# Routine preoperative tests for elective surgery

## NICE guideline: short version

## Draft for consultation, October 2015

**This guideline covers** the use of routine preoperative tests before elective surgery. The tests covered by this guideline are:

- Chest X-ray
- Echocardiography (resting)
- Electrocardiogram (ECG; resting)
- Full blood count (haemoglobin, white blood cell count and platelet count)
- Glycated haemoglobin (HbA1c) testing
- Haemostasis tests
- Kidney function (estimated glomerular filtration rate, electrolytes, potassium, sodium, creatinine and/or urea levels)
- Lung function tests and arterial blood gas analysis (spirometry, including peak expiratory flow rate, forced vital capacity and forced expiratory volume)
- Polysomnography
- Pregnancy testing
- Sickle cell disease/trait tests
- Urine tests.

The recommendations were developed in relation to the following comorbidities:

- Cardiovascular
- Diabetes
- Obesity

- Renal
- Respiratory.

**Who is it for?**

- Healthcare professionals involved in preoperative assessment
- GPs
- Adults and young people (over 16 years old) who are having minor, intermediate or major/complex elective surgery, and their families and carers.

Children, pregnant women and people having cardiovascular procedures or neurosurgery are excluded from the guideline because they need highly specialised management.

This version of the guideline contains the draft recommendations, context and recommendations for research. The Guideline Committee's discussion and the evidence reviews are in the full guideline

Other information about how the guideline was developed is on the project page This includes the scope, and details of the Committee and any declarations of interest.

This guideline will update and replace NICE guideline CG3 (published June 2003).

See Update information for a full explanation of what is being updated.

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# Contents

# Recommendations

People have the right to be involved in discussions and make informed decisions about their care, as described in Your care.

Making decisions using NICE guidelines also explains how we use words to show the strength of our recommendations, and has information about safeguarding and prescribing medicines (including 'off-label' use).

Guidance on consent for young people aged 16–17 is available from the reference guide to consent for examination or treatment (Department of Health, 2009).

The Guideline Committee noted the importance of providing information about preoperative tests to people having elective surgery. When offering tests before surgery, clinicians should give people information in line with recommendations on consent and capacity made in the NICE guideline on patient experience in adult NHS services.

## *Recommendations relevant for all people having routine preoperative tests*

### *1.1 Communicating test results*

1.1.1 Ensure any preoperative test results undertaken in primary care are included when referring people for surgery.

### *1.2 Chest X-ray*

1.2.1 Do not routinely offer chest X-rays before surgery.

### *1.3 Glycated haemoglobin testing for people without diabetes*

1.3.1 Do not offer glycated haemoglobin (HbA1c) testing before surgery to people without diabetes.

## *1.4 Glycated haemoglobin testing for people with diabetes*

1.4.1 People with diabetes who are being referred for surgery from primary care should have their most recent HbA1c test results included in their referral information.

1.4.2 Offer HbA1c testing to people with diabetes having surgery if they have not been tested in the last 3 months.

## *1.5 Pregnancy tests*

1.5.1 On the day of surgery, sensitively ask all women of childbearing potential whether there is any possibility they could be pregnant.

1.5.2 Make sure women who could possibly be pregnant are aware of the risks of the anaesthetic and the procedure to the fetus.

1.5.3 Carry out a pregnancy test with the woman's consent if there is any doubt about whether she could be pregnant.

1.5.4 Document all discussions with women about whether or not to carry out a pregnancy test.

1.5.5 Develop locally agreed protocols for checking pregnancy status before surgery.

- Make sure they are documented and audited and in line with statutory and professional guidance.

## *1.6 Sickle cell disease/trait tests*

1.6.1 Do not routinely offer testing for sickle cell disease or sickle cell trait before surgery.

1.6.2 Ask the person having surgery if they or any member of their family have sickle cell disease.

1.6.3 If the person is known to have sickle cell disease and has their disease managed by a specialist sickle cell service, liaise with this team before surgery.

## *1.7 Urine tests*

1.7.1 Do not routinely offer urine dipstick tests before surgery.

1.7.2 Consider microscopy and culture of midstream urine sample before surgery if the presence of a urinary tract infection would influence the decision to operate.

## *Recommendations specific to surgery grades*

The rest of the recommendations are organised by surgery grade (see box 1) and, where applicable, ASA grade (see box 2).

### Minor surgery

Do not offer the following tests to people having minor surgery:

- Electrocardiogram
- Full blood count
- Kidney function

Do not routinely offer the following tests to people having minor surgery:

- Echocardiography
- Lung function/arterial blood gas analysis
- Haemostasis

**Table 1 Intermediate surgery**

| | ASA grade and comorbidities | | | |
|---|---|---|---|---|
| **Test** | **ASA 1** | **ASA 2 (all comorbidities)** | **ASA 3 or ASA 4 with respiratory or obesity comorbidities** | **ASA 3 or ASA 4 with cardiovascular, renal or diabetes comorbidities** |
| **ECG** | No | Consider for people with cardiovascular, renal or diabetes comorbidities | Consider | Yes |
| **Echocardiogram** | Not routinely | Not routinely | Not routinely | Not routinely |
| **Full blood count** | No | No | No | Consider for people with cardiovascular/ renal disease if any symptoms not recently investigated |
| **Haemostasis** | Not routinely | Not routinely | Consider in people with chronic liver disease[1] | |
| **Kidney function** | No | Consider in people at risk of AKI[2] | Yes | Yes |
| **Lung function/arterial blood gas** | Not routinely | Not routinely | Consider referring people with known or suspected respiratory disease for a senior anaesthetist's opinion as soon as possible after assessment. | Not routinely |

AKI, acute kidney injury.
[1]If people on anticoagulants need modification of their therapy, monitor them at point of care.
[2]See recommendation 1.1.8 of the NICE guideline on acute kidney injury.

**Table 2 Major/complex surgery**

| | ASA grade and comorbidities | | | |
|---|---|---|---|---|
| **Test** | **ASA 1** | **ASA 2 (all comorbidities)** | **ASA 3 or ASA 4 with respiratory or obesity comorbidities** | **ASA 3 or ASA 4 with cardiovascular, renal or diabetes comorbidities** |
| **ECG** | Consider for people aged >65 if no ECG results available from past 12 months | Yes | Yes | Yes |
| **Echocardiogram** | Not routinely | Consider if the person has:<br>• a heart murmur and any cardiac symptom (including breathlessness, pre-syncope, syncope or chest pain) **or**<br>• signs or symptoms of heart failure<br>Before ordering the resting echocardiogram, carry out a resting electrocardiogram (ECG) and discuss the findings with an anaesthetist. | | |
| **Full blood count** | Yes | Yes | Yes | Yes |
| **Haemostasis** | Not routinely | Not routinely | Consider in people with chronic liver disease[1] | |
| **Kidney function** | Consider in people at risk of AKI[2] | Yes | Yes | Yes |
| **Lung function/ arterial blood gas** | Not routinely | Not routinely | Consider referring people with known or suspected respiratory disease for a senior anaesthetist's opinion as soon as possible after assessment. | Not routinely |

AKI, acute kidney injury.
[1]If people on anticoagulants need modification of their therapy, monitor them at point of care.
[2]See recommendation 1.1.8 of the NICE guideline on acute kidney injury

# Terms used in this guideline

| |
|---|
| [**Yes**] Offer the test<br>[**No**] Do not offer the test<br>**[Not routinely]** Do not routinely offer the test<br>[**Consider**] Consider the test (the value of carrying out the test may depend on specific patient characteristics) |

**Box 1 Surgery grades**

| **Surgery grades** | **Examples** |
|---|---|
| Minor | • excising skin lesion<br>• draining breast abscess |
| Intermediate | • primary repair of inguinal hernia<br>• excising varicose veins in the leg<br>• tonsillectomy or adenotonsillectomy<br>• knee arthroscopy |
| Major/complex | • total abdominal hysterectomy<br>• endoscopic resection of prostate<br>• lumbar discectomy<br>• thyroidectomy<br>• total joint replacement<br>• lung operations<br>• colonic resection<br>• radical neck dissection |

**Box 2 ASA grades**

The ASA (American Society of Anesthesiologists) Physical Status Classification System is a simple scale describing fitness to undergo an anaesthetic. The ASA states that it does not endorse any elaboration of these definitions. However, anaesthetists in the UK often qualify (or interpret) these grades as relating to functional capacity – that is, comorbidity that does not (ASA 2) or that does (ASA 3) limit a person's activity.

| | |
|---|---|
| ASA 1 | Normal healthy person (that is, without clinically important comorbidity and without clinically significant past/present medical history) |
| ASA 2 | A person with mild systemic disease |
| ASA 3 | A person with severe systemic disease |
| ASA 4 | A person with severe systemic disease that is a constant threat to life |

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|---|
| To find out what NICE has said on topics related to this guideline, see our web page on surgical care. |

# Context

In 2003, NICE issued guidance on the use of routine preoperative tests for people having elective surgery (NICE clinical guideline 3, 2003). Many apparently healthy people are tested before surgery to check for undetected conditions that might affect their treatment. This can provide a benefit where test results yield additional information that cannot be obtained from a patient history and physical examination alone. However, excessive preoperative testing can cause significant anxiety, delays in treatment and unnecessary, costly and possibly harmful treatments when false positive results are obtained. Even genuinely abnormal results often do not result in any significant change in perioperative management in relatively healthy people.

Since 2003 there has been a reduction in the ordering of routine tests for young, healthy people having minor surgery (What is the value of routinely testing full blood count, electrolytes and urea, and pulmonary function tests before elective surgery in patients with no apparent clinical indication and in

subgroups of patients with common comorbidities: a systematic review of the clinical and cost-effective literature, HTA 2012). However, there remains a concern that some unnecessary tests continue to be requested. According to Hospital Episode Statistics 2012-13 (Health and Social Care Information Centre) the NHS in England completed 10.6 million operations compared to 6.61 million in 2002/2003 (Hospital Episode Statistics 2002-03, HSCIC), an increase of 60%. Therefore even a small percentage of unnecessary preoperative testing can affect a large number of people.

Over the past 12 years preoperative assessment has changed radically. Most people are now seen well in advance of surgery in a preoperative assessment clinic, where a structured history and targeted examination are performed by experienced nursing staff. Some preoperative tests have been abandoned in favour of others (for example random blood glucose in favour of glycated haemoglobin), while new tests have been developed that are increasingly being used in some people having elective surgery (for example non-invasive cardiac stress tests, cardiopulmonary exercise test and polysomnography).

# Recommendations for research

The Guideline Committee has made the following recommendations for research.

## *1 Polysomnography*

a) Does preoperative screening of people who are at risk of obstructive sleep apnoea (OSA) with polysomnography identify those at higher risk of postoperative complications?

b) Does treating OSA perioperatively improve outcomes?

**Why this is important**

OSA is a common condition, particularly in people who are obese, and is associated with adverse postoperative outcomes. However, it is frequently undiagnosed before surgery. Work is ongoing to examine whether OSA is associated with a variety of postoperative outcomes (morbidity, mortality,

quality of life) in specific surgical populations. However, there is currently no robust evidence or ongoing trials studying whether preoperative assessment and diagnosis of OSA leads to preoperative intervention or improved postoperative outcomes.

### *2 Glycated haemoglobin testing*

Does optimisation of glycated haemoglobin (HbA1c) in people with poorly controlled diabetes improve surgical outcomes?

**Why this is important**

Diabetes is the most common metabolic disorder in the UK and people with diabetes are increasingly needing surgical procedures. Diabetes leads to increased morbidity, length of stay and in-patient costs. Evidence suggests that doctors often fail to identify high-risk patients before surgery and do not provide perioperative interventions to control HbA1c levels. However, the impact of optimising HbA1c levels before surgery has not been assessed in a randomised clinical trial.

## Update information

This guideline is an update of NICE guideline CG3 (published June 2003) and will replace it.

New recommendations and a research recommendation have been added for the following tests that were not included in the original guideline:

- Echocardiography (resting)
- Polysomnography
- HbA1c testing

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