

# Preoperative tests (update)

## Routine preoperative tests for elective surgery

*NICE guideline NG45*

*Appendix J: Forest plots*

*April 2016*

*Developed by the National Guideline Centre,  
hosted by the Royal College of Physicians*



**Disclaimer**

Healthcare professionals are expected to take NICE clinical guidelines fully into account when exercising their clinical judgement. However, the guidance does not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of each patient, in consultation with the patient and, where appropriate, their guardian or carer.

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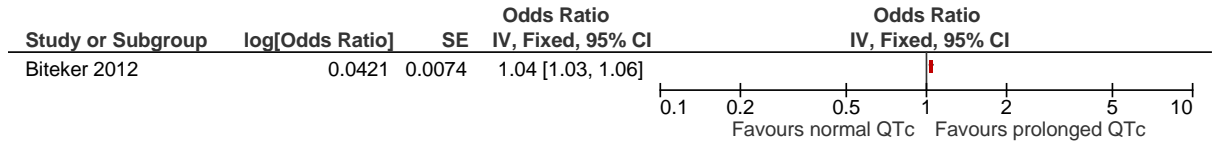
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## Appendix J: Forest plots

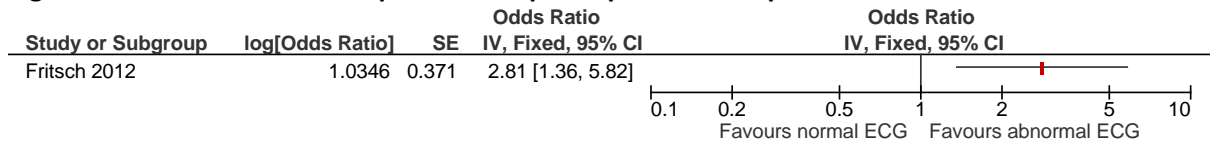
### J.1 Resting electrocardiography (ECG)

See Section 5.7.1 of the full guideline for evidence statements.

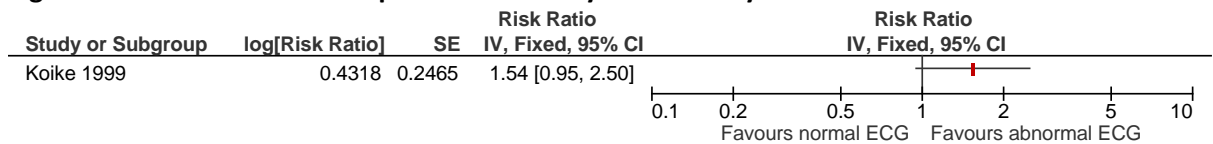
**Figure 1: Prolonged QTc interval as a predictor of perioperative cardiovascular events**



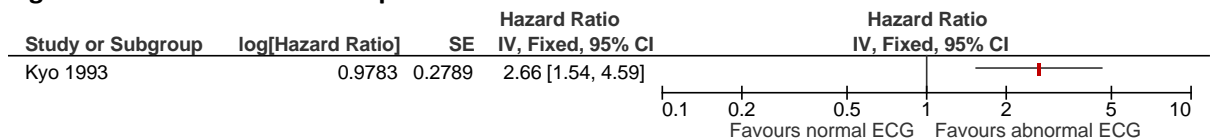
**Figure 2: Abnormal ECG as a predictor of post-operative complications**



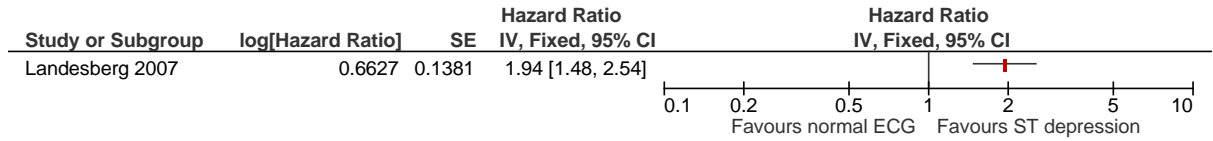
**Figure 3: Abnormal ECG as a predictor of one-year mortality**



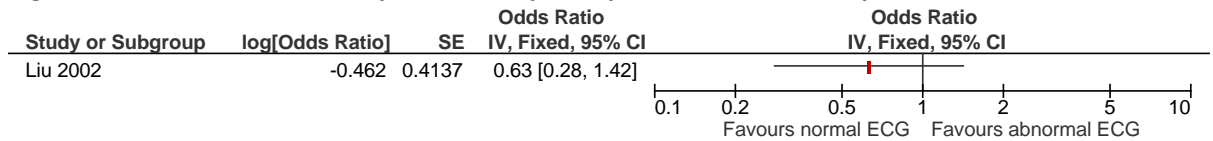
**Figure 4: Abnormal ECG as a predictor of survival rate**



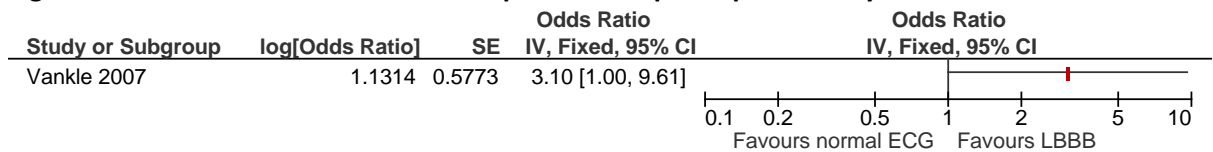
**Figure 5: ST segment depression as a predictor of long-term survival**



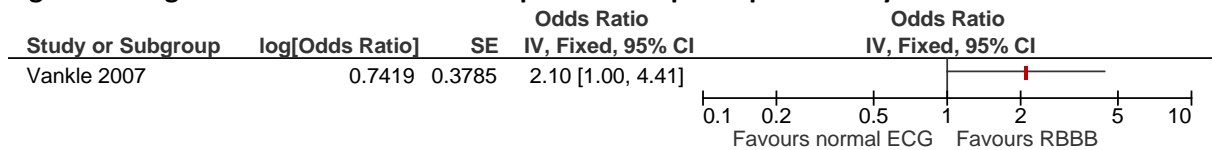
**Figure 6: Abnormal ECG as a predictor of post-operative cardiac complications**



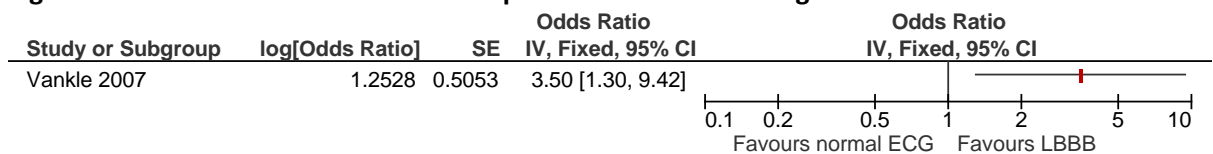
**Figure 7: Left bundle branch block as a predictor of post-operative myocardial infarction**



**Figure 8: Right bundle branch block as a predictor of post-operative myocardial infarction**



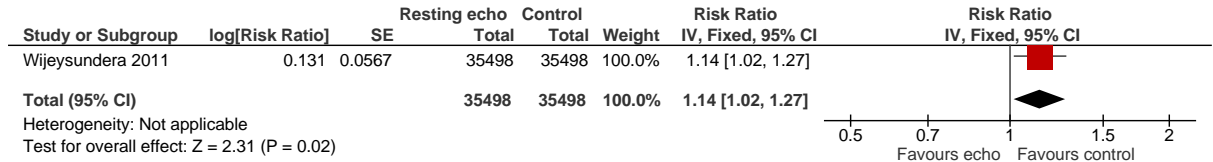
**Figure 9: Left bundle branch block as a predictor of death during admission**



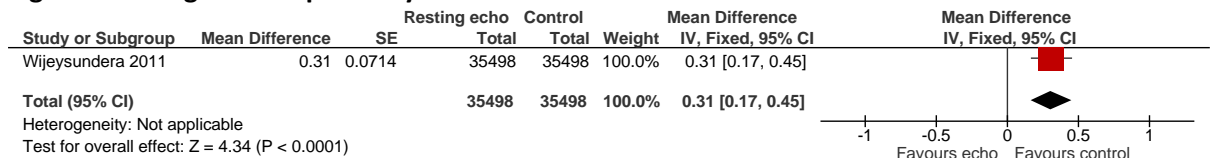
## J.2 Resting echocardiography

See Section 6.5.1 of the full guideline for evidence statements.

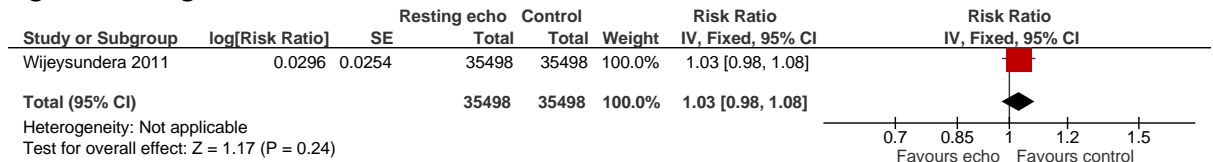
**Figure 10: 30-day mortality**



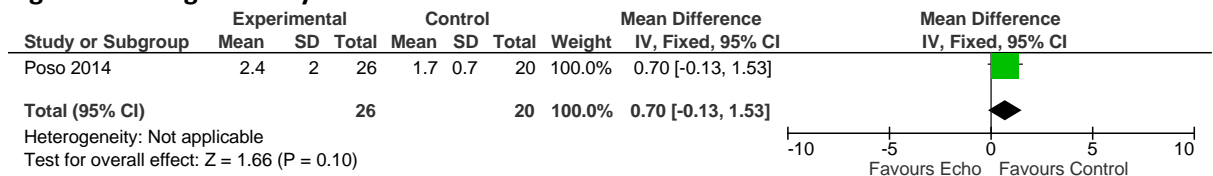
**Figure 11: Length of hospital stay**



**Figure 12: Surgical site infection**



**Figure 13: Length of stay**



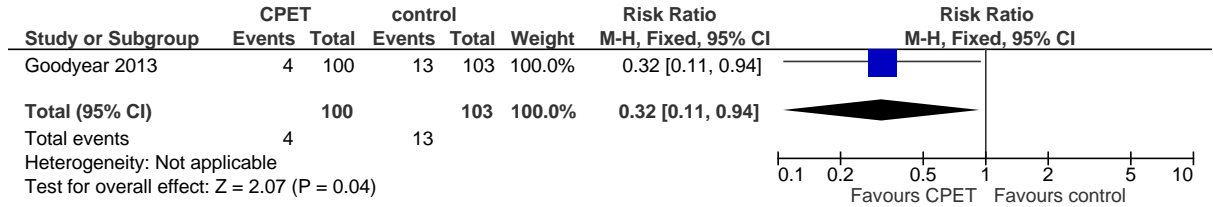
## J.3 Cardiopulmonary exercise testing (CPET)

See Section 7.7.1 of the full guideline for evidence statements.

### J.3.1 Intervention review

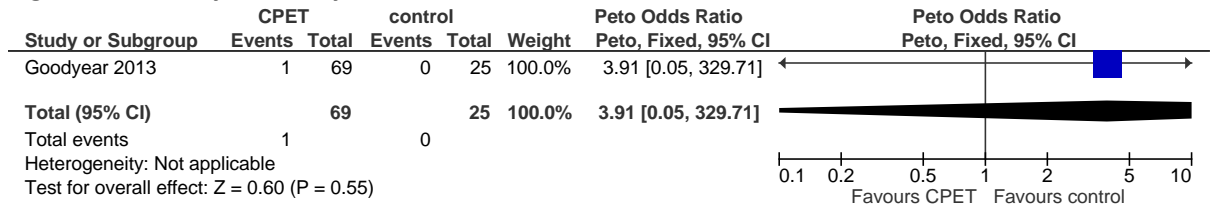
#### Open AAA surgery

Figure 14: 30-day mortality



#### EVAR AAA surgery

Figure 15: 30-day mortality



### J.3.2 Prognostic review

#### J.3.2.1 Abdominal aortic aneurysm (AAA) repair surgery

##### J.3.2.1.1 Anaerobic threshold (AT)

Figure 16: 30-day mortality

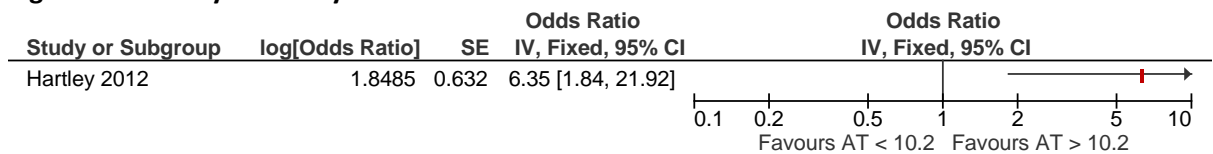
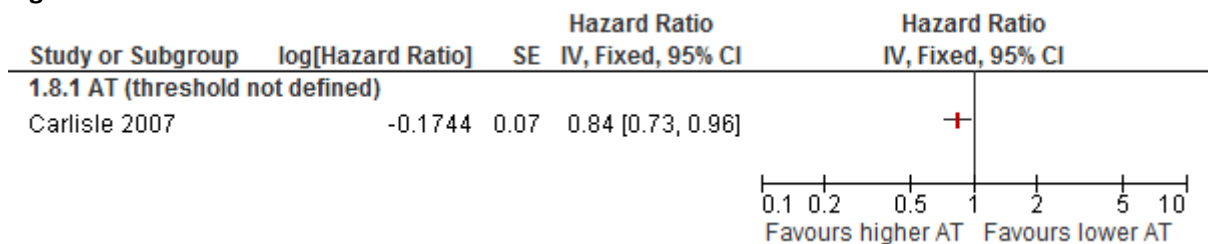
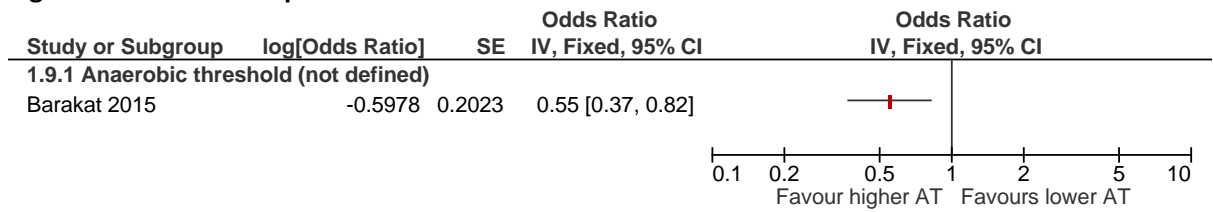


Figure 17: Survival at 35 months

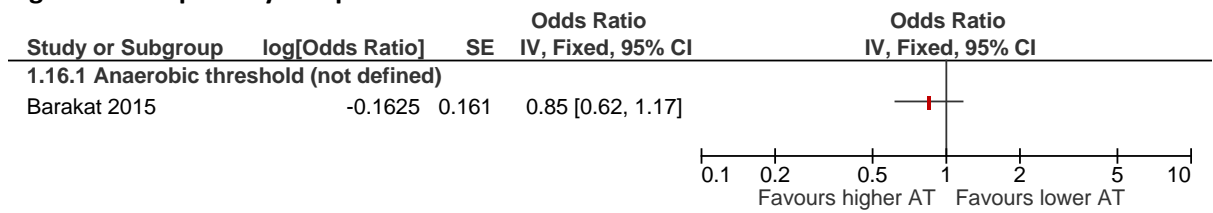




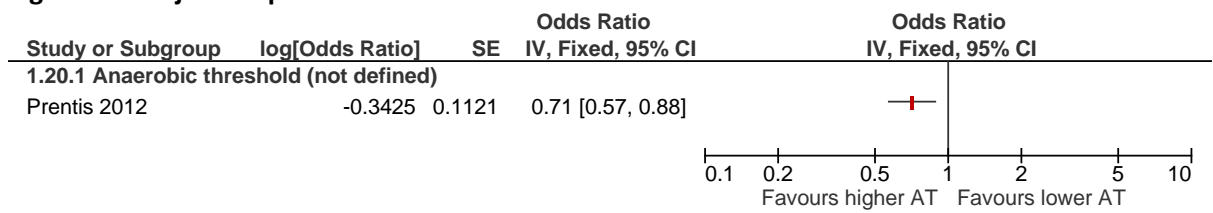
**Figure 18: Cardiac complications**



**Figure 19: Respiratory complications**

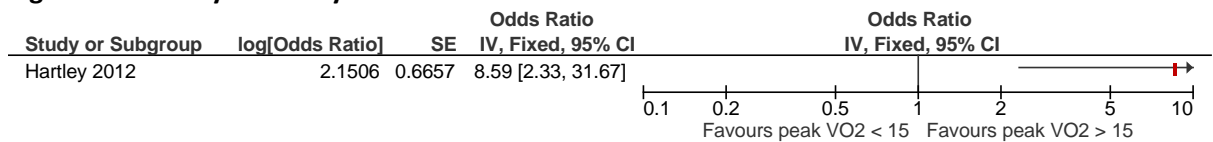


**Figure 20: Major complications**

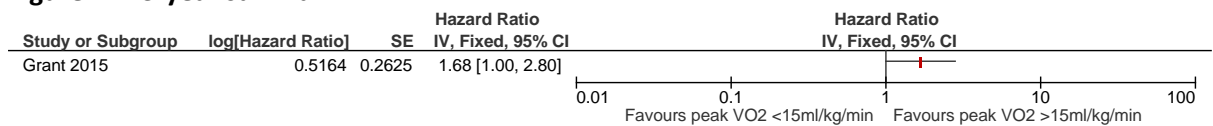


**J.3.2.1.2 VO<sub>2</sub>**

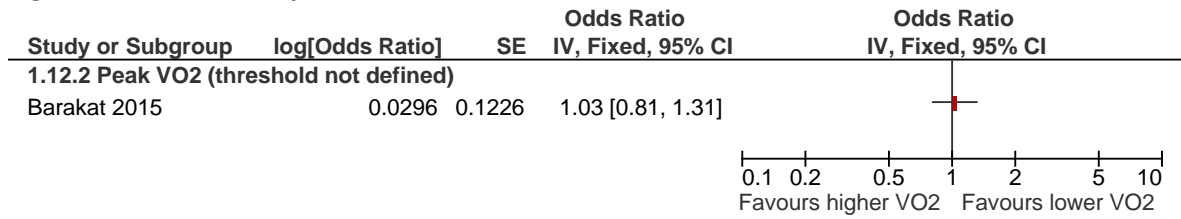
**Figure 21: 90-day mortality**



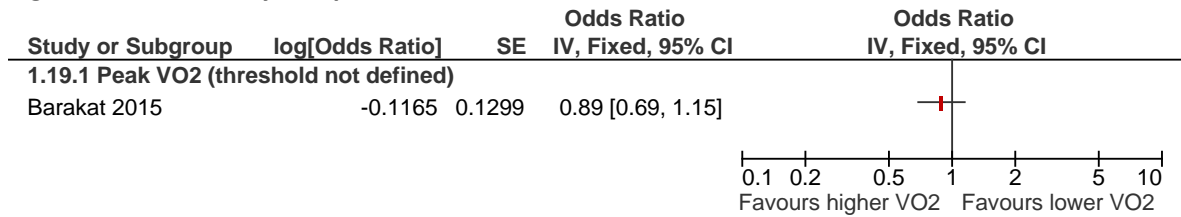
**Figure 22: 3-year survival**



**Figure 23: Cardiac complications**

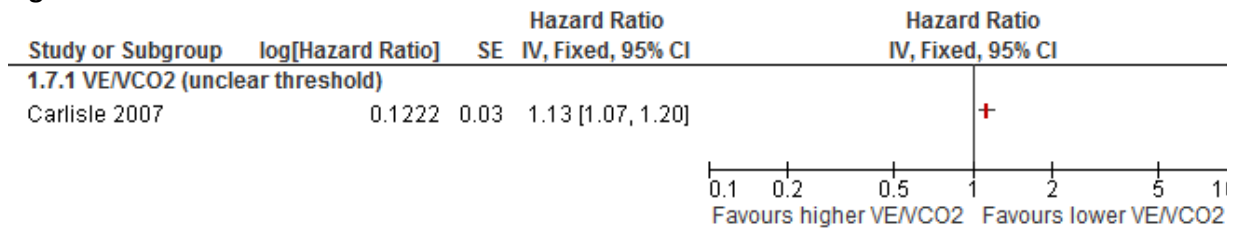


**Figure 24: Pulmonary complications**

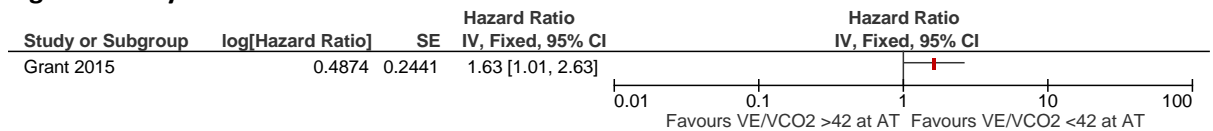


**J.3.2.1.3 VE/VCO<sub>2</sub>**

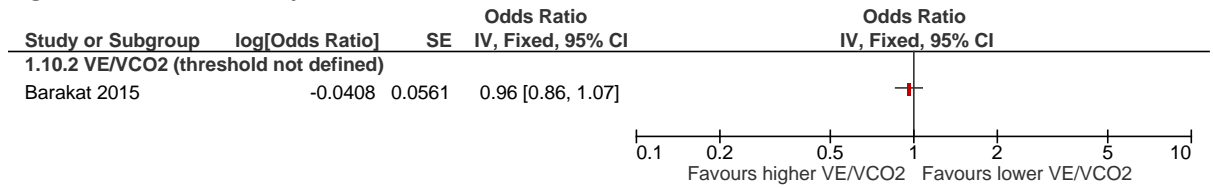
**Figure 25: Survival at 35 months**



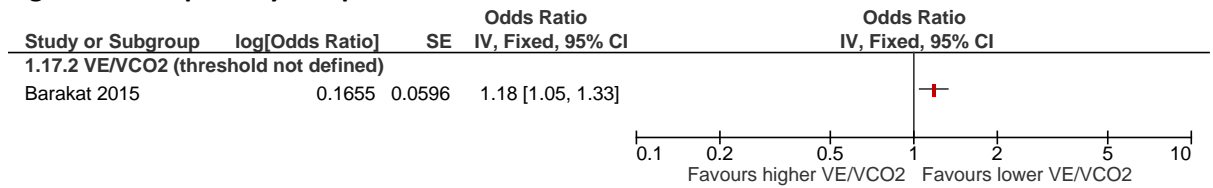
**Figure 26: 3-year survival**



**Figure 27: Cardiac complications**



**Figure 28: Respiratory complications**

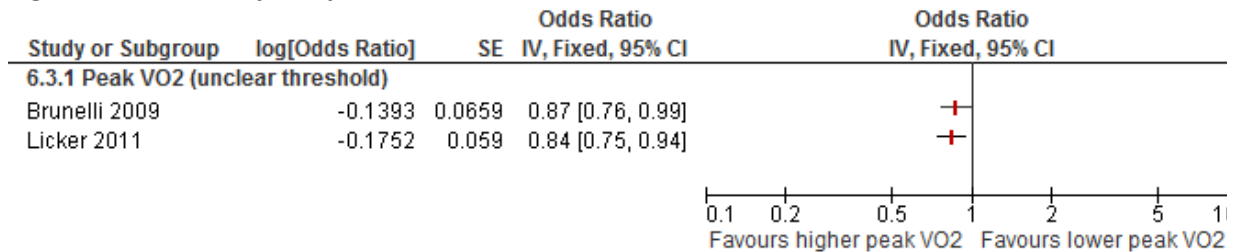


**J.3.2.2 Lung resection surgery**

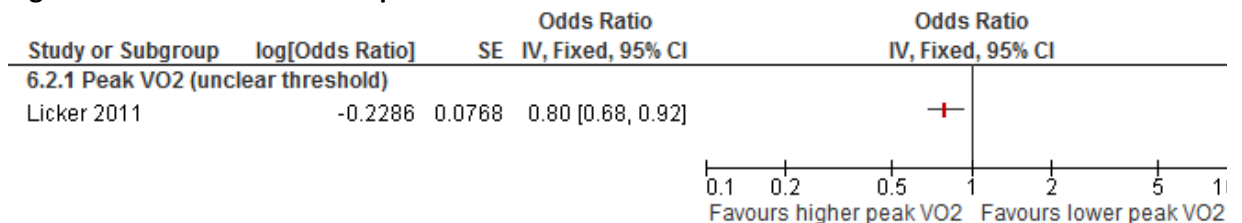
**J.3.2.2.1 VO<sub>2</sub>**

**Complications**

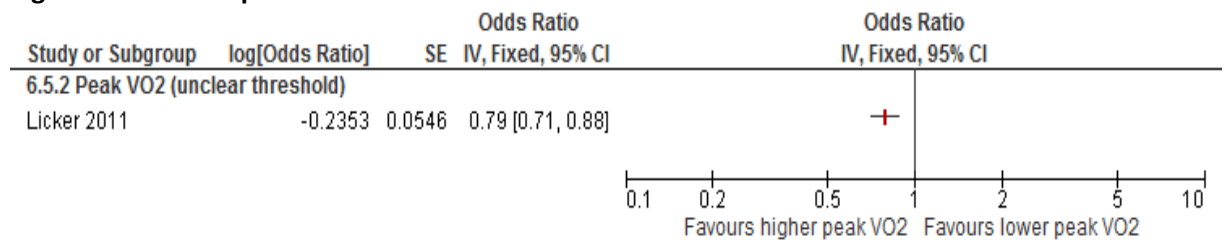
**Figure 29: Pulmonary complications**



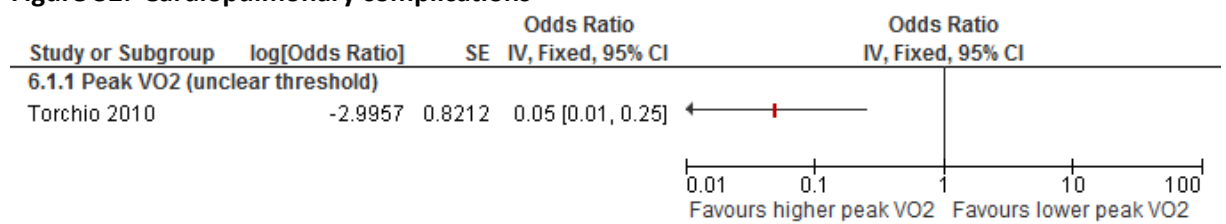
**Figure 30: Cardiovascular complications**



**Figure 31: All complications**

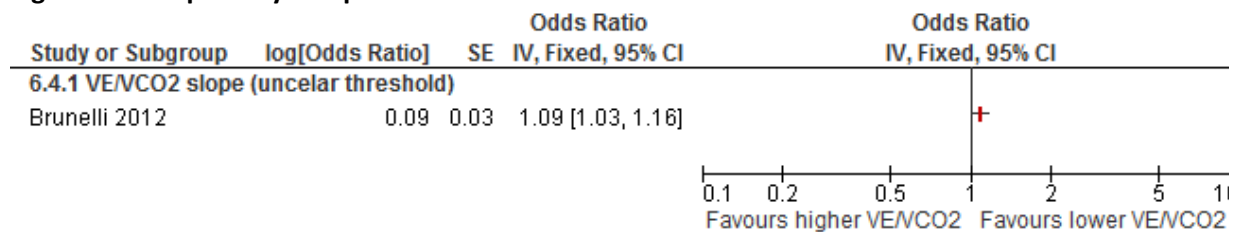


**Figure 32: Cardiopulmonary complications**

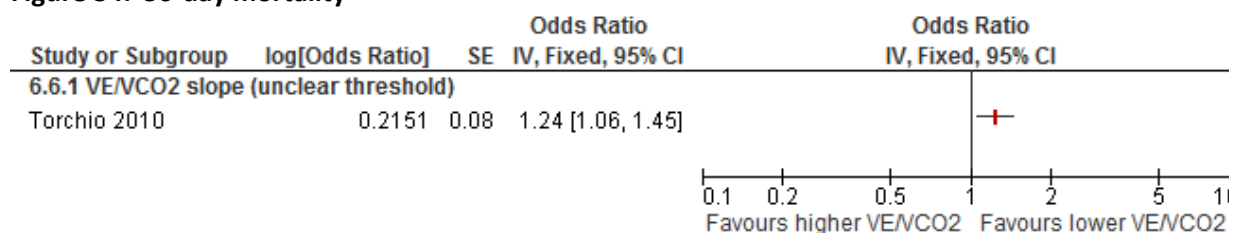


**J.3.2.2.2 VE/VCO<sub>2</sub> slope**

**Figure 33: Respiratory complications**



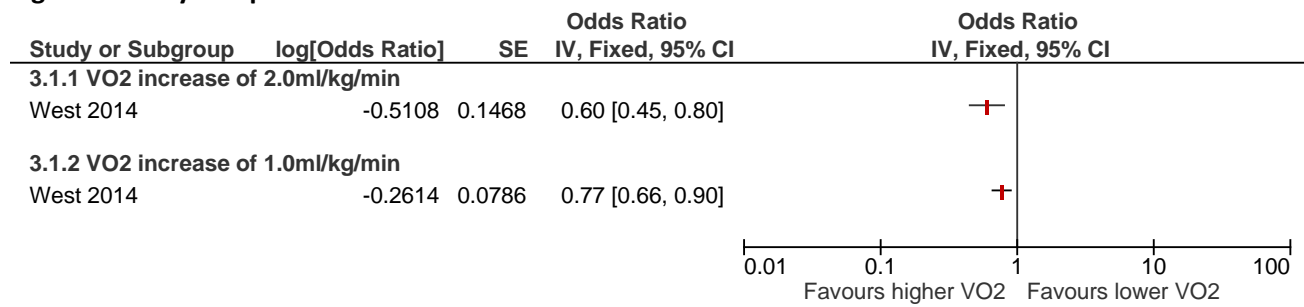
**Figure 34: 30-day mortality**



**J.3.2.3 Major colonic surgery**

**Peak VO<sub>2</sub>**

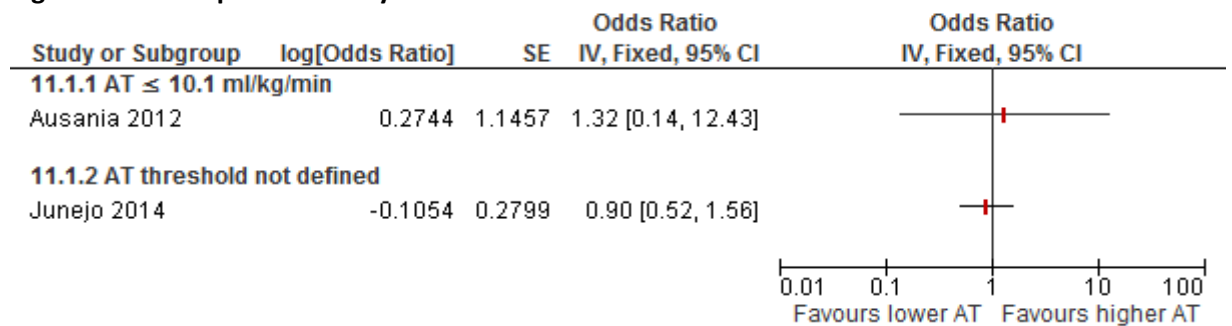
**Figure 35: Any complication**



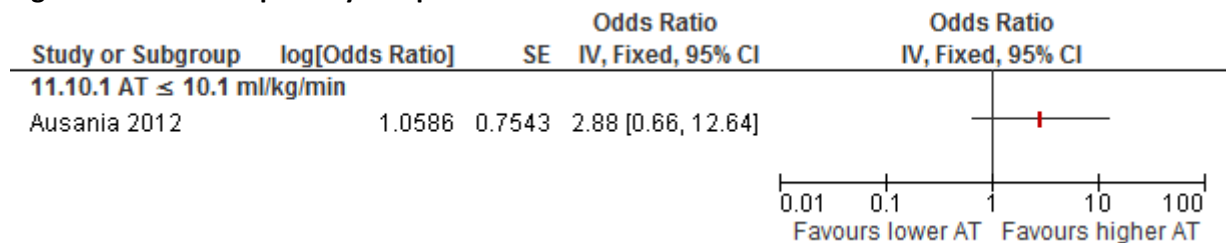
### J.3.2.4 Pancreaticoduodenectomy

#### J.3.2.4.1 Anaerobic threshold

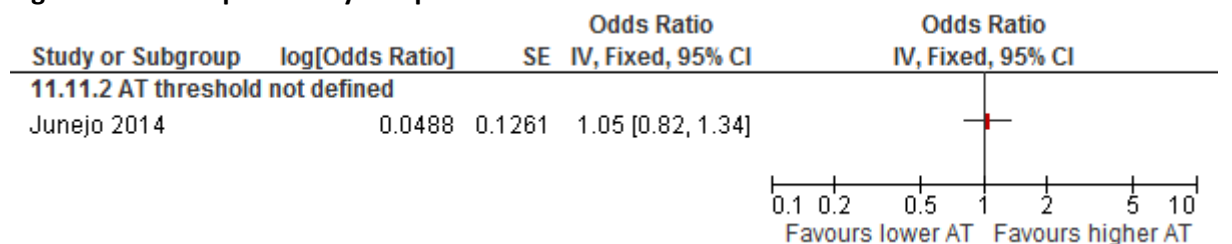
**Figure 36: In hospital mortality**



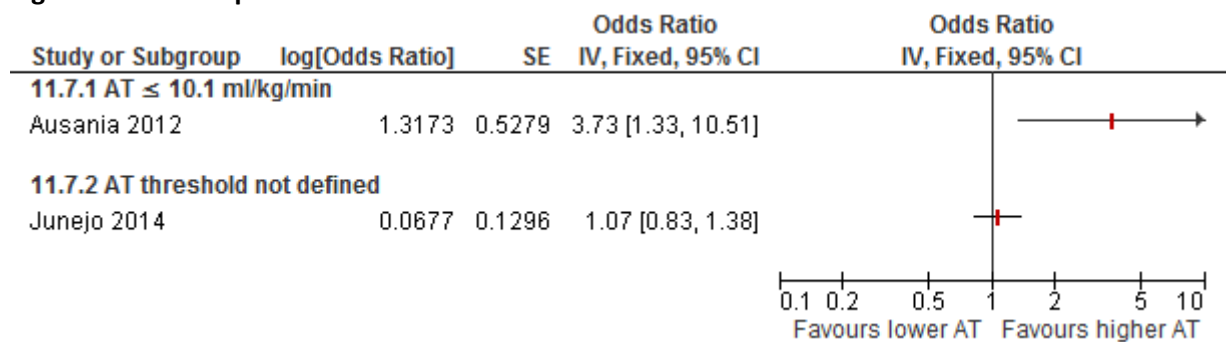
**Figure 37: Cardiorespiratory complications**



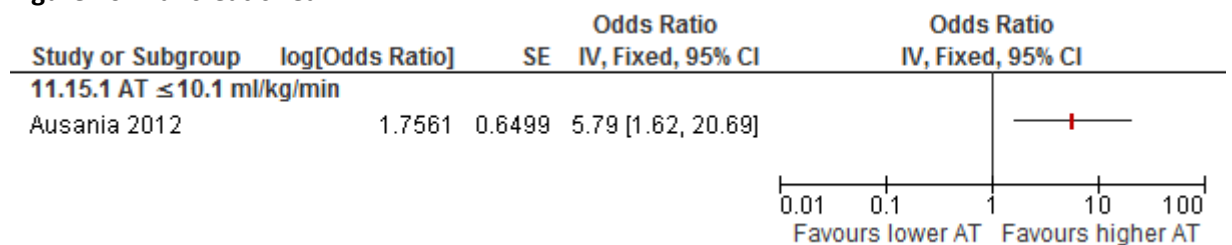
**Figure 38: Cardiopulmonary complications**



**Figure 39: All complications**

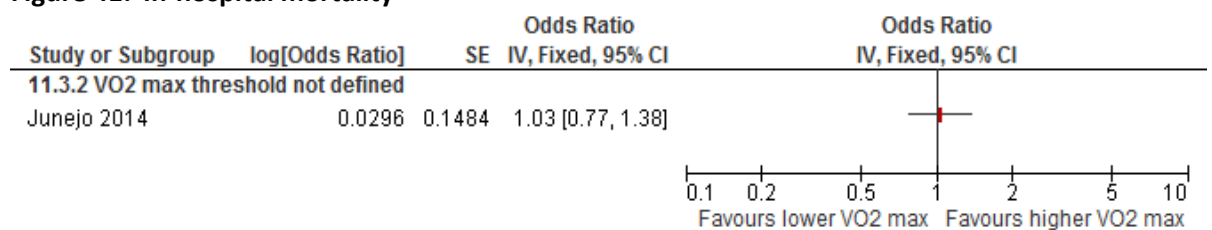


**Figure 40: Pancreatic Leak**

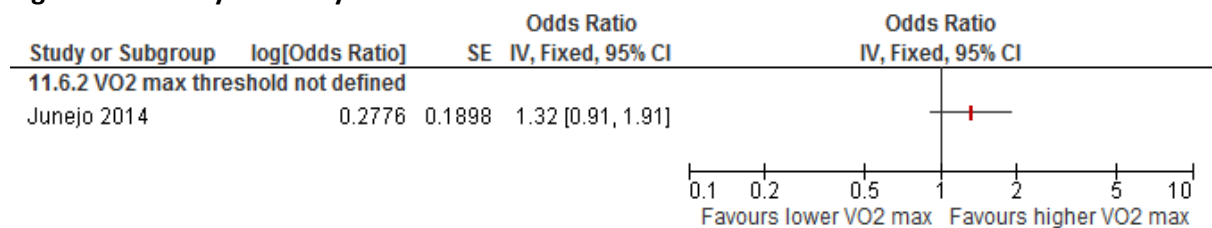


**J.3.2.4.2 VO<sub>2</sub>**

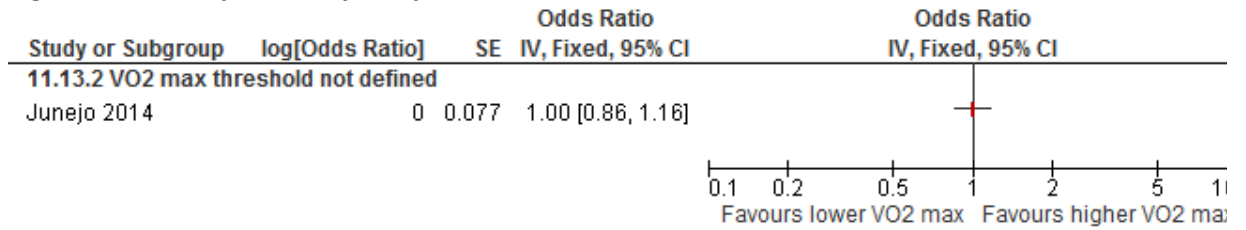
**Figure 41: In-hospital mortality**



**Figure 42: 30-day mortality**

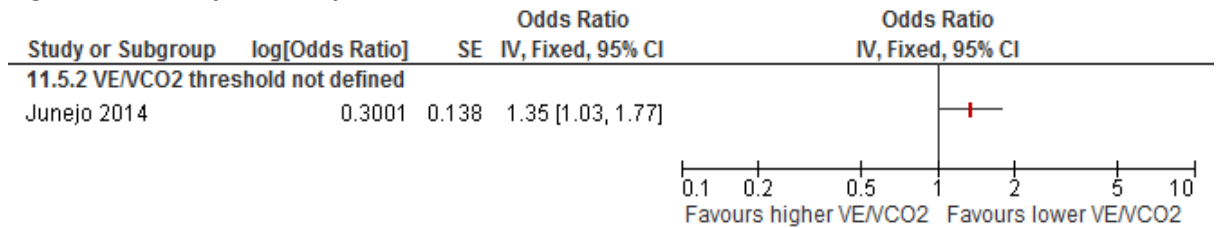


**Figure 43: Cardiopulmonary complications**

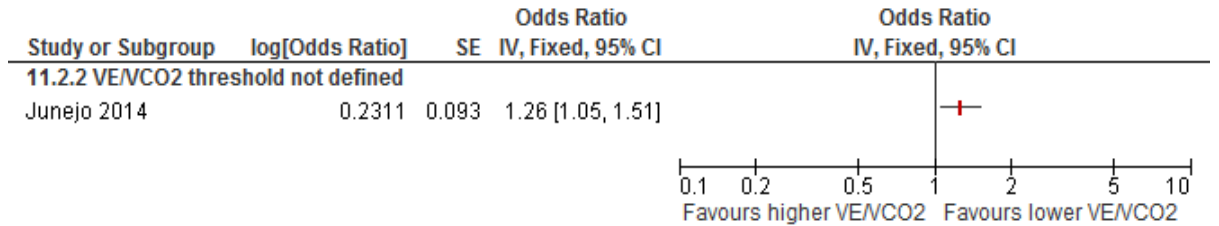


**J.3.2.4.3 VE/VCO<sub>2</sub>**

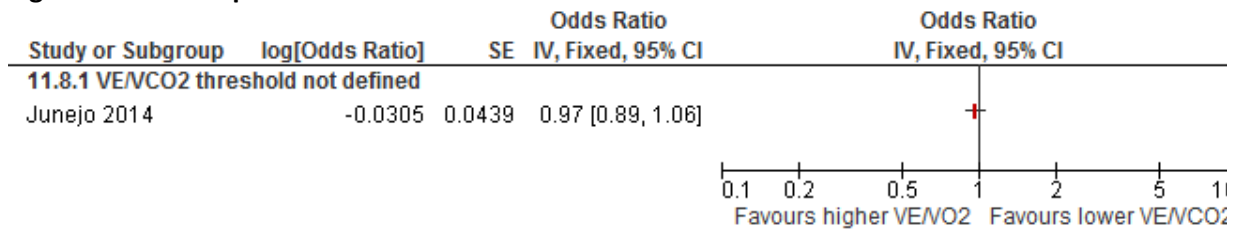
**Figure 44: 30-day mortality**



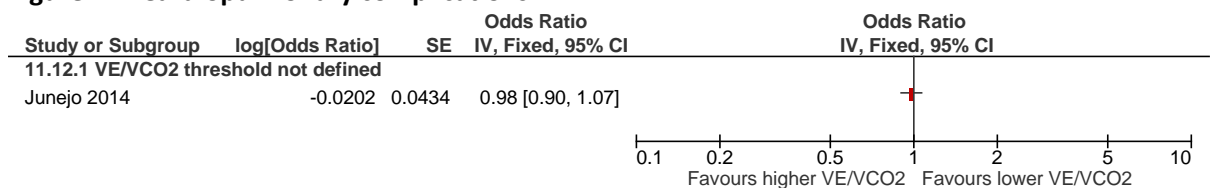
**Figure 45: In hospital mortality**



**Figure 46: All complications**



**Figure 47: Cardiopulmonary complications**



J.3.2.5 Other types of surgeries

J.3.2.5.1 Anaerobic threshold

Figure 48: Post-operative morbidity

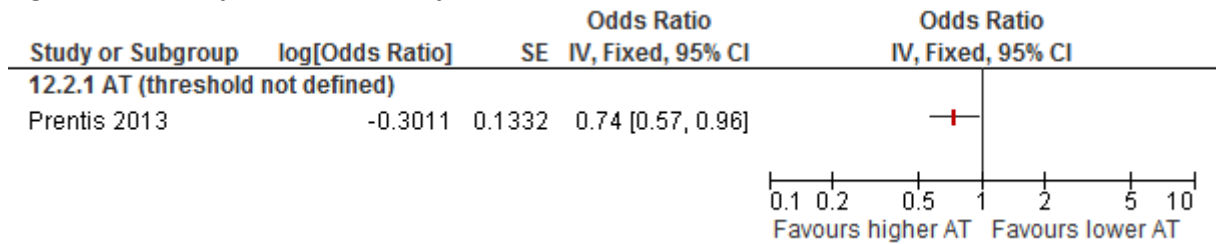


Figure 49: Any complications

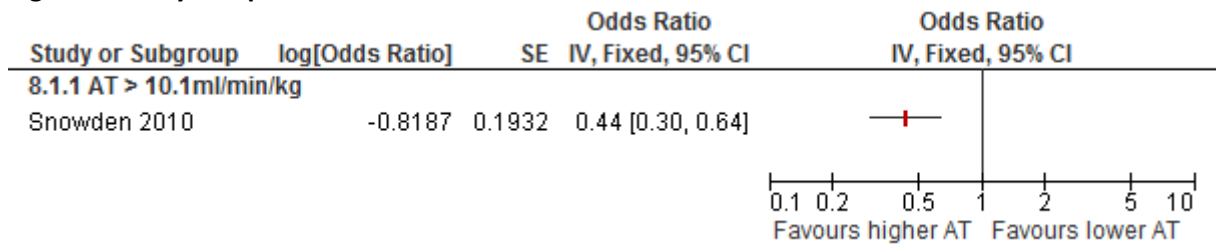
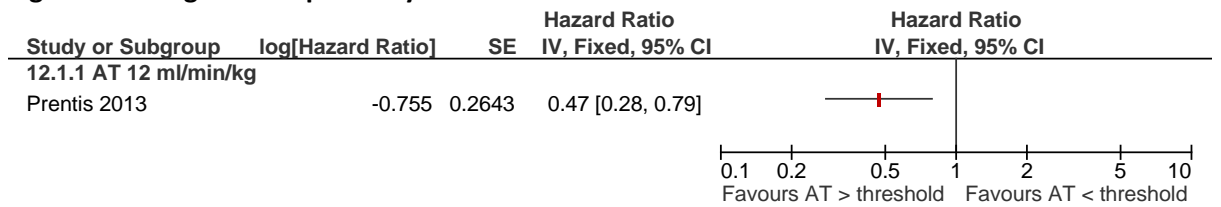
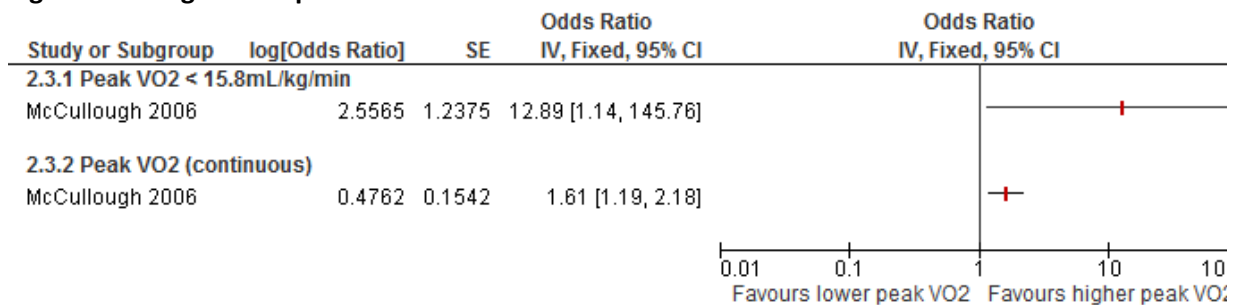


Figure 50: Length of hospital stay



J.3.2.5.2 VO<sub>2</sub>

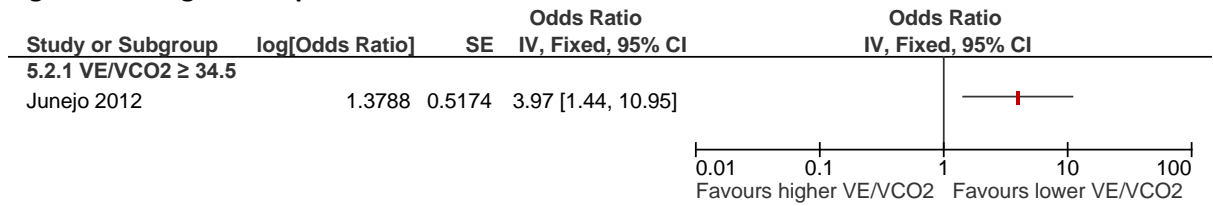
Figure 51: Surgical complications



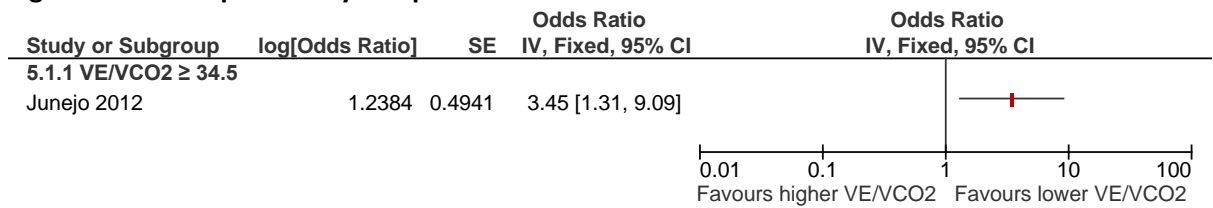


### J.3.2.5.3 VE/VCO<sub>2</sub>

**Figure 52: Surgical complications**



**Figure 53: Cardiopulmonary complications**

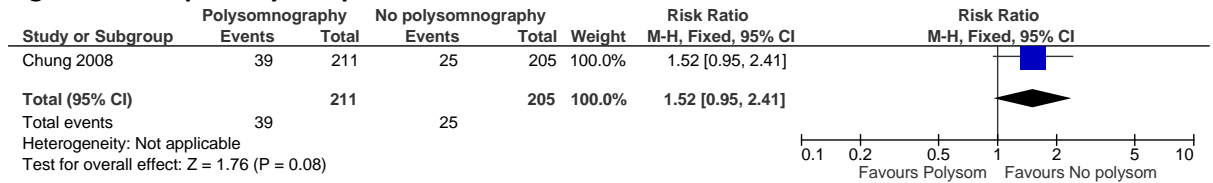


## J.4 Polysomnography

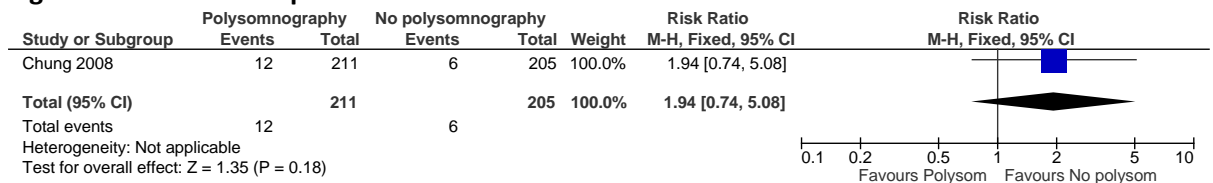
See Section 9.7.1 of the full guideline for evidence statements.

### J.4.1 Intervention evidence

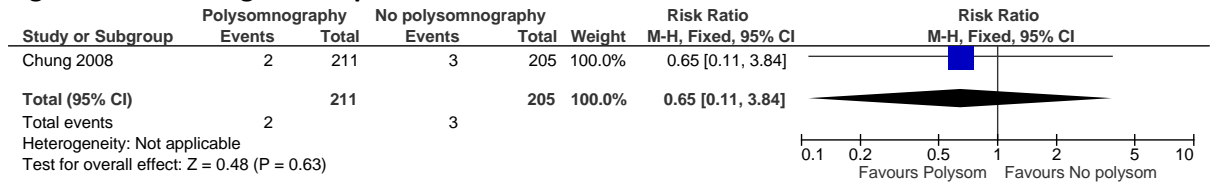
**Figure 54: Respiratory complications**



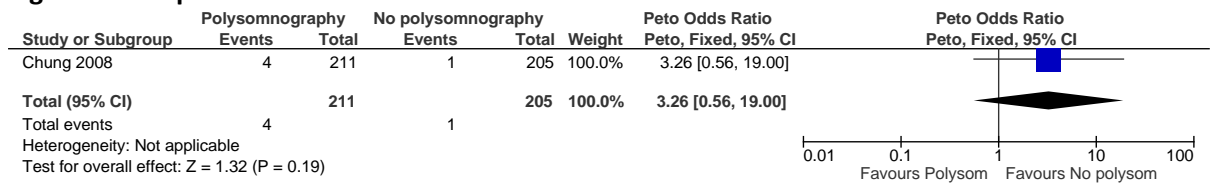
**Figure 55: Cardiac complications**



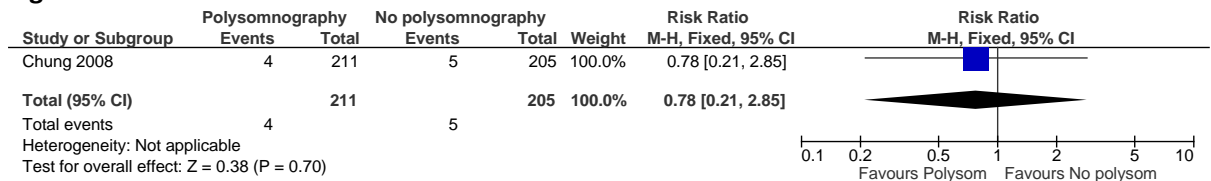
**Figure 56: Neurological complications**



**Figure 57: Unplanned ICU admission**

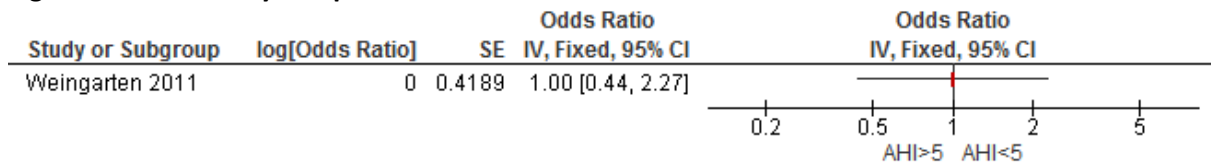


**Figure 58: Re-admission to ICU**

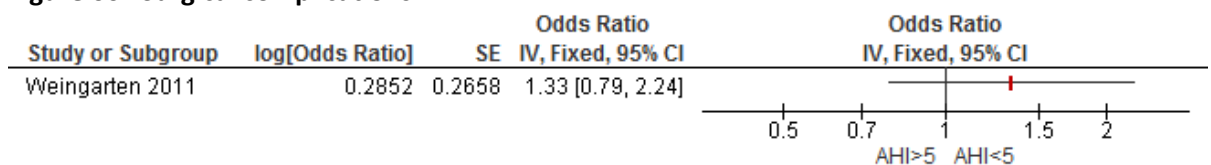


## J.4.2 Prognostic evidence

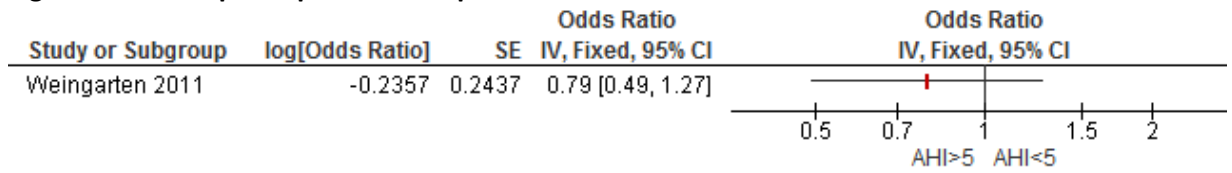
**Figure 59: Pulmonary complications**



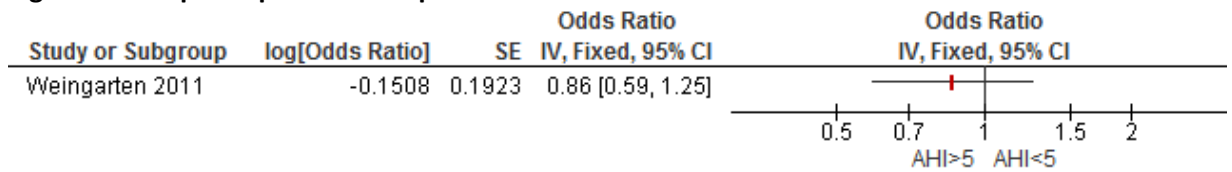
**Figure 60: Surgical complications**



**Figure 61: Other post-operative complications**



**Figure 62: All post-operative complications**



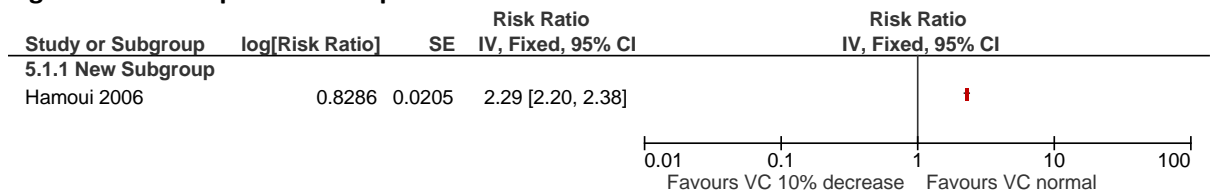
## J.5 Health technology assessment update

### J.5.1 Lung function tests

See Section 10.8.1 of the full guideline for evidence statements.

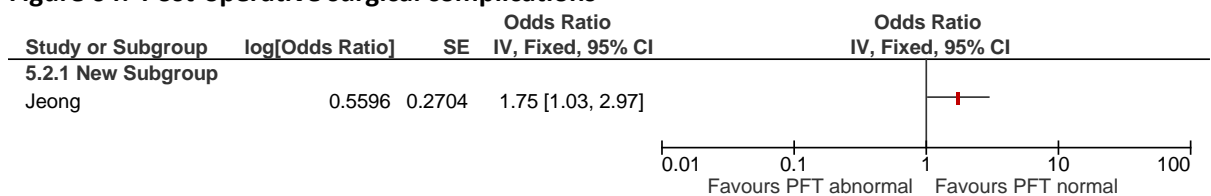
#### J.5.1.1 Bariatric surgery

**Figure 63: Post-operative complications**

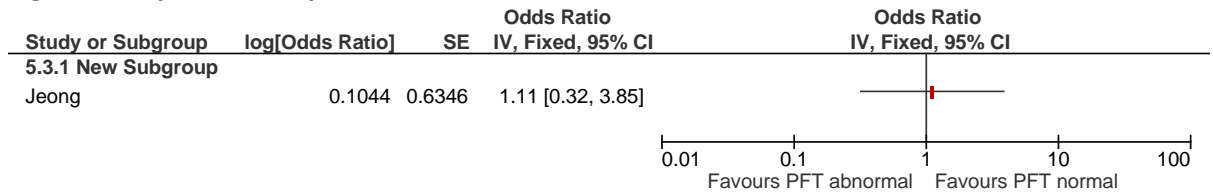


#### J.5.1.2 Cancer surgery

**Figure 64: Post-operative surgical complications**



**Figure 65: Systemic complication**

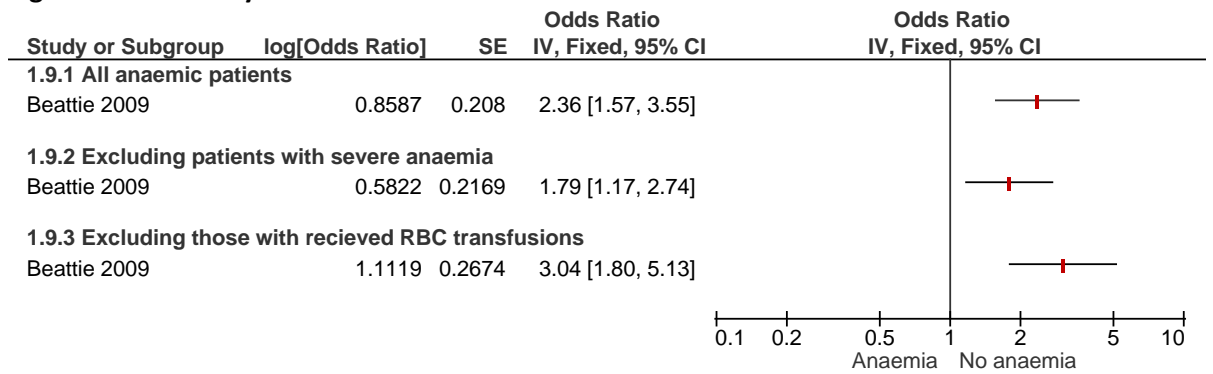


## J.5.2 Full blood count

See Section 11.8.1 of the full guideline for evidence statements.

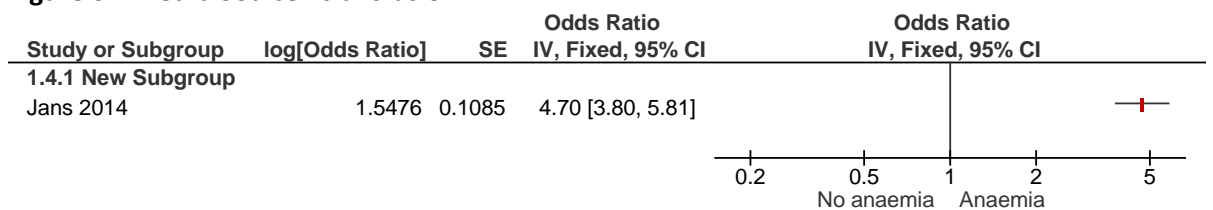
### J.5.2.1 All elective surgeries - anaemia

**Figure 66: Mortality**

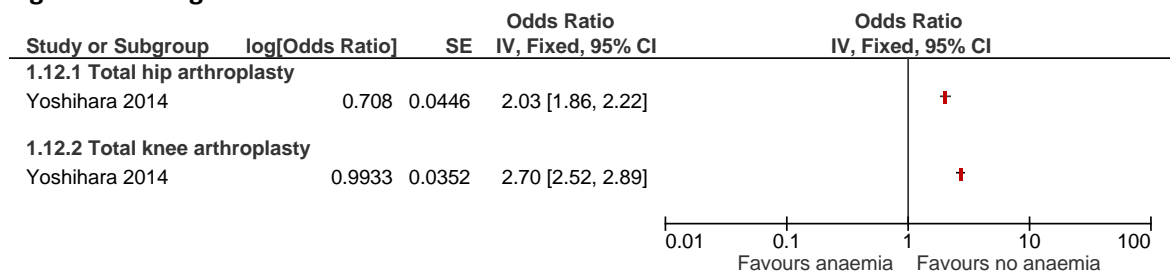


### J.5.2.2 Orthopaedic surgery – hip or knee arthroplasty

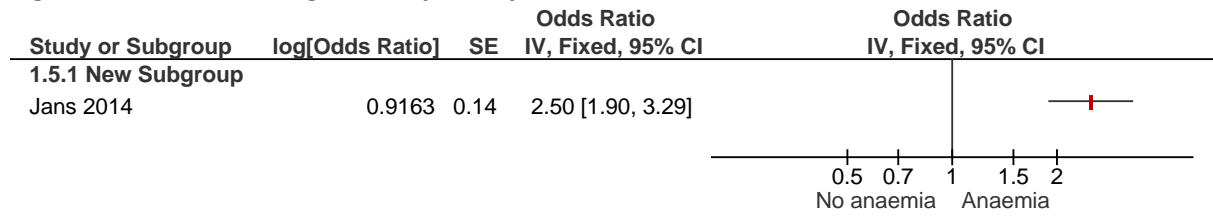
**Figure 67: Red blood cell transfusion**



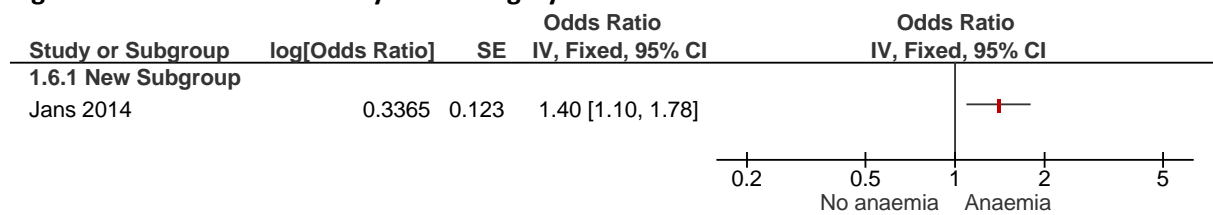
**Figure 68: Allogenic blood transfusion**



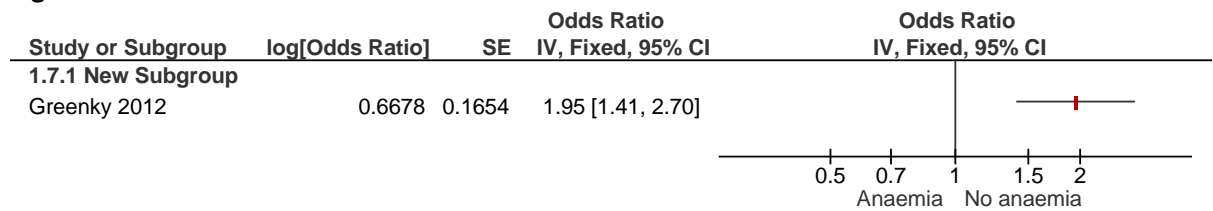
**Figure 69: Increased length of stay  $\geq 5$  days**



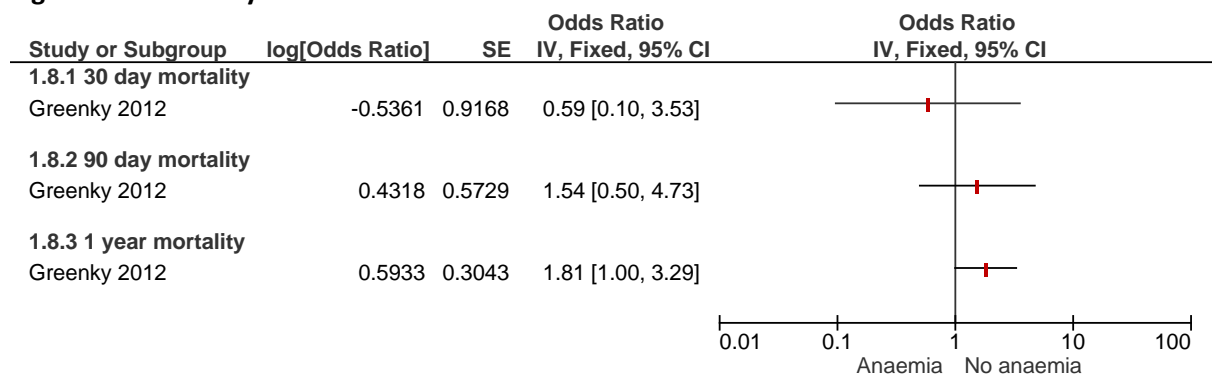
**Figure 70: Readmission 90 days after surgery**



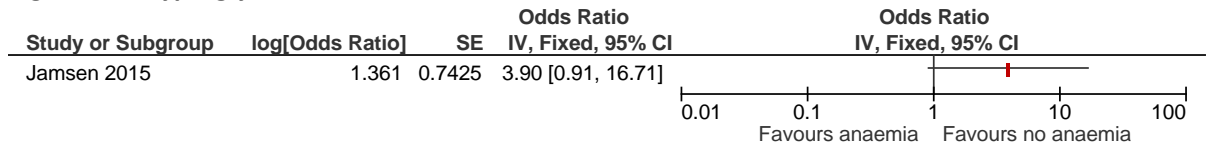
**Figure 71: Joint infection**



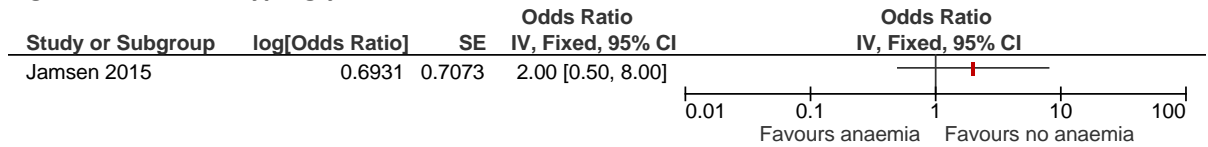
**Figure 72: Mortality**



**Figure 73: Hyperglycaemia**

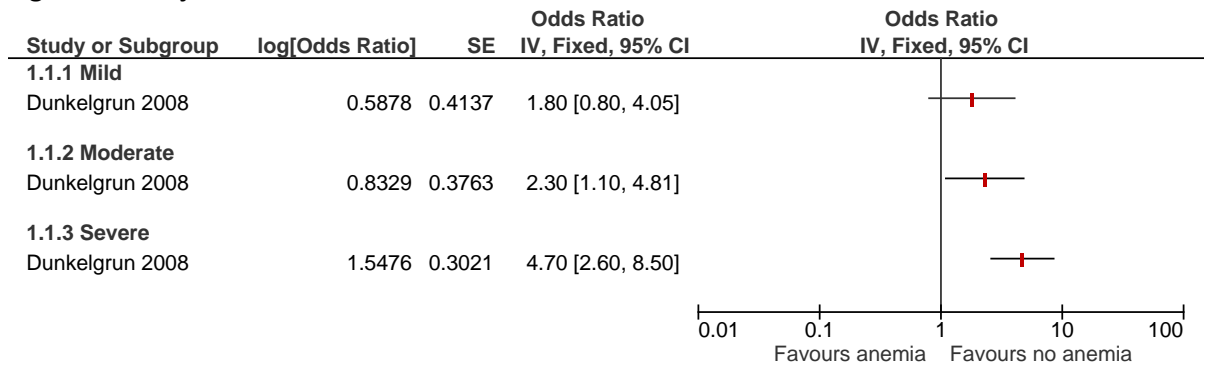


**Figure 74: Severe Hyperglycaemia**



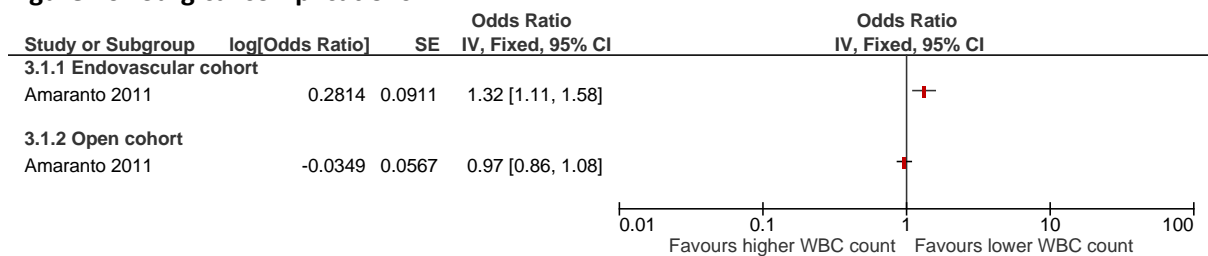
**J.5.2.3 Vascular surgery - anaemia**

**Figure 75: Major adverse cardiac event**

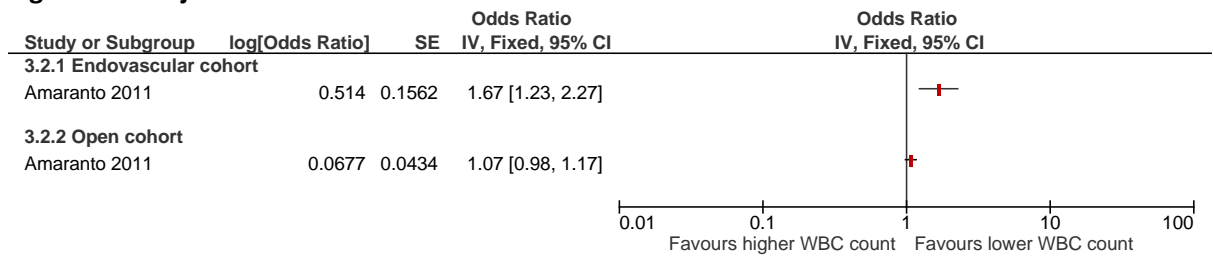


**J.5.2.4 Vascular surgery – white blood cell count**

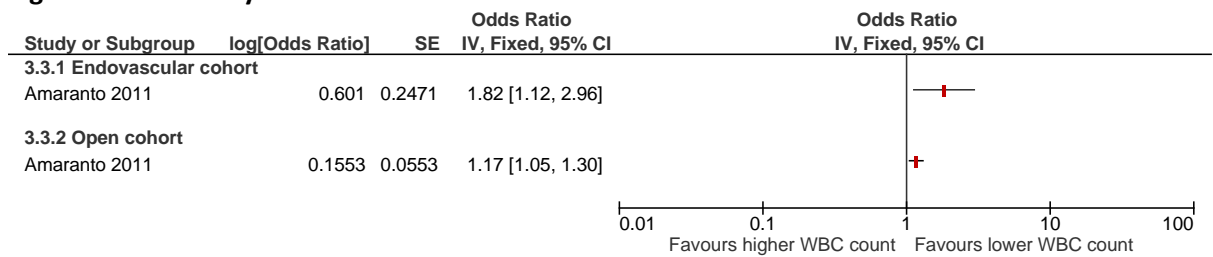
**Figure 76: Surgical complications**



**Figure 77: Major adverse events**

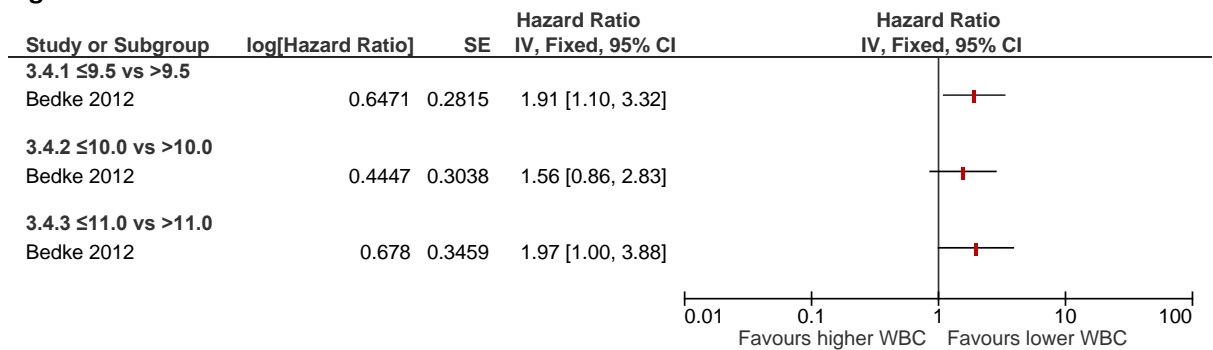


**Figure 78: Mortality**



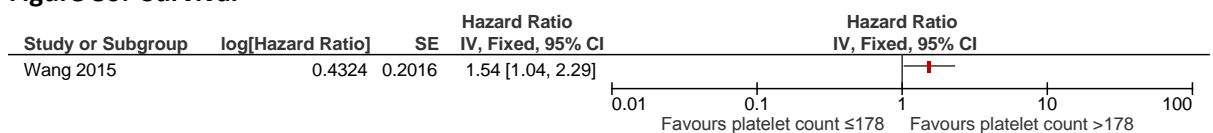
**J.5.2.5 Cancer surgery – White blood cell count**

**Figure 79: Survival**



**J.5.2.6 Cancer surgery – Platelet count**

**Figure 80: Survival**



J.5.2.7 Non-cardiac surgery - platelet count

Figure 81: Blood transfusion

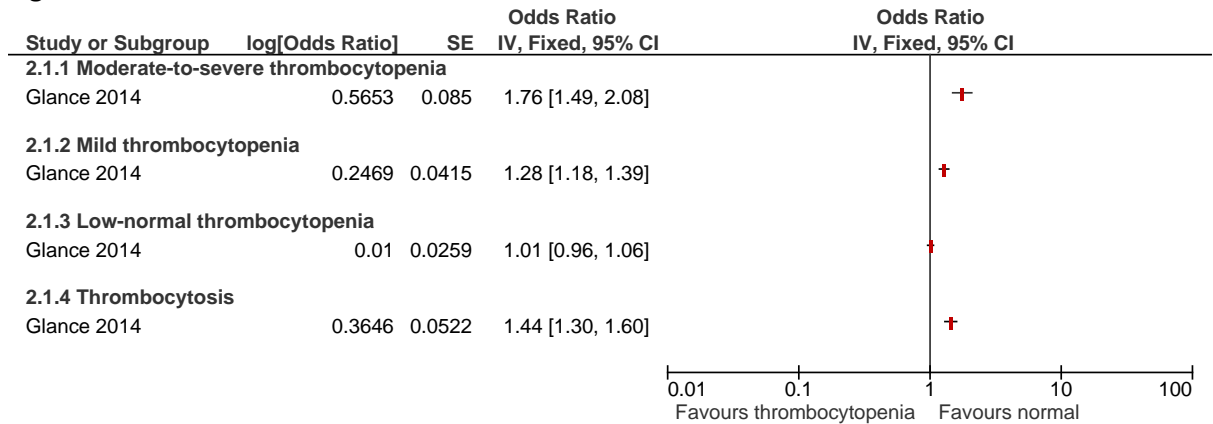


Figure 82: Mortality

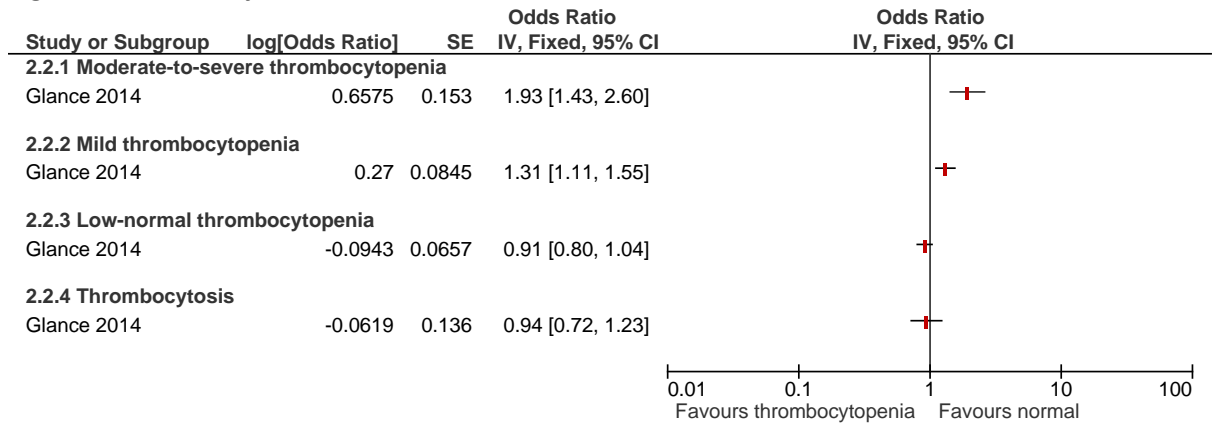
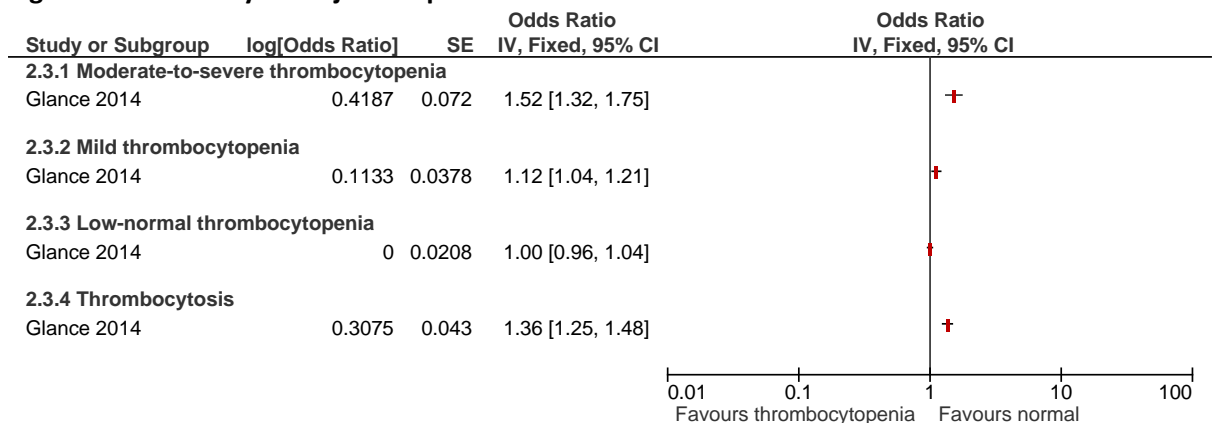
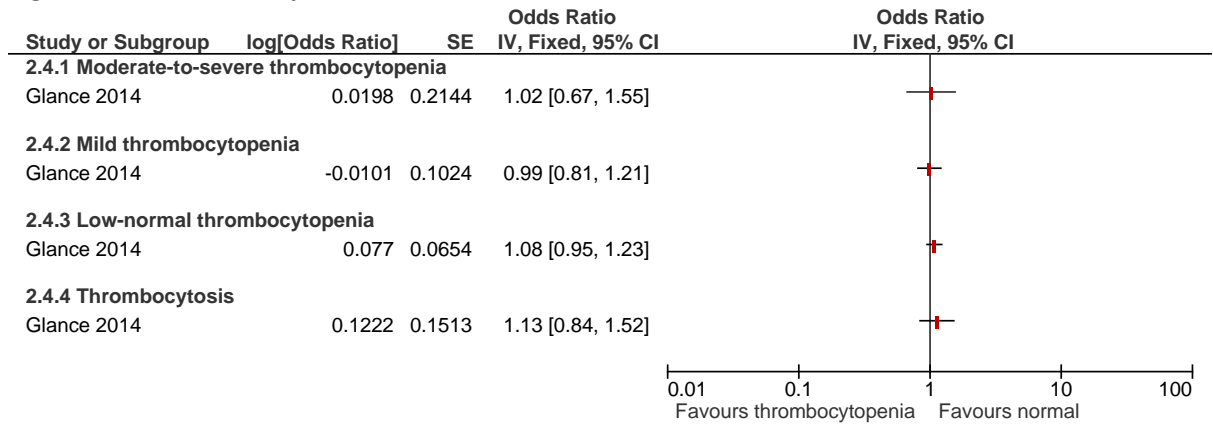


Figure 83: Mortality or major complication

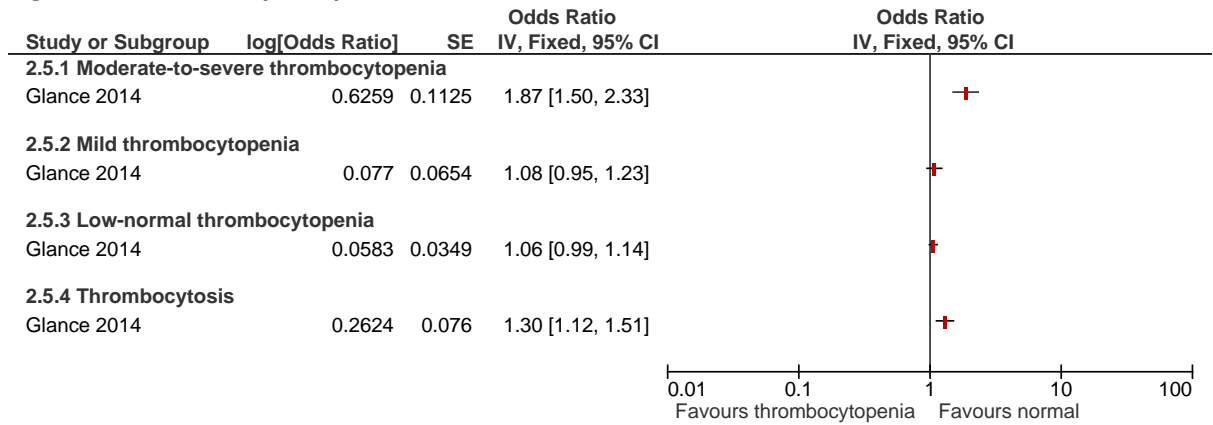




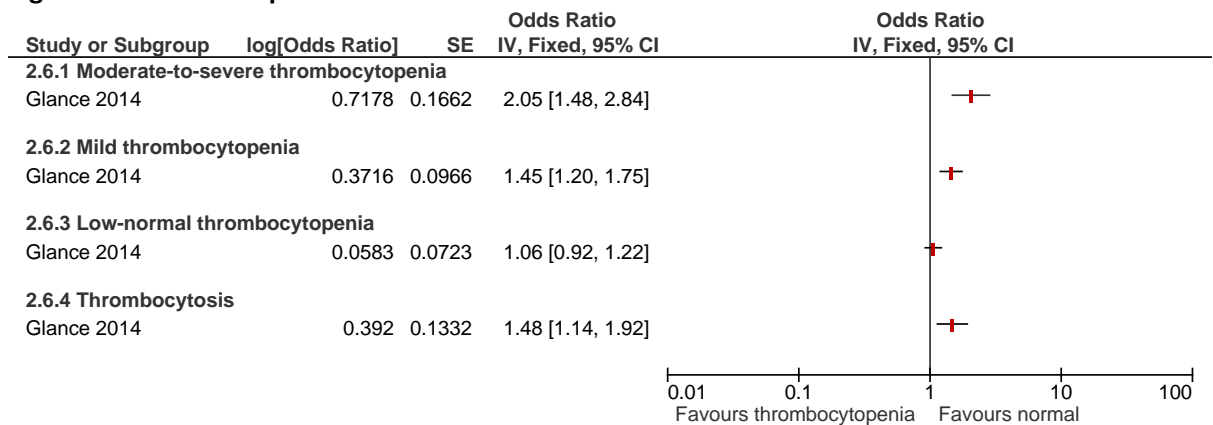
**Figure 84: Cardiac complication**



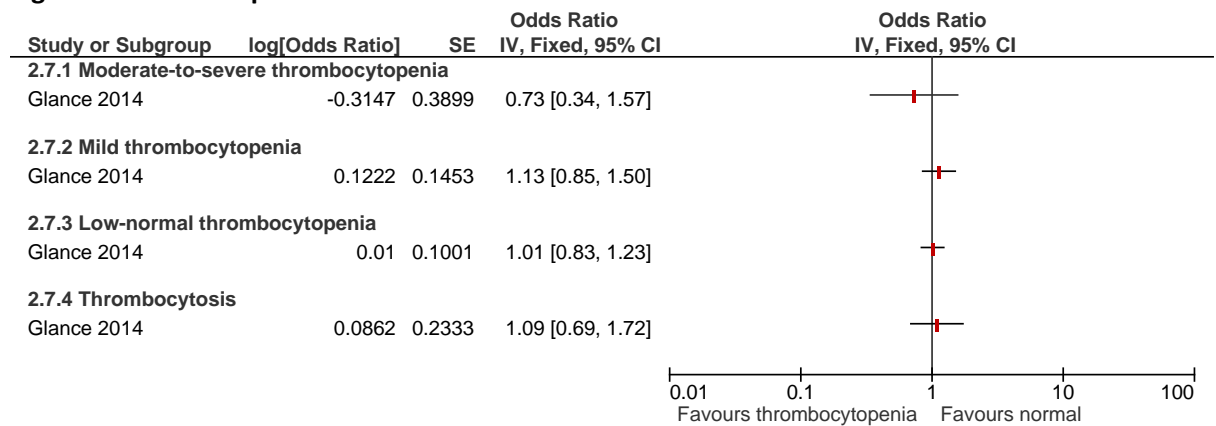
**Figure 85: Pulmonary complication**



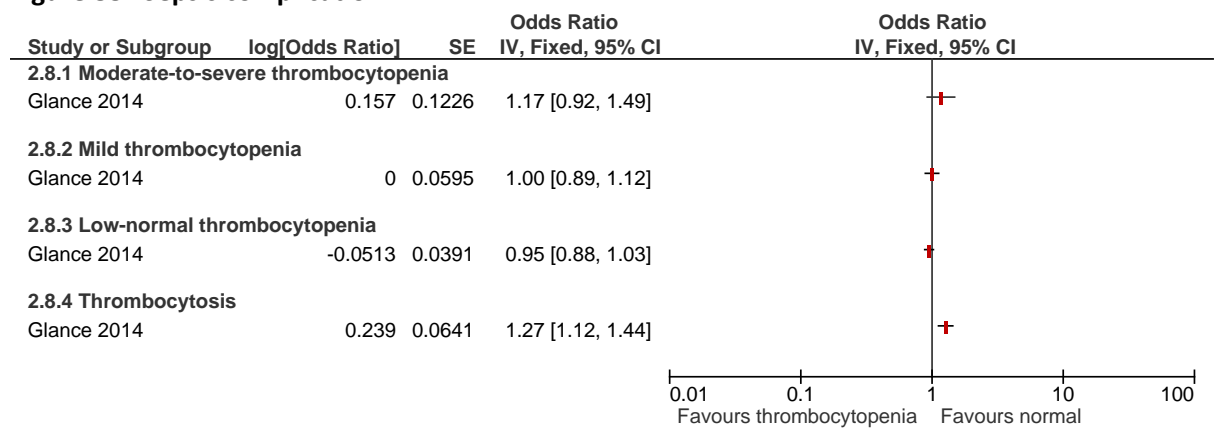
**Figure 86: Renal complication**



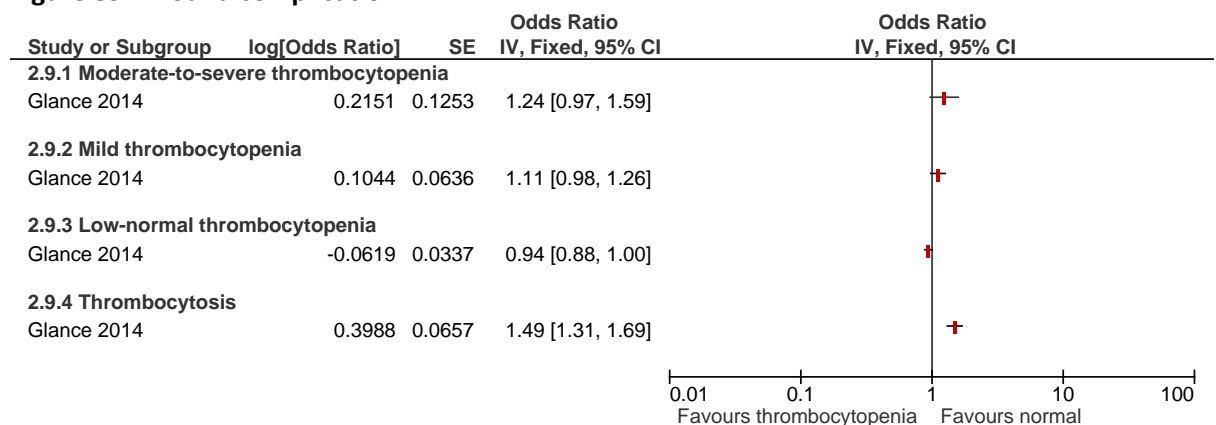
**Figure 87: CNS complication**



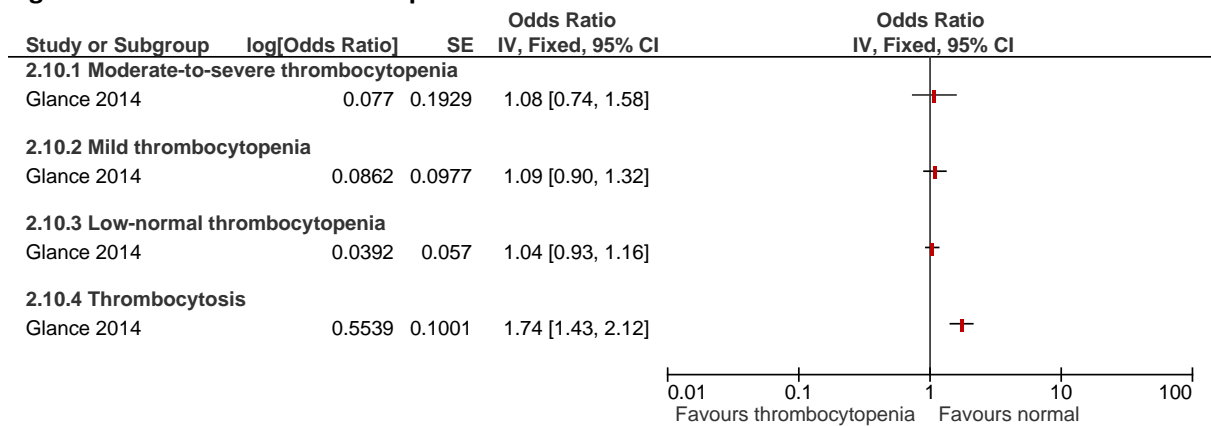
**Figure 88: Sepsis complication**



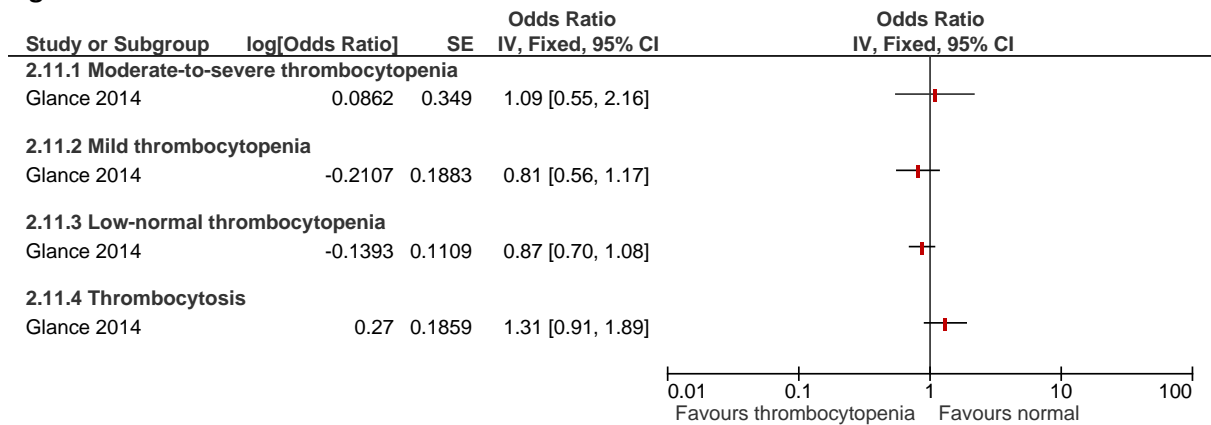
**Figure 89: Wound complication**



**Figure 90: Thromboembolic complication**



**Figure 91: Graft failure**

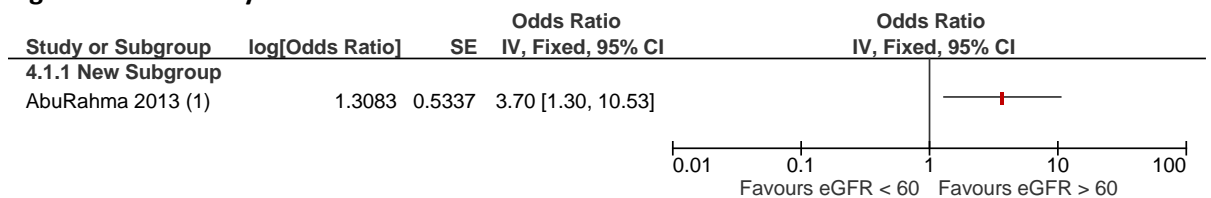


### J.5.3 Kidney function tests (urea and electrolytes)

See Section 12.8.1 of the full guideline for evidence statements.

#### J.5.3.1 Vascular surgery- eGFR

**Figure 92: Mortality or stroke**

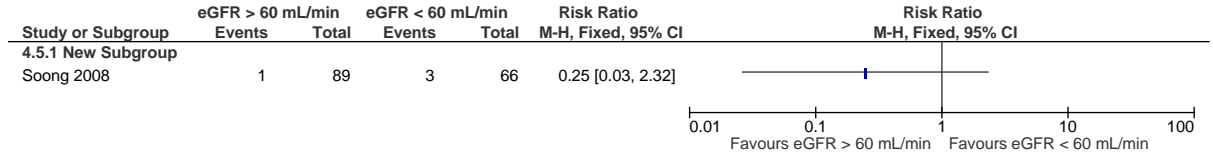


Footnotes

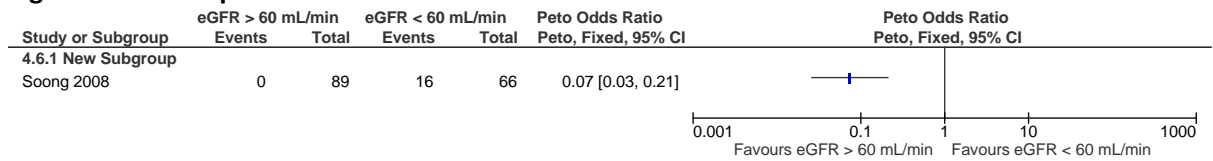
(1) eGFR value refers to a cut off of 60 ml/min/1.73m<sup>2</sup>

### J.5.3.2 Endovascular repair of abdominal aortic aneurysm- eGFR

**Figure 93: Perioperative mortality**

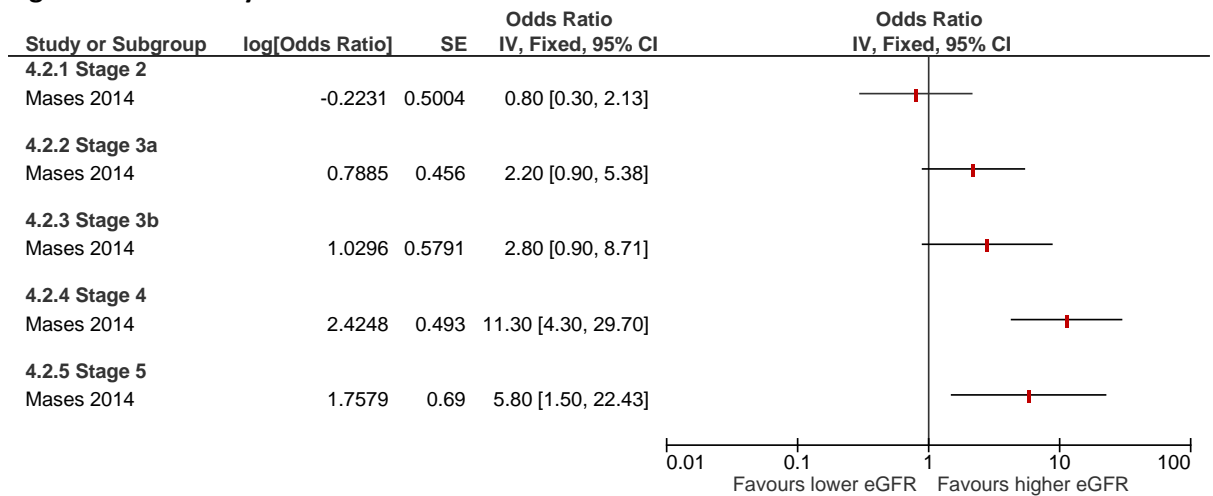


**Figure 94: Post-operative renal failure**

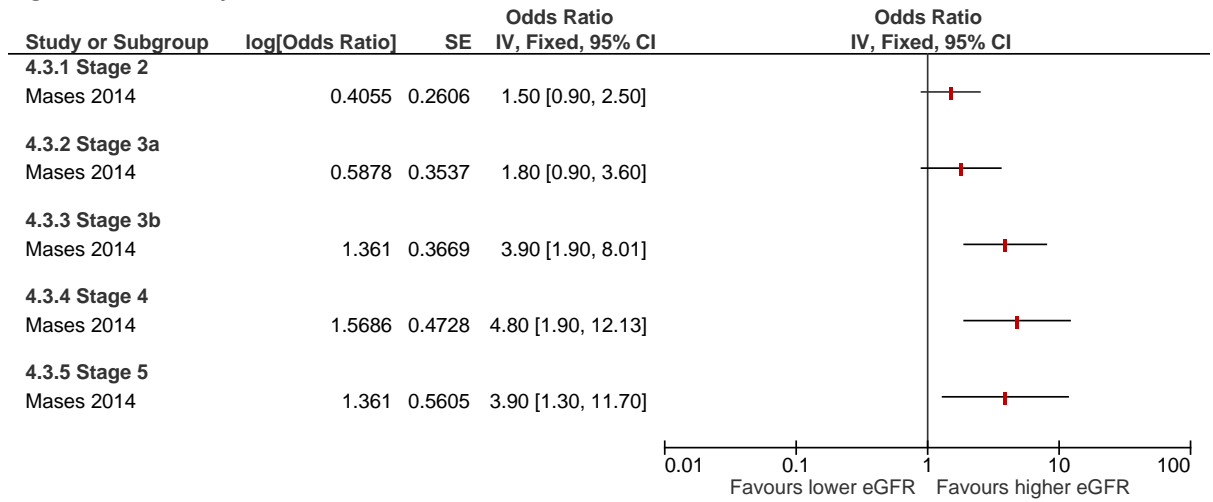


### J.5.3.3 Non-cardiac surgery -eGFR

**Figure 95: Mortality**



**Figure 96: Post-operative MACE**



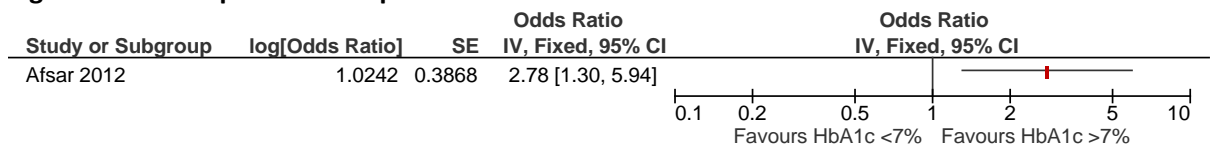
## J.6 Glycated haemoglobin test

### J.6.1 Diagnosed diabetes

See Section 14.1.7 of the full guideline for evidence statements.

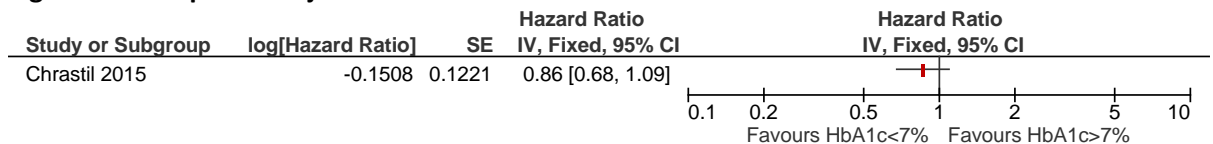
#### J.6.1.1 Primary arteriovenous fistula failure

**Figure 97: Post-operative complications**

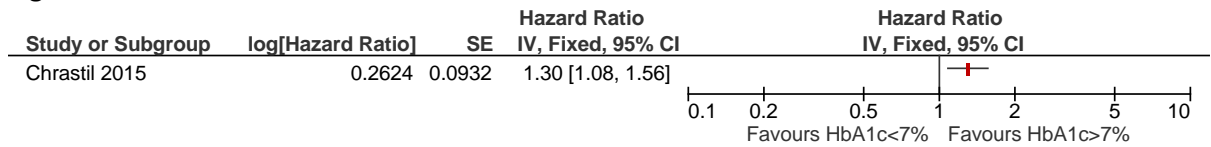


#### J.6.1.2 Hip/ joint arthroplasty

**Figure 98: Periprosthetic joint infection**

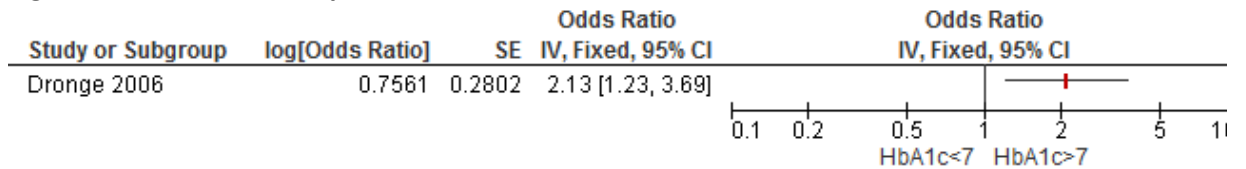


**Figure 99: Death**



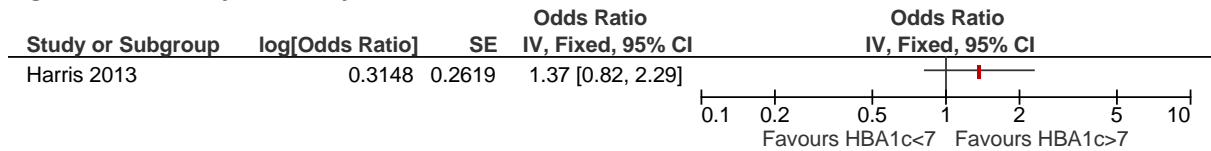
**J.6.1.3 Non-cardiac surgery**

**Figure 100: Infections complications**

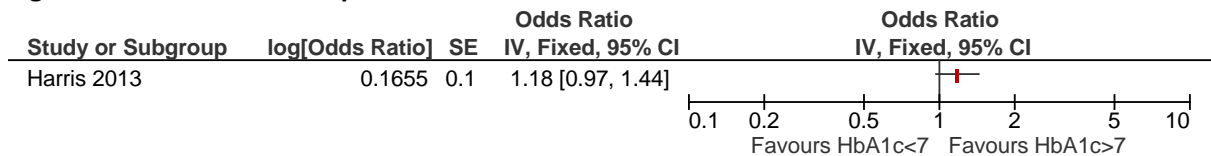


**J.6.1.4 Joint arthroplasty**

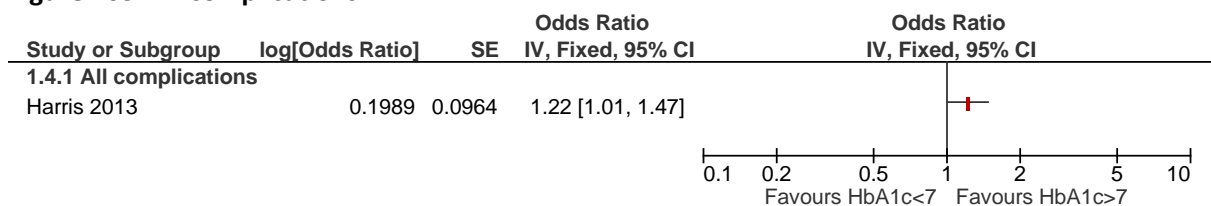
**Figure 101: 90-day mortality**



**Figure 102: Number of complications**



**Figure 103: All complications**

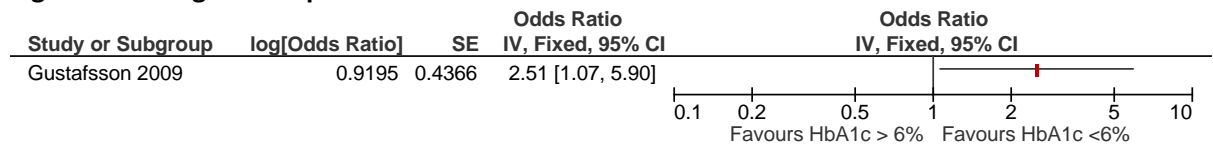


## J.6.2 Undiagnosed diabetes

See Section 14.2.6 of the full guideline for evidence statements.

### J.6.2.1 Colorectal surgery

**Figure 104: Surgical complications**



**Figure 105: Infection**

