Section 1: Preoperative care

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1.1 Patient information about anaesthesia

1.2 Consent to anaesthesia

1.3 Pre-admission clinics

1.4 Management of chronic medication

1.5 Preoperative visiting

1.6 Preoperative airway assessment

1.7 Preoperative fasting in adults

1.8 Premedication

1.9 Thromboprophylaxis

1.10 Preoperative cross-matching of blood

1.11 Protocols for preoperative investigation

1.12 Choice of technique – general, local or regional anaesthesia

Patient information about anaesthesia

Dr L A White

Why do this audit?

High quality information for patients is now a clear requirement. Written and verbal information should be provided. In 2001 the Department of Health stated that 'in elective treatment, it is not acceptable for the patient to receive no information about anaesthesia until their preoperative visit from the anaesthetist: at such a late stage the patient will not be in a position genuinely to make a decision about whether to proceed...'[1]

Written information materials should be developed by anaesthetists and patients working together.[2] They should be clearly written in plain English, using and explaining technical words where necessary. They should be evidence based and up to date, and they should include information about side effects and complications. They should be well designed and be available in alternative formats – such as other languages, large print and materials for those with low literacy skills.

Auditors of patient information services must understand a fundamental issue. Patients vary in the amount of information that they want. Our duty is to provide information in an accessible form, but we cannot insist that all patients take up the information service provided. Audits must accommodate this fact.

On the one hand, more than ever before, there is money and support from managers, risk managers and politicians for the use of information materials of all kinds. On the other hand, there are new barriers for anaesthetists in their quest to inform patients fully about what to expect before, during and after their anaesthetic. Nurse led pre-assessment clinics are increasingly replacing the preoperative visit and patients may reach the day of surgery without having met their anaesthetist and having received no specific information about what is going to happen to them. They may have been assessed and 'labelled' as fit to proceed, but no-one has actually explained what is going to happen, and why. Audits are needed to ensure that there is no erosion of the new trend of providing high quality information for patients who want it.

Best practice: research evidence or authoritative opinion

Best practice in the provision of written information for patients expecting to have an anaesthetic is described in detail in the Royal College of Anaesthetists' book *Raising the Standard: Information for Patients*.[2] This was published in 2003 following a two-year project which included an extensive consultation process between patients and anaesthetists. The book also explains the importance of verbal information to follow up on the use of leaflets. Numerous references are given.

Suggested indicators

Providing information for patients has a number of stages and any or all of these are open to audit. The stages are outlined below with suggested standards or targets.

Stage 1: ensure high quality and suitability of all written information leaflets for use.

% information leaflets to be used that have been evaluated via an approved process. A suitable evaluation tool can be found on the RCoA website. If the RCoA leaflet series is used, or some commercial leaflets, evaluation has already been done. Standard = 100%.

% patients in a sample of the proposed distribution group who agree that the information leaflet was helpful/comprehensive/clearly written etc. This would be a small and detailed audit with opportunity for feedback and changes to the proposed leaflet. Suggested target (when process completed and leaflet altered) > 90%.

Stage 2: set up distribution of leaflets (who by, and when in the patient pathway).

% patients who received the leaflet at the specified time in their care pathway. Target will depend on the circumstances.

Stage 3: assess whether the leaflet is effective.

% patients who are satisfied with the written information that they received. This will include some patients who are satisfied, but never read it. Suggested target > 90%.

% patients who can answer questions about material that the leaflet has covered. It may or may not be appropriate to conduct this kind of audit depending on the material covered. Target will depend on the circumstances.

Stage 4: assess the quality of verbal information.

% patients who are satisfied with the information they received from their anaesthetist. Target = 90%.

% patients who are satisfied with information that they received about anaesthesia from other health professionals before they came to theatre. This might be:

- pre-assessment nurses
- surgical ward nurses
- recovery nurses conducting a preoperative visit
- intensive care unit nurses conducting a preoperative visit when postoperative intensive care is planned
- acute pain service nurses talking about plans for postoperative pain control.

Target = 90%.

% patients who are satisfied with information that they received from operating department staff on arrival in theatre, in the anaesthetic room, in theatre during the operation (if under local or regional anaesthetic) or in the recovery room. Target = 90%.

Proposed standard or target for best practice

See above.

Suggested data to be collected

This will depend on which audit is planned.

Common reasons for failure to reach standards

Poor quality, not evaluated information materials.

Failure by staff to understand the principles of producing high quality information leaflets.

No funds to set up a robust distribution service.

Leaflet reaches patient at the wrong point in their care – too early or too late.

Leaflet not suitable for the patients who receive it.

Anaesthetist does not have enough (or any) time allocated for preoperative visits.

Lack of knowledge in other staff about issues relating to anaesthesia.

Related audits

9.1 – Preoperative parent and patient information

References

1 Department of Health. Reference guide to consent for examination or treatment. *DH*, London 2001 (see: www.dh.gov.uk/assetRoot/04/01/90/79/04019079.pdf).

2 Royal College of Anaesthetists. Raising the standard: Information for patients. *RCoA*, London 2003 (see: www.youranaesthetic.info).

Consent to anaesthesia

Dr E James

Why do this audit?

All patients have a right to give or withhold consent to medical treatment. Lack of informed consent is an issue in approximately 30% of claims against anaesthetists. The legal implications of inadequate information disclosure have been highlighted in cases such as the 'dental suppository' case.[1] Patients and, where appropriate, parents are reassured by a preoperative visit which includes the provision of adequate information, and allows an informed choice regarding anaesthetic management. Recent evidence would suggest that standards relating to documentation of discussion relating to anaesthetic techniques and associated risks are often not met.[2]

Best practice: research evidence or authoritative opinion

The provision of detailed information does not increase patient anxiety but actually reassures the majority of patients, especially the most anxious.[3] However, not all patients desire a comprehensive account of the conduct of anaesthesia and all the risks involved. This applies particularly to a more elderly population.[4] The amount of information which patients find appropriate also depends on how much information they are given.[5] The Association of Anaesthetists has produced guidance on this subject.[6] The Department of Health (DH) has issued a model consent policy and model documentation[7] and instruction that these be universally adopted.[8]

Suggested indicators

Presence and use of a policy on consent based on DH guidelines and best practice.[6,7]

We suggest an audit of consent for a specific procedure. This might be a spinal or caudal block, an epidural for labour, insertion of invasive monitoring, or insertion of a suppository. Alternatively a more general audit of documentation of anaesthetic techniques and material risks discussed could be carried out over a fixed time period. A list should be drawn up in consultation with colleagues of minimum elements required for informed consent.

% of patients in which documentation exists that all elements were explained and patient consent gained.

% of patients to whom this explanation was given by the anaesthetist giving the anaesthetic.

Proposed standard or target for best practice

All departments should have and use a written consent policy.

100% patients should have proposed anaesthetic techniques and associated risks explained and this should be documented in an appropriate place in the case notes or in the anaesthetic record.

100% patients should be given the explanation by the anaesthetist giving the anaesthetic.

Suggested data to be collected

Question all relevant staff on knowledge and use of consent policy.

Anaesthetist, surgical specialty and procedure.

Was the patient seen by an anaesthetist preoperatively? Was this the anaesthetist who then carried out the procedure?

Was explanation of the minimum elements given and documented? If there is no documentation, you may wish to question the anaesthetist. However documentation is important, especially in the event of legal proceedings.

Common reasons for failure to reach standards

No preoperative visit by anaesthetist or visit by different anaesthetist.

Inadequate information disclosure during visit.

Failure to document information given.

Lack of awareness or use of consent policy.

Related audits

8.5 – Consent given by women during labour

9.2 – Consent

References

1 Mitchell J. A fundamental problem of consent. *Br Med J* 1995;**310**:43–48.

2 NHS Quality Improvement Scotland, Anaesthesia Project Group. Anaesthesia – Care before, during and after anaesthesia. *NHS QIS,* Edinburgh July 2003 (see: www.nhshealthquality.org/nhsqis/files/Anaesthesia.pdf).

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4 Franill D, Inglis S. Patients desire for information about anaesthesia: Australian attitudes. *Anaesthesia* 1994;**49(2)**:162–164.

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6 Association of Anaesthetists of Great Britain and Ireland. Consent for anaesthesia. *AAGBI*, London 2006 (see: www.aagbi.org/pdf/Consent.pdf).

7 Deparment of Health. Good practice in consent implementation guide. *DH,* London November 2001 (see: www.dh.gov.uk/assetRoot/04/01/90/61/04019061.pdf).

8 Department of Health Circular: Good practice in consent. HSC 2001/023. *DH,* London November 2003 (see: www.dh.gov.uk/assetRoot/04/01/22/86/04012286.pdf).

Pre-admission clinics

Dr W G Hilditch

Why do this audit?

The main reasons for having pre-admission clinics are:

- to improve patient care by careful preoperative evaluation of the patient with coexisting disease[1–4]
- to improve provision of patient information
- to improve theatre utilisation[1–4]
- to reduce bed occupancy.[1–4]

With proper use of pre-admission clinics, there is adequate time for the evaluation and optimisation of coexisting medical conditions; this ensures a higher level of patient care. Also, there is a reduction in short notice cancellations and theatre utilisation is improved. Patients can be admitted on the day of surgery reducing the length of stay and enhancing bed occupancy.

Best practice: research evidence or authoritative opinion

Screening and preoperative assessment is usually carried out by a specially trained multi-disciplinary team with access to a consultant anaesthetist. They use locally developed protocols to screen and assess patients' fitness for anaesthesia and surgery.[3,4] The National Health Service Health Technology Assessment Programme has reported the OpCheck trial comparing preoperative assessments done by PRHOs with those done by appropriately trained nurse.[5] The trial ran for 12 months from April 1998, and recruited 1,874 patients. The nurses' preoperative assessments were essentially equivalent to house officers'. Given the evidence that such clinics can be run by experienced nurses it is important that anaesthetists are involved with the review of protocols and audit the performance of the screening process.

Suggested indicators

For patients who attended the pre-admission clinic:

% patients postponed by the clinic and reason for postponement.

% postponements correct in the opinion of the auditor.

% patients 'passed' by the clinic who subsequently had their operation postponed due to a problem that could have been noted at the pre-admission clinic, in the opinion of the auditor.

% patients correctly referred to another specialist for further preparation.

For patients who did not attend a pre-admission clinic:

% patients who subsequently had their operation postponed as a result of a factor that could have been noted at a pre-admission clinic, in the opinion of the auditor.

If a surgical service is setting up a pre-admission clinic for the first time:

% patients requiring short notice cancellation due to problems that could have been noted by a pre-admission clinic before and after establishing the clinic.

Proposed standard or target for best practice

100% postponements by the clinic should be appropriate.

0% further short notice postponements should occur in clinic attendees, in the absence of a new medical problem.

100% of further referrals should be appropriate.

0% postponements should occur in those not referred as above.

With introduction of a new service there should be a significant fall in the number of unexpected cancellations/postponements due to problems that the clinic could have picked up.

Suggested data to be collected

Number of patients attending the clinic.

The reasons for postponement at time of clinic.

The reasons for referring to a specialist for further optimisation.

Number and reasons for late cancellation.

Common reasons for failure to reach standards

Inadequate training of nurses staffing the clinic.

Factors that nurses are not trained to recognise, e.g. heart murmurs, difficult airway.

Factors not included in standard pre-admission clinic guidelines.

Failure to review the results of investigations performed by the clinic.

References

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Management of chronic medication

Dr J Crawford

Why do this audit?

Continuation of chronic medication before and after surgery may be required to prevent destabilisation of chronic conditions. For general surgical patients the rate of non-surgical complications increases with the length of time patients are without their regular medicines.[1] Perioperative discontinuation of some drug classes may lead to withdrawal syndromes (e.g. opioids, benzodiazepines, beta blockers).[2,3] Particular risks of myocardial infarction and death may be associated with perioperative withdrawal of beta-blockers.[4] Accumulating evidence supports continuation of many such 'essential' drugs before and after anaesthesia. This is often not done. Drugs prescribed are often not administered.[5,6]

Continuation of other drugs perioperatively may lead to unwanted side effects that require them to be discontinued, or require that specific management plans be put into place (e.g. warfarin, antiplatelet drugs, diabetic drugs, corticosteroids, MAOI, oral contraceptives).[7] Drugs that are withdrawn, or replaced, preoperatively must be reintroduced safely (e.g. anticoagulants, metformin).

Non-prescribed drug use should also be considered.

There are also many drugs which can be thought of as non-essential perioperatively and may be safely omitted.

Best practice: research evidence or authoritative opinion

The anaesthetist should receive a written record of a patient's current medication.[8]

There should be local guidelines to define which drugs should be administered pre- and postoperatively, and which should be discontinued. These should include guidance on managing those patients who are 'nil by mouth' postoperatively.

There should be additional guidelines for the management of specific drug classes/conditions. For example:

- continuation of beta blockers in those 'nil by mouth'
- management of diabetes
- management of drugs of dependence
- warfarin and antiplatelet drugs use.

Planning for patients with complex drug histories who will be 'nil by mouth' for some time should take place as early as possible and involve hospital pharmacists if appropriate.[9]

These guidelines should take into account the type of surgery, patient choice and the relative lack of evidence in some cases.

Suggested indicators

% of cases in which the anaesthetist obtains a timely and accurate written record of patients' medications.

Presence/absence of the guidelines above.

Adherence to guidelines.

% of drugs deemed 'essential' that are administered preoperatively.

% of drugs deemed 'essential' that are administered postoperatively.

% adherence to specific management plans.

Proposed standard or target for best practice

100% elective cases the anaesthetist should receive a timely and accurate written record of patients' medications.

There should be guidelines as above.

100% adherence to guidelines or documented deviation from them.

100% patients should receive 'essential' preoperative drugs.

100% patients should receive 'essential' postoperative drugs.

Suggested data to be collected

Presence of local guidelines for the management of pre- and postoperative administration of chronic medication.

Rates of adherence to this guidance.

It may be useful to subdivide such audits into preoperative administration and postoperative administration and to focus on groups with the best documented risks (e.g. failure to administer beta blockers in vascular patients).

Reasons for failure to follow guidelines should be gathered to inform future practice (e.g. from the 'not-administered' codes on drug prescription sheets).

Common reasons for failure to reach standards

Lack of local policy, or a failure to implement such policies. Lack of integration of these guidelines with fasting policies.

Lack of preassessment. Failure to involve all relevant staff (e.g. GPs, preoperative assessment, pharmacy, ward).

Variance in practice because of lack of evidence.

Lack of accurate information on chronic medication.

References

1 Kennedy JM et al. Polypharmacy in a general surgery unit and consequences of drug withdrawal. *Br J Clin Pharmacol* 2000;**49(4)**:353–362.

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3 Shammash JB et al. Perioperative beta blocker withdrawal and mortality in vascular surgery patients. *Am Heart J* 2001;**141**:148–153.

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9 Thomson FC, Naysmith MR, Lindsay A. Managing drug therapy in patients receiving enteral and parenteral nutrition. *Hospital Pharmacist* 2000;**7(6)**:155–164.

Preoperative visiting

Dr L A White

Why do this audit?

The preoperative visit is under threat. In the modern health service more patients must be treated using fewer resources, but quality of care must be preserved. We now find that patients are to be assessed in clinics by nurses, and then admitted on the morning of surgery. It is essential that anaesthetists identify the important components of preoperative counselling and ensure that they are preserved in the modern NHS.

Best practice: research evidence or authoritative opinion

Preoperative visiting is widely regarded as an important part of patient care.[1–4] The Association of Anaesthetists states that all patients should be seen by an anaesthetist and that the decision to proceed with anaesthesia cannot be delegated.[4]

In addition there is a patient perspective to the importance of the preoperative visit. One study showed that out of 132 preoperative visits, 82% of patients rated the visit as useful or very useful.[5] Patients 'expect to assess the person to whom they are entrusting themselves'.[6] The preoperative visit is important to create trust and confidence.[4]

Suggested indicators

% patients who feel that they had adequate time to speak with an anaesthetist who was able to explain the type of anaesthetic that they subsequently received.

% patients who feel that they had adequate time to speak with their own anaesthetist.

% anaesthetics given when the anaesthetist felt that he/she had adequate and timely contact with the patient beforehand.

Proposed standard or target for best practice

100% patients should feel that they have had enough time to talk to an anaesthetist who is able to explain the type of anaesthetic planned for them. Local arrangements may or may not allow this anaesthetist to be the anaesthetist who gives the anaesthetic though this is desirable and should be considered best practice.[7] This standard is 100% because without this element of care, the anaesthetist who gives the anaesthetic would be acting without informed consent.

Anaesthetists should feel that they have had adequate and timely contact with 100% patients. This element of care must be built into all new plans for patient care.

Suggested data to be collected

This data is probably not suitable for a 'tick box' audit on large numbers of patients. Data will need to be collected by patient interview as an atmosphere of trust will need to be established with the researcher to understand the patient's true thoughts.

Common reasons for failure to reach standards

New arrangements for increasing efficiency may not include adequate time for patients to talk to an anaesthetist or, ideally, their own anaesthetist. However, anaesthetists should not be seen to be standing in the way of new procedures, but only to be defending important elements of care.

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Preoperative airway assessment

Dr G A McLeod

Why do this audit?

The management of the airway is the responsibility of the anaesthetist. A difficult airway exists when an anaesthetist has difficulties with mask ventilation, intubation or both. The incidence of difficult mask ventilation is 5% (CI: 3.9–6.1%)[1] and the incidence of difficult intubation in patients without known airway problems is 5.8% (CI: 4.5–7.5%).[2] Despite difficulties with airway management, failure to intubate the trachea occurs in 0.04% to 0.05% of patients.[3] However, a poorly managed airway may be associated with airway trauma or cardiac or neurological hypoxic injury. Failed tracheal intubation is more common in obstetric patients (1 in 238).[4]

Best practice: research evidence or authoritative opinion

Single preoperative tests of difficult ventilation or intubation have low sensitivity and low positive predictive value. Therefore, assessment of a patient's history and examination of anatomical features are required in order to improve the sensitivity of any test. Independent predictors of difficult mask ventilation are age > 55 years, BMI > 26 kg m^{-2}, lack of dentition, beard, and a history of snoring.[1]

Independent predictors of difficult intubation[5] in one study were: previous difficult intubation, airway pathology and symptoms, inter-incisor gap, thyromental distance, maximum range of head and neck movement and Mallampati score.[6] A meta-analysis of 35 studies[2] has shown that the most useful bedside test is the combination of Mallampati and thyromental distance, but this test was still associated with low sensitivity 36% (14–59%).

Therefore, because no single or multiple test can accurately predict difficult intubation, it is essential that a preoperative history and thorough examination of the airway is undertaken before anaesthesia.

Suggested indicators

% patients seen by anaesthetist who then gives the anaesthetic.

% patients in whom airway was assessed at preoperative visit.

% patients with adequate documentation of airway assessment.

% patients with difficulty in ventilation.

% patients with difficult intubation.

% patients with failed intubation.

Proposed standard or target for best practice

100% patients seen by anaesthetist who then gives the anaesthetic.

100% patients having airway assessment at preoperative visit.

100% patients with documentation of airway assessment.

In patients with an unexpected difficult airway (either because the airway was assessed as normal or the airway was not assessed).

< 5% patients with difficulty in mask ventilation.

< 5% patients with difficult intubation.

< 0.03% of patients with failed intubation.[3]

Suggested data to be collected

Prospective collection of data for all airway interventions.

Data should include:

- history of previous difficult intubation, airway pathology and symptoms, measurement of inter-incisor gap, thyromental distance, maximum range of head and neck movement, Mallampati score and thyromental distance
- number of patients predicted to have difficult ventilation or intubation
- number of patients with difficult ventilation or intubation
- morbidity and mortality.

Common reasons for failure to reach standards

No preoperative airway assessment.

Poor preoperative airway assessment.

Different anaesthetist performs preoperative assessment.

Predictive tests have low sensitivity and positive predictive value.

Related audits

8.11 – Airway and intubation problems during general anaesthesia for Caesarean section

14.7 – Airway management training for novice anaesthetists

References

1 Langeron O et al. Prediction of difficult mask ventilation. *Anesthesiology* 2000;**92**:1229–1236.

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Preoperative fasting in adults

Dr A F Smith

Why do this audit?

Patients have traditionally been denied food and drink for 6 hours before the induction of general anaesthesia, though where this figure originated is not clear. This was thought to reduce the incidence of pulmonary aspiration of gastric contents. Much attention has been paid to reducing fasting times in children, who become dehydrated and hypoglycaemic more readily, but fluid deprivation is unpleasant for adults too. Shortening the fluid fast may also lead to less anxiety preoperatively[1] and less nausea and vomiting postoperatively.[2]

Best practice: research evidence or authoritative opinion

Clear fluids are cleared rapidly from the normal stomach. A Cochrane review of randomized controlled trials has assessed fasting before surgery.[3] There was no evidence of difference in volume or pH of gastric contents when a shortened fluid fast was compared with a standard fast. Gastric volumes were nearly identical. These findings have led to the recommendation that clear fluids may be given to day cases and in-patients until 3 hours[4] or even 2 hours.[5–7] before surgery. This would not include emergency cases, those with gastrointestinal disease or those who have had drugs such as opioids which slow gastric emptying.

There is insufficient evidence to address the safety of preoperative fasting for solids although a consensus opinion of a fasting period of 6 hours for a light meal, such as tea and toast is well established.[5–7]

Locally developed protocols for preoperative fasting periods for solids and fluids should be used by staff involved in the preoperative care of patients (i.e. preoperative assessment clinics, surgical wards and day surgery units).

Also refer to audit 9.4 for preoperative fasting for paediatric surgery.

Suggested indicators

% of preoperative clinical areas which use fasting protocols.

% of eligible patients who are permitted to drink in accordance with guidelines.

% of eligible patients who are permitted a light meal in accordance with guidelines.

Proposed standard or target for best practice

100% healthy elective adult patients should be allowed to drink water or other clear fluids until 2 hours before the induction of anaesthesia.

100% healthy elective adult patients should be allowed a light meal until 6 hours before the induction of anaesthesia.

100% of all clinical areas involved with the preoperative care of patients should use fasting protocols.

Suggested data to be collected

Fasting times.

Number of patients to whom fluid given inappropriately.

Number of patients to whom solids given inappropriately.

Question staff in each relevant clinical area regarding existence and use of a fasting protocol.

Incidence and nature of organisational problems caused by new policy.

Common reasons for failure to reach standards

Nurses and patients not aware of policy.

Difficulties 'tailoring' fasting times to individual patients rather than all patients on an operating list.

Cancellation by those not aware of, or disagreeing with, policy.

Related audits

9.4 – Preoperative fasting in elective paediatric surgery

References

1 Read MS, Vaughan RS. Allowing pre-operative patients to drink: effects on patients' safety and comfort of unlimited oral water until 2 hours before anaesthesia. *Acta Anaesthesiol Scand* 1991;**35**: 591–595.

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Premedication

Dr M Garrioch

Why do this audit?

Premedication may be an important component of anaesthetic practice. It may allay patient anxiety,[1] alleviate preoperative pain, reduce the pain of vascular cannulation or regional anaesthesia, reduce nausea/vomiting, minimise risk of aspiration, act as an antisialogogue or facilitate a smooth anaesthetic induction. Therefore where these effects are required, premedication should be prescribed, be correctly given and be effective. This audit relates to adult practice, refer to audit 9.5 for premedication in paediatric anaesthesia.

Best practice: research evidence or authoritative opinion

Premedication blocks the preoperative stress response, β-endorphin levels being lower in premedicated patients.[2] Risks of acid aspiration are reduced by preoperative use of various drugs.[3] Anaesthesia induction is aided by concomitant sedative premedication.[4]

Suggested indicators

Of patients where a premed was prescribed:

% patients in whom it was given correctly at an appropriate time relative to induction of anaesthesia.

% patients for whom anaesthetist had the opportunity to order a premed.

% of patients with an acceptable preoperative anxiety score as observed by someone other than the anaesthetist.

% of patients who feel the pain of cannulation or regional block was acceptable. This also depends on what local anaesthetic was used and ease of technique but the patient's memory of events is a useful indicator.

% of patients who were satisfied with their premedication.

Proposed standard or target for best practice

100% premeds to be given correctly within 2 h of induction.

100% of cases the anaesthetist to have the opportunity to order a premed.

90% patients had an acceptable preoperative anxiety score.

90% patients found the pain of cannulation or regional block acceptable.

90% patients were satisfied with their premedication.

Suggested data to be collected

Premed prescribed, anaesthetist, whether given correctly and when.

Time of induction of anaesthesia.

Did anaesthetist have opportunity to prescribe premedication?

Preoperative anxiety score, by someone other than the anaesthetist – either the patient or an independent observer.

Patient postoperative interview – information as above.

Common reasons for failure to reach standards

Anaesthetist may not see emergency cases preoperatively.

Patients admitted after lists have started.

Change in list order or time.

Misjudgement of the need for an anxiolytic.

Related audits

9.5 – Premedication in pre-school age children

References

1 Leigh JM, Walker J, Janaganathan P. Effect of preoperative anaesthetic visit on anxiety. *Br Med J* 1977;**2**:987–989.

2 Walsh J et al. Premedication abolished the increase in plasma β endorphin observed in the immediate preoperative period. *Anesthesiology* 1987;**66**:402.

3 Manchikanti L et al. Assessment of effect of various modes of premedication on acid aspiration risk factors in outpatient surgery. *Anesth Analg* 1987;**66**:81–84.

4 Eger EI. Anaesthetic uptake and action. *Williams and Wilkins*, Baltimore 1974.

Thromboprophylaxis

Dr K James

Why do this audit?

The risk of deep venous thrombosis (DVT) and pulmonary thromboembolism (PTE) may be increased by a factor of 10 in immobilised hospital patients (medical, surgical and obstetric).[1] Identifying at-risk patients and employing appropriate antithrombotic strategies (pharmacological and mechanical) will reduce morbidity, mortality and healthcare costs.[2,3]

Best practice: research evidence or authoritative opinion

Routine screening for asymptomatic DVT in all patients is not cost effective but routine thromboprophylaxis for at-risk patients reduces morbidity, mortality and cost.[2,3]

All available methods of prophylaxis should be considered – general measures (mobilisation, hydration etc), mechanical techniques and pharmacological agents.

Suggested indicators

Existence of local protocols, developed for specific patient groups, based on national guidelines.[4] Guidelines should include the timing of anticoagulant administration in relation to spinal and epidural insertion and catheter removal.[4]

At-risk patient groups should be identified based on personal risk factors, past history and proposed surgery.[2,3]

Evidence of the use of appropriate prophylaxis techniques (including timing and duration), tailored to individual patient need based on risk, efficacy and safety.

Evidence of use of local guidelines on DVT prophylaxis.

Evidence of use of local guideline on timing of anticoagulants and regional blockade.

% of patients where the correct risks are identified.

% of patients receiving prophylaxis.

% of patients where prophylaxis is appropriate for their identified risk.

% of patients where the duration of prophylaxis treatment is correct.

% of patients where problems arise either with DVT or with bleeding.

% of patients where the guidelines for timing of pharmacological prophylaxis in relation to spinal/epidural block are used.

Proposed standard or target for best practice

Existence and use of protocols/guidance described above.

100% of patients should be correctly identified with respect to their risk factors.

100% of patients receive thromboprophylaxis appropriate to their risk.

100% of patients receive treatment for an appropriate duration.

100% patients with central regional block have anticoagulant therapy tailored accordingly.

Suggested data to be collected

As above.

Common reasons for failure to reach standards

Lack of agreement among specialties on management guidelines.

Inadequate patient assessment and poor assessment of risk.

Failure to prescribe and administer appropriate therapy.

Premature discontinuation of treatment.

References

1 Sandler DA, Martin JF. Autopsy proven pulmonary embolism hospital patients: are we detecting enough deep vein thrombosis? *J Roy Soc Med* 1989;**82**:203–205.

2 Scottish Intercollegiate Guidelines Network. Prophylaxis of venous thromboembolism. Guidelines No 62. *SIGN*, Edinburgh 2002 (see: www.sign.ac.uk/guidelines/fulltext/62/index.html).

3 Edmonds MJ et al. Evidence-based risk factors for post-operative deep vein thrombosis. *Aust N Z J Surg* 2004;**74(12)**:1082–1097.

4 NHS Quality Improvement Scotland, Anaesthesia Project Group. Anaesthesia – Care before, during and after anaesthesia. Standard 3.6. *NHS QIS*, Edinburgh July 2003 (see: www.nhshealthquality.org/nhsqis/files/Anaesthesia.pdf).

Preoperative cross-matching of blood

Dr B J McCreath

Why do this audit?

Cross-matching of blood that is not transfused consumes blood bank resources unnecessarily, increases the blood inventory that must be maintained, and increases the number of units that become outdated. Occasionally, e.g. if a procedure is associated with a risk of sudden massive blood loss, this may be a deliberate policy. More commonly, however, the decision to cross-match blood is based on traditional practice that may be outdated. This audit will identify those operations for which blood is needlessly cross-matched.

Best practice: research evidence or authoritative opinion

The Maximum Surgical Blood Order Schedule (MSBOS) recommends that, for patients with a high likelihood of blood transfusion, the number of units cross-matched be twice the median requirement for that surgical procedure (cross-match-to-transfusion [C:T] ratio of 2:1).[1]
A recently published article suggests that the C:T ratio may be reduced with the introduction of a Patient-Specific Blood Ordering System (PSBOS) that estimates a postoperative haematocrit using the patient's blood volume, the surgeon-defined expected blood loss, and preoperative haematocrit.[2]

Suggested indicators

The C:T ratio for a specific operation.

The number of urgent requests for cross-matched blood made during elective surgery that, in the opinion of the auditor, could have been predicted.

Proposed standard or target for best practice

The C:T ratio for elective surgery should be no more than 2:1. Unless the procedure is known to carry a significant risk of life-threatening sudden haemorrhage.

There should be no requirement for emergency cross-matching techniques during elective surgery.

Suggested data to be collected

This audit should be carried out in conjunction with the Haematology Department and it should include the key points outlined in the Scottish Intercollegiate Guidelines Network (SIGN) Guideline No. 54.[3]

Presence and evidence of use of a local protocol based on national guidelines.

For a specific operation, collect the following data for each patient: weight and sex, operation details including grade of surgeon and any problems, blood loss, pre- and postoperative haemoglobin concentration (Hb), target Hb, C:T ratio, and discharge Hb.

When an urgent request for cross-matched blood has been made during elective surgery, the circumstances surrounding the request should be considered. Could the need for blood have been predicted? Would a PSBOS have been helpful?

Common reasons for failure to reach standards

Inability of ward-based medical staff to estimate likely blood loss.

Resistance to the changing of traditional practice.

Reluctance of a surgeon to begin surgery without blood immediately available when the anticipated blood loss is greater than a litre.

Inability of a transfusion laboratory to provide a rapid response to urgent requests for cross-matched blood.

Related audits

2.9 – Safe red cell transfusion

2.10 – Blood conservation strategies

References

1 Friedman BA et al. The maximum surgical blood order schedule and surgical blood use in the United States. *Transfusion* 1976;**16**:380–387.

2 Palmer T et al. Reducing unnecessary cross-matching: a patient-specific blood ordering system is more accurate in predicting who will receive a blood transfusion than the maximum blood ordering system. *Anesth Analg* 2003;**96(2)**:369–375.

3 Scottish Intercollegiate Guidelines Network. Perioperative blood transfusion for elective surgery. Guideline No. 54. *SIGN*, Edinburgh October 2001 (see: www.sign.ac.uk/pdf/sign54.pdf and review www.sign.ac.uk/pdf/2005bloodtransfusionreport.pdf).

Protocols for preoperative investigation

Dr P Doherty

Why do this audit?

Hospitals that perform surgical procedures should review their existing practice for preoperative testing in concordance with guidelines published by NICE in 2003.[1] Assessment prior to anaesthesia is the responsibility of the anaesthetist[2] and local protocols for preoperative investigations should be designed by Departments of Anaesthesia.[3] Pre-anaesthetic screening achieves several objectives, allowing patients to be deemed fit for anaesthesia and surgery, with all investigations completed and available preoperatively to minimise disruption, enhance efficiency and minimise patient distress.

Best practice: research evidence or authoritative opinion

Recent NICE guidelines[1] give recommendations on which investigations to perform depending on operation and co-morbidity. Implementation of these guidelines should be audited and reviewed regularly.

There should be a protocol for preoperative investigations that is widely available to all staff involved in the perioperative care of the patient.

Suggested indicators

% patients who are tested in compliance with the guidelines or local protocol.

% patients who are tested at variance with the recommendations of the guidance or protocol.

% investigations done that were not included in the protocol for which reasons for variance were documented.

% requested investigations that are available in time for preoperative assessment.

% cases delayed or postponed because necessary investigations not available and reasons for this.

% results available in notes preoperatively or % of X-rays accompanying the patient to theatre.

Proposed standard or target for best practice

Evidence of use of appropriate protocol for preoperative investigations.

100% of investigations as recommended in the protocol should be performed.

0% of unnecessary investigations should be performed at variance to the protocol.

100% requested investigations should be available for preoperative assessment and in the case notes for theatre.

0% cases should be delayed or postponed because of an absence of preoperative investigation.

Suggested data to be collected

For each investigation – whether necessary or done as per protocol or according to anaesthetic request.

For each theatre list – total percentage of investigations not performed or available in the notes.

By each surgical ward – total percentage of investigations not performed or available in the notes.

Common reasons for failure to reach standards

Protocol not available, not publicised or not widely accepted.

Patient falls outside existing protocols.

Lack of understanding by house staff or pre-admission clinic.

Late admission of patient.

Urgent theatre cases.

References

1 National Institute for Clinical Excellence Guidelines: Preoperative Tests – The use of routine preoperative tests for surgery. *NICE*, London June 2003 (see www.nice.org.uk/page.aspx?o=56818).

2 Association of Anaesthetists of Great Britain and Ireland. The anaesthesia team. *AAGBI*, London 2005 (see: www.aagbi.org/pdf/the_anaesthesia_team.pdf).

3 Association of Anaesthetists of Great Britain and Ireland. Risk management. *AAGBI*, London1998 (see: www.aagbi.org/pdf/27doc.pdf).

Choice of technique – general, local or regional anaesthesia

Dr S M Nimmo

Why do this audit?

The choice of anaesthetic is based on the clinical condition of the patient, the operation to be performed and acceptability to the patient of the technique chosen. In some situations a local anaesthetic technique may be usefully used alone, in others a combination of local and general anaesthesia confers advantages for the patient. For example, epidural blockade can provide excellent dynamic analgesia and also have beneficial effects including reduction of postoperative respiratory complications, ileus and thromboembolic events.[1] More generally the use of a local anaesthetic technique should improve analgesia, allowing optimal patient recovery and is often opioid sparing reducing postoperative nausea and vomiting. However, the use of these techniques may be associated with a variety of unwanted side effects and complications some of which may result in permanent patient disability. It is therefore important to assess the risks and benefits of the chosen anaesthetic technique to optimise patient outcome.

Best practice: research evidence or authoritative opinion

The risks and benefits of anaesthetic techniques will vary between patients and surgical procedures. In cataract extraction for example, local anaesthesia is the routine. In surgery for fractured neck of femur a beneficial effect of regional anaesthesia techniques is harder to demonstrate.[2] Epidural analgesia can provide excellent dynamic analgesia, e.g. following major abdominal surgery and is of proven benefit in some patient groups, for example those with significant respiratory disease but has shown less convincing benefit in other high risk groups.[3]

Suggested indicators

A specific operation and regional anaesthetic technique may be chosen, e.g. the use of a caudal block in patients for circumcision or thoracic epidural for laparotomy. The following questions may then be addressed:

- % patients in whom the local or regional block was considered versus success rate, documenting reasons for not undertaking the block including patient choice, failure to achieve an effective block, including external factors such as lack of time, equipment or staff.
- Benefits of the technique may be stated and audited, % patients in whom the expected benefit of the technique can be shown, e.g. good postoperative analgesia, reduction in opioid consumption, earlier mobilisation, earlier return of gut function.
- Complications both of performing the block and subsequent effects on the patient should be audited.

Proposed standard or target for best practice

There should be a satisfactory outcome in patients who have the block. The success rate will vary with the type of regional technique for example success rates in excess of 95% may be anticipated for brachial plexus blockade in skilled hands[4] whereas it is likely to be around 70% for epidural analgesia.[5] Success rate should be defined by pain scoring and patient satisfaction, coupled with objective assessment of local anaesthetic block if possible.

If the combination of regional anaesthesia and general anaesthesia is considered to confer benefit to the patient, for example in reducing postoperative ileus, then an audit should be able to demonstrate this advantage in comparison to patients in whom local or regional blockade was not used.

Complication rates for individual regional and local techniques are well documented in the literature and audits should demonstrate complication rates of similar levels or better.

Suggested data to be collected

Number of patients having the operation chosen, and number achieving a successful block. Reasons why the block was not done or was not effective.

Measurement of the proposed benefit.

Data on relevant side effects for example hypotension with epidural analgesia as this may limit the efficacy of improved analgesia by preventing patient mobilisation.

Data on complications such as transient or permanent neurological deficit.

Common reasons for failure to reach standards

Contraindications to the block, e.g. neuraxial block in a patient on clopidogrel.

Anaesthetist unwilling or unable to perform block.

Block declined by patient.

Lack of time, equipment, staff or HDU/ICU bed.

Technique not actually as effective as thought.

References

1 Rodgers A et al. Reduction of postoperative mortality and morbidity with epidural or spinal anaesthesia results from an overview of randomised trials. *Br Med J* 2000;**321**:1493.

2 Sutcliffe AJ. Mortality after spinal and general anaesthesia for surgical fixation of hip fractures. *Anaesthesia* 1994;**49**:237–240.

3 Rigg JR et al and the MASTER Anaesthesia Trial Study Group. Epidural anaesthesia and analgesia and outcome of major surgery. A randomised trial. *Lancet* 2002;**359**:1276–1282.

4 Al-Haddad MF, Coventry DM. Brachial plexus blockade. *Br J Anaes CEPD Review* 2002;**2**:33–36.

5 McLeod G et al. Postoperative pain relief using thoracic epidural analgesia: outstanding success and disappointing failures. *Anaesthesia* 2001;**56**:75–81.