followed-up for one year postoperatively to allow costs and effects to be collected. Costs from the time of the patients visit immediately before the operation to one year after were calculated at 15 time points.	*Hip and knee surgeries combined:* Incremental (ERP vs SC): -£984 *Total hip arthroplasty:* Incremental (ERP vs SC): -£644 *Total knee arthroplasty or unicompartmental knee arthroplasty:* Incremental (ERP vs SC): -£2,236	*Hip and knee surgeries combined:* Incremental QALYs (ERP vs SC): 0.05 *Total hip arthroplasty:* Incremental QALYs (ERP vs SC): 0.09 *Total knee arthroplasty or unicompartmental knee arthroplasty:* Incremental QALYs (ERP vs SC): -0.04	*Hip and knee surgeries combined:* Intervention 2 is dominant[(e)] *Total hip arthroplasty:* Intervention 2 is dominant[(e)] *Total knee arthroplasty or unicompartmental knee arthroplasty:* Intervention 2 resulted in less costs but also less QALYs therefore the ICER for intervention 1 vs intervention 2: £58,400[(d)]	Uncertainty was explored by using bootstrap simulations with 2000 replicates of the incremental difference. This showed that for the combined and hip arthroplasty analyses 97% - 98% of the ICERs resulted in intervention 2 being dominant. For knee surgery 93% of simulations resulted in intervention 2 being cost-saving.

Abbreviations: ERP = enhanced recovery after surgery; ICER = incremental cost effectiveness ratio; QALY = quality-adjusted life years; RCT = randomised controlled trial; SC = standard care

(a) Danish societal perspective and 2006 Danish Krone may not be relevant to current UK practice, costs include productivity loss which is not considered appropriate in NICE reference case. The study uses the Danish EQ-5D tariff which is not in line with the NICE reference case.

(b) Analysis was based on a single study and so does not reflect full body of available evidence for this area (76 RCTs included in the clinical review). Patient reporting was a method of obtaining unit costs which may be unreliable.
(c) 2006 Danish Krone converted to UK pounds.[152]. Cost components: Drug costs, physiotherapy, hospitalisation costs, staff time, tests, informal care, transportation, food and readmissions. The base case univariate analysis included productivity costs therefore an alternative multivariate analysis was reported for the costs as it excluded productivity costs. However, the QALYs reported and bootstrap replicates reported are from the univariate analysis.
(d) Note comparators have been switched around for ease of intepretation so the more effective intervention can be compared against the less effective intervention. The interpretation is that standard care is not cost effective and therefore ERP is the most cost effective.
(e) Interventions are dominant when they are both less costly and more effective.

Table 7: Health economic evidence profile: Enhanced recovery after surgery programmes versus standard care

Study	Applicability	Limitations	Other comments	Incremental cost[(c)]	Incremental effects	Cost effectiveness	Uncertainty
Lemanu 2013[103] (New Zealand)	Partially applicable[(a)]	Potentially serious limitations [(b)]	• Population: People undergoing elective laparoscopic sleeve gastrectomy • Intervention 1: Standard care • Intervention 2: ERP • Cost-consequence analysis • Follow up: 30 days post-discharge • Within-trial analysis of RCT (Lemanu 2013[103]) • The total cost incurred per person was calculated by adding the costs incurred during the index admission to those of subsequent readmissions. A comparative analysis was conducted to determine the cost-savings of laparoscopic sleeve gastrectomy with an ERP programme.	Incremental (ERP vs SC): -£351	**Total complications:** Risk ratio 1.10 (CI: 0.60, 1.99) **Readmission:** Peto odds ratio 0.94 (CI: 0.31, 2.80); ARD -11 per 1000 **Total hospital length of stay (median):** Incremental (ERP vs SC): -1	ERP is cost-saving ERP had a slightly higher complication risk but reduced readmission and total length of stay.	No sensitivity analyses conducted

Abbreviations: ARD = absolute risk difference; CI = confidence interval; ERP = enhanced recovery programme; RCT = randomised controlled trial

(a) New Zealand hospital perspective may not reflect current UK practice, cost year was not reported and measure of effect is not in line with NICE reference case as the analysis does not report QALYs.
(b) Analysis was based on a single study and so does not reflect full body of available evidence for this area (76 RCTs included in the clinical review). Does not give a breakdown of the cost components, unclear where unit costs were obtained and whether the cost of the intervention was included.
(c) 2013 New Zealand Dollars converted to UK pounds.[152]. Cost components: not reported

Table 8: Health economic evidence profile: Enhanced recovery programme versus standard care

Study	Applicability	Limitations	Other comments	Incremental cost[(c)]	Incremental effects	Cost effectiveness	Uncertainty
Scioscia 2017[170] (Italy)	Partially applicable[(a)]	Potentially serious limitations [(b)]	• Population: People aged >18 years with preoperative evidence of bowel endometriosis (ultrasound, MRI or double contrast barium enema); primary laparoscopic approach; and obtained informed consent • Intervention 1: Standard care • Intervention 2: ERP • Cost-consequence analysis • Within-trial analysis based on single RCT (Scioscia 2017[170]) • Follow-up: 30 days post-surgery • Direct medical costs were estimated through costing up diagnostic-related group codes. Complications were taken into account and costs of hospitalisation according to each subgroup were identified	Incremental (ERP vs SC): -£1,793	**Total complications:** Risk ratio 0.76 (CI: 0.26, 2.22) **Total hospital length of stay (median):** Incremental (ERP vs SC): -4 **Readmission:** Peto odds ratio 1.16 (CI: 0.56, 2.54); ARD 17 per 1000	ERP is cost saving ERP had a slightly higher readmission rate but reduced complications and total length of stay	No sensitivity analyses conducted

Study	Applicability	Limitations	Other comments	Incremental cost[(c)]	Incremental effects	Cost effectiveness	Uncertainty
			and attached to the numbers experiencing each event in each group.				

Abbreviations: ARD = absolute risk difference; CI = confidence interval; ERP = enhanced recovery programme; RCT = randomised controlled trial

(a) Italian hospital perspective and 2015 Italian Euros may not reflect current UK practice, measure of effect is not in line with NICE reference case as the analysis does not report QALYs.

(b) Analysis was based on a single study and so does not reflect full body of available evidence for this area (76 RCTs included in the clinical review); does not give details of cost components and unit costs were obtained from a single hospital and not national sources. Unclear whether the intervention cost was included.

(c) 2015 Italian Euros converted to UK pounds.[152]. Cost components: All direct medical costs associated with hospital resource utilisations for this type of surgery and additional complications.

Table 9: Health economic evidence profile: Enhanced recovery programme versus standard care

Study	Applicability	Limitations	Other comments	Incremental cost[(c)]	Incremental effects	Cost effectiveness	Uncertainty
Tanaka 2017[182] (Japan)	Partially applicable[(a)]	Potentially serious limitations [(b)]	• Population: People with histologically confirmed adenocarcinoma of the stomach for which curative gastrectomy was planned • Intervention 1: Standard care • Intervention 2: ERP • Cost-consequence analysis • Within trial analysis based on RCT (Tanaka 2017[182]) • All costs incurred during the hospital stay were calculated for each intervention and were divided into charges for consultation,	**Total costs (median per person):** Incremental (ERP vs SC): -£223	**Mortality:** Incremental (ERP vs SC): 0 **Postoperative hospital length of stay (median):** Incremental (ERP vs SC): -1 **Complications:** *Clavien-Dindo classification grade ≥ 2:* RR 0.60 (CI: 0.34, 2.80); ARD -127 per 1000 *Clavien-Dindo classification grade*	ERP is cost saving ERP reduced complications, readmissions and postoperative length of hospital stay. There was no difference in mortality.	No sensitivity analyses conducted

Study	Applicability	Limitations	Other comments	Incremental cost[(c)]	Incremental effects	Cost effectiveness	Uncertainty
			prescriptions, injections, nursing care, the operating theatre, the laboratory, radiology, the ward and meals, and other services.		≥ *3:* RR 0.28(CI: 0.08, 0.99); ARD -104 per 1000 **Readmission (mean):** RR 0.94 (CI: 0.06, 15.27); ARD -1 per 1000		

Abbreviations: ARD = absolute risk difference; CI = confidence interval; ERP = enhanced recovery programme; RCT = randomised controlled trial; SC = standard care

(a) Japanese hospital perspective may not reflect current UK practice, cost year was not reported and measure of effect is not in line with NICE reference case as the analysis does not report QALYs.

(b) Analysis was based on a single study and so does not reflect full body of available evidence for this area (76 RCTs included in the clinical review). Unclear where unit costs were obtained and whether the intervention cost was included.

(c) 2017 Japanese Yen converted to UK pounds.[152]. Cost components: consultations, prescriptions, injections, nursing care, the operating theatre, the laboratory, radiology, the ward and meals, and other services.

Table 10: Health economic evidence profile: Enhanced recovery programme versus standard care

Study	Applicability	Limitations	Other comments	Incremental cost[(c)]	Incremental effects	Cost effectiveness	Uncertainty
Vlug 2011[191] (Netherlands)	Partially applicable[(a)]	Potentially serious limitations [(b)]	• Population: People aged 40 - 80 years of age; ASA grade I-III; undergoing elective segmental colectomy for histologically confirmed adenocarcinoma or adenoma; without evidence of metastatic disease. • Laparoscopy analysis: - Intervention 1: Standard care	**Total costs (median):** **University hospital costs:** *Laparoscopy:* Incremental (ERP vs SC): -£1,159 *Open surgery:* Incremental	**Major complications (mean per person):** *Laparoscopy:* (ERP vs SC): RR 1.15 (CI: 0.63, 2.11) ARD 24 per 1000 *Open surgery:* (ERP vs SC): RR 0.91 (CI: 0.58, 1.43) ARD -27 per	Teaching hospital costs showed that both laparoscopy and open surgery resulted in fewer costs with ERP. University hospital costs showed that laparoscopy resulted in fewer costs with ERP	No sensitivity analyses conducted

Study	Applicability	Limitations	Other comments	Incremental cost[(c)]	Incremental effects	Cost effectiveness	Uncertainty
			- Intervention 2: ERP • Open surgery analysis: - Intervention 1: Standard care - Intervention 2: ERP • Cost-consequence analysis • Within-trial analysis based on RCT (Vlug 2011[191])] • Follow-up: 30 days post-discharge • The marginal direct medical in-hospital costs were calculated for the four treatment strategies per person.	(ERP vs SC): £1,964 **Teaching hospital costs:** <u>*Laparoscopy:*</u> Incremental (ERP vs SC): -£388 <u>*Open surgery:*</u> Incremental (ERP vs SC): -£129	1000 **Minor complications (mean):** <u>*Laparoscopy:*</u> (ERP vs SC): RR 0.86 (CI: 0.49, 1.51) ARD -34 per 1000 <u>*Open surgery:*</u> (ERP vs SC): RR 1.23 (CI: 0.71, 2.21) ARD 56 per 1000 **Total hospital length of stay (median):** <u>*Laparoscopy:*</u> (ERP vs SC): -1 <u>*Open surgery:*</u> Incremental (ERP vs SC): 0	but open surgery resulted in higher costs with ERP. ERP reduced major complications for those undergoing open surgery but resulted in slightly more minor complications. ERP reduced minor complications in those undergoing laparascopy but resulted in slightly more major complications. Total hospital stay was reduced for those undergoing laparoscopy.	

Abbreviations: ARD = absolute risk difference; CI = confidence interval; ERP = enhanced recovery programme; RCT = randomised controlled trial

(a) Dutch healthcare perspective may not reflect current UK practice, cost year was not reported and measure of effect is not in line with NICE reference case as the analysis does not report QALYs.

(b) Analysis was based on a single study and so does not reflect full body of available evidence for this area (76 RCTs included in the clinical review), unclear where the unit costs were obtained.

(c) 2011 Dutch Euros converted to UK pounds.[152]. Cost components: outpatient care, operating time, patient-days, cost of laparoscopy and enhanced recovery care, complications, reoperations and readmissions.

1.5.4 Unit costs

Relevant unit costs are provided below to aid consideration of cost effectiveness. The cost of a hospital bed day is provided and the cost of additional days spent in hospital for the standard care arm is calculated based on the clinical review.

Table 11: UK costs of additional hospital length of stay

Cost of hospital bed day	Cost of additional days in standard care arm	Source, assumptions
£407	£1,229	Additional days in hospital taken from the clinical review where ERP group had 3.02 fewer postoperative days in hospital Based on elective inpatient excess bed days, all episodes excluding paediatrics

Source: NHS Reference Costs 2017/18[42]

1.6 Evidence statements

1.6.1 Clinical evidence statements

No evidence was found for patient and staff adherence and psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)).

ERP versus standard care

Mortality

Twenty eight studies showed no clinically important difference between ERP and standard care for mortality (28 studies, n=3703, very low quality evidence).

Length of stay

Eighteen studies demonstrated a clinically important benefit with ERP to length of hospital stay compared to standar care(18 studies, n = 1621, very low quality evidence).

Twenty five studies showed a clinically important benefit with ERP to postoperative length of stay compared to standard care (25 studies, n = 3815, very low quality evidence).

Three studies found no clinically important difference between ERP intervention and standard care in ICU admissions (3 studies, n= 569, very low quality evidence).

Forty three studies showed no clinically important difference between ERP and standard care in readmission rates (43 studies, n= 5159, low quality evidence).

Quality of life

One study showed no clinically important difference between ERP and standard care for patient satisfaction (1 study, n = 64, very low quality evidence).

One study using the EQ-5D scale found a clinically important benefit with ERP on quality of life at 3 months compared to standard care (1 study, n= 87, low quality evidence).

One study adopting the QLQ-C30 scale found there was no clinically important difference between ERP and standard care in quality of life at 2 weeks (1 study, n= 44, moderate quality evidence).

A single study found no clinically important difference between ERP when assessing quality of life using the Cleveland Clinic Global Scale at 30 days compared to standard care (1 study, n= 64, low quality evidence).

One study which looked at SF – 12 (physical) scores at two, six and twelve weeks found no clinically important different with ERP and two weeks and twelve weeks and a clinically important harm with ERP at six weeks compared to standard care (1 study, n=49, very low quality of evidence)

One study which looked at SF – 12 (mental) scores at two, six and twelve weeks found a clinically important benefit with ERP at six weeks but clinically important difference at two weeks or twelve weeks postoperatively compard to standard care (1 study, n=49, very low quality of evidence)

Adverse events

Fifty five studies showed a clinically important benefit between ERP for total complications compared to standard care (55 studies, n=8034, low quality evidence).

Three studies found no clinically important difference between ERP and standard care using the Clavien Dindo Grade I classification for complications (3 studies, n= 300, very low quality evidence).

Five studies found no clinically important difference between ERP and standard care in Clavien Dindo Grade II complications (5 studies, n= 522, very low quality evidence).

Four studies demonstrated no clinically important difference between ERP and standard care of Clavien Dindo Grade IIIa complications (4 studies, n= 442, very low quality evidence)

One study showed a no clinically important difference between ERP and standard care in Clavien Dindo Grade IV complications(1 study, n= 100, very low quality evidence)

A single study found no clinically important difference between ERP and standard care in Clavien Dindo Grade V complications (1 study, n= 100, very low quality evidence)

Pain

Five studies found no clinically important difference between ERP and standard care for pain scores 1 – 3 days postoperatively and (5 studies, n= 467, low quality evidence)

Five studies found no clinically important difference between ERP and standard care in pain scores between 3 – 10 days postoperatively (5 studies, n= 687, low quality evidence)

Two studies found no clinically importance difference between ERP and standard care in pain scores, beyond 10 days postoperatively, when using a visual analogue scale (2 studies, n= 164, moderate quality evidence)

One study measured a mean difference in pain scores at two, six and twelve weeks, which showed a clinically important benefit with ERP at two and six weeks but no clinically important difference with ERP at twelve weeks compared to standard care (1 study, n=49, very low quality evidence)

One study found a clinically important benefit with ERP when measuring those with a VAS score over three on postoperative day one compared to standard care (1 study, n=32, low quality of evidence)

Evidence not suitable for GRADE analysis:

One study showed no statistically significant difference between ERP and standard care in the median area under the curve for quality of life using the EQ-5D scale (1 study, n= 104, high risk of bias)

Twenty one studies showed a clinically important benefit or no statistically significant different with ERP compared to standard care for length of hospital stay (21 studies, n= 3146, high risk of bias)

Nine studies found a statistically significant difference with ERP in postoperative length of stay compared to standard care (9 studies, n= 1090, high risk of bias)

Four studies assessing pain through a visual analogue scale found no statistical difference between ERP and standard care in pain scores at different postoperative time points (4 studies, n= 378, high risk of bias)

Three studies found no statistical difference i between ERP i compared to standard care in length of stay in ICU (3 studies, n= 386, high risk of bias)

1.6.2 Health economic evidence statements

- One cost-utility analysis found that ERP was dominant (less costly and more effective) compared to standard care. This analysis was assessed as partially applicable with potentially serious limitations.
- Three cost-consequences analyses found that ERP was cost saving compared to standard care (cost saving: between £230 and 1800 per person). These analyses were assessed as partially applicable with potentially serious limitations.
- One cost-consequence analysis found that ERP was cost saving compared to standard care (cost saving: between £100 and £1200). However, for the analysis where people underwent open surgery at a university hospital it was not cost-saving. This analysis was assessed as partially applicable with potentially serious limitations.

1.7 The committee's discussion of the evidence

Please see recommendations 1.2.1 – 1.2.2 in the guideline.

1.7.1 Interpreting the evidence

1.7.1.1 The outcomes that matter most

The aim of ERP is for patients to return to their baseline function as quickly as possible and to reduce the incidence of postoperative complications. As such, the committee considered critical outcomes for decision making to be health-related quality of life, mortality, patient, family and carer experience of care, adverse events and complications and patient and staff adherence. Length of hospital stay, unplanned intensive care unit admission, length of stay in intensive care unit, hospital readmission and psychological distress and mental well-being were also thought to be important outcomes and were considered when weighin up the benefits and harms of ERP.

No evidence was identified for patient and staff adherence; symptom scores and function measures; and psychological distress and mental wellbeing.

1.7.1.2 The quality of the evidence

The quality of evidence that was suitable for GRADE analysis ranged from very low to moderate. The majority of the evidence was graded at very low quality. This was mostly due to risk of bias and imprecision. The committee noted the quality of evidence alongside the often relatively large size of the datasets when considering the weight of the evidence in influencing decision making.

Outcomes which were not suitable for GRADE analysis were considered to be at low to high risk of bias.

1.7.1.3 Benefits and harms

The committee discussed the evidence on enhanced recovery programmes for adults having major surgery.

The committee noted that there was some limited evidence showing a benefit of ERP for patient quality of life. Four studies reported quality of life using different measurement scales. When assessing the evidence using the EQ-5D scale, there was a clinically important benefit in quality of life. Whereas when using the QLQ-30 and Cleveland Global Quality of Life scales, no clinically important difference was identified through the evidence. One study assessed quality of life through the SF-12 score at two, six and twelve weeks. There was a clinically important harm at six and twelve weeks in the physical component but a clinically important benefit in the mental component at six weeks. Otherwise there was no clinically important difference in the physical or mental component of the score at the other time points. The committee noted that the number of patients included in these studies and the subsequent outcomes were too small to draw any strong conclusions.

Twenty eight studies showed no clinically important difference in mortality rates between enhanced recovery programmes and standard care.

When looking at total complications from fifty six different studies, the committee noted a clinically important benefit of enhanced recovery programmes. Grade of complication was also reported by some studies. Generally patients had a reduced risk of experiencing both low grade and more severe complications. However, the committee did not feel that the decreased risk of complications was a clinically important benefit due to the small risk difference. The variation of effect of enhanced recovery programmes over complication severities caused a level of uncertainty in the committee's confidence to make a conclusion, but they noted the potential benefit of enhanced recovery programmes in reducing the total number of complications.

Within the evidence, length of stay was divided into two outcomes as reported by the incuded studies: length of hospital stay and postoperative length of stay. The committee noted that the length of hospital stay would in turn be shortened by the reduced postoperative length of stay. The committee reviewed the evidence which showed a clinically important benefit in reducing length of hospital stay and reducing postoperative length of stay across eighteen studies and twenty five studies respectively. The committee felt that this large body of evidence showing a benefit with ERP in reduced complications and length of hospital stay was significant and contributed heavily to discussions around a recommendation for ERP.

The committee noted that the evidence presented showed a higher rate of intensive care admission in the enhanced recovery arm, but agreed that this difference was not of clinical importance overall and was possibly related to the use of epidurals in the studies. The committee also added that this is not consistent with routine clinical practice as epidurals are typically avoided if possible in enhanced recovery programmes. The committee considered that this noted difference could have alternatively been due to a higher level of attention given in the review of patients with ERP with some of the admissions not being necessary.

Forty two studies reported readmission rates within a one month period. When assessing these results, the committee agreed there was no clinically important difference in readmission rates between enhanced recovery programmes and standard care.

There were no clinically important differences in pain scores between postoperative days one to three, three to ten and over ten days. One study assessed the mean difference in pain scores over two, six and twelve weeks postoperatively. This study showed a clinically important benefit at two and six weeks, but this trend was not continued at twelve weeks. Another study showed a clinically important benefit in reducing the number of people who reported a VAS score >3 on postoperative day one. Overall, the committee felt that while there is a general trend in reduction of pain scores for patients in the enhanced recovery programmes, the difference in mean pain scores between the groups was not enough to draw a strong conclusion.

In summary, the committee agreed that while there was no notable evidence of difference with ERP for a number of outcomes, an enhanced recovery program may result in a reduction in perioperative complications and a shorter length of hospital stay, as well as some potential improvements in quality of life.

1.7.2 Cost effectiveness and resource use

Five economic evaluations were included in the evidence. One study was a cost-utility analysis and four were cost-consequences analyses.

One study was a cost-utility analysis based on a single RCT in Denmark. The study implemented an enhanced recovery programme for adults undergoing joint replacement (hip and knee). The study looked at a one year time horizon and showed that for both hip and knee surgery, the enhanced recovery programme was dominant as it resulted in fewer costs and more QALYs (utility was measured using the EQ-5D). They also looked at hip and knee replacement separately. For hip surgery, the enhanced recovery programme remained dominant. For knee surgery, the enhanced recovery programme was less costly but resulted in slightly fewer QALYs. This study was assessed as partially applicable with potentially serious limitations. This was because 2006 Danish costs and societal perspective may not be relevant to current UK practice and the analysis was based on a single RCT and therefore does not reflect the full body of available evidence in this area.

One study conducted a cost-consequences analysis based on a single RCT looking at adults undergoing elective laparoscopic sleeve gastrectomy in New Zealand. The analysis showed that the enhanced recovery programme resulted in a reduction in length of stay of one day and a reduction in costs. Readmission was also reduced but total complications were slightly higher in the enhanced recovery programme arm. This study was assessed as partially applicable with potentially serious limitations. Reasons for this included that the cost year was not reported, the measure of effect was not in line with the NICE reference case as they did not measure QALYs and the analysis was based on a single RCT.

Another study also conducted a cost-consequences analysis based on a single RCT in Italy. They assessed implementing the enhanced recovery programme for women undergoing laparoscopic surgery for bowel endometriosis. The results showed that there was a reduction in length of stay of 4 days, a reduction in complications and reduction in costs. Another cost-consequences analysis based on a single RCT in Japan compared an enhanced recovery programme to standard care for adults undergoing curative gastrectomy for stomach cancer. The results also showed that there was a reduction in length of stay, a reduction in complications and reduction in costs. Both studies were assessed as partially applicable with potentially serious limitations. As neither of them measured QALYs, it was unclear whether they included the cost of the intervention and the analysis was based on a single RCT, and therefore does not reflect the full body of evidence available in this area.

Lastly, another study conducted a cost-consequences analysis based on a single RCT looking at adults undergoing colectomy for adenocarcinoma or adenoma in the Netherlands. The study compared an enhanced recovery programme in laparoscopic surgery and open surgery. In the laparoscopy comparison there was a reduction in length of stay for the enhanced recovery programme and a reduction in costs for both university and teaching hospitals. In the open surgery comparison there was no difference in length of stay and the enhanced recovery programme resulted in fewer costs in the teaching hospitals but was more costly in the university hospitals. The committee discussed the issue that there was a different result between university and teaching hospitals in the open surgery comparison, but agreed that this could be due to differences in the health care system in the Netherlands and that in the NHS, it is unlikely that you would find a big difference in costs across different hospitals. Also, they acknowledged that laparoscopic surgery is more relevant as enhanced recovery programmes are more likely to adopt a less invasive surgery approach. This study was assessed as partially applicable with potentially serious limitations. Reasons for this rating were because the analysis did not measure QALYs, the cost year was not reported and the analysis was based on a single RCT.

Overall the results showed that the enhanced recovery programmes were cost-saving which was mostly due to a reduction in complications and length of stay. The cost-utility analysis showed that the enhanced recovery programme was dominant as it resulted in less costs and more QALYs for adults undergoing hip and knee surgery. One study included in the clinical review measured patient's quality of life with the EQ-5D. This showed that patient's quality of life improved at three months with the enhanced recovery programme, which could indicate that the enhanced recovery programme is potentially a dominant strategy as it results in less costs and increased benefits.

All studies were rated as partially applicable with potentially serious limitations. All studies were not from a UK NHS perspective and apart from one analysis, the studies did not measure quality of life. Also, some of the studies did not report the source of their unit costs or they obtained them from local hospitals rather than national sources. Each study was an analysis based on a single RCT which does not reflect the full body of available evidence for this area as identified in the clinical review.

The committee highlighted the importance of the reduction in postoperative length of stay in the enhanced recovery programme arm. The clinical review showed that there was a mean reduction in postoperative length of stay of 3.02 days. The committee were presented with an example of unit costs in relation to this reduction in length of stay. Using the average cost of a hospital bed day, the enhanced recovery programme would save £1,229 per person. The committee highlighted that this would offset the cost of implementing an enhanced recovery programme. A lot of the concepts involved in an enhanced recovery programme are already available in hospitals, for example, early mobilisation and early intake of food and fluids. In order to have an enhanced recovery programme it requires bundling these elements together and ensuring the patient receives the elements before, during and after surgery. There may be some additional costs due to an increase in resource use, for example, some hospitals may choose to have a dedicated member of staff, like an enhanced recovery nurse, that is responsible for ensuring the pathway is in place. However, this is not essential for delivering the programme. Another additional cost would be the carbohydrate drinks which are a common element of the enhanced recovery programme. There are different carbohydrate drinks available but the cost ranges from £2 to £8 per patient. The annual PQIP 2018 report showed that 61% of people undergoing elective surgery were enrolled on an ERP pathway, and showed that some specialities had higher uptake than others. Starting an enhanced recovery programme may have an initial resource impact, however, the committee noted that the downstream savings in relation to a reduction in length of stay would outweigh the cost of implementing the programme.

The clinical review demonstrated that there was an increase in ICU admissions for those receiving an enhanced recovery programme. The committee felt that this did not reflect what

is seen in current practice in the NHS where enhanced recovery programmes tend to reduce ICU admission. They highlighted that there were factors that could have contributed to this such as the studies that reported ICU admission used epidurals, whereas in UK practice epidurals would be avoided in an enhanced recovery programme.

The economic evidence included was not from a UK perspective, which might imply that resource use could be different, for example, in terms of average length of stay. However, the committee concluded that the difference in resource use reported in the studies, like reduction in length of stay - that led to the resulting cost savings - was likely to be feasible in the UK NHS and was confirmed by the guideline evidence review. Therefore, the committee felt confident that the clinical and economic evidence demonstrated a strong case for recommending enhanced recovery programmes, and this was also in keeping with the committees own experiences in practice.

Overall the committee felt that there was substantial evidence to make a recommendation and felt that implementing enhanced recovery programmes will lead to future savings for the NHS.

1.7.3 Other factors the committee took into account

The adoption of ERP in the UK is evidenced by how enhanced recovery pathways feature strongly in the UK Perioperative Quality Improvement programme [PQIP] and is highlighted in their annual report. PQIP is a multi-speciality innovation between the Royal Colleges of Anaesthesia and Surgery and aims to improve surgical morbidity and outcomes for patients. Enhanced recovery has been identified as one of the top 5 National improvement priorities for 2019-2020. Speciality specific audits and shared resources could potentially strengthen the case for ERPs.

The committee noted the significant variation in the composition of ERP from the evidence presented. It was agreed that there are key components to enhanced recovery across pre, intra and post-operative care, but also that enhanced recovery should be multimodal and flexible to the institution and patient. The committee also noted that epidural pain relief was implemented in a number of the studies, although there is a general effort in the UK to minimise epidural usage and epidural catheters are now no longer usually part of an enhanced recovery programme because they can limit mobilisation and delay recovery.

The committee acknowledged that while the application of enhanced recovery programmes may not be currently available to all centres due to their resource availability and local requirements, the usefulness of ERPs for adults having major surgery by reducing the length of stay in hospital, postoperative pain scores and lowering risk of postoperative complications is significant. However, the committee felt that the enhanced recovery programmes need to be tailored to suit the individual speciality requirements. There are particularly beneficial for people undergoing gynaecological oncological, orthopaedic, colo-rectal and vascular procedures and emerengency surgery. The committee noted that ERPs are not relevant to day surgery or to dental surgery.

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Appendices

Appendix A: Review protocols

Table 12: Review protocol: enhanced recovery programmes

ID	Field	Content
0.	PROSPERO registration number	Not registered on PROSPERO
1.	Review title	What is the clinical and cost effectiveness of enhanced recovery programmes for adults having major surgery?
2.	Review question	What is the clinical and cost effectiveness of enhanced recovery programmes for adults having major surgery?
3.	Objective	To determine the clinical and cost effectiveness of enhanced postoperative recovery programmes for adults having major surgery.
4.	Searches	The following databases will be searched: • Cochrane Central Register of Controlled Trials (CENTRAL) • Cochrane Database of Systematic Reviews (CDSR) • Embase • MEDLINE The searches may be re-run 6 weeks before the final committee meeting and further studies retrieved for inclusion if relevant. The full search strategies will be published in the final review.
5.	Condition or domain being studied	Perioperative care
6.	Population	Inclusion: Adults 18 years and over having major surgery. Exclusion: • surgery for burns, traumatic brain injury or neurosurgery • Children and young people aged <18 years
7.	Intervention/Exposure/Test	• enhanced recovery programmes (ERAS: enhanced recovery after surgery)
8.	Comparator/Reference standard/Confounding factors	• no enhanced recovery programme (standard care)
9.	Types of study to be included	Randomised controlled trials (RCTs), systematic reviews of RCTs. Observational studies if no relevant RCT

		evidence is identified.
10.	Other exclusion criteria	• non-English language studies • cross-over randomised controlled trials • studies published before 1990
11.	Context	Pre, intra and post-operative efforts can be made to enhance the recovery of the person undergoing surgery. This review focuses on the efficacy of multi-component programmes.
12.	Primary outcomes (critical outcomes)	• health-related quality of life • mortality • patient, family and carer experience of care • adverse events and complications (Clavien-Dindo, postoperative morbidity score (POMS)) • patient and staff adherence The committee did not agree to on any established minimal clinically important differences, therefore the default MIDs will be used and any difference in mortality will be considered clinically important.

13.	Secondary outcomes (important outcomes)	• length of hospital stay
		• unplanned intensive unit admission
		• length of stay in intensive care unit
		• hospital readmission
		• psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))
		• pain
		  ○ 1-3 postoperative days
		  ○ >3-10 postoperative days
		  ○ >10 postoperative days
		The committee did not agree to on any established minimal clinically important differences, therefore the default MIDs will be used and any difference in mortality will be considered clinically important.

14.	Data extraction (selection and coding)	EndNote will be used for reference management, sifting, citations and bibliographies. All references identified by the searches and from other sources will be screened for inclusion. 10% of the abstracts will be reviewed by two reviewers, with any disagreements resolved by discussion or, if necessary, a third independent reviewer. The full text of potentially eligible studies will be retrieved and will be assessed in line with the criteria outlined above. EviBASE will be used for data extraction. Study investigators may be contacted for missing data where time and resources allow.
15.	Risk of bias (quality) assessment	Risk of bias will be assessed using the appropriate checklist as described in Developing NICE guidelines: the manual • Systematic reviews: Risk of Bias in

		Systematic Reviews (ROBIS) • Randomised Controlled Trial: Cochrane RoB (2.0) • Non randomised study, including cohort studies: Cochrane ROBINS-I • Case control study: CASP case control checklist • Controlled before-and-after study or Interrupted time series: Effective Practice and Organisation of Care (EPOC) RoB Tool • Cross sectional study: JBI checklist for cross sectional study • Case series: Institute of Health Economics (IHE) checklist for case series 10% of all evidence reviews are quality assured by a senior research fellow. This includes checking: • papers were included /excluded appropriately • a sample of the data extractions • correct methods are used to synthesise data • a sample of the risk of bias assessments Disagreements between the review authors over the risk of bias in particular studies will be resolved by discussion, with involvement of a third review author where necessary.
16.	Strategy for data synthesis	• Pairwise meta-analyses will be performed using Cochrane Review Manager (RevMan5). • GRADEpro will be used to assess the quality of evidence for each outcome, taking into account individual study quality and the meta-analysis results. The 4 main quality elements (risk of bias, indirectness, inconsistency and imprecision) will be appraised for each outcome. Publication bias is tested for when there are more than 5 studies for an outcome. The risk of bias across all available evidence was evaluated for each outcome using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group http://www.gradeworkinggroup.org/ Where meta-analysis is not possible, data will be presented and quality assessed individually per outcome. Heterogeneity between the studies in effect measures will be assessed using the I^2 statistic and visually inspected. An I^2 value greater than 50% will be considered indicative of substantial heterogeneity. Sensitivity analyses will be

		conducted based on pre-specified subgroups using stratified meta-analysis to explore the heterogeneity in effect estimates. If this does not explain the heterogeneity, the results will be presented pooled using random-effects.			
17.	Analysis of sub-groups	Subgroups: • older people (over 60) • American Society of Anesthesiologists (ASA) Physical Status grade • type of surgery (ortho/large joint replacement; lower and upper GI; vascular; thoracic; gynae-oncology; urology)			
18.	Type and method of review	☒	Intervention		
		☐	Diagnostic		
		☐	Prognostic		
		☐	Qualitative		
		☐	Epidemiologic		
		☐	Service Delivery		
		☐	Other (please specify)		
19.	Language	English			
20.	Country	England			
21.	Anticipated or actual start date	To be added			
22.	Anticipated completion date	To be added			
23.	Stage of review at time of this submission	Review stage		Started	Completed
		Preliminary searches		☐	☐
		Piloting of the study selection process		☐	☐
		Formal screening of search results against eligibility criteria		☐	☐
		Data extraction		☐	☐
		Risk of bias (quality) assessment		☐	☐
		Data analysis		☐	☐
24.	Named contact	5a. Named contact National Guideline Centre 5b Named contact e-mail			

		perioperativecare@nice.org.uk 5e Organisational affiliation of the review National Institute for Health and Care Excellence (NICE) and the National Guideline Centre
25.	Review team members	From the National Guideline Centre: Ms Kate Ashmore Ms Kate Kelley Ms Sharon Swain Mr Ben Mayer Ms Maria Smyth Mr Vimal Bedia Mr Audrius Stonkus Ms Madelaine Zucker Ms Margaret Constanti Ms Annabelle Davis Ms Lina Gulhane
26.	Funding sources/sponsor	This systematic review is being completed by the National Guideline Centre which receives funding from NICE.
27.	Conflicts of interest	All guideline committee members and anyone who has direct input into NICE guidelines (including the evidence review team and expert witnesses) must declare any potential conflicts of interest in line with NICE's code of practice for declaring and dealing with conflicts of interest. Any relevant interests, or changes to interests, will also be declared publicly at the start of each guideline committee meeting. Before each meeting, any potential conflicts of interest will be considered by the guideline committee Chair and a senior member of the development team. Any decisions to exclude a person from all or part of a meeting will be documented. Any changes to a member's declaration of interests will be recorded in the minutes of the meeting. Declarations of interests will be published with the final guideline.
28.	Collaborators	Development of this systematic review will be overseen by an advisory committee who will use the review to inform the development of evidence-based recommendations in line with section 3 of Developing NICE guidelines: the manual. Members of the guideline committee are available on the NICE website: [NICE guideline webpage].
29.	Other registration details	[Give the name of any organisation where the systematic review title or protocol is registered (such as with The Campbell Collaboration, or

		The Joanna Briggs Institute) together with any unique identification number assigned. If extracted data will be stored and made available through a repository such as the Systematic Review Data Repository (SRDR), details and a link should be included here. If none, leave blank.]	
30.	Reference/URL for published protocol	[Give the citation and link for the published protocol, if there is one.]	
31.	Dissemination plans	NICE may use a range of different methods to raise awareness of the guideline. These include standard approaches such as: • notifying registered stakeholders of publication • publicising the guideline through NICE's newsletter and alerts • issuing a press release or briefing as appropriate, posting news articles on the NICE website, using social media channels, and publicising the guideline within NICE.	
32.	Keywords	Perioperative care, ERAS, enhanced recovery	
33.	Details of existing review of same topic by same authors	n/a	
34.	Current review status	☐	Ongoing
		☐	Completed but not published
		☐	Completed and published
		☐	Completed, published and being updated
		☐	Discontinued
35..	Additional information	n/a	
36.	Details of final publication	www.nice.org.uk	

Table 13: Health economic review protocol

Review question	All questions – health economic evidence
Objectives	To identify health economic studies relevant to any of the review questions.
Search criteria	• Populations, interventions and comparators must be as specified in the clinical review protocol above. • Studies must be of a relevant health economic study design (cost–utility analysis, cost-effectiveness analysis, cost–benefit analysis, cost–consequences analysis, comparative cost analysis). • Studies must not be a letter, editorial or commentary, or a review of health economic evaluations. (Recent reviews will be ordered although not reviewed. The bibliographies will be checked for relevant studies, which will then be ordered.) • Unpublished reports will not be considered unless submitted as part of a call for evidence. • Studies must be in English.

Search strategy	A health economic study search will be undertaken using population-specific terms and a health economic study filter – see appendix B below.
Review strategy	Studies not meeting any of the search criteria above will be excluded. Studies published before 2003, abstract-only studies and studies from non-OECD countries or the USA will also be excluded. Each remaining study will be assessed for applicability and methodological limitations using the NICE economic evaluation checklist which can be found in appendix H of Developing NICE guidelines: the manual (2014).[145] **Inclusion and exclusion criteria** • If a study is rated as both 'Directly applicable' and with 'Minor limitations' then it will be included in the guideline. A health economic evidence table will be completed and it will be included in the health economic evidence profile. • If a study is rated as either 'Not applicable' or with 'Very serious limitations' then it will usually be excluded from the guideline. If it is excluded then a health economic evidence table will not be completed and it will not be included in the health economic evidence profile. • If a study is rated as 'Partially applicable', with 'Potentially serious limitations' or both then there is discretion over whether it should be included. **Where there is discretion** The health economist will make a decision based on the relative applicability and quality of the available evidence for that question, in discussion with the guideline committee if required. The ultimate aim is to include health economic studies that are helpful for decision-making in the context of the guideline and the current NHS setting. If several studies are considered of sufficiently high applicability and methodological quality that they could all be included, then the health economist, in discussion with the committee if required, may decide to include only the most applicable studies and to selectively exclude the remaining studies. All studies excluded on the basis of applicability or methodological limitations will be listed with explanation in the excluded health economic studies appendix below. The health economist will be guided by the following hierarchies. *Setting:* • UK NHS (most applicable). • OECD countries with predominantly public health insurance systems (for example, France, Germany, Sweden). • OECD countries with predominantly private health insurance systems (for example, Switzerland). • Studies set in non-OECD countries or in the USA will be excluded before being assessed for applicability and methodological limitations. *Health economic study type:* • Cost–utility analysis (most applicable). • Other type of full economic evaluation (cost–benefit analysis, cost-effectiveness analysis, cost–consequences analysis). • Comparative cost analysis. • Non-comparative cost analyses including cost-of-illness studies will be excluded before being assessed for applicability and methodological limitations. *Year of analysis:* • The more recent the study, the more applicable it will be. • Studies published in 2003 or later but that depend on unit costs and resource data entirely or predominantly from before 2003 will be rated as 'Not applicable'. • Studies published before 2003 will be excluded before being assessed for applicability and methodological limitations.

	Quality and relevance of effectiveness data used in the health economic analysis: • The more closely the clinical effectiveness data used in the health economic analysis match with the outcomes of the studies included in the clinical review the more useful the analysis will be for decision-making in the guideline. For example, economic evaluations based on observational studies will be excluded, when the clinical review is only looking for RCTs,

Appendix B: Literature search strategies

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual 2014, updated 2018.[145]

For more detailed information, please see the Methodology Review.

B.1 Clinical search literature search strategy

Searches were constructed using a PICO framework where population (P) terms were combined with Intervention (I) and in some cases Comparison (C) terms. Outcomes (O) are rarely used in search strategies for interventions as these concepts may not be well described in title, abstract or indexes and therefore difficult to retrieve. Search filters were applied to the search where appropriate.

Table 14: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 30 May 2019	Exclusions
Embase (OVID)	1974 – 30 May 2019	Exclusions
The Cochrane Library (Wiley)	Cochrane Reviews to 2019 Issue 5 of 12 CENTRAL to 2019 Issue 5 of 12 DARE, and NHSEED to 2015 Issue 2 of 4 HTA to 2016 Issue 4 of 4	None

Medline (Ovid) search terms

1.	postoperative care/ or exp Postoperative Period/ or exp perioperative nursing/
2.	((postoperative* or postop* or post-op* or post-surg* or postsurg*) adj3 (care* or caring or treat* or nurs* or monitor* or recover* or medicine)).ti,ab.
3.	((care* or caring or treat* or nurs* or recover* or monitor*) adj3 after adj3 (surg* or operat* or anaesthes* or anesthes*)).ti,ab.
4.	or/1-3
5.	limit 4 to English language
6.	(exp child/ or exp pediatrics/ or exp infant/) not (exp adolescent/ or exp adult/ or exp middle age/ or exp aged/)
7.	5 not 6
8.	letter/
9.	editorial/
10.	news/
11.	exp historical article/
12.	Anecdotes as Topic/
13.	comment/
14.	case report/
15.	(letter or comment*).ti.
16.	or/8-15
17.	randomized controlled trial/ or random*.ti,ab.
18.	16 not 17
19.	animals/ not humans/

20.	exp Animals, Laboratory/
21.	exp Animal Experimentation/
22.	exp Models, Animal/
23.	exp Rodentia/
24.	(rat or rats or mouse or mice).ti.
25.	or/18-24
26.	7 not 25
27.	((enhance* or fast track or accelerate*) adj5 (recover* or rehab*)).ti,ab.
28.	ERAS.ti,ab.
29.	((FT or fast track or recover* or rehab*) adj5 (protocol* or program*)).ti,ab.
30.	or/27-29
31.	26 and 30

Embase (Ovid) search terms

1.	*postoperative care/ or *postoperative period/ or *perioperative nursing/ or *surgical patient/
2.	((postoperative* or postop* or post-op* or post-surg* or postsurg*) adj3 (care* or caring or treat* or nurs* or monitor* or recover* or medicine)).ti,ab.
3.	((care* or caring or treat* or nurs* or recover* or monitor*) adj3 after adj3 (surg* or operat* or anaesthes* or anesthes*)).ti,ab.
4.	or/1-3
5.	limit 4 to English language
6.	(exp child/ or exp pediatrics/) not (exp adult/ or exp adolescent/)
7.	5 not 6
8.	letter.pt. or letter/
9.	note.pt.
10.	editorial.pt.
11.	case report/ or case study/
12.	(letter or comment*).ti.
13.	or/8-12
14.	randomized controlled trial/ or random*.ti,ab.
15.	13 not 14
16.	animal/ not human/
17.	nonhuman/
18.	exp Animal Experiment/
19.	exp Experimental Animal/
20.	animal model/
21.	exp Rodent/
22.	(rat or rats or mouse or mice).ti.
23.	or/15-22
24.	7 not 23
25.	((enhance* or fast track or accelerate*) adj5 (recover* or rehab*)).ti,ab.
26.	ERAS.ti,ab.
27.	((FT or fast track or recover* or rehab*) adj5 (protocol* or program*)).ti,ab.
28.	or/25-27
29.	24 and 28

Cochrane Library (Wiley) search terms

#1.	MeSH descriptor: [Postoperative Care] this term only
#2.	MeSH descriptor: [Postoperative Period] this term only
#3.	MeSH descriptor: [Perioperative Nursing] this term only
#4.	(or #1-#3)
#5.	((postoperative* or postop* or post-op* or post-surg* or postsurg*) near/3 (care* or caring or treat* or nurs* or monitor* or recover* or medicine)):ti,ab
#6.	((care* or caring or treat* or nurs* or recover* or monitor*) near/3 (after) near/3 (surg* or operat* or anaesthes* or anesthes*)):ti,ab
#7.	(or #4-#6)
#8.	((enhance* or "fast track" or accelerate*) near/5 (recover* or rehab*)):ti,ab
#9.	ERAS:ti,ab
#10.	((FT or "fast track" or recover* or rehab*) near/5 protocol* or program*):ti,ab
#11.	(or #8-#10)
#12.	#7 and #11

B.2 Health Economics literature search strategy

Health economic evidence was identified by conducting a broad search relating to the perioperative care population in NHS Economic Evaluation Database (NHS EED – this ceased to be updated after March 2015) and the Health Technology Assessment database (HTA) with no date restrictions. NHS EED and HTA databases are hosted by the Centre for Research and Dissemination (CRD). Additional health economics searches were run on Medline and Embase.

Table 15: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline	2014 – 30 May 2019	Exclusions Health economics studies
Embase	2014 – 30 May 2019	Exclusions Health economics studies
Centre for Research and Dissemination (CRD)	HTA - Inception – 02 May 2019 NHSEED - Inception to 02 May 2019	None

Medline (Ovid) search terms

1.	exp Preoperative Care/ or exp Perioperative Care/ or exp Perioperative Period/ or exp Perioperative Nursing/
2.	((pre-operative* or preoperative* or preop* or pre-op* or pre-surg* or presurg*) adj3 (care* or caring or treat* or nurs* or monitor* or recover* or medicine)).ti,ab.
3.	((perioperative* or peri-operative* or intraoperative* or intra-operative* or intrasurg* or intra-surg* or peroperat* or per-operat*) adj3 (care* or caring or treat* or nurs* or monitor* or recover* or medicine)).ti,ab.
4.	((postoperative* or postop* or post-op* or post-surg* or postsurg*) adj3 (care* or caring or treat* or nurs* or monitor* or recover* or medicine)).ti,ab.
5.	((care* or caring or treat* or nurs* or recover* or monitor*) adj3 (before or prior or advance or during or after) adj3 (surg* or operat* or anaesthes* or anesthes*)).ti,ab.
6.	1 or 2 or 3 or 4 or 5
7.	(intraoperative* or intra-operative* or intrasurg* or intra-surg* or peroperat* or per-operat* or perioperat* or peri-operat*).ti,ab.

8.	((during or duration) adj3 (surg* or operat* or anaesthes* or anesthes*)).ti,ab.
9.	7 or 8
10.	postoperative care/ or exp Postoperative Period/ or exp Perioperative nursing/
11.	(postop* or post-op* or post-surg* or postsurg* or perioperat* or peri-operat*).ti,ab.
12.	(after adj3 (surg* or operat* or anaesthes* or anesthes*)).ti,ab.
13.	(post adj3 (operat* or anaesthes* or anesthes*)).ti,ab.
14.	10 or 11 or 12 or 13
15.	exp Preoperative Care/ or Preoperative Period/
16.	(pre-operat* or preoperat* or pre-surg* or presurg*).ti,ab.
17.	((before or prior or advance or pre or prepar*) adj3 (surg* or operat* or anaesthes* or anesthes*)).ti,ab.
18.	15 or 16 or 17
19.	6 or 9 or 14 or 18
20.	letter/
21.	editorial/
22.	news/
23.	exp historical article/
24.	Anecdotes as Topic/
25.	comment/
26.	case report/
27.	(letter or comment*).ti.
28.	or/20-27
29.	randomized controlled trial/ or random*.ti,ab.
30.	28 not 29
31.	animals/ not humans/
32.	exp Animals, Laboratory/
33.	exp Animal Experimentation/
34.	exp Models, Animal/
35.	exp Rodentia/
36.	(rat or rats or mouse or mice).ti.
37.	or/30-36
38.	19 not 37
39.	limit 38 to English language
40.	(exp child/ or exp pediatrics/ or exp infant/) not (exp adolescent/ or exp adult/ or exp middle age/ or exp aged/)
41.	39 not 40
42.	economics/
43.	value of life/
44.	exp "costs and cost analysis"/
45.	exp Economics, Hospital/
46.	exp Economics, medical/
47.	Economics, nursing/
48.	economics, pharmaceutical/
49.	exp "Fees and Charges"/
50.	exp budgets/

51.	budget*.ti,ab.
52.	cost*.ti.
53.	(economic* or pharmaco?economic*).ti.
54.	(price* or pricing*).ti,ab.
55.	(cost* adj2 (effectiv* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
56.	(financ* or fee or fees).ti,ab.
57.	(value adj2 (money or monetary)).ti,ab.
58.	or/42-57
59.	41 and 58

Embase (Ovid) search terms

1.	*preoperative period/ or *intraoperative period/ or *postoperative period/ or *perioperative nursing/ or *surgical patient/
2.	((pre-operative* or preoperative* or preop* or pre-op* or pre-surg* or presurg*) adj3 (care* or caring or treat* or nurs* or monitor* or recover* or medicine)).ti,ab.
3.	((perioperative* or peri-operative* or intraoperative* or intra-operative* or intrasurg* or intra-surg* or peroperat* or per-operat*) adj3 (care* or caring or treat* or nurs* or monitor* or recover* or medicine)).ti,ab.
4.	((care* or caring or treat* or nurs* or recover* or monitor*) adj3 (before or prior or advance or during or after) adj3 (surg* or operat* or anaesthes* or anesthes*)).ti,ab.
5.	1 or 2 or 3 or 4
6.	peroperative care/ or exp peroperative care/ or exp perioperative nursing/
7.	(intraoperative* or intra-operative* or intrasurg* or intra-surg* or peroperat* or per-operat* or perioperat* or peri-operat*).ti,ab.
8.	((during or duration) adj3 (surg* or operat* or anaesthes* or anesthes*)).ti,ab.
9.	6 or 7 or 8
10.	postoperative care/ or exp postoperative period/ or perioperative nursing/
11.	(postop* or post-op* or post-surg* or postsurg* or perioperat* or peri-operat*).ti,ab.
12.	(after adj3 (surg* or operat* or anaesthes* or anesthes*)).ti,ab.
13.	(post adj3 (operat* or anaesthes* or anesthes*)).ti,ab.
14.	10 or 11 or 12 or 13
15.	exp preoperative care/ or preoperative period/
16.	(pre-operat* or preoperat* or pre-surg* or presurg*).ti,ab.
17.	((before or prior or advance or pre or prepar*) adj3 (surg* or operat* or anaesthes* or anesthes*)).ti,ab.
18.	15 or 16 or 17
19.	5 or 9 or 14 or 18
20.	letter.pt. or letter/
21.	note.pt.
22.	editorial.pt.
23.	case report/ or case study/
24.	(letter or comment*).ti.
25.	or/20-24
26.	randomized controlled trial/ or random*.ti,ab.
27.	25 not 26

28.	animal/ not human/
29.	nonhuman/
30.	exp Animal Experiment/
31.	exp Experimental Animal/
32.	animal model/
33.	exp Rodent/
34.	(rat or rats or mouse or mice).ti.
35.	or/27-34
36.	19 not 35
37.	limit 36 to English language
38.	(exp child/ or exp pediatrics/) not (exp adult/ or exp adolescent/)
39.	37 not 38
40.	health economics/
41.	exp economic evaluation/
42.	exp health care cost/
43.	exp fee/
44.	budget/
45.	funding/
46.	budget*.ti,ab.
47.	cost*.ti.
48.	(economic* or pharmaco?economic*).ti.
49.	(price* or pricing*).ti,ab.
50.	(cost* adj2 (effectiv* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
51.	(financ* or fee or fees).ti,ab.
52.	(value adj2 (money or monetary)).ti,ab.
53.	or/40-52
54.	39 and 53

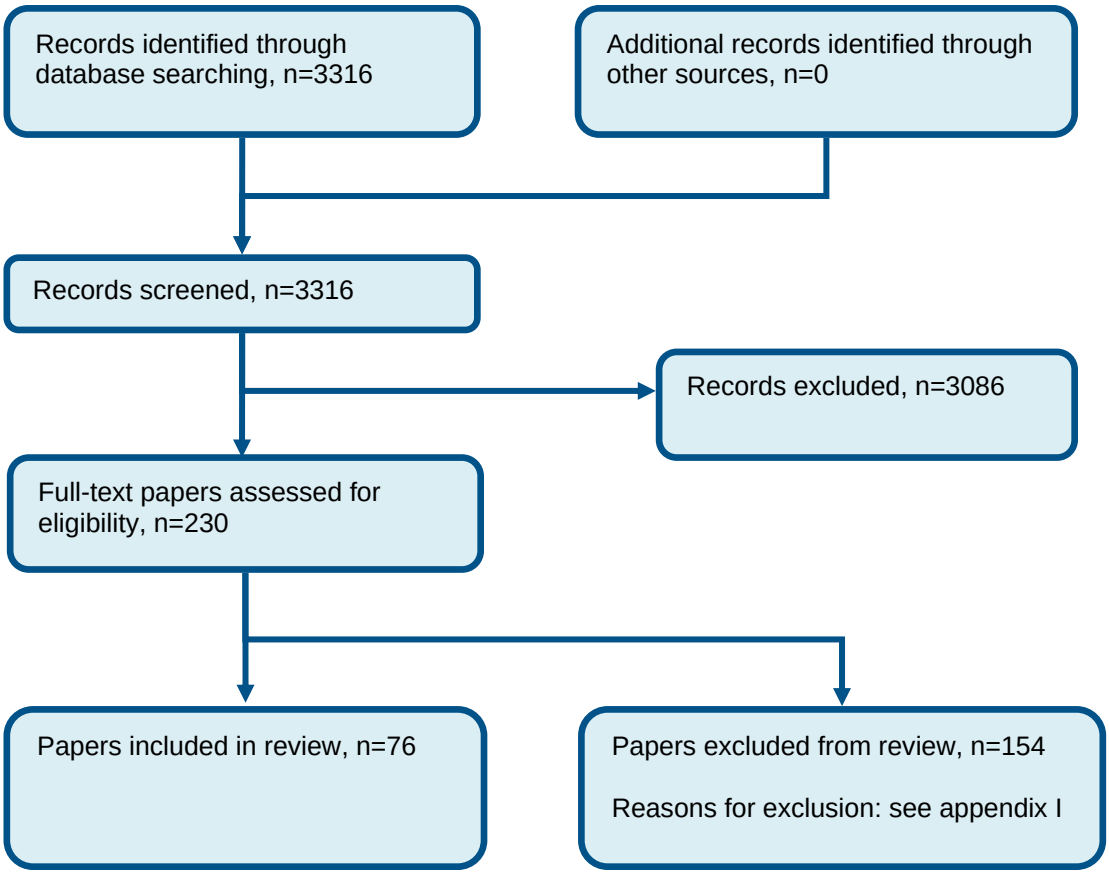
NHS EED and HTA (CRD) search terms

#1.	MeSH DESCRIPTOR Preoperative Care EXPLODE ALL TREES
#2.	MeSH DESCRIPTOR Perioperative Care EXPLODE ALL TREES
#3.	MeSH DESCRIPTOR Perioperative Period EXPLODE ALL TREES
#4.	MeSH DESCRIPTOR Perioperative Nursing EXPLODE ALL TREES
#5.	(((perioperative* or peri-operative* or intraoperative* or intra-operative* or intrasurg* or intra-surg* or peroperat* or per-operat*) adj3 (care* or caring or treat* or nurs* or monitor* or recover* or medicine)))
#6.	(((care* or caring or treat* or nurs* or recover* or monitor*) adj3 (before or prior or advance or during or after) adj3 (surg* or operat* or anaesthes* or anesthes*)))
#7.	(((pre-operative* or preoperative* or preop* or pre-op* or pre-surg* or presurg*) adj3 (care* or caring or treat* or nurs* or monitor* or recover* or medicine)))
#8.	(((postoperative* or postop* or post-op* or post-surg* or postsurg*) adj3 (care* or caring or treat* or nurs* or monitor* or recover* or medicine)))
#9.	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8
#10.	(* IN HTA)

#11.	(* IN NHSEED)
#12.	#9 AND #10
#13.	#9 AND #11
#14.	MeSH DESCRIPTOR Intraoperative Care EXPLODE ALL TREES
#15.	#1 OR #2 OR #3 OR #4 OR #14
#16.	((intraoperative* or intra-operative* or intrasurg* or intra-surg* or peroperat* or per-operat* or perioperat* or peri-operat*))
#17.	(((during or duration) adj3 (surg* or operat* or anaesthes* or anesthes*)))
#18.	((postop* or post-op* or post-surg* or postsurg* or perioperat* or peri-operat*))
#19.	((after adj3 (surg* or operat* or anaesthes* or anesthes*)))
#20.	((post adj3 (operat* or anaesthes* or anesthes*)))
#21.	((pre-operat* or preoperat* or pre-surg* or presurg*))
#22.	(((before or prior or advance or pre or prepar*) adj3 (surg* or operat* or anaesthes* or anesthes*)))
#23.	#15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22
#24.	#10 AND #23
#25.	#11 AND #23
#26.	#12 OR #13 OR #24 OR #25

Appendix C: Clinical evidence selection

Figure 1: Flow chart of clinical study selection for the review of pre-operative optimisation clinics.



Appendix D: Clinical evidence tables

Study	Anderson 2003[6]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=30)
Countries and setting	Conducted in United Kingdom; Setting: Scarborough Hospital
Line of therapy	1st line
Duration of study	Intervention + follow up: unclear
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	lived independently at home and required left or right hemicolectomy
Exclusion criteria	not stated
Recruitment/selection of patients	Consecutive patients from surgical outpatients department
Age, gender and ethnicity	Age - Median (IQR): Optimization Group 64 (55-68); Control Group 68 (65-75). Gender (M:F): 11/14. Ethnicity: NR
Further population details	1. Age: >60 years (Optimization Group 64 (55-68); Control Group 68 (65-75) (Median (IQR))). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 1 (ASA I & II - 23, ASA III - 2). 3. Type of surgery: lower and upper GI (hemicolectomy for colonic resection).
Indirectness of population	No indirectness
Interventions	(n=14) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. written preoperative information, pre-assessment by surgical registrar or anesthetist, prebiotics and probiotics for 7 days, no bowel preparation, oral carbohydrate loading; during maintenance of anesthesia, 80% oxygen was administered and IV morphine avoided (otherwise anesthetic agents used were the same in both groups), transverse incision, epidural catheter inserted for postoperative pain relief, prophylactic antibiotics - cefuroxime and metronidazole; No nasogastric tubes or drains, free fluids on day of operation, light diet day 1 and full diet day 2, epidural catheter removed 24-36h after surgery, walk the length of the ward with physiotherapist; Ibuprofen, Paracetamol and Morphine as rescue analgesia . Duration preoperative admission to discharge . Concurrent medication/care: NA. Indirectness: No indirectness (n=11) Intervention 2: No enhanced recovery programme (standard care) - Standard care. No extra

Study	Anderson 2003[6]
	information, standard pre-assessment clinic, bowel preparation, fast from midnight prior to surgery; intraoperatively IV morphine titrated according to response (otherwise anesthetic agents used were the same in both groups), midline or paramedian incision; prophylactic IV cefuroxime and metronidazole; Nasogastric tubes or drains according to surgeons preference, fluids and diet introduced in stepwise manner, patient controlled analgesia (1mg morphine); chest physiotherapy and ward mobilization by nurses.. Duration preoperative admission to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: OPTIMIZATION GROUP versus CONTROL GROUP

Protocol outcome 1: Mortality
- Actual outcome: Death at admission to discharge; Group 1: 0/14, Group 2: 1/11
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: -- ; Group 1 Number missing: 0, Reason: no missing data; Group 2 Number missing: 0, Reason: no missing data

Protocol outcome 2: Perioperative complications
- Actual outcome: postoperative complications at within 30 days of discharge; Group 1: 4/14, Group 2: 5/11; Comments: Optimization group: ineffective epidural, ileus, urinary tract infection and wound infection
Conventional group: urinary retention, atrial fibrillation, respiratory depression related to PCA and ileus
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: -- ; Group 1 Number missing: 0, Reason: no missing data; Group 2 Number missing: 0, Reason: no missing data

Protocol outcome 3: Length of hospital stay
- Actual outcome: length of hospital stay at admission to discharge; Median : Optimization group 3 (2-7); Control group 7 (4-10), Comments: p value 0.002);
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: -- ; Group 1 Number missing: 0, Reason: no missing data; Group 2 Number missing: 0, Reason: no missing data

Protocol outcome 4: Hospital readmission
- Actual outcome: readmission at within 30 days of discharge; Group 1: 0/14, Group 2: 0/11
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low,

Study	Anderson 2003[6]
Crossover - Low; Indirectness of outcome: -- ; Group 1 Number missing: 0, Reason: no missing data; Group 2 Number missing: 0, Reason: no missing data Protocol outcome 5: Pain - Actual outcome: Postoperative pain scores (at rest, movement and coughing) at postoperatively; visual analogue scale: not provided 1 - 10 Top=High is poor outcome, Comments: only P values provided Conventional group (rest;movement;coughing) : p value = 0.026; p value = 0.020; p value =0.011 Optimization group (rest;movement;coughing) : p value = 0.113; p value = 0.153; p value =0.091; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - High, Measurement - Low, Crossover - Low; Indirectness of outcome: -- ; Group 1 Number missing: 0, Reason: no missing data; Group 2 Number missing: 0, Reason: no missing data	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	Chen Hu 2012[26]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=88)
Countries and setting	Conducted in China; Setting: University Hospital
Line of therapy	Not applicable
Duration of study	--: January 2009 to May 2011
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	•age 25–75 years old, male or female; •diagnosis confirmed by endoscopic biopsy; •acceptance by the patients and their families.
Exclusion criteria	•lymph node or distant metastasis diagnosed by preoperative abdominal computed tomography; •history of autoimmune or severe cardiopulmonary diseases; •preoperative radiotherapy or chemotherapy; digestive obstruction, •perioperative blood or albumin infusion, or combined intraoperative devisceration
Recruitment/selection of patients	not stated

Study	Chen Hu 2012[26]
Age, gender and ethnicity	Age - Median (range): FTS Laproscopic: 59(49-71); FTS Open: 64(40-71); Trad Laproscopic: 62.5(45-72); Trad Open: 64.5(49-75). Gender (M:F): 41/41. Ethnicity: NR
Further population details	1. Age: >60 years (FTS Laproscopic: 59(49-71); FTS Open: 64(40-71); Trad Laproscopic: 62.5(45-72); Trad Open: 64.5(49-75)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: lower and upper GI (Radical Distal Gastrectomy).
Indirectness of population	No indirectness
Interventions	(n=44) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative: Health instruction, information, and discussion about FTS except for schedule of surgery and informed consent; no routine bowel preparation; Oral nutritional supplements (e.g., TPF) were given for 5–7 days to patients at severe nutritional risk; Feed semi-fluid meal until 6 h before surgery, and carbohydrate drink (commonly 250–500 ml 10 % glucose solution) until 2 h before surgery; Nasogastric decompression only if necessary and to be removed as early as possible after surgery. •Intraoperative: Minimally invasive incision (epigastrium midline incision, ODG about 10–15 cm, not over umbilicus; LADG about 5–8 cm); abdominal cavity drain not used as routine treatment but removed as early as possible if necessary; restrictive fluid infusion regimen with Ringer's lactate 20 ml/kg in the first hour, then followed at the rate of 6 ml/kg/h. •Postoperation: Non-opioid analgesic by intramuscular injection or PCA, oral cyclooxygenase inhibitor; Oral diet was initiated 6–8 h after surgery, following a stepwise program from warm clear water to carbohydrate drink to TPF, then to semi-fluids to normal food. Adhere to the premise of eating little and often. During first 1–2 days, the appropriate intravenous nutritional infusion was administered; Urine catheter for 6-24h and to be removed as early as possible; Encourage patient mobilization on bed after anesthesia recovery and out of bed 8–12 h after surgery; acceleration of enterocinesia on first or second day after operation, accelerant administered via anus. . Duration 7 days before surgery up to discharge . Concurrent medication/care: NA (n=44) Intervention 2: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative: Schedule of surgery and informed consent; Mechanical bowel cleansing or oral laxative on the night before surgery; no nutritional support; No meal for 12 h before surgery and no drink for 8 h before surgery; Place the nasogastric tube on the day of surgery. •Intraoperative: Traditional laparotomy approach (epigastrium midline incision from the xiphoid to umbilicus or 1–2 cm below umbilicus); abdominal cavity drainage tube in situ; no restrictive fluid infusion regimen, Ringer's lactate 20 ml/kg in the first hour, then at the rate of 10–12 ml/kg/h. •Postoperation: Opioid analgesic by intramuscular injection or patient-controlled analgesia (PCA); Parenteral nutrition until flatus. Then, remove nasogastric tube and initiate oral diet from fluids to semi-fluids and normal food; urine catheter in situ for 24-48h; Mobilization out of bed until 24–48 h after surgery; and no acceleration of enterocinesia . Duration 1 day preoperatively up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness

Study	Chen Hu 2012[26]
Funding	Funding not stated
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK versus TRADITIONAL CARE Protocol outcome 1: Perioperative complications - Actual outcome: Complications Grade I (Clavien-Dindo) at postoperative up to 30 days after discharge; Group 1: 16/41, Group 2: 9/43 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: withdrew consent; lost to follow up; Group 2 Number missing: 1, Reason: lost to follow up - Actual outcome: Complications Grade II (Clavien-Dindo) at postoperative up to 30 days after discharge; Group 1: 9/41, Group 2: 5/43 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: withdrew consent; lost to follow up; Group 2 Number missing: 1, Reason: lost to follow up - Actual outcome: Complications Grade III 3a (Clavien-Dindo) at postoperative up to 30 days after discharge; Group 1: 1/41, Group 2: 2/43 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: withdrew consent; lost to follow up; Group 2 Number missing: 1, Reason: lost to follow up Protocol outcome 2: Length of hospital stay - Actual outcome: Postoperative hospital stay at postoperative to discharge; Median (range): - days, Comments: FTS Laparopscopic: 7 (5.5–10) FTS Open: 7.5 (6–11) Traditional Laparoscopic: 7.5 (6–11) Traditional Open: 8.75 (7–14)); Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: withdrew consent; lost to follow up; Group 2 Number missing: 1, Reason: lost to follow up	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Delaney 2003[38]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=64)

Study	Delaney 2003[38]
Countries and setting	Conducted in USA
Line of therapy	Not applicable
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	Any patients scheduled for elective segmental intestinal or rectal resection by laparotomy, including patients undergoing reoperation or pelvic surgery and those with comorbidities, were eligible for inclusion in the study.
Exclusion criteria	Loop ileostomy closure and ventral hernia repair without scheduled intestinal resection were not included.
Age, gender and ethnicity	Age - Mean (SD): CREAD: 50.6 ± 16.9; TRAD: 41.9 ± 13.3. Gender (M:F): 42/22. Ethnicity: NR
Further population details	1. Age: <60 years (CREAD: 50.6 ± 16.9; TRAD: 41.9 ± 13.3). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 3; ASA II - 42; ASA III - 19). 3. Type of surgery: lower and upper GI (segmental intestinal or rectal resection by laparotomy, including reoperation or pelvic surgery).
Extra comments	CREAD: controlled rehabilitation with early ambulation and diet
Indirectness of population	No indirectness
Interventions	(n=31) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Patients were seen by the Colorectal Nurse Manager and given information. CREAD patients received supporting written information documenting the expected postoperative milestones. •Orogastric tubes placed during anesthesia were removed before extubation. •Patients were permitted to walk and were offered liquids as desired on the evening of surgery. •Analgesia was supplemented with 30 mg of intravenous ketorolac every six hours as needed. •On Postoperative Day (POD) 1, patients were encouraged to walk at least one circuit of the nursing floor (approximately 60 meters) up to five times, to sit out of bed between walks, and to do regular incentive spirometry. •They were allowed non carbonated liquids ad libitum and were offered solid food that evening if tolerating oral fluids, without waiting for signs of intestinal function. •Oral analgesia (oxycodone) was started on POD 2 if either liquids or diet was being tolerated, and the patient-controlled anesthesia was discontinued. •A wall chart was placed opposite the bed emphasizing the walking, incentive spirometry, and above dietary allowance of the CREAD program. •Oxycodone (5 mg) was used because it has been the standard oral analgesic at this institution in recent times, and patients were prescribed to take one to two tablets every four to six hours as needed. . Duration preadmission to discharge. Concurrent medication/care: NA. Indirectness: No indirectness

Study	Delaney 2003[38]
	(n=33) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Nasogastric tubes were placed after induction of anesthesia and removed the next day if there was less than 200 ml of drainage over a four-hour period. •Patients sat out of bed on POD 1 and were asked to walk four to five times daily after POD 2. •Patients were instructed to only take sips of clear liquid, but diet was withheld until flatus or stool had passed. •Oral analgesia (oxycodone) was started when liquids were tolerated. •Wall charts were not used.. Duration preadmission to discharge . Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: CREAD versus TRADITIONAL

Protocol outcome 1: Quality of life
- Actual outcome: Overall Cleveland Clinic Global Quality-of-Life score at Discharge / Day 10; Group 1: mean 5.6 score (SD 1.8); n=31, Group 2: mean 6.3 score (SD 2.1); n=33; Cleveland Clinic Global Quality-of-Life score 1-10 Top=High is good outcome; Comments: Score includes current quality of life; current quality of health; and current energy level
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0
- Actual outcome: Overall Cleveland Clinic Global Quality-of-Life score at Day 30; Group 1: mean 7.5 score (SD 1.7); n=31, Group 2: mean 7.6 score (SD 1.4); n=33; Cleveland Clinic Global Quality-of-Life score 1-10 Top=High is good outcome; Comments: Includes current quality of life; current quality of health; and current energy level
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0

Protocol outcome 2: Perioperative complications
- Actual outcome: Significant complications at postoperatively up to 30 days post discharge; Group 1: 7/31, Group 2: 10/33; Comments: p 0.58
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0

Protocol outcome 3: Hospital readmission
- Actual outcome: Total length of stay at admission to discharge (including readmissions);
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 0; Group 2 Number missing: 0
- Actual outcome: Readmissions at up to 30 days post discharge; Group 1: 3/31, Group 2: 6/33; Comments: p value 0.48
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0

Study	Delaney 2003[38]
Protocol outcome 4: Pain - Actual outcome: Pain score (VAS) at day 2; Group 1: mean 3.3 score (SD 1.9); n=31, Group 2: mean 3.4 score (SD 1.5); n=33; Visual Analogue Scale 1-10 Top=High is poor outcome Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 - Actual outcome: Pain score (VAS) at Discharge / Day 10; Group 1: mean 3.1 score (SD 2); n=31, Group 2: mean 3.1 score (SD 2.4); n=33; Visual Analogue Scale 1-10 Top=High is poor outcome Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 - Actual outcome: Pain score (VAS) at Day 30; Group 1: mean 1.2 score (SD 1.6); n=31, Group 2: mean 1.5 score (SD 2.1); n=33; Visual Analogue Scale 1-10 Top=High is poor outcome Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Mortality ; Patient and staff adherence ; Length of hospital stay ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	Dickson 2017[43]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=112)
Countries and setting	Conducted in USA; Setting: hospital setting
Line of therapy	Not applicable
Duration of study	Intervention time: 2 years (2013 - 2015)
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	all patients with a planned laparotomy on the gynecology oncology service
Exclusion criteria	patients undergoing planned laparoscopy, vulvar, or minor procedures were ineligible because the median stay for these patients is less than 1 day.

Study	Dickson 2017[43]
Recruitment/selection of patients	recruitment at discretion of treating physician
Age, gender and ethnicity	Age - Mean (SD): ERP 55.4 (52.3-58.5); Standard care 56.0 (52.8-59.2). Gender (M:F): NA - gynecological surgery . Ethnicity: NR
Further population details	1. Age: >60 years (mean age of 55.7 years (53.5-57.9 95% CI)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear (ASA status of patients not documented in article). 3. Type of surgery: gynae-oncology (laparotomy for gynecology oncology (type of oncology not specified)).
Extra comments	all patients with a planned laparotomy on the gynecology oncology service . all patients were counseled about the potential risks and benefits of the enhanced recovery after surgery protocol before being offered enrollment.
Indirectness of population	No indirectness
Interventions	(n=56) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Standardized preoperative counselling, including a one page scripted discussion of expectations with emphasis on the benefits of decreasing narcotic use as well postoperative expectations with regards to early ambulation, eating, and criteria for discharge. Allowed regular diet until 6 hours before surgery nd allowed clear liquids until 2 hours before surgery. routine mechanical bowel preparation discouraged unless planned bowel resection. perioperative anesthesia included either placement of spinal block with 16mg isobaric tetracaine with 0.2mg epinephrine was and 0.1mg preservative free hydromorphone given at level L3-4 or a T12 epidural using 0.125% bupivacaine at a rate of 8 - 12ml per hour. Also recieved bilateral transversus abdominis plane infiltration with liposomal bupivicaine. IV fluids was restricted to 1cc/kg per hour and phenylephrine was used to maintain blood pressure. Encouraged to ambulate within 2 hours after surgery and offered a regular diet immediately. Pain management included oral acetaminophen and ibuprofen followed by narcotic medications as needed as well as epidural use if this was used prior. Foley catheter removed when patient able to ambulate. Referred to physical therapy during their hospital stay.. Duration pre-admission and then from day or surgery to discharge. . Concurrent medication/care: NA. Indirectness: No indirectness Comments: 7 patients in intervention group did not receive regional anesthesia in violation of the protocol. 11 patients also did not receive physical therapy. (n=56) Intervention 2: No enhanced recovery programme (standard care) - Standard care. patients randomized to the control arm received perioperative counseling per their primary surgeon. To compare against "current practice," the control arm was not formally dictated, which permitted the use of any or all of the enhanced recovery after surgery tenets. . Duration day of surgery to day of discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Academic or government funding

Study	Dickson 2017[43]
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE Protocol outcome 1: Perioperative complications - Actual outcome: Complications postoperatively at day of surgery to day of discharge; Group 1: 7/51, Group 2: 4/52 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Comments - ; Indirectness of outcome: No indirectness ; Blinding details: Patients were informed of risks and benefits of enhanced recovery after surgery protocol before being offered enrollment. ; Group 1 Number missing: 5, Reason: Did not undergo eligible surgery; Group 2 Number missing: 4, Reason: Did not undergo eligible surgery Protocol outcome 2: Length of hospital stay - Actual outcome: length of hospital stay at day of surgery to day of discharge; p value: 0.36 days, Comments: The median length of hospital stay was at 3.0 days (95% CI 2.0-3.0) for the control group compared with 3.0 days (95% CI 2.0-3.0) for the enhanced recovery after surgery group.); Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Comments - ; Indirectness of outcome: No indirectness ; Blinding details: Patients were informed of risks and benefits of enhanced recovery after surgery protocol before being offered enrollment. ; Group 1 Number missing: 5, Reason: Did not undergo eligible surgery; Group 2 Number missing: 4, Reason: Did not undergo eligible surgery Protocol outcome 3: Unplanned intensive unit admission - Actual outcome: ICU Admission at up to 30 days post operatively; Group 1: 3/51, Group 2: 1/52 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Comments - ; Indirectness of outcome: No indirectness ; Blinding details: Patients were informed of risks and benefits of enhanced recovery after surgery protocol before being offered enrollment. ; Group 1 Number missing: 5, Reason: Did not undergo eligible surgery; Group 2 Number missing: 4, Reason: Did not undergo eligible surgery	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Gonenc 2014[69]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	n/a (n=62)
Countries and setting	Conducted in Turkey; Setting: Training and Research Hospital, Turkey
Line of therapy	Not applicable

Study	Gonenc 2014[69]
Duration of study	Intervention + follow up: May 2012 - January 2013
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	Patients with a perforated ulcer less than 10 mm in size who underwent laparoscopic Graham patch repair
Exclusion criteria	(1) refusal to join the study or sign the informed consent form; (2) age younger than 15 years; (3) the presence of any psychiatric or neurologic disease; (4) class 3 and 4 surgical patients according to the classification of The American Society of Anesthesiologists; (5) septic shock on admission; (6) pregnancy; (7) predisposing factors for impaired wound healing (eg, chronic use of steroids); (8) peptic ulcers that were simultaneously bleeding and perforated; (9) multiple perforated peptic ulcers; (10) spontaneously sealed-off perforated ulcers that were diagnosed either preoperatively or during surgery and that did not require surgical repair; (11) conversion to open technique; (12) perforated ulcers that were not amenable to Graham patch repair because of size or technical considerations; and (13) malignant ulcers confirmed by histopathological examination if biopsied for a high index of suspicion for malignity
Recruitment/selection of patients	Patients who were diagnosed with perforated peptic ulcer disease between May 2012 and January 2013 were recruited for the study
Age, gender and ethnicity	Age - Mean (SD): ERP: 35.4 ± 13.2 years (range 18-66); Control: 37.8 ± 14.3 (range 18-71). Gender (M:F): 36/11. Ethnicity: NRTurkish
Further population details	1. Age: <60 years (ERP: 35.4 ± 13.2 years (range 18-66); Control: 37.8 ± 14.3 (range 18-71)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: lower and upper GI (perforated peptic ulcer disease repair).
Indirectness of population	No indirectness
Interventions	(n=26) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative: placement of a nasogastric tube, the administration of crystalloids for fluid replacement, intravenous antibiotherapy with cefuroxime (1,500 mg every 12 hours), intravenous pain relief with tramadol (100 mg every 6 hours), and intravenous acid-reducing therapy with pantoprazole (40 mg every 12 hours). Patients older than 45 years and who had risk factors for venous thrombosis received subcutaneous thromboprophylaxis with enoxaparin. •Intraoperative: All of the surgical procedures were performed under general anesthesia; The gastric content was aspirated via the nasogastric tube by the anesthesiologist at the end of the procedure, and the nasogastric tube was withdrawn in the operating room immediately after the patient had recovered from anesthesia. •Postoperative: POD 0: Nil by mouth; No nasogastric decompression; Removal of the urinary catheter;

Study	Gonenc 2014[69]
	Diclofenac (75 mg every 12 hours IM); Pantoprazole (40 mg every 12 hours IV); Metoclopramide (10 mg every 8 hours IV). POD 1: Liquids; Diclofenac (75 mg on demand IM); Pantoprazole (40 mg every 12 hours IV); Metoclopramide (10 mg every 8 hours IV). POD2: Soft food; Acetaminophen (500 mg on demand PO); Pantoprazole (40 mg every 12 hours PO). POD 3: Normal food; Acetaminophen (500 mg on demand PO); Pantoprazole (40 mg every 12 hours PO); Moxifloxacin (400 mg daily PO); Discharge. Duration preoperative assessment to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=36) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperative: placement of a nasogastric tube, the administration of crystalloids for fluid replacement, intravenous antibiotherapy with cefuroxime (1,500 mg every 12 hours), intravenous pain relief with tramadol (100 mg every 6 hours), and intravenous acid-reducing therapy with pantoprazole (40 mg every 12 hours). Patients older than 45 years and who had risk factors for venous thrombosis received subcutaneous thromboprophylaxis with enoxaparin. •Intraoperative: patients left the operating room with their nasogastric tube in place. •Postoperative: The urinary catheter was removed on postoperative day 1. Postoperative pain was managed with tramadol (100 mg every 6 hours intravenously). Intravenous metoclopramide (10 mg every 8 hours) was administered for the first 2 postoperative days. The intravenous acid-reducing therapy with pantoprazole (40 mg every 12 hours) was continued throughout the hospital stay. The nasogastric tube was not withdrawn until the drainage was less than 300 mL/d. Oral intake of liquids was started after active bowel movements had begun. The subhepatic drain was withdrawn 12 hours after the initiation of oral intake. After the oral feeding had been initiated, tramadol was switched to oral acetaminophen. Patients were discharged only after showing complete tolerance to oral feeding and the passage of wind or stool in the absence of any postoperative complications.. Duration preoperative assessment to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Mortality
- Actual outcome: Mortality at within 30 days of surgery and discharge; Group 1: 0/21, Group 2: 1/26; Comments: p value 0.363
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 5, Reason: did not receive allocated intervention; lost to follow up; ; Group 2 Number missing: 10, Reason: did not receive allocated intervention; discontinued intervention; lost to follow up; excluded from analysis

Protocol outcome 2: Perioperative complications

Study	Gonenc 2014[69]
- Actual outcome: Total complications at postoperative up to 30 days postdischarge; Group 1: 6/21, Group 2: 13/26; Comments: includes: superficial type surgical site infection; postoperative ileus; pulmonary complications; organ / space type surgical site infection; post operative bleeding; incarcerated trocar site hernia Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 5, Reason: did not receive allocated intervention; lost to follow up; ; Group 2 Number missing: 10, Reason: did not receive allocated intervention; discontinued intervention; lost to follow up; excluded from analysis Protocol outcome 3: Length of hospital stay - Actual outcome: Length of hospital stay at admission to discharge; Group 1: mean 3.8 days (SD 1.9); n=21, Group 2: mean 6.9 days (SD 2.2); n=26; Comments: ERP: range 3-15 Control: range 4-17 P value 0.0001 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 5, Reason: did not receive allocated intervention; lost to follow up; ; Group 2 Number missing: 10, Reason: did not receive allocated intervention; discontinued intervention; lost to follow up; excluded from analysis	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Abdikarim 2015[1]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	1 (n=61)
Countries and setting	Conducted in China
Line of therapy	Not applicable
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	Only those diagnosed with advanced gastric cancer were enrolled into the study after undergoing a diagnostic workup consisting of endoscopy with biopsy, total body CT scan, and endoscopic ultrasound in

Study	Abdikarim 2015[1]
	selected patients. Inclusion criteria were as follows: diagnosis of advanced gastric cancer, elective laparoscopic surgery and age under 75 years.
Exclusion criteria	Patients with early gastric cancer received neoadjuvant chemotherapy, and those with pyloric obstruction or with distant metastasis were excluded from the study.
Age, gender and ethnicity	Age - Median (range): male 63 +/- 12 female 62 +/- 11. Gender (M:F): 41/20. Ethnicity: Chinese
Further population details	1. Age: >60 years 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not applicable 3. Type of surgery: lower and upper GI (laparoscopic radical gastrectomy).
Indirectness of population	No indirectness
Interventions	(n=30) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. during the postoperative period, fluid intake was from POD 1 or POD 2 in the ERAS group, patients were advised to begin cautiously and increase intake according to tolerance. Furthermore, they were encouraged to take full semi-liquid diet on POD 2, and normal food as soon as possible after surgery. In the conventional group, postoperative oral intake was restricted. In the ERAS group, patients were encouraged to mobilize early from POD 1, and meet daily targets for mobilization. . Duration 1 day before the surgery + 30 days follow up. Concurrent medication/care: N/A. Indirectness: No indirectness (n=31) Intervention 2: No enhanced recovery programme (standard care) - Standard care. The conventional group received traditional postoperative care including bed rest. Urinary bladder drainage was routinely used in the conventional group, but limited to POD 1. Duration 1 day before the surgery + 30 days follow up. Concurrent medication/care: N/A. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Perioperative complications
- Actual outcome: Readmission at 30 day follow up; Group 1: 0/30, Group 2: 0/31
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness ; Baseline details: Inclusion criteria were as follows: diagnosis of advanced gastric cancer, elective
laparoscopic surgery and age under 75 years. Patients with early gastric cancer
received neoadjuvant chemotherapy, and those with pyloric obstruction or with
distant metastasis were excluded from the study.

Study	Abdikarim 2015[1]
	; Group 1 Number missing: 0, Reason: N/A; Group 2 Number missing: 0, Reason: N/A - Actual outcome: Mortality at 30 day follow up; Group 1: 0/30, Group 2: 0/31 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness ; Baseline details: Inclusion criteria were as follows: diagnosis of advanced gastric cancer, elective laparoscopic surgery and age under 75 years. Patients with early gastric cancer received neoadjuvant chemotherapy, and those with pyloric obstruction or with distant metastasis were excluded from the study. ; Group 1 Number missing: 0, Reason: N/A; Group 2 Number missing: 0, Reason: N/A - Actual outcome: Complications at 30 day follow up; Group 1: 1/30, Group 2: 2/31 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness ; Baseline details: Inclusion criteria were as follows: diagnosis of advanced gastric cancer, elective laparoscopic surgery and age under 75 years. Patients with early gastric cancer received neoadjuvant chemotherapy, and those with pyloric obstruction or with distant metastasis were excluded from the study.; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 2: Length of hospital stay - Actual outcome: Length of hospital stay at 30 day follow up; Group 1: mean 8.3 days (SD 1.3); n=30, Group 2: mean 9.9 days (SD 1.1); n=31 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness ; Baseline details: Inclusion criteria were as follows: diagnosis of advanced gastric cancer, elective laparoscopic surgery and age under 75 years. Patients with early gastric cancer received neoadjuvant chemotherapy, and those with pyloric obstruction or with distant metastasis were excluded from the study. ; Group 1 Number missing: 0, Reason: N/A; Group 2 Number missing: 0, Reason: N/A
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Fujikuni 2016[65]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	N/A (n=80)
Countries and setting	Conducted in Japan; Setting: Hiroshima University, between September 2011 and February 2015.
Line of therapy	Not applicable
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall: 40 patients were assigned to each of the conventional treatment group (CG) and the ERP group (EG). Patients were assigned according to thestratified randomization method by age (< 70 vs ≥ 70) and surgical approach (abdominal vs laparoscopic surgery). All patients completed their treatment.
Subgroup analysis within study	Stratified then randomised:
Inclusion criteria	consecutive patients who underwent gastrectomy at the Department of Gastroenterological and Transplant Surgery
Exclusion criteria	not stated
Recruitment/selection of patients	consecutive patients
Age, gender and ethnicity	Age - Other: <70 years ERP=29 Standard= 28; >/=70 years ERP 11, Standard=12. Gender (M:F): 44/36. Ethnicity: Japanese
Further population details	1. Age: Not applicable (<70 years vs >/=70 years). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: lower and upper GI
Indirectness of population	No indirectness
Interventions	(n=40) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Patients in both groups were managed perioperatively using equivalent standardized clinical pathway protocols except for perioperative nutrition and intravenous fluid. STANDARD CARE Preoperative: 2 days before the surgery Normal diet+water; Intraoperative+1 day after the surgery: No oral intake; Postoperative: 2 days after the surgery till 8 day of surgery- Water; 3rd day after the surgery - 8th day after the surgery - Liquid diet (3 steps up to a soft diet every 2d); In the EG,intravenous fluid was restricted to a minimal daily requirement during the first 3 postoperative days. Additional intravenous fluid was administered when patient showed poor oral intake of water or food. The CG received intravenous fluid for 1 wk postoperatively. Regarding perioperative oral nutrition, patients in the EG received 875 mL of carbohydrate-rich (157 g). fluid until 2 h before the surgery. On POD 1, the patients commenced oral intake with water and oral rehydration solution. On POD 2, patients began to

Study	Fujikuni 2016[65]
	consume a liquid diet. In the CG, patients were allowed to drink water until the day before the surgery. On POD 2, these patients commenced oral intake beginning with water; liquid diets were offered on POD 3. Duration 2 days before the surgery + 8 days after the surgery. Concurrent medication/care: Not stated. Indirectness: No indirectness (n=40) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Patients in both groups were managed perioperatively using equivalent standardized clinical pathway protocols except for perioperative nutrition and intravenous fluid. In the EG, . Duration 2 days before the surgery + 8 days after the surgery. Concurrent medication/care: Not stated. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Quality of life
- Actual outcome: Health related quality of life ; MEAN PCS SCORE
Preoperative day
ERP group - 50.8 vs conventional group - 52.5;
POD2
ERP 37.7 vs Conventional39.2;
POD7
ERP 42.4 vs Conventional 44.0

MEAN MCS SCORE
Preoperative care
ERP 48.6 vs conventional 49.9
POD2
ERP 47.3 vs conventional 48.4
POD7
ERP 49.3 vs conventional 49.7;
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing 0 ; Group 2 Number missing 0

Protocol outcome 2: Perioperative complications
- Actual outcome: Clavien-Dindo grade =>2 ; Group 1: 4/40, Group 2: 5/40

Study	Fujikuni 2016[65]
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 3: Length of stay in intensive care unit - Actual outcome: Length of hospital stay at within 12 days; p: 0.724, Comments: Mean (Range) ERP group 9.8 (6-20) Conventional 10.4 (7-23)); Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing 0 ; Group 2 Number missing 0	
Protocol outcomes not reported by the study	Mortality ; Patient and staff adherence ; Length of hospital stay ; Unplanned intensive unit admission ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Fei 2015[52]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	n/A (n=125)
Countries and setting	Conducted in China; Setting: Not stated
Line of therapy	Not applicable
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall: N/A
Subgroup analysis within study	Not applicable: N/A
Inclusion criteria	1) SDPD-PV for PHT; (2) not combined with hepatic tumor; (3) without severe cardiopulmonary disease; (4) Child-Pugh score <10.
Exclusion criteria	Not stated
Recruitment/selection of patients	patients who underwent SDPDPV from January 2012 to April 2014. All eligible patients were enrolled in the study
Age, gender and ethnicity	Age - Mean (SD): FTS 46.3 years +/- 6.9; Non-FTS 44.9 years +/-8.1. Gender (M:F): Define. Ethnicity: Chinese

Study	Fei 2015[52]
Further population details	1. Age: Not applicable 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 1 (ASA 1-2: FTS 45 patients Non FTS 40 patients; ASA 3-4 FTS 14 patients; Non FTS 17). 3. Type of surgery: vascular
Indirectness of population	No indirectness
Interventions	(n=63) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Preoperative management: 1. Detailed information given to the patient regarding the therapeutic course, preoperative patient education focusing on recovery expectations 2. Preoperative respiratory physiotherapy; 3. Avoidance oral fluid intake 12 hours before operation; Intraoperative management: 1. Keep warm temperature in the operating room, warm normal saline to wash the abdominal cavity, and drip administration at a controlled temperature; 2. Ultrasound knife and reabsorbable clips were used for dissection and vessel ligation 3. Antibiotic prophylaxis 4. Anesthetic protocol: insertion of epidural catheter (level T8-T9) 5. Adjusted hydration: replacement of blood loss and imperceptible loss at the rate of 6-8 mL/kg/h 6. Control infusion fluid, especially excessive crystalloid solution Postoperative: 1. Catheter with local anesthetics in continued perfusion, and removal of epidural analgesia 48 hours postoperatively 2. Respiratory physiotherapy and atomizing inhalation of Ambroxol during the first 72 hours; 3. Removal of the abdominal drains after 48 hours if no more bloody fluid is observed; 4. Discontinuation of gastric decompression by 8 a.m. the day after surgery 5. Patients are encouraged to drink immediately after recovery from anesthesia. After flatus and oral tolerance is reached, a gradual transition from semi-liquid diet to soft diet/low fiber solid food 6. Removal of foley catheter on the third postoperative day 7. Intravenous injection furosemide (20mg /q.d) .during the first 72 hours. Thereafter, change to oral furosemide (20mg b.i.d.). 8. Prokinetic and somatostatin 9. Mobility, as much as possible from the first postoperative day (moving patients to a chair). 10. An emphasis on minimization of intravenous fluids to keep patients at their baseline weight. 11. Supplement plasma or human albumin on the basis of liver function and albumin values discretionarily to maintain concentration of serum albumin not less than 30g/L. Duration 12 hours before the surgery+72 hours post surgery. Concurrent medication/care: Not Stated. Indirectness: No indirectness (n=62) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Patients randomized into the non-FTS group were instructed in the standard manner. Conventional information on PHT were informed to the patients. Preoperative respiratory physiotherapy was not offered to them. Four hours before operation, avoidance of oral fluid intake was carried out. Antibiotic prophylaxis was not performed in the patients. During the course of operation, ultrasound knife and reabsorbable clips were not used for dissection and vessel ligation. Patients had a feeding tube inserted if they agreed to this process, and they fasted from the midnight before surgery. The type of anesthesia was general anesthesia. Postoperative analgesia comprised continuous epidural analgesia using local anesthetics combined with

Study	Fei 2015[52]
	epidural morphine or subcutaneous morphine. Both methods were supplemented by bolus administration of metamizol or diclofenac. Insertion of gastric drainage tube, intra-abdominal drains and urinary catheter was routine. Postoperative oral intake and rehabilitation proceeded in the standard manner.. Duration 12 hours before the surgery+72 hours post surgery. Concurrent medication/care: Not stated. Indirectness: No indirectness
Funding	Funding not stated
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE Protocol outcome 1: Perioperative complications - Actual outcome: complications at 30 d follow up; Group 1: 37/59, Group 2: 58/57 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 4; Group 2 Number missing: 5 - Actual outcome: Clavien classification at 30 d follow up; Group 1: 15/59, Group 2: 24/57; Comments: ERP overall = 15; Grade I =7; grade II = 3; grade IIIa = 5; grade IIIb,IVa, IVb, V = 0; Standard care = 24, Grade I = 15, grade II = 3, Grade IIIa =6, grade IIIb,IVa, IVb, V = 0; Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 4; Group 2 Number missing: 5 Protocol outcome 2: Length of hospital stay - Actual outcome: Length of hospital stay at 30 d follow up; p: 0.005, Comments: mean FTS 17.3 days +/-5.5; Non FTS 23.6 days +/-7.3); Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 4; Group 2 Number missing: 5	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Feng 2013[53]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	N/A (n=122)
Countries and setting	Conducted in China; Setting: This study was performed in Xijing Hospital of Digestive Diseases affiliated to the Fourth Military Medical niversity from November 2011 to August 2012.
Line of therapy	Not applicable
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall: N/A
Subgroup analysis within study	Not applicable: N/A
Inclusion criteria	1) diagnosis of gastric cancer based on clinical symptoms, imaging and pathology; (2) age between 18 and 75 years; (3) no preoperative radiotherapy or chemotherapy; (4) no distant metastasis; (5) no history of primary diabetes mellitus, bowel obstruction, severe cardiopulmonary diseases, and immune related diseases; (6) no pregnancy or breast feeding; (7) an American Society of Anesthesiologists (ASA) score of Ⅰ or Ⅱ; (8) undergoing elective standard D2 total gastrectomy; and (9) written informed consent was obtained from the patient and the family.
Exclusion criteria	Not stated
Age, gender and ethnicity	Age - Mean (SD): Fast track 54.98 +/-11.35; Conventional 55.79 +/-10.06. Gender (M:F): 85/34. Ethnicity: Chinese
Further population details	1. Age: Not applicable 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not applicable (ASA 1 or 2). 3. Type of surgery: lower and upper GI
Indirectness of population	No indirectness
Interventions	(n=61) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Diet before surgery: Intake of 1000 mL 14% carbohydrate drink 12 h before and 350 mL 14% carbohydrate drink 3 h before surgery. Anesthesia: Tracheal intubation and general anesthesia; Thermal insulation of the body and extremities, body temperature was maintained at 36 ℃; Operation procedure: Standard laparotomy approach; No routine use of abdominal drainage tube; Analgesia after operation: Infiltration of surgical wounds with ropivacaine at the end of surgery and 24 h after surgery. Oral intake of 200 mg celecoxib twice daily; Mobilization after operation: Encourage patients to mobilize out of bed; Diet after operation: Encourage patients to mobilize out of bed Oral intake of 500-1000 mL glucose saline on the day of surgery.

	Intake of 2000-3000 mL liquid food containing 1000 kcal to 1200 kcal per day from the 1st day after surgery; Intravenous nutrition after operation: Infusion of parenteral nutrition iv if oral intake is not adequate. Appropriate level of iv fluid intake based on the volume of liquid intake and output, and physiological need; Removal of nasogastric tube within 24 h after surger; Removal of urine catheter within 24 h after surgery; Standard use of antibiotics before and once after surgery; Infusion of parenteral nutrition iv if oral intake is not adequate. Appropriate level of iv fluid intake based on the volume of liquid intake and output, and physiological need Removal of nasogastric tube within 24 h after surgery; Removal of urine catheter within 24 h after surgery; Standard use of antibiotics before and once after surgery;. Duration 1 day before the surgery + 5 days after. Concurrent medication/care: Not stated. Indirectness: No indirectness (n=61) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Diet before surgery: No intake of food and drink after supper the day before surgery; Anesthesia: Tracheal intubation and general anesthesia; No thermal insulation, room temperature was maintained at 22 ℃; Operattion Procedure: Standard laparotomy approach; Use of abdominal drainage tube; Analgesia after operation: Standard use of patient-controlled analgesic pump; Mobilization after operation: Mobilize out of bed on patients' own request; Diet after operation: Oral intake initiated after flatus (following a stepwise plan from water to other liquids to semi-fluids to normal food); Intravenous nutrition after operation: Infusion of glucose saline and amino acid injection iv on the day of surgery. Infusion of parenteral nutrition (25 kcal/kg of body weight) iv before oral intake. Appropriate level of iv fluid intake based on the volume of liquid intake and output, and physiological need; Removal of nasogastric tube after flatus; Removal of urine catheter on the 3rd after surgery or 4th day after surgery; Standard use of antibiotics for 3 d after surgery;. Duration 1 day before the surgery + 5 days after. Concurrent medication/care: Not stated. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Mortality
- Actual outcome: Mortality at post surgery; Group 1: 0/59, Group 2: 0/60
Risk of bias: All domain - --, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2; Group 2 Number missing: 1

Protocol outcome 2: Perioperative complications
- Actual outcome: Complications at post surgery; Group 1: 17/59, Group 2: 6/60

Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2; Group 2 Number missing: 1 Protocol outcome 3: Length of hospital stay - Actual outcome: Length of hospital stay at post surgery; p: 0.000, Comments: FTS 5.68 days +/- 1.22; Conventional 7.1 days +/- 2.13); Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 1; Group 2 Number missing: 2 Protocol outcome 4: Hospital readmission - Actual outcome: hospital readmission at post surgery; Group 1: 0/60, Group 2: 0/59 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2; Group 2 Number missing: 1	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	**Chen 2016[27]**
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	1 (n=276)
Countries and setting	Conducted in China; Setting: Department of Thoracic Surgery at Harbin Medical University Cancer Hospital
Line of therapy	Not applicable
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall: N/A

Subgroup analysis within study	Not applicable: N/A
Inclusion criteria	age ≥18 and ≤75 years, American Society of Anesthesiologists (ASA) grade I/II, body mass index (BMI) 18.5–27.5 kg/m2,resectable esophageal cancer
Exclusion criteria	patients with known immunological dysfunction (advanced liver disease (decompensated cirrhosis, portal hypertension or hepatocellular carcinoma), HIV infection, hepatitis C virus infection), pulmonary insufficiency (An acute or chronic condition marked by impaired pulmonary function, characterized by elevated carbon dioxide or decreased oxygen, or both), unresectable esophageal cancer Guidelines version 1.2013), ASA III-IV, Karnofsky index less than 60, BMI less than 18.5 kg/m2,and age of 65–75 years with hypertension, diabetes, or vascu- lar disease.
Age, gender and ethnicity	Age - Median (range): . Gender (M:F): fast track 103/25; conventional 106/26. Ethnicity: Chinese
Further population details	1. Age: Not applicable 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 1 (ASA 1/2). 3. Type of surgery: lower and upper GI
Indirectness of population	No indirectness
Interventions	(n=138) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Preoperative: Patients were educated systematically by the esophageal clinical nurse consultant; Day before surgery: Last drink 2 h and diet 6 h; Fructose and protein loading; Day Of Surgery: No routine use of nasogastric tube; No Pre-anesthetic medication; General anesthesia + Epidural; Maintaining normothermia; Autologous blood transfusion or limit allogenic blood transfusion; No routine use of drains; Early postoperative care: Patient sent to floor; Analgesia Epidural PCA Enteral nutrition: Jejunostomy tube feeding anesthesia; before operation POD1 Jejunostomy tube feeding 500 mL (starting at 20 mL/h); Early postoperative mobilization program (>2 h out of bed);Physical therapy and nebulizers; Remove urine catheter; Head of bed put at 30°; Supply albumin; Chest tube to suction; Promoted to lung recruitment POD2 Jejunostomy tube feeding 1000 mL (40 mL/h); Chest tube to suction; Expand mobilization (>4 h out of bed);Continue physical therapy and nebulizers; Continue supply albumin; POD3 Jejunostomy tube feeding 1500 mL (60–80 mL/h); Remove chest tube; Remove epidural catheter; Expand mobilization (>6 h out of bed); Continue physical therapy and nebulizers; Continue supply albumin; POD4 Gastrografin opacification of upper gastrointestine; If swallow shows no leak, advance patient to oral drink; Jejunostomy tube feeding 1500 mL (60–80 mL/h);

	Continue physical therapy and nebulizers; Education on aspiration precaution; Education on chewing and swallowing POD5 Jejunostomy tube feeding 1500 mL (60–80 mL/h); Advance patient to a full liquid diet; Continue aspiration precautions;Continue physical therapy and nebulizers POD6 Increase liquid diet; Decrease jejunostomy tube feeding (500 ml or 1000 ml); Continue aspiration precautions; Continue physical therapy and nebulizers; POD7 Remove jejunostomy tube; Full liquid diet; Discharge home on soft diet and liquid diet; Continue aspiration precautions;. Duration 1 day before the surgery + 7 days post surgery. Concurrent medication/care: N/A. Indirectness: No indirectness (n=138) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Preoperative education: Patients were educated in the standard manner; Day Before surgery: Last drink and diet at midnight; no Fructose and protein loading; Day Of Surgery: Routine use of nasogastric tube; Pre anesthetic medication - Diazepam 10 mg; General anesthesia; no Maintaining normothermia; Allogenic blood transfusion; Routine placement; Remove at POD3; Routine placement; Remove at POD2; Early postoperative care: Patient sent to ICU; Analgesia by morphine or vein PCA; Nasojejunal tube feeding; POD1 Total parenteral nutrition; Bed rest; Gastrointestinal decompression; Closed thoracic drainage; POD2 Nasojejunal tube feeding 500 mL (starting at 20 mL/h); Remove urine catheter; With help, sit in the chair 2 times during the day for at least 30 min each time; Gastrointestinal decompression;Closed thoracic drainage POD3 Nasojejunal tube feeding 1000 mL (40 mL/h); Sit in the chair 3 times for at least 30–60 min each time.; With help, walk twice in the hallway.; Do deep breathing exercise; Remove nasogastric tube; Closed thoracic drainage; POD4 Nasojejunal tube feeding 1000 mL (40 mL/h); Sit in the chair 3 times today for at least 30–60 min each time.; Walk the length of the hallway 3 times;Continue to do breathing exercises; Closed thoracic drainage; POD5 Nasojejunal tube feeding 1500 mL (60–80 mL/h); Walk the length of the hallway 4–5 times. Sit in the chair 3 times today for at least 30–60 min; Continue to do breathing exercises; POD6 Nasojejunal tube feeding 1500 mL (60–80 mL/h); Remove chest tube;Walk the length of the hallway 4–5 times. Sit in the chair 3 times today for at least 30–60 min; Continue to do breathing exercises; POD7 Gastrografin opacification of upper gastrointestine; If swallow shows no leak, advance patient to oral drink; Nasojejunal tube feeding 1500 mL (60–80 mL/h);Expand mobilization (>4 h out of bed); Continue to do breathing exercises; POD8 Increase liquid diet; Decrease jejunostomy tube feeding (500 ml or 1000 ml); Expand mobilization (>6 h out of bed); Continue to do breathing exercises; POD9 Remove nasojejunal tube; Full liquid diet; Expand mobilization (>6 h out of bed); Continue to do

	breathing exercises; POD 10-11 Soft diet and liquid diet; Nearly out of bed; Observe whether there is delayed anastomotic leakage; POD12 Discharge home on soft diet and liquid diet. Duration 1 day before the surgery + 12 days post surgery. Concurrent medication/care: N/A. Indirectness: No indirectness
Funding	No funding

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Mortality
- Actual outcome: Length of hospital stay at postoperatively to discharge; Group 1: mean 7.62 (SD 1.38); n=128, Group 2: mean 12.56 (SD 1.92); n=132
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Baseline details: N/A; Group 1 Number missing: 10, Reason: did not complete the treatment; Group 2 Number missing: 6, Reason: did not complete the treatment
- Actual outcome: Mortality at follow up time; Group 1: 2/128, Group 2: 2/132
Risk of bias: All domain - High, Selection - Low, Blinding - Low, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 10; Group 2 Number missing: 6

Protocol outcome 2: Perioperative complications
- Actual outcome: Complications at postoperatively up to 30 days post discharge; Group 1: 11/128, Group 2: 16/132
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 10; Group 2 Number missing: 6

Protocol outcome 3: Hospital readmission
- Actual outcome: Hospital readmission at 30 days postoperatively; Group 1: 3/128, Group 2: 3/132
Risk of bias: All domain - High, Selection - Low, Blinding - Low, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 10; Group 2 Number missing: 6

Protocol outcome 4: Pain
- Actual outcome: Pain at follow up time; p: 1.0, Comments: FTS group 4.72 +/-1.94; Conventional group 7.66 +/- 1.59);
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 10; Group 2 Number missing: 6

Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Length of hospital stay ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	Dong 2017[46]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	N/A (n=35)
Countries and setting	Conducted in China
Line of therapy	Not applicable
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall: N/A
Subgroup analysis within study	Not applicable: N/A
Inclusion criteria	1) diagnosed with primary pulmonary adenocarcinoma or squamous cell carcinoma via biopsies guided by videobronchoscopy or CT scan and never received chemotherapy or radiotherapy; (2) presented with central lung cancers whose chest CT scans strongly indicated the necessity of a pneumonectomy and showed no signs of remote metastases in isotope bone scan, brain MRI, and abdominal CT; (3) did not present with a history of arrhythmias or myocardial infarction; (4) did not present signs of chronic obstructive pulmonary disease (COPD) with a forced expiratory volume in 1 s (FEVl) >2.5 L; (5) did not have interstitial lung disease or asthma preoperatively; (6) were 44–65 years old; and (7) had no hypertension, diabetes, renal dysfunction, or gastrointestinal diseases. atients should also (1) tolerate preoperative enteral nutrition and thoracic epidural anesthesia without coagulation dysfunction, (2) have a body mass index (BMI) of 18.5–30.0 kg/m2, and (3) have a physical status between I and II sets by the American Society of Anesthesiologists (ASA).
Exclusion criteria	Patients who had neuromuscular diseases and could not receive postoperative chest physiotherapy or had ever received thoracic surgeries were excluded.
Age, gender and ethnicity	Age - Mean (range): FTS 55.1 (44-65); conventional 56.6 (50-65). Gender (M:F): 27/8. Ethnicity: Chinese
Further population details	1. Age: Not applicable 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not applicable 3. Type of surgery: Not applicable (Pneumonectomy).
Indirectness of population	No indirectness
Interventions	(n=17) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS.

Study	Dong 2017[46]
	Preoperative education: Concept of FTS; Diet: ook 1000 ml of 10% glucose orally at the night before operation; took 200 ml of 10% glucose orally 2 h before operation; Preoperative sedation to improve sleep; Indwelling catheter after anesthesia; Intraoperative warming; Postoperative analgesia: Patient-controlled epidural analgesia—oral use of nonsteroidal analgesic painkillers for 48 h; Postoperative amount of fluid: Fast intravenous infusion of 250 ml saline within 1 h: the rest were the same as the conservative group; Diet 6 h postoperatively: 400 ml liquid form; Measures to promote bowel movements: Chewing gum; Early extubation of urinary catheter: 12 h postoperatively; Early exercise: Active bed activities of the lower limbs;. Duration day before the surgery + 7 days post surgery. Concurrent medication/care: not stated. Indirectness: No indirectness (n=18) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Preoperative education :Concept of standard manner Preoperative diet: Fasting for 6 h Preoperative sedation to improve sleep; Indwelling catheter after anaesthesia; No intraoperative warming; Patient-controlled epidural analgesia; Total postoperative intravenous infusion volume within 24 h should be <1500 ml, with a intravenous infusion rate of 20–30 ml min; if hypotension appeared or urine volume was <20 ml/h, vasoconstrictors were used; Diet 6h postoperatively: small amount of water; No measures to promote bowel movements; Early extubation of urinary catheter - 24 h postoperatively; Early exercise following patients will;. Duration day before the surgery + 7 days post surgery. Concurrent medication/care: Not stated. Indirectness: No indirectness
Funding	Academic or government funding (The research was supported by the Fourth Affiliated Hospital, Harbin Medical University. The funding body has no role in the design of the study and collection, analysis, and interpretation of data and in writing the manuscript.)

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Perioperative complications
- Actual outcome: Complications at Postoperative; Group 1: 4/17, Group 2: 6/18
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover

Study	Dong 2017[46]
- Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 2: Length of hospital stay - Actual outcome: Length of hospital stay at Postoperative; p: 0.0001, Comments: FTS 18.1 days +/- 1.4; Control 27.4 days +/- 6.6); Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Bu 2015[21]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	N/A (n=256)
Countries and setting	Conducted in China
Line of therapy	Not applicable
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall: group (75–89 years old); group (45–74 years old)
Subgroup analysis within study	Stratified then randomised
Inclusion criteria	a diagnosis of GC by a preoperative gastroscope pathological biopsy, tumor, node, metastasis (TNM) (TNM classification system of the National Comprehensive Cancer Network (NCCN) 2010 Clinical Practice Guidelines for GC50) staging of I–III for the period of the postoperative pathological diagnosis, American Society of Anesthesiology (ASA) score grades I–III, age ≥45 and ≤90 years, no emergency surgery, no preoperative radiotherapy or chemotherapy, receipt of open gastric cancer radical surgery, and no preoperative complete digestive tract obstruction or digestive tract perforation.
Exclusion criteria	autoimmune diseases or severe cardiopulmonary diseases, preoperative tumor TNMstage of IV,ASAscore of IV, emergency surgery,merging other malignant tumors, and cachexia.
Age, gender and ethnicity	Age - Mean (SD): . Gender (M:F): 45 - 74 years old FTS1 33/31, CC1 35/29; 75-89 years old FTS2 37/27, CC-2 40/24. Ethnicity: Chinese

Study	Bu 2015[21]
Further population details	1. Age: Not applicable ((45–74 years old) and (75–89 years old)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 4 3. Type of surgery: lower and upper GI (Gastric cancer).
Indirectness of population	No indirectness
Interventions	(n=128) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Preoperative: Inform patients and their families of perioperative management measures and the likely scenario; Semi-fluid meals were administered until 6 h before surgery, and carbohydrate drinks (commonly 500 ml of a 5 % glucose solution) or same amount of water (for diabetes patients) were administered until 2 h before initiation of anesthesia; No routine postoperative nasogastric tube; Routine transurethral bladder drainage after anesthesia, Remove within 24 h after surgery; Mechanical bowel preparation should not be used routinely; Routine prophylaxis with intravenous antibiotics should be administered 30–60 min before surgery; Additional doses should be given if the operation time is more than 3 h; Intraoperative: Endotracheal intubation and intravenous general anesthesia compound (using drugs with a short half-life); Intraoperative rehydration capacity is 1500 ml or less The total fluid volume is 2500 ml or less on the day of surgery; Intraoperative input liquid and abdominal cavity flushing fluid are used after heating the operating room to 23 to 25 °C. Incision size As far as possible to narrow the incision; Drainage tube No routine placement intraoperatively (usage rate was 9 %, remove 1 day after surgery); Postoperative: Encourage patients to ambulate 1 day postoperatively; Oral feeding is initiated at 24 h after surgery, following a stepwise program from warm clear water to a carbohydrate drink and, finally, to semi-fluid meals and normal food; Epidural analgesia pump 24–48 h, no use of opioid drugs. Duration 1 day before the surgery 48 hours after the surgery. Concurrent medication/care: N/A. Indirectness: No indirectness Comments: fast track group (45-74 years old) (n=128) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Preoperative: Gave patients information related to the operation and possible risks, Preoperative 3-day oral liquid diet with an intestinal bacteriostatic agent; No meal for 12 h and no drink for 8 h before surgery; Preoperative routine use of nasogastric tube; Postoperative removal after anal exhaust; Preoperative routine use of catheter Remove within 7 days after surgery; Preoperative (1 day) administration of bowel cleaning fluid Prophylaxis with intravenous antibiotics should be administered 30–60 min before surgery. Additional doses should be given if the operative time is more than 3 h and should extend to 3 days postsurgery. Intraoperative: Compound endotracheal intubation and intravenous general anesthesia;Conventional infusion and begin parenteral nutrition support 1–2 days preoperatively; No regular intraoperative heat preservation; No special emphasis on creating a narrow incision; Conventional use of drainage tube; Postoperative: The patient gets out of bed when he or she feels ready; Drink water after anal exhaust and

Study	Bu 2015[21]
	gradually return to a normal diet; Intravenous analgesia pump for 48 h, use of opioid drugs;. Duration 3 days before the surgery + 3 days after the surgery. Concurrent medication/care: N/A. Indirectness: No indirectness Comments: 45 - 89 years old
Funding	No funding
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE Protocol outcome 1: Perioperative complications - Actual outcome: Complications ; Group 1: 94/125, Group 2: 89/123 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3; Group 2 Number missing: 5 Protocol outcome 2: Length of hospital stay - Actual outcome: Postoperative hospital stay ; ERP group Mean=8.25; SD=2.674 Control group Mean=10.55; SD=2.278; Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3; Group 2 Number missing: 5 Protocol outcome 3: Hospital readmission - Actual outcome: Hospital readmission ; Group 1: 18/125, Group 2: 5/123 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3; Group 2 Number missing: 5	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Feng 2014[54]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=120)
Countries and setting	Conducted in China; Setting: University Hospital

Study	Feng 2014[54]
Line of therapy	Not applicable
Duration of study	Intervention + follow up: 1 month
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	patients diagnosed with rectal cancer based on clinical symptoms, imaging, and pathological evidence, with no findings of tumor invasion to adjacent organs, local or distant metastasis; aged 18 - 75 years; in the absence of preoperative radiotherapy or chemotherapy; ASA status of I or II
Exclusion criteria	pregnant or lactating women; primary diabetes, complete bowel obstruction, severe cardiopulmonary or immune-related diseases, human immunodeficiency virus infection or acquired immunodeficiency syndrome related diseases (> ASA II); palliative or emergency operation; combined with resection of spleen or pancreas; severe adverse events such as cerebrovascular accident or massive hemorrhage; and history of chemotherapy
Recruitment/selection of patients	not clearly stated how patients were recruited or selected
Age, gender and ethnicity	Age - Mean (SD): Conventional group 56.31 ± 11.52; Fasttrack 53.95 ± 11.95. Gender (M:F): 76/40. Ethnicity: NR
Further population details	1. Age: <60 years (Conventional group 56.31 ± 11.52; Fasttrack 53.95 ± 11.95). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 5; ASA II 111). 3. Type of surgery: lower and upper GI (radical anterior resection for rectal cancer).
Extra comments	Patient with diagnosed rectal cancer (located more than 5cm from the anal verge) were recruited for the study.
Indirectness of population	No indirectness
Interventions	(n=60) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Normal meal until 10pm the day before surgery, 250ml of 5% carbohydrate drink 2 hours before surgery, no bowel preparation, tracheal intubation and general anesthesia; thermal insulation of the body and extremities, body temperature maintained at 36C, laparoscopic anterior resection with total mesorectal excision, no routine use of abdominal drainage tube; wound infiltration with ropivacaine at the end of 24 hours of operation, 200mg celecoxib twice a day, movement out of bed for 1 hour night of surgery and 4 hours per day after 24 hours of surgery, oral intake of 250ml glucose saline mixed with water of 30-50mL every 1 - 2 hours on postoperative day 1, appropriate level of IV fluid intake based on the volume of liquid intake and output; removal of nasogastric and urine tubes on postoperative day 1. . Duration pre-admission to discharge postoperatively. Concurrent medication/care: NA. Indirectness: No indirectness

Study	Feng 2014[54]
	(n=60) Intervention 2: No enhanced recovery programme (standard care) - Standard care. normal meal until 10pm the day before surgery, routine bowel preparation; tracheal intubation and general anesthesia, no thermal insulation, room temperature maintained at 22C; laparoscopic anterior resection with mesorectal excision, use of abdominal drainage tube; standard use of patient-controlled analgetic pump, encourage movement out of bed; IV infusion of glucose saline and amino acid injection at the end of the surgery, IV infusion parenteral nutrition before oral intake, appropriate level of IV fluid infusion based on the volume of liquid intake and output as well as physiological need; removal of NG tube after flatus and removal of urinary catheter on the 3rd day after operation. Duration pre-admission to discharge postoperatively. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Academic or government funding

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK GROUP versus CONVENTIONAL CARE GROUP

Protocol outcome 1: Perioperative complications
- Actual outcome: surgery related complications at surgery up to 30 days post discharge; Group 1: 0/57, Group 2: 6/59; Comments: includes incision infection; abdominal infection; anastomotic leak; and ileus
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: excluded due to withdrawal of consent; Group 2 Number missing: 1, Reason: excluded due to unresectable tumor
- Actual outcome: non - surgery related complications at surgery up to 30 days post discharge; Group 1: 2/57, Group 2: 3/59
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: excluded due to withdrawal of consent; Group 2 Number missing: 1, Reason: excluded due to unresectable tumor

Protocol outcome 2: Length of hospital stay
- Actual outcome: postoperative hospital stay at surgery to discharge; Mean; (mean ± standard deviation : Fasttrack group 5.05 ± 1.38 and conventional group 6.98 ± 2.26) days, Comments: p value 0.000);
Risk of bias: All domain - --, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: excluded due to withdrawal of consent; Group 2 Number missing: 1, Reason: excluded due to unresectable tumor

Protocol outcome 3: Hospital readmission
- Actual outcome: Readmission at post discharge up to 30 days; Group 1: 0/57, Group 2: 1/59
Risk of bias: All domain - --, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover -

Study	Feng 2014[54]
Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: excluded due to withdrawal of consent; Group 2 Number missing: 1, Reason: excluded due to unresectable tumor Protocol outcome 4: Pain - Actual outcome: postoperative pain at postoperative day 1 - 5; pain visual analogue scale : not reported 1-10 Top=, Comments: p value < 0.05 when comparing pain in the Fast track group compared to conventional care group ; Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - High, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: excluded due to withdrawal of consent; Group 2 Number missing: 1, Reason: excluded due to unresectable tumor	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	Forsmo 2016[59]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=324)
Countries and setting	Conducted in Norway; Setting: University Hospital
Line of therapy	Not applicable
Duration of study	Intervention + follow up: January 2012 - March 2015
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	adult patients above 18 years scheduled for malignant or benign diseases, with or without stoma. Patients with rectal cancer who had had pelvic radiation were also included.
Exclusion criteria	Patients were excluded if a multivisceral resection was planned or if the patient was scored ASA IV. Additional exclusion criteria were pregnancy, emergency operations, difficulty to give informed consent because of impaired mental capacity, or inability to adapt to the ERP criteria.
Recruitment/selection of patients	Unclear how patients were recruited or selected. Of 653 eligible patients, 329 were not included mainly for logistical reasons and a lack of capacity or resources.

Study	Forsmo 2016[59]
Age, gender and ethnicity	Age - Median (range): ERP 65 (23-89) & Standard care 66 (19-93). Gender (M:F): 165/142. Ethnicity: NR
Further population details	1. Age: >60 years (median age range: ERP 65 (23-89) and standard care 66 (19-93)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 66, ASA II - 194, ASA III 47). 3. Type of surgery: lower and upper GI (open or laparoscopic colorectal surgery for malignant or benign diseases.).
Extra comments	patients scheduled for colorectal surgery for malignant or benign diseases. . Randomized patients were excluded if the intended colonic or rectal surgery was not performed.
Indirectness of population	No indirectness
Interventions	(n=162) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. ERP group received preoperative counseling, feeding, carbohydrate feeding, no bowel preparation, no premedication and no antimicrobial prophylaxis. Intraoperatively, patients were given total intravenous anesthesia, were fluid restricted, measures were taken to prevent hypothermia with minimally invasive incisions and epidural anesthesia. Post operatively, there was no routine use of NG tubes, no use of drains for colon surgery, enforced postoperative mobilization and feeding, no systemic morphine use, with standard laxatives and early removal of urinary catheter. All patients were allowed to drink clear liquids up to 2 hours before surgery. Bowel preparation did not include enema. All patients also received thromboembolic prophylaxis, preoperative antibiotics and prevention of hypothermia. In both groups, patients were encouraged to mobilize early starting immediately after surgery and were allowed to eat and drink if they wanted to. . Duration pre-admission counseling, postoperative hospital stay plus additional days if readmission was necessary within the first 30 days after surgery. . Concurrent medication/care: NA. Indirectness: No indirectness Comments: 8 patients were excluded due to protocol violation, emergency operation or operated within another hospital. (n=162) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Patients within the standard care group were given antimicrobial prophylaxis. Intraoperatively had gas induction for anesthesia with mechanisms to prevent hypothermia and epidural anesthesia. Postoperatively also had no routine use of NG tubes and drains for colon surgery. All patients were allowed to drink clear liquids up to 2 hours before surgery. Bowel preparation did not include enema. All patients also received thromboembolic prophylaxis, preoperative antibiotics and prevention of hypothermia. In both groups, patients were encouraged to mobilize early starting immediately after surgery and were allowed to eat and drink if they wanted to. . Duration pre-admission counseling, postoperative hospital stay plus additional days if readmission was necessary within the first 30 days after surgery. . Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

Study	Forsmo 2016[59]
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERAS versus STANDARD CARE Protocol outcome 1: Mortality - Actual outcome: total number of deaths at postoperatively and up to 30 days follow up; Group 1: 3/154, Group 2: 0/153 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: patient and caregiver not blinded. unclear if assessor was blinded; Group 1 Number missing: 8, Reason: protocol violation – 6; emergency operation – 1; operated in another hospital – 1; Group 2 Number missing: 9, Reason: protocol violation – 6; emergency operation - 1 operated in another hospital - 2 Protocol outcome 2: Perioperative complications - Actual outcome: Anastomotic leakage at postoperatively and up to 30 days follow up; Group 1: 10/154, Group 2: 4/153 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: patient and caregiver not blinded. unclear if assessor was blinded; Group 1 Number missing: 8, Reason: protocol violation – 6; emergency operation – 1; operated in another hospital – 1; ; Group 2 Number missing: 9, Reason: protocol violation - 6 emergency operation – 1; operated in another hospital - 2 - Actual outcome: Patients with anastomosis at postoperatively and up to 30 days follow up; Group 1: 117/154, Group 2: 122/153 Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: patient and caregiver not blinded. unclear if assessor was blinded; Group 1 Number missing: 8, Reason: protocol violation – 6; emergency operation – 1; operated in another hospital – 1; Group 2 Number missing: 9, Reason: protocol violation – 6; emergency operation - 1 operated in another hospital – 2 - Actual outcome: Abdominal wall dehiscence at postoperatively and up to 30 days follow up; Group 1: 5/154, Group 2: 5/153 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 8, Reason: Protocol violation - 6 emergency operation - 1 operated in another hospital - 1; Group 2 Number missing: 9, Reason: Protocol violation - 6 emergency operation - 1 operated in another hospital - 2 - Actual outcome: Mechanical ileus requiring reoperation at postoperatively and up to 30 days follow up; Group 1: 0/154, Group 2: 1/153 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: patient and care giver not blinded. Unclear if assessor blinded or not; Group 1 Number missing: 8, Reason: Protocol violation - 6 emergency operation - 1 operated in another hospital - 1; Group 2 Number missing: 9, Reason: Protocol violation - 6	

Study	Forsmo 2016[59]
	emergency operation - 1 operated in another hospital - 2 - Actual outcome: Other complications requiring reoperation at postoperatively and up to 30 days follow up; Group 1: 2/154, Group 2: 2/153; Comments: other complications requiring reoperation includes postoperative bleeding, deep abdominal infection, or iatrogenic bowel perforation. Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: patient and caregiver not blinded. unclear if assessor was blinded; Group 1 Number missing: 8, Reason: protocol violation - 6 emergency operation - 1 operated in another hospital - 1 ; Group 2 Number missing: 9, Reason: protocol violation - 6 emergency operation - 1 operated in another hospital - 2 - Actual outcome: Other major complication at postoperatively and up to 30 days follow up; Group 1: 4/154, Group 2: 1/153; Comments: other major complications include cerebral vascular accident, gastrointestinal bleeding requiring endoscopic intervention, sepsis Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: patient and caregiver not blinded. unclear if assessor was blinded; Group 1 Number missing: 8, Reason: protocol violation - 6 emergency operation - 1 operated in another hospital - 1 ; Group 2 Number missing: 9, Reason: protocol violation - 6 emergency operation - 1 operated in another hospital - 2 - Actual outcome: Patients with one or more minor complications at within 30 days of surgery; Group 1: 53/154, Group 2: 63/153 Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: patient and caregiver not blinded. unclear if assessor was blinded; Group 1 Number missing: 8, Reason: protocol violation - 6 emergency operation - 1 operated in another hospital - 1 ; Group 2 Number missing: 9, Reason: protocol violation - 6 emergency operation - 1 operated in another hospital - 2

Study	Forsmo 2016[59]
	Protocol outcome 3: Length of hospital stay - Actual outcome: number of days in hospital from admission at pre-admission to 30 day follow up; p value: 0.001 days, Comments: Total Hospital Stay ERP 5 (2-50) Standard Care 8 (2-48)); Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: patient and caregiver not blinded. unclear if assessor was blinded; Group 1 Number missing: 8, Reason: protocol violation - 6 emergency operation - 1 operated in another hospital - 1 ; Group 2 Number missing: 9, Reason: protocol violation - 6 emergency operation - 1 operated in another hospital - 2 Protocol outcome 4: Unplanned intensive unit admission - Actual outcome: number of admissions to ICU due to respiratory complications at postoperatively; Group 1: 2/154, Group 2: 0/153 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: patient and caregiver not blinded. unclear if assessor was blinded; Group 1 Number missing: 8, Reason: protocol violation - 6 emergency operation - 1 operated in another hospital - 1 ; Group 2 Number missing: 9, Reason: protocol violation - 6 emergency operation - 1 operated in another hospital - 2 Protocol outcome 5: Hospital readmission - Actual outcome: total number of readmissions at within 30 days of surgery; Group 1: 29/154, Group 2: 21/153 Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: patient and caregiver not blinded. unclear if assessor was blinded; Group 1 Number missing: 8, Reason: protocol violation - 6 emergency operation - 1 operated in another hospital - 1

Study	Forsmo 2016[59]
; Group 2 Number missing: 9, Reason: protocol violation - 6 emergency operation - 1 operated in another hospital - 2	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Fransen 2018[61]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=50)
Countries and setting	Conducted in Netherlands; Setting: Specialist orthopedic mental centre, Amsterdam, Netherlands
Line of therapy	1st line
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	Patients were eligible for inclusion if they required a primary unilateral TKA, had American Society of Anaesthesiologists (ASA) status I or II, and were willing and able to comply with the scheduled postoperative clinical and radiographic evaluations and with the rehabilitation program.
Exclusion criteria	Patients were excluded if they had other lower limb problems or were diagnosed with insulin-dependent diabetes, severe osteoporosis, rheumatoid arthritis, or a different inflammatory cause for osteoarthritis.
Recruitment/selection of patients	Patients scheduled for total knee arthroplasty
Age, gender and ethnicity	Age - Mean (SD): fast track: 64 (9); standard care: 61 (7). Gender (M:F): 20/29. Ethnicity: NR

Study	Fransen 2018[61]
Further population details	1. Age: <60 years (fast track: 64 (9); standard care: 61 (7)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear (ASA I or II). 3. Type of surgery: ortho/large joint replacement (knee arthroplasty).
Indirectness of population	No indirectness
Interventions	(n=25) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. In the fast-track protocol (FP), no tourniquet was used during the operation. Omitting the tourniquet was assumed to reduce pain, bleeding and swelling after surgery, thereby leading to a possible faster activation of muscle function and performance. The operation was performed through a subvastus approach, a patella-in-place balancer was used, and patients received intra-operative local infiltration analgesia (LIA). All patients received a patella component. The risk for infection was minimized by not using pain pumps, wound drains or bladder catheters. The post-operative protocol focused on rapid mobilization under guidance of a physiotherapist. Postoperatively patients received paracetamol 1000 mg four times a day, diclofenac 50 mg three times a day (unless they had an allergy for non-steroidical anti- inflammatory drugs) and oral oxynorm 5 mg only when needed. Patients in the FP were told to expect being discharged from the hospital 2 days after surgery.. Duration Intra / postoperative . Concurrent medication/care: NA. Indirectness: No indirectness (n=25) Intervention 2: No enhanced recovery programme (standard care) - Standard care. The regular protocol (RP) group underwent the regular hospital TKA protocol, which included the use of a tourniquet, wound drains and bladder catheter. The operation was per- formed through a midline approach. All patients received a patella component. Mobilization was started the first day after surgery, and patients were told beforehand that the average discharge was 4 days after surgery. Similar to the FP, postoperatively patients received identical doses of paracetamol and diclofenac. Contrary to the FP group, patients started with a patient-controlled analgesia (PCA) pump with intravenous morphine. Patients in both groups reduced opioid use as soon as pain allowed this. . Duration intra / postoperative . Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Study funded by industry (This study was partly funded by Stryker, Mahwah, USA)

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Quality of life
- Actual outcome: SF 12 - physical at 2 weeks postoperative; Group 1: mean -0.2 (SD 4.5); n=25, Group 2: mean -0.2 (SD 4.6); n=24; SF 12 0-100 Top=High is good outcome; Comments: p value 0.973
Risk of bias: All domain - Very high, Selection - High, Blinding - Very high, Incomplete outcome data - Low, Outcome reporting - High, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 1, Reason: patient not operated upon

Study	Fransen 2018[61]
	- Actual outcome: SF 12 - physical at 6 weeks postoperative; Group 1: mean 0.4 (SD 7.1); n=25, Group 2: mean 6 (SD 8.1); n=24; SF 12 0-100 Top=High is good outcome; Comments: p value 0.021 Risk of bias: All domain - Very high, Selection - High, Blinding - Very high, Incomplete outcome data - Low, Outcome reporting - High, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 1, Reason: patient not operated upon - Actual outcome: SF 12 - physical at 12 weeks postoperative; Group 1: mean 5.3 (SD 7.5); n=24, Group 2: mean 7.4 (SD 8.5); n=24; SF 12 0-100 Top=High is good outcome; Comments: p value 0.397 Risk of bias: All domain - Very high, Selection - High, Blinding - Very high, Incomplete outcome data - Low, Outcome reporting - High, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 1, Reason: patient not operated upon - Actual outcome: SF 12 - mental at 2 weeks postoperative; Group 1: mean 0.6 (SD 8); n=25, Group 2: mean 0 (SD 4.6); n=24; SF 12 0-100 Top=High is good outcome; Comments: p value 0.784 Risk of bias: All domain - Very high, Selection - High, Blinding - Very high, Incomplete outcome data - Low, Outcome reporting - High, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 1, Reason: patient not operated upon - Actual outcome: SF 12 - mental at 6 weeks postoperative; Group 1: mean 1 (SD 8.1); n=25, Group 2: mean -2.4 (SD 6.1); n=24; SF 12 0-100 Top=High is good outcome; Comments: p value 0.139 Risk of bias: All domain - Very high, Selection - High, Blinding - Very high, Incomplete outcome data - Low, Outcome reporting - High, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 1, Reason: patient not operated upon - Actual outcome: SF 12 - mental at 12 weeks postoperative; Risk of bias: All domain - Very high, Selection - High, Blinding - Very high, Incomplete outcome data - Low, Outcome reporting - High, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 1, Reason: patient not operated upon Protocol outcome 2: Length of hospital stay - Actual outcome: Length of hospital stay at postoperative; Group 1: mean 3.7 days (SD 1.8); n=25, Group 2: mean 4.7 days (SD 1.3); n=24; Comments: p value 0.036 Risk of bias: All domain - Very high, Selection - High, Blinding - Very high, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 1, Reason: patient not operated upon Protocol outcome 3: Pain - Actual outcome: Pain scores at ≤2 hours; Group 1: mean 2.25 (SD 2.53); n=24, Group 2: mean 4.6 (SD 2.72); n=24; VAS 0-10 Top=High is poor outcome; Comments: pain scores for 1 hr and 2 hours postoperatively combined Risk of bias: All domain - Very high, Selection - High, Blinding - Very high, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 1, Reason: patient not operated upon - Actual outcome: Pain score (mean difference) at 2 weeks postoperative; Group 1: mean -15 (SD 27.7); n=25, Group 2: mean -18.5 (SD 35.3); n=24;

Study	Fransen 2018[61]
VAS 0-100 Top=High is poor outcome; Comments: p value 0.705 Risk of bias: All domain - Very high, Selection - High, Blinding - Very high, Incomplete outcome data - Low, Outcome reporting - High, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 1, Reason: patient not operated upon - Actual outcome: Pain score (mean difference) at 6 weeks postoperative; Group 1: mean -14 (SD 26.7); n=25, Group 2: mean -23.3 (SD 27.7); n=24; VAS 0-100 Top=High is poor outcome; Comments: p value 0.250 Risk of bias: All domain - Very high, Selection - High, Blinding - Very high, Incomplete outcome data - Low, Outcome reporting - High, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 0; Group 2 Number missing: 1, Reason: patient not operated upon - Actual outcome: Pain score (mean difference) at 12 weeks postoperative; Group 1: mean -21.1 (SD 23.7); n=25, Group 2: mean -20.5 (SD 27.8); n=24; VAS 0-100 Top=High is poor outcome; Comments: p value 0.943 Risk of bias: All domain - Very high, Selection - High, Blinding - Very high, Incomplete outcome data - Low, Outcome reporting - High, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 0; Group 2 Number missing: 1, Reason: patient not operated upon	
Protocol outcomes not reported by the study	Mortality ; Perioperative complications ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	Frees 2018[64]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=23)
Countries and setting	Conducted in Canada; Setting: Vancouver General Hospital
Line of therapy	Not applicable
Duration of study	Intervention time:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	patients with previously diagnosed bladder cancer with an indication for radical cystectomy. In addition, patients were required to complete a QoL questionnaire, study subject diary, and subject experience and satisfaction questionnaires.

Study	Frees 2018[64]
Exclusion criteria	patients with insulin-dependent diabetes mellitus, diagnosis of Parkinson disease and other neurological co-morbidities
Recruitment/selection of patients	30 consecutive patients scheduled for radical cystectomy undergoing ileal urinary diversion for advanced bladder cancer.
Age, gender and ethnicity	Age - Mean (SD): total 68.33; ERP - 65.75 (49-86), standard 70.4 (51-84). Gender (M:F): 18/5. Ethnicity: NR
Further population details	1. Age: >60 years (mean age 68.33 (49-86)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 1, ASA II - 15, ASA III - 7). 3. Type of surgery: urology (radical cystecomy and ileal urinary diversion for bladder cancer).
Extra comments	patients with bladder cancer scheduled for cystectomy.
Indirectness of population	No indirectness
Interventions	(n=10) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Counseled by trained ward staff and instructed how to complete the diary and questionnaires. Two nutritional drinks were taken by the patients the evening before surgery. No preoperative bowel preparation was initiated. intraoperative fluids were limited by real time targeting of cardiac output using vascular pressure of Doppler monitoring. Low molecular weight heparin was prescribed for 4 weeks and compression stockings were prescribed for the time of hospital stay. Epidural analgesia was used if not contraindicated. Fist post operative day, patients received two nutritional drinks daily for 7 days and were advised to have 30-60ml clear fluids per hour. Metoclopramide was prescribed until first bowel movement. Chewing gum was prescribed for first 7 days and patients were instructed to chew a new piece every 2 - 3 hours. Second postoperative day, patients were allowed a light diet (clear fluids including gelatine based food) as tolerated. Daily diary served as a retrospective measurement tool to assess how well patients followed each protocol. . Duration 1 day before surgery and the duration of stay in hospital . Concurrent medication/care: NA. Indirectness: No indirectness Comments: three patients withdrew from ERP group after randomization and prior to surgery. Two patients decided for different treatment option after randomization and these patients were excluded from the trial. (n=13) Intervention 2: No enhanced recovery programme (standard care) - Standard care. no preoperative bowel preparation, patients fasted from midnight prior to the day of surgery and until the first incident of flatulence. Compression of stockings and low molecular weight heparin was prescribed only for the duration of the hospital stay. NG tubes were not routinely placed perioperatively. Customarily pro-motility agents were not used and nor were patients advised to chew gum. Patients did not receive nutritional counselling. Diet was initiated with clear fluids on the first day after flatulence and then escalated from a soft to a full diet on the following days as tolerated. Pain was managed with epidural anesthesia unless contraindicated. . Duration one day prior to surgery and until discharge . Concurrent medication/care: NA. Indirectness: No indirectness

Study	Frees 2018[64]
	Comments: Two patients decided for alternative treatment after randomization and these patients were excluded from the trial
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Perioperative complications
- Actual outcome: Minor complications (Clavien-Dindo <2) at postoperatively up to 30 days post discharge ; Group 1: 2/10, Group 2: 0/13; Comments: one patient suffered post operative delirium and the other had a minor cardiac event leading to diagnostic coronary angiography with no need for further intervention.
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Comments - Paper only mentions that 30 consecutive patients were randomized prospectively but does not explain how the patients were chosen or randomized.; Indirectness of outcome: No indirectness ; Baseline details: patients following ERP were similar in age, gender, body mass index, type of diversion ASA score and Charlson Comorbidity Index. ; Group 1 Number missing: 5, Reason: some patients withdrew or were excluded; Group 2 Number missing: 2, Reason: some patients withdrew or were excluded

Protocol outcome 2: Length of hospital stay
- Actual outcome: length of stay in hospital at one day pre-operatively until discharge from hospital ; Mean; (P value : 0.020) days(mean), Comments: length of stay for ERP patients 6.1 (5-7) days compared to 7.39 (5-11) days for standard care patients);
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Comments - Paper only mentions that 30 consecutive patients were randomized prospectively but does not explain how the patients were chosen or randomized.; Indirectness of outcome: No indirectness ; Baseline details: patients following ERP were similar in age, gender, body mass index, type of diversion ASA score and Charlson Comorbidity Index. ; Group 1 Number missing: 5, Reason: some patients withdrew or were excluded; Group 2 Number missing: 2, Reason: some patients withdrew or were excluded

Protocol outcome 3: Hospital readmission
- Actual outcome: Readmission to hospital at postoperatively up to 30 days post discharge ; Group 1: 1/10, Group 2: 0/13
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Comments - ; Indirectness of outcome: No indirectness ; Group 1 Number missing: 5, Reason: some patients withdrew or were excluded; Group 2 Number missing: 2, Reason: some patients withdrew or were excluded

Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Gatt 2005[67]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=39)
Countries and setting	Conducted in United Kingdom; Setting: General Hospital
Line of therapy	Not applicable
Duration of study	Intervention + follow up: unclear
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	requiring elective colorectal surgery and living independently at home
Exclusion criteria	failure to obtain consent, <18 years, pregnancy, intolerance to probiotics and or prebiotics, contraindication to one or more optimization strategy, contraindications to early postoperative discharge, prescribed medications that may independently prolong hospital stay (e.g. anticoagulants), advanced malignancy on preoperative assessment, palliative surgery, emergency surgery, failure to perform colonic or rectal resection
Recruitment/selection of patients	not clear how patients were recruited, only explains that 44 consecutive patients were recruited of which 5 were excluded prior randomization.
Age, gender and ethnicity	Age - Median (IQR): control 67 (60-73) & optimized 67 (59-76). Gender (M:F): 23/16. Ethnicity: NR
Further population details	1. Age: >60 years (control 67 (60-73) & optimized 67 (59-76) p value 0.643). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (median (IQR) control 2 (2-3) & optimized 2 (2-2) p value 0.532). 3. Type of surgery: lower and upper GI (major colonic resection).
Indirectness of population	No indirectness
Interventions	(n=19) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. 7 - 14 days probiotic and prebiotic to be taken daily. patients were admitted a day before surgery and were allowed to eat and drink freely until midnight. Carbohydrate drink administered night before surgery and 3-4 hours preoperatively. Patients did not receive bowel preparation. In perioperative period, patients were maintained on a high inspired oxygen concentration (80%). Patients received epidural analgesia through a catheter, with bupivacaine and fentanyl to cover the intraoperative period and up to 36 hours after operation. Transverse abdominal decisions were performed whenever possible. No drains left at the end of the procedure and any nasogastric tubes placed during surgery were removed on completion of the operation. Patients were allowed fluids immediately after surgery, and diet was introduced as tolerated. Followed structured mobilization plan involving sitting out of bed on the day of surgery and walking the length of the

Study	Gatt 2005[67]
	walk on the first postoperative day.. Duration 14 days preadmission up to discharge postoperatively. Concurrent medication/care: NA. Indirectness: No indirectness (n=20) Intervention 2: No enhanced recovery programme (standard care) - Standard care. patients were admitted one day prior to surgery, received bowel preparation and fasted from midnight. The protocol for anesthesia and postoperative pain was epidural analgesia through a catheter, with bupivacaine and fentanyl to cover the intraoperative period and up to 36 hours after operation. Vertical (midline or paramedian) incisions were used and nasogastric tubes and abdominal drains were placed according to the surgeons preference. After surgery, patients had oral fluids and diet introduced in a traditional stepwise manner. All received postoperative chest physiotherapy and were mobilized by nursing staff. . Duration 1 day preoperatively up to discharge postoperatively . Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: OPTIMIZED GROUP versus CONTROL GROUP

Protocol outcome 1: Mortality
- Actual outcome: Mortality at postoperative up to 30 days follow up; Group 1: 1/19, Group 2: 0/20
Risk of bias: All domain - Low, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: trial not blinded; Group 1 Number missing 0 ; Group 2 Number missing 0

Protocol outcome 2: Perioperative complications
- Actual outcome: total number of complications at postoperative up to 30 days post discharge ; Group 1: 8/19, Group 2: 15/20
Risk of bias: All domain - Low, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: trial not blinded; Group 1 Number missing 0 ; Group 2 Number missing 0

Protocol outcome 3: Length of hospital stay
- Actual outcome: length of hospital stay at preoperative admission until discharge; p value: 0.027 days, Comments: Optimized patients stayed in hospital for a median of 5 (4-9) days and control group patients were hospitalized for 7.5 (6-10) days);
Risk of bias: All domain - Low, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: trial not blinded; Group 1 Number missing 0 ; Group 2 Number missing 0

Protocol outcome 4: Hospital readmission
- Actual outcome: Readmission to hospital at Readmission within 30 days of surgery ; Group 1: 1/19, Group 2: 4/20
Risk of bias: All domain - Low, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low,

Study	Gatt 2005[67]
Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: trial not blinded; Group 1 Number missing 0 ; Group 2 Number missing 0 Protocol outcome 5: Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) - Actual outcome: HAD score at admission to discharge; Risk of bias: All domain - Low, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - High, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: trial not blinded; Group 1 Number missing 0 ; Group 2 Number missing 0	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Pain

Study	Gralla 2007[70]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=50)
Countries and setting	Conducted in Germany; Setting: University Hospital
Line of therapy	Not applicable
Duration of study	Intervention time: September 2004 to February 2005
Method of assessment of guideline condition	Unclear method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	Patients up to ASA III were included in the study; localized prostate cancer
Exclusion criteria	severe reduced renal function due to analgetic treatment with COX-II-Inhibitors
Age, gender and ethnicity	Age - Mean (SD): Conventional: 62.27 ± 7.01; Fast Track: 61.80 ± 4.75. Gender (M:F): all male (prostate cancer). Ethnicity: NR
Further population details	1. Age: >60 years (Conventional: 62.27 ± 7.01; Fast Track: 61.80 ± 4.75). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: urology (prostate resection).
Indirectness of population	No indirectness
Interventions	(n=25) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperatively: Preoperative diagnostics; informed consent; breakfast; lunch; soup for dinner; two enema at night; drinking until 24:00; advised discharge POD3. •Intraoperatively(surgical/analgetic): Cefuroxim/metronidazol; 12 mmHg pneumoperitoneum; 37°C, scrotal jockstrap; Piritramid, metamizol,

Study	Gralla 2007[70]
	parecoxib, 200 mg erythromycin. •Postoperatively Operation day: 1,500 ml i.v. volume; 2 h postoperatively tea/water; 4 h postoperatively yoghurt; 200 mg Erythromycin; 40 mg parecoxib; walking in patients room and ward. • POD1: No i.v. volume; "light" hospital diet; 120 mg etoricoxib; mobilization out of bed at least 8 h. •POD2: No i.v. volume; normal nutricion; 120 mg Etoricoxib; bed just for sleeping •POD3: debriefing and discharge. •POD5: ambulatory micturating cysto-urethrogram. Duration Preoperative assessment to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=25) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperatively: Preoperative diagnostics; informed consent; breakfast, no further oral nutrition; 3,000 ml Klean prep, advised discharge 6–8 postoperative day •Intraoperatively (surgical/analgetic): Cefuroxim/metronidazol 15 mmHg; pneumoperitoneum 18°C; Piritramid, metamizol, PCA-device. •Postoperatively Operation day: 2,500 ml i.v. volume; no oral nutricion; PCA, metamizol; mobilization: upright position. •POD1: 2,000 ml i.v. volume; 600 ml tea/water 24 h; PCA; metamizol; mobilization in patients room •POD2: 500 ml i.v. volume; tea/water; PCA, metamizol; mobilization on ward. •POD3: No i.v. volume; tea/soup; PCA; metamizol; mobilization on the ward. •POD4: No i.v. volume; light hospital diet; metamizol; mobilisation on the ward. •POD5: No i.v. volume; normal nutrition; metamizol; mobilization on the ward; Micturating Cysto-urethrogram for anastomosis tightness. •POD6: debriefing & discharge . Duration Preoperative assessment to discharge . Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK CARE versus CONVENTIONAL CARE

Protocol outcome 1: Mortality
- Actual outcome: Mortality at Postoperative ; Group 1: 0/25, Group 2: 0/25
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0

Protocol outcome 2: Perioperative complications
- Actual outcome: Total complications at Postoperative; Group 1: 6/25, Group 2: 14/25; Comments: p 0.02
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0

Protocol outcome 3: Length of hospital stay

Study	Gralla 2007[70]
- Actual outcome: Discharge at days postoperatively until discharge; Group 1: mean 3.6 days (SD 1.22); n=25, Group 2: mean 6.72 days (SD 0.94); n=25; Comments: p value <0.001 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 4: Hospital readmission - Actual outcome: Readmission at up to 30 days post discharge; Group 1: 2/25, Group 2: 1/25 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - High, Crossover - Low, Comments - period of readmission unclear; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	He 2015[74]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=99)
Countries and setting	Conducted in China
Line of therapy	Not applicable
Duration of study	Intervention + follow up: April 2014 - October 2014
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	all lesions <10cm and benign and malignant liver lesions suitable for laparoscopy were included
Exclusion criteria	infection; long term blood dissemination; surface lymph node metastasis; serious cardio-cerebrovascular disease; or other important organ function disorder
Recruitment/selection of patients	selection from patients undergoing laparoscopic liver resection
Age, gender and ethnicity	Age - Mean (SD): ERP 56.3 ± 16.3; traditional 60.4 ± 20.7. Gender (M:F): 40/46. Ethnicity: NR
Further population details	1. Age: >60 years (ERP 56.3 ± 16.3; traditional 60.4 ± 20.7). 2. American Society of Anesthesiologists (ASA)

Study	He 2015[74]
	Physical Status grade: ASA 2 (ASA I - 22; ASA II - 50; ASA III - 4). 3. Type of surgery: lower and upper GI (laparoscopic liver resection).
Indirectness of population	No indirectness
Interventions	(n=50) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Patients in the ERP group underwent conventional peri-operative care combined with enhanced rehabilitation nursing. Pre-surgery education was provided (details about rehabilitation time of each stage, suggestions to promote rehabilitation, suggestions about early oral feeding and out of bed); preoperative preparation (reducing the fasting time from conventional 12-2h, preoperative glucose administration, antibiotic prophylaxis and prevention of hypothermia); post operative rehabilitation programs (early oral intake and deambulation without using laxatives, control of infusion volume, enteroplegia) to promote the recovery of intestinal function. Patients received antibiotics and antithrombotic prophylaxis before surgery. All patients received the same standardized anesthesia. Gastric tube or drainage tube will not be routinely indwelled. Urine catheter was removed at POD 1 and fluid infusion restricted to <2500mL/day. Water intake began at 4h after surgery and liquid diet restored at 12 h after surgery. Patients were encouraged to do ambulation and stretch gradually. . Duration pre-admission to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=49) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Patients in the control group underwent routine nursing such as fasting for 12h, and fluids stopped 4h prior to surgery. Laxatives were orally taken 1 day before the surgery. Patients received antibiotics and antithrombotic prophylaxis before surgery. All patients received the same standardized anesthesia. Gastric tube or drainage tubes will not be routinely indwelled. Urine catheter removed at POD 2 - 3. . Duration pre-admission to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Mortality
- Actual outcome: Mortality at up to 40 days after surgery; Group 1: 0/48, Group 2: 0/38
Risk of bias: All domain - High, Selection - Low, Blinding - Low, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: inoperable at surgery; awaiting surgery; Group 2 Number missing: 11, Reason: inoperable at surgery; open liver resection; additional procedure; operation not required

Protocol outcome 2: Perioperative complications
- Actual outcome: Complications at after surgery to discharge; Group 1: 7/48, Group 2: 6/38

Study	He 2015[74]
Risk of bias: All domain - High, Selection - Low, Blinding - Low, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: inoperable at surgery; awaiting surgery; Group 2 Number missing: 11, Reason: inoperable at surgery; open liver resection; additional procedure; operation not required Protocol outcome 3: Length of hospital stay - Actual outcome: postoperative length of stay at after surgery to discharge; median (IQR): ERP 6 (4-8); Traditional 10 (7-15) days); Risk of bias: All domain - High, Selection - Low, Blinding - Low, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: inoperable at surgery; awaiting surgery; Group 2 Number missing: 11, Reason: inoperable at surgery; open liver resection; additional procedure; operation not required Protocol outcome 4: Hospital readmission - Actual outcome: Readmission at up to 40 days after surgery; Group 1: 1/48, Group 2: 1/38 Risk of bias: All domain - High, Selection - Low, Blinding - Low, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: inoperable at surgery; awaiting surgery; Group 2 Number missing: 11, Reason: inoperable at surgery; open liver resection; additional procedure; operation not required	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Ionescu 2009[79]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=96)
Countries and setting	Conducted in Romania; Setting: University Hospital
Line of therapy	Not applicable
Duration of study	Intervention + follow up: October 2006 - May 2007
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	colorectal neoplasm needing open colorectal surgery
Exclusion criteria	Exclusion criteria from the study were previous abdominal surgery, extensive neoplasm, severe malnutrition,

Study	Ionescu 2009[79]
	surgery for complications (bowel obstruction), and palliative surgical procedures.
Recruitment/selection of patients	consecutive patients admitted to the hospital from October 2006 - May 2007
Age, gender and ethnicity	Age - Mean (SD): FT: 60.94 ± 9.9; Conventional: 63.1 ± 12.19. Gender (M:F): 61/35. Ethnicity: NR
Further population details	1. Age: >60 years (FT: 60.94 ± 9.9; Conventional: 63.1 ± 12.19). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 1 (ASA I - 50; ASA II - 43; ASA III - 3). 3. Type of surgery: lower and upper GI (open colorectal resection).
Indirectness of population	No indirectness
Interventions	(n=48) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperatively: Information of surgical procedure, expected length and daily milestones for recovery; No bowel preparation except fluids for the last 18 h; Carbohydrate fluids load 3 h before operation. •Day of surgery: Mobilized in bed (turning, sitting in bed); Fluids if tolerated (no NG tube unless severe PONV); Multimodal analgesia; Prokinetics: Metoclopramide. •Postoperative day 1: Mobilized out of bed (walking); Fluids; Solid food (yogurt, cheese); Remove bladder catheter; Multimodal analgesia; Discharge on the surgical ward (if possible). •Postoperative day 2: Solid food (normal feeding); Multimodal analgesia (NSAID, paracetamol, weak opioids if needed); Discharge on the surgical ward; Remove epidural catheter (if present). Duration 1 day preoperatively up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=48) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperatively: Patient information; Mechanical bowel preparation; No fluids morning of operation. •Day of surgery: Mobilized in bed; Nasogastric tube, nil by mouth; Multimodal analgesia. •Postoperative day 1: Mobilized out of bed; Nil by mouth; Nasogastric tube; Bladder catheter in place; Multimodal analgesia; Discharge on the surgical ward (if possible). •Postoperative day 2: If bowel passage, remove nasogastric tube, fluids orally (if not, maintain nasogastric tube); Multimodal analgesia (NSAID, paracetamol, weak opioids if needed); Discharge on the surgical ward; Remove epidural catheter (if present); Remove bladder catheter. Duration 1 day preoperatively up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK versus CONVENTIONAL CARE

Protocol outcome 1: Perioperative complications
- Actual outcome: Total complications at unclear; Group 1: 5/48, Group 2: 11/48; Comments: includes: anastomotic leak; wound infection; pulmonary embolism; postoperative hernia; urinary tract infection; hematuria

Study	Ionescu 2009[79]
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 2: Length of hospital stay - Actual outcome: Hospitalization time at admission to discharge; Group 1: mean 6.43 days (SD 3.41); n=48, Group 2: mean 9.16 days (SD 2.67); n=48 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 3: Length of stay in intensive care unit - Actual outcome: Admission in HDU at postoperative to discharge to step down ward; Group 1: mean 0.92 days (SD 1.1); n=48, Group 2: mean 1.77 days (SD 1.46); n=48 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 4: Hospital readmission - Actual outcome: Readmission at unclear; Group 1: 0/48, Group 2: 0/48 Risk of bias: All domain - High, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 5: Pain - Actual outcome: Intensity of postoperative pain at postoperatively, every 6h; Visual Analogue Scale 0-5 Top=High is poor outcome; Results not reported; Risk of bias: All domain - High, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - High, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 0; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	Jensen 2015[80]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=107)
Countries and setting	Conducted in Denmark; Setting: Aarhus University Hospital, Denmark
Line of therapy	Not applicable
Duration of study	--: May 2011 - February 2013

Study	Jensen 2015[80]
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	all patients scheduled for radical cystectomy owing to localized muscle invasive bladder cancer or high risk non muscle invasive bladder cancer
Exclusion criteria	patients with mental or cognitive disorders, or who had been referred because of voiding dysfunctions or neuromuscular diseases
Recruitment/selection of patients	patients scheduled for radical cystectomy
Age, gender and ethnicity	Age - Mean (range): Intervention: 69 (66-72 95% CI) range (46-85); Standard 71 (68-73 95% CI) range (47-91). Gender (M:F): 79/28. Ethnicity: NR
Further population details	1. Age: >60 years (Intervention: 69 (66-72 95% CI) range (46-85); Standard 71 (68-73 95% CI) range (47-91)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 15; ASA II - 73; ASA III - 17; unknown - 2). 3. Type of surgery: urology (open or robot assisted radical cystectomy).
Extra comments	.
Indirectness of population	No indirectness
Interventions	(n=50) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. dose/quantity, brand name, extra details. Duration 2 weeks prior to surgery up to discharge . Concurrent medication/care: •preoperative (2 weeks before surgery): prehabilitation (exercise programme - information about standard goals for patient involvement concerning mobilization, exercise training and urinary diversion; step training on a step trainer (15 mins per session); six different muscle strength and endurance exercises; telephone call after 1 week to check adherance); •perioperative: infection prophylaxis (single doses); mini laparotomy or robot assisted radical cystectomy; standardized anesthesia and analgesia throughout surgery; •Postoperative: posthabilitation (exercise programme and enhanced mobilization - increasing scheduled time out of bed and walking distance; physical therapy twice per day for 7 days; discharged home with home training exercise programme). Indirectness: No indirectness (n=57) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperative: nutritional screening and counselling (oral supplements where recommended); patient education (lifestyle issues, alcohol, smoking and postoperative care); counseling on choice of urinary diversion. Evening before surgery - emptying of rectal ampulla and fasting from midnight. carbohydrate loading 4h before surgery. •Intraoperative: infection prophylaxis (single doses); mini laparotomy or robot assisted radical cystectomy; standardized anesthesia and analgesia throughout surgery. •Postoperative: first 72h, subfascial pain buster providing continuous infusion of bupivacaine, supplemented with oral paracetamol; prevention of nausea;

Study	Jensen 2015[80]
	thromboembolism prophylaxis (compression stockings and fragmin injections); early oral intake with oral supplements; standard mobilization supervised by physiotherapist; and early removal of IV and urinary catheters. . Duration 2 weeks prior to surgery up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Mortality
- Actual outcome: mortality at ≤ 90 days of surgery; Group 1: 3/47, Group 2: 4/53
Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: death within 7 or 120 days; Group 2 Number missing: 4, Reason: death within 7 or 120 days
- Actual outcome: postoperative pain at postoperatively up to discharge; not reported in paper);
Risk of bias: All domain - Very high, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - High, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: death within 7 or 120 days; Group 2 Number missing: 4, Reason: death within 7 or 120 days

Protocol outcome 2: Perioperative complications
- Actual outcome: Grade 0 Clavien-Dindo score at ≤ 90 days of surgery; Group 1: 20/47, Group 2: 23/53
Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: death within 7 or 120 days; Group 2 Number missing: 4, Reason: death within 7 or 120 days
- Actual outcome: Grade 1 Clavien-Dindo score at ≤ 90 days of surgery; Group 1: 9/47, Group 2: 15/53
Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: death within 7 or 120 days; Group 2 Number missing: 4, Reason: death within 7 or 120 days
- Actual outcome: Grade 2 Clavien-Dindo score at ≤ 90 days of surgery; Group 1: 9/47, Group 2: 5/53
Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: death within 7 or 120 days; Group 2 Number missing: 4, Reason: death within 7 or 120 days
- Actual outcome: Grade 3 Clavien-Dindo score at ≤ 90 days of surgery; Group 1: 8/47, Group 2: 8/53
Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: death within 7 or 120 days; Group 2 Number missing: 4, Reason: death within 7 or 120 days

Study	Jensen 2015[80]
- Actual outcome: Grade 4 Clavien-Dindo score at ≤ 90 days of surgery; Group 1: 1/47, Group 2: 2/53 Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: death within 7 or 120 days; Group 2 Number missing: 4, Reason: death within 7 or 120 days - Actual outcome: Grade 5 Clavien-Dindo score at ≤ 90 days of surgery; Group 1: 3/47, Group 2: 4/53 Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: death within 7 or 120 days; Group 2 Number missing: 4, Reason: death within 7 or 120 days Protocol outcome 3: Length of hospital stay - Actual outcome: length of stay at post surgery to discharge; median (range): Intervention: 8 (3-30); Starndard 8 (4-55) days); Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: death within 7 or 120 days; Group 2 Number missing: 4, Reason: death within 7 or 120 days Protocol outcome 4: Hospital readmission - Actual outcome: readmission at < 30 days of surgery; Group 1: 13/47, Group 2: 12/53 Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: death within 7 or 120 days; Group 2 Number missing: 4, Reason: death within 7 or 120 days	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Jia 2014[82]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=240)
Countries and setting	Conducted in China; Setting: Fourth Hospital of Hebei Medical University, China
Line of therapy	Not applicable
Duration of study	Intervention + follow up: 2008 - 2011
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	Colorectal cancer; aged 70-88
Exclusion criteria	history of dementia; Parkinson's disease; alcohol intake of ≥250 g/day, long-term use of sleeping pills or anxiolytics; those who received anesthesia within the past 30 days. Those enrolled patients who were subsequently given intraoperative blood transfusion or were admitted to the ICU for further treatment after operation were also excluded from analysis.
Recruitment/selection of patients	admitted to Fourth Hospital of Hebei Medical University for open curative resection between 2008 and 2011
Age, gender and ethnicity	Age - Mean (SD): FTS: 75.66±4.18; Traditional: 74.78±4.01. Gender (M:F): 150/90. Ethnicity: NR
Further population details	1. Age: >60 years (FTS: 75.66±4.18; Traditional: 74.78±4.01). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: lower and upper GI (resection for colorectal carcinoma).
Indirectness of population	No indirectness
Interventions	(n=120) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative preparation: Oral purgatives; No mechanical enema; Normal meal until 6 h before surgery; Normal carbohydrate drink until 2 h before surgery; No nasogastric tube insertion; No antibiotics. •Anesthesia: Thoracic epidural. •Pain control: Ropivacaine2mg/ml via PCEA for 48 h; Opium-derived agents were excluded; No routine drainage tube placement. •Postoperative mangement: water was allowed from 6 h postoperation, liquid diet in the morning and semiliquid diet at noon and evening of the first and second postoperative days, regular diet on POD 3; Urinary catheter withdrawal on POD 1–2; Out-of-bed mobilization on POD 1. . Duration 1 day before surgery to discharge . Concurrent medication/care: NA. Indirectness: No indirectness (n=120) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperative preparation: Liquid diet for 3 days; Mechanical enema(1time/day) for 3 consecutive days; Fasting at 8 h;

	Drink deprivation 4 h before surgery; Routine nasogastric tube insertion; Oral antibiotics administration for 3 days. •Anesthesia: general. •Pain control: Fentanyl0.25 mg/ml; Midazolam0. 5 mg/ml; Nefopam1.0 mg/ml; via PCIA for 48 h; routine drainage tube placement. •Postoperative management: liquid diet intake after recovery of bowel movement; Urinary catheter withdrawal at 3 to 5 days; Out-of-bed mobilization at 3 to 5 days. . Duration 3 days preoperatively up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK SURGERY versus TRADITIONAL CARE Protocol outcome 1: Perioperative complications - Actual outcome: Complications (cases) at admission to 30 days postoperatively; Group 1: 32/117, Group 2: 68/116; Comments: complications include: infection of incision; pulmonary infection; urinary infection; anastomotic leakage; intestinal obstruction; heart failure; and deep vein thrombosis Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3; Group 2 Number missing: 4 - Actual outcome: Incidence of delirium at admission to 30 days postoperatively; Group 1: 4/117, Group 2: 15/116 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 3; Group 2 Number missing: 4 Protocol outcome 2: Length of stay in intensive care unit - Actual outcome: Length of stay at admission to discharge; Group 1: mean 9.01 days (SD 1.75); n=117, Group 2: mean 13.21 days (SD 1.32); n=116; Comments: p value <0.001 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3; Group 2 Number missing: 4	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Length of hospital stay ; Unplanned intensive unit admission ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	**Jones 2013[84]**
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=104)
Countries and setting	Conducted in United Kingdom; Setting: Royal Surrey County Hospital
Line of therapy	Not applicable

Study	Jones 2013[84]
Duration of study	--:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	open liver resection
Exclusion criteria	Patients were excluded if they underwent an entirely laparoscopic operation, needed a second concomitant procedure (for example bile duct repair), were found to be inoperable at the time of surgery, or were unable to consent
Recruitment/selection of patients	all adult patients presenting for open liver resection at Royal Surrey County Hospital
Age, gender and ethnicity	Age - Median (IQR): ERP: 64 (27-83); Standard care 67 (27-84). Gender (M:F): 54/37. Ethnicity: NR
Further population details	1. Age: >60 years (ERP: 64 (27-83); Standard care 67 (27-84)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 2; ASA II - 81; ASA III - 8). 3. Type of surgery: lower and upper GI (liver resection).
Indirectness of population	No indirectness
Interventions	(n=50) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Before surgery: Information and education, including mobilization and dietary goals; Oral nutritional supplements; Carbohydrate drink. •During Surgery: Standard anaesthetic protocol and surgical management; Thoracic epidural for postop. analgesia; All patients extubated and taken to level 2 HDU. •POD 0: Eat and drink normally; Oral nutritional supplements; Goal-directed fluid therapy for 6h to optimize stroke volume; LiDCOrapid colloid boluses; Chest physiotherapy. •POD1: Physiotherapy/mobilization twice daily; Stop i.v. maintenance fluid; Oral nutritional supplements; Eat and drink normally. •POD2: Diamorphine 3mg via epidural; Epidural removed in the morning, or stopped and capped off if INR≥1·5; Regular oral analgesics and oral morphine as needed; Physiotherapy/mobilization twice daily; Urinary catheter removed 4h after epidural; Removal of surgical drains (if appropriate); CVC removed; Blinded assessment of discharge criteria. •POD3+4: Physiotherapy/mobilization twice daily; Home if meets blinded assessment of discharge criteria; Blinded assessment of discharge criteria. Duration 1 day before surgery up to discharge. Concurrent medication/care: NA (n=54) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Before surgery: followed normal preoperative starvation guidelines of nil by mouth from midnight. •During Surgery: Standard anaesthetic protocol and surgical management; Thoracic epidural for postop. analgesia; all patients extubated and taken to level 2 HDU. •POD0: Eat and drink normally; Fluid resuscitation to standard markers: CVP, urine output,

Study	Jones 2013[84]
	lactate, mixed venous saturations; Fluid therapy at discretion of intensive care team. •POD1: Physiotherapy once daily; Fluid therapy at discretion of intensive care team; Eat and drink normally. •POD2: Epidural managed by acute pain team; Physiotherapy once daily; Removal of surgical drains (if appropriate); CVC removed at discretion of surgical team; Blinded assessment of discharge criteria. •POD3+4: Epidural managed by acute pain team- usually removed on POD 3 or 4; Urinary catheter removed 12 h after epidural in accordance with current guidelines; Blinded assessment of discharge criteria.. Duration 1 day before surgery up to discharge. Concurrent medication/care: NA
Funding	Equipment / drugs provided by industry (medical equipment provided by LiDCO and drinks provided by Nutricia. Guildford Undetected Tumour Screening and Liver Cancer Surgery Appeal charities provided grants for the trial)

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ENHANCED RECOVERY PROGRAM versus STANDARD CARE

Protocol outcome 1: Quality of life
- Actual outcome: Quality of life (EQ-5D) at 28 days; Mean; (p: 0.002), Comments: There was a significant difference in QoL between the two groups during the 28 days after surgery. The median AUC was 37·2 for the ERP group compared with 35·6 for the standard care group.);
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 4, Reason: inoperable at time of surgery or scan; awaiting surgery ; Group 2 Number missing: 9, Reason: inoperable at time of surgery or scan; laparoscopic surgery; additional procedure; operation not required

Protocol outcome 2: Mortality
- Actual outcome: Death at Postoperatively up to 30 days post discharge; Group 1: 1/46, Group 2: 1/45; Comments: p value 0.987
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 4, Reason: inoperable at time of surgery or scan; awaiting surgery ; Group 2 Number missing: 9, Reason: inoperable at time of surgery or scan; laparoscopic surgery; additional procedure; operation not required

Protocol outcome 3: Perioperative complications
- Actual outcome: General Complications at unclear; Group 1: 4/46, Group 2: 20/45
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Comments - supplementary information with breakdown of complications and grading not accessible ; Indirectness of outcome: No indirectness ; Group 1 Number missing: 4, Reason: inoperable at time of surgery or scan; awaiting surgery ; Group 2 Number missing: 9, Reason: inoperable at time of surgery or scan; laparoscopic surgery; additional procedure; operation not required

Protocol outcome 4: Length of hospital stay

Study	Jones 2013[84]
- Actual outcome: Length of stay (including readmissions) at time of surgery up to 30 days postoperatively ; Median (IQR): ERP: 4 (3-5); Standard 7 (6-8) days, Comments: p value <0.001); Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 4, Reason: inoperable at time of surgery or scan; awaiting surgery ; Group 2 Number missing: 9, Reason: inoperable at time of surgery or scan; laparoscopic surgery; additional procedure; operation not required Protocol outcome 5: Hospital readmission - Actual outcome: Readmission at Postoperatively up to 30 days post discharge; Group 1: 2/46, Group 2: 0/45; Comments: p value 0.153 readmitted for abdominal collections Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 4, Reason: inoperable at time of surgery or scan; awaiting surgery ; Group 2 Number missing: 9, Reason: inoperable at time of surgery or scan; laparoscopic surgery; additional procedure; operation not required Protocol outcome 6: Pain - Actual outcome: Pain scores at POD 2; Group 1: mean 2.5 (SD 1.4); n=46, Group 2: mean 3.3 (SD 2); n=45; Visual Analogue Scale 1-10 Top=High is poor outcome; Comments: p value 0.044 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - High, Measurement - Low, Crossover - Low, Comments - pain scores measured on POD 2, 3, 5, 7, 10, 14 and 28 but only results for POD 2 provided and supplementary data mentioned in article not accessible; Indirectness of outcome: No indirectness; Group 1 Number missing: 4, Reason: inoperable at time of surgery or scan; awaiting surgery ; Group 2 Number missing: 9, Reason: inoperable at time of surgery or scan; laparoscopic surgery; additional procedure; operation not required	
Protocol outcomes not reported by the study	Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	Kapritsou 2017[87]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=63)
Countries and setting	Conducted in Greece; Setting: University Hospital
Line of therapy	Not applicable
Duration of study	Intervention time: May 2012 - May 2014
Method of assessment of guideline condition	Adequate method of assessment/diagnosis

Study	Kapritsou 2017[87]
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	cancer patients who were eligible for surgical treatment and underwent hepatectomy or pancreatectomy up to 2 months after cancer diagnosis; ASA I-III; > 18 years of age; and normal level of consciousness and communication
Exclusion criteria	presence of chronic pain; kidney disease; neuropathy; or systemic or chronic treatment with analgesics
Recruitment/selection of patients	recruitment / selection not discussed
Age, gender and ethnicity	Age - Mean (SD): Fast track 58.48 (11.74); Conventional 63.00 (11.68). Gender (M:F): 35/25. Ethnicity: NR
Further population details	1. Age: >60 years (Fast track 58.48 (11.74); Conventional 63.00 (11.68)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: lower and upper GI (hepatectomy or pancreatectomy).
Indirectness of population	No indirectness
Interventions	(n=29) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative: information about FT protocol given; no preanesthetic medication; no bowel preparation. •Day of surgery: mobilization after 4h after surgery; oral fluids intake (0.5L) 6h after operation; NG tube removal as early as possible after surgery; administration of paracetamol and avoidance of opioid drugs. •POD 1: patients hydric diet (tea, soup, gelatin); removal of urinary drainage; paracetamol after numeric VAS; progressive mobilization at least 8 times out of bed. •POD 2-3: normal diet. •POD 4-6 discharge. Duration preadmission up to discharge. Concurrent medication/care: NA (n=34) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperative: information about protocol given to patient; no preanesthetic medication; no bowel preparation. •Day of surgery: no mobilization scheme; no oral intake scheme; no plan regarding NG tube after surgery; administration of opioid drug. •POD 1: oral intake after mobilization; no plan regarding urinary drainage after surgery; continuation of opioid administration after evaluation with VAS; mobilization after POD1. •POD 2-3: Continue as on POD1. •POD 4-6: resumption of normal meals; mobilization of patient; PO analgesia administration . Duration preadmission up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Academic or government funding
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK versus CONVENTIONAL Protocol outcome 1: Perioperative complications	

Study	Kapritsou 2017[87]
- Actual outcome: number of complications at after surgery to discharge; Group 1: 7/29, Group 2: 17/34; Comments: includes nausea/vomitting; fever; rupture of anastomosis; hemorrhage; cholorrhea Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing 0 ; Group 2 Number missing 0 Protocol outcome 2: Length of hospital stay - Actual outcome: length of postoperative stay at after surgery to discharge; Group 1: mean 5.93 days (SD 2.49); n=29, Group 2: mean 11.91 days (SD 5.52); n=34 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing 0 ; Group 2 Number missing 0 Protocol outcome 3: Pain - Actual outcome: pain levels at 4 hours after patients transportation from the operation and PACU to the ward; Group 1: mean 6.44 (SD 2.76); n=29, Group 2: mean 5.86 (SD 2.91); n=34; Visual Analogue Scale 1-10 Top=High is poor outcome; Comments: p value 0.475 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Baseline details: pain baseline preoperatively (VAS): FT 0.1 (0.31); CON 0.12 (0.32); Group 1 Number missing 0 ; Group 2 Number missing 0 - Actual outcome: pain levels at post operative day 1; Group 1: mean 5.87 (SD 2.76); n=29, Group 2: mean 6.77 (SD 12.27); n=34; Visual Analogue Scale 1-10 Top=High is poor outcome; Comments: p value 0.008 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing 0 ; Group 2 Number missing 0 - Actual outcome: pain levels at FT group - pre discharge; Con group - 5th day of stay; Group 1: mean 3 (SD 2.2); n=29, Group 2: mean 2.6 (SD 1.06); n=34; Visual Analogue Scale 1-10 Top=High is poor outcome; Comments: p value 0.722 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing 0 ; Group 2 Number missing 0	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	Khoo 2007[88]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=81)
Countries and setting	Conducted in United Kingdom; Setting: Tertiary Hospital

Study	Khoo 2007[88]
Line of therapy	Not applicable
Duration of study	Intervention + follow up: May 2003 - October 2004
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	Colorectal cancer (colonic and rectal)
Exclusion criteria	Patients were excluded if they were unable to mobilize independently over 100 m at preoperative assessment, had contraindications to thoracic epidurals, or had preexisting clinical depression. Patients were also excluded if they were having palliation only, or undergoing joint operation involving another surgical speciality
Recruitment/selection of patients	selected from patients presenting with colon cancer from May 2003 - October 2004
Age, gender and ethnicity	Age - Median (range): Multimodal: 69.3 (46.3-87.7); Control: 73.0 (46.4-84.6). Gender (M:F): 27/43. Ethnicity: NR
Further population details	1. Age: >60 years (Multimodal: 69.3 (46.3-87.7); Control: 73.0 (46.4-84.6)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 8; ASA II - 52; ASA III - 10). 3. Type of surgery: lower and upper GI (colonic resection).
Indirectness of population	No indirectness
Interventions	(n=40) Intervention 1: No enhanced recovery programme (standard care) - Standard care. •Bowel preparation and IV fluid restriction: All patients were admitted the morning prior to surgery for standard bowel preparation with sodium dihydrogen phosphate dihydrate given on admission and 12 hours later; allowed oral fluids up to 3 hours before surgery; and control arm patients received 125 mL/h of intravenous fluid starting from 2200 hours on the night of admission. The anesthetist was free to follow the normal intraoperative fluid practice. Postoperatively, patients in the control arm were allowed 30 mL/h of oral fluids. This was increased stepwise (30 mL/h to 60 mL/h to free oral fluids) every 12 hours unless there was nausea. Sufficient supplementary intravenous fluids were given to maintain a urine output of at least 0.5 mL/kg per hour and a systolic blood pressure of □90 mm Hg. • Diet: Nasogastric tubes were inserted; nasogastric tubes were removed the following morning unless there was > 200 mL of free drainage overnight. Diet was commenced only on signs of returning bowel motility. In the multimodal arm, diet was allowed immediately after the operation. •Thoracic epidurals and pain relief: A thoracic epidural was attempted in the anesthetic room in all patients; Patient controlled analgesia with morphine and cyclizine was used if a thoracic epidural was not possible; In the control arm, the epidural infusion rate was titrated against pain and narcotization, and removed when the rate was <1 mL/h; oral paracetamol (1 g every 6 hours) and

Study	Khoo 2007[88]
	ibuprofen (400 mg every 6 hours) were given from the immediate postoperative period given as required in the control arm. •Mobilization: patients were sat out and assisted to mobilize on the first postoperative day, but not normally aggressively mobilized until discontinuation of the thoracic epidural. Urinary catheters were removed following epidural. catheter removal. Duration 1 day preoperatively up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=41) Intervention 2: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Bowel preparation and intravenous fluid restriction: All patients were admitted the morning prior to surgery for standard bowel preparation with sodium dihydrogen phosphate given on admission and 12 hours later; allowed oral fluids up to 3 hours before surgery. Multimodal arm patients received no supplementary intravenous fluids until 3 hours before surgery but were encouraged to make up the loss through oral rehydration; Postoperatively, patients were allowed free oral fluids immediately after the operation. Intravenous fluids were discontinued when the patient was able to tolerate 200 mL of water over 30 minutes. •Diet: nasogastric tubes were removed in the recovery room; diet was allowed immediately after the operation; received regular domperidone, magnesium hydroxide 8%, and liquid protein/calorie supplements from admission. •Thoracic epidurals and pain relief: A thoracic epidural was attempted in the anesthetic room in all patients; patient controlled analgesia with morphine and cyclizine was used if a thoracic epidural was not possible. In the multimodal arm, the infusion rate was not adjusted unless there were features of narcotization, and epidurals were discontinued 48 hours postoperatively. Oral paracetamol (1 g every 6 hours) and ibuprofen (400 mg every 6 hours) were given from the immediate postoperative period. •Mobilization: mobilization was encouraged from the night of the operation. Patients were encouraged to meet predefined mobility targets over the postoperative days. Urinary catheters were removed 24 hours postoperatively following colonic resection and at 72 hours after TME. . Duration 1 day preoperatively up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: MULTIMODAL versus CONTROL

Protocol outcome 1: Mortality
- Actual outcome: Death at postoperatively up to 30 days post-discharge; Group 1: 0/35, Group 2: 2/35
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 6, Reason: metastatic disease; withdrew consent; unfit for surgery; Group 2 Number missing: 5, Reason: metastatic disease; withdrew consent

Study	Khoo 2007[88]
Protocol outcome 2: Perioperative complications - Actual outcome: Complications at postoperatively up to 30 days post-discharge; Group 1: 9/35, Group 2: 16/35; Comments: includes: intestinal leaks; NGT decompression; cardiorespiratory compromise; pressure sores; urinary tract infection; transient urinary retention Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 6, Reason: metastatic disease; withdrew consent; unfit for surgery; Group 2 Number missing: 5, Reason: metastatic disease; withdrew consent Protocol outcome 3: Length of hospital stay - Actual outcome: Length of stay (including readmissions) at postoperative up to 30 days post-discharge; Median (range): Multimodal: 5 (3-37); Control: 7 (4-63) days, Comments: p value <0.001); Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 6, Reason: metastatic disease; withdrew consent; unfit for surgery; Group 2 Number missing: 5, Reason: metastatic disease; withdrew consent Protocol outcome 4: Hospital readmission - Actual outcome: Readmissions at up to 30 days post-discharge; Group 1: 3/35, Group 2: 1/35; Comments: include: abscess; upper gastrointestinal bleed; wound infection; and pressure sore Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 6, Reason: metastatic disease; withdrew consent; unfit for surgery; Group 2 Number missing: 5, Reason: metastatic disease; withdrew consent	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Larsen 2008[98]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=90)
Countries and setting	Conducted in Denmark; Setting: Holstebro Regional Hospital
Line of therapy	Not applicable
Duration of study	Intervention + follow up: June 2004 - May 2006
Method of assessment of guideline condition	Adequate method of assessment/diagnosis

Study	Larsen 2008[98]
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	patients undergoing elective primary total hip arthroplasty, total knee arthroplasty, or unicompartmental knee arthroplasty
Exclusion criteria	The exclusion criteria were mental disability or severe neurological disease.
Recruitment/selection of patients	consecutive patients planned to undergo elective surgery
Age, gender and ethnicity	Age - Mean (SD): Accelerated Intervention: 64 (10.8); Current Intervention 66 (9.2). Gender (M:F): 43/34. Ethnicity: NR
Further population details	1. Age: >60 years (Accelerated Intervention: 64 (10.8); Current Intervention 66 (9.2)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: 3. Type of surgery: ortho/large joint replacement
Indirectness of population	No indirectness
Interventions	(n=45) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. All patients, with a relative, were invited to an information day on the Friday before their week of surgery. The purpose of the information day was to inform the patients (in groups) of the accelerated path, and also to prepare the patients for surgery through individual consultations with the surgeon, anesthetist, and nurse. Final blood tests, heart EKG, and radiographs were taken. All patients were hospitalized in the new accelerated unit on the day of surgery. The patients used their own clothes during the whole stay. Health Care staff worked to achieve written preset daily goals regarding: (1) information, (2) pain relief, (3) nausea control, (4) nutrition, (5) mobilization, and (6) elimination. (1) Information about the information day focused on partial goals during the hospital stay, the discharge planned for the fourth postoperative day, how to relieve pain, mobilization strategies, and how to get help. (2) Pain relief consisted of Oxycontin/Oxynorm and Paracetamol. (3) Zofran was used for control of nausea. (4) A nutrition screening was performed on the information day, and the patient ate according to this result in combination with a daily intake of two protein bever- ages, with a total fluid consumption of at least 2 liters. (5) Mobilization started on the day of surgery. On the first postoperative day, the goal was 4 h out of bed including training with a physiotherapist and an occupational therapist. Our aim was more than 8 h of mobilization per day for the rest of the hospital stay. (6) For elimination, we used Magnesia. Patients also followed a scheme with the above-mentioned preset goals for nutrition, fluid consumption, and mobilization.. Duration 7 days before surgery up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=45) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Patients were hospitalized on the day before surgery, and placed in a general orthopedic ward. They were given hospital

Study	Larsen 2008[98]
	clothes to be worn during the whole stay, and were informed of the procedure and prepared for surgery. During the day before surgery the patients were individually informed of the path by the surgeon, anesthetist, and nurse. Final blood tests, heart EKG, and radiographs were taken. Immediately after surgery, the patient's pain was evaluated and analgesics were given accordingly. On the day after surgery the patients started training in bed before lunch, and were mobilized out of bed after lunch by a physiotherapist. During the following days mobilization was increased, in order to reach the discharge criteria. During the stay, care was given in response to the patient's actual needs and rehabilitation was adjusted according to the patient's immediate state.. Duration 1 day before surgery to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ACCELERATED PROCEDURE versus CURRENT PROCEDURE

Protocol outcome 1: Quality of life
- Actual outcome: gain in quality of life score at at 3 months follow up; Group 1: mean 0.42 (SD 0.31); n=45, Group 2: mean 0.26 (SD 0.31); n=42;
Comments: unadjusted crude difference in gain in QOL of 0.16 (95% CI: 0.02–0.29)
The adjusted mean difference in gain in QOL of 0.08 (95% CI: 0.004–0.16)
(both in favor of the intervention group)
Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Baseline details: Baseline QOL
Accelerated Intervention: 0.46 (0.28)
Current Intervention: 0.53 (0.22); Group 1 Number missing: 0; Group 2 Number missing: 3, Reason: did not receive allocated treatment

Protocol outcome 2: Mortality
- Actual outcome: Death at postoperative up to 3 months follow up; Group 1: 0/45, Group 2: 1/42; Comments: 1 death in control group due to perioperative pulmonary embolism
Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 3, Reason: did not receive allocated treatment

Protocol outcome 3: Length of hospital stay
- Actual outcome: Length of stay at admission to discharge ; Group 1: mean 4.9 days (SD 2.4); n=45, Group 2: mean 7.8 days (SD 2.1); n=42
Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 3, Reason: did not receive allocated treatment

Study	Larsen 2008[98]
Protocol outcome 4: Hospital readmission - Actual outcome: Readmission at postoperative up to 3 months follow up; Group 1: 2/45, Group 2: 1/42 Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 3, Reason: did not receive allocated treatment	
Protocol outcomes not reported by the study	Perioperative complications ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Lee 2011[101]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=100)
Countries and setting	
Line of therapy	Not applicable
Duration of study	Intervention + follow up: September 2007 to October 2009
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	all patients receiving laparoscopic colon resection for colonic tumor
Exclusion criteria	a synchronous distant metastasis, intestinal obstruction or perforation, previous major abdominal surgery such as gastrectomy and colectomy and severe medical comorbidity (severe pulmonary disease and cardiovascular disease)
Recruitment/selection of patients	not stated
Age, gender and ethnicity	Age - Mean (SD): rehabilitation program 61.9 ± 11.2; 60.6 ± 0.0. Gender (M:F): 56/44. Ethnicity: NR
Further population details	1. Age: >60 years (rehabilitation program 61.9 ± 11.2; 60.6 ± 0.0). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 43; ASA II - 51; ASA III - 5). 3. Type of surgery: lower and upper GI (laparoscopic colonic resection).
Indirectness of population	No indirectness
Interventions	(n=46) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. before admission: operative risk assessment; preoperative: counseling with patient and family, written

Study	Lee 2011[101]
	informed consent, mechanical bowel preparation, preoperative fasting at least 8 hours, no nasogastric tube; Day of surgery: sit in chair for >1 hour, sips of water <1L; Postoperative day 1: sit in chair for >3 hours, ward ambulation >400m, semifluid diet >1L, continuous infusion of PCA, remove urinary catheter; postoperative day 2: ward ambulation >600m, soft blend diet or regular diet, remove PCA and use laxatives routinely. . Duration pre-admission up to discharge postoperatively. Concurrent medication/care: NA. Indirectness: No indirectness (n=54) Intervention 2: No enhanced recovery programme (standard care) - Standard care. before admission: operative risk assessment, counseling with patient and family, written informed consent, mechanical bowel preparation, preoperative fasting at least 8 hours, no nasogastric tube; day of surgery: bed rest and nil by mouth; postoperative day 1: sit in chair for >1hour, mobilize in bed, nil by mouth till flatus, continuous infusion of PCA, urinary catheter in place; operative day 2: ward ambulation >400m, sips of water if bowel passage, remove PCA if relief of pain, use laxative if necessary, remove urinary catheter. Duration pre-admission up to discharge postoperatively. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: REHABILITATION PROGRAM versus CONVENTIONAL CARE

Protocol outcome 1: Mortality
- Actual outcome: mortality at post discharge; Group 1: 0/46, Group 2: 0/54
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Comments - ; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0, Reason: no missing data reported; Group 2 Number missing: 0, Reason: no missing data reported

Protocol outcome 2: Perioperative complications
- Actual outcome: total complications at within 1 week postoperatively ; Group 1: 6/46, Group 2: 14/54; Comments: p value 0.136
Includes anastomotic leakage, wound discharge, ileus, chylous ascites and urinary retention
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Comments - ; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0, Reason: no missing data reported; Group 2 Number missing: 0, Reason: no missing data reported

Protocol outcome 3: Length of stay in intensive care unit
- Actual outcome: length of postoperative hospital stay at admission to discharge; Median (IQR): Rehabilitation group 7 (6-8); conventional care 9 (8-10) days);
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low,

Study	Lee 2011[101]
Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0, Reason: no missing data reported; Group 2 Number missing: 0, Reason: no missing data reported Protocol outcome 4: Hospital readmission - Actual outcome: readmission at post discharge; Group 1: 0/46, Group 2: 0/54 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Comments - ; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0, Reason: no missing data reported; Group 2 Number missing: 0, Reason: no missing data reported Protocol outcome 5: Pain - Actual outcome: VAS pain score at 1 week after surgery; VAS pain score: rehabilitation group 1.2 ± 1.1 and control group 1.1 ± 1.3, Comments: p value 0.867); Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Comments - ; Indirectness of outcome: No indirectness ; Baseline details: preoperative VAS pain score rehabilitation group 0.6 +/- 1.3 & conventional group 0.5 +/- 1.1; p value = 0.730; Group 1 Number missing: 0, Reason: no missing data reported; Group 2 Number missing: 0, Reason: no missing data reported - Actual outcome: VAS pain score at 4 weeks after surgery; VAS pain score: rehabilitation group 0.7 ± 1.5 and conventional group 0.7 ± 1.2 1-10 Top=High is poor outcome, Comments: p value 0.868; Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Comments - ; Indirectness of outcome: No indirectness ; Baseline details: preoperative VAS pain score rehabilitation group 0.6 +/- 1.3 & conventional group 0.5 +/- 1.1; p value = 0.730; Group 1 Number missing: 0, Reason: no missing data reported; Group 2 Number missing: 0, Reason: no missing data reported	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Length of hospital stay ; Unplanned intensive unit admission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	Lemanu 2013[103]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=106)
Countries and setting	Conducted in New Zealand; Setting: Manukau Surgery Centre (Counties Manukau District Health Board, Auckland, New Zealand)
Line of therapy	Not applicable
Duration of study	Intervention + follow up: August 2011 and May 2012

Study	Lemanu 2013[103]
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	patients had to have their operation at the elective surgery hospital, Manukau Surgery Centre
Exclusion criteria	Patients having laparoscopic sleeve gastrectomy as a revisional bariatric procedure
Recruitment/selection of patients	All patients offered laparoscopic sleeve gastrectomy as a definitive bariatric procedure between August 2011 and May 2012 were recruited.
Age, gender and ethnicity	Age - Mean (SD): ERP: 43.5 ± 6.9; Standard care: 43.9 ± 6.0 . Gender (M:F): 23/55. Ethnicity: NR
Further population details	1. Age: <60 years (ERP: 43.5 ± 6.9; Standard care: 43.9 ± 6.0). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 1; ASA II - 48; ASA III - 29). 3. Type of surgery: lower and upper GI (laparoscopic sleeve gastrectomy).
Indirectness of population	No indirectness
Interventions	(n=53) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative: Formal standardized preoperative education; Formal goal-setting session; Tour of the ward; Clear oral fluids up to 2 h before surgery; Carbohydrate drinks ×2. •Intraoperative: 8 mg i.v. dexamethasone at induction of anaesthesia; standardized anaesthesia; Intraperitoneal local anaesthetic; Avoidance of prophylactic nasogastric tubes and abdominal drains. •Postoperative: Early instigation of oral intake; Mobilization 2 h after return to ward; Standardized multimodal analgesia and antiemesis; Standardized multimodal thrombrophylaxis. •Postdischarge: Telephone call 1 day and 1 week after discharge; 2 week follow up in clinic. Duration preoperative assessment to follow up. Concurrent medication/care: NA. Indirectness: No indirectness (n=53) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Preoperative: advice given by bariatric surgeon. Intraoperative & postoperative: Care decided by anaesthetist and bariatric surgeon. Postdischarge: 2 week follow up in clinic. Duration preoperative assessment to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	No funding
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE	

Study	Lemanu 2013[103]
Protocol outcome 1: Perioperative complications - Actual outcome: total complications at postoperatively up to 30 days post discharge; Group 1: 10/40, Group 2: 8/38 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 13, Reason: surgery changed to another site; surgery cancelled; miscellaneous; Group 2 Number missing: 15, Reason: surgery changed to another site; surgery cancelled; miscellaneous - Actual outcome: major complications at postoperatively up to 30 days post discharge; Group 1: 5/40, Group 2: 5/38 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low, Comments - classified according to Clavien Dindo grades; Indirectness of outcome: No indirectness; Group 1 Number missing: 13, Reason: surgery changed to another site; surgery cancelled; miscellaneous; Group 2 Number missing: 15, Reason: surgery changed to another site; surgery cancelled; miscellaneous Protocol outcome 2: Length of hospital stay - Actual outcome: length of index admission at admission to discharge; Median (IQR): ERP: 1 (1-2); Standard 2(0) days); Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 13, Reason: surgery changed to another site; surgery cancelled; miscellaneous; Group 2 Number missing: 15, Reason: surgery changed to another site; surgery cancelled; miscellaneous - Actual outcome: readmission at within 30 days of discharge; Group 1: 8/40, Group 2: 8/38 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 13, Reason: surgery changed to another site; surgery cancelled; miscellaneous; Group 2 Number missing: 15, Reason: surgery changed to another site; surgery cancelled; miscellaneous - Actual outcome: total hospital stay at hospital stay including readmissions longer than 24h; Median (IQR): ERP: 1 (1-3); Standard care: 2 (2-3) days); Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 13, Reason: surgery changed to another site; surgery cancelled; miscellaneous; Group 2 Number missing: 15, Reason: surgery changed to another site; surgery cancelled; miscellaneous	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Li 2014[105]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=464)
Countries and setting	Conducted in China; Setting: Center of Gastroenterology Surgery, West China Hospital, Sichuan University.
Line of therapy	Not applicable
Duration of study	Intervention time: January 2011 to February 2012
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	≥ 18 years of age; histologically diagnosed with colorectal cancer by enteroscope and underwent colorectal surgery
Exclusion criteria	Patients with metabolic diseases, immunological diseases, ileus, enterobrosis, chronic enteritis, fever, severe diarrhea, pleural or abdominal fluid, liver function failure or cardi-opulmonary insufficiency (ASA grade IV) were excluded.
Recruitment/selection of patients	Patients enrolled at Centre of Gastroenterology Surgery who fit the inclusion criteria
Age, gender and ethnicity	Age - Mean (SD): Fast track: 57.7 ± 12.0; Traditional: 60.0 ± 12.8. Gender (M:F): 270/175. Ethnicity: NR
Further population details	1. Age: >60 years (Fast track: 57.7 ± 12.0; Traditional: 60.0 ± 12.8). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 41; ASA II - 305; ASA III - 99). 3. Type of surgery: lower and upper GI (colorectal surgery for colorectal cancer).
Indirectness of population	No indirectness
Interventions	(n=219) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative: pre-operative assessment, counseling and FT management education; free diet, but limitation of fibers; fast solid food before 6 h and liquid food (without milk or bev-erage with fat) before2 h nil by mouth; patients are not received mechanical bowel preparation, only oral intestinal cleaner 12 h pre-operation can be accepted, but no need of liquid stool; receive single-dose antibiotic prophylaxis, (1.5 g cefuroxim, Zinacef, and 0.5 g metronidazol, Clont) at induction of anaesthesia. •Intraoperative: continuous epidural anesthesia; right-sided colon resection via a T6-T7 level catheter; sigmoidectomy with a 9-T10 level catheter; rectectomy via a L1-L4 level catheter; if chosen general anesthesia, enough dose in first injection; minimally invasive techniques; prevention of hypothermia, keeping the intra-operative core temperature at 36 ±0.5C. •Postoperative: POD1: for non-hypovolemia patients, give fluid restriction to 1500 ml/kg/d; with or without nasogastric tube in after 12 h; remove urinary catheter for

	patients received colon and upper segment of rectum surgery; without or remove drainage tube in 24h; early oral feeding of water or tea at 12 h, use of EN emulsion (Fresubin®), 50% of total dose in 24 h (Total energy: 25-30 kcal/kg·d); early activities mobilized in bed at 6 h, spend 2 h out of bed on the day of surgery and 6 h per day until discharge; regular pain control by a PCA (patient-controlled analgesia) pump 96 ml/2 ml/hr, opioid-sparing multimodal analgesia, including oral paracetamol, non-steroidal anti-inflammatory drugs, gabapentanoids; no regular parenteral nutrition support. POD2: fluid restriction to 1000 ml/kg·d; remove urinary catheter for rectal lower segment; walk around ward in 24h~48 h, and go to bathroom; keeping urinary catheter in for 1-3 days; 100% total dose of EN in 48 h. (Total energy was 25-30 kcal/kg·d). POD 3-5: fluid restriction to 500 ml/d; discharge with criteria: oral drug analgesia, solid diet and no fluid transfusion. Duration preoperative assessment to discharge. Concurrent medication/care: NA (n=245) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperative: nasogastric tube and urinary catheter were routine; pre-operative fasting at least 8h; orthograde mechanical bowel preparation. •Intraoperative: general anesthesia; open surgery; 34.7±0.6C. •Postoperative: nasogastric tube remain; nil by mouth until flatus, sips of water if bowel passage; mobilization of the patients from post-operative day 1; transfuse fluid for patients about 3000 ml/kg·d until intake food; TPN (Kabiven TM PI) by PICC or CVC, 1-2 ml/kg·d, 50% of total dose in 24h, total dose in 48h; oral feeding after aerocluxus, (Total energy was 25-30 kcal/kg·d); continuous epidural anaesthesia for 2-3 days; consider the removal of the urinary catheter at post-operative days 3–5 on the basis of the patient's need. Duration preoperative assessment to discharge. Concurrent medication/care: NA
Funding	Academic or government funding

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST-TRACK versus TRADITIONAL

Protocol outcome 1: Perioperative complications
- Actual outcome: complications post operation at after surgery to discharge; Group 1: 18/208, Group 2: 47/237; Comments: p value 0.001
Risk of bias: All domain - High, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - High, Crossover - Low, Comments - period of measurement of complications not defined; Indirectness of outcome: No indirectness; Group 1 Number missing: 8; Group 2 Number missing: 8

Protocol outcome 2: Length of hospital stay
- Actual outcome: length of hospitalization post operation at after surgery to discharge; Group 1: mean 8.54 days (SD 3.18); n=208, Group 2: mean 9.62 days (SD 3.83); n=237; Comments: p value 0.080
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 8; Group 2 Number missing: 8

Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	**Li 2018[107]**
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=226)
Countries and setting	Conducted in China; Setting: Xiangya Hospital, Central South University, China
Line of therapy	Not applicable
Duration of study	Intervention + follow up: 6 months
Method of assessment of guideline condition	Adequate method of assessment/diagnosis

Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	between 18 - 70 years of age; had a body mass index of 15-30kg/m² ; receiving elective heart valve surgery
Exclusion criteria	New York Heart Association class of heart function of IV; an international normalized ration >2.0; a history of stroke; creatinine levels >300µmol/l; an abnormal liver function test, such as decreased synthesis of liver proteins such as albumin and clotting factors; presence of endocrine disease, such as thyroid and adrenal diseases; presence of infection; severe mental disorder; emergent surgery; existing pacemaker; a history of alcohol and drug abuse and patient refusal.
Recruitment/selection of patients	not specified
Age, gender and ethnicity	Age - Mean (SD): Control group 52.2 ± 10.4 (23.0-69.0); ERP group 51.0 ± 10.1 (25.0-69.0). Gender (M:F): 100/109. Ethnicity: NR
Further population details	1. Age: <60 years (Control group 52.2 ± 10.4 (23.0-69.0); ERP group 51.0 ± 10.1 (25.0-69.0)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 3 (ASA II 41; ASA III 168). 3. Type of surgery: Not applicable (cardio-thoracic surgery).
Indirectness of population	No indirectness
Interventions	(n=113) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. patients in the ERP group received a detailed explanation of their perioperative care and a health manual. 5 day preoperatively patients without contraindications received recombinant human erythropoeitin injection. Preoperative bowel preparation and preoperative sedative use were not administered. Preoperative fasting was reduced to 6 hours with light meals. Patients received a carbohydrate solution containing 25g of glucose 2 hour before surgery and prophylactic antibiotics were administered within 60 minutes of surgical incision. Intraoperative management included fast track cardiac anesthesia; optimization of cardiopulmonary bypass through strict fluid management; lung protection strategies; goal directed fluid management; cerebral oxygen saturation monitor and bispectral index monitor; blood conservation measures and ropivacaine infiltration at incision site. A postoperative bundle included multimodal postoperative analgesia; nausea and vomiting prevention; EPO therapy; early oral intake after tracheal extubation; early removal of drainage tube and early mobilization as soon as possible. . Duration 5 days preadmission to hospital discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=113) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Conventional group care protocol not clearly stated and missing from specified table. Only mentions removal of urinary catheters and thoracic drainage tubes on postoperative day 2 or 3.. Duration unclear. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus CONTROL GROUP

Protocol outcome 1: Mortality
- Actual outcome: Death at postoperatively up to 30 days; Group 1: 0/104, Group 2: 0/105
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 9, Reason: refused surgery; withdrew before surgery; Group 2 Number missing: 8, Reason: refused surgery; withdrew before surgery

Protocol outcome 2: Perioperative complications
- Actual outcome: Total complications at post discharge up to 30 days; Group 1: 18/104, Group 2: 36/105; Comments: includes: cardiac arrest; heart block; permanent stroke; acute kidney injury; coma; acute respiratory distress syndrome; unplanned reintubation; unplanned re-do operation; postoperative atrial fibrillation; pericardial tamponade; postoperative delirium; hyperthyroidism crisis and gastrointestinal bleeding.
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 9, Reason: refused surgery; withdrew before surgery; Group 2 Number missing: 8, Reason: refused surgery; withdrew before surgery

Protocol outcome 3: Length of hospital stay
- Actual outcome: postoperative hospital stay at day of admission to day of discharge; Mean; (median (range): control group 8.7 (6.6-18.8); ERP group 8.6 (5.7-14.2)) days , Comments: p value 0.07);
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 9, Reason: refused surgery; withdrew before surgery; Group 2 Number missing: 8, Reason: refused surgery; withdrew before surgery

Protocol outcome 4: Unplanned intensive unit admission
- Actual outcome: Intensive Care Unit readmission at postoperatively up to 30 days; Group 1: 1/104, Group 2: 1/105
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 9, Reason: refused surgery; withdrew before surgery; Group 2 Number missing: 8, Reason: refused surgery; withdrew before surgery

Protocol outcome 5: Length of stay in intensive care unit
- Actual outcome: Intensive Care Unit stay at postoperatively; median (range): Control group 22.0 (13.4-212.3); ERP group 20.9 (13.5-69.3) hours, Comments: p value 0.001);
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 9, Reason: refused surgery; withdrew before surgery; Group 2 Number missing: 8, Reason: refused surgery; withdrew before surgery

Protocol outcome 6: Hospital readmission

- Actual outcome: 30 day readmission at post discharge up to 30 days; Group 1: 0/104, Group 2: 0/105 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 9, Reason: refused surgery; withdrew before surgery; Group 2 Number missing: 8, Reason: refused surgery; withdrew before surgery Protocol outcome 7: Pain - Actual outcome: VAS pain scores at postoperatively up to discharge ; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - High, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 9, Reason: refused surgery; withdrew before surgery; Group 2 Number missing: 8, Reason: refused surgery; withdrew before surgery	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	**Li 2019[109]**
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=200)
Countries and setting	Conducted in China; Setting: Ninghai First Hospital, China
Line of therapy	1st line
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	Patients aged 55 - 65 years old, with the preoperative diagnosis of colorectal malignant tumours by fiberoptic electron colonoscopy and histopathology and undergoing elective laparoscopic radical resection of colorectal cancer.
Exclusion criteria	Pathologically confirmed benign colorectal tumour, emergency surgery, conversion from laparoscopy to open surgery, open surgery, and palliative surgery. Surgical contraindications include severe heart disease, liver, and lung disease, distant metastatic carcinoma of the organs and infiltration of adjacent organs
Recruitment/selection of patients	Patients undergoing laparoscopic colorectal cancer surgery
Age, gender and ethnicity	Age - Mean (SD): ERP: 56.2 (5.5); Conventional: 55.3 (5.3). Gender (M:F): 133/67. Ethnicity: NR

Study	Li 2019[109]
Further population details	1. Age: <60 years (ERP: 56.2 (5.5); Conventional: 55.3 (5.3)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear (ASA I: 42; ASA II: 158). 3. Type of surgery: lower and upper GI (laparoscopic colorectal cancer surgery).
Indirectness of population	No indirectness
Interventions	(n=100) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative: preoperative education through face to face communication, written notice and multimedia. Preopearive education includes anesthesia and srugical procedure, encouragement or early postoperative feeding and activity, promotion of pain management and respiratory therapy, pre-setting discharge criteria, and notification of follow up and readmission pathway. The education continues through the entire process of the perioperative period until the patient is discharged. The ERP group did not require regular bowel preparation. Fasted for 6 hours before surgery, and water and clear liquid food was banned 2 hours before surgery. •Intraoperative: temperature monitoring and heat preservation were carried out in the ERP group. Fluid management was focused on the needs of the patient and avoided excessive fluid intake mainly as oral water supplementation to prevent gastrointestinal edema. •Postoperative: multimodal analgesia, including intraoperative local anesthesia with ropivacaine infiltration and 50mg intramuscular injection of tramadol after surgery. Patients were encouraged to move out of the bed. . Duration peroperative. Concurrent medication/care: NA (n=100) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperative: general preoperative presurgery education. Mechanical bowel preparation and oral administration of antibacterials to clear intestinal bacteria. This group were fasted for 12 hours before surgery and water was banned 6 hours before surgery. •Intraoperative: No special heat preservation measures were taken. Glucose saline and amino acid were administered IV on the day of surgery, which was reasonably controlled according to the patients physiological requirements, intake and output. •Postoperative: Analgesic pump IV and the patients in this group got out of bed at the time of the patients will. . Duration perioperative. Concurrent medication/care: NA
Funding	Academic or government funding (study was supported by science and technology foundation of Ninghai country (China))

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Perioperative complications
- Actual outcome: Total complications at postoperative; Group 1: 12/100, Group 2: 25/100; Comments: p value 0.028
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing:0 ; Group 2 Number missing:0

Study	Li 2019[109]
Protocol outcome 2: Pain - Actual outcome: Pain score at 1 day after surgery; Group 1: mean 5.67 (SD 1.23); n=100, Group 2: mean 5.78 (SD 1.03); n=100; VAS 0-10 Top=High is poor outcome; Comments: p value 0.494 Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; - Actual outcome: Pain score at 3-7 days after surgery; Group 1: mean 2.98 (SD 1.578); n=100, Group 2: mean 2.97 (SD 1.442); n=100; VAS 0-10 Top=High is poor outcome Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 0; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Length of hospital stay ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	Liang 2018[112]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=126)
Countries and setting	Conducted in China; Setting: University Hospital
Line of therapy	1st line
Duration of study	Intervention time:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	partial hepatectomy or half liver resection, body mass index of between 18 and 35, if patients were diagnosed with tumors; tumors either in the right or left lobe, Child-Pugh class A/B liver functional status, ASA grades I-III, no major concomitant surgical procedures (bowel or bile duct resection)
Exclusion criteria	pregnant or lactating women, unwillingness to participate, inability to give written informed consent, Child-Pugh classification of C, ASA grades IV-V, tumor invasion of the inferior vena cava or confluence part of hepatic vein.
Recruitment/selection of patients	Not clear how patients were selected or if all patients between the study dates (august 2015 - June 2016) were approached for the study
Age, gender and ethnicity	Age - Median (range): 16-85. Gender (M:F): 72/47. Ethnicity: NR
Further population details	1. Age: <60 years (Median (range) ERP - 58 Traditional Care - 59). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 12/8, ASA II - 35/48, ASA III - 11/5). 3. Type of surgery: lower and upper GI (Laparoscopic liver resection).
Extra comments	patients undergoing laparoscopic liver resection
Indirectness of population	Serious indirectness: one patient included, who was 16 and included in the RCT
Interventions	(n=60) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. 400ml oral carbohydrate solution 2 hours before surgery. Nutritionists would provide nutritional support based on nutritional risk screening tool (NRS2002). Patients who had chronic respiratory disease or a long history of smoking would receive respiratory care before surgery. Nurse navigators to provide more information about perioperative care. Patients and their families received a checklist about rehabilitation plan, daily mobilization and nutritional goals. Received 0.75% ropivacaine for local anesthesia. 5mg Dexamethasone IV was used before vascular exclusion. Fluid management followed by goal-directed fluid therapy. Abdominal cavity drainage tubes avoided. Water or liquids given 6 hours after surgery. Titrating regimen of feeding commenced from POD 1. Intravenous fluids stopped as soon as adequate intake was

	achieved. Received 40mg ParecoxibNa per 12 hour injection and tramadol 50-100mg twice a day orally. Patient controlled intravenous anesthesia used. Post operative nausea and vomiting prophylaxis followed with metoclopramide and then ondansetron. Patients advised to mobilize from POD 1, urinary catheter removed POD1 and abdominal drains as soon as possible. Duration one day pre-operatively until discharge and followed up after 30 days. Concurrent medication/care: NA. Indirectness: No indirectness (n=66) Intervention 2: No enhanced recovery programme (standard care) - Standard care. standard perioperative education, fasting and drinking forbidden for 8 hours before surgery and no oral nutritional supplements. No preoperative bowel preparation or premedication given. No local anesthesia or dexamethasone was used during operations. Indwelled abdominal cavity drainage tubes routinely used. Received oral intake until gastrointestinal function recovered. Maintenance fluids were used about 1 - 2 ml per kg per hour. ParecoxibNa 40mg given IV 12 hourly, other analgesia if necessary. Strong opioids allowed. Only 10mg Metoclopramide IV twice a day given. Urinary catheter removed at 2 or 3 days post operatively and abdominal drains removed depending on clinical need. . Duration one day preoperatively until discharge with follow up 30 days later. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Perioperative complications
- Actual outcome: Patients with complications at one day prior to surgery up to 30 days post discharge follow up; Group 1: 21/58, Group 2: 34/61
Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Baseline details: one patient not comparable due to age of 16; Blinding details: states the study was a randomized controlled single-blind trial, but no other information of blinding given.; Group 1 Number missing: 2, Reason: inoperable - 1
additional procedure - 1; Group 2 Number missing: 5, Reason: inoperable - 3
additional procedure - 2
- Actual outcome: Readmission rates (<30 days) at up to 30 days post discharge; Group 1: 4/58, Group 2: 5/61
Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Baseline details: one patient not comparable due to age of 16; Blinding details: states the study was a randomized controlled single-blind trial, but no other information of blinding given.; Group 1 Number missing: 2, Reason: inoperable - 1
additional procedure - 1; Group 2 Number missing: 5, Reason: inoperable - 3
additional procedure - 2

Protocol outcome 2: Length of hospital stay
- Actual outcome: length of hospital stay at one day prior to surgery up to 30 days post discharge follow up; P value: <0.001, Comments: length of stay for ERP patient was 5 days (1 - 24) compared to 8 days (6 - 11) in the traditional care group);
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low,

Crossover - Low; Indirectness of outcome: No indirectness ; Baseline details: one patient not comparable due to age of 16; Blinding details: states the study was a randomized controlled single-blind trial, but no other information of blinding given.; Group 1 Number missing: 2, Reason: inoperable - 1 additional procedure - 1; Group 2 Number missing: 5, Reason: inoperable - 3 additional procedure - 2	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	**Lin 2018[116]**
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=290)
Countries and setting	Conducted in China; Setting: University Hospital
Line of therapy	Not applicable
Duration of study	Intervention + follow up: October 2014 - July 206
Method of assessment of guideline	Adequate method of assessment/diagnosis

condition	
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	curative goal (clinical stage Ta-T4a/N0-2/Mo); age > 18 years; ASA I-II; Karnofsky score > 70
Exclusion criteria	other concomitant malignancies; distant metastases; concurrent resection of kidney/ureter/urethra; previous ileal surgery; gastrointestinal disease affecting feeding; inflammatory bowel disease; severe function loss of heart, liver and or kidney, and pregnancy, lactation or pregnancy planning
Recruitment/selection of patients	Bladder cancer patients scheduled for curative treatment from 25 different centers (Chinese bladder cancer consortium)
Age, gender and ethnicity	Age - Mean (SD): ERP: 62.9 ± 10.1; CRAS: 63.3 ± 10.3. Gender (M:F): 250/40. Ethnicity: NR
Further population details	1. Age: >60 years (ERP: 62.9 ± 10.1; CRAS: 63.3 ± 10.3). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (all patients ASA grade I-II but numbers not specified). 3. Type of surgery: urology (radical cystecomy with with ileal urinary diversion).
Indirectness of population	--
Interventions	(n=145) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Surgery preparation: preop day 3 normal diet; preop day 2 normal diet; preop day 1 normal breakfast, fluid diet, laxatives and unrestricted clear fluids; •2 hours prior to surgery: Nil per os, IV antibiotics; •intraoperative: non-NGT; •Postoperative: clear fluids <500ml as tolerated after 2 hours of surgery, mobilization as possible; •POD 1: clear fluids as tolerated, protein drinks and light diet, mobilization as possible, ambulation, prokinetic agents, pain medication using mainly non opioids (opioids only for breakthrough); •POD 2 (~discharge)@ rectal laxative if needed, fluid diet after gradual return of feeding, regular / light diet after bowel movement, mobilization as possible, prokinetic agents, similar pain medication with non opioids; •After discharge: audited for outcomes for 30 days. Duration 3 days before surgery to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=145) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Surgery preparation: preop day 3 & preop day 2 fluid diet, oral bowel preparation, oral antibiotics; preop day 1 clear fluid diet, unrestricted clear fluids, 2 enemas, oral bowel preparation and oral antibiotics; 2 hours before surgery: NPO, NGT, IV antibiotics; •Intraoperative: NGT; Postoperative: no fluids, mobilization as possible; •POD 1: clear fluids as tolerated, NGT, mobilization, pain medication using non opioids (or opioids for breakthrough); •POD 2 (~ discharge): NGT until fluid tolerance, fluid diet after gradual return of feeding, rectal laxative if needed, regular/light diet after bowel movement, mobilization as possible, pain medication using non opioids. Duration 3 days before surgery to discharge. Concurrent medication/care: NA. Indirectness: No indirectness

Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus CRAS

Protocol outcome 1: Mortality
- Actual outcome: mortality at post surgery up to 30 after discharge; Group 1: 0/144, Group 2: 0/145
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 1, Reason: patient died preoperatively; Group 2 Number missing: 0

Protocol outcome 2: Perioperative complications
- Actual outcome: reoperation at post surgery up to 30 after discharge; Group 1: 4/144, Group 2: 4/145
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 1, Reason: patient died preoperatively; Group 2 Number missing: 0
- Actual outcome: total complications at post surgery up to 30 after discharge; Group 1: 55/144, Group 2: 55/145; Comments: includes ileus; intestinal fistula; bleeding; abdominal abscess; infection of incision; sepsis; leakage of urine; lymphorrhagia; readmission; and others
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 1, Reason: patient died preoperatively; Group 2 Number missing: 0

Protocol outcome 3: Length of hospital stay
- Actual outcome: postoperative length of stay at post surgery to discharge; median time: ERP: 15; CRAS 17; p value 0.26 days);
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 1, Reason: patient died preoperatively; Group 2 Number missing: 0

Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Liu 2010[122]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=63)
Countries and setting	Conducted in China; Setting: University hospital
Line of therapy	Not applicable
Duration of study	Intervention + follow up: June 2006 to January 2007
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	recently diagnosed with gastric cancer and living independently at home
Exclusion criteria	excluded if patient had reluctance to discharge early, presence of other organ dysfunction (such as lung or renal) and abnormal test results. Patients who had chemotherapy or radiotherapy preoperatively were also excluded.
Recruitment/selection of patients	70 consecutive patients were invited to be a part of the study, who were under one surgeon.
Age, gender and ethnicity	Age - Mean (SD): Optimized group 60.7+/-9.7 Control group 61.9+/-8.3. Gender (M:F): 33/29. Ethnicity: NR
Further population details	1. Age: >60 years (Optimized group 60.7+/-9.7 Control group 61.9+/-8.3). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (Median (interquartile range) ASA II). 3. Type of surgery: lower and upper GI (gastrectomy for gastric cancer).
Extra comments	patients diagnosed with gastric cancer under the care of one surgeon . no further criteria for selection of patients given.
Indirectness of population	No indirectness
Interventions	(n=33) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Patients allowed normal diet up to and including the evening meal. A glucose drink given the night before surgery and a carbohydrate drink given 3 - 4 hours preoperatively. Patients did not receive bowel preparation. Minimal abdominal incisions were made and none across umbilicus. Abdominal drains or nasogastric tubes were not placed unless required (abdominal contamination or confirmed gastric retention). Clear guidelines set out for posteperative early diet and enforced mobilization program. . Duration day of surgery to day of discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=30) Intervention 2: No enhanced recovery programme (standard care) - Standard care. day before surgery, patients received gastrointestinal preparation and were fasted from midnight. The lengths of incision were determined according to the surgeons preference (usually across the umbilicus). Nasogastric tubes

	were placed preoperatively and usually remained until flatus occurred after operation and no gastric retention presented. Intraabdominal drains were placed during surgery and maintained until the day before discharge home. Postoperatively patients had no oral intake until bowel flatus or obvious GI movement occurred. Patients mobilized at their will and usually lay in bed for about 2 days after surgery. . Duration day of surgery to day of discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: OPTIMIZED GROUP versus STANDARD CARE Protocol outcome 1: Perioperative complications - Actual outcome: Total Complications at day of surgery to 30 days postoperatively ; Group 1: 4/33, Group 2: 6/30; Comments: includes septic (urinary tract infection, wound infection or breakdown & abdominal infection); non septic (deep vein thrombosis, diarrhea and vomiting and ileus); anastomotic leakage; readmission; death Risk of bias: All domain - Low, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: authors stated that it was not possible to blind this study. ; Group 1 Number missing: 0, Reason: no missing data reported; Group 2 Number missing: 0, Reason: no missing data reported Protocol outcome 2: Length of hospital stay - Actual outcome: length of hospital stay at day of surgery to discharge; Mean; (p value : <0.001) days, Comments: 6.2 +/- 1.9 days for the optimized group and 9.8 +/- 2.8 days for the standard care group); Risk of bias: All domain - Low, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: authors stated that it was not possible to blind this study. ; Group 1 Number missing: , Reason: no missing data reported; Group 2 Number missing: , Reason: no missing data reported	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	**Liu 2016[120]**
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=86)
Countries and setting	Conducted in China; Setting: Department of General Surgery, Chinese PLA General Hospital
Line of therapy	Not applicable

Study	Liu 2016[120]
Duration of study	Intervention + follow up: September 2014 and August 2015
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	a diagnosis of Gastric Cancer by a preoperative pathological biopsy using a gastroscope; age ≥60 years; conforming with surgical indications and having no surgical contraindications according to “Japanese gastric cancer treatment statute”; and good compliance
Exclusion criteria	a history of cancer, abdominal surgery, and the presence of recent acute infection; tumor impregnated with serous or Stage IV according to intraoperative assessment; merging obstruction or perforation; receiving preoperative radiotherapy or chemotherapy; with contraindications of anesthesia or pneumoperitoneum; and autoimmune diseases, metabolic diseases, or major diseases of other systems
Recruitment/selection of patients	Patients diagnosed with GC between September 2014 and August 2015 were recruited to participate in this study.
Age, gender and ethnicity	Age - Mean (SD): FTS: 68.5 ± 4.6; Conventional: 69.5 ± 5.4. Gender (M:F): 42/42. Ethnicity: NR
Further population details	1. Age: >60 years (FTS: 68.5 ± 4.6; Conventional: 69.5 ± 5.4). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: lower and upper GI (laparoscopy and laparatomy for gastric cancer).
Indirectness of population	No indirectness
Interventions	(n=42) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative: great importance given to preoperative education; Fasting for 6 h; water deprivation for 2 h; no bowel preparation; No routine gastric tube or pull the gastric tube as soon as possible after surgery. •Intraoperative: Intraoperative transfusion capacity is 1,500 mL or less; intraoperative insulation routinely; Incision processing as small as possible. •Postoperative: Nonsteroidal anti-inflammatory drug intravenously after surgery twice daily; Urine tube unplugged within 48h; off bed activity and diet commenced one day after surgery. Duration 1 day preoperatively up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=42) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Intraoperative: routine education preoperatively; Fasting for 12 h; water deprivation for 4 h; Oral laxatives; Preoperative routine use of nasogastric tube. •Intraoperative: No routine intraoperative insulation; no control of intraoperative transfusion capacity; No special emphasis on creating a narrow incision. •Postoperative: No anti-inflammatory drug given routinely; urine tube unplugged after 3-5 days postoperativelyl; diet restarted

Study	Liu 2016[120]
	after recovery of intestinal function; mobilization not encouraged. . Duration 1 day preoperatively up to discharge . Concurrent medication/care: NA. Indirectness: No indirectness
Funding	No funding
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK versus CONVENTIONAL CARE Protocol outcome 1: Perioperative complications - Actual outcome: Postoperative complications at postoperative up to 30 days after discharge ; Group 1: 24/42, Group 2: 12/42 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 2: Length of hospital stay - Actual outcome: Postoperative hospital stay time at postoperative to discharge ; Group 1: mean 8.05 days (SD 2.4); n=42, Group 2: mean 9.2 days (SD 2.4); n=42; Comments: p value < 0.05 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Lu 2014[124]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=297)
Countries and setting	Conducted in China; Setting: University Hospital
Line of therapy	Not applicable
Duration of study	Intervention + follow up: 32 months
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable

Study	Lu 2014[124]
Inclusion criteria	first diagnosed and pathological examination confirmed; preoperative assessment suggested no existing physical illnesses; A or B Child-Pugh grade, no metastasis and limited partial liver resection; no preoperative or intraoperative transcatheter hepatic arterial chemoembolization or radiofrequency ablation performed; the tumor was completely resected.
Exclusion criteria	not specified
Recruitment/selection of patients	Unclear. States 297 hepatocellular carcinoma patients within liver surgery department were selected.
Age, gender and ethnicity	Age - Mean (SD): Fast track 54.0 ± 11.4; non fast track 52.6 ± 11.3. Gender (M:F): 144/53. Ethnicity: NR
Further population details	1. Age: <60 years (Fast track 54.0 ± 11.4; non fast track 52.6 ± 11.3). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 1 (ASA I - 159; ASA II - 138). 3. Type of surgery: lower and upper GI (liver resection).
Indirectness of population	No indirectness
Interventions	(n=135) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. In Fast-track (FT) group, shorten anesthetic time and controlled central venous pressure (CVP) was less than 5mmHg and hypothermic and fluid overload were avoided. Precision liver resection was performed on patients in the FT group; on the basis of complete resection of tumor, hepatic portal occlusion time was shortened as much as possible and no surgical drainage was used. After operation, for patients in FT group, early mobilization on postoperative day 1 was encourages, enteral nutrition was given and meanwhile IV infusion was limited and urinary catheter was removed first day postoperatively. . Duration admission to discharge. Concurrent medication/care: NA. Indirectness: No indirectness Comments: Both groups underwent the same preoperative programs: which included preoperative education of surgical procedure and postoperative care; absence of bowel preparation and prophylactic antibiotics; preoperative fasting for 6 hours and water deprivation and glucose solution infusion 2 hours before the operation; no routine use of NG tube. (n=162) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Conventional anesthetic and surgical procedures were followed. Operation methods included i) simple lobectomy ii) lobectomy and cholecystectomy iii) simple left liver resection iv) simple right liver resection v) left liver resection with cholecystectomy. No early mobilization, routine use of surgical drains and patients followed a traditional process of enteral nutrition and removal of urinary catheter. . Duration admission to discharge. Concurrent medication/care: NA. Indirectness: No indirectness Comments: Both groups underwent the same preoperative programs: which included preoperative education of surgical procedure and postoperative care; absence of bowel preparation and prophylactic antibiotics; preoperative fasting for 6 hours and water deprivation and glucose solution infusion 2 hours before the operation; no routine use of NG tube.

Study	Lu 2014[124]
Funding	Funding not stated
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST-TRACK GROUP versus NON FAST-TRACK GROUP Protocol outcome 1: Mortality - Actual outcome: Mortality at Unclear; Group 1: 0/135, Group 2: 0/162 Risk of bias: All domain - Low, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0, Reason: analysis reported for all patients randomized; Group 2 Number missing: 0, Reason: analysis reported for all patients randomized Protocol outcome 2: Perioperative complications - Actual outcome: incidence of postoperative complications at admission to discharge; Group 1: 7/135, Group 2: 12/162; Comments: p value 0.436 Risk of bias: All domain - Low, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0, Reason: analysis reported for all patients randomized; Group 2 Number missing: 0, Reason: analysis reported for all patients randomized Protocol outcome 3: Length of hospital stay - Actual outcome: Hospital stay at admission to discharge; Median (interquartile range): FT group 10 (9-12); Non FT group 13 (11-15) days, Comments: p value 0.000); Risk of bias: All domain - Low, Selection - High, Blinding - High, Incomplete outcome data - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0, Reason: analysis reported for all patients randomized; Group 2 Number missing: 0, Reason: analysis reported for all patients randomized Protocol outcome 4: Hospital readmission - Actual outcome: Readmission at Unclear; Group 1: 0/135, Group 2: 0/162 Risk of bias: All domain - Low, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0, Reason: analysis reported for all patients randomized; Group 2 Number missing: 0, Reason: analysis reported for all patients randomized	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Magheli 2011[129]

Study	Magheli 2011[129]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=50)
Countries and setting	Conducted in Germany
Line of therapy	Not applicable
Duration of study	Intervention time:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	not stated
Exclusion criteria	reduced renal function (creatinine levels preoperatively >1.6mg/dL); ASA IV; use of cytotoxic drugs, immunosuppressants, or anticonvulsives; severe general or central nervous system diseases; and refusal to participate in the study
Recruitment/selection of patients	not stated
Age, gender and ethnicity	Age - Mean (SD): Fast track 61.8 ± 4.7; Conventional care 61.9 ± 7.0. Gender (M:F): all male (prostate surgery). Ethnicity: NR
Further population details	1. Age: >60 years (Fast track 61.8 ± 4.7; Conventional care 61.9 ± 7.0). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 4; ASA II - 42; ASA III - 4). 3. Type of surgery: urology (radical prostatectomy).
Indirectness of population	No indirectness
Interventions	(n=25) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. FT patients received an accelerated oral nutrition and mobilization management with an adapted opioid free analgetic treatment that incorporated high dose COX2 inhibitors postoperatively. Furthermore, FT patients were subject to highly encouraged postoperative mobilization and early discharge from the hospital. . Duration admission to discharge. Concurrent medication/care: NA (n=25) Intervention 2: No enhanced recovery programme (standard care) - Standard care. conventional care protocols not specified in article. Duration admission to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

Study	Magheli 2011[129]
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK GROUP versus CONVENTIONAL CARE GROUP Protocol outcome 1: Length of hospital stay - Actual outcome: Hospital stay at postoperative to discharge; Group 1: mean 3.6 (SD 1.2); n=25, Group 2: mean 6.7 (SD 0.9); n=25; Comments: p value < 0.001 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Comments - FT patients were discharged home on POD 3 with an indwelling transurethral catheter. Conventional patients were briefed on a hospital stay of 6 - 8 days with removal of transurethral catheter prior to discharge. ; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Perioperative complications ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Mari 2014[133]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=52)
Countries and setting	Conducted in Italy
Line of therapy	Not applicable
Duration of study	Intervention + follow up: January 2012 - October 2012
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	total laparoscopic high anterior resection (HAR); ASA I - III; aged between 18 - 85; BMI < 30; no intestinal diversion
Exclusion criteria	not specified
Recruitment/selection of patients	selected from patients who had indication for total laparoscopic high anterior resection (HAR) for benign or oncologic disease
Age, gender and ethnicity	Age - Median (range): 66 (29 - 83). Gender (M:F): 25/27. Ethnicity: NR
Further population details	1. Age: >60 years (median: 66 (29 - 83)). 2. American Society of Anesthesiologists (ASA) Physical Status

Study	Mari 2014[133]
	grade: ASA 1 (ASA I - 35, ASA II - 15, ASA III - 1). 3. Type of surgery: lower and upper GI (total laparoscopic high anterior resection (HAR) for benign or oncologic disease).
Indirectness of population	No indirectness
Interventions	(n=26) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •fiber free diet for 4 - 5 days preoperatively. •Day before surgery: free diet; with maltodestrine drinks and clisma fleet bowel preparation the evening before surgery. •Intraoperatively: NG tubes removed after surgery; urinary catheter in situ; fluid administration 10mL/kg/h; analgesia - paracetamol 1g QDS with wound infiltration naroprine 7.5% 2fL. •Antibiotic therapy: short term cephazoline 2g IV and metronidazole. •Mobilization: 5h after surgery patient sits out of bed, free walking from day 1. •Oral intake: 5h after surgery oral semi fluid diet. •Fluid administration: 100mL/h for 20h in continuous parenteral infusion with protein loaded drink. •Day 1-3: removal of bladder catheter; semi-solid diet / fiber free diet; mobilization at least 100m; paracetamol.. Duration 5 days preoperatively up to discharge . Concurrent medication/care: NA. Indirectness: No indirectness (n=26) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •fiber free diet 4-5 days preoperatively. • Day before surgery: fasting from dinner (1000 glucosalina) and osmotic laxative for bowel preparation. •Intraoperatively : NG tube; central line; and bladder catheter kept in situ. •fluid administration: 15 mL/kg/h. •Analgesia: Morfyn 3fL + NSAID; 2fL + metoclopramyd 1fL. •Antibiotic therapy: short term cephazoline + metronidazole. •Fluid administration of 100mL/l for 48h in continuous parenteral infusion. •Day 1-5: step wise introduction of mobilization and fiber free diet; removal of NG tube; stop opioids and parenteral fluid management. . Duration 5 days preoperatively up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK GROUP versus STANDARD CARE

Protocol outcome 1: Perioperative complications
- Actual outcome: Major Complications at postoperatively up to 30 days of discharge; Group 1: 1/25, Group 2: 0/25; Comments: FT group - medical complication of respiratory distress requiring diuretic and antibiotic therapy
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 1, Reason: had to perform laparotic conversion ; Group 2 Number missing: 1, Reason: further surgery needed

Protocol outcome 2: Length of hospital stay
- Actual outcome: Day of discharge at admission to discharge; Group 1: mean 4.7 (SD 2.4); n=25, Group 2: mean 7.65 (SD 2.4); n=25

Study	Mari 2014[133]
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 1, Reason: had to perform laparotic conversion ; Group 2 Number missing: 1, Reason: further surgery needed Protocol outcome 3: Hospital readmission - Actual outcome: Readmission at within 30 days of discharge; Group 1: 0/25, Group 2: 0/25 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 1, Reason: had to perform laparotic conversion ; Group 2 Number missing: 1, Reason: further surgery needed Protocol outcome 4: Pain - Actual outcome: Pain perception at postoperatively prior to discharge; Visual Analogue Scale: No results provided points 1-10 Top=High is poor outcome, Comments: p value < 0.05; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 1, Reason: had to perform laparotic conversion ; Group 2 Number missing: 1, Reason: further surgery needed	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	Mari 2016[132]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=140)
Countries and setting	Conducted in Italy
Line of therapy	Not applicable
Duration of study	Intervention time: February 2014 - December 2015
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	Aged 18 - 80; ASA I - III; autonomous for mobilization and walking; eligible for laparoscopic technique of

Study	Mari 2016[132]
	surgery.
Exclusion criteria	not specified
Recruitment/selection of patients	Patients who had an indication for major colorectal surgery
Age, gender and ethnicity	Age - Median (IQR): ERP 64 (42-83); Standard 67 (39-87). Gender (M:F): 74/66. Ethnicity: NR
Further population details	1. Age: >60 years (ERP 64 (42-83); Standard 67 (39-87)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 32; ASA II - 89; ASA III - 19). 3. Type of surgery: lower and upper GI (laparoscopic colorectal surgery).
Indirectness of population	No indirectness
Interventions	(n=70) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •preoperative: no bowel preparation, 200mL maltodextrin intake 6 and 2 hours before surgery; •Intraoperatively: 5-20mL/kg/h during surgery, NG tube to be removed after intubation, no drainage tube; •Analgesia: combined spinal analgesia with opioid and oral NSAIDS after surgery; •Postoperative: 1500mL/d until 24h after surgery, fluid meal 6h after surgery then solid meal 24h after surgery, mobilization 6h after surgery. Had to walk 100m the day after surgery.. Duration 1 day before surgery to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=70) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperative: laxative 2 days before surgery and cleaning enema 1 day before surgery, fasting after midnight before surgery; •Intraoperative: no restriction in fluid management during surgery, to keep NG tube until 24h after surgery, drainage tube according to surgeons preference; •Analgesia: IV opioid unti after surgery then oral NSAIDSs; •Postoperative: 2000mL/d until 48h after surgery, fluid meal 48h after surgery then solid meal, mobilization on POD 1 and then at least 100m walk on POD 2.. Duration 2 days before surgery to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Length of hospital stay
- Actual outcome: Day of discharge at admission to discharge; Group 1: mean 5 days (SD 2.6); n=65, Group 2: mean 7.2 days (SD 3); n=70
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - High, Crossover - Low, Comments - day of discharge not listed in methodology and only discussed in results section; Indirectness of outcome: No indirectness ; Blinding details: no blinding information given; Group 1 Number missing: 5, Reason: lost to follow up; Group 2 Number missing: 0

Study	Mari 2016[132]
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Perioperative complications ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Mingjie 2017[138]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=152)
Countries and setting	Conducted in China; Setting: university hospital
Line of therapy	Not applicable
Duration of study	Intervention + follow up: September 2013 - August 2014
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	A preoperative cancer of stage T2, T3, T4a, any N, M0 without digestive obstruction confirmed by the whole body CT scan, which could be treated with Laparoscopic gastrectomy. age 18 - 75. Pathologic confirmation of gastric adenocarcinoma by endoscopic biopsy. Normal hematological, renal, hepatic, and cardiac parameters. ASA score <III without severe systemic disease. No history of treatment with neoadjuvant chemotherapy and or radiotherapy.
Exclusion criteria	patients requiring conversion to open gastrectomy. Excessive bleeding > 500ml. Patients opting out of the study.
Recruitment/selection of patients	152 patients of the same surgeon that met the eligibility criteria. Unclear how the patients were selected.
Age, gender and ethnicity	Age - Mean (range): ERP 61 (40-75), Conventional 63 (35-75). Gender (M:F): 98/51. Ethnicity: NR
Further population details	1. Age: >60 years (ERP 61 years and conventional care 63 years (mean age)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (patients were ASA II or III. ERP 2 (2 - 3) and Conventional 2.5 (2 - 3) (mean ASA scores)). 3. Type of surgery: lower and upper GI (laparoscopic gastrectomy for early gastric cancer).
Extra comments	Patients with operable advanced gastric cancer receiving treatment at the department of gastric and colorectal surgery. One patient in the ERP group suffered from excessive bleeding and two other patients withdrew their consent during the course of the study.
Indirectness of population	No indirectness

Study	Mingjie 2017[138]
Interventions	(n=76) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Educated to ensure they were ready to participate in the ERP program pre-operatively. Allowed to take normal meal until 6 hours before the operation and then drink carbohydrate drinks until 2 hours before the operation. Mechanical bowel preparation and nasogastric tube were avoided. Intraoperative anesthetic guidelines included nonopioid analgesia after induction, need-based vasoactive drug administration, restriction of IV fluids and intra-peritoneal ropivacaine infusion. Postoperatively provided with specific instructions for nonopioid pain control, early drain removal, early oral diet and early mobilization. . Duration 1-3 days admission prior to surgery to day of discharge post operatively. Concurrent medication/care: NA. Indirectness: No indirectness Comments: one patient suffered excessive bleeding during the operation and excluded from the study. Two patients withdrew their consent during the course of the study. (n=76) Intervention 2: No enhanced recovery programme (standard care) - Standard care. No solid foods at dinner befor the day of surgery, no liquids 12 hours before surgery. Routine bowel preparation and NG tube placement on the day or surgery. Intraoperative routine use of anesthetic medication, no fluid restriction and routine use of abdominal drainage tubes and placement of catheters. Postoperatively patient not advised to get out of bed until 24 - 48 hours after surgery, IV fluids not restricted, intramuscular opioid analgesics, parenteral nutrition until flatus and drain removal prior to discharge. . Duration 1 - 3 days admission prior to surgery to day of discharge post operatively. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus CONVENTIONAL CARE

Protocol outcome 1: Mortality
- Actual outcome: mortality post operatively at postoperative; Group 1: 0/73, Group 2: 0/76
Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: no explanation of blinding process for participants, caregivers or outcome assessors. ; Group 1 Number missing: 3, Reason: did not receive allocated intervention; Group 2 Number missing: 0, Reason: did not receive allocated intervention

Protocol outcome 2: Length of hospital stay
- Actual outcome: length of postoperative stay at Postoperative to dicharge; Group 1: mean 6.38 (SD 2.04); n=73, Group 2: mean 8.62 (SD 2.87); n=76; Comments: p value < 0.001
Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: no explanation of blinding process for participants, caregivers or outcome assessors. ; Group 1 Number missing: 3, Reason: did not receive allocated intervention; Group 2 Number missing: 0, Reason: did not receive allocated intervention

Study	Mingjie 2017[138]
Protocol outcome 3: Hospital readmission - Actual outcome: readmission post discharge at up to 30 days postoperatively; Group 1: 1/73, Group 2: 0/76; Comments: readmission due to anastomotic leakage Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Blinding details: no explanation of blinding process for participants, caregivers or outcome assessors. ; Group 1 Number missing: 3, Reason: did not receive allocated intervention; Group 2 Number missing: 0, Reason: did not receive allocated intervention	
Protocol outcomes not reported by the study	Quality of life ; Perioperative complications ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Deng 2017[41]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	N/A (n=159)
Countries and setting	Conducted in China; Setting: Department of surgery, Ruijin hospital, Shanghai Jiao Tong University School of Medicine
Line of therapy	Not applicable
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall: N/A
Subgroup analysis within study	Not applicable: N/A
Inclusion criteria	patients undergoing pancreaticoduodenectomy
Exclusion criteria	widespread tumor metastasis, adhesion with nearby organs, vessels invasion and widespread peritoneal metastasis.
Recruitment/selection of patients	not stated
Age, gender and ethnicity	Age - Mean (SD): ERP 54.5±12.7 (33-84) standard 51.3±15.0 (37-78). Gender (M:F): 92/67. Ethnicity: chinese
Further population details	1. Age: Not applicable 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: lower and upper GI

Study	Deng 2017[41]
Indirectness of population	No indirectness
Interventions	(n=76) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Day before surgery: Normal oral nutrition until 10 pm; No pre-anaesthetic medication; Day of surgery: Preoperative information given to patient, including daily milestones; Elastomeric analgesia pump:(flurbiprofen 300mg, tramadol 60 mg in 100-ml saline solution) Warm i.v.fluids, and upper and lower air-warming device; Avoidance of excessive i.v.fluid; First night in ICU (intensive care unit) Day 1-2: Patient sent back to surgical ward; Removal of naso-gastric tube if<200ml; Patient mobilized at least 4 times a day; Day 2: Continue mobilization minimum 4 times per day; Sip of warm water at rate≤30ml/h; Metoclopramide os to prevent nausea and vomiting Day 3: Urinary catheters removed; Stop elastomeric pump; Clear oral liquid; Enhanced mobilization; Day 4: Soft solid diet; Day 5: Dietary increase on daily basis; Medical oncology and radiaation oncology consults(if appropriate); Day 7-10: Removal of drainage tubes if no pancreatic/biliary fistula and <200ml; Discharge: Absence of fever for more than 48h; Day 8-11: Able to take solid food; Passage of normal stools; Adequate mobilization; Acceptance of discharge by the patient . Duration day before the surgery + 11 days post surgery. Concurrent medication/care: Not stated. Indirectness: No indirectness (n=83) Intervention 2: No enhanced recovery programme (standard care) - Standard care. The conventional perioperative parameters included routine perioperative bowel preparation with regular oral antibiotics and no oral intake for 12 hours before surgery. The naso-gastric tube was kept in place until day 7 after surgery with no scheduled early mobilization. The oral liquid intake was resumed from day 7 and a stepwise oral intake recovery was allowed with only water for the first two days followed by resumption of liquid diet during the next 4 days. Later, mashed hard food intake was allowed.. Duration day before the surgery + 11 days post surgery. Concurrent medication/care: not stated. Indirectness: No indirectness
Funding	Academic or government funding (This study was funded by Nature Science Foundation of China (30872511), Shanghai Charity Foundation for Cancer Research and Ph.D. Innovation Fund of Shanghai Jiaotong University School of Medicine

Study	Deng 2017[41]
	(BXJ201709).)
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE Protocol outcome 1: Mortality - Actual outcome: Mortality ; Group 1: 0/76, Group 2: 0/83 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 2: Perioperative complications - Actual outcome: Hospital readmission at in 30 days; Group 1: 1/76, Group 2: 1/83 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 - Actual outcome: Perioperative complications at post surgery; Group 1: 76/76, Group 2: 87/83 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 3: Length of hospital stay - Actual outcome: length of hospital stay at post surgery; p: 0.024, Comments: ERP 15 days +/-8; Conventional 19 days +/- 10); Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 4: Length of stay in intensive care unit - Actual outcome: Stay in ICU at post surgery; p: 0.733, Comments: ERP 4 days +/- 1; Conventional 4+/-2); Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Muehling 2008[141]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=59)
Countries and setting	Conducted in Germany

Study	Muehling 2008[141]
Line of therapy	Not applicable
Duration of study	Intervention time:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	All patients that were admitted with suspected lung neoplasms and who had the indication of lung resection (wedge or anatomic resection) were eligible for the study. After given written informed consent patients were randomly assigned to either the conservative or the fast track patient management.
Exclusion criteria	Patients were excluded if one of the following conditions was given: withdrawal of informed consent, clinical signs of infection (fever, leukocytosis) on admission, pre-existing pneumonia, contraindications for thoracic epidural anesthesia (e.g. coagulopathy), or neuromuscular disorder that did not allow proper postoperative physiotherapy. Repeat lung resection or neo-adjuvant chemotherapy were not reasons for exclusion from the study.
Recruitment/selection of patients	Selected from patients who had indications for lung resection
Age, gender and ethnicity	Age - Median (range): Fast Track: 67 (45-81); Conservative: 64 (24-83). Gender (M:F): 43/15. Ethnicity: NR
Further population details	1. Age: >60 years (Fast Track: 67 (45-81); Conservative: 64 (24-83)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 3 (ASA II - 9; ASA III - 47; ASA IV - 4). 3. Type of surgery: Not applicable (lung resection).
Indirectness of population	No indirectness
Interventions	(n=30) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. The introduced fast track regimen includes preoperative patient education identical to the conservative management; preoperative fasting is limited to 2 h preoperatively and pain control was realized using a preoperatively inserted thoracic epidural catheter which was placed in the intervertebral spaces at the level between T5 and T9 with the loss of resistance technique. Patients received 10 ml of ropivacaine 1% preoperatively followed by the administration of ropivacaine 0.2% and sufentanil (2 mg/ml) postoperatively in a patient controlled manner (PCEA) accompanied by NSAIDs. Enteral feeding and ambulation started on the evening of the operation. Duration admission to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=28) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Traditional

Study	Muehling 2008[141]
	perioperative management of patients undergoing lung resection in our institution consists of the following measurements: preoperative patient education, preoperative fasting for 6 h;pain control is usually achieved by application of intercostal nerve blockade intraoperatively using 5 ml of ropivacaine 0.75% and postoperative administration of i.v. opioids (piritramide) in a patient controlled manner (PCA). Apart from that patients receive medication with NSAIDs (diclofenac75 mg twice daily + metamizole 1g i.v. four times daily). Enteral feeding and ambulation start from the first postoperative day, i.v. fluids are restricted to 1000 ml/24 h. . Duration admission to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus CONSERVATIVE CARE

Protocol outcome 1: Mortality
- Actual outcome: Death at Postoperatively; Group 1: 1/27, Group 2: 1/28; Comments: unclear time period
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: drop outs; Group 2 Number missing: 0

Protocol outcome 2: Perioperative complications
- Actual outcome: Total complications at Postoperatively; Group 1: 8/30, Group 2: 13/28; Comments: arrhythmia; myocardial infarction/decompensation
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 3, Reason: drop outs; Group 2 Number missing: 0
- Actual outcome: Reoperation at Postoperatively; Group 1: 1/30, Group 2: 1/28
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: drop outs; Group 2 Number missing: 0

Protocol outcome 3: Length of hospital stay
- Actual outcome: Day of discharge at admission to discharge; Mean; (median (range): FT: 11 (8-33); Conservative 11 (7-34)) days);
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: drop outs; Group 2 Number missing: 0

Protocol outcome 4: Length of stay in intensive care unit
- Actual outcome: Length of stay in ICU at Postoperatively ; Median (range) : FT: 1 (1-33); Conservative: 1(1-12) days);
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: drop outs; Group 2 Number missing: 0

Study	Muehling 2008[141]
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Muehling 2009[140]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=101)
Countries and setting	Conducted in Germany; Setting: University Hospital
Line of therapy	Not applicable
Duration of study	Intervention time:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	All patients admitted with indications for the elective open repair of an infrarenal aortic aneurysm were eligible for the study. We see an indication for aneurysmectomy if the diameter exceeds 5.5 cm or if the aneurysm shows a rapid increase in diameter of more than 0.5 cm within 6 months.
Exclusion criteria	A patient was excluded for any of the following reasons: withdrawal of informed consent, clinical signs of infection (fever, leukocytosis) on admission, contraindications for epidural anesthesia (e.g.,coagulopathy), neuromuscular disorder that would not allow proper postoperative physiotherapy. Planned suprarenal clamping also led to exclusion from the study.
Recruitment/selection of patients	all patients admitted with indications for the elective open repair of an infrarenal aortic aneurysm
Age, gender and ethnicity	Age - Median (range): FT 67 (40-81); Traditional care 68 (52-84). Gender (M:F): 93/6. Ethnicity: NR
Further population details	1. Age: >60 years (FT 67 (40-81); Traditional care 68 (52-84)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 3 (ASA I - 10; ASA III - 66; ASA IV 3). 3. Type of surgery: vascular (abdominal aortic aneurysm repair).
Indirectness of population	No indirectness
Interventions	(n=50) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. The introduced the fast-track regimen includes preoperative patient education identical to traditional management; preoperative fasting is limited to 2 h preoperatively and bowel washout is not performed. General anesthesia was supplemented by a preoperatively inserted epidural catheter which was placed in

Study	Muehling 2009[140]
	the intervertebral spaces at the level between T7 and T10 with the loss-of-resistance technique. Patients received 10 ml of ropivacaine 1% preoperatively followed by the administration of ropivacaine 0.2% and sufentanil (2 lg/ml) postoperatively in a patient-controlled manner (patient-controlled epidural analgesia [PCEA]) accompanied by NSAIDs. Enteral feeding and ambulation were begun on the evening of the operation; the nasogastric tube was removed at the end of the operation. Intravenous fluids were restricted to 1,000 ml/24 h, and patients were allowed to drink up to 2,000 ml/24 h. Mobilization from POD 1. Duration 1 day preoperatively up to discharge. Concurrent medication/care: The patients' regular medication - in particular b-blockers - was continued perioperatively. All patients received an oral benzodiazepine premedication with clorazepate dipotassium (20 mg) in the evening and midazolam (7.5 mg) 1 hour prior to induction of anesthesia.. Indirectness: No indirectness (n=51) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Traditional perioperative management consists of the following factors: preoperative patient education, preoperative fasting for 6 h, and bowel washout; pain control is usually achieved by postoperative administration of i.v. opioids (piritramide) in a patient-controlled manner. In addition, patients receive nonsteroidal anti-inflammatory drugs (NSAIDs; diclophenac 75 mg twice daily metamizole 1 g i.v. four times daily). The naso-gastric tube is removed if secretions amount to less than 300 ml/24 h. Enteral feeding starts from the second post operative day after onset of bowel movements; i.v. fluids (cristalloids) in the early postoperative period are set to 3,000 ml/24 h. Mobilization from evening of operation. Duration 1 day preoperatively up to discharge . Concurrent medication/care: The patients' regular medication - in particular b-blockers - was continued perioperatively. All patients received an oral benzodiazepine premedication with clorazepate dipotassium (20 mg) in the evening and midazolam (7.5 mg) 1 hour prior to induction of anesthesia.. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK versus STANDARD CARE

Protocol outcome 1: Mortality
- Actual outcome: Postoperative mortality at postoperatively up to discharge; Group 1: 0/49, Group 2: 0/50
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 1, Reason: withdrew consent; Group 2 Number missing: 1, Reason: withdrew consent

Protocol outcome 2: Perioperative complications
- Actual outcome: Reoperation at postoperatively up to discharge; Group 1: 5/49, Group 2: 4/50; Comments: number of patients

Study	Muehling 2009[140]
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 1, Reason: withdrew consent; Group 2 Number missing: 1, Reason: withdrew consent - Actual outcome: Patients with medical complications at postoperatively up to discharge; Group 1: 8/49, Group 2: 18/50 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 1, Reason: withdrew consent; Group 2 Number missing: 1, Reason: withdrew consent - Actual outcome: Patients with surgical complications at postoperatively up to discharge; Group 1: 6/49, Group 2: 5/50; Comments: Including: postoperative bleeding; peripheral embolization; graft occlusion; ischemic colitis; cholecystitis; incisional hernia; wound infection Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 1, Reason: withdrew consent; Group 2 Number missing: 1, Reason: withdrew consent Protocol outcome 3: Length of hospital stay - Actual outcome: Postoperative length of stay at postoperative to discharge; Median (range): FT - 10 (6-49); TC - 11 (8-45) days); Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 1, Reason: withdrew consent; Group 2 Number missing: 1, Reason: withdrew consent Protocol outcome 4: Length of stay in intensive care unit - Actual outcome: Length of stay in ICU at postoperatively; Median (range): FT - 20 (14-336); TC - 32 (12-293) hours); Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 1, Reason: withdrew consent; Group 2 Number missing: 1, Reason: withdrew consent	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Muller 2009[142]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=156)
Countries and setting	Conducted in Switzerland; Setting: multicenter, randomized trial in 4 surgical departments (teaching hospitals) in Switzer- land.

Study	Muller 2009[142]
Line of therapy	Not applicable
Duration of study	Intervention + follow up: November 2004 until October 2006
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	older than 18 years of age who were undergoing open elective colonic resection with a primary anastomosis.
Exclusion criteria	emergency situations, contraindication to epidural anesthesia, scheduled total colectomy or rectum resection, and preoperatively immobile patients.
Age, gender and ethnicity	Age - Median (range): Fast track: 62 (27-91); Control: 59 (39-89). Gender (M:F): 77/74. Ethnicity: NR
Further population details	1. Age: Not stated / Unclear (Fast track: 62 (27-91); Control: 59 (39-89)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 5; ASA II - 104; ASA III - 42). 3. Type of surgery: lower and upper GI (open colonic surgery).
Indirectness of population	No indirectness
Interventions	(n=76) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. no bowel preparation was performed and patients were allowed to drink clear fluids until 4 hours before surgery. All patients received thromboprophylaxis and perioperative antibiotics. Surgery was performed through a median laparotomy and the anastomosis was either hand sewn or a stapler technique was used. No nasogastric tubes or intra-abdominal drains were used postoperatively. All anesthetic procedures and agents were standardized. Patients received a restricted fluid regimen with a preoperative loading of Ringer's lactate solution at 1 mL/kg/h nothing by mouth and an intraoperative substitution of 5 mL/kg/h. All fluids were discontinued at day 1 after surgery unless there was a medical reason to do otherwise. All patients were encouraged to early mobilization starting immediately after surgery in both groups. Patients were allowed to start drinking immediately after surgery. Two additional protein drinks were given (Fresenius Power Drink; Fresenius Kabi, Stans, Switzerland) for the first 3 days, and patients were invited to resume oral nutrition on day 1 after surgery. An epidural catheter with ropivacaine 0.33% or bupivacaine 0.25% was placed at thoracic level 6–9 preoperatively and removed on the second postoperative day. As additional analgesics, only paracetamol was given intravenously. . Duration day of surgery to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=75) Intervention 2: No enhanced recovery programme (standard care) - Standard care. no bowel preparation was performed and patients were allowed to drink clear fluids until 4 hours before surgery. All patients received thromboprophylaxis and perioperative antibiotics. Surgery was performed through a

Study	Muller 2009[142]
	median laparotomy and the anastomosis was either hand sewn or a stapler technique was used. No nasogastric tubes or intra-abdominal drains were used postoperatively. All anesthetic procedures and agents were standardized. The group received Ringer's lactate at 2 mL and 10 mL/kg/h for preoperative loading and intraoperative substitution, respectively. The patients received 2000 mL of Ringer's lactate per 24 hours until day 3 after surgery. Additional fluid or vasopressors were given when the mean arterial pressure was less than 60 mm Hg or urine output was less than 0.5 mL/kg/h. All patients were encouraged to early mobilization starting immediately after surgery in both groups. Patients were allowed to start drinking on day 2 and started increasing oral nutrition on day 2, with possible full oral nutrition by day 4. An epidural catheter with ropivacaine 0.33% or bupivacaine 0.25% was placed at thoracic level 6–9 preoperatively and removed on the second postoperative day. As additional analgesics, only paracetamol was given intravenously. A failure of epidural analgesia was defined as the need for supplemental intravenous opioids. . Duration day of surgery to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK versus CONTROL

Protocol outcome 1: Perioperative complications
- Actual outcome: Total complications at postoperatively up to 30 days post discharge; Group 1: 16/76, Group 2: 37/75; Comments: p value 0.0014
Risk of bias: All domain - High, Selection - Low, Blinding - Very high, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0, Reason: 5 patients missing but unclear from which treatment arm; no details given; Group 2 Number missing: 0, Reason: 5 patients missing but unclear from which treatment arm; no details given

Protocol outcome 2: Length of hospital stay
- Actual outcome: Hospital stay at admission to discharge; Median (range): Fast track: 5 (2-30); Control: 6 (6-30), Comments: p value < 0.0001);
Risk of bias: All domain - High, Selection - Low, Blinding - Very high, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0, Reason: 5 patients missing but unclear from which treatment arm; no details given; Group 2 Number missing: 0, Reason: 5 patients missing but unclear from which treatment arm; no details given

Protocol outcome 3: Hospital readmission
- Actual outcome: Rehospitalization at discharge to 30 days postoperatively ; Group 1: 3/76, Group 2: 2/75; Comments: p value 1
Risk of bias: All domain - High, Selection - Low, Blinding - Very high, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 0, Reason: 5 patients missing but unclear from which treatment arm; no details given; Group 2 Number missing: 0, Reason: 5 patients missing but unclear from which treatment arm; no details given

Study	Muller 2009[142]
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Alito 2016[5]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	N/A (n=36)
Countries and setting	Conducted in Brazil; Setting: São Mateus Hospital (Cuiabá, Brazil) from May 2012 to February 2013
Line of therapy	Not applicable
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Method of assessment /diagnosis not stated
Stratum	Overall: N/A
Subgroup analysis within study	Not applicable: N/A
Inclusion criteria	adult patients (18–80 y/o) of both sexes who had hip osteoarthrosis and were candidates for elective THA.
Exclusion criteria	Patients were excluded if they had fasting glycemia measurements >200 mg/dL; acquired immuno-deficiency; renal failure (creatinine >2 mg/dL); cirrhosis; moderate or severe Alzheimer's disease (clinical dementia rating score between 2 and 3); an American Society of Anesthesiologists (ASA) score >2; previous spinal surgery (arthrodesis) or previous THA (reviewing or changing the prostheses); or severe malnutrition (loss of 10 % of body weight over the last 6 months). We also excluded patients whose blood samples were not obtained at the scheduled time or who did not complete the perioperative protocol, e.g., did not consume the immune supplement if assigned to the ACERTO group.
Recruitment/selection of patients	adult patients (18–80 y/o) of both sexes who had hip osteoarthrosis and were candidates for elective THA.
Age, gender and ethnicity	Age - Mean (SD): ERP 57 +/-12; Standard care 58 +/-17. Gender (M:F): Define. Ethnicity: Brazilian
Further population details	1. Age: Not applicable 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 3. Type of surgery: ortho/large joint replacement (Total Hip Arthroplasty).
Indirectness of population	No indirectness
Interventions	(n=17) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Preoperative fasting 6-8 h fast for solid; carbohydrate drink (12%maltodextrin), 200mL uo to 2 h before surgery. Preoperative nutrition - Immune supplement 600 mL/day for 5 days prior to surgery; Anesthesia -

Study	Alito 2016[5]
	Spinal blockage; Antibiotic prophylaxis - Kefazolin: 2 g during anesthesia induction followed by 1 g every 8 h for 48 h. Drains and catheters Not used; Intravenous fluids - Intra-operative: 5 to 10 mL of crystalloids/kg/h; Antithrombotic prophylaxis - 20 mg of enoxaparin immediately post-operative (6 h after anesthetic block) and 40 mg/day from the 1st until the 35th post-operative day. Use of medium leg compression stockings; Early Feeding - Diet at will starting 2–4 h after surgery; Mobilization -Sit up and walk the same day as surgery. . Duration 6 days (5 days before the surgery +1 day post surgery). Concurrent medication/care: N/A. Indirectness: No indirectness (n=19) Intervention 2: No enhanced recovery programme (standard care) - Standard care. standard care: fasting 6–8 h fast prior to surgery. Spinal blockage. Kefazolin: 2 g during anesthesia induction followed by 1 g every 8 h for 48 h. Intra-operative: 5 to 10 mL of crystalloids/kg/h. Postoperative course: 0.9 % saline solution, 30 to 40 mL/kg/day, until the 2nd postoperative day. 20 mg of enoxaparin immediately post-operative (6 h after anesthetic block) and 40 mg/day from the 1st until the 35th post-operative day. Use of medium leg compression stockings. Diet at will starting 6 h after surgery. Sit up and walk on the 1st postoperative day.. Duration 6 days (5 days before the surgery +1 day post surgery). Concurrent medication/care: N/A. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Perioperative complications
- Actual outcome: Complications at follow up 60 days; Group 1: 0/15, Group 2: 0/17
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: Error in the fasting protocol; Group 2 Number missing: 2, Reason: Missing blood samples

Protocol outcome 2: Length of hospital stay
- Actual outcome: Length of hospital stay at follow up 60 days; ACERTO group (median = 3 days, range 2–5 days) stayed a median of 3 days less (p <0.01) than the controls (median = 6 days, range 3–8 days).
;
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: error in the fasting protocol; Group 2 Number missing: 2, Reason: missing blood samples
- Actual outcome: Readmission at follow up 60 days; Group 1: 0/15, Group 2: 0/17

Study	Alito 2016[5]
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2; Group 2 Number missing: 2	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study (subsidiary papers)	LAFA study trial: Vlug 2011[191] (Van Bree 2011[187], Veenhof 2012[189])
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=427)
Countries and setting	Conducted in Netherlands; Setting: university and teaching hospitals
Line of therapy	Not applicable
Duration of study	Intervention + follow up: July 2005 - August 2009
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	40 - 80 years of age; ASA grade I-III; undergo elective segmental colectomy for histologically confirmed adenocarcinoma or adenoma; without evidence of metastatic disease
Exclusion criteria	prior midline laparotomy; unavailability of laparoscopic surgeon; emergency surgery; planned stoma
Recruitment/selection of patients	patients recruited from 9 Dutch Hospitals (3 university hospitals and 6 teaching hospitals)
Age, gender and ethnicity	Age - Mean (SD): FT: 66.96 ± 9.51; Standard Care: 67.05 ± 8.10. Gender (M:F): 234/166. Ethnicity: NR
Further population details	1. Age: >60 years (FT: 66.96 ± 9.51; Standard Care: 67.05 ± 8.10). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear (ASA I/II - 319 patients). 3. Type of surgery: lower and upper GI (elective segmental colectomy).
Extra comments	patients from LAFA trial
Indirectness of population	No indirectness
Interventions	(n=209) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative phase: discussion focusing on placement of thoracic epidural catheter for management of

Study (subsidiary papers)	LAFA study trial: Vlug 2011[191] (Van Bree 2011[187], Veenhof 2012[189])
	perioperative analgesia plus discussion of the FT program; preadmission counseling and guided tour of the surgical ward. •Day of admission: routine food intake; enema bowel preparation; 4 units of carbohydrate loaded liquids; last meal 6h before operation; lorazepam evening before operation as preanesthetic •Day of surgery: 2 units of carbohydrate loaded liquids 2 hours before surgery; no preanesthesia; placement of thoracic epidural (until POD 2); combined with balanced general anesthesia; restricted per-operative fluid infusion regimen; use of vasopressor drugs to manage mean drop in BP; forced body heating; removal of NG tube before extubation; prophylactic use of ondansetron. •Surgical management: minimal invasive incisions/laparoscopy; suprapubic urine catheter; infiltration of surgical wounds with bupivacaine; no standard use of abdominal drains. •Early postoperative management: use of epidural catheter including paracetamol; oral drinks 2h after surgery supplemented with 2 units carbohydrate liquids; IV infusion Ringers lactate; mobilization on the evening of surgery; first semi solid food intake in the evening. •POD 1: oral intake >2L; normal diet; stop IV fluids; start laxatives; close suprapubic urine catheter and remove; increase mobilization. •POD 2: remove epidural and add diclofenac; remove IV cannula; continue paracetamol; normal diet; increase mobilization; plan discharge until criteria fulfilled. Duration preoperative assessment to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=218) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperative phase: open discussion about different possibilities for management of perioperative analgesia •Day of admission: routine oral intake; enema bowel preparation; last meal at midnight; lorazepam or temazepam as preanesthetic medication. •Day of surgery: preoperative fasting; lorazepam or midazolam as preanesthetic medication; placement of thoracic epidural or lower level PCA pump; combined with balanced general anesthesia; standard preoperative fluid infusion regimen; fluid challenge for drop in BP; forced body heating; removal of NGT before extubation; ondansetron, dexamethasone or droperidol for PONV (anesthesiologist choice) •Surgical management: median laparotomy/laproscopy; urine catheter according to surgeon; no infiltration of surgical wounds with local anesthetic; no standard use of abdominal drains •Early postoperative management: Epidural or PCA morphine to which paracetamol and or diclofenac added; small amount of water orally; IV infusion of Ringer's lactate; no mobilization scheme •POD 1: diet increased on daily basis; IV fluid administration until adequate oral intake; mobilization according to surgeon •POD 2: epidural removed according to anesthesiologist; continue as POD 1 until discharge criteria fulfilled. Duration preoperative assessment to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Other author(s) funded by industry (Johnson & Johnson International; Nutricia)
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK versus STANDARD CARE Protocol outcome 1: Mortality	

Study (subsidiary papers)	LAFA study trial: Vlug 2011[191] (Van Bree 2011[187], Veenhof 2012[189])

- Actual outcome: In hospital mortality at postoperatively up to discharge; Group 1: 6/193, Group 2: 4/207; Comments: p value 0.65
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 16, Reason: protocol violation; withdrawal; metastasis; inoperable; carcinoma; emergency operation ; Group 2 Number missing: 11, Reason: protocol violation; withdrawal; emergency operation

Protocol outcome 2: Perioperative complications
- Actual outcome: Patients with one or more major complication at after surgery up to 30 days postoperatively; Group 1: 33/193, Group 2: 33/207; Comments: p value 0.19
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 16, Reason: protocol violation; withdrawal; metastasis; inoperable; carcinoma; emergency operation ; Group 2 Number missing: 11, Reason: protocol violation; withdrawal; emergency operation
- Actual outcome: Total number of major complications at after surgery up to 30 days postoperatively; Group 1: 43/193, Group 2: 46/207
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 16, Reason: protocol violation; withdrawal; metastasis; inoperable; carcinoma; emergency operation ; Group 2 Number missing: 11, Reason: protocol violation; withdrawal; emergency operation
- Actual outcome: Patients with one or more minor complication at after surgery up to 30 days postoperatively; Group 1: 44/193, Group 2: 45/207; Comments: p value 0.58
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 16, Reason: protocol violation; withdrawal; metastasis; inoperable; carcinoma; emergency operation ; Group 2 Number missing: 11, Reason: protocol violation; withdrawal; emergency operation
- Actual outcome: Total number of minor complications at after surgery up to 30 days postoperatively; Group 1: 82/193, Group 2: 86/207
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 16, Reason: protocol violation; withdrawal; metastasis; inoperable; carcinoma; emergency operation ; Group 2 Number missing: 11, Reason: protocol violation; withdrawal; emergency operation

Protocol outcome 3: Length of hospital stay
- Actual outcome: Total hospital stay at admission to discharge; Median (IQR): - days, Comments: Laparoscopy & FT: 5 (4-8)
Open & FT: 7 (5-11)
Laparoscopy & Standard care: 6 (4.5-9.5)
Open & Standard care: 7 (6-13)
p value <0.001);
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 16, Reason: protocol violation; withdrawal; metastasis; inoperable; carcinoma; emergency operation ; Group 2 Number missing: 11, Reason: protocol violation; withdrawal; emergency operation
- Actual outcome: Postoperative hospital stay at after surgery to discharge; Median (IQR): - days, Comments: Laparoscopy & FT: 5 (4-7)
Open & FT: 6 (4.5-10)
Laparoscopy & Standard care: 6 (4-8.5)

Study (subsidiary papers)	LAFA study trial: Vlug 2011[191] (Van Bree 2011[187], Veenhof 2012[189])
Open & Standard care: 7 (6-10.5) p value <0.001); Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 16, Reason: protocol violation; withdrawal; metastasis; inoperable; carcinoma; emergency operation ; Group 2 Number missing: 11, Reason: protocol violation; withdrawal; emergency operation Protocol outcome 4: Hospital readmission - Actual outcome: Readmissions at < 30 days postoperatively; Group 1: 13/193, Group 2: 14/207; Comments: p value 0.97 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 16, Reason: protocol violation; withdrawal; metastasis; inoperable; carcinoma; emergency operation ; Group 2 Number missing: 11, Reason: protocol violation; withdrawal; emergency operation	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Petersen 2006[154]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=79)
Countries and setting	Conducted in Denmark
Line of therapy	Not applicable
Duration of study	Intervention + follow up: total length of study unclear
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	patients scheduled for elective primary unilateral total hip replacement and peri-operative epidural analgesia
Exclusion criteria	chronic opioid use, chronic pain syndrome, rheumatoid arthritis and mental disorders
Recruitment/selection of patients	how patients were selected not clarified
Age, gender and ethnicity	Age - Median (IQR): Intervention 55 (28-84); Control 58 (26-81). Gender (M:F): 29/28. Ethnicity: NR
Further population details	1. Age: <60 years (Intervention 55 (28-84); Control 58 (26-81)). 2. American Society of Anesthesiologists

Study	Petersen 2006[154]
	(ASA) Physical Status grade: ASA 1 (ASA I - 32; ASA II - 21; ASA III - 4). 3. Type of surgery: ortho/large joint replacement (total hip replacement).
Extra comments	study differentiates between randomized population, intention to treat group and per-protocol population. However, demographic characteristics documented are missing information for 9 patients.
Indirectness of population	No indirectness
Interventions	(n=34) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. pre-operative optimization: standard goals for mobilization and energy intake were described. Verbal and written supplementary information was standardized. After surgery, transfer and walking techniques required were taught; post-operative mobilization: aggressive and progressive structured mobilization plans; post-operative nutrition: early and aggressive fluid and diet re-introduction; post-operative rehabilitation: early aggressive rehabilitation and early introduction to exercise programme. Duration day of admission to day of discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=36) Intervention 2: No enhanced recovery programme (standard care) - Standard care. The control group received none of the optimization package. After surgery, mobilization, oral fluid and diet were re-introduced in a traditional step wise manner. Treating team responded to the will of the patient in providing post-operative care and no attempt was made to enforce mobilization or to encourage patients to eat and drink despite lack of appetite. . Duration day of admission to day of discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: OPTIMIZATION GROUP versus STANDARD CARE

Protocol outcome 1: Perioperative complications
- Actual outcome: postoperative complications at postoperatively up to 30 days post discharge; RR; (Relative Risk: 1.7 (0.5-5.3)), Comments: It's not clear whether this relative risk is for the whole of the analyzed group or for intervention or control group individually. Only one relative risk stated.); Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - High, Measurement - High, Crossover - Low, Comments - Only a relative risk provided for complications but no breakdown of complications or numerical data provided; Indirectness of outcome: No indirectness ; Group 1 Number missing: 13, Reason: did not receive allocated intervention; discontinued intervention; excluded from analysis; Group 2 Number missing: 9, Reason: did not receive allocated intervention; discontinued intervention; excluded from analysis

Protocol outcome 2: Length of hospital stay
- Actual outcome: length of stay at day of admission to day of discharge; Median: Intervention 7 (1-9); Control 8 (1-10) days, Comments: p value 0.019); Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low,

Study	Petersen 2006[154]
Crossover - Low, Comments - results written within the results section but numerical data not fully provided; Indirectness of outcome: No indirectness ; Group 1 Number missing: 13, Reason: did not receive allocated intervention; discontinued intervention; excluded from analysis; Group 2 Number missing: 9, Reason: did not receive allocated intervention; discontinued intervention; excluded from analysis Protocol outcome 3: Hospital readmission - Actual outcome: Readmission post discharge at up to 30 days post discharge; Group 1: 0/27, Group 2: 0/30; Comments: number analyzed taken from the total number of patients who completed the study and not from the intention to treat population also differentiated in the study Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - High, Measurement - Low, Crossover - Low, Comments - briefly mentioned but not included in results table; Indirectness of outcome: No indirectness ; Group 1 Number missing: 13, Reason: did not receive allocated intervention; discontinued intervention; excluded from analysis; Group 2 Number missing: 9, Reason: did not receive allocated intervention; discontinued intervention; excluded from analysis Protocol outcome 4: Pain - Actual outcome: VAS pain score at first 48 hours post operatively; VAS pain score (median): Intervention 1.8 (0-5.5); Control 1.2 (0-4.1) 1-10 Top=High is poor outcome; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - High, Measurement - Low, Crossover - Low, Comments - numerical data or breakdown of results not provided; Indirectness of outcome: No indirectness ; Group 1 Number missing: 13, Reason: did not receive allocated intervention; discontinued intervention; excluded from analysis; Group 2 Number missing: 9, Reason: did not receive allocated intervention; discontinued intervention; excluded from analysis - Actual outcome: VAS pain score at 4 days post operatively; VAS pain scoare: Intervention 1.0 (0-5); Control 1.0 (0-5.5) 1-10 Top=High is poor outcome; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - High, Measurement - Low, Crossover - Low, Comments - numerical data or breakdown of results not provided; Indirectness of outcome: No indirectness ; Group 1 Number missing: 13, Reason: did not receive allocated intervention; discontinued intervention; excluded from analysis; Group 2 Number missing: 9, Reason: did not receive allocated intervention; discontinued intervention; excluded from analysis	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	Pimenta 2015[157]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=41)
Countries and setting	Conducted in Brazil
Line of therapy	Not applicable

Study	Pimenta 2015[157]
Duration of study	Intervention + follow up: April to October, 2012
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	between 18 and 45 years of age, from both sexes, who had an initial body mass index (BMI) equal to or greater than 40 kg/m2 to be a candidate for the sleeve procedure through laparoscopy
Exclusion criteria	Operated on by other surgical teams, those who did not follow the fasting protocol, and also those with uncompleted laboratory results
Recruitment/selection of patients	The population of the study was composed of patients with morbid obesity and candidate to be operated by the same surgeon (GPP) in Cuiaba, Mato Grosso, Brazil, from April to October, 2012.
Age, gender and ethnicity	Age - Median (range): ACERTO: 39.0 (33–45); Control: 32.0 (26–38) . Gender (M:F): 2/18. Ethnicity: NR
Further population details	1. Age: <60 years (ACERTO: 39.0 (33–45); Control: 32.0 (26–38)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: lower and upper GI (nmorbidly obese patients undergoing sleeve gastrectomy).
Indirectness of population	No indirectness
Interventions	(n=21) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative: received less intravenous fluids and had a short time of preoperative fasting. They received 400 mL of a beverage containing water plus 50 g (12.5 %) of maltodextrin 6 h before the operation and an extra 200 mL of this beverage containing water plus 25 g of maltodextrin (12.5 %) 3 h before the operation. •Intraoperative: They received 1 to 1.5 L of crystalloid fluids (ringer lactate) in the intraoperative period. •Postoperative: Acerto group was programmed to receive 2 L of crystalloid fluids (ringer lactate) and 1 to 2 L in the first day of the postoperative period. The venous hydration was suspended as soon as they started to drink liquids. The Acerto group received 8 mg of intravenous dexamethasone at the beginning of the anesthesia and 4–8 mg ondansetron after the surgery as prophylaxis for nausea and vomiting. Analgesia for patients in this group was done with intravenous dipyrone and ketorolac and, if necessary, low doses of morphine. All individuals received the same antimicrobial prophylaxis (cefazolin 1–2 g every 8 h). After the surgery, all the patients were sent to the ICU. They were discharged from ICU to the infirmary (at the discretion of the intensivist) if they were clinically stable (usually 24 to 48 h after surgery). Postoperatively, all patients were stimulated to early mobilization and allowed to initiate feeding 24 h after the operation.. Duration preoperative preparation up to discharge. Concurrent medication/care: NA (n=20) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperative: protocol of fasting for at least 8 h; receiving 1 to 2 L of crystalloid fluid (ringer lactate) in the intraoperative

Study	Pimenta 2015[157]
	period, summing up to 3 to 4 L of crystalloid fluids during the day of surgery (ringer lactate, saline 0.9 %, and/or dextrose 5 %). •Intraoperative: during the anesthetic induction, antibiotic prophylaxis (cefazolin 3 g/day for 2 days) was administrated. •Postoperative: during the first postoperative day, they received 2 to 3 L, and finally, 1 to 2 L were given in the second postoperative day. Postoperative analgesia for patients of the control group was done with intravenous dipyrone, tramadol hydrochloride, and morphine. The prophylaxis of nausea and vomiting was done with intravenous 8-mg dexamethasone in the beginning of the anesthesia and the 10mg metoclopramide at the end of the surgery. After the surgery, all the patients were sent to the ICU. They were discharged from ICU to the infirmary (at the discretion of the intensivist) if they were clinically stable (usually 24 to 48 h after surgery). Postoperatively, all patients were stimulated to early mobilization and allowed to initiate feeding 24 h after the operation.. Duration preoperative preparation up to discharge. Concurrent medication/care: NA
Funding	Funding not stated
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ACERTO versus STANDARD CARE Protocol outcome 1: Length of hospital stay - Actual outcome: Postoperative length of stay at ICU discharge to hospital discharge; Median (range): Acerto: 2 (2); Control: 3 (2-3) days); Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 11; Group 2 Number missing: 10 Protocol outcome 2: Length of stay in intensive care unit - Actual outcome: Length of stay in ICU at postoperative up to ICU discharge; Median (range): Acerto: 1 (1-1); Control: 2 (1-2)); Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 11; Group 2 Number missing: 10	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Perioperative complications ; Patient and staff adherence ; Unplanned intensive unit admission ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Qi 2018[161]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=160)
Countries and setting	Conducted in China; Setting: Hospital setting

Study	Qi 2018[161]
Line of therapy	Not applicable
Duration of study	Intervention time: August 2016 - November 2017
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	aged 18 - 70, no mental health disease, no physical activity disorder, no serious heart, lung brain or renal dysfunction, no history of malignancy, Child-Pugh class A/B liver function and complete data, informed consent and cooperation.
Exclusion criteria	under 16 or over 70, emergency surgery, terminal hepatic malignancy and declined consent to participate.
Recruitment/selection of patients	unclear how patients were selected to be part of study
Age, gender and ethnicity	Age - Mean (SD): ERP 53.7 ± 9.8 & conventional group 55.4 ± 9.2. Gender (M:F): 87/73. Ethnicity: NR
Further population details	1. Age: <60 years (ERP 53.7 +/- 9.8 & conventional group 55.4 +/- 9.2). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 3 (ASA II - 22, ASA III - 128 (10 patients unaccounted for)). 3. Type of surgery: Not applicable (partial hepatectomy).
Extra comments	all patients who had received partial hepatectomy caused by various liver diseases .
Indirectness of population	No indirectness
Interventions	(n=80) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. perioperative information about ERAS education, assess nutritional status by NRS 2002 and give enteral nutrition, no routine bowel preparation, oral carbohydrates 400ml 2 hours before operation. Middle thoracic epidural anesthesia (local anesthetic + low dose opioid) combined tracheal intubation and general anesthesia. Target oriented fluid infusion and low central venous pressure, wear stretch hose, routine medical insulation blanket and heated transfusion, no NG tube or removed as soon as possible. Minimal use of abdominal drain. Adopt preventive, timely and multimodal analgesia. Drinking at 6 hours, 24 hours feeding fluid and gradual transition to normal diet. 12 hours after surgery - mobilize at least 4 times out of bed. 24 hours after surgery mobilization 4 times daily. After 48 hours of surgery to discharge - normal mobilization. Remove catheter 12 hours after surgery. Early removal of abdominal drain. . Duration preoperative assessment, day of surgery to day or discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=80) Intervention 2: No enhanced recovery programme (standard care) - Standard care. preoperative education in standard manner. Routine bowel preparation. Routine tracheal intubation and general anesthesia. Standard mode of fluid therapy. Routine NG tube and abdominal drains. On demand analgesia.

Study	Qi 2018[161]
	Can only eat after anal exhausts. No mobilization plan. Remove catheter after mobilization. Leave hospital as per standard time. . Duration preoperative, day of surgery to day of discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE Protocol outcome 1: Perioperative complications - Actual outcome: overall complications at day of surgery to day of discharge ; Group 1: 23/80, Group 2: 39/80; Comments: p value 0.009 Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 2: Length of hospital stay - Actual outcome: number of days in hospital at day of surgery to day of discharge ; Group 1: mean 16.9 (SD 3.4); n=80, Group 2: mean 21.6 (SD 6.8); n=80 Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 0; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Ren 2012[165]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=676)
Countries and setting	Conducted in China; Setting: Zhongshan Hospital (major colorectal cancer centre), China
Line of therapy	Not applicable
Duration of study	Intervention time:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall

Study	Ren 2012[165]
Subgroup analysis within study	Not applicable
Inclusion criteria	age between 20 and 80 years (inclusive); single colorectal lesion; and medically eligible for radical colorectal surgery
Exclusion criteria	emergency surgery, synchronous resection of other organs (such as for hepatic metastases), past abdominopelvic surgical history, and affliction with a disease that would affect recovery (e.g., paralysis, spinal deformity, autoimmune diseases, myocardial infarction)
Recruitment/selection of patients	patients undergoing radical resection for colorectal cancer
Age, gender and ethnicity	Age - Median (range): ERP: 59 (24-78); Control: 61 (21-80). Gender (M:F): 368/229. Ethnicity: NR
Further population details	1. Age: >60 years (ERP: 59 (24-78); Control: 61 (21-80)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 1 (ERP: 1.4 ± 0.3; Control: 1.4 ± 0.4). 3. Type of surgery: lower and upper GI (radical resection for colorectal cancer).
Indirectness of population	No indirectness
Interventions	(n=342) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative: Neither mechanical bowel preparation nor oral antibiotic preparation; Take only fluids on the day before surgery; Take 400 ml nutritional supplements before midnight or 6 h before surgery and another 200 ml 2 h before surgery. •Intraoperative: Continuous epidural anesthesia combined with general endotracheal anesthesia; Intubation with rapid sequence induction; Restrictive intraoperative fluid protocol (4 ml/kg/h) and warmed fluid; A combination of dexamethasone and tropisetron to minimize postoperative nausea and vomiting; Active warming with a warmer coat and warmed fluid; No nasogastric intubation, drainage tube if necessary. •Postoperative: Patient-controlled analgesia and oral NSAIDs; Urinary catheter for the duration of thoracic epidural analgesia and early removal; Ileus prophylaxis and gastrointestinal motility promotion - Infusion of raw rhubarb 10 g five times a day after surgery, injection of neostigmine 0.5 mg at each Zusanli acupoint daily after surgery; Restrictive IV fluid protocol (1500 ml/day); Drank 500 ml water starting at 6 h after surgery on the day of surgery and took 500 ml nutritional supplements and 1,000 ml water daily postoperatively; Clear liquid diet after the first postoperative flatus; Out of bed for 2 h on the first day after surgery and 4–6 h each day thereafter.. Duration 1 day preoperatively up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=334) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperative: Gentamicin 80,000 U, Metronidazole 0.4 g; If obstructed, cleaning enema if not obstructed, take polyethylene glycol; Take only semifluid 2 days before surgery; Fluids on the day before surgery; Fasting after midnight. Intraoperative: Continuous epidural anesthesia combined with general endotracheal anesthesia; intubation after general induction; Liberal intraoperative IV fluid protocol; A combination of dexamethasone and tropisetron to minimize postoperative nausea and vomiting; Intraoperative temperature not monitored; NG intubation and drainage tubes if necessary. Postoperative: Patient-controlled analgesia; Use urinary catheter

Study	Ren 2012[165]
	for the duration of thoracic epidural analgesia and early removal; No ileus prophylaxis and gastrointestinal motility promotion; liberal IV fluids protocol (2,000-2,500 ml/day); Clear liquid diet started after the first postoperative flatus; mobilization as tolerated by individual patients. Duration 2 days preoperatively up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Academic or government funding
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE Protocol outcome 1: Length of hospital stay - Actual outcome: Postoperative length of stay at postoperative up to discharge; Group 1: mean 5.7 days (SD 1.6); n=299, Group 2: mean 6.6 days (SD 2.4); n=298; Comments: p value < 0.001 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 43, Reason: not meeting inclusion criteria or refusal to participate; Group 2 Number missing: 36, Reason: not meeting inclusion criteria or refusal to participate - Actual outcome: Postoperative Complications at postoperative; Group 1: 29/299, Group 2: 28/298; Comments: p value 0.900 Risk of bias: All domain - High, Selection - Low, Blinding - Low, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low, Comments - time period of measuring complications not specified; Indirectness of outcome: No indirectness; Group 1 Number missing: 43, Reason: not meeting inclusion criteria or refusal to participate; Group 2 Number missing: 36, Reason: not meeting inclusion criteria or refusal to participate	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Perioperative complications ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Ruiz-Tovar 2019[169]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=180)
Countries and setting	Conducted in Spain; Setting: University hospital, Spain
Line of therapy	1st line
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis

Study	Ruiz-Tovar 2019[169]
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	Patients were included if BMI >40kg/m² or > 35kg/m² with the presence of co-morbidities associated to obesity
Exclusion criteria	Patients undergoing other bariatric techniques, severe underlying cardiovascular diseases, chronic renal failure, hepatic dysfunction, previous foregut surgery, and any contraindication for bariatric surgery.
Recruitment/selection of patients	Patients undergoing Roux Y gastric bypass surgery
Age, gender and ethnicity	Age - Mean (SD): ERP: 45.3 (11.7); standard care: 44.8 (10.8). Gender (M:F): 50/130. Ethnicity: NR
Further population details	1. Age: <60 years (ERP: 45.3 (11.7); standard care: 44.8 (10.8)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: lower and upper GI (bariatric surgery (Roux Y gastric bypass surgery)).
Indirectness of population	--
Interventions	(n=50) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative: Provision of verbal and written information to patients regarding the ERP; preoperative nutritional, cardiologic, anemia, and comorbidity optimization; blood tests; polisomnographic study to control and or diagnosis of SAHS - start CPAP at least 4 - 6 weeks before surgery; (day before surgery) low residue diet; dietary supplements; thromboprophylaxis; fasting 6 hour solid food and 2 hours for clear liquid; avoid anxiolytic drugs. •Intraoperative: placement of compression stocing or intermittent pneumatic compression according to thromboembolic risk; peripheral catheter placement; antibiotic prophylaxis 1 hour before surgical incision; (intraoperative) administration of antireflux prophylaxis; rapid sequence of orotracheal intubation; haemodynamic optimization; remifentanil perfusion; deep neuromuscular block; active heating; no NG tube; prophylaxis of nausea and vomiting; multimodal postoperative analgesia with port site infiltration. •Postoperative: liquid diet; active mobilization; start oral analgesia; analytic evaluation of C reaction protein and or procalcitonin; maintenance of thromboprophylaxis for 28 days postoperatively; telephone monitoring for 48 hours; outpatient follow up after 15 days; nutritional recommendations given . Duration Perioperatively. Concurrent medication/care: NA. Indirectness: No indirectness (n=50) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperative: Provision of verbal and written information to patients regarding the ERP; preoperative nutritional, cardiologic, anemia, and comorbidity optimization; blood tests; polisomnographic study to control and or diagnosis of SAHS - start CPAP at least 4 - 6 weeks before surgery; (day before surgery) low residue diet; dietary supplements; thromboprophylaxis; fasting 12 hours; avoid anxiolytic drugs. •Intraoperative: placement of compression stockings or intermittent pneumatic compression; peripheral catheter placement; antibioptic placement 1 hour before surgical incision; central and bladder catheter placement; administration

Study	Ruiz-Tovar 2019[169]
	of antireflux prophylaxis; rapid sequence orotracheal intubation; fluid management based on weight; remifentanil infusion; deep neuromuscular block; active heating; NG tube placement; IV analgesia and morphine as required, fasting for at least 24 hours after surgery; •Postoperative: oral intake of water and chamomile infusions; sit patient in seat for 24 hours after surgery; IV analgesia (POD 1); liquid diet; active mobilization; IV analgesia (POD 2): active mobilization; start oral analgesia (POD 3); maintenance of thromboprophylaxis for 28 days postoperatively; telephone monitoring for 48 hours; outpatient follow up after 15 days; nutritional recommendations given . Duration Perioperatively. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE Protocol outcome 1: Perioperative complications - Actual outcome: Complications at postoperative; Group 1: 1/50, Group 2: 1/50; Comments: reported as 2.2% respectively Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing:0 ; Group 2 Number missing: 0 Protocol outcome 2: Length of hospital stay - Actual outcome: length of hospital stay at perioperative; Group 1: mean 1.7 days (SD 1.8); n=50, Group 2: mean 2.8 days (SD 3.1); n=50; Comments: p value <0.001 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 3: Hospital readmission - Actual outcome: Readmission at postoperative; Group 1: 0/50, Group 2: 1/50; Comments: reported as a percentage 2.2% for standard care. Not significant p value Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 0; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Kim 2012[90]

Study	Kim 2012[90]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	N/A (n=47)
Countries and setting	Conducted in South Korea; Setting: The study took place at the gastric cancer clinic of Gangnam Severance Hospital in Seoul, Republic of Korea, from April 2011 to January 2012.
Line of therapy	Not applicable
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall: stratified for gender
Subgroup analysis within study	Not applicable
Inclusion criteria	Patients were included if they were diagnosed with gastric cancer that could be treated with laparoscopic distal gastrectomy. Specifically, eligibility criteria included pathologic confirmation of gastric adenocarcinoma; a pre-operative cancer stage of T1N0M0, T1N1M0, or T2N0M0; and location of the lesion in the lower half of the stomach.
Exclusion criteria	patients were excluded if they had factors that might impede a fast recovery, such as pregnancy, inflammatory bowel disease, chronic renal disease, chronic liver disease, cardiopulmonary dysfunction, complicated diabetes, the use of anticholinergic medications, an American Society of Anesthesiologists (ASA) score greater than 2, or an Eastern Cooperative Oncology Group (ECOG) grade over 2.
Age, gender and ethnicity	Age - Mean (SD): FTS 52.64 ± 11.57; Conventional 57.45 ± 14.54. Gender (M:F): 28/16. Ethnicity: South Korean
Further population details	1. Age: Not applicable 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 3. Type of surgery: lower and upper GI
Indirectness of population	No indirectness
Interventions	(n=24) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Day before the surgery:Preoperative education Normal meal at dinner; Oral carbohydrate-rich beverage at 10:00 p.m. (soybean drink; carbohydrate 3 %, 200 ml) IV carbohydrate loading: H/D 1,000 cc (125 cc/h); No bowel preparation The day of surgery: Apply intermittent pneumatic compressor; Tracheal intubation with general anesthesia; Insertion of Foley catheter; No nasogastric tube drainage; Minimal invasive surgery;LAPD catheter insertion to preperitoneal layer Routine use of abdominal drain (closed drainage); Ambulation at evening as possible; Alert for thermostasis;

Study	Kim 2012[90]
	POD1 Keep NPO; Continue local anesthetics perfusion (LAPD); Ketorolac tromethamine 15 mg IV q 8–24 h after surgery; Paracetamol 1 g IV q 6–72 h after surgery; Training and removal of Foley catheter 24 h after surgery; O2 inhalation 3 l/min until 8:00 a.m. Continue ambulation; POD2 Keep paracetamol 1 g IV q 6–72 h after surgery; Keep LAPD just until ending of the local; anesthetics perfusion; SOW 48 h after surgery; Clear liquid diet at dinner; POD3: Clear liquid diet at breakfast; Full liquid diet at lunch and dinner; POD4: Soft diet at breakfast and lunch; Check discharge criteria; . Duration day before the surgery +5 days after the surgery. Concurrent medication/care: Not stated. Indirectness: No indirectness (n=23) Intervention 2: No enhanced recovery programme (standard care) - Standard care. The day before surgery: Liquid diet at dinner; Midnight NPO; No bowel preparation; The day of surgery: Apply intermittent pneumatic compressor; Tracheal intubation with general anesthesia; Insertion of Foley catheter; No nasogastric tube drainage; Minimal invasive surgery; IV PCA; Routine use of abdominal drain (closed drainage); POD1 Keep NPO; Keep IV PCA; No routine additional analgesics except IV PCA; Training and removal of Foley catheter 24 h after surgery; O2 inhalation 3 l/min until 8:00 a.m.; Ambulation 24 h after surgery; POD2 Keep IV PCA just until ending of the analgesics infusion; SOW after flatus; POD3: Diet build-up; three steps (clear liquid–full liquid–soft diet), one step a day, from the day after start day of SOW; POD4: Check discharge criteria after soft diet intake;. Duration day before the surgery +5 days after the surgery. Concurrent medication/care: not stated. Indirectness: No indirectness
Funding	Equipment / drugs provided by industry (The LAPD was supplied from B. Braun Korea Company just for this study. The drug which was loaded into the LAPD was paid for by the patients.)

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Quality of life
- Actual outcome: Health related quality of life (EORTC QLQ C-30 and EORTC QLQ STO-22) at two weeks after discharge; Mean +/- SD
EORTC QLQ C-30
FTS vs Conventional
Functional scale
Physical 8.24 ± 1.45; 9.10 ± 2.32 0.175;
Role 3.71 ± 1.10; 4.10 ± 1.51 0.413;

Study	Kim 2012[90]
Emotional 5.86 ± 1.88; 6.62 ± 1.88 0.204; Cognitive 2.52 ± 0.68; 2.81 ± 0.93 0.317; Social 3.29 ± 1.01; 3.19 ± 1.21 0.757; Global quality of life 8.90 ± 2.46; 9.28 ± 2.40 0.571; Symptom scale/items Fatigue 6.00±1.31; 7.19±2.06 0.032 Nausea and vomiting 2.81 ± .87; 3.10±1.64 0.482 Pain 3.29 ± 1.19; 3.48 ± 1.29 0.746 Dyspnea 1.45 ± 0.60; 1.57 ± 0.60 0.522 Sleep disturbance 1.45 ± 0.76; 1.67 ± 0.80 0.378 Apetite loss 1.65 ± 0.75; 2.43 ± 1.03 0.009 Constipation 1.55 ± 0.61; 1.57 ± 0.75 0.920 Diarrhea 1.60 ± 0.60; 1.57 ± 0.60 0.879 Financial problem 1.10 ± 0.31; 1.43 ± 0.60 0.034 EORTC QLQ STO-22 Dysphagia 6.14 ± 2.12; 6.91 ± 3.10 0.335 Pain 3.45 ± 1.10; 3.77 ± 0.92 0.305 Reflux 6.45 ± 2.46 6.23 ± 2.14 0.745 Eating restriction 10.00 ± 3.58; 10.63 ± 2.22 0.483 Anxiety 8.82 ± 3.57; 11.50 ± 2.89 0.009; Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2; Group 2 Number missing: 1 Protocol outcome 2: Perioperative complications - Actual outcome: Complications at day before surgery + days after the surgery; Group 1: 3/22, Group 2: 4/22 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2; Group 2 Number missing: 1 Protocol outcome 3: Length of hospital stay - Actual outcome: Length of hospital stay at day before surgery + days after the surgery; p: <0.001, Comments: Mean; SD (range) FTS 5.36 ± 1.46 (4–11); conventional care 7.95 ± 1.98 (6–15)); Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2; Group 2 Number missing: 1 Protocol outcome 4: Hospital readmission - Actual outcome: Hospital readmission at day before surgery + days after the surgery; Group 1: 1/22, Group 2: 0/22 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover

Study	Kim 2012[90]
- Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2; Group 2 Number missing: 1 Protocol outcome 5: Pain - Actual outcome: Pain at day before surgery + days after the surgery; p: 0.746, Comments: Mean +/- SD EORTC QLQ C-30 scale FTS 3.29 +/-1.19; Conventional 3.48 +/-1.29 EORTC QLQ-22 scale FTS 3.45 +/-1.1; Conventional 3.77+/-0.92); Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2; Group 2 Number missing: 1	
Protocol outcomes not reported by the study	Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	Scioscia 2017[170]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=227)
Countries and setting	Conducted in Italy
Line of therapy	--Please Select--
Duration of study	Intervention + follow up: January 2015 - December 2015
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	> 18 years; preoperative evidence of bowel endometriosis (ultrasound, MRI or double contrast barium enema); primary laparoscopic approach; and obtained informed consent
Exclusion criteria	patients undergoing surgery for reasons other than endometriosis (laparotomy or vaginal approach); patients with endometriosis without bowel involvement; and patients with bowel endometriosis who did not consent to intestinal surgery
Age, gender and ethnicity	Age - Mean (SD): Fast track: 35.2 ± 4.4; Conventional care: 35.6 ± 5.8. Gender (M:F): all female. Ethnicity: NR

Study	Scioscia 2017[170]
Further population details	1. Age: <60 years (Fast track: 35.2 ± 4.4; Conventional care: 35.6 ± 5.8). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: lower and upper GI (colorectal surgery for deep infiltrating endometriosis).
Indirectness of population	No indirectness
Interventions	(n=62) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. preoperative low residue diet for bowel preparation, prompt removal of NG tube after surgery, early oral fluid intake, resumption of oral semi-liquid feeding within 24 hours, no postoperative antibiotic therapy, early mobilization and discharge from the hospital as soon as bowel function was restored. . Duration preoperative preparation to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=165) Intervention 2: No enhanced recovery programme (standard care) - Standard care. osmotic medications (sodium phosphate) was used to clear the lumen of stool and leave gas only. The NG tube was removed soon after surgery, and oral fluids were allowed for 24 hours but no earlier than 8 hours from surgery. Antibiotic therapy was discontinued after 72 hours if no sign of infection was detected . Duration preoperative preparation to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK versus CONVENTIONAL CARE

Protocol outcome 1: Perioperative complications
- Actual outcome: Severe complications at postoperatively up to 30 post discharge; Group 1: 4/62, Group 2: 14/165; Comments: p value 0.20
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0

Protocol outcome 2: Length of hospital stay
- Actual outcome: Median hospital stay at admission to discharge; Median (range): Fast track: 3 (3-12); Conventional: 7 (4-33) days, Comments: p value < 0.001);
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0

Protocol outcome 3: Hospital readmission
- Actual outcome: Readmission at within 30 days of discharge; Group 1: 11/62, Group 2: 26/165; Comments: p value 0.69
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 0; Group 2 Number missing: 0

Study	Scioscia 2017[170]
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Serclova 2009[171]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=105)
Countries and setting	Conducted in Czech Republic; Setting: University Hospital
Line of therapy	Not applicable
Duration of study	Intervention + follow up: April 2005 - December 2007
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	18 - 70 years and were scored ASA I or II
Exclusion criteria	ASA III-IV; pelvic radiation and those having multi-organ resections; cancer; and pregnancy.
Recruitment/selection of patients	patients selected from those scheduled for open intestinal resection
Age, gender and ethnicity	Age - Median (IQR): Fast track group 33.0 years (20-66 years) & non Fast track group 36.0 years (18-68 years). Gender (M:F): 52/51. Ethnicity: NR
Further population details	1. Age: <60 years (Fast track group 33.0 years (20-66 years) & non Fast track group 36.0 years (18-68 years)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 1 (all patients ASA I or II, figures not stated.). 3. Type of surgery: lower and upper GI (open intestinal resection).
Extra comments	. authors presumed that selection of patients with low polymorbidity would lead to better cooperation and easier interdisciplinary coordination during introduction of the new method.
Indirectness of population	No indirectness
Interventions	(n=53) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Patients in FT group informed prior to surgery about perioperative anesthesia and analgesic care. PCA training was provided and taught how to use visual analogue scale for pain. Also instructed by the physiotherapist, dietician and surgeon. Thoracic epidural inserted prior to surgery. Only underwent bowel

Study	Serclova 2009[171]
	preparation if having rectal surgery. Normal oral intake during the day before surgery until 2pm and a light dinner preoperatively. Then advised to increase fluid intake and carbohydrate cocktail intake. Fluid intake stopped 2 - 4 hours pre-surgery. Postoperative analgesia included the PCA pump supplemented with IV paracetamol and diclofenac. After postoperative stabilization patients were encouraged to exercise in bed and out of it. A semi solid and solid diet was offered to patients from the day of surgery according to tolerance. NG tube inserted during surgery only at surgeons request. Intraabdominal drains selectively inserted into patients with extensive intraabdominal procedure and potential diffuse bleeding (removed day after surgery). Urinary catheter inserted only if necessary due to the type of surgery. . Duration day before admission to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=52) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Educated in the standard manner. Orthograde mechanical bowel preparation and an enteral feeding tube was inserted if they agreed. Fasted from midnight before surgery. The type of anesthesia and analgesia care was determined by the anesthesiologist. Postoperative analgesia comprised continuous epidural analgesia by local anesthetics combined with morphine or subcutaneous morphine. Both methods supplemented by bolus of metamizol or diclofenac. Insertion of NGT, intraabdominal drains and urinary catheter was routine. Postoperative oral intake and rehabilitation proceeded in the standard manner on the day of surgery. . Duration day before admission to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Academic or government funding

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK GROUP versus NON FAST TRACK GROUP

Protocol outcome 1: Mortality
- Actual outcome: Mortality at days 0 - 30; Group 1: 0/51, Group 2: 0/52
Risk of bias: All domain - High, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: Protocol failure; Group 2 Number missing: 0

Protocol outcome 2: Perioperative complications
- Actual outcome: Complications at days 0 - 30; Group 1: 11/51, Group 2: 27/52
Risk of bias: All domain - High, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 2, Reason: Protocol failure; Group 2 Number missing: 0
- Actual outcome: Wound Complications at days 0 - 30; Group 1: 4/51, Group 2: 17/52
Risk of bias: All domain - High, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: Protocol failure; Group 2 Number missing: 0

Study	Serclova 2009[171]
Protocol outcome 3: Length of hospital stay - Actual outcome: Hospital stay at Postoperative to discharge; Group 1: mean 7.4 days (SD 1.3); n=51, Group 2: mean 10.4 days (SD 3.1); n=52; Comments: Median (IQR) FT - 7.0 days (5-11 days) Non FT - 9.0 days (7-22 days) Risk of bias: All domain - High, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: Protocol failure; Group 2 Number missing: 0 Protocol outcome 4: Hospital readmission - Actual outcome: readmission post discharge at days 0 - 30; Group 1: 0/51, Group 2: 0/52 Risk of bias: All domain - High, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: Protocol failure; Group 2 Number missing: 0 Protocol outcome 5: Pain - Actual outcome: Highest reached daily VAS score at days 0-5; Median VAS Score: - points 1-10 Top=High is poor outcome, Comments: FT group (days 0-5): 3.0, 2.0, 1.0, 1.0, 0.0, 0.0 Non FT group (days 0-5): 6.0, 4.0, 3.0, 3.0, 2.0, 2.0 p value < 0.001 in all days ; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: Protocol failure; Group 2 Number missing: 0 - Actual outcome: Average daily VAS score at days 0-5; Median VAS score: - points 1-10 Top=High is poor outcome, Comments: FT group (days 0-5): 1.6, 1.0, 0.6, 0.3, 0.0, 0.0 Non FT group (days 0.5): 3.2, 2.4, 1.8, 1.6, 1.2, 0.8 p value < 0.001 in all days ; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: Protocol failure; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	Shetiwy 2017[173]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=70)
Countries and setting	Conducted in Egypt; Setting: University Hospital

Study	Shetiwy 2017[173]
Line of therapy	Not applicable
Duration of study	Intervention + follow up: June 2012 and October 2016
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	presence of a pathologically confirmed colorectal carcinoma amenable for elective surgery and no severe physical disability (American Society of Anesthesiologists physical status classification I–III).
Exclusion criteria	previous history of abdominal surgery; chronic pain syndrome; and the need for emergency surgery.
Recruitment/selection of patients	Seventy colorectal cancer patients planned for elective resection were admitted to the Surgical Oncology Unit, Oncology Center – Mansoura University (OCMU) between June 2012 and October 2016.
Age, gender and ethnicity	Age - Mean (SD): ERP: 48.54 ± 12.29; Conventional: 53.63 ± 11.5. Gender (M:F): 45/25. Ethnicity: NR
Further population details	1. Age: <60 years (ERP: 48.54 ± 12.29; Conventional: 53.63 ± 11.5). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear (inclusion criteria states all patients ASA I-III). 3. Type of surgery: lower and upper GI (colorectal cancer resection).
Indirectness of population	No indirectness
Interventions	(n=35) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative: counseling done by ERP team; Carbohydrate-rich drinks on the day before surgery; Drinking is encouraged until 4 hours preoperatively (morning of surgery). Mechanical bowel preparation only for rectal/rectosigmoid malignancy. •Intraoperative: fluid management (avoidance of sodium/fluid overload); Preference for transverse incisions over longitudinal incisions; Mandatory warming of patient and IV fluids; •Postoperative: Nasogastric tube removal on the day of surgery (POD 0) except for patients with PONV; Oral sips within 24 hours of surgery; Then, resume full diet on POD 3 with IV fluid restricted to a minimum; Forcing patients to get out of bed for 2 hours postoperatively (on POD 0) and on the morning of POD 1; Opiates not allowed (in combination with epidural); Epidurals for 48 hours only, start oral analgesia early regular doses (acetaminophen + NSAIDs) after 48 hours; allowed oral / rectal laxatives to stimulate gut motility. . Duration preoperative counseling to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=35) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperative: counseling done by surgeons; Drinks on the 2 days before surgery; Fasting from the night of surgery; routine mechanical bowel preparation. Intraoperative: routine perioperative fluid management; Type of incision used

Study	Shetiwy 2017[173]
	according to surgeon's preference; warming of patient and IV fluids not mandatory. Postoperatively: NG tube removal only when peristalsis occurs; oral nutrition not before 3 days PO once peristalsis occurs; Patients gets out of bed on POD 1; Opiates allowed unless contraindicated ± IV (together with epidural); late start of oral analgesia once patient starts oral intake; oral / rectal laxatives allowed for stimulation of gut motility (unless refused). NSAIDs (motion or flatus). Duration preoperative counseling to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus CONVENTIONAL CARE Protocol outcome 1: Perioperative complications - Actual outcome: total complications at postoperative; Group 1: 16/35, Group 2: 44/35; Comments: (combined results) Includes: nausea and vomiting; postoperative ileus; anastomotic leak; wound infection; respiratory tract infection; intra-abdominal collection; urine retention; pulmonary embolism; urinary tract infection; acute abdomen; wound bursting; urinary bladder tear; and ureteric leak Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - High, Crossover - Low, Comments - period of time for measurement of complications not specified; Indirectness of outcome: No indirectness; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 2: Length of hospital stay - Actual outcome: hospital discharge at postoperative to discharge; Group 1: mean 4.49 days (SD 0.853); n=35, Group 2: mean 13.31 days (SD 6.897); n=35; Comments: p value < 0.001 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 3: Hospital readmission - Actual outcome: number of readmissions at post discharge; Group 1: 4/35, Group 2: 4/35; Comments: p value 1.000 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - High, Crossover - Low, Comments - unclear definition of readmission period; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Takagi 2019[181]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=80)
Countries and setting	Conducted in Japan; Setting: Okayama University Hospital
Line of therapy	Not applicable
Duration of study	Intervention + follow up: June 2014 - October 2016
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	20 - 80 years of age undergoing pancreaticoduodenectomy
Exclusion criteria	failure to obtain consent; severe respiratory dysfunction (arterial Pa02 <70mmHg); severe cardiac dysfunction (New York Heart Association ≥ 3); severe hepatic dysfunction (Child Pugh classification C); severe renal dysfunction (hemodialysis); pregnancy; preoperative chemotherapy and or radiation therapy; acute bacterial infection; severe psychiatric disorder; advanced malignancy; palliative surgery; emergency surgery; and when the investigator was unavailable
Recruitment/selection of patients	any patient within inclusion criteria approached for study
Age, gender and ethnicity	Age - Mean (SD): ERP group 67.8 ± 9.7; Control group 66.8 ± 9.3. Gender (M:F): 40/34. Ethnicity: NR
Further population details	1. Age: >60 years (ERP group 67.8 ± 9.7; Control group 66.8 ± 9.3). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 9; ASA II - 49; ASA III - 16). 3. Type of surgery: lower and upper GI (pancreaticoduodenectomy).
Indirectness of population	No indirectness
Interventions	(n=40) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. preoperative factors: counselling; assessment and guidance of mobilization; immunonutrition; no bowel preparation; fasting and carbohydrate loading. Intraoperative factors: no premedication. Maintenance: total intravenous anesthesia; fluid restriction (goal directed therapy), using forced-air warming. Analgesia: epidural analgesia. Postoperative factors: no nasogastric tube; early oral intake; enteral tube feeding; synbiotics; early removal or urinary catheter and drains at low risk; fluid restriction; strict glycemic control; standardized multimodal analgesia; anti-thrombotic prophylaxis; early scheduled mobilization. After discharge: telephone call.. Duration preadmission to post-discharge phone call. Concurrent medication/care: NA (n=40) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Preoperative

Study	Takagi 2019[181]
	factors: advice given by surgeon; no immunonutrition; bowel preparation; fasting and carbohydrate loading; no premedication; total intravenous anesthesia; conventional fluid management; using forced-air warming. Analgesia: epidural analgesia. Postoperative factors: nasogastric tube removal on postoperative day 1; care according to surgeon's preference; ward mobilization by nurses. After discharge: no phone call. . Duration preadmission to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Quality of life
- Actual outcome: Japanese QoR-40 score at predischarge ; QoR-40J: ERP 184 ± 12.4; Control 177 ± 14.5 points 0-10 Top=High is good outcome;
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: no pancreaticoduodenectomy ; withdrawal of consent; Group 2 Number missing: 3, Reason: no pancreaticoduodenectomy ; withdrawal of consent

Protocol outcome 2: Mortality
- Actual outcome: mortality at admission to 30 days post discharge; Group 1: 0/37, Group 2: 0/37
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: no pancreaticoduodenectomy ; withdrawal of consent; Group 2 Number missing: 3, Reason: no pancreaticoduodenectomy ; withdrawal of consent

Protocol outcome 3: Perioperative complications
- Actual outcome: Any infections at admission to 30 days post discharge; Group 1: 7/37, Group 2: 15/37
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: no pancreaticoduodenectomy ; withdrawal of consent; Group 2 Number missing: 3, Reason: no pancreaticoduodenectomy ; withdrawal of consent
- Actual outcome: Other complications at after surgery or within 30 days of discharge; Group 1: 12/37, Group 2: 24/37; Comments: complications include: bile leakage; hemorrhage; thrombosis; incisional SSI; organ/space SSI; cholangitis; pneumonia; enteritis; bacteremia
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: no pancreaticoduodenectomy ; withdrawal of consent; Group 2 Number missing: 3, Reason: no pancreaticoduodenectomy ; withdrawal of consent
- Actual outcome: Pancreatic Fistula at after surgery or within 30 days of discharge; data presented as numbers: -, Comments: ERP Group (PF grade 0/A/B/C): 21/09/06/01
Control Group (PF grade 0/A/B/C): 11/16/09/01);
Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low,

Study	Takagi 2019[181]
Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: no pancreaticoduodenectomy ; withdrawal of consent; Group 2 Number missing: 3, Reason: no pancreaticoduodenectomy ; withdrawal of consent Protocol outcome 4: Length of hospital stay - Actual outcome: length of stay at admission to discharge; Group 1: mean 20.1 (SD 5.4); n=37, Group 2: mean 26.9 (SD 13.5); n=37 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: no pancreaticoduodenectomy ; withdrawal of consent; Group 2 Number missing: 3, Reason: no pancreaticoduodenectomy ; withdrawal of consent Protocol outcome 5: Hospital readmission - Actual outcome: Readmission at within 30 days of discharge; Group 1: 0/37, Group 2: 3/37 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: no pancreaticoduodenectomy ; withdrawal of consent; Group 2 Number missing: 3, Reason: no pancreaticoduodenectomy ; withdrawal of consent	
Protocol outcomes not reported by the study	Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Tanaka 2017[182]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=148)
Countries and setting	Conducted in Japan; Setting: Department of General and Gastroenterological Surgery, Osaka Medical College
Line of therapy	Not applicable
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	histologically confirmed adenocarcinoma of the stomach for which curative gastrectomy was planned without simultaneous resection of other organs except for the gallbladder, no involvement of the duodenum or esophagus, age 20–85 years, sufficient oral intake, an American society of Anesthesiologists (ASA) score of

Study	Tanaka 2017[182]
	less than 4, and no prior chemotherapy or radiotherapy for any malignancy
Exclusion criteria	patients were excluded if they had factors that might impede a fast recovery, such as pregnancy, inflammatory bowel disease, chronic renal disease, severe cardiopulmonary dysfunction, or complicated diabetes.
Recruitment/selection of patients	unclear
Age, gender and ethnicity	Age - Median (range): ERP: 68 (29-85); Conventional: 67 (44-85). Gender (M:F): 98/44. Ethnicity: NR
Further population details	1. Age: >60 years (ERP: 68 (29-85); Conventional: 67 (44-85)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 44; ASA II - 87; ASA III - 11). 3. Type of surgery: lower and upper GI (Gastrectomy).
Indirectness of population	No indirectness
Interventions	(n=73) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperatively: no bowel preparation; Intake of normal diet on the day before surgery; Intake of 250 ml oral carbohydrate solution (Arginaid water) on the night before surgery and 2 h before anesthesia. •Intraoperatively: antibiotics before skin incision, every 3 h during surgery and one administration after surgery; Use of 1 abdominal drainage tube in patients undergoing total gastrectomy or proximal gastrectomy. •Postoperatively: Start to drink water and intake of 500 ml oral carbohydrate solution (Arginaid water) on POD 1; Start a liquid diet on POD 2 and 4 steps leading to regular food intake on POD 6; Epidural analgesia for 3 days after open surgery; Acetaminophen twice daily orally until POD 5; End of parenteral nutrition on POD 4; and encouraged to walk by themselves after POD 1. Duration day before surgery up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=75) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Pre-operatively: Oral laxative (24 mg sennoside AB on the night before surgery); Intake of normal diet on the day before surgery; No intake of food and drink after dinner on the day before surgery. •Intraoperative: antibiotics before skin incision and every 3 h during surgery, one administration after surgery; routine use of 1 abdominal drain; Start to drink water on POD 1; Start a liquid diet on POD 3 and 5 steps leading to regular food intake on POD 8; Epidural analgesia for 3 days after open surgery; Parenteral nutrition until POD 5; and encouraged to walk by themselves after POD 1. Duration day before surgery up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Academic or government funding
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus CONVENTIONAL CARE	

Study	Tanaka 2017[182]
Protocol outcome 1: Mortality - Actual outcome: Death at postoperatively up to 30 days of discharge; Group 1: 0/73, Group 2: 0/69 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 6, Reason: Received a total gastrectomy with splenectomy for scirrhous gastric cancer; Exhibited peritoneal dissemination disease; Developed para-aortic lymph node metastasis Protocol outcome 2: Perioperative complications - Actual outcome: Clavien Dindo Grade ≥ II at postoperatively up to 30 days of discharge; Group 1: 14/73, Group 2: 22/69; Comments: p value 0.087 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 6, Reason: Received a total gastrectomy with splenectomy for scirrhous gastric cancer; Exhibited peritoneal dissemination disease; Developed para-aortic lymph node metastasis - Actual outcome: Clavien Dindo Grade ≥ III at postoperatively up to 30 days of discharge; Group 1: 3/73, Group 2: 10/69; Comments: p value 0.042 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 0; Group 2 Number missing: 6, Reason: Received a total gastrectomy with splenectomy for scirrhous gastric cancer; Exhibited peritoneal dissemination disease; Developed para-aortic lymph node metastasis Protocol outcome 3: Length of hospital stay - Actual outcome: Postoperative hospital stay at after surgery to discharge; Median (range): ERP: 9 (8-10); Conventional: 10 (9-11.5) days, Comments: p value 0.037); Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 6, Reason: Received a total gastrectomy with splenectomy for scirrhous gastric cancer; Exhibited peritoneal dissemination disease; Developed para-aortic lymph node metastasis Protocol outcome 4: Hospital readmission - Actual outcome: Readmission at within 30 days of discharge; Group 1: 1/73, Group 2: 1/69; Comments: p value 1.000 Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 0; Group 2 Number missing: 6, Reason: Received a total gastrectomy with splenectomy for scirrhous gastric cancer; Exhibited peritoneal dissemination disease; Developed para-aortic lymph node metastasis
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Tang 2015[183]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=100)
Countries and setting	Conducted in China
Line of therapy	Not applicable
Duration of study	Intervention time: December 2012 to December 2013
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	adrenal tumor <6 cm in diameter; no history of extensive operation on abdominal; American Society of Anesthesiology (ASA) score: degree I-III; no active gastrointestinal bleeding or peptic ulceration; and self-care function prior to hospitalization.
Exclusion criteria	having clinically significant cardiac, pulmonary, hepatic, or renal disease; abnormal renal function; extensive previous abdominal surgery; ASA score: degree IV; and refusal to participate in the study.
Recruitment/selection of patients	selected from patients undergoing retroperitoneal laparoscopic adrenalectomy
Age, gender and ethnicity	Age - Mean (SD): FT 49.34 ± 10.18; Conventional: 47.70 ± 10.95. Gender (M:F): 51/49. Ethnicity: NR
Further population details	1. Age: <60 years (FT 49.34 ± 10.18; Conventional: 47.70 ± 10.95). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 1 (ASA I - 72; ASA II - 25; ASA III - 3). 3. Type of surgery: Not applicable (retroperitoneal laparoscopic adrenalectomy).
Indirectness of population	No indirectness
Interventions	(n=50) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative preparation: preoperative patient education about FT surgery management; no bowel preparation, pre-operative liquids containing carbohydrates only until 2 h and solid food 6 h before operation. •Intraoperative preparation: General anesthesia and Foley catheter are used in all cases; F12 drain is placed in all cases, the skin wound is closed in a subcuticular (3-0 monocryl), intravenous fluid restricted to <30 ml/kg in order to avoid fluid overload. •Postoperative preparation: FT group: 40 mg parecoxib sodium (prizer) IV injection is administered immediately after surgery, then 20 mg parecoxib sodium parecoxib sodium (prizer) IV injection is administered at 12 h and 24 h after surgery. Postoperative feeding is served according to the patients' appetite . Patients are encouraged to ambulate as soon as possible after surgery. On day 1, the Foley catheter and drain are removed. Fluid infusion is withdrawn as soon as the patient is able to take

Study	Tang 2015[183]
	oral nutrition. . Duration 1 day preoperatively up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=50) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperative preparation: The traditional care program includes a routine bowel preparation with soapsuds, pre-operative fast solid food before 12 h and liquid food before 6 h. •Intraoperative preparation: a F28 drain is placed in all cases, the skin wound is closed with non-resorbable silk thread (3-0), and intravenous fluid ≥3000 ml. •Postoperative preparation: Analgesia is not routinely administrated, but if patient can't tolerate the pain, 40 mg parecoxib sodium (Prizer) IV injection is administered as a rescue medication. Oral intake is allowed after passage of gas. The drain is removed if the total drainage fluid is less than 10 ml in 24 h. The Foley catheter is removed when patients begin to take off-bed activities. Stitches are taken out in 7 days after surgery. The intravenous drip is stopped when patients meet the same criteria in FT group. . Duration 1 day preoperatively up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK versus CONVENTIONAL

Protocol outcome 1: Quality of life
- Actual outcome: General State at preoperatively; and postoperative day 1 & day 2; Visual Analogue Scale: not reported points Visual Analogue Scale 0-10 Top=High is good outcome;
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - High, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 0; Group 2 Number missing: 0

Protocol outcome 2: Perioperative complications
- Actual outcome: Complications at postoperatively up to discharge; Group 1: 7/50, Group 2: 11/50; Comments: includes peritoneal injury; abdominal distension; and vomiting
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0

Protocol outcome 3: Length of hospital stay
- Actual outcome: Postoperative length of stay at postoperatively up to discharge; Group 1: mean 2.35 days (SD 0.87); n=50, Group 2: mean 5.23 days (SD 1.62); n=50; Comments: p value 0.000
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0

Study	Tang 2015[183]
Protocol outcome 4: Pain - Actual outcome: pain scores postoperatively at 2h, 12h, 24h postoperatively; Visual Analogue Scale: not reported points Visual Analogue Scale 0-10 Top=High is poor outcome; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - High, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	Taupyk 2015[184]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=70)
Countries and setting	Conducted in China
Line of therapy	Not applicable
Duration of study	Intervention time: January 2011 - July 2012
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	•Age ≤ 75 years •Good nutrition and no systemic infection •Elective laparoscopic surgery
Exclusion criteria	•Age ≥ 75 years •Malnutrition or an organ system infection •Associated with obstruction; bleeding; emergency surgery; or surgical intervention •Tumor with extensive metastasis •Prior to surgery patient underwent gastrointestinal decompression and received nutritional support •Previous history of abdominal surgery •Patient previously undergone gastrostomy
Recruitment/selection of patients	patients who were admitted to the Department of Gastrointestinal Surgery, First Hospital of Jilin University

Study	Taupyk 2015[184]
Age, gender and ethnicity	Age - Mean (SD): FTS: 58.5 ± 8.4; Conventional: 57.4 ± 10.1. Gender (M:F): 42/28. Ethnicity: NR
Further population details	1. Age: <60 years (FTS: 58.5 ± 8.4; Conventional: 57.4 ± 10.1). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: lower and upper GI (laparoscopic surgery for colorectal cancer).
Indirectness of population	No indirectness
Interventions	(n=31) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative: No mechanical bowel preparation; Pre-operative fasting for 2 h for liquids and for 6 h for solid food; Enteral nutrition 24 h prior to surgery and 500 ml of 10% glucose solution 3 h prior to surgery; Intravenous antibiotics 30 min prior to surgery. •Intraoperative: Colloidal fluid consumption limited to 500 ml and crystalloid fluid consumption limited to 150ml; vasoactive drugs may be used when necessary. •Postoperative: Continuous epidural analgesia (up to 48 h post-surgery); At 6 h post-surgery, the patient can consume a liquid diet, with restoration of a solid diet at 24 h post-surgery; No nasogastric tube used, and if used, removed at the end of the surgery; No drainage tube; Removed on the first post-operative day; Ambulation started on the first post-operative day. Duration 1 day preoperatively up to discharge . Concurrent medication/care: NA. Indirectness: No indirectness (n=39) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Pre-operative: Mechanical bowel preparation; Pre-operative fasting for 24 h prior to surgery; Semi-liquid diet initiated 72 h prior to surgery, and fasting prescribedon the morning of surgery; Orally administered metronidazole and amikacin 72 h prior to surgery, and intravenous antibiotics 30 min prior to surgery. •Intraoperative: Sufficient fluid administered according to urine volume. •Postoperative: Intermittent injection of meperidine; Fluid diet fed after the passage of first flatus, 3-4 days post-surgery; Remove NG tube after 3-4 days; Remove drainage tube at 3-5 days; Remove urinary catheter at 3-4 days; Ambulation started at 3-4 days post-surgery; ambulation cannot start until full recovery of physical strength. Duration 1 day preoperatively up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FTS versus CONTROL

Protocol outcome 1: Perioperative complications
- Actual outcome: Complications at postoperatively to discharge; Group 1: 1/31, Group 2: 2/39; Comments: includes anastomotic leakage; intestinal obstruction; wound infection
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low,

Study	Taupyk 2015[184]
Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 2: Length of hospital stay - Actual outcome: Length of hospital stay at admission to discharge; Group 1: mean 5.9 days (SD 0.8); n=31, Group 2: mean 10.9 days (SD 1.3); n=39; Comments: p value < 0.001 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 0; Group 2 Number missing: 0 - Actual outcome: Post-operative days at postoperatively to discharge; Group 1: mean 4.3 days (SD 0.8); n=31, Group 2: mean 8 days (SD 1.1); n=39; Comments: p value < 0.001 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Feng 2016[55]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	N/A (n=230)
Countries and setting	Conducted in China; Setting: A total of 263 hospitalized patients with CRC undergoing open colorectal surgery were continually recruited at the Center for Gastroenterology Surgery, West China Hospital, Sichuan University, from August 2014 to March 2015.
Line of therapy	Not applicable
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall: N/A
Subgroup analysis within study	Not applicable: N/A
Inclusion criteria	age between 18 and 70 years; a histological diagnosis of CRC with enteroscopy, followed by colorectal surgery; no radiotherapy or chemotherapy treatment; no severe diarrhea, liver, and kidney function failure or cardiopulmonary insufficiency; an American Society of Anesthesiologists (ASA) grade of I–III; a body mass index

Study	Feng 2016[55]
	(BMI) between 18.5 and 30; and an abdominal CT examination that found no obvious lymph node or distant metastasis.
Exclusion criteria	history of abdominal surgery; endocrine or immune system dysfunction (such as diabetes, thyroid disease, multiple sclerosis, and rheumatoid ar- thritis or other endocrine metabolic disorders); recent blood transfusions; preoperative treatment with opioids, hormones, nonsteroidal anti-inflammatory drugs, or other immunomodulatory substances; and contraindications for epidural anesthesia.
Age, gender and ethnicity	Age - Mean (SD): FST 58.12 +/-11.04; Traditional 58.31 +/- 10.89. Gender (M:F): 129/101. Ethnicity: Chinese
Further population details	1. Age: Not applicable 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not applicable 3. Type of surgery: lower and upper GI
Indirectness of population	No indirectness
Interventions	(n=121) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Preoperative • Preoperative assessment, detailed discussionswith the patient and the patient's family about FTS management • Free diet, but with the limitation of fiber; a solid-food fast 6 h before surgery and the consumption of liquid food only (no milk or beverages containing fat); nil by mouth 2 h before surgery; 250 ml of carbohydrate-rich drink 2–3 h prior to surgery • Nomechanical bowel preparation; only oral intestinal cleaner 12 h preoperation. No need for liquid stool • Single-dose antibiotic prophylaxis • No routine use of nasogastric tube or urinary catheter Intraoperative • Continuous epidural anesthesia; • Right-sided colon resection via a T6–T7 level catheter; sigmoidectomy with a T9–T10 level catheter; rectectomy viaaL1–L4 level catheter If general anesthesia is used, an adequate dose is administered with the first injection •Minimally invasive techniques • Hypothermia prevention; the intraoperative core temperature is maintained at 36± 0.5 °C Postoperative Postoperative day 1:• For non-hypovolemia patients, give fluids at most up to1500 ml/kg · day • If a nasogastric tube was placed, remove it after 12 h • Remove urinary catheter for patients who underwent colon and upper rectal segment surgery • If drainage tube was placed, remove it after 24 h • Early oral feeding of water or tea at 12 h:, oral feeding of emulsion (Fresubin®), 50 % of total dose over 24 h (total energy: 25–30 kcal/kg · day) •Mobilization of patient in the evening (2 h of sitting up or standing) • Regular pain control with a patient-controlled analgesia (PCA) pump administering 96 ml/2 ml/h of opioid-sparing multimodal analgesia, including oral paracetamol,

Study	Feng 2016[55]
	non-steroidal anti-inflammatory drugs, gabapentanoids • No regular parenteral nutrition support postoperative day 2: • Fluid restriction to 1000 ml/kg · day • Remove urinary catheter for patients who underwent rectal lower segment surgery •Mobilization of patient in the ward (4–6h out of bed) • Urinary catheter kept in place for 1–3days • Normal diet or emulsion (100 %of total dose over 48 h; total energy of 25–30 kcal/kg · day) Postoperative days 3–5: • Fluid restriction to 500 ml/day • Discharge criteria: Stable vital signs, alert and oriented state of consciousness, absence of complications or symptoms, autonomous walking, possibility of solid diet consumption, no fluid transfusion, successful first flatus, spontaneous diuresis, self-sufficiency in basic daily activities. Duration 1 day before the surgery+ 6 days after. Concurrent medication/care: Not stated. Indirectness: No indirectness (n=120) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Preoperative: • Nasogastric tube and urinary catheter use is routine • Pre-operative fasting for at least 8 h •Mechanical bowel preparation Intraoperative: • General anesthesia • Open surgery • Temperature maintained at 34.7 ±0.6 °C Postoperative: • Nasogastric tube kept in place • Nil bymouth until flatus; sips ofwater if bowel passage occurs •Mobilization of the patients from postoperative 24 h • Fluid transfusion (approximately 3000 ml/kg · day) until food intake begins • TPN (Kabiven TM PI) via PICC or CVC, 1-2 ml/kg · day, 50 %of total dose over 24 h, total dose over 48 h •Oral feeding after aerofluxus, (total energy 25–30 kcal/kg · day) • Continuous epidural anesthesia for 2–3days • Possible removal of the urinary catheter at postoperative day 3–5 according to the patient's needs. Duration 1 day before the surgery+ 6 days after. Concurrent medication/care: Not stated. Indirectness: No indirectness
Funding	Academic or government funding (This research was supported by a program of the science department of Sichuan Province, China (No. 2013SZ0026). The funders had no role in the study design, data collection and analysis, decision to publish, or preparation of the manuscript.)

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE

Protocol outcome 1: Perioperative complications
- Actual outcome: complications at Post-operative period; Group 1: 7/116, Group 2: 17/114
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 5; Group 2 Number missing: 6

Protocol outcome 2: Length of hospital stay

Study	Feng 2016[55]
- Actual outcome: Length of hospital stay at na; p: 0.215, Comments: Mean +/- SD FST 7.54± 2.18; Traditional group 8.62± 2.83); Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 5; Group 2 Number missing: 6	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Wang 2010[193]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=94)
Countries and setting	Conducted in China; Setting: Department of General Surgery, Affiliated Hospital of Qingdao University Medical College
Line of therapy	Not applicable
Duration of study	Intervention + follow up: January 2008 to August 2008
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	patients younger than 80 years of age who were not receiving preoperative chemotherapy and radiotherapy
Exclusion criteria	primary diabetesmellitus or impaired glucose tolerance; primary hepatonephric diseases; primary cardio-cerebral diseases; severe obesity or body mass index (BMI) >30 kg/m2; severe malnutrition (BMI<15 kg/m2), and hyperthyroidism or hypothyroidism
Recruitment/selection of patients	patients selected from outpatients clinic
Age, gender and ethnicity	Age - Mean (SD): Fast track: 58.76±9.66; Conventional: 56.87±9.16. Gender (M:F): 61/31. Ethnicity:
Further population details	1. Age: <60 years (Fast track: 58.76±9.66; Conventional: 56.87±9.16). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: lower and upper GI (Gastrectomy).
Indirectness of population	No indirectness

Study	Wang 2010[193]
Interventions	(n=47) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Day before surgery: Preoperative information about FTS education; Normal meal until 6 h before surgery; Normal carbohydrate drink until 2 h before surgery; No pre-anesthetic medication; No bowel preparation. •Day of surgery: Mid-thoracic epidural anesthesia and analgesia (T7–10, depending on resection); Combined tracheal intubation and general anesthesia; No routine nasogastric tube drainage; if used, remove as early as possible after surgery; Restricted fluid regimen during surgery (Ringer's lactate 20 mL/kg in the first hour, followed by 6 mL/kg/h); Vasopressor drugs as management if the mean arterial pressure is <60 mmHg or urine output is <0.5 mL/kg/h; Minimally invasive incision; infiltration of surgical wounds with bupivacaine; No routine use of abdominal drains; Patients transferred to anesthesia recovery room; Oral intake of a little clear water as soon as effects of anesthesia disappear+i.v. infusion of Ringers lactate 2.0 L (avoid excessive i.v. fluids); Mobilization on bed in the evening. •POD1: Continue epidural analgesia with local anesthetic + 1,000 mg paracetamol every 6 h; Patients drink at least 0.5 L liquid (follow a stepwise plan from water to other liquids to semi-fluids to normal food) +i.v. infusion of Ringer's lactate (appropriate level of i.v. fluid intake based on the volumes of liquid intake and output, and physiological need by the attending surgeon); Remove urine catheter as early as possible; Patients mobilize out of bed at least four times per day. •POD2: Patients drink at least 1 L liquid+others as above (patients gradually resume eating a normal diet; the daily increase in oral intake after surgery is managed by the attending surgeon). •POD3: Stop epidural analgesia; Continue mobilization. •POD4: Continue until fulfills discharge criteria. Duration day before surgery to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=47) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Day before surgery: Normal meal until midnight; No intake of oral carbohydrate drink on the day of surgery; Pre-anesthetic medication; Routine bowel preparation. •Day of surgery: Tracheal intubation and general anesthesia; Routine nasogastric tube drainage; Standard fluid regimen during surgery (Ringer's lactate 20 mL/kg in the first hour, followed by 10–12 mL/kg/h); Additional fluid infusion as the first choice for management if the mean arterial pressure is <60 mmHg or urine output is <0.5 mL/kg/h; Standard laparotomy approach; No infiltration of surgical wounds with bupivacaine; Standard use of abdominal drains; Patients transferred to anesthesia recovery room; Fasting until normal bowel sounds are heard; I.v. infusion of about 2.5–3.0 L of Ringer's lactate by the attending surgeon; Bed rest. •POD1: Continuous i.v. infusion of morphine or PCA-morphine; Oral intake is initiated if normal bowel sounds are heard (follow a stepwise plan from water to other liquids to semi-fluids to normal food) +i.v. infusion of about 2.5–3.0 L of Ringer's lactate by the attending surgeon until adequate oral intake; Encourage patients to mobilize out of bed. •POD2: continue as POD1 and to gradually resume eating a normal diet. •POD3+4: continue as POD1 until discharge criteria fulfilled . Duration day before surgery to discharge. Concurrent medication/care: NA. Indirectness: No indirectness

Study	Wang 2010[193]
Funding	Funding not stated
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK versus CONVENTIONAL CARE Protocol outcome 1: Quality of life - Actual outcome: Death at postoperatively up to 30 days post discharge; Group 1: 0/45, Group 2: 0/47 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: withdrew consent; Group 2 Number missing: 0 - Actual outcome: Quality of life at after discharge; Group 1: mean 15.71 (SD 1.83); n=45, Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: withdrew consent; Group 2 Number missing: 0 Protocol outcome 2: Perioperative complications - Actual outcome: Total complications at postoperatively up to 30 days post discharge; Group 1: 8/45, Group 2: 6/47 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: withdrew consent; Group 2 Number missing: 0 Protocol outcome 3: Length of hospital stay - Actual outcome: Hospital stay at postoperative to discharge; Median (range): FT: 6 (6-7); Conventional: 8 (7-8) days, Comments: P value < 0.001); Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: withdrew consent; Group 2 Number missing: 0 Protocol outcome 4: Hospital readmission - Actual outcome: Readmission at up to 30 days post discharge ; Group 1: 1/45, Group 2: 1/47; Comments: p 1.000 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: withdrew consent; Group 2 Number missing: 0 Protocol outcome 5: Pain - Actual outcome: Postoperative pain at day 0 - day 5; -: - Visual Analogue Scale 1-10 Top=High is poor outcome, Comments: only reported as p < 0.05; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - High, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 2, Reason: withdrew consent; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Study	Wang 2011[195]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=230)
Countries and setting	Conducted in China
Line of therapy	Not applicable
Duration of study	Intervention + follow up: July 2007 to August 2009
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	resection of colorectal cancer
Exclusion criteria	(unclear) non-selective admission, preoperative distant metastasis, stoma, emergency situations, scheduled total colectomy or abdominoperineal resection, contraindications for epidural anesthesia or early ambulation
Recruitment/selection of patients	selected patients from those due to undergo colorectal resection
Age, gender and ethnicity	Age - Median (range): FTR: 57 (38-69); Conventional Care: 55 (40-67). Gender (M:F): 125/85. Ethnicity: NR
Further population details	1. Age: <60 years (FTR: 57 (38-69); Conventional Care: 55 (40-67)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 59; ASA II - 116; ASA III - 35). 3. Type of surgery: lower and upper GI (colorectal resection).
Indirectness of population	No indirectness
Interventions	(n=115) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative: Patients and their relatives were informed about the surgical procedure and postoperative course. •Day before surgery: 4 units of carbohydrate liquids; last meal 6h before operation. •Day of surgery: 2 units of carbohydrate liquid before surgery; general anesthesia; epidural catheter •Surgical management: minimal invasive incision; infiltration of surgical wounds with Bupivacaine; no surgical drains unless necessary. •Early post operative care: Use of epidural catheter; First oral drink 2 h after surgery; IV infusion of Ringers lactate 1.5 L/d; Mobilization in the evening (> 2 h out of bed). •POD1: Oral intake > 2 L (including 4 units carbohydrate liquids); Semi-solid food intake; Stop IV fluid administration; remove urine catheter; Expand mobilization (> 6 h out of bed). •POD2: Remove epidural add Diclofenac 3 × 50 mg/d; Normal diet; expand mobilization (> 8 h); Plan discharge; •POD3: Continue as on day 2 till discharge criteria fulfilled. Duration preoperative assessment to discharge . Concurrent medication/care: NA. Indirectness: No indirectness

Study	Wang 2011[195]
	(n=115) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperative: Patient were educated in the standard manner. •Day before surgery: Two oral sachets of fleet bowel preparation; Last meal at midnight. •Day of surgery: pre-operative fasting; routine placement of NG tube; preanesthetic oral diazepam; general anesthesia. •Surgical management: Median laparotomy approach; Routine placement usually discarded the day before discharge. •Early postoperative care: Analgesia by bolus administration of diclofenac or morphine; No oral application scheme; IV infusion of Ringers lactate 2.5 L/d; No mobilization scheme. •POD1: Diet increased on daily basis; IV fluid administration (2.5 L/d) till adequate oral fluid intake; Mobilization according to attending surgeon. •POD ≥2: Continue as on day 1 till discharge criteria fulfilled. Duration preoperative assessment to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Academic or government funding

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK REHABILITATION PROGRAM versus CONVENTIONAL CARE

Protocol outcome 1: Mortality
- Actual outcome: Death at within 30 days of surgery; Group 1: 2/106, Group 2: 1/104; Comments: p value 0.572
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 9, Reason: did not fulfill inclusion criteria; Group 2 Number missing: 11, Reason: did not fulfill inclusion criteria

Protocol outcome 2: Perioperative complications
- Actual outcome: Overall complications at within 30 days of surgery; Group 1: 20/106, Group 2: 39/104; Comments: p value 0.015
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 9, Reason: did not fulfill inclusion criteria; Group 2 Number missing: 11, Reason: did not fulfill inclusion criteria

Protocol outcome 3: Length of hospital stay
- Actual outcome: Hospital stay time at postoperative to discharge; Group 1: mean 5.1 days (SD 3.1); n=106, Group 2: mean 7.6 days (SD 4.8); n=104; Comments: p value 0.001
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 9, Reason: did not fulfill inclusion criteria; Group 2 Number missing: 11, Reason: did not fulfill inclusion criteria

Protocol outcome 4: Hospital readmission

Study	Wang 2011[195]
- Actual outcome: Readmission at within 30 days of surgery; Group 1: 4/106, Group 2: 9/104 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 9, Reason: did not fulfill inclusion criteria; Group 2 Number missing: 11, Reason: did not fulfill inclusion criteria	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Wang 2012[200]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=78)
Countries and setting	Conducted in China; Setting: University Hospital
Line of therapy	Not applicable
Duration of study	Intervention + follow up: April 2006 - October 2009
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	aged over 65 years; diagnosis of colorectal cancer; and undergoing laparoscopic colorectal resection
Exclusion criteria	Younger than 65 years; distant metastasis involving pelvic invasion; the urethra or the iliac vessels, or unable to undergo surgery becayse of poor cardiopulmonary function.
Recruitment/selection of patients	recruited from Department of Gastric and Colorectal surgery, First Hospital of Jilin University
Age, gender and ethnicity	Age - Median (range): FT group 71 (65-81); Control 72 (65-82). Gender (M:F): 42/36. Ethnicity: NR
Further population details	1. Age: >60 years (FT group 71 (65-81); Control 72 (65-82)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: lower and upper GI (laparoscopic colorectal resection).
Indirectness of population	No indirectness
Interventions	(n=40) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative care: •bowel prep - oral administration of two bags of polyethylene glycol-electrolyte powder dissolved in 2000 ml of warm boiled water 1 day before surgery, no administration of intestinal antibiotics, no

Study	Wang 2012[200]
	mechanical bowel irrigation; •Diet control - oral consumption of non residue nutrison 1 day before surgery, oral consumption of 500ml 10% glucose solution 3 hours before surgery; •Intraoperative: •Nasogastric tube - routinely placed and removed after surgery, •Anesthesia - general endotracheal anesthesia together with continuous epidural anesthesia, •Restricted fluid replacement - colloidal fluid consumption limited to 500ml and crystalloid fluid consumption limited to 1500ml, vasoactive drugs may be used when necessary; •Postoperative: •analgesia - continuous epidural analgesia (up to 48 hours post op), early food intake - water was given after patients returned to consciousness, fluid diet given on POD 1 with incremental amounts given in the following days, on POD 3 normal diet resumed and edible oil orally administered to facilitate defecation, •Early mobilization - ambulation on POD 1, •urinary catheter - removed POD 1, •drainage tube - removed POD 3.. Duration 1 day before admission to discharge. Concurrent medication/care: NA (n=38) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperative: •bowel preparation - daily oral administration of 30ml of 33% magnesium sulphate (once) as well as amikacin and metronidazole (three times a day) 3 days before surgery, •bowel irrigation performed on the night before surgery; •Diet control - semi liquid initiated 3 days before surgery and fasting prescribed on the morning of surgery, •Nasogastric tube - routinely placed and removed after passage of flatus; Intraoperative: Anesthesia - general endotracheal anesthesia, Restricted fluid replacement - sufficient fluid was given according to urine volume; •Postoperative: •Analgesia - intermittent injection of meperidine, •Early food intake - fluid diet was fed after passage of first flatus, •Early mobilization - ambulation was not started until full recovery of physical strength, •Urinary catheter - removed on POD 3-4, •Drainage tube - removed on POD 6-7. Duration 3 days before surgery to discharge. Concurrent medication/care: NA
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST-TRACK GROUP versus CONTROL GROUP

Protocol outcome 1: Mortality
- Actual outcome: Mortality at Postoperatively ;
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - High, Measurement - High, Crossover - Low, Comments - unclear which group mortality is reported for and within which time frame; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0

Protocol outcome 2: Perioperative complications
- Actual outcome: Overall Complications at Postoperatively; Group 1: 2/40, Group 2: 8/38
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low,

Study	Wang 2012[200]
Crossover - Low, Comments - ; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 3: Length of hospital stay - Actual outcome: Length of stay at Unclear; Median (IQR): FT 5.5 (5-6); Control 7.0 (6-8) days, Comments: not defined is total admission period covered in length of stay or postoperative to discharge period measured); Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Comments - ; Indirectness of outcome: No indirectness ;	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Wang 2012[196]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=99)
Countries and setting	Conducted in China; Setting: Research Institute of General Surgery, Jinling Hospital
Line of therapy	Not applicable
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	--
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	no pre-operative chemotherapy or radiotherapy, no previous abdominal surgery, absence of distant metastases, American Society of Anesthesiology (ASA) I - III and informed consent
Exclusion criteria	age less than 18 years, cannot take care of themselves at home, have undergone conversion to laparotomy, epidural catheter could not be inserted or worked, anastomosis were performed below 12cm from the anus and patients receiving stoma.
Recruitment/selection of patients	99 consecutive patients
Age, gender and ethnicity	Age - Median (range): median age 55 years (range 33 - 65). Gender (M:F): 59/40. Ethnicity: NR
Further population details	1. Age: <60 years (median age 55 years (range 33 - 65)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 13/15, ASA II 27/24, ASA III 9/11). 3. Type of surgery: lower and

Study	Wang 2012[196]
	upper GI (laparoscopic colonic resection).
Extra comments	patients diagnosed with adenocarcinoma of the colon. both groups treated at a single centre, by the same surgical team.
Indirectness of population	No indirectness
Interventions	(n=54) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. preoperative patient education, no bowel preparation, no preoperative fasting but carbohydrate containing liquids until 2 hours before surgery, analgesia with routine oral non-steroidal anti-inflammatory medications and minimization of opioid pain management, avoidance of perioperative fluid overload, no routine use of NG tubes, early feeding and enforced ambulation on the day of surgery.. Duration day before surgery, discharge and initial telephone follow up and 30 day outpatient appointment. . Concurrent medication/care: not stated. Indirectness: No indirectness (n=53) Intervention 2: No enhanced recovery programme (standard care) - Standard care. routine bowel preparation, NGT use and diet advancement from clears to soft diet according to surgeon preference. . Duration day before surgery, discharge and 30 day outpatient appointment. . Concurrent medication/care: not stated. Indirectness: No indirectness
Funding	Academic or government funding

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK CARE versus TRADITIONAL CARE

Protocol outcome 1: Mortality
- Actual outcome: Death at postoperative; Group 1: 1/49, Group 2: 0/50
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness ; Blinding details: clearly stated that it was not possible to blind this study. To avoid cross-contamination between the two groups of patients, the groups were cared for in different wards and every measure of randomization was directed by the surgical research team. Both groups were cared for by the same team. ; Group 1 Number missing: 5, Reason: conversion to laparotomy PCA pump failure
received stoma; Group 2 Number missing: 3, Reason: conversion to laparotomy metaptosis to pelvic floor

Protocol outcome 2: Perioperative complications
- Actual outcome: General Complications at postoperative; Group 1: 3/49, Group 2: 6/50
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness ; Blinding details: clearly stated that it was not possible to blind this study. To avoid cross-contamination between the two groups of patients, the groups were cared for in different wards and every measure of randomization was

Study	Wang 2012[196]
directed by the surgical research team. Both groups were cared for by the same team. ; Group 1 Number missing: 5, Reason: conversion to laparotomy PCA pump failure received stoma; Group 2 Number missing: 3, Reason: conversion to laparotomy metaptosis to pelvic floor - Actual outcome: Surgical Complications at postoperative; Group 1: 3/49, Group 2: 4/50 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness ; Blinding details: clearly stated that it was not possible to blind this study. To avoid cross-contamination between the two groups of patients, the groups were cared for in different wards and every measure of randomization was directed by the surgical research team. Both groups were cared for by the same team. ; Group 1 Number missing: 5, Reason: conversion to laparotomy PCA pump failure received stoma; Group 2 Number missing: 3, Reason: conversion to laparotomy metaptosis to pelvic floor Protocol outcome 3: Length of hospital stay - Actual outcome: length of hospital stay at day of surgery to discharge; Median (range): FT: 4 days (2 - 12); non-FT: 5 days (3 - 48) days, Comments: P value 0.01); Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness ; Blinding details: clearly stated that it was not possible to blind this study. To avoid cross-contamination between the two groups of patients, the groups were cared for in different wards and every measure of randomization was directed by the surgical research team. Both groups were cared for by the same team. ; Group 1 Number missing: 5, Reason: conversion to laparotomy PCA pump failure received stoma; Group 2 Number missing: 3, Reason: conversion to laparotomy metaptosis to pelvic floor Protocol outcome 4: Hospital readmission - Actual outcome: Readmission at post discharge; Group 1: 2/49, Group 2: 3/50 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness ; Blinding details: clearly stated that it was not possible to blind this study. To avoid cross-contamination between the two groups of patients, the groups were cared for in different wards and every measure of randomization was directed by the surgical research team. Both groups were cared for by the same team. ; Group 1 Number missing: 5, Reason: conversion to laparotomy PCA pump failure received stoma; Group 2 Number missing: 3, Reason: conversion to laparotomy metaptosis to pelvic floor	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Wang 2012[194]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=170)
Countries and setting	Conducted in China; Setting: Research Institute of General Surgery, Jinling Hospital
Line of therapy	Not applicable
Duration of study	Follow up (post intervention): July 2008 - February 2010
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	no disease of the immune system; no pre-operative radiotherapy or chemotherapy; no history of operation on abdominal and distant me- tastases; American Society of Anesthesiology (ASA) score: degree I–III; and self-care function prior to hospitalization.
Exclusion criteria	The exclusion criteria were as follows: association with other organ resection, conversion from laparoscopic operation to laparotomy, inability to place an epidural catheter, inability to infuse drugs, need for a stoma, and emergency operation.
Recruitment/selection of patients	Recruited from patients diagnosed with colon carcinoma
Age, gender and ethnicity	Age - Median (range): FT group: 57.2 ± 18.1 / 55.7 ± 17.3; Traditional group: 55.4 ± 16.8 / 56.1 ± 14.6 . Gender (M:F): 102/61. Ethnicity: NR
Further population details	1. Age: <60 years (FT group: 57.2 ± 18.1 / 55.7 ± 17.3; Traditional group: 55.4 ± 16.8 / 56.1 ± 14.6). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 64; ASA II - 76; ASA III - 23). 3. Type of surgery: lower and upper GI (Colonic resection).
Indirectness of population	No indirectness
Interventions	(n=84) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Day before operation: No bowel preparation was performed; 100 g of glucose in 1,000 mL of water (glucose injection 10 %) orally administered at 10 p.m. on the evening before operation; a further 50 g of carbohydrate in 500 mL of water given 3–4 h before operation; Intake of clear fluids until 2 h before initiation of anesthesia and a 6-h fast for solid food; • Day of operation: General anesthesia; Epidural catheter with bupivacaine; no surgical drains unless needed; •Postoperative care: Use of epidural catheter 0.125 % bupivacaine with fentanyl; discard abdominal drains on POD 1; remove urinary catheter within 24 hours; start to eat and drink early (free fluids on the day of operation followed by a regular diet as tolerated); encourage patients to

Study	Wang 2012[194]
	ambulate early . Duration 1 day before surgery to discharge . Concurrent medication/care: NA (n=86) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Day before operation: Mechanical bowel preparation; no carbohydrate loading; fasted from midnight before operation day; • Day of operation: general anesthesia; routine placement of surgical drain; • Postoperative care: analgesia by bolus administration of diclofenac or morphine; abdominal cavity drain removed the day before discharge; urine catheter in situ for 3 days; no eating and drinking until bowel venting; mobilization at patients will.. Duration 1 day before surgery to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK CARE versus TRADITIONAL CARE

Protocol outcome 1: Mortality
- Actual outcome: In-hospital mortality at Postoperatively up to discharge; Group 1: 1/81, Group 2: 1/82
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: could not place epidural catheter; deviation from specified protocol; Group 2 Number missing: 4, Reason: deviation from specified protocol

Protocol outcome 2: Perioperative complications
- Actual outcome: General Complications at after surgery to discharge ; Group 1: 6/81, Group 2: 11/82; Comments: General complications were defined as follows: cardiovascular, pulmonary, thromboembolic, urinary tract, and other complications.
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: could not place epidural catheter; deviation from specified protocol; Group 2 Number missing: 4, Reason: deviation from specified protocol
- Actual outcome: Surgical Complications at after surgery to discharge ; Group 1: 6/81, Group 2: 5/82; Comments: Surgical complications were defined as wound complication, anastomotic leak, and bowel obstruction requiring reoperation.
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: could not place epidural catheter; deviation from specified protocol; Group 2 Number missing: 4, Reason: deviation from specified protocol

Protocol outcome 3: Length of hospital stay
- Actual outcome: Postoperative hospital stay at after surgery to discharge (including readmission stay within 30 days); Group 1: mean 5.9 days (SD 4.1); n=81, Group 2: mean 6.7 days (SD 4.5); n=82
Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low,

Study	Wang 2012[194]
Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: could not place epidural catheter; deviation from specified protocol; Group 2 Number missing: 4, Reason: deviation from specified protocol Protocol outcome 4: Hospital readmission - Actual outcome: Readmission at up to 30 days post discharge; Group 1: 4/81, Group 2: 5/82 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 3, Reason: could not place epidural catheter; deviation from specified protocol; Group 2 Number missing: 4, Reason: deviation from specified protocol	
Protocol outcomes not reported by the study	Quality of life ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Wang 2015[197]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=180)
Countries and setting	Conducted in China; Setting: University Hospital
Line of therapy	Not applicable
Duration of study	Intervention time: January 2008 - April 2014
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	Patient with oesophageal cancer
Exclusion criteria	no serious cardiovascular disease or liver and kidney dysfunction, hyperlipidemia, diabetes or other endocrine metabolic disorders, or hormone, radiotherapy, or chemotherapy treatment. Patients who could not complete treatment because of unwillingness to cooperate, unsuccessful epidural catheter placement, surgery duration >6 hours (hrs), intraoperative blood volume of 500 mL, unresectable tumor, complications after severe thoracic surgery (recurrent laryngeal nerve damage, phrenic nerve damage, respiratory failure, and pulmonary embolism) were excluded.
Recruitment/selection of patients	selected from patients within Thoracic surgery Department of East Affiliated Hospital of Tongji University

Study	Wang 2015[197]
Age, gender and ethnicity	Age - Other: ≥60: 103; <60: 77 . Gender (M:F): 120/60. Ethnicity: NR
Further population details	1. Age: >60 years (≥60: 103; <60: 77). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: lower and upper GI (radical section of oesophageal cancer).
Indirectness of population	No indirectness
Interventions	(n=90) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative Treatment: Patients with a NRS score of ≥3 points were included in the nutrition support program. Combined parenteral nutrition (PN) and EN were administered from the early preoperative stage (5-7 days) to support treatment. Patients did not fast the day before surgery, did not undergo coloclysis on the evening before surgery, or receive conventional indwelling stomach tube. On the morning of surgery. Patients were administered 500 mL of EN emulsion 12 hrs before surgery, and 300-500 mL of EN emulsion 2 hrs before surgery •Intraoperative: General anesthesia and epidural anesthesia at T6-8. Before induction of anesthesia, 10 mg of dexamethasone and short-acting propofol and remifentanil were administered as sedative and analgesic drugs. Surgery was performed immediately after successful anesthesia; the anesthesia time was minimized as much as possible. Intraoperatively, the infusion rate was controlled at a fluid volume of ≤1500 mL (500 mL of colloid with 1000 mL of balanced salt solution), and vasoactive drugs were used based on heart rate and blood pressure. The infusion liquid was heated using the infusion warmer and other methods to maintain the patients' body temperature at approximately 36°C during surgery. The damage control surgical approach was used. •Postoperative: The study group patients began physical activity in bed on the day of surgery, and were allowed to stand bedside the bed with little movement 1 day after surgery. The optimized nutritional support program involving PN and EN administered to control the fluid profile included the following: EN infusion through a nasojejunal feeding tube immediately after surgery,6 hrs after surgery; dose increased to nearly 1000 mL depending on patient tolerance at 36-48 hrs after surgery; and dose further increased to >1000 mL at 72 hrs after surgery. The volume of intravenous fluids was correspondingly decreased. The stomach tube was disconnected after exsufflation, and the patients were fed a liquid diet. The feeding tube was removed after the patients could consume approximately 2000-2500 mL of the liquid diet, after which they were gradually fed a semi-liquid diet, followed by a normal diet. If the volume of fluid drained from the chest was <200 mL/day, lung function was good, and plasma protein levels were within the normal range, the chest tube was removed. Postoperative placement of an epidural catheter was performed for continuous infusion of the analgesia for 48 hrs.. Duration 7 days preoperatively up to discharge. Concurrent medication/care: NA (n=90) Intervention 2: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative preparation: The control group underwent conventional preoperative management, and no NRS was performed or targeted nutritional support administered. They could eat in the afternoon on the day before surgery, have liquid food in the night before surgery, undergo coloclysis in the evening before surgery and gastric tube or catheter placement in the morning of surgery, fast for 6 h before surgery, and could not

Study	Wang 2015[197]
	drink water for 2 hrs before surgery. •Intraoperative treatment: In the control group, general anesthesia was administered, the volume of fluid was not controlled, no insulation measures were taken, and dexamethasone was not used. The incision length and the use of double-lumen endotracheal intubation and one-lung ventilation without enteral feeding tube placement were decided by the surgeon. •Postoperative treatment: performed activities in bed before drainage tube removal, and out of bed after removal. The indications for removal of the chest drainage tube were drainage volume <100 mL/day, and good lung function on chest radiography. Postoperative nutrition included PN. In patients with no anastomotic fistula on esophagography on postoperative day 7, the stomach tube was disconnected to allow liquid diet consumption. On postoperative day 10, the nasojejunal feeding tube was removed and a semi-liquid diet was started. . Duration 1 day preoperatively up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK versus ERP Protocol outcome 1: Perioperative complications - Actual outcome: Postoperative Complications at after surgery to discharge ; Group 1: 6/90, Group 2: 17/90; Comments: study group included 1 case of wound infection, 2 cases of arrhythmia, 1 case of pleural effusion, and 2 cases of pulmonary infection. The control group had 7 cases of lung infection, 4 cases of heart failure, 2 cases of wound infection, 1 case of anastomotic bleeding, 2 cases of pleural effusion, and 1 case of deep vein thrombosis. Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 2: Length of hospital stay - Actual outcome: Postoperative length of stay at after surgery to discharge ; Group 1: mean 9 days (SD 0.78); n=90, Group 2: mean 11.7 days (SD 1.39); n=90 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 0; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Yang 2012[212]

Study	Yang 2012[212]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=70)
Countries and setting	Conducted in China; Setting: University Hospital
Line of therapy	Not applicable
Duration of study	Intervention time: November 2008 - January 2009
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	age ≥ 18 and ≤ 80 years; no preoperative chemotherapy and radiotherapy; ASA I-II; grade, BMI 17.5-27.5 kg/m2; preoperative serum albumin ≥ 30 g/L
Exclusion criteria	immune related diseases; primary diabetes mellitus or impaired glucose tolerance; hiatus hernia; gastroesophageal reflux disease; pregnancy; bowel obstruction; patients with difficult airway access; and prescribed or other drug use that might affect bowel movement and function.
Recruitment/selection of patients	selected from department of gastrointestinal-pancreatic surgery
Age, gender and ethnicity	Age - Mean (SD): FT 57.2 ± 11.7; Conventional 59.5 ± 12.1. Gender (M:F): 42/20. Ethnicity: NR
Further population details	1. Age: <60 years (FT 57.2 ± 11.7; Conventional 59.5 ± 12.1). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear (all patients ASA I/II - figures not stated). 3. Type of surgery: lower and upper GI (colorectal resection for colorectal carcinoma).
Indirectness of population	No indirectness
Interventions	(n=35) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Normal meals until 10pm the day before surgery; •then 2 hours before surgery drink 250ml of 5% carbohydrate; •no routine NG tube drainage; •removal of urine and venous catheters as early as possible; •oral feeding started 6-12 hours after surgery, following a stepwise plan from liquid nutrition to normal diet (Ensure was mixed with water and used for oral nutrition, slowly increased amounts up to 200ml) every 2 - 3 hours, plus semi-fluids according to tolerance; •Mobilization encouraged beginning the night of the operation and had predefined mobility targets.. Duration day before surgery up to discharge. Concurrent medication/care: NA (n=35) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Normal meal until 10pm the day before surgery; •routine use of nasogastric tube drainage; oral feeding initiated on return to normal gastrointestinal function and followed a stepwise plan from oral liquid nutrition (Ensure) to a normal

Study	Yang 2012[212]
	diet. •Patients sat up and were assisted to mobilize on the first postoperative day, but not aggressively encouraged to mobilize until discontinuation of the thoracic epidural anesthesia. •Urinary catheters were removed following epidural catheter removal. . Duration day before surgery up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK versus CONVENTIONAL Protocol outcome 1: Perioperative complications - Actual outcome: Total Complications at admission to discharge ; Group 1: 6/32, Group 2: 12/30; Comments: Includes surgical site infection; pneumonia; intestinal dysbacteriosis; stress ulcer; arrhythmia; urinary leakage Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: different procedure; irresectable carcinoma; Group 2 Number missing: 5, Reason: blood transfusion; failure of epidural catheter; irresectable carcinoma Protocol outcome 2: Length of hospital stay - Actual outcome: Hospital stay at admission to discharge; Group 1: mean 6 (SD 1); n=32, Group 2: mean 11.7 (SD 3.8); n=30 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3; Group 2 Number missing: 5 Protocol outcome 3: Hospital readmission - Actual outcome: Readmission at readmission post discharge ; Group 1: 0/32, Group 2: 0/30 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness; Group 1 Number missing: 3, Reason: different procedure; irresectable carcinoma; Group 2 Number missing: 5, Reason: blood transfusion; failure of epidural catheter; irresectable carcinoma	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Yang 2012[211]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=70)

Study	Yang 2012[211]
Countries and setting	Conducted in China; Setting: Department of Gastrointestinal and Pancreatic Surgery, First Affiliated Hospital of Sun Yat-sen University
Line of therapy	Not applicable
Duration of study	Intervention time: November 2008 to January 2009
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	Inclusion criteria included: age ≥18 and ≤80 years, no preoperative chemotherapy or radiotherapy, American Society of Anesthesiologists (ASA) grade I/II, body mass index (BMI) 17.5–27.5 kg/m2, preoperative serum albumin ≥30 g/l. All of the patients underwent elective open colorectal resection with combined tracheal intubation and general anesthesia.
Exclusion criteria	Exclusion criteria included immune-related disease; primary diabetes mellitus or impaired glucose tolerance; hiatus hernia; gastroesophageal reflux disease (GERD); pregnancy; bowel obstruction; patients with difficult airway access (difficult to intubate); and drug intake, which might affect bowel movement and function. Patients also would be excluded if the following circumstances occurred: failure of thoracic epidural catheter insertion; intraoperative blood transfusion; patients who required a stoma; unresectable carcinoma.
Recruitment/selection of patients	selected from patients who were clinically diagnosed as having colorectal carcinoma
Age, gender and ethnicity	Age - Mean (SD): FTS: 57.2 ± 11.70; Conventional: 59.5 ± 12.10. Gender (M:F): 42/20. Ethnicity: NR
Further population details	1. Age: <60 years (FTS: 57.2 ± 11.70; Conventional: 59.5 ± 12.10). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear (All patients ASA I or II, figures not stated). 3. Type of surgery: lower and upper GI (elective open colorectal resection).
Indirectness of population	No indirectness
Interventions	(n=35) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Day before surgery: normal meal until 10 p.m. the day before surgery; Routine bowel preparation was done with gentamicin and metronidazole; Polyethylene glycol electrolyte powder was used as a laxative. •Day of surgery: drink 250 ml of 5 % carbohydrate 2 h before surgery; prophylactic use of antibiotics; avoidance of long-acting opioids; •Intraoperative: maintenance of normothermia with an upper-body forced-air heating cover; a midline incision of minimal length; intraoperative and postoperative fluid restriction; no routine use of abdominal drains; the combination of continuous epidural mid-thoracic local anesthetics plus nonsteroidal anti-inflammatory drugs (NSAIDs) to control postoperative •Postoperative: no routine nasogastric tube drainage; early as possible removal of urine and venous

Study	Yang 2012[211]
	catheters (urinary catheter: removed when the patient became conscious and could be mobilized out of bed; deep venous catheter: removed when vital signs were stable); oral feeding started 6–12h after surgery, following a stepwise plan from oral liquid nutrition to normal diet. Mobilization was encouraged from the night of the operation. Patients were encouraged to meet predefined mobility targets over the postoperative days. pain. . Duration 1 day before surgery up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=35) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Day before surgery: normal meal until 10 p.m. the day before surgery; routine bowel preparation was done with gentamicin and metronidazole; Polyethylene glycol electrolyte powder was used as a laxative. •Intraoperative: prophylactic use of antibiotics; avoidance of long-acting opioids; maintenance of normothermia with an upper-body forced-air heating cover; a midline incision of minimal length; intraoperative and postoperative fluid restriction; no routine use of abdominal drains; the combination of continuous epidural mid-thoracic local anesthetics plus nonsteroidal anti-inflammatory drugs (NSAIDs) to control postoperative pain. •Postoperative: routine use of nasogastric tube drainage, and oral intake initiated on return to normal gastrointestinal function (bowel sounds or flatus) following a stepwise plan from oral liquid nutrition to a normal diet. Patients were sat up and assisted to mobilize on POD 1, but they were not aggressively mobilized until discontinuation of the thoracic epidural. Urinary catheters were removed following epidural catheter removal. . Duration 1 day preoperatively up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated

Study	Yang 2012[211]
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus CONVENTIONAL CARE Protocol outcome 1: Perioperative complications - Actual outcome: Infectious complications at postoperative to discharge; Group 1: 2/32, Group 2: 8/30; Comments: p < 0.05 includes: surgical site infection; pneumonia; intestinal dysbiosis Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: underwent different procedure; irresectable carcinoma; Group 2 Number missing: 5, Reason: underwent different procedure; irresectable carcinoma; intraoperative blood transfusion - Actual outcome: Non-Infectious complications at postoperative to discharge; Group 1: 4/32, Group 2: 4/30; Comments: p value 1.000 includes: vomiting; stress ulcer; arrhythmia; urine distension Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: underwent different procedure; irresectable carcinoma; Group 2 Number missing: 5, Reason: underwent different procedure; irresectable carcinoma; intraoperative blood transfusion Protocol outcome 2: Length of hospital stay - Actual outcome: Postoperative hospital stay at postoperative to discharge; Group 1: mean 6 day (SD 1); n=32, Group 2: mean 11.7 day (SD 3.82); n=30; Comments: p < 0.05 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: underwent different procedure; irresectable carcinoma; Group 2 Number missing: 5, Reason: underwent different procedure; irresectable carcinoma; intraoperative blood transfusion	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Yilmaz 2018[215]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=62)
Countries and setting	Conducted in Turkey; Setting: University of Health Sciences, Faculty of Medicine, Sultan Suleyman Hospital, Turkey
Line of therapy	1st line
Duration of study	Intervention + follow up:

Study	Yilmaz 2018[215]
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	not specified
Exclusion criteria	not specified
Recruitment/selection of patients	patients undergoing abdominal hysterectomies
Age, gender and ethnicity	Age - Mean (SD): ERP: 47.9 ± 7.36; Standard care: 48.3 ± 5.84. Gender (M:F): all female. Ethnicity: NR
Further population details	1. Age: <60 years (ERP: 47.9 ± 7.36; Standard care: 48.3 ± 5.84). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear (ASA I: 9; ASA II: 45; ASA III: 8). 3. Type of surgery: gynae-oncology (abdominal hysterectomy).
Indirectness of population	No indirectness
Interventions	(n=30) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative: Counselling before hospital admission; Fluid, and carbohydrate loading; Avoiding prolongation of fasting period; Avoiding bowel preparation or its application only in selective cases; Application of antibiotic prophylaxis; Application of thromboprophylaxis; Avoiding premedication. •Perioperative: Use of short-acting anesthetic agents; Application of midthoracal, epidural anesthesia/analgesia; Refraining from using drains; Refraining from salt, and water overload; Maintenance of normothermia (heating the body, and use of warmed up intravenous fluids. •Postoperative: Application of midthoracal, epidural anesthesia/analgesia; Refraining from use of nasogastric tube; Prevention of nausea, and vomiting; Refraining from salt, and water overload; Earlier removal of catheters; Initiation of oral intake at an early period; Use of nonopioid oral analgesics/NSAIDs; Early mobilization; Adherence to the protocol, and auditing results. Duration Perioperatively. Concurrent medication/care: NA. Indirectness: No indirectness (n=32) Intervention 2: No enhanced recovery programme (standard care) - Standard care. Patients were admitted the day before their operation. In the operating room all patients received a urinary catheter. Thirty minutes before the first incision, cefoperazone (1000 mg) was given intravenously. Patients were operated under general anesthesia. Postoperatively, oral intake was prohibited, and standard intravenous fluid was set at 2–2.5 L/24 h. Patients received 4000 mg of paracetamol (in four separate doses of 1000 mg). If necessary, diclofenac 150 mg in three doses of 50 mg and morphine substitutes were also given. Discharge was arranged when the following criteria were met: there are no remaining lines or catheters, solid food is tolerated, there has been the passage of stool, pain is controlled using oral analgesics only and the patient is able to restart basic daily activities and self-care. Duration Perioperatively. Concurrent medication/care: NA. Indirectness: No indirectness

Study	Yilmaz 2018[215]
Funding	No funding
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE Protocol outcome 1: Perioperative complications - Actual outcome: Total complications at postoperative; Group 1: 9/30, Group 2: 12/32; Comments: p value 0.112 Risk of bias: All domain - High, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; - Actual outcome: Readmission at postoperative; Group 1: 1/30, Group 2: 11/32; Comments: p value 0.002 Risk of bias: All domain - High, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Protocol outcome 2: Length of hospital stay - Actual outcome: postoperative length of stay at postoperative; Median (range) : ERP: 2.0 (1.0); Standard care: 3.0 (1.75) days, Comments: p value 0.010); Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing:0 ; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Zhang 2018[221]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=114)
Countries and setting	Conducted in China; Setting: University Hospital
Line of therapy	Not applicable
Duration of study	Intervention + follow up: June 2012 - June 2016
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall

Study	Zhang 2018[221]
Subgroup analysis within study	Not applicable
Inclusion criteria	Patients with primary esophageal carcinoma, having never received any treatment before this study and with no other malignant tumors.
Exclusion criteria	Patients with history of metabolic diseases, such as diabetes mellitus, severe heart, lung, liver or kidney problems, or severe malnutrition.
Recruitment/selection of patients	patients were selected whose lesions were located in median or median-lower esophagus. No other criteria for initial selection given.
Age, gender and ethnicity	Age - Mean (SD): Intervention group 66.89 ±13.45 & regular group 67.01 ± 12.78 (p value 0.089). Gender (M:F): 37/77. Ethnicity: NR
Further population details	1. Age: >60 years (Intervention group 66.89 +/-13.45 & regular group 67.01 +/- 12.78 (p value 0.089)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: lower and upper GI (surgical treatment for esophageal carcinoma).
Extra comments	patients admitted for surgical treatment of esophageal carcinoma confirmed by endoscopy and pathological examination . no explanation given of randomization process, blinding or of allocation concealment.
Indirectness of population	No indirectness
Interventions	(n=57) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. Patients received preoperative education exercise and nutrient support for maintaining the functions of organs before the operation, rational drug administration before operation, ameliorating the patient tension and fear and other aspects conducive patients to cooperating for surgery physically and emotionally. Two to three days preoperatively patients were required to take a liquid diet that mainly consisted of enteral nutritional suspension, and the evening before surgery, patients only took 500ml of carbohydrate solution without any bowel preparation and received the energy mixture via IV the next morning on the day of surgery. Patients received combined IV-inhalation anesthesia with anesthetics of rapid metabolism and short half life. Heat preservation was carried out through infusion and flushing with warm liquid and heating bed; after operation, analgesia was performed by application of self controlled analgesic pump in combination with non steroidal anti inflammatory drugs. After the operation, patients were transfered to the wards, were administered subcutaneous low molecular weight heparin sodium every night and an antithrombotic pressure pump for one week, and immediately after the recovery of anesthesia, patients were required to use the ankle pump for exercise. Early enteral nutrition was provided to patients in this group. Patients received intraoperative intubation of drainage tube in certain cases and left bed for removal of urethral catheter in an early stage after operation and extubation of chest drainage tube 2 or 3 days after operation. . Duration preoperative admission up to day of discharge. Concurrent medication/care: NA. Indirectness: No indirectness

Study	Zhang 2018[221]
	(n=57) Intervention 2: No enhanced recovery programme (standard care) - Standard care. The patients within the regular group received routine introduction of the notice of admission. They had to complete routine fasting overnight. Intraoperatively had conventional anesthesia with no special measures for heat preservation and opioid drugs for analgesia. Postoperatively, routine subcutaneous injections of low molecular weight heparin sodium were administered every night for one week, routine nutritional support was provided and patients mobilized out of bed after one week. . Duration preoperative admission up to day of discharge. Concurrent medication/care: NA. Indirectness: No indirectness Comments: management protocols of the regular group described very briefly
Funding	Funding not stated
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: INTERVENTION GROUP versus REGULAR GROUP Protocol outcome 1: Perioperative complications - Actual outcome: incidence rate of complications at day of surgery up to 7 days postoperatively; Group 1: 6/57, Group 2: 16/57; Comments: Includes gastrointestinal symptoms, infection of respiratory system, deep vein thrombosis, incisional infection, urinary tract infection, pleural exudation, incomplete bowel obstruction. Risk of bias: All domain - Low, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: -- ; Blinding details: no blinding information given; Group 1 Number missing: 0; Group 2 Number missing: 0 Protocol outcome 2: Length of stay in intensive care unit - Actual outcome: length of stay at day of surgery to discharge; Group 1: mean 9.74 (SD 2.65); n=57, Group 2: mean 13.52 (SD 4.67); n=57 Risk of bias: All domain - Low, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: --; Blinding details: no blinding information given; Group 1 Number missing: 0; Group 2 Number missing: 0	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Length of hospital stay ; Unplanned intensive unit admission ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Zhao 2014[222]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=80)
Countries and setting	Conducted in China; Setting: University Hospital

Study	Zhao 2014[222]
Line of therapy	Not applicable
Duration of study	Intervention + follow up: November 2009 and March 2011
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	undergoing esophagectomy for esophageal cancer
Exclusion criteria	•a tumor of the hypopharynx or cervical esophagus •serious comorbidity, ASA III and IV •preoperative distant metastasis, and perioperative instability •previous coronary artery bypass graft surgery •moderate chronic obstructive pulmonary disease •Karnofsky index less than 60 •body mass index (BMI) less than 18.5 kg/m2 •age of 65–75 years with hypertension, diabetes, or vascular disease.
Recruitment/selection of patients	Not stated
Age, gender and ethnicity	Age - Median (range): FTS: 55.14 ± 10.65; Conventional: 57.86 ± 11.34. Gender (M:F): 52/16. Ethnicity: NR
Further population details	1. Age: <60 years (FTS: 55.14 ± 10.65; Conventional: 57.86 ± 11.34). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not stated / Unclear 3. Type of surgery: lower and upper GI (esophagectomy for esophageal cancer).
Indirectness of population	No indirectness
Interventions	(n=41) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative education: Patients were educated systematically by the esophageal clinical nurse consultant •Day before surgery: Last drink 2 h and diet 6 h before operation; fructose and protein loading. •Day of surgery: No routine use of NG tube; no preanesthetic; general anesthesia + epidural anesthesia; early extubation; maintaining normothermia; autologous blood transfusion or limit allogenic blood transfusion. •Postoperatively: no routine use of drains; patient sent to floor; epidural PCA; and jejunostomy tube feeding. Duration preoperative assessment up to discharge. Concurrent medication/care: NA. Indirectness: No indirectness (n=39) Intervention 2: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative education: patients were educated in the standard manner. •Day before surgery: last drink and diet at midnight; no fructose or protein loading. •Day of surgery: routine use of NG tube; Diazepam 10mg; general anesthesia; late extubation; routine placement of abdominal tube (removed POD 3); routine placement of cervical tube (removed POD 2). •Postoperative care: patient send to ICU; analgesia by morphine or vein PCA; nasojejunal tube feeding. . Duration 1 day preoperative to discharge. Concurrent medication/care: NA. Indirectness: No indirectness

Study	Zhao 2014[222]
Funding	Academic or government funding
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: FAST TRACK versus CONVENTIONAL CARE Protocol outcome 1: Perioperative complications - Actual outcome: Total Complications at postoperative up to 30 days post discharge; Group 1: 2/34, Group 2: 4/34; Comments: complications include: atrial arrhythmia; ileus; pneumonia; anastomotic leak; incision infection Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 7, Reason: failed to undergo FTS pathway; irresectable carcinoma; Group 2 Number missing: 5, Reason: failed to undergo FTS pathway; irresectable carcinoma Protocol outcome 2: Length of hospital stay - Actual outcome: Postoperative hospital stay at after surgery to discharge; Group 1: mean 7.15 day (SD 1.23); n=34, Group 2: mean 12.52 day (SD 1.47); n=34; Comments: p value 0.000 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 7, Reason: failed to undergo FTS pathway; irresectable carcinoma; Group 2 Number missing: 5, Reason: failed to undergo FTS pathway; irresectable carcinoma Protocol outcome 3: Hospital readmission - Actual outcome: 30 day readmission rate at 30 days post discharge; Group 1: 1/34, Group 2: 0/34; Comments: p value 1.000 Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 7, Reason: failed to undergo FTS pathway; irresectable carcinoma; Group 2 Number missing: 5, Reason: failed to undergo FTS pathway; irresectable carcinoma	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Zhao 2018[223]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=114)
Countries and setting	Conducted in China; Setting: Jinling Hospital

Study	Zhao 2018[223]
Line of therapy	Not applicable
Duration of study	Intervention time: April 2015 to July 2017
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	•Patients received neoadjuvant chemotherapy with locally advanced gastric cancer •Age >18 and <75 years •ASA Class: I–III •Participants can objectively describe the symptoms and actively cooperate •Written informed consent
Exclusion criteria	•Patients allergic to medications such as oxaliplatin, tegafur gimerac •Patients with ischemic heart disease, cerebrovascular disease and peripheral vascular disease, or cardiac function >II (NYHA) •Patients with complications (bleeding, perforation, and obstruction) caused by gastric cancer •Patients with severe liver and renal dysfunction (Child–Pugh ≥10; creatinine clearance <25 ml/min) •Patients who require simultaneous surgery for other diseases •Patients who received upper abdominal surgery •Pregnancy or breast-feeding
Recruitment/selection of patients	unclear
Age, gender and ethnicity	Age - Mean (SD): ERP: 60.8 ± 9.4; SC: 59.8 ± 7.9. Gender (M:F): 75/31. Ethnicity: NR
Further population details	1. Age: >60 years (ERP: 60.8 ± 9.4; SC: 59.8 ± 7.9). 2. American Society of Anesthesiologists (ASA) Physical Status grade: ASA 2 (ASA I - 42; ASA II - 51; ASA III - 13). 3. Type of surgery: lower and upper GI (total or distal gastrectomy for locally advanced gastric cancer).
Indirectness of population	No indirectness
Interventions	(n=57) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •The ERAS program included sufficient preoperative patient education, no bowel preparation, a normal diet until 6 h before surgery. •Liquid intake until 2 h before surgery, preoperative carbohydrate loading before surgery (100 g glucose/1000 ml water taken orally at 10 p.m. on the evening before the surgery and 50 g glucose/500 ml water taken 2–3 h preoperatively). •Analgesia with nonsteroidal anti-inflammatory drugs, minimization of opioid pain management, avoidance of perioperative fluid overload, no routine use of nasogastric tubes, no abdominal drains unless required, early removal of bladder catheters. •Liquid diet on recovery from anesthesia, semi-liquid diet on return of bowel

Study	Zhao 2018[223]
	function (stool or repeated flatus), tolerated liquid diet, and forced ambulation on the day of surgery. . Duration 1 day preoperatively until discharge. Concurrent medication/care: NA . Indirectness: No indirectness (n=57) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Patients received gastrointestinal preparation before surgery, and they fasted from midnight. •Nasogastric tubes were placed preoperatively and usually remained until flatus occurred and no gastric retention presented after surgery. •Intra-abdominal drains were placed during surgery, and in most cases, were maintained until the day before discharge. •After surgery, the patients were not allowed oral intake until bowel flatus or obvious gastrointestinal movement occurred. •The patients mobilized at will and usually remained in bed for approximately 2 days after surgery.. Duration 1 day preoperatively until discharge . Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Funding not stated
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE Protocol outcome 1: Perioperative complications - Actual outcome: Complications (total) at postoperatively up to discharge; Group 1: 5/51, Group 2: 6/52 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: unresectable tumour; tumor metastasis; Group 2 Number missing: 4, Reason: unresectable tumour; tumor metastasis Protocol outcome 2: Length of hospital stay - Actual outcome: Postoperative length of stay at postoperatively up to discharge; Group 1: mean 5.9 day (SD 5.6); n=54, Group 2: mean 8.1 day (SD 5.3); n=52; Comments: p value 0.037 Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Group 1 Number missing: 3, Reason: unresectable tumour; tumor metastasis; Group 2 Number missing: 4, Reason: unresectable tumour; tumor metastasis	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) ; Pain

Study	Zhu 2018[227]

Study	Zhu 2018[227]
Study type	RCT (Patient randomised; Parallel)
Number of studies (number of participants)	(n=32)
Countries and setting	Conducted in China; Setting: Medical centre, China
Line of therapy	1st line
Duration of study	Intervention + follow up:
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	Patients were eligible if they were between 14 and 70 years of age, had histologically proven CD with disease localized to the terminal ileum with or without cecum involvement
Exclusion criteria	Exclusion criteria were previous bowel resection, evidence of abscesses or fistulas, emergency surgery, contraindications to laparoscopy, or a planned stoma.
Recruitment/selection of patients	Patients undergoing ileocecal resection for Crohn's disease
Age, gender and ethnicity	Age - Median (IQR): ERP: 31.5 (29.25, 43.50); Standard care: 29.5 (26.25, 43.50). Gender (M:F): 20/12. Ethnicity: NR
Further population details	1. Age: <60 years (ERP: 31.5 (29.25, 43.50); Standard care: 29.5 (26.25, 43.50)). 2. American Society of Anesthesiologists (ASA) Physical Status grade: Not applicable (All patients ASA I or II). 3. Type of surgery: lower and upper GI (laparoscopy for ileocecal resection for crohns disease).
Indirectness of population	No indirectness
Interventions	(n=16) Intervention 1: Enhanced recovery programmes (ERAS: enhanced recovery after surgery) - ERAS. •Preoperative: Multidisciplinary patient information; No bowel preparation; No fasting, fluids until 2 h before surgery, solids until 6 h; Orally take 1000mL+500mL 5% glucose solution the night; before and on the morning of surgery; •Intraoperative: Laparoscopic standardized technique; Fluid restriction (max 1500 mL); Prevention of deep vein thrombosis: stretch socks; Infusion heating; No abdominal drainage; •Postoperative: No nasogastric tube removal at awakening; Early mobilization 2 h after surgery; Early diet intake, fluids in postoperative day 0, and soft food in postoperative day 1; Opioid-free analgesia; Urinary catheter removal on postoperative day 1. Duration Perioperatively . Concurrent medication/care: NA. Indirectness: No indirectness (n=16) Intervention 2: No enhanced recovery programme (standard care) - Standard care. •Preoperative: Patient information; Mechanical bowel preparation; Fasting since midnight before operation; No 5% glucose

Study	Zhu 2018[227]
	solution; •Intraoperative: Laparoscopic standardized technique; Fluid overload (over 1500mL); No stretch socks; No infusion heating; Abdominal drainage; •Postoperative: Nasogastric tube removal after passing flatus; Mobilization from postoperative day 1; Fluids and solids intake after first passage of stools; Opioid-free analgesia; Urinary catheter removal on postoperative day 2/3. Duration Perioperatively. Concurrent medication/care: NA. Indirectness: No indirectness
Funding	Academic or government funding (This study was supported by the Natural Science Foundation of Zhejiang Province (award number: LY18H030006))
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: ERP versus STANDARD CARE Protocol outcome 1: Perioperative complications - Actual outcome: total complications at Postoperative; Group 1: 2/16, Group 2: 2/16 Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness; Protocol outcome 2: Length of hospital stay - Actual outcome: Postoperative length of stay at Postoperative; Group 1: mean 5.19 days (SD 1.28); n=16, Group 2: mean 9.94 days (SD 3.33); n=16; Comments: p value <0.001 Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness ; Protocol outcome 3: Pain - Actual outcome: Postoperative pain > 3 on day 1 at Postoperative; Group 1: 1/16, Group 2: 4/16 Risk of bias: All domain - Low, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness;	
Protocol outcomes not reported by the study	Quality of life ; Mortality ; Patient and staff adherence ; Unplanned intensive unit admission ; Length of stay in intensive care unit ; Hospital readmission ; Psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS))

Appendix E: Forest plots

E.1 ERP compared to standard care

Figure 2: Mortality

Study or Subgroup	ERP Events	ERP Total	Standard care Events	Standard care Total	Weight	Peto Odds Ratio Peto, Fixed, 95% CI
Abdikarim 2015	0	30	0	31		Not estimable
Anderson 2003	0	14	1	11	2.7%	0.10 [0.00, 5.34]
Anderson 2003	0	14	1	11	2.7%	0.10 [0.00, 5.34]
Chen 2016	2	128	2	132	10.7%	1.03 [0.14, 7.41]
Dong 2017	0	76	0	83		Not estimable
Feng 2013	0	59	0	60		Not estimable
Gatt 2005	1	19	0	20	2.7%	7.79 [0.15, 393.02]
Gonenc 2014	0	21	1	26	2.7%	0.16 [0.00, 8.45]
Gralla 2007	0	25	0	25		Not estimable
He 2015	0	48	0	38		Not estimable
Jensen 2015	3	47	4	53	17.7%	0.84 [0.18, 3.87]
Jones 2013	1	46	1	45	5.3%	0.98 [0.06, 15.88]
Khoo 2007	0	35	2	35	5.3%	0.13 [0.01, 2.14]
Larsen 2008	0	45	1	42	2.7%	0.13 [0.00, 6.37]
Lee 2011	0	46	0	54		Not estimable
Li 2018	0	104	0	105		Not estimable
Lin 2018	0	144	0	145		Not estimable
Lu 2014	0	135	0	162		Not estimable
Mingjie 2017	0	73	0	76		Not estimable
Muehling 2008	1	30	1	28	5.3%	0.93 [0.06, 15.30]
Muehling 2009	0	49	0	50		Not estimable
Serclova 2009	0	51	0	52		Not estimable
Takagi 2019	0	37	0	37		Not estimable
Tanaka 2017	0	73	0	69		Not estimable
Vlug 2011	6	193	4	207	26.3%	1.62 [0.46, 5.67]
Wang 2010	0	45	0	47		Not estimable
Wang 2011	2	106	1	104	8.0%	1.92 [0.20, 18.69]
Wang 2012	1	81	1	82	5.4%	1.01 [0.06, 16.33]
Wang 2012 2	1	49	0	50	2.7%	7.54 [0.15, 380.14]
Total (95% CI)		**1823**		**1880**	**100.0%**	**0.93 [0.49, 1.76]**
Total events	18		20			

Heterogeneity: Chi² = 9.41, df = 13 (P = 0.74); I² = 0%
Test for overall effect: Z = 0.23 (P = 0.82)

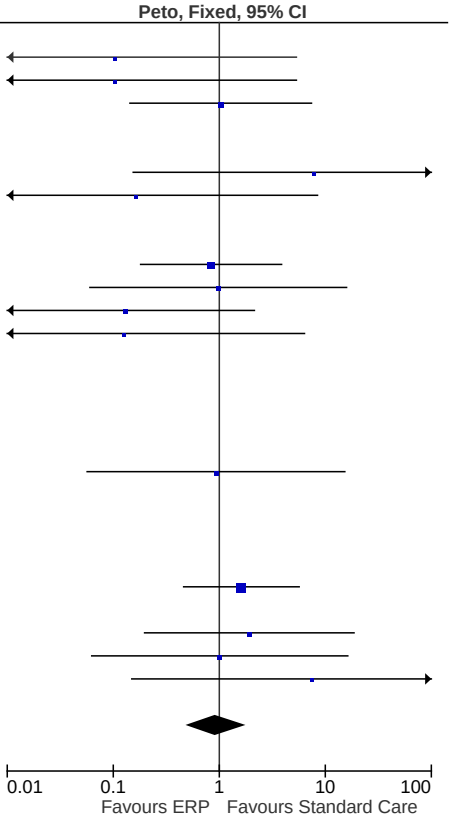


Figure 3: Quality of life (EQ-5D; 3 months)

Study or Subgroup	ERP Mean	ERP SD	ERP Total	Standard care Mean	Standard care SD	Standard care Total	Weight	Mean Difference IV, Fixed, 95% CI
Larsen 2008	0.42	0.31	45	0.26	0.31	42	100.0%	0.16 [0.03, 0.29]
Total (95% CI)			**45**			**42**	**100.0%**	**0.16 [0.03, 0.29]**

Heterogeneity: Not applicable
Test for overall effect: Z = 2.41 (P = 0.02)

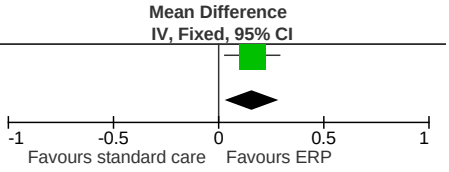


Figure 4: Quality of life (EORTC-QLQ; 2 weeks)

Study or Subgroup	ERP Mean	ERP SD	ERP Total	Standard care Mean	Standard care SD	Standard care Total	Weight	Mean Difference IV, Fixed, 95% CI
Kim 2012	8.9	2.46	22	9.28	2.4	22	100.0%	-0.38 [-1.82, 1.06]
Total (95% CI)			**22**			**22**	**100.0%**	**-0.38 [-1.82, 1.06]**

Heterogeneity: Not applicable
Test for overall effect: Z = 0.52 (P = 0.60)

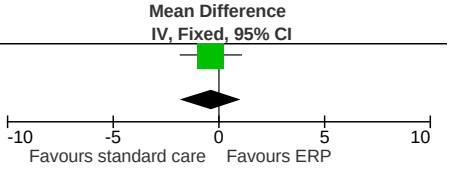


Figure 5: Quality of life score (Cleveland clinic global)

Study or Subgroup	ERP Mean	ERP SD	ERP Total	Standard care Mean	Standard care SD	Standard care Total	Weight	Mean Difference IV, Fixed, 95% CI
Delaney 2003	7.5	1.7	31	7.6	1.4	33	100.0%	-0.10 [-0.87, 0.67]
Total (95% CI)			**31**			**33**	**100.0%**	**-0.10 [-0.87, 0.67]**

Heterogeneity: Not applicable
Test for overall effect: Z = 0.26 (P = 0.80)

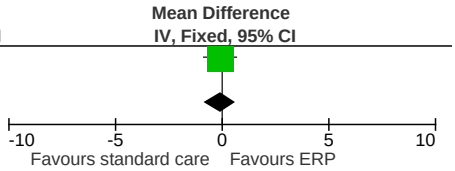


Figure 6: SF-12 (physical) 2 weeks

Study or Subgroup	ERP Mean	ERP SD	ERP Total	standard care Mean	standard care SD	standard care Total	Weight	Mean Difference IV, Fixed, 95% CI
Fransen 2018	-0.2	4.5	25	-0.2	4.6	24	100.0%	0.00 [-2.55, 2.55]
Total (95% CI)			**25**			**24**	**100.0%**	**0.00 [-2.55, 2.55]**

Heterogeneity: Not applicable
Test for overall effect: Z = 0.00 (P = 1.00)

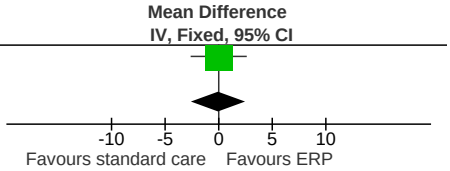


Figure 7: SF-12 (physical) 6 weeks

Study or Subgroup	ERP Mean	ERP SD	ERP Total	standard care Mean	standard care SD	standard care Total	Weight	Mean Difference IV, Fixed, 95% CI
Fransen 2018	0.4	7.1	25	6	8.1	24	100.0%	-5.60 [-9.87, -1.33]
Total (95% CI)			**25**			**24**	**100.0%**	**-5.60 [-9.87, -1.33]**

Heterogeneity: Not applicable
Test for overall effect: Z = 2.57 (P = 0.01)

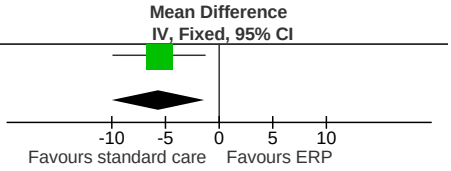


Figure 8: SF-12 (physical) 12 weeks

Study or Subgroup	ERP Mean	ERP SD	ERP Total	standard care Mean	standard care SD	standard care Total	Weight	Mean Difference IV, Fixed, 95% CI
Fransen 2018	5.3	7.5	25	7.4	8.5	24	100.0%	-2.10 [-6.60, 2.40]
Total (95% CI)			**25**			**24**	**100.0%**	**-2.10 [-6.60, 2.40]**

Heterogeneity: Not applicable
Test for overall effect: Z = 0.92 (P = 0.36)

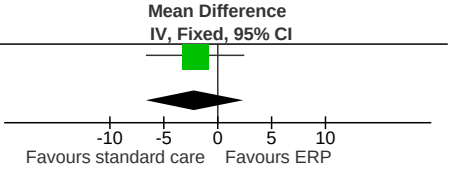


Figure 9: SF-12 (mental) 2 weeks

Study or Subgroup	ERP Mean	ERP SD	ERP Total	standard care Mean	standard care SD	standard care Total	Weight	Mean Difference IV, Fixed, 95% CI
Fransen 2018	0.6	8	25	0	4.6	24	100.0%	0.60 [-3.04, 4.24]
Total (95% CI)			**25**			**24**	**100.0%**	**0.60 [-3.04, 4.24]**

Heterogeneity: Not applicable
Test for overall effect: Z = 0.32 (P = 0.75)

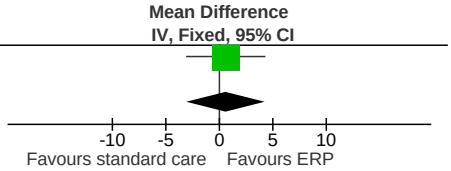


Figure 10: SF-12 (mental) 6 weeks

Study or Subgroup	ERP Mean	ERP SD	ERP Total	standard care Mean	standard care SD	standard care Total	Weight	Mean Difference IV, Fixed, 95% CI
Fransen 2018	1	8.1	25	-2.4	6.1	24	100.0%	3.40 [-0.60, 7.40]
Total (95% CI)			**25**			**24**	**100.0%**	**3.40 [-0.60, 7.40]**

Heterogeneity: Not applicable
Test for overall effect: Z = 1.66 (P = 0.10)

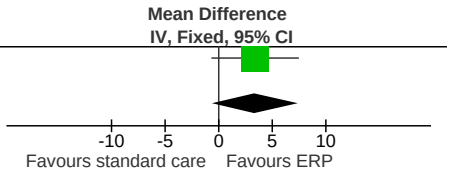


Figure 11: SF-12 (mental) 12 weeks

Study or Subgroup	ERP Mean	ERP SD	ERP Total	standard care Mean	standard care SD	standard care Total	Weight	Mean Difference IV, Fixed, 95% CI
Fransen 2018	-0.6	5.8	25	-0.7	5.6	24	100.0%	0.10 [-3.09, 3.29]
Total (95% CI)			**25**			**24**	**100.0%**	**0.10 [-3.09, 3.29]**

Heterogeneity: Not applicable
Test for overall effect: Z = 0.06 (P = 0.95)

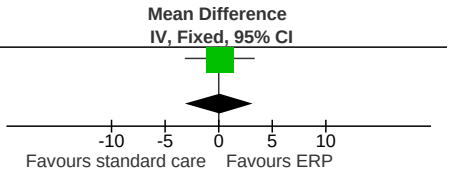


Figure 12: Total complications

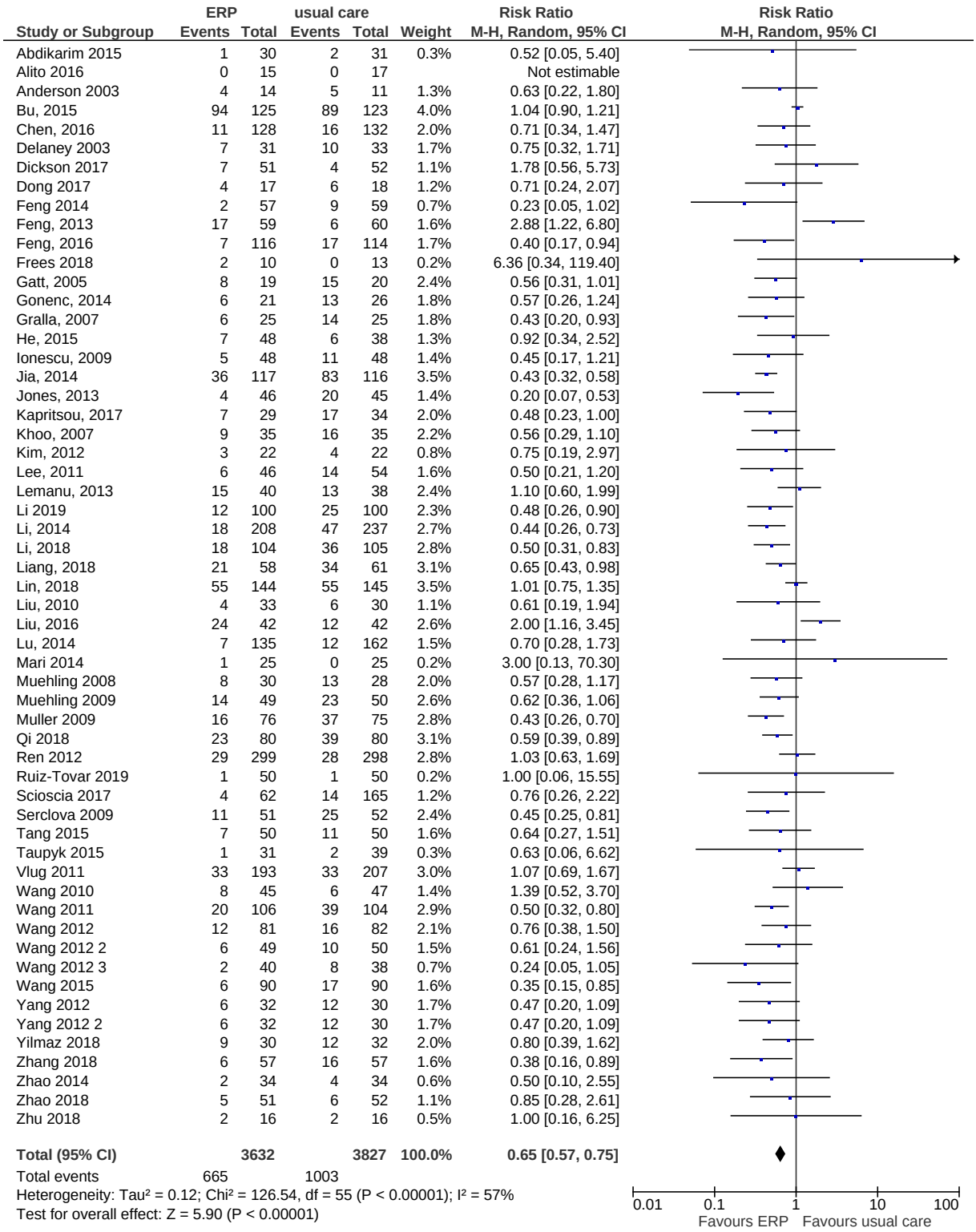


Figure 13: Complications Grade 1 (Clavien-Dindo)

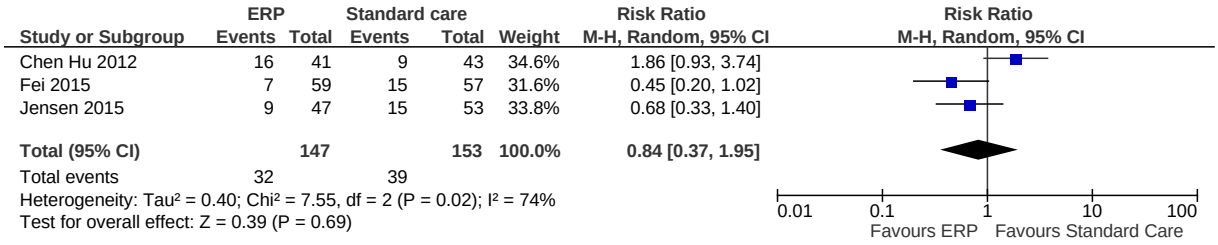


Figure 14: Complications Grade 2 (Clavien-Dindo)

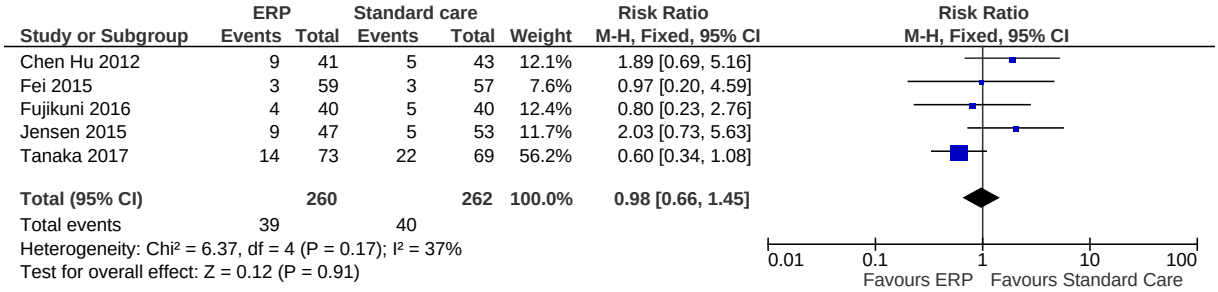


Figure 15: Complications Grade 3 (Clavien-Dindo)

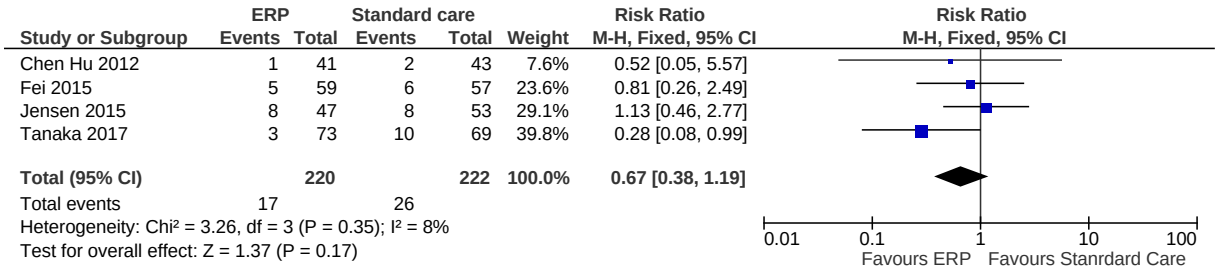


Figure 16: Complications Grade 4 (Clavien-Dindo)

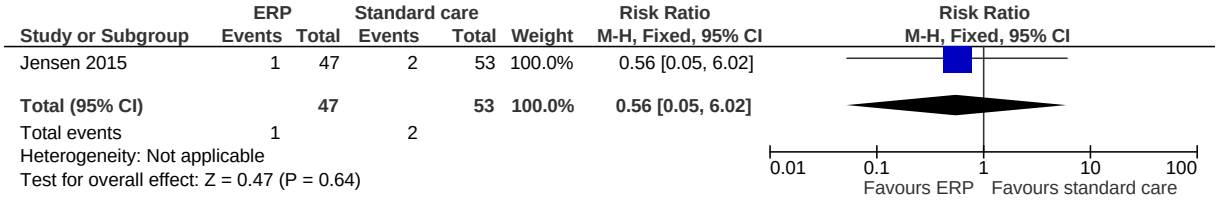


Figure 17: Complications Grade 5 (Clavien-Dindo)

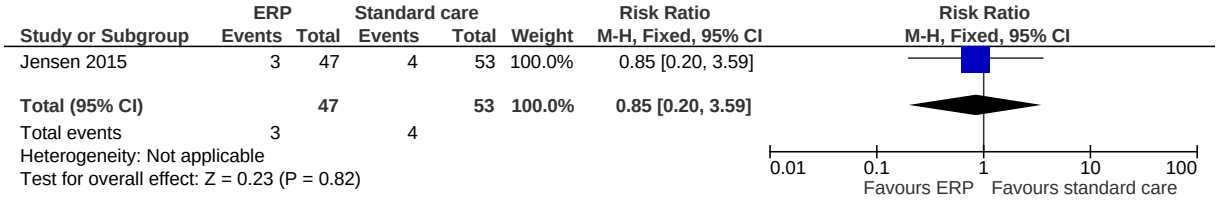


Figure 18: Patient satisfaction with care

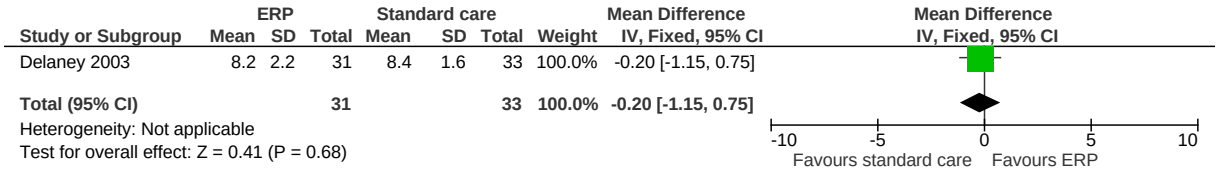


Figure 19: Length of hospital stay

Study or Subgroup	ERP Mean	ERP SD	ERP Total	Standard care Mean	Standard care SD	Standard care Total	Weight	Mean Difference IV, Random, 95% CI
Abdikarim 2015	8.3	1.3	30	9.9	1.1	31	6.8%	-1.60 [-2.21, -0.99]
Delaney 2003	5.2	2.5	31	5.8	3	33	5.9%	-0.60 [-1.95, 0.75]
Fei 2015	17.3	5.5	63	23.6	7.3	62	4.5%	-6.30 [-8.57, -4.03]
Fransen 2018	3.7	1.8	25	4.7	1.3	24	6.5%	-1.00 [-1.88, -0.12]
Gonenc 2014	3.8	1.9	21	6.9	2.2	26	6.1%	-3.10 [-4.27, -1.93]
Ionescu 2009	6.43	3.41	48	9.16	2.67	48	6.0%	-2.73 [-3.96, -1.50]
Jia 2014	9.01	1.75	117	13.21	1.32	116	7.0%	-4.20 [-4.60, -3.80]
Kim 2012	5.36	1.46	22	7.95	1.98	22	6.3%	-2.59 [-3.62, -1.56]
Larsen 2008	4.9	2.4	45	7.8	2.1	42	6.4%	-2.90 [-3.85, -1.95]
Mari 2014	4.7	2.4	25	7.65	2.4	25	5.9%	-2.95 [-4.28, -1.62]
Mari 2016	5	2.6	65	7.2	3	70	6.4%	-2.20 [-3.15, -1.25]
Qi 2018	16.9	3.4	80	21.6	6.8	80	5.4%	-4.70 [-6.37, -3.03]
Ruiz-Tovar 2019	1.7	1.8	50	2.8	3.1	50	6.4%	-1.10 [-2.09, -0.11]
Takagi 2019	20.1	5.4	37	26.9	13.5	37	2.0%	-6.80 [-11.49, -2.11]
Taupyk 2015	5.9	0.8	31	10.9	1.3	39	6.9%	-5.00 [-5.50, -4.50]
Yang 2012 2	6	1	32	11.7	3.8	30	5.8%	-5.70 [-7.10, -4.30]
Zhang 2018	9.74	2.65	57	13.52	4.67	57	5.8%	-3.78 [-5.17, -2.39]
Total (95% CI)			**779**			**792**	**100.0%**	**-3.15 [-3.94, -2.37]**

Heterogeneity: Tau² = 2.29; Chi² = 187.85, df = 16 (P < 0.00001); I² = 91%
Test for overall effect: Z = 7.84 (P < 0.00001)

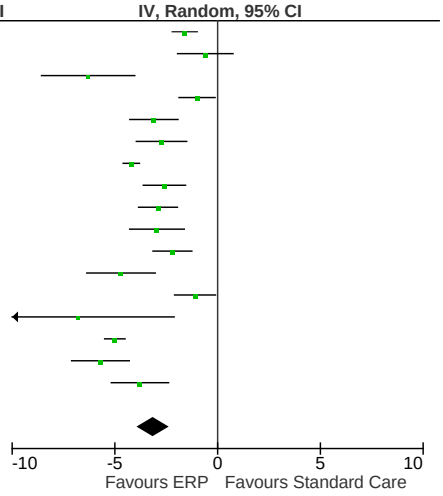


Figure 20: Postoperative length of stay

Study or Subgroup	ERP Mean	ERP SD	ERP Total	Standard care Mean	Standard care SD	Standard care Total	Weight	Mean Difference IV, Random, 95% CI
Bu 2015	8.25	2.674	125	10.55	2.278	123	4.4%	-2.30 [-2.92, -1.68]
Chen 2016	7.62	1.38	128	12.56	1.92	132	4.5%	-4.94 [-5.35, -4.53]
Dong 2017	15	8	76	19	10	83	2.3%	-4.00 [-6.80, -1.20]
Feng 2013	5.68	1.22	61	7.1	2.13	61	4.4%	-1.42 [-2.04, -0.80]
Feng 2014	5.05	1.38	60	6.98	2.26	60	4.4%	-1.93 [-2.60, -1.26]
Feng 2016	7.54	2.18	121	8.62	2.83	120	4.4%	-1.08 [-1.72, -0.44]
Gralla 2007	3.6	1.22	25	6.72	0.94	25	4.4%	-3.12 [-3.72, -2.52]
Kapritsou 2017	5.93	2.49	29	11.91	5.52	34	3.0%	-5.98 [-8.04, -3.92]
Li 2014	8.54	3.18	208	9.62	3.83	237	4.4%	-1.08 [-1.73, -0.43]
Liu 2010	6.2	1.9	33	9.8	2.8	30	3.9%	-3.60 [-4.79, -2.41]
Liu 2016	8.05	2.4	42	9.2	2.4	42	4.1%	-1.15 [-2.18, -0.12]
Magheli 2011	3.6	1.2	25	6.7	0.9	25	4.4%	-3.10 [-3.69, -2.51]
Mingjie 2017	6.38	2.04	73	8.62	2.87	76	4.3%	-2.24 [-3.04, -1.44]
Ren 2012	5.7	1.6	299	6.6	2.4	298	4.5%	-0.90 [-1.23, -0.57]
Serclova 2009	7.4	1.3	51	10.4	3.1	52	4.2%	-3.00 [-3.92, -2.08]
Shetiwy 2017	4.49	0.85	35	13.31	6.9	35	2.8%	-8.82 [-11.12, -6.52]
Tang 2015	2.35	0.87	50	5.23	1.62	50	4.5%	-2.88 [-3.39, -2.37]
Taupyk 2015	4.3	0.8	31	8	1.1	39	4.5%	-3.70 [-4.15, -3.25]
Wang 2011	5.1	3.1	106	7.6	4.8	104	4.0%	-2.50 [-3.60, -1.40]
Wang 2012	5.9	4.1	81	6.7	4.5	82	3.8%	-0.80 [-2.12, 0.52]
Wang 2015	9	0.78	90	11.7	1.39	90	4.5%	-2.70 [-3.03, -2.37]
Yang 2012	6	1	32	11.7	3.82	30	3.7%	-5.70 [-7.11, -4.29]
Zhao 2014	7.15	1.23	34	12.52	1.47	34	4.4%	-5.37 [-6.01, -4.73]
Zhao 2018	5.9	5.6	54	8.1	5.3	52	3.0%	-2.20 [-4.28, -0.12]
Zhu 2018	5.19	1.28	16	9.94	3.33	16	3.3%	-4.75 [-6.50, -3.00]
Total (95% CI)			**1885**			**1930**	**100.0%**	**-3.02 [-3.63, -2.42]**

Heterogeneity: Tau² = 2.09; Chi² = 475.79, df = 24 (P < 0.00001); I² = 95%
Test for overall effect: Z = 9.75 (P < 0.00001)

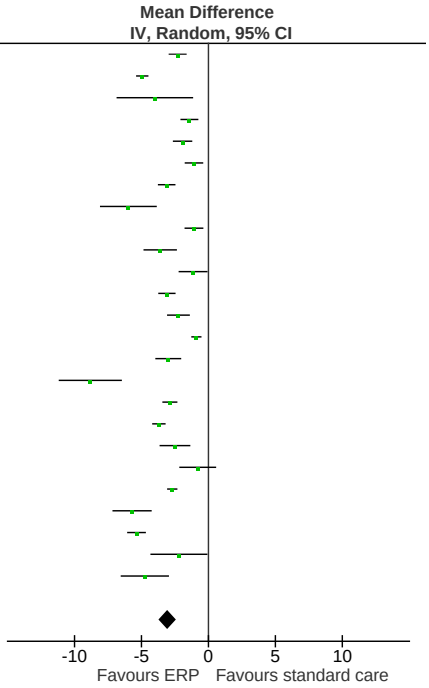


Figure 21: ICU admission

Study or Subgroup	ERP Events	ERP Total	Standard care Events	Standard care Total	Weight	Peto Odds Ratio Peto, Fixed, 95% CI
Dickson 2017	3	51	1	52	66.1%	2.86 [0.39, 20.90]
Dong 2017	0	76	0	83		Not estimable
Forsmo 2016	2	154	0	153	33.9%	7.39 [0.46, 118.68]
Total (95% CI)		**281**		**288**	**100.0%**	**3.95 [0.78, 19.88]**
Total events	5		1			

Heterogeneity: Chi² = 0.30, df = 1 (P = 0.59); I² = 0%
Test for overall effect: Z = 1.66 (P = 0.10)

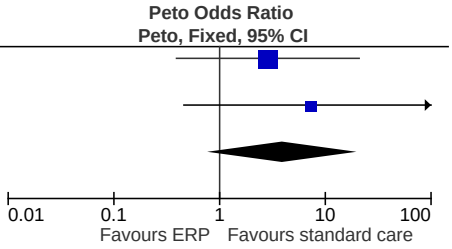


Figure 22: Readmission

Study or Subgroup	ERP Events	ERP Total	Standard care Events	Standard care Total	Weight	Peto Odds Ratio Peto, Fixed, 95% CI
Abdikarim 2015	0	30	0	31		Not estimable
Alito 2016	0	15	0	17		Not estimable
Anderson 2003	0	14	0	11		Not estimable
Bu 2015	18	125	5	123	8.3%	3.40 [1.44, 8.00]
Chen 2016	3	128	3	132	2.3%	1.03 [0.20, 5.19]
Delaney 2003	3	31	6	33	3.1%	0.50 [0.12, 2.03]
Dong 2017	4	76	1	83	1.9%	3.76 [0.64, 22.23]
Feng 2013	0	60	0	59		Not estimable
Feng 2014	0	57	1	59	0.4%	0.14 [0.00, 7.06]
Forsmo 2016	29	154	21	153	16.7%	1.45 [0.79, 2.66]
Frees 2018	1	10	0	13	0.4%	9.97 [0.19, 519.94]
Gatt 2005	1	19	4	20	1.8%	0.28 [0.04, 1.77]
Gralla 2007	2	25	1	25	1.1%	2.00 [0.20, 20.20]
He 2015	1	48	1	38	0.8%	0.79 [0.05, 13.05]
Ionescu 2009	0	48	0	48		Not estimable
Jensen 2015	13	47	12	53	7.5%	1.30 [0.53, 3.21]
Jones 2013	2	46	0	45	0.8%	7.39 [0.46, 120.06]
Khoo 2007	3	35	1	35	1.5%	2.84 [0.38, 21.10]
Kim 2012	1	22	0	22	0.4%	7.39 [0.15, 372.38]
Larsen 2008	2	45	1	42	1.2%	1.85 [0.19, 18.25]
Lee 2011	0	46	0	54		Not estimable
Lemanu 2013	8	40	8	38	5.1%	0.94 [0.31, 2.80]
Li 2018	1	104	1	105	0.8%	1.01 [0.06, 16.25]
Liang 2018	4	58	5	61	3.3%	0.83 [0.21, 3.22]
Lu 2014	0	135	0	162		Not estimable
Mari 2014	0	25	0	25		Not estimable
Mingjie 2017	1	73	0	76	0.4%	7.70 [0.15, 388.32]
Muller 2009	3	76	2	75	1.9%	1.49 [0.25, 8.80]
Petersen 2006	0	27	0	30		Not estimable
Ruiz-Tovar 2019	0	50	1	50	0.4%	0.14 [0.00, 6.82]
Scioscia 2017	11	62	26	165	9.8%	1.16 [0.53, 2.54]
Serclova 2009	0	51	0	52		Not estimable
Shetiwy 2017	4	35	4	35	2.9%	1.00 [0.23, 4.31]
Takagi 2019	0	37	3	37	1.2%	0.13 [0.01, 1.27]
Tanaka 2017	1	73	1	69	0.8%	0.94 [0.06, 15.27]
Vlug 2011	13	193	14	207	10.0%	1.00 [0.46, 2.17]
Wang 2010	1	45	1	47	0.8%	1.04 [0.06, 16.98]
Wang 2011	4	106	9	104	4.9%	0.43 [0.14, 1.33]
Wang 2012	4	81	5	82	3.4%	0.80 [0.21, 3.06]
Wang 2012 2	2	49	3	50	1.9%	0.67 [0.11, 4.03]
Yang 2012 2	0	32	0	30		Not estimable
Yilmaz 2018	1	30	11	32	3.9%	0.14 [0.04, 0.49]
Zhao 2014	1	34	0	34	0.4%	7.39 [0.15, 372.38]
Total (95% CI)		**2497**		**2662**	**100.0%**	**1.09 [0.85, 1.39]**
Total events	142		151			

Heterogeneity: Chi² = 39.42, df = 31 (P = 0.14); I² = 21%
Test for overall effect: Z = 0.67 (P = 0.51)

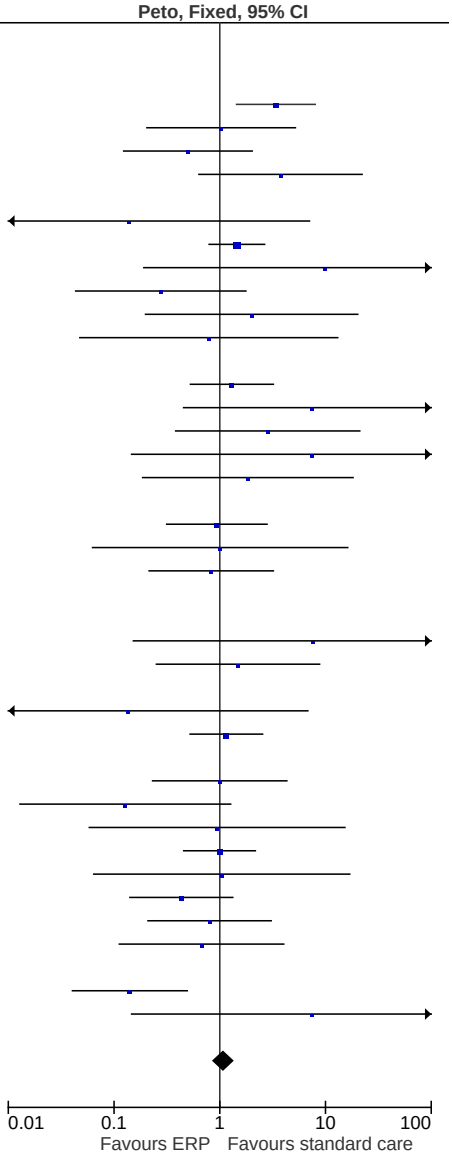


Figure 23: Pain score VAS (days 1-3)

Study or Subgroup	ERP Mean	ERP SD	ERP Total	Standard care Mean	Standard care SD	Standard care Total	Weight	Mean Difference IV, Random, 95% CI
Delaney 2003	3.3	1.9	31	3.4	1.5	33	23.4%	-0.10 [-0.94, 0.74]
Fransen 2018	2.25	2.53	25	4.6	2.72	24	13.0%	-2.35 [-3.82, -0.88]
Jones 2013	2.5	1.4	46	3.3	2	45	26.3%	-0.80 [-1.51, -0.09]
Kapritsou 2017	5.87	2.76	29	6.77	12.27	34	2.2%	-0.90 [-5.14, 3.34]
Li 2019	5.67	1.23	100	5.78	1.03	100	35.1%	-0.11 [-0.42, 0.20]
Total (95% CI)			**231**			**236**	**100.0%**	**-0.60 [-1.25, 0.06]**

Heterogeneity: Tau² = 0.29; Chi² = 11.03, df = 4 (P = 0.03); I² = 64%
Test for overall effect: Z = 1.79 (P = 0.07)

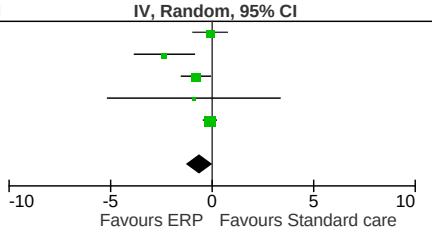


Figure 24: Pain score VAS (days >3-10)

Study or Subgroup	ERP Mean	ERP SD	ERP Total	Standard care Mean	Standard care SD	Standard care Total	Weight	Mean Difference IV, Random, 95% CI
Chen 2016	4.72	1.94	128	7.66	1.59	132	20.6%	-2.94 [-3.37, -2.51]
Delaney 2003	3.1	2	31	3.1	2.4	33	18.8%	0.00 [-1.08, 1.08]
Kapritsou 2017	3	2.2	29	2.6	1.06	34	19.5%	0.40 [-0.48, 1.28]
Lee 2011	1.2	1.1	46	1.1	1.3	54	20.5%	0.10 [-0.37, 0.57]
Li 2019	2.98	1.578	100	2.97	1.442	100	20.6%	0.01 [-0.41, 0.43]
Total (95% CI)			**334**			**353**	**100.0%**	**-0.51 [-1.94, 0.93]**

Heterogeneity: Tau² = 2.56; Chi² = 131.98, df = 4 (P < 0.00001); I² = 97%
Test for overall effect: Z = 0.69 (P = 0.49)

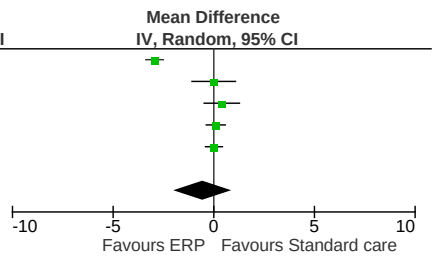


Figure 25: Pain score VAS (day >10)

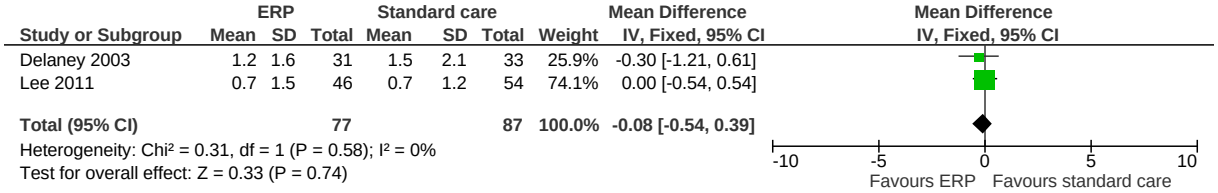


Figure 26: Pain score (2 weeks)

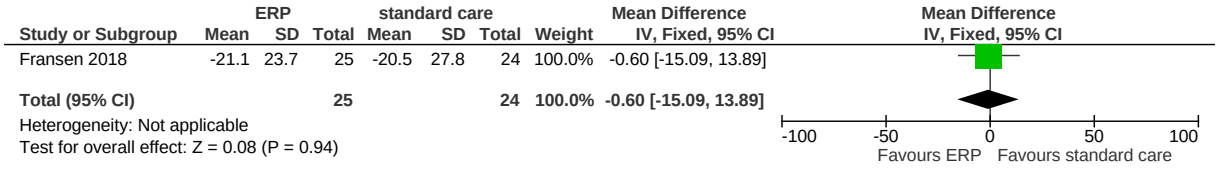


Figure 27: Pain score (6 weeks)

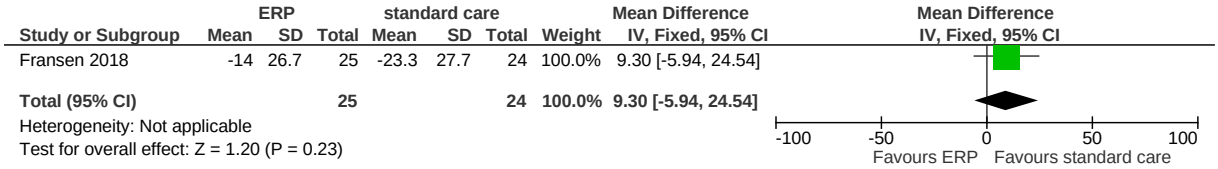


Figure 28: Pain score (12 weeks)

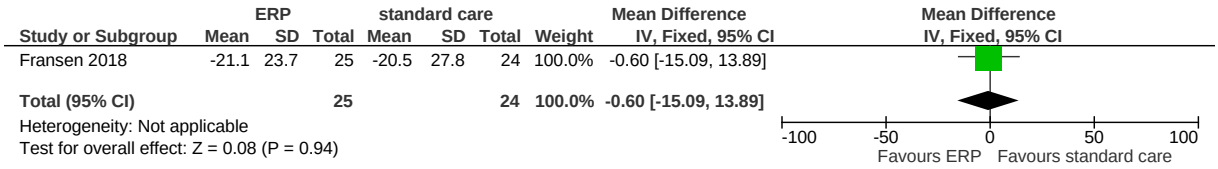
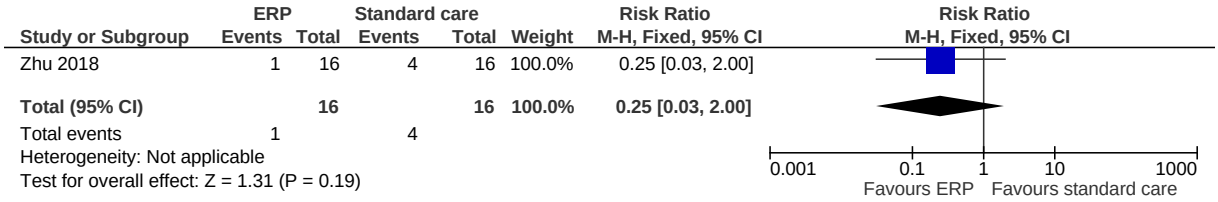


Figure 29: Pain score (VAS >3 day 1)



Appendix F: GRADE tables

Table 16: Clinical evidence profile: ERP compared to standard care

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	ERP	Standard care	Relative (95% CI)	Absolute		
Mortality												
28	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	18/1823 (0.99%)	0%	Peto OR 0.93 (0.49 to 1.76)	-	⊕OOO VERY LOW	CRITICAL
Quality of life (EQ-5D; 3 months) (follow-up 3 months; Better indicated by higher values)												
1	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	45	42	-	MD 0.16 higher (0.03 to 0.29 higher)	⊕⊕OO LOW	CRITICAL
Quality of life (EORTC-QLQ; 2 weeks) (follow-up 2 weeks; Better indicated by higher values)												
1	randomised trials	no serious risk of bias	no serious inconsistency	no serious indirectness	serious[2]	none	22	22	-	MD 0.38 lower (1.82 lower to 1.06 higher)	⊕⊕⊕O MODERATE	CRITICAL
Quality of life score (cleveland clinic global) day 30 (Better indicated by higher values)												
1	randomised	serious[1]	no serious	no serious	serious[2]	none	31	33	-	MD 0.1 lower (0.87	⊕⊕OO	CRITICAL

	trials		inconsistency	indirectness						lower to 0.67 higher)	LOW	
SF 12 (physical) - 2 weeks (Better indicated by higher values)												
1	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	25	24	-	MD 0 higher (2.55 lower to 2.55 higher)	⊕OOO VERY LOW	CRITICAL
SF 12 (physical) - 6 weeks (Better indicated by higher values)												
1	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	25	24	-	MD 5.6 lower (9.87 to 1.33 lower)	⊕⊕OO LOW	CRITICAL
SF 12 (physical) - 12 weeks (Better indicated by higher values)												
1	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	25	24	-	MD 2.1 lower (6.6 lower to 2.4 higher)	⊕OOO VERY LOW	CRITICAL
SF 12 (mental) - 2 weeks (Better indicated by higher values)												
1	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	25	24	-	MD 0.6 higher (3.04 lower to 4.24 higher)	⊕OOO VERY LOW	CRITICAL
SF 12 (mental) - 6 weeks (Better indicated by higher values)												
1	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	25	24	-	MD 3.4 higher (0.6 lower to 7.4 higher)	⊕OOO VERY LOW	CRITICAL
SF 12 (mental) - 12 weeks (Better indicated by higher values)												

1	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	25	24	-	MD 0.1 higher (3.09 lower to 3.29 higher)	⊕OOO VERY LOW	CRITICAL
Total complications												
57	randomised trials	serious[1]	serious[3]	no serious indirectness	no serious imprecision	none	665/3632 (18.3%)	26.2%	RR 0.65 (0.57 to 0.75)	92 fewer per 1000 (from 68 fewer to 113 fewer)	⊕⊕OO LOW	CRITICAL
Complications Grade I (Clavien-Dindo) (follow-up 3 months)												
3	randomised trials	serious[1]	serious[3]	no serious indirectness	very serious[2]	none	32/147 (21.8%)	26.3%	RR 0.84 (0.37 to 1.95)	42 fewer per 1000 (from 166 fewer to 250 more)	⊕OOO VERY LOW	CRITICAL
Complications Grade II (Clavien-Dindo) (follow-up 3 months)												
5	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	39/260 (15%)	11.6%	RR 0.98 (0.66 to 1.45)	2 fewer per 1000 (from 39 fewer to 52 more)	⊕OOO VERY LOW	CRITICAL
Complications Grade IIIa (Clavien-Dindo) (follow-up 3 months)												
4	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	17/220 (7.7%)	12.5%	RR 0.67 (0.38 to 1.19)	41 fewer per 1000 (from 78 fewer to 24 more)	⊕OOO VERY LOW	CRITICAL
Complications Grade IV (Clavien-Dindo) (follow-up 3 months)												
1	randomised	serious[1]	no serious	no serious	very serious[2]	none	1/47	3.8%	RR 0.56 (0.05	17 fewer per 1000 (from 36 fewer to 191	⊕OOO	CRITICAL

	trials		inconsistency	indirectness			(2.1%)		to 6.02)	more)	VERY LOW	
Complications Grade V (Clavien-Dindo) (follow-up 3 months)												
1	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	3/47 (6.4%)	7.6%	RR 0.85 (0.2 to 3.59)	11 fewer per 1000 (from 61 fewer to 197 more)	⊕OOO VERY LOW	CRITICAL
Patient satisfaction with hospital stay 30 days (follow-up mean 30 days; Better indicated by lower values)												
1	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	31	33	-	MD 0.2 lower (1.15 lower to 0.75 higher)	⊕OOO VERY LOW	CRITICAL
Length of hospital stay (Better indicated by lower values)												
18	randomised trials	serious[1]	very serious[3]	no serious indirectness	no serious imprecision	none	804	817	-	MD 3.15 lower (3.94 to 2.37 lower)	⊕OOO VERY LOW	IMPORTANT
Postoperative length of stay (Better indicated by lower values)												
25	randomised trials	serious[1]	very serious[3]	no serious indirectness	no serious imprecision	none	1885	1930	-	MD 3.02 lower (3.63 to 2.42 lower)	⊕OOO VERY LOW	IMPORTANT
ICU admission												
3	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	5/281 (1.8%)	0%	Peto OR 3.95 (0.78 to 19.88)	-	⊕OOO VERY LOW	IMPORTANT
Readmission												

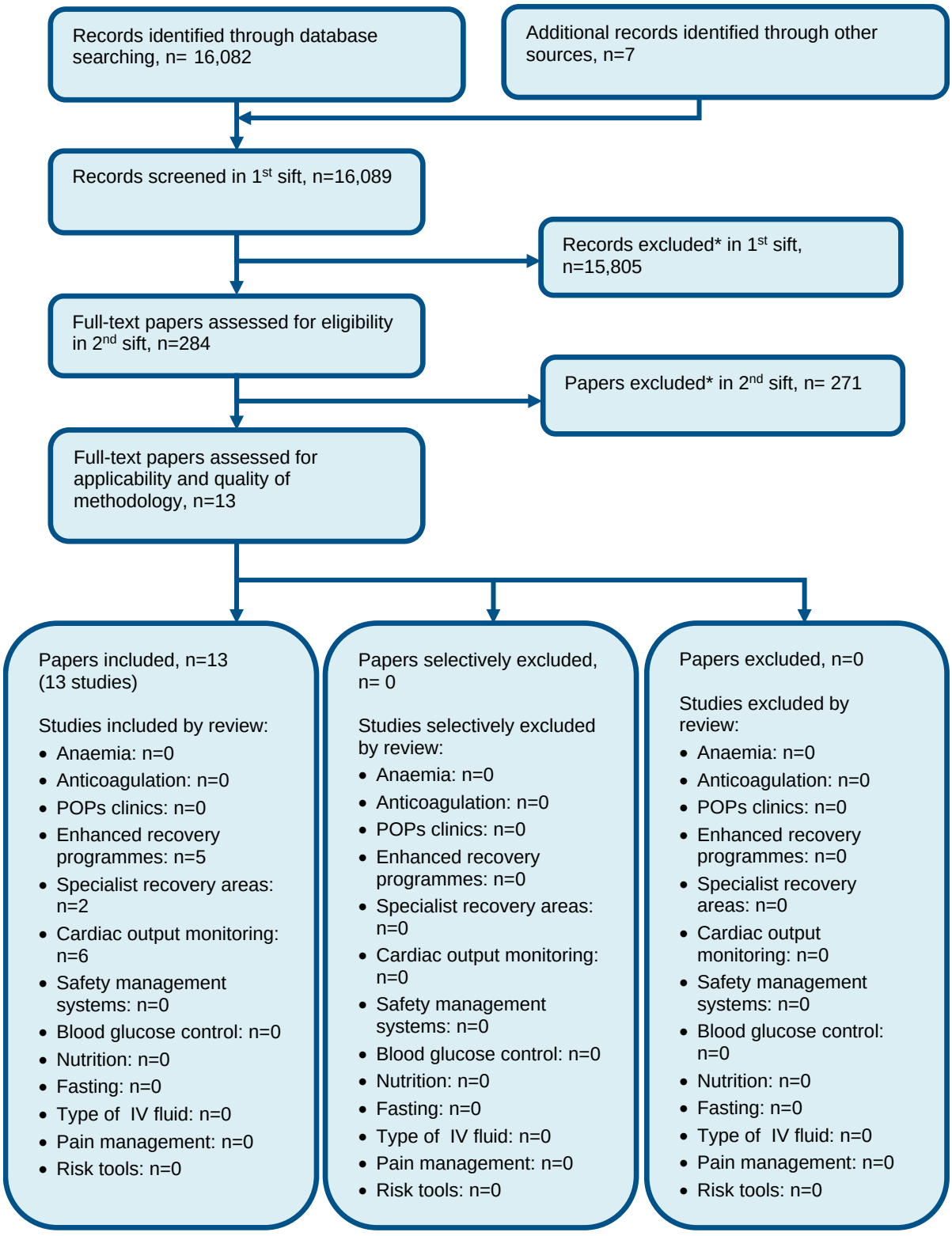
43	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	142/2497 (5.7%)	2.1%	Peto OR 1.09 (0.85 to 1.39)	2 more per 1000 (from 3 fewer to 8 more)	⊕⊕OO LOW	IMPORTANT
Pain score VAS (days 1 - 3) (follow-up 1 days; Better indicated by lower values)												
5	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	231	236	-	MD 0.60 lower (1.25 lower to 0.06 higher)	⊕⊕OO LOW	IMPORTANT
Pain score VAS (days >3-10) (follow-up 5 days; Better indicated by lower values)												
5	randomised trials	serious[1]	very serious[3]	no serious indirectness	no serious imprecision	none	334	353	-	MD 0.51 lower (1.94 lower to 0.93 higher)	⊕OOO VERY LOW	IMPORTANT
Pain score VAS (day >10) (Better indicated by lower values)												
2	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	77	87	-	MD 0.08 lower (0.54 lower to 0.39 higher)	⊕⊕⊕O MODERATE	IMPORTANT
Pain score (mean difference) - 2 weeks (Better indicated by lower values)												
1	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	25	24	-	MD 3.5 higher (14.31 lower to 21.31 higher)	⊕OOO VERY LOW	IMPORTANT
Pain score (mean difference) - 6 weeks (Better indicated by lower values)												
1	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	25	24	-	MD 9.3 higher (5.94 lower to 24.54 higher)	⊕OOO VERY LOW	IMPORTANT

Pain score (mean difference) - 12 weeks (Better indicated by lower values)												
1	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	25	24	-	MD 0.6 lower (15.09 lower to 13.89 higher)	⊕OOO VERY LOW	IMPORTANT
VAS > 3 (day 1)												
1	randomised trials	no serious risk of bias[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	1/16 (6.3%)	25%	RR 0.25 (0.03 to 2)	188 fewer per 1000 (from 243 fewer to 250 more)	⊕⊕OO LOW	IMPORTANT

[1] Downgraded by 1 increment if the majority of the evidence was at high risk of bias, and downgraded by 2 increments if the majority of the evidence was at very high risk of bias
[2] Downgraded by 1 increment if the confidence interval crossed one MID or by 2 increments if the confidence interval crossed both MIDs
[3] Downgraded by 1 or 2 increments because: The point estimate varies widely across studies, unexplained by subgroup analysis. The confidence intervals across studies show minimal or no overlap, unexplained by subgroup analysis Heterogeneity, I2=50%, p=0.04, unexplained by subgroup analysis.

Appendix G: Health economic evidence selection

Figure 30: Flow chart of health economic study selection for the guideline



* Non-relevant population, intervention, comparison, design or setting; non-English language

Appendix H: Health economic evidence tables

Study	Larsen 2009[97]			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost effectiveness**
Economic analysis: CUA(health outcome: QALYs) **Study design:** Within trial analysis (RCT) **Approach to analysis:** Participants from the RCT[98] were followed-up for one year postoperatively to allow costs and effects to be collected. Costs from the time of the patients visit immediately before the operation to one year after were calculated at 15 time points. Uncertainty was explored with bootstrap simulations. Resource use was obtained from the patients via questionnaires or from medical records, with unit costs applied. **Perspective:** Denmark societal **Follow-up**: 1 year	**Population:** People undergoing elective primary total hip arthroplasty, total knee arthroplasty, or unicompartmental knee arthroplasty **Patient characteristics:** N = 87 Mean age ERP = 64 (SD:10.8) Mean age standard care = 66 (SD:9.2) **Intervention 1:** Standard care N= 42 **Intervention 2:** ERP N= 45	**Total costs (mean per person):** *Hip and knee surgeries combined:* Incremental (2−1): -£984 (95% CI: -£95, -£1,874; p=NR) *Total hip arthroplasty:* Incremental (2−1): -£644 (95% CI: £25, -£1,285; p=NR) *Total knee arthroplasty or unicompartmental knee arthroplasty:* Incremental (2−1): -£2,236 (95% CI: -£150, -£6,341; p=NR) **Currency & cost year:** 2006 Danish Krone (presented here as 2006 UK pounds[(a)]) **Cost components incorporated:** Drug costs, physiotherapy,	**Total QALYs (mean per person):** *Hip and knee surgeries combined:* Intervention 1: 0.78 Intervention 2: 0.83 Incremental (2−1): 0.05 (95% CI: NR; p=NR) *Total hip arthroplasty:* Intervention 1: 0.75 Intervention 2: 0.84 Incremental (2−1): 0.09 (95% CI: NR; p=NR) *Total knee arthroplasty or unicompartmental knee arthroplasty:* Intervention 1: 0.85 Intervention 2: 0.81 Incremental (2−1): -0.04 (95% CI: NR; p=NR)	*Hip and knee surgeries combined:* Intervention 2 is dominant[(d)] 97% of bootstrap replicates were in the dominant quadrant. *Total hip arthroplasty:* Intervention 2 is dominant[(d)] 98% of bootstrap replicates were in the dominant quadrant. *Total knee arthroplasty or unicompartmental knee arthroplasty:* Intervention 2 resulted in less costs but also less QALYs (ICER intervention 1 vs intervention 2 = £58,400) 93% of the bootstrap replicates showed that intervention 2 had a lower cost **Analysis of uncertainty:** Uncertainty was explored by using bootstrap simulations with 2000 replicates of the incremental difference. All different scenarios explored came to the same conclusion as those reported in the basecase.

Discounting: N/A		hospitalisation costs, staff time, tests, informal care, transportation, food and readmissions		

Data sources

Health outcomes: Baseline risks, relative treatment effects an quality of life weights were based on a patient level analysis of the trial consisting of 87 participants undergoing total hip arthroplasty, total knee arthroplasty and unicompartmental knee arthroplasty at a hospital in Denmark . Initial effects measured length of hospital stay, health related quality of life and adverse events within the first 3 months postoperatively. All patients were then followed-up for an additional 9 months and data was obtained from the hospital central accounting system and by sending questionnaires to patients **Quality of life weights:** The EQ-5D questionnaire was completed by patients at baseline and then weekly from the 1st to 12th week postoperatively. It was then completed at 26, 39 and 52 weeks postoperatively. EQ-5D scored were based on the Danish tariff. **Cost sources:** Obtained from central Danish hospital employee register, the register of primary care data, StatBank Denmark, the Dutch manual for Costing in Economic Evaluations 2002 and patient reporting. Patient reported costs included non-prescribed drug costs, paid private help, informal care, home changes, training centre costs, transportation and complementary alternative medicine. The cost of implementing the intervention was included.

Comments

Source of funding: NR. **Limitations:** Danish societal perspective and 2006 Danish Kroner may not be relevant to current UK practice, costs include productivity loss which is not considered appropriate in NICE reference case. The study uses the Danish EQ-5D tariff which is not in line with the NICE reference case. Analysis was based on a single study and so does not reflect full body of available evidence for this area (76 RCTs included in the clinical review). Patient reporting was a method of obtaining unit costs which may be unreliable. **Other:** The basecase univariate analysis included productivity costs therefore an alternative multivariate analysis was reported for the costs as it excluded productivity costs. However, the QALYs reported and bootstrap replicates reported are from the univariate analysis. Intervention of ERP included components like focus on fluid consumption and protein beverages, mobilisation started earlier and twice as many hours of mobilisation per day than the comparator arm.

Overall applicability:[(b)] Partially applicable **Overall quality:[(c)]** Potentially serious limitations

Abbreviations: 95% CI = 95% confidence interval; CUA = cost-utility analysis; EQ-5D = Euroqol 5 dimensions (scale: 0.0 [death] to 1.0 [full health], negative values mean worse than death); ERP = enhanced recovery programme; NR = not reported; QALY = quality-adjusted life years; RCT = randomised controlled trial; SD = standard deviation
(a) Converted using 2006 purchasing power parities[152]
(b) Directly applicable / Partially applicable / Not applicable
(c) Minor limitations / Potentially serious limitations / Very serious limitations
(d) Interventions are dominant when they are both less costly and more effective.

Study	**Lemanu 2013[103]**			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost effectiveness**
Economic analysis: CCA (health outcome: hospital	**Population:** People undergoing elective	**Total costs (mean per people):**	**Total complications:** Risk ratio 1.10 (CI: 0.60,	Intervention 2 is cost-saving

length of stay, complications, readmission) **Study design:** Within trial analysis (RCT) **Approach to analysis:** The total cost incurred per person was calculated by adding the costs incurred during the index admission to those of subsequent readmissions. A comparative analysis was then conducted to determine the cost-savings of laparoscopic sleeve gastrectomy with an ERP programme. **Perspective:** New Zealand hospital perpective **Follow-up**: 30 days post-discharge **Discounting:** n/a	laparoscopic sleeve gastrectomy **Patient characteristics:** N = 78 Mean age ERP = 43.5 (SD: 6.9) Mean age standard care = 43.9 (SD: 6.0) **Intervention 1:** Standard care N= 38 **Intervention 2:** ERP N= 40	Intervention 1: £7,484 Intervention 2: £7,133 Incremental (2−1): -£351 (95% CI: NR; p=NR) **Currency & cost year:** Cost year not reported, therefore publication year is used. 2013 New Zealand dollars (presented here as 2013 UK pounds[(a)]) **Cost components incorporated:** NR	1.99) **Readmission:** Peto odds ratio 0.94 (CI: 0.31, 2.80); ARD -11 per 1000 **Total hospital length of stay (median):** Intervention 1: 2 Intervention 2: 1 Incremental (2−1): -1 (95% CI: NR; p<0.001)	ERP had a slightly higher complication risk but reduced readmission and total length of stay. **Analysis of uncertainty:** None
Data sources				
Health outcomes: Baseline risks and relative treatment effects weer based on a patient level analysis of the trial consisting of 78 participants undergoing laparoscopic sleeve gastrectomy at a hospital in New Zealand. Outcomes recorded in the trial incuded complications, readmission and length of hospital stay. **Cost sources:** Resource use obtained from the trial and unit cost data not reported.				
Comments				
Source of funding: Health Research Council of New Zealand. **Limitations:** New Zealand hospital perspective may not reflect current UK practice, cost year was not reported and measure of effect is not in line with NICE reference case as the analysis does not report QALYs. Analysis was based on a single study and so does not reflect full body of available evidence for this area (76 RCTs included in the clinical review). Does not give a breakdown of the cost components, unclear where unit costs were obtained and whether the cost of the intervention was included. **Other:** ERP arm included elements				

such as preoperative education, clear fluids up to 2 hours before surgery, carbohydrate drinks, avoidance of nasogastric tubes and abdominal drains, early oral intake, early mobilisation and multimodal analgesia. They also included a historical group but this was excluded from this analysis.

Overall applicability:[(b)] Partially applicable **Overall quality:**[(c)] Potentially serious limitations

Abbreviations: ARD = absolute risk difference; CCA = cost–consequences analysis; 95% CI = 95% confidence interval; ERP = enhanced recovery programme; NR = not reported; RCT = randomised controlled trial; SD = standard deviation

(a) Converted using 2013 purchasing power parities[152]

(d) Directly applicable / Partially applicable / Not applicable

(e) Minor limitations / Potentially serious limitations / Very serious limitations

Study	**Scioscia 2017[170]**			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost effectiveness**
Economic analysis: CCA (health outcome: hospital length of stay, readmission) **Study design:** Within trial analysis (RCT) **Approach to analysis:** Direct medical costs were estimated through costing up diagnostic-related group codes. Complications were taken into account of by dividing the population into three subgroups (patients who had surgery with no complications, patients who had an ileostomy, and patients who had post - operative complications) and costs of hospitalisation according to each subgroup were identified and attached to the numbers experiencing	**Population:** People aged > 18 years with preoperative evidence of bowel endometriosis (ultrasound, MRI or double contrast barium enema); primary laparoscopic approach; and obtained informed consent **Patient characteristics:** N = 224 Mean age ERP = 35.2 (SD: 4.4) Mean age standard care = 35.6 (SD: 5.8) **Intervention 1:** Standard care N= 162 **Intervention 2:**	**Total costs (mean per person):** Intervention 1: £8,126 Intervention 2: £6,276 Incremental (2−1): -£1,850 (95% CI: NR; p<0.01) **Currency & cost year:** 2015 Italian euros (presented here as 2015 UK pounds[(a)]) **Cost components incorporated:** All direct medical costs associated with hospital resource utilisations for this type of surgery and additional complications.	**Total complications:** Risk Ratio 0.76 (CI: 0.26, 2.22) **Readmission:** Peto odds ratio 1.16 (CI: 0.56, 2.54); ARD 17 per 1000 **Total hospital length of stay (median):** Intervention 1: 7 Intervention 2: 3 Incremental (2−1): -4 (95% CI: NR; p<0.001)	Intervention 2 is cost-saving ERP had a slightly higher readmission rate but reduced complications and total length of stay. **Analysis of uncertainty:** None

each event in each group. **Perspective:** Italian healthcare perpective **Follow-up:** 30 days post-surgery **Discounting:** n/a	ERP N= 62			
Data sources				
Health outcomes: Baseline risks and relative treatment effects weer based on a patient level analysis of the trial consisting of 224 participants undergoing colorectal surgery for bowel endometriosis at a hospital in Italy. Outcomes recorded in the trial included readmission and length of hospital stay. **Cost sources:** The costs used in the analysis were obtained from and specific to a tertiary referral centre with a high volume of surgery.				
Comments				
Source of funding: NR. **Limitations:** Italian hospital perspective and 2015 Italian Euros may not reflect current UK practice, measure of effect is not in line with NICE reference case as the analysis does not report QALYs. Analysis was based on a single study and so does not reflect full body of available evidence for this area (76 RCTs included in the clinical review); does not give details of cost components and unit costs were obtained from a single hospital and not national sources. Unclear whether the intervention cost was included. **Other:** ERP arm included elements such as a preoperative diet for bowel preparation, early removal of nasogastric tube, early oral semi-fluid intake and early mobilisation.				
Overall applicability:[(b)] Partially applicable **Overall quality:**[(c)] Potentially serious limitations				

Abbreviations:ARD = absolute risk difference; CCA = cost–consequences analysis; 95% CI = 95% confidence interval; ERP = enhanced recovery programme; NR = not reported; RCT = randomised controlled trial; SD = standard deviation

(a) Cost year not reported therefore assumedConverted using 2015 purchasing power parities[152]

(b) Directly applicable / Partially applicable / Not applicable

(c) Minor limitations / Potentially serious limitations / Very serious limitations

Study	**Tanaka 2017[182]**			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost effectiveness**
Economic analysis: CCA (health outcome: mortality, postoperative length of stay, complications, readmissions) **Study design:** Within trial	**Population:** People histologically confirmed adenocarcinoma of the stomach for which curative gastrectomy was planned without simultaneous resection of other organs except for the	**Total costs (median per person):** Intervention 1: £10,699 Intervention 2: £10,476 Incremental (2−1): -£223 (95% CI: NR; p=0.045)	**Mortality:** Intervention 1: 0 Intervention 2: 0 Incremental (2-1): 0 (95% CI: NR; p<0.001) **Postoperative hospital**	Intervention 2 was cost-saving ERP reduced complications, readmissions and postoperative length of hospital stay. There was no

analysis **Approach to analysis:** All costs incurred during the hospital stay were calculated for each intervention and were divided into charges for consultation, prescriptions, injections, nursing care, the operating theatre, the laboratory, radiology, the ward and meals, and other services. **Perspective:** Japanese hospital **Follow-up:** One month post-surgery **Discounting:** n/a	gallbladder, no involvement of the duodenum or oesophagus, age 20–85 years, sufficient oral intake, an ASA score of less than 4, and no prior chemotherapy or radiotherapy for any malignancy. **Patient characteristics** N = 142 Median age ERP = 68 (range: 29-85) Median age standard care = 67 (range: 44-85) **Intervention 1:** Standard care N = 69 **Intervention 2:** ERP N = 73	**Currency & cost year:** Cost year not reported, therefore publication year is used. 2017 Japanese yen (presented here as 2017 UK pounds[(a)]) **Cost components incorporated:** All costs incurred during the hospital stay, and was divided into charges for consultation, prescriptions, injections, nursing care, the operating theatre, the laboratory, radiology, the ward and meals, and other services.	**length of stay (median):** Intervention 1: 10 Intervention 2: 9 Incremental (2-1): -1 (95% CI: NR; p<0.001) (95% CI: NR; p<0.001) **Complications:** *Clavien-Dindo classification grade ≥ 2:* RR 0.60 (CI: 0.34, 2.80); ARD -127 per 1000 *Clavien-Dindo classification grade ≥ 3:* RR 0.28(CI: 0.08, 0.99); ARD -104 per 1000 **Readmission:** RR 0.94 (CI: 0.06, 15.27); ARD -1 per 1000	difference in mortality. **Analysis of uncertainty:** None.
Data sources				
Health outcomes: Baseline risks and relative treatment effects were based on a patient level analysis of the trial consisting of 142 participans undergoing curative gastrectomy at a hospital in Japan. **Cost sources:** Resource use obtained from the trial and unit cost data was not reported.				
Comments				
Source of funding: Japan Society for the Promotion of Science Grants-in-Aid for Scientific Research. **Limitations:** Japanese hospital perspective may not reflect current UK practice, cost year was not reported and measure of effect is not in line with NICE reference case as the analysis does not report QALYs. Analysis was based on a single study and so does not reflect full body of available evidence for this area (76 RCTs included in the clinical review). Unclear where unit costs were obtained and whether the intervention cost was included. **Other:** ERP arm included elements such as carbohydrate loading, early mobilisation and early oral fluid intake.				
Overall applicability:[(b)] Partially applicable **Overall quality:[(c)]** Potentially serious limitations				

Abbreviations: ARD = absolute risk difference; CCA = cost–consequences analysis; 95% CI = 95% confidence interval; ERAS = enhanced recovery after surgery; NR = not reported; RCT = randomised controlled trial; RR = risk ratio; SD = standard deviation

(a) Cost year not reported therefore assumed to be the same as publication year. Converted using 2017 purchasing power parities[152]

(b) Directly applicable / Partially applicable / Not applicable

(c) Minor limitations / Potentially serious limitations / Very serious limitations

Study	**Vlug 2011[191]**			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost effectiveness**
Economic analysis: CCA (health outcomes: hospital length of stay, complications) **Study design:** Within trial analysis (RCT) **Approach to analysis:** The marginal direct medical in-hospital costs were calculated for the four treatment strategies per patient. These costs included outpatient care, operating time, patient days, the additional costs of laparoscopy and of ERP, as well as costs of complications, reoperations and readmissions within 20 days after the index admission. **Perspective:** Dutch hospital perspective **Follow-up**: 30 days post-	**Population:** People aged 40 - 80 years of age; ASA grade I-III; undergoing elective segmental colectomy for histologically confirmed adenocarcinoma or adenoma; without evidence of metastatic disease. *Laparoscopy:* **Intervention 1:** Laparoscopy with standard care N = 109 Mean age = 68 (SD: 10.3) Male = 62% **Intervention 2:** Laparoscopy with ERP N = 100 Mean age = 66 (SD: 8.6) Male = 53% *Open surgery:*	**Total costs (median):** **University hospital costs:** *Laparoscopy:* Intervention 1: £10,106 Intervention 2: £8,947 Incremental (2−1): -£1,159 (95% CI: NR; p=NR) *Open surgery:* Intervention 1: £8,849 Intervention 2: £10,814 Incremental (2−1): £1,964 (95% CI: NR; p=NR) **Teaching hospital costs:** *Laparoscopy:* Intervention 1: £5,260 Intervention 2: £4,871 Incremental (2−1): -£388 (95% CI: NR; p=NR) *Open surgery:* Intervention 1: £4,771	**Total hospital length of stay (median):** *Laparoscopy:* Intervention 1: 6 Intervention 2: 5 Incremental (2−1): -1 (95% CI: NR; p=0.026) *Open surgery:* Intervention 1: 7 Intervention 2: 7 Incremental (2−1): 0 (95% CI: NR; p=NR) **Major complications (mean per person):** Laparoscopy: (ERP vs SC): RR 1.15 (CI: 0.63, 2.11) ARD 24 per 1000 Open surgery: (ERP vs SC): RR 0.91 (CI: 0.58, 1.43) ARD -27 per 1000	Teaching hospital costs showed that both laparoscopy and open surgery resulted in fewer costs with ERP. University hospital costs showed that laparoscopy resulted in fewer costs with ERP but open surgery resulted in higher costs with ERP. ERP reduced major complications for those undergoing open surgery but resulted in slightly more minor complications. ERP reduced minor complications in those undergoing laparoscopy but resulted in slightly more major complications. Total hospital stay was reduced for those undergoing laparoscopy. **Analysis of uncertainty:**

discharge **Discounting:** n/a	**Intervention 1:** Open surgery with standard care N = 98 Mean age = 66 (SD: 7.1) Male = 60% **Intervention 2:** Open surgery with ERP N = 93 Mean age = 66 (SD: 10.3) Male = 58%	Intervention 2: £4,642 Incremental (2−1): -£129 (95% CI: NR; p=NR) **Currency & cost year:** Cost year not reported, therefore publication year is used. 2011 Dutch euros (presented here as 2011 UK pounds[(a)]) **Cost components incorporated:** Outpatient care, operating time, patient-days, cost of laparoscopy and enhanced recovery care, complications, reoperations and readmissions.	**Minor complications (mean per person):** Laparoscopy: (ERP vs SC): RR 0.86 (CI: 0.49, 1.51) ARD -34 per 1000 Open surgery: (ERP vs SC): RR 1.23 (CI: 0.71, 2.21) ARD 56 per 1000	None
Data sources				
Health outcomes: Baseline risks and relative treatment effects were based on a patient level analysis of the LAFA trial consisting of 400 participans undergoing segmental colectomy treated at nine hospitals in the Netherlands and were allocated to either open surgery or laparoscopy. Treatment effects and baseline risks obtained from the LAFA-study (Vlug 2011). **Cost sources:** The marginal direct medical in-hospital costs were calculated for the 4 treatment strategies per patient. Unit cost source was not reported.				
Comments				
Source of funding: Governmental subvention (ZonMW). The study was also supported by Johnson and Johnson International and Nutricia. **Limitations**: Dutch healthcare perspective may not reflect current UK practice, cost year was not reported and measure of effect is not in line with NICE reference case as the analysis does not report QALYs. Analysis was based on a single study and so does not reflect full body of available evidence for this area (76 RCTs included in the clinical review), unclear where the unit costs were obtained. **Other:** ERP arm included elements such as carbohydrate loading, early mobilisation and early oral fluid intake.				
Overall applicability:[(b)] Partially applicable **Overall quality:[(c)]** Potentially serious limitations				

Abbreviations: ARD = absolute risk difference; CCA = cost–consequences analysis; 95% CI = 95% confidence interval; ERP = enhanced recovery programme; NR = not reported; RCT = randomised controlled trial; RR = risk ratio; SD = standard deviation
For studies where the time horizon is longer than the treatment duration, an assumption needs to be made about the continuation of the study effect. For example, does a difference in utility between groups during treatment continue beyond the end of treatment and if so for how long.

(a) Converted using 2011 purchasing power parities[152]
(b) Directly applicable / Partially applicable / Not applicable
(c) Minor limitations / Potentially serious limitations / Very serious limitations

Appendix I: Excluded studies

I.1 Excluded clinical studies

Table 17: Studies excluded from the clinical review

Reference	**Reason for exclusion**
Agarwal 2019[2]	Incorrect study design
Ahmed 2018[3]	RCT's from this systematic review included in our review
Albalawi 2017[4]	RCT's from this systematic review included in our review
Angus 2019[7]	Incorrect study design
Anon 2017[210]	non-English language studies
Anon 2017[118]	non-English language studies
Anon 2018[8]	Paper not available
Awad 2014[9]	Incorrect study design
Badalihan 2015[10]	Inappropriate comparison
Bagnall 2014[11]	RCT's from this systematic review included in our review
Bannister 2015[12]	Systematic review: study designs inappropriate.
Basse 2002[13]	Incorrect study design
Bater 2017[14]	Incorrect study design
Beamish 2015[15]	Systematic review: references screened
Bizheva 2016[16]	surgery for burns, traumatic brain injury or neurosurgery
Bond-Smith 2016[17]	RCT's from this systematic review included in our review
Borgwardt 2009[18]	Incorrect interventions. not ERP
Bousquet-Dion 2018[19]	Inappropriate comparison. ERP vs ERP comparison
Brusko 2019[20]	Not enough ERP components
Burden 2012[22]	Incorrect interventions. nutrition not ERP
Cameron 1993[23]	Incorrect interventions
Campsen 2019[24]	Not enough ERP components
Chemali 2017[25]	Systematic review: study designs inappropriate. Incorrect interventions. Inappropriate comparison.
Chen 2014[28]	Systematic review: study designs inappropriate
Cheng 2018[29]	RCT's from this systematic review included in our review
Chi 2012[30]	non-English language studies
Chong 2019[31]	Incorrect study design
Collins 2016[32]	Inappropriate comparison
Coolsen 2013[34]	No RCT's included
Coolsen 2013[35]	No RCT's included
Coolsen 2014 [33]	Incorrect study design
Corso 2017[36]	No RCT's included
De Aguilar-Nascimento 2008[37]	Incorrect study design
Demanet 2011[39]	Not in English
Den Hertog 2012[40]	Incorrect study design
Ding 2017[44]	RCT's from this systematic review included in our review
Ding 2018[45]	Incorrect study design

Ebert 2008[47]	Incorrect interventions. Rehabilitation not ERP
Engblom 1992[48]	Incorrect interventions
Eskicioglu 2009[49]	RCT's from this systematic review included in our review
Fan 2011[50]	non-English language studies
Fang 2016[51]	Incorrect study design
Feo 2009[56]	Incorrect study design. Case control study
Fiore 2016[57]	RCT's from this systematic review included in our review
Fiore 2017[58]	Inappropriate comparison
Forsmo 2016[60]	Inappropriate comparison. within ERP comparison
Frassanito 2019[62]	Incorrect comparison: ERP vs ERP
Frees 2017[63]	Conference abstract
Garcia-Botello 2011 [66]	Paper not available
Gillis 2016[68]	Incorrect interventions. Whey protein vs placebo
Grant 2017[71]	RCT's from this review included in our study
Greco 2014[72]	RCT's from this systematic review included in our review
Hall 2012[73]	Systematic review: study designs inappropriate. No RCT's
Herdy 2008[75]	Incorrect interventions. Inappropriate comparison
Horosz 2016[76]	Incorrect study design. Literature review
Huang 2013[77]	Not in English
Hughes 2014[78]	RCT's from this systematic review included in our review
Ji 2018[81]	No RCT's included
Jiang 2019[83]	Not enough ERP components
Jones 2014[85]	Systematic review: study designs inappropriate. no RCT's
Kagedan 2015[86]	Systematic review: study designs inappropriate. no RCT's
Kim 2003[91]	Incorrect interventions
Kim 2012[92]	RCT's from this systematic review included in our review
Kim 2018[89]	Incorrect study design
Kisialeuski 2015[93]	Inappropriate comparison. ERP vs ERP
Kocian 2019[94]	Incorrect study design
Koea 2009[95]	Incorrect interventions. Inappropriate comparison
Laronche 2017[96]	Incorrect study design
Lau 2017[99]	RCT's from this systematic review included in our review
Lee 2013[100]	Incorrect interventions
Lei 2014[102]	RCT's from this systematic review included in our review
Letton 2013[104]	Incorrect study design
Li 2017[106]	RCT's from this systematic review included in our review
Li 2017[110]	RCT's from this systematic review included in our review
Li 2017[111]	RCT's from this systematic review included in our review
Li 2018 [108]	Systematic review: references screened
Liang 2016[113]	Not review population
Liao 2018 [114]	Incorrect intervention – not appropriate surgical intervention
Lin 2012[115]	RCT's from this systematic review included in our review
Lindemann 2017[117]	Systematic review: study designs inappropriate. non ERP
Ling 2017 [118]	Not in English
Linhares 2017[119]	Incorrect interventions
Liu 2016[123]	Incorrect study design. Cohort study

Liu 2018[121]	Systematic review: references screened
Lv 2012[125]	RCT's from this systematic review included in our review
Ma 2018[126]	Incorrect study design
Macfie 2012[127]	Incorrect study design
Maffei 2017[128]	Inappropriate comparison
Malczak 2017[130]	RCT's from this systematic review included in our review
Marcantuono 2015[131]	Incorrect study design
Markar 2015[134]	RCT's from this systematic review included in our review
Marx 2006[135]	Incorrect study design
Melloul 2016[136]	Non ERP
Messenger 2017[137]	RCT's from this systematic review included in our review
Moon 2001[139]	Incorrect study design
Najafi 2008[143]	Incorrect study design. case control study
Nanavati 2014[144]	Incorrect study design
Nelson 2014[146]	Systematic review: study designs inappropriate.
Neville 2014[147]	RCT's from this systematic review included in our review
Ni 2013[148]	Not review population
Ni 2015[149]	RCT's from this systematic review included in our review
Nielsen 2008[150]	economical study
Oosterhuis 2014[151]	surgery for burns, traumatic brain injury or neurosurgery
Paduraru 2017[153]	RCT's from this systematic review included in our review
Petrick 2015[155]	Incorrect study design
Phan 2014 [156]	Incorrect comparison
Pirzada 2017[158]	Not guideline condition. Patients from 15 years old
Pisarska 2017[159]	RCT's from this systematic review included in our review
Pu 2012 [160]	Paper not available
Qi 2018 [161]	Duplicate paper
Rao 2017[162]	Not review population
Rawlinson 2011[163]	RCT's from this systematic review included in our review
Recart 2005[164]	Incorrect study design
Roig 2011 [166]	Paper not available
Rollins 2016[167]	RCT's from this systematic review included in our review
Ronellenfitsch 2012[168]	Incorrect study design. Inappropriate comparison. historical control group
Shao 2014[172]	RCT's from this systematic review included in our review
Shou 2014[174]	non-English language studies
Singh 2017[175]	no RCT's to include
Sokouti 2011[176]	Incorrect interventions. Inappropriate comparison
Sommer 2014[177]	Incorrect study design – protocol only
Soop 2004[178]	Inappropriate comparison
Stein 2009[179]	Incorrect intervention - Rehabilitation not ERP
Stenvall 2007[180]	Incorrect interventions. Rehabilitation not ERP
Trejo-Avila 2019[185]	Incorrect intervention – not appropriate surgical intervention
Tyson 2016[186]	RCT's from this systematic review included in our review
Varadhan 2010[188]	RCT's from this systematic review included in our review
Visioni 2018[190]	RCT's from this systematic review included in our review
Wallstrom 2014[192]	RCT's from this systematic review included in our review

Wang 2013[201]	Paper not available
Wang 2017[198]	Systematic review: study designs inappropriate. Only cohort studies included
Wang 2018[199]	RCT's from this systematic review included in our review
Wei 2015[202]	Inappropriate comparison
Wong 2016[203]	RCT's from this systematic review included in our review
Wongyingsinn 2011[204]	Incorrect interventions. Inappropriate comparison
Wongyingsinn 2012[205]	Incorrect interventions. Inappropriate comparison. Systematic review: study designs inappropriate
Wrench 2015[206]	Incorrect study design
Wu 2015[207]	RCT's from this systematic review included in our review
Xiong 2016[208]	no RCT's to include
Xu 2015[209]	no relevant outcomes
Xu 2017[210]	Paper not available
Yang 2016[214]	RCT's from this systematic review included in our review
Yang 2017[213]	Incorrect study design
Yoong 2014[216]	Incorrect study design
Zang 2018[217]	Incorrect study design. Cohort study
Zargar-Shoshtari 2009[218]	Incorrect study design
Zeng 2018[219]	Incorrect study design
Zhang 2011[220]	Not in English
Zhao 2017[224]	RCT's from this systematic review included in our review
Zhou 2017[225]	Incorrect study design
Zhu 2017[226]	RCT's from this systematic review included
Zhuang 2013[228]	RCT's from this systematic review included in our review
Zietek 2015[229]	Incorrect interventions. Inappropriate comparison
Zouros 2016[230]	Incorrect study design

I.2 Excluded health economic studies

Published health economic studies that met the inclusion criteria (relevant population, comparators, economic study design, published 2003 or later and not from non-OECD country or USA) but that were excluded following appraisal of applicability and methodological quality are listed below. See the health economic protocol for more details.

Table 18: Studies excluded from the health economic review

Reference	Reason for exclusion
None.	

Appendix J: Research recommendation

Research question: What is the clinical and cost effectiveness of enhanced recovery programmes for adults having major surgery?

Why this is important:

Enhanced recovery is a multimodal approach optimising patients' physiological and psychological states across preoperative, intraoperative and postoperative domains of care. The aim of enhanced recovery programmes (ERP) or enhanced recovery after surgery (ERAS) is for patients to return to their baseline function as quickly as possible and to reduce the incidence of postoperative complications. There are self-evident patient-centred and fiscal benefits if an expeditious and uncomplicated recovery can be achieved. Further research is needed to support explore the clinical and cost effectiveness of these programmes when compared to 'traditional' care.

PICO question	Population: Adults 18 years and over who require major surgery including unplanned surgery Intervention(s): Enhanced recovery programmes Comparison: Standard care Outcome(s): Health-related quality of life, mortality, patient, family and carer experience of care, adverse events and complications (Clavien-Dindo, postoperative morbidity score (POMS)), patient and staff adherence, length of hospital stay, unplanned intensive care unit admission, length of stay in intensive care unit, hospital readmission, psychological distress and mental wellbeing (hospital anxiety and depression scale (HADS)) and pain
Importance to patients or the population	The provision of enhanced recovery programmes could improve health-related quality of life and reduce mortality and morbidity
Relevance to NICE guidance	There is currently limited evidence and guidance on the effectiveness of this limited resource.
Relevance to the NHS	Research in this area will inform NICE recommendations for service delivery and provide information about clinical and cost-effectiveness.
National priorities	Provision of enhanced recovery programmes as a resource will have financial implications on the NHS and nationally.
Current evidence base	There was a large body of evidence showing that hospital stays are shorter, postoperative complications less frequent and overall costs lower when people having elective major surgery follow an enhanced recovery programme (ERP).
Equality	Not applicable
Study design	RCT
Feasibility	There is heterogeneity regarding the provision of enhanced recovery programmes and a consistent approach would be necessary to conduct the research
Other comments	None
Importance	• Medium: the research is relevant to the recommendations in the guideline and would be useful to future updates.