



# AAGBI SAFETY GUIDELINE

Pre-operative Assessment and Patient Preparation

The Role of the Anaesthetist

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Published by  
The Association of Anaesthetists of Great Britain and Ireland  
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January 2010

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**This guideline has been seen and approved by the Council of the AAGBI.**

The working party is grateful to Dr Helgi Johannsson for his contribution to this guideline.

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To be reviewed by 2015.

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# 1. Recommendations

This guidance has been designed to help anaesthetists provide high quality pre-operative assessment services and patient preparation before surgery. In addition it defines the roles and responsibilities of anaesthetists both after planned and after unplanned admissions.

Anaesthetists should assume a central role in the organisation of pre-operative services that encompass much more than preparing the delivery of anaesthesia.

The anaesthetist has the skills necessary to assess, optimise and estimate risk and support patients deciding whether to proceed with surgery and anaesthesia.

Pre-operative anaesthetic assessment should minimise risk for all patients as well as identify patients at particularly high risk. The pre-operative anaesthetic clinic should co-operate with primary care to achieve these aims.

Skilled nurse practitioners are safe and cost-effective in preparing patients for anaesthesia and should work closely with anaesthetists with a special interest in pre-operative assessment and preparation.

After scheduled admissions, anaesthetists must confirm that patients have been prepared adequately by pre-operative services so that anaesthesia and surgery can proceed safely.

Tests performed before surgery should be limited to those recommended by national and local guidelines and protocols.

Most anaesthetic departments should plan for one consultant whole-time equivalent to run and manage daily high-risk clinics with appropriate secretarial support.

Anaesthetic departments must establish clear pathways of care for unplanned admissions with surgeons, emergency departments, critical care and theatre personnel.

Special considerations must be given to children and young people undergoing anaesthesia and surgery.

Operating sessions and the individual anaesthetist's job plan must be arranged to allow time for the anaesthetist responsible for an individual's care to visit him/her pre-operatively at an appropriate time before surgery.

In all but exceptional circumstances this should take place in a designated reception area, dedicated clinic room or in the ward ensuring privacy and respecting patients' dignity, and not in the anaesthetic room.

Clinical Directors for anaesthesia and theatres should work with appropriate managers to establish comprehensive and integrated pre-operative assessment facilities and ensure that there is a lead anaesthetist for pre-operative assessment.

## 2. Introduction

Preparing a patient for anaesthesia requires an understanding of the patient's pre-operative status, the nature of the surgery and the anaesthetic techniques required for surgery, as well as the risks that a particular patient may face during this time.

Anaesthetists are in the unique position that they can offer all of these skills, and the ultimate responsibility for pre-operative anaesthetic assessment lies with the anaesthetist. Therefore, anaesthetists should take the lead in organising pre-operative anaesthetic services.

Patients often have comorbidities that require careful assessment and co-ordination. Preparation for surgery may take weeks to achieve, and could therefore potentially cause delay and cancellation of surgery if not done adequately.

Pre-operative anaesthetic assessment services decrease cancellations on the day of surgery, improve the patient's experience of their hospital admission, and may reduce complication rates and mortality. The pre-operative visit may relieve anxiety and answer questions about both the anaesthetic and surgical processes [1].

Effective communication and a team approach are vital in the pre-operative period. Complications and malpractice lawsuits are often attributable to poor preparation and failures in communication [2]. Essential team members include anaesthetists, surgeons, physicians and general practitioners. Specialist anaesthetic pre-operative assessment nurses have been shown to be safe and effective at pre-operative screening and should be an integral part of the team [3].

The lead anaesthetist for pre-operative assessment and evaluation should be given the responsibility to:

- Agree and co-ordinate policies and procedures with surgical and anaesthetic departments.
- Liaise with the lead pre-operative assessment nurse to establish a comprehensive service with appropriate input from anaesthetists.
- Ensure with the lead pre-operative assessment nurse that the pre-operative service nurses receive adequate education and training to deliver this service safely.
- Ensure that the design of the service delivers a maximum of 18 weeks referral to treatment time (RTT) or less if locally agreed.
- Ensure that Foundation and Speciality Doctors are able to acquire the knowledge and competencies required to assess and prepare a patient for surgery.

Due consideration should be given to vulnerable groups of patients, (e.g. patients with learning disabilities or severe physical handicap) who may require a greater degree of support from family, carers and healthcare personnel.

### 3. Before planned admission

Pre-operative services should:

- Ensure every patient\* is fully informed about their proposed procedure and the interventions that will need to be undertaken.
- Estimate the level of risk for every patient.
- Ensure every patient\* understands their own individual risk so that they can make an informed decision about whether to proceed to surgery.
- Identify co-existing medical illnesses and optimally prepare patients whilst taking into account the urgency of the operation.
- Identify patients with a high risk of complications in the peri-operative period and define the appropriate post-operative level of care (day stay, inpatient, ward, HDU, critical care).
- Plan discharge.

The visit to the pre-operative clinic also gives the patients an opportunity to discuss the choices of anaesthetic technique, methods for pain relief and the risks, in a calmer atmosphere than immediately before the operation.

Senior anaesthetists with a special interest in pre-operative assessment are ideally suited to this role.

There are several models available for the pre-operative anaesthetic assessment clinic, most of which rely both on anaesthetists and specialist nurses. All hospitals should aim to provide appropriately staffed clinics. The number of clinics required will depend on the size and throughput of the individual trust.

\* This assumes that all patients have the capacity to take in the information provided and make an autonomous decision. For those who do not, attempts must be made to provide *appropriate* information and readers are referred to other guidance on consent issued by the AAGBI and GMC.



## Pre-operative systems and communication

Recognising that at least 80% of patients could be treated as day cases (<24-h stay), The Modernisation Agency High Impact change No 1 states that day surgery (rather than inpatient surgery) should be the norm for elective surgery. Booking of patient as inpatients should therefore be the exception rather than the rule.

A well-designed peri-operative service will decrease the instances of failure to proceed to surgery due to communication or administration errors [4].

Electronic systems can greatly help with decision-making, communication and analysis, and can prevent errors. They can contribute to national data collection, audit and research.

Telephone and web-based assessment can form part of a successful pre-operative service.

## Pre-operative primary care

Primary care can help optimise patients' fitness before surgery by offering advice on smoking cessation, exercise and weight reduction, and by optimising treatment of chronic conditions such as diabetes and anaemia (female <12 g.dl<sup>-1</sup>, male <13 g.dl<sup>-1</sup>). This may help increase survival, decrease peri-operative morbidity and shorten the duration of hospital admission.

General practitioners (GPs) can help advise patients on which drugs to continue or discontinue peri-operatively in liaison with the pre-operative anaesthetic clinic.

Anaesthetist-led pre-operative services should therefore form working partnerships with GP practices. This could take the form of accessing smoking cessation clinics, dietary advice and exercise regimens.

Pathologies that predictably progress from medical to surgical treatment, such as aortic aneurysmal disease and osteoarthritis, would be particularly suitable for early attempts at optimising health.

Shortened waits between GP referral and surgery have decreased the time in which to prepare patients for surgery. Surgical investigation and pre-operative preparation should therefore take place in parallel. Early referral by primary care and surgical teams for pre-operative management will increase efficiency.

## **Nurse-led pre-operative assessment**

Pre-operative anaesthetic assessment is an extended role for nurses that has been shown to be safe and cost effective [3-5]. These nurses usually work as an integral part of the pre-operative team and are a very important link between the patient and the entire peri-operative team. Physician Assistants (Anaesthetics) – PA(A) – may also have a role to play.

Nurses should work closely with the anaesthetists involved in the service and have good communication skills and links with the rest of the hospital.

Their purpose is to contribute to the pre-operative preparation of all patients, to identify patients with a high peri-operative risk, to institute investigations and to refer to the anaesthetist, as well as to assess patients for suitability for day surgery. In addition, they will implement the various pre-operative protocols, including fasting and administration of regular medication, and are able to answer many of the patient's questions about their anaesthetic. Current fasting guidelines are given in Appendix 1.

Protocols should empower the nurses to refer patients to relevant services such as echocardiography when there is a

history of a heart murmur, or pulmonary function tests for chest disease. These protocols should be written by senior anaesthetic staff and should be regularly reviewed and updated.

In-clinic spirometry is useful and easy to perform, and may decrease the number of patients referred for formal pulmonary function tests.

Pre-operative assessment nurses should co-operate closely with primary care services, particularly when administration of specific medication is required, such as subcutaneous anticoagulation or optimisation of diabetic treatment.

Liaison with secondary care diabetes teams and medical outreach teams can be particularly helpful and may prevent unnecessarily long stays in hospitals, both pre- and post-operatively.

It is important that pre-operative assessment nurses have readily available communication channels with pre-operative assessment anaesthetists; they should be able to discuss specific cases and receive feedback from the anaesthetist.

## **The anaesthetist in the pre-operative assessment clinic**

Senior anaesthetists with a specialist interest in pre-operative assessment and optimisation should staff pre-operative assessment clinics with the number of sessions needed being dependent on the throughput of the hospital and its casemix.

These anaesthetists should see all patients who are potentially at high risk, make an assessment of the risks and benefits of surgery and ensure that patients:

- Are confident that they want surgery.

- Have balanced the pros and cons of different surgical and non-surgical alternatives.
- Are receiving optimum treatment if they have significant medical co-morbidities.
- Have had their risks assessed with regard to mortality and common morbidities.
- Have been informed of these risks and had the opportunity to discuss them.
- Have been informed how to reduce their risks pre-operatively.
- Have been given the opportunity and time to reduce their risks.

The pre-operative assessment anaesthetist therefore needs to be skilled at assessing and managing these risks, and in communicating them both to the patient and to the treating surgeon [6].

Consultant-to-consultant communication between anaesthetists, surgeons and critical care physicians is essential, particularly when the patient is high-risk and the benefits of surgery may be outweighed by the risks to the patient. Pre-operative anaesthetists should be able to accept referrals from all appropriate staff, including GPs, surgeons, pre-operative nurses and specialist screening clinics.

Multidisciplinary meetings should help anaesthetic consultants identify and manage high-risk cases, particularly when major surgery is planned.

## **Estimating and managing peri-operative risk**

Survival and risk in many populations is predictable. Risk prediction can be used to guide the patient's pre-operative care and determine whether the patient needs to see an anaesthetist in the pre-operative assessment clinic.

Anaesthetic, critical care and surgical departments should discuss risk thresholds for:

- Referral by a pre-operative assessment nurse to an anaesthetist.
- Pre-operative exercise and drug prescriptions.
- Multidisciplinary team meetings.
- Invasive intra-operative monitoring.
- Post-operative critical care admission and outreach observation.

These thresholds can be used as markers to help hospitals determine the level of resources they need to invest to provide their catchment patient population with adequate pre-operative services.

A combination of nine variables provide independent prognostic information:

- i. Age
- ii. Sex
- iii. Socioeconomic status [7]
- iv. Aerobic fitness [8-10]
- v. Diagnosed ischaemic heart disease (myocardial infarction and angina)
- vi. Diagnosed heart failure
- vii. Diagnosed ischaemic brain disease (stroke and transient ischaemic attacks)
- viii. Diagnosed kidney failure [11]
- ix. Diagnosed peripheral arterial disease

Pre-operative and post-operative risks of mortality and morbidity can be estimated with these variables when adjusted for surgical disease and surgical procedures respectively (see Appendix 2).

Aerobic fitness when measured objectively is an important

tool for survival prediction in addition to traditional risk factors such as hypertension, hypercholesterolaemia, smoking, chronic obstructive pulmonary disease (COPD) and diabetes [8-10].

In the pre-operative assessment clinic, aerobic fitness can be estimated with the incremental shuttle walk test or more precisely quantified with cardiopulmonary exercise testing (CPX/CPET), which can also diagnose whether aerobic performance is limited by pulmonary, cardiac or peripheral disease, and may be a good screening test for ischaemic heart disease [12].

## **Resources and funding**

Setting up pre-operative services where none exist requires a substantial time commitment in order to put in place the infrastructure, to recruit staff and to oversee the organisation, administration and processes at all levels. This may well require in the region of 5-10 programmed activities per week but this may vary with the caseload and casemix of the organisation, and will require the appropriate level of administrative support.

A time commitment is necessary for the lead anaesthetist adequately to manage the pre-operative service. This role includes liaison with surgeons, clinicians in other specialties, doctors in training, primary care, other anaesthetists, theatres and critical care.

The proportion of patients who would benefit from consultant pre-operative assessment depends on the type of surgery undertaken at the hospital, the age and socioeconomic status of the population and the size of catchment area. Currently, an average district general hospital might expect to commit 7.5 programmed consultant activities per week to provide one anaesthetist-led clinic per day (five clinics per week). The pre-operative assessment clinic provides valuable opportunities for teaching – of both undergraduate and

postgraduate personnel. This may necessitate increased clinic resources with regard to both the time taken and the space for trainees and students to see patients.

Cardiopulmonary exercise testing, when undertaken by trained personnel, takes about 30 minutes to perform and a similar time to discuss the results with the patient. A specialist anaesthetist working with a technician should be able to assess between four and seven patients in a programmed clinical activity.

## 4. After planned admission

*Anaesthetists are central to ensuring the safety of patients in the peri-operative period.*

Operating sessions must be planned to allow time for the anaesthetist responsible for an individual's care to visit him/her pre-operatively. This should take place before arrival in the anaesthetic room in all but exceptional circumstances.

It is the responsibility of the individual anaesthetist giving the anaesthetic to ensure that the pre-operative assessment is adequate and that the patient has sufficient information to make a reasoned decision. It is the responsibility of the Trust to ensure that sufficient time is made available for this, as a matter of routine and without undue pressure. Pre-operative anaesthetic assessment is an integral part of the surgical process, and must be included in the estimates of time required for the operating list.

The pre-operative assessment process should have identified and addressed problems with individual patients, and provided the patient with appropriate information on the probable peri-operative course. This should allow the pre-operative visit to focus on the individual patient's needs and concerns.

As a part of the pre-operative visit the anaesthetist should:

- Establish a rapport with the patient and when relevant the patient's family.
- Determine the adequacy of pre-operative assessment and preparation, including arrangements for intra-operative and postoperative care.
- Confirm the plan and discuss anaesthetic and postoperative care, including premedication, mode of anaesthesia, analgesia and anti-emetics.



- Ensure the patient is aware of any risks particular to that patient or associated with specific anaesthetic procedures.
- Ensure the patient understands the nature of the operation and is happy to proceed (N.B. see footnote on page 7).
- Confirm the availability of HDU or intensive care unit beds if appropriate, before proceeding.

Anaesthetists in training and non-consultant grades should discuss high-risk patients with consultant colleagues. The consultant contacted should ensure that the patient is cared for by an anaesthetist with the expertise required for that particular situation. Failure of the pre-operative service to match personnel to the need of the patient may result in surgery being postponed until the necessary expertise is available.

Cancellations have a negative impact on patients, families and clinical services. Where possible, department protocols should be adhered to and cancellations for idiosyncratic reasons discouraged.

Occasionally, anaesthetists will cancel surgery in patients who have been assessed and prepared by another senior anaesthetist. Anaesthetists should alert their colleagues if there is a failure in following protocol or when the protocol has been ineffective. Differences of opinion should be discussed within a department with the aim of avoiding future cancellations, and protocols modified accordingly.

If surgery is cancelled the anaesthetist should:

- Explain the reasons for cancellation and ensure that the patient and his/her family understand what will happen next.
- Explain the cancellation to the surgical and pre-operative assessment teams, and primary care where appropriate.
- Clearly document the reason for cancellation and any

recommendations for optimisation in the patient's medical notes.

- Take steps to allow surgery to proceed safely at a future date.
- Address deficiencies in the system to reduce the number of late cancellations.

## 5. After unplanned admission

*Patients requiring anaesthesia after unplanned admission are at higher risk of medical errors and peri-operative complications [13]. These patients are often cared for by junior staff.*

The standards and principles for the care of elective patients apply equally to those admitted in an emergency, even though it is often more difficult to achieve them. Clear pathways of care for unplanned admissions are vital and should include surgeons, emergency departments and theatre departments. The purpose of these pathways should be to enable a high standard of care, avoid omissions and prevent excessive periods of starvation and fluid deprivation – particularly in vulnerable groups such as the elderly.

There must be clear communication between surgeons, anaesthetists and intensivists with the common goal being the welfare and best interests of the patient. Often a balance has to be reached between prevention of deterioration caused by delaying surgery and the benefit of optimising medical conditions pre-operatively. Where possible, patients and/or their next of kin should be included in these discussions. The risks and benefits of surgery should be explained clearly. These discussions should be documented clearly in the patient's medical notes, particularly when a decision has been made:

- To proceed with anaesthesia when potentially important investigations have been omitted or when the patient's condition has not been optimised.
- Not to proceed with surgery when there is correctable surgical disease.

High standards of care must be maintained and the patient's safety and best interests remain paramount.

## 6. Children and young people

*Children and young people have special healthcare needs because they are physically and emotionally different from adults, and need the constant care and support of their parents or guardians [14].*

Children should receive care that is integrated and co-ordinated around their particular needs and the needs of the family. At least 90% of surgery in children can be performed on a day stay basis.

They, and their parents, should be treated with respect, and given the necessary support and information to enable them to understand and cope with the proposed surgery and anaesthesia. They should be treated as active partners in decisions about their health and care, and, where possible, be able to exercise choice [15].

### **Before admission**

A clear explanation of the proposed surgery and admission procedures should be given to the parents and the child at the initial outpatient clinic visit.

Parents and children should be supplied with suitable written information regarding the proposed surgery and anaesthesia as well as instructions on what and when the child may eat and drink before surgery. Such instructions should conform to recent guidelines [16] (Appendix 1).

Pre-admission care may include attendance at a pre-operative assessment clinic and/or a pre-admission tour of the hospital.

The pre-operative assessment should include a complete birth history including the duration of gestation, any difficulties at

delivery and the presence of congenital and acquired disease particularly those affecting the airway or the cardiovascular system. A history of previous anaesthetics and family history of anaesthetic problems should be obtained. Sickle-cell screening should be performed in susceptible populations. The airway should be assessed and the presence of any loose, usually deciduous, teeth noted.

Telephone contact on the day before surgery provides an opportunity to confirm attendance, re-enforce pre-operative instructions and detect reasons for late cancellation such as infections or family problems.

## **After admission**

The child should be admitted to a children's ward or the day surgery unit staffed by medical and nursing staff trained in dealing with children and their families. The décor should be suitable for children, and toys, books, videos and a play therapist should be available.

Children should not be cared for next to adults and, where possible, there should also be separate facilities for adolescents [17].

The law on consent in minors varies across the UK. In England and Wales, parental consent is usually sought for operations on a child aged less than 16 years, although the child him/herself has the right to consent if he/she have achieved sufficient understanding and intelligence to understand fully what is proposed, i.e. they are 'Gillick competent'. However, in cases in which a child has refused or resisted medical treatment, the courts have upheld the right of the parents to consent for the treatment.

In Scotland, parents cannot overturn the decision of a

competent minor to refuse treatment. In such cases, much will depend on the judgement of the doctor as to whether the child is competent or not, taking into account the importance or urgency of the proposed operation. In all cases it is important that staff know who has parental responsibility [18].

The anaesthetist should see the parents and child before surgery to confirm/perform pre-operative assessment, establish a rapport, check compliance with guidelines on eating and drinking, discuss anaesthetic techniques and postoperative pain relief, and obtain verbal consents, e.g. for nerve blocks and suppositories.

- All children should be weighed and have their pulse rate and temperature recorded on admission.
- All communication should be comprehensible to the parents and the child.
- The possible modes of induction (intravenous/inhalation) should be discussed and the wishes of the parents and child complied with where possible.
- If intravenous induction is planned, local analgesic cream or gel should be applied to possible venepuncture sites in all but extreme emergencies.
- Selected children may benefit from oral sedative premedication. This must be carefully timed, and efficient communication between the theatre team and the ward is vital.
- Children should be allowed to wear suitable clothing of their own to theatre.
- Parents should be invited to accompany the child at induction of anaesthesia and his/her role in the induction room discussed.
- A ward nurse should be present at induction to escort the parent back to the ward.
- A parent should be called to the recovery room as soon as the child is conscious.

## 7. Tests and investigations

*Routine pre-operative investigations are expensive, labour-intensive and of questionable value, especially as they may contribute to morbidity or cause additional delays due to spurious results.*

The National Institute of Healthcare and Clinical Excellence (NICE) recommends the following pre-operative tests (surgical severity scores are given in Appendix 3) [19]:

- Electrocardiography: if older than 80; if older than 60 and surgical severity at  $\geq 3$ ; any cardiovascular disease; severe renal disease.
- Full blood count: if older than 60 **and** surgical severity  $\geq$  grade 2; all adults if surgical severity  $\geq$  grade 3; severe renal disease.
- Urea, electrolytes and creatinine: if older than 60 and surgical severity  $\geq$  grade 3; all adults if surgical severity grade 4; any renal disease; severe cardiovascular disease.
- Pregnancy test for women who may be pregnant.
- Sickle-cell test on families with homozygous disease or heterozygous trait; ancestry that is African, Afro-Caribbean, Asian, Middle-Eastern, east-Mediterranean.
- Chest X-ray: patients scheduled for critical care.

History and examination performed by appropriately trained and competent personnel remains the most efficient and accurate way of initially detecting significant morbidity. There is recent evidence that patients of any age with no major comorbidities (ASA physical status 1 or 2 – see Appendix 4) presenting for day surgery do not need pre-operative investigations [20].

Local departmental protocols should determine which additional tests should be used based upon patient age,

comorbidity and complexity of the surgery.

Anaemia ( $< 12 \text{ g.dl}^{-1}$  for women and  $< 13 \text{ g.dl}^{-1}$  for men) should be investigated and treated before planned surgery, using haematinics such as oral/intravenous iron rather than transfusion. The urgency and nature of surgery, plus patient-specific factors, will determine the balance between reversing anaemia and proceeding with surgery. The aim, to avoid peri-operative blood transfusion, is best achieved when hospital pre-operative services work with other departments and primary care.

Evaluation of high-risk patients should estimate cardiovascular risk according to the severity of systemic disease (see Appendix 5), functional capacity and the grade of the planned surgery [21].

Tests of functional capacity include exercise ECG, CPX testing and myocardial perfusion scans.



## 8. The patient's perspective

This document defines the objectives of pre-operative assessment, emphasising the need to:

- Support all patients as they prepare themselves for surgery.
- Identify important high-risk patients and promote safety.
- Reduce the risk to the patient and optimise the patient's condition pre-operatively.
- Identify and mitigate potential anaesthetic difficulties.
- Allay fear, anxiety and lack of understanding through clear explanation, written information and appropriate discussion.

Many patients, however, will not see an anaesthetist before admission as they will have been adequately assessed by skilled practitioners using established protocols. Anaesthetists must therefore ensure that the information provided not only allows for efficiency on the day of admission but also addresses any of the patient's concerns previously noted. If these concerns are not adequately dealt with by the practitioner, the patient should have access to a consultation with an anaesthetist before the day of operation.

Both assessment before admission and the pre-operative visit allow patients to:

- Discuss their peri-operative care.
- Ask questions and discuss their fears and anxieties, particularly about previous anaesthetic experiences.

Communication must be clear, with consistent messages given to the patient regarding choices for anaesthesia, post-operative analgesia, prevention and treatment of nausea and vomiting, pre-operative starvation and any other concerns raised by the patient.

It is extremely important that adequate explanation is given by anaesthetists and other staff should it become necessary to postpone surgery. In addition to the impact on the patient's medical condition, it is likely to cause considerable disruption to both their work and their home life.

Information specifically targeted for patients is also available in the patient information section of the Royal College of Anaesthetists website (<http://www.rcoa.ac.uk>)

The prospect of anaesthesia remains daunting for many people. Given the time constraints of 'same-day' admission it may be difficult for the patients to receive the level of consultation that would be considered ideal. However, the opportunity to talk to a doctor who fully understands their needs may ensure a more confident and co-operative relationship between the patient and the doctor.

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# Appendices

1. Fasting guidelines in adults and children
2. Survival prediction
3. Surgical severity
4. ASA physical status
5. Systemic disease

# Appendix 1

## Fasting guidelines for adults and children (RCN pre-operative fasting guidelines, 2005)

### Adults

Pre-operative fasting in adults undergoing elective surgery – ‘the 2-6 rule’:

- ‘2’ – Intake of water up to 2 h before induction of anaesthesia.
- ‘6’ – A minimum pre-operative fasting time of 6 h for food (solids, milk and milk-containing drinks).
- The anaesthetic team should consider further interventions for patients at higher risk of regurgitation and aspiration.

Post-operative resumption of oral intake in healthy adults:

- Patients should be encouraged to drink when ready, providing there are no contraindications.

### Children

Pre-operative fasting in children undergoing elective surgery – ‘the 2-4-6 rule’:

- ‘2’ – Intake of water and other clear fluid up to 2 h before induction of anaesthesia.
- ‘4’ – Breast milk up to 4 h before.
- ‘6’ – Formula milk, cow’s milk or solids up to 6 h before.
- The anaesthetic team should consider further interventions for children at higher risk of regurgitation and aspiration.

Post-operative resumption of oral intake in healthy children:

- Oral fluids can be offered to healthy children when they are fully awake following anaesthesia, providing there are no contraindications. There is no requirement to drink as part of the discharge criteria.

### Chewing gum

Chewing gum may be allowed up to 2 h before induction of anaesthesia.\*

\* This is AAGBI guidance and is not taken from the RCN fasting guidelines.



# Appendix 2

## Survival prediction

**Age.** The risk of dying doubles every 7 years from the age of 10 so that by 90 years the monthly mortality risk is 5000 times the risk at the age of 10. Life tables for the United Kingdom, its constituent countries and individual health authorities are updated at [www.gad.gov.uk](http://www.gad.gov.uk)

**Sex.** Men are 1.7 times more likely to die than women the same age.

**Socioeconomic status.** The impoverished are twice as likely to die as the rich.

**Aerobic fitness.** The predicted peak power in metabolic equivalents (METs), where 1 MET requires an oxygen consumption of  $3.5 \text{ ml.kg}^{-1}.\text{min}^{-1}$ ;

- a) For men  $18.4 - (0.16 \times \text{age})$
- b) For women  $14.7 - (0.13 \times \text{age})$

Mortality risk is multiplied by 1.2 for every MET short of predicted, or by 0.84 for every MET in excess of predicted.

**Diagnoses of myocardial infarction, heart failure, stroke, peripheral arterial disease and renal failure** ([creatinine] >  $150 \mu\text{mol.l}^{-1}$ ) independently multiply long-term mortality risk by 1.5 times. Diagnoses of angina and transient ischaemic cerebral events multiply risk by 1.2 times (in the absence of MI or stroke respectively).

Please email [john.carlisle@nhs.net](mailto:john.carlisle@nhs.net) for a more detailed and referenced version including Excel spreadsheets that calculate individual risk.

# Appendix 3

## Surgical severity (from NICE pre-operative testing)

- Grade 1 examples: diagnostic endoscopy or laparoscopy, breast biopsy.
- Grade 2 examples: inguinal hernia, varicose veins, adenotonsillectomy, knee arthroscopy.
- Grade 3 examples: total abdominal hysterectomy, TURP, lumbar discectomy, thyroidectomy.
- Grade 4 examples: total joint replacement, artery reconstruction, colonic resection; radical neck dissection.

# Appendix 4

## ASA physical status

ASA grade 1 A normal healthy patient: i.e. without any clinically important comorbidity and without a clinically significant past/present medical history.

ASA grade 2: A patient with mild systemic disease.

ASA grade 3: A patient with severe systemic disease.

ASA grade 4: A patient with severe systemic disease that is a constant threat to life.

ASA grade 5: A moribund patient who is not expected to survive without the operation.

ASA grade 6: A declared brain-dead patient whose organs are being removed for donor purposes.

Adapted from: <http://www.asahq.org/clinical/physicalstatus.htm>

# Appendix 5

## Systemic disease (from NICE pre-operative testing)

### Cardiovascular disease: 'mild'

- Mild angina pectoris (no/slight limitation of ordinary activity, e.g. > 1 flight of stairs).
- Myocardial infarction > 1 month ago (including Q waves on 12 lead ECG).
- Compensated heart failure (no/slight limitation of activity, comfortable at rest).

### Cardiovascular disease: 'severe'

- Severe or unstable angina pectoris (marked limitation of ordinary activity).
- Myocardial infarction < 1 month ago.
- Decompensated heart failure (marked limitation of ordinary activity or symptoms at rest).
- Severe valvular disease (exercise-induced syncope, angina, dyspnoea, orthopnoea, fatigue, palpitations).

### Renal disease: 'severe'

- Creatinine > 150  $\mu\text{mol.l}^{-1}$



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