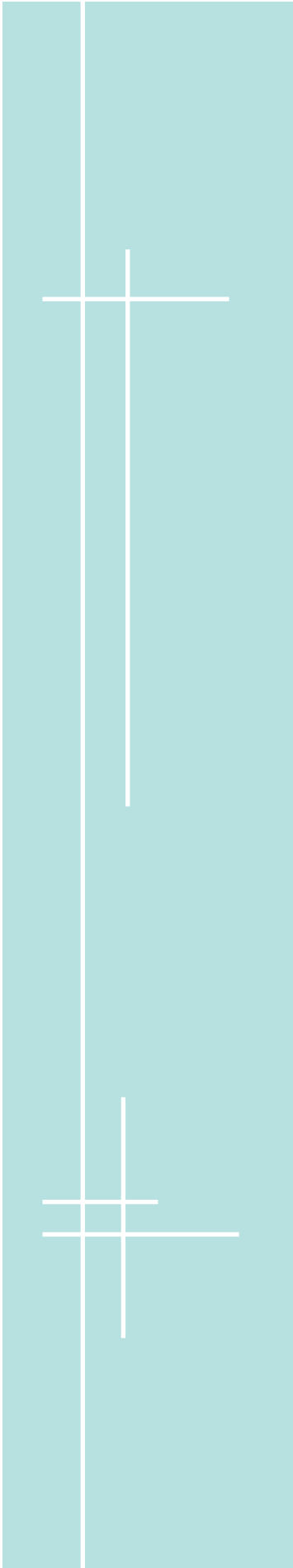


Section 3: Post-operative care

Edited by Dr Justin Phillips

- 
- 3.1 Recovery room staffing and monitoring provision**
 - 3.2 Oxygen therapy**
 - 3.3 Airway problems**
 - 3.4 Hypertension/hypotension in recovery**
 - 3.5 Post-operative nausea and vomiting (PONV)**
 - 3.6 Record keeping**
 - 3.7 Discharge protocols**
 - 3.8 Unplanned admissions of elective surgical patients to HDU/ICU**
 - 3.9 Post-operative visiting**
 - 3.10 Handover of responsibility for patients in the post-anaesthetic care unit (PACU)**
 - 3.11 Patient satisfaction with anaesthesia**

3.1

Recovery room staffing and monitoring provision

Dr C J Peden, Dr M Lacey

Why do this audit?

Sufficient monitoring and care is of paramount importance for the safe outcome of patients in the immediate post-operative period.¹

For a significant number of patients, recovery from anaesthesia can be a life threatening process; appropriate resources, and prompt intervention by adequately trained staff in the post-anaesthetic care unit (PACU) is vital to ensure a safe outcome for patients.¹

Such standards should also be maintained in any area where anaesthesia is administered including obstetrics, cardiology, X-ray, dental, psychiatric and community hospitals.

Best practice: research evidence or authoritative opinion

Emergence from anaesthesia is potentially hazardous and patients require a high standard of observation until recovery is complete.² Recommendations from the Association of Anaesthetists of Great Britain and Ireland state that the PACU must have sufficient numbers of trained staff available throughout all operating hours, and if an emergency surgical service is run, the PACU must remain open 24 hours.³

No fewer than two nurses should be present if one patient is in the PACU. Any patient unable to maintain their own airway must be nursed continuously on a one to one basis by a nurse who has no other duties. Staffing should be sufficient so this is routine practice, even in peak periods.

A high standard of monitoring is required until the patient has fully recovered from anaesthesia. Clinical observations must be supplemented by pulse oximetry, non-invasive blood pressure (NIBP) and temperature monitoring; an ECG, nerve stimulator, and capnography must be immediately available should they be needed.⁴

Careful records should be maintained, with an increasing move to electronic recording.

Suggested indicators

- D % unconscious patients who are being cared for on a one to one basis.
- D % of staff present in recovery room trained to the recognised standard, audited at different times of day and night.
- D % intubated patients with capnography monitoring.
- D % conscious patients requiring critical care or critical care monitoring cared for in a ratio of one nurse to two patients. This might include patients who are vomiting, patients with uncontrolled pain, and patients who are potentially unstable including those recently admitted following regional anaesthesia.
- D % conscious stable patients who are being cared for by nurses not involved with the patients above, at a nurse to patient ratio that is acceptable in the opinion of the audit team and the nurse in charge of recovery. This might include patients who are ready to leave and are waiting transfer to the ward.
- D % patients admitted to recovery out-of-hours where there are two members of staff present in recovery until discharged.
- D % of patients having monitoring recorded electronically.
- D % of patients having their observations recorded with appropriate frequency.
- D % of patients monitored with non-invasive blood pressure, pulse oximetry and temperature.
- D Ease of attaining further monitoring equipment such as capnography and ECG.
- D Audit should be applied to all areas of the hospital where patients are recovering from anaesthesia, and the adequacy of facilities in outlying areas should be audited on a regular basis.
- D Critical incidents involving patients in PACU should be recorded and reviewed on a monthly basis, with learning points disseminated to all staff caring for anaesthetised patients, and patients recovering from anaesthesia.

Proposed standard or target for best practice

- D All patients recovering from a spinal, epidural or general anaesthesia should be cared for in a specifically designed recovery area with sufficient numbers of staff who are trained to a nationally agreed standard.²
- D 100% of patients recovering from general anaesthesia should be nursed on a one to one basis until fully recovered.

	<ul style="list-style-type: none"> D 100% of intubated patients monitored with capnography until extubated.² D 100% of patients admitted out-of-hours should have no fewer than two members of staff present at all times. D 100% of patients should have non-invasive blood pressure, pulse oximetry and temperature recordings. <p>The above should be met in any area of the hospital where a patient is recovering from anaesthesia.</p>
<p>Suggested data to be collected</p>	<ul style="list-style-type: none"> D Any proposed audit should be discussed with senior recovery room staff. A member of the audit team should visit PACU at random times of the day, particularly during busy periods. Patient dependency and staffing ratios for each patient should be recorded. D Any problems during periods of observation should be noted (e.g. delay in arrival of ward staff to collect patient, patient awaiting ICU bed following unexpected deterioration). D Periods where PACU has to be closed to new admissions due to inadequate staffing levels should be highlighted. D When the audit team visits PACU the following should be collected for each patient: <ul style="list-style-type: none"> ◆ Type of anaesthetic/surgery. ◆ ASA grade. ◆ Special considerations taken by the anaesthetist. ◆ Monitoring assessment completed. ◆ Monitoring in use compared to that indicated by audit. ◆ Frequency of observations and if appropriate. ◆ Reasons for lack of any monitoring or equipment availability.
<p>Common reasons for failure to meet standard</p>	<ul style="list-style-type: none"> D Inadequate staffing levels for the number of patients in recovery. D Lack of understanding by recovery staff of a patient's monitoring needs, and failure by the anaesthetist to communicate this. D Monitoring equipment not available. D Peripheral recovery areas inadequately staffed and resourced.
<p>CPD and Curriculum mapping</p>	<p>Training curriculum competence: PO_BK_02</p>
<p>References</p>	<ol style="list-style-type: none"> 1 Miller, R. Postoperative care. Textbook of Anaesthesia. <i>Churchill Livingstone</i>, 2000. 2 Recommendations for Standards of Monitoring during Anaesthesia and Recovery (4th Edition). <i>AAGBI</i>, London 2007 (http://www.aagbi.org/sites/default/files/standardsofmonitoring07.pdf). 3 The anaesthesia team 3. <i>AAGBI</i>, London 2010 (http://www.aagbi.org/sites/default/files/anaesthesia_team_2010_0.pdf). 4 Association of Anaesthetists of Great Britain and Ireland Statement on use of Capnography outside operating theatres. <i>AAGBI</i>, London 2011 (http://www.aagbi.org/sites/default/files/Capnographyaagbi090711AJH%5B1%5D_0.pdf).



3.2

Oxygen therapy

Dr M Spivey, Dr J Phillips

Why do this audit?

Oxygen therapy is recognised as an important element of post-operative care both in the recovery room and after discharge to the ward.^{1,2,3,4,5} Difficulties in providing adequate oxygen therapy include patient not tolerating or complying with treatment,⁶ nursing mistakes, equipment failure and inadequate communication by the prescribing anaesthetist. It is important to establish the efficacy of this simple therapeutic procedure that may reduce post-operative morbidity and mortality.

Best practice: research evidence or authoritative opinion

Hypoxaemia occurs in the post-operative period both in the recovery room and after discharge of the patient to the ward;³ in NAP4, 45% of the reported patients who had post-operative complications developed profound hypoxia.⁷ Treatment by facemask oxygen is effective in treating hypoxaemia in many cases in the early post-operative period.⁷ Prescription of oxygen can decrease the incidence of hypoxaemia after recovery room discharge. This is important in high-risk patient groups.⁴ The effectiveness of this depends on patient compliance,⁶ nursing care, equipment availability and the prescribing anaesthetist. The 2008 BTS guidelines on oxygen⁸ explicitly state that they do not apply to the post-operative period, but they promote a targeted use of oxygen with monitoring of oxygen saturations and have brought about a widespread change to practice.

Suggested indicators

- D % patients receiving oxygen in the recovery room as described in local guidelines.
- D % patients who, in the opinion of the auditors, might benefit from oxygen therapy on the post-operative ward, who are prescribed it.
- D Of patients who have been prescribed oxygen to be used on the ward post-operatively, % who are using it correctly when visited by the audit team.

Proposed standard or target for best practice

- D 100% patients in recovery should receive oxygen therapy as above.
- D 100% patients who the auditors feel would have benefited from the use of oxygen on the post-operative ward should have been prescribed it.
- D 100% of patients prescribed oxygen should be using it correctly when visited by the audit team.

Suggested data to be collected

- D A policy for the use of oxygen in the recovery room should exist before this audit can be performed. This will require discussion with fellow anaesthetists. Data to collect includes operation, anaesthetic technique, oxygen used before and after waking, criteria for discontinuing oxygen in recovery.
- D Looking for patients who might have benefited from oxygen therapy on the ward may be difficult. A list of indications should be drawn up.¹ The notes of all patients who pass through recovery in a day may be examined. Alternatively a group where pathology is more likely to be found may be chosen. For example:
 - ◆ all ASA 3, 4 or 5 patients;
 - ◆ all patients on urology lists;
 - ◆ all patients having major joint replacements or all vascular surgery patients.
- D If oxygen is prescribed, post recovery room data to be collected will include prescription details, indication, compliance with prescription when ward is visited, reasons for non-compliance.

Common reasons for failure to meet standard

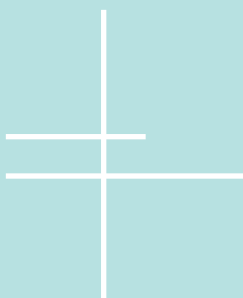
- D Poor patient compliance and failure by anaesthetist to explain importance.
- D Failure of nurses to understand the value of oxygen.
- D Equipment failure.
- D Poor communication by prescribing anaesthetist.

CPD and Curriculum mapping

Training curriculum competences: PO_BK_05, AM_BK_08

References

- 1 Powell JF, Menon DK, Jones JG. The effects of hypoxaemia and recommendations for postoperative oxygen therapy. *Anaesthesia* 1996;**51**:769–772.
- 2 Roe PG, Jones JG. Causes of oxyhaemoglobin saturation instability in the postoperative period. *Br J Anaesth* 1993;**71**:481–487.
- 3 Reeder MK et al. Postoperative hypoxaemia after major abdominal vascular surgery. *Br J Anaesth* 1992;**68**:23–26.
- 4 Rosenberg J et al. Effect of oxygen therapy on late postoperative episodic and constant hypoxaemia. *Br J Anaesth* 1992;**68**:18–22.
- 5 Canet J, Ricos M, Vidal F. Early postoperative arterial oxygen desaturation. Determining factors and response to oxygen therapy. *Anesth Analg* 1990;**69**:890–895.
- 6 Nolan KM et al. Video surveillance of oxygen administration by mask in postoperative patients. *Br J Anaesth* 1992;**69**:194–196.
- 7 Cook TM, Woodall N, Frerk C. Fourth National Audit Project. Major complications of airway management in the UK: results of the Fourth National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society. Part 1: anaesthesia. *Br J Anaesth* 2011;**106**:617–631.
- 8 BTS guideline for emergency oxygen use in adult patients. *Thorax* 2008;**63**:vi1-vi68.



3-3

Airway problems

Dr M Spivey, Dr J Phillips

Why do this audit?

Airway problems such as obstruction occur in the immediate post-operative period and are an immediate threat to patient safety.¹ This may be due to laryngospasm, persisting relaxation of airway muscles, soft tissue oedema, haematoma, vocal cord dysfunction or foreign body. Vigilant patient monitoring during the post-anaesthesia period is important firstly to identify airway problems and secondly to initiate effective management.²

Best practice: research evidence or authoritative opinion

Airway problems are the second most frequent complications after nausea and vomiting. In a large prospective study of 18,473 post-anaesthesia patients, 6.9% required airway support.²

Most interventions were simple and involved manual support of the jaw or insertion of an oral or nasal airway. Only 0.02% of patients needed re-intubation. Other studies show an incidence of airway problems of 2–7%^{3,4,5,6} with a higher incidence following endotracheal intubation compared to the laryngeal mask airway or facemask.⁶ In NAP4, 28% of major airway complications occurred at emergence or in the recovery room. In all of these, airway obstruction was the cause and in 50% there was a delay in the diagnosis.⁷

Suggested indicators

- D Desaturation requiring airway intervention or medication (including O₂ with reservoir).
- D % of patients re-intubated in the recovery room.

Proposed standard or target for best practice

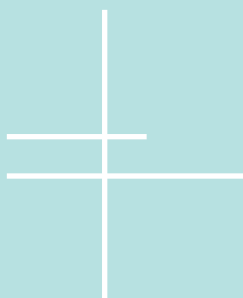
- D < 5% post-operative patients in the recovery room should require airway support by the recovery nurse.
- D < 1% of patients should require re-intubation.

Suggested data to be collected

- D Anaesthetist, ASA status, type of operation and anaesthesia.
- D Conscious state on admission to recovery.
- D Airway problem.
- D Intervention and time of intervention needed.
- D Outcome.

Common reasons for failure to meet standard

- D Patients admitted to recovery ward too early.
- D Surgical or anaesthetic complications.



CPD and Curriculum mapping

CPD matrix codes: IC01, IC02, 3A01

Training curriculum competences: PO_BK_04, AM_BS_07, AM_BS_12

References

- 1 Miller KA, Harkin CP, Bailey PL. Postoperative tracheal extubation. *Anesth Analg* 1995;**80**:149–172.
- 2 Hines R et al. Complications occurring in the postanesthesia care unit: a survey. *Anesth Analg* 1992;**74**:503–509.
- 3 Beard K, Jack H, Walker AM. Adverse respiratory events occurring in the recovery room. *Anesthesiology* 1986;**64**:269–272.
- 4 Moller J, Wittrop M, Johansen S. Hypoxemia in the postanesthesia care unit. An observer study. *Anesthesiology* 1990;**73**:890–895.
- 5 Asai T, Koga K, Vaughn RS. Respiratory complications associated with tracheal intubation and extubation. *Br J Anaesth* 1998;**80**:767–775.
- 6 Abdy S. An audit of airway problems in the recovery room. *Anaesthesia* 1999;**54**:372–392.
- 7 Cook TM, Woodall N, Frerk C; Fourth National Audit Project. Major complications of airway management in the UK: results of the Fourth National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society. Part 1: anaesthesia. *Br J Anaesth* 2011;**106**:617–631.



3.4

Hypertension/hypotension in recovery

Dr M Davies

Why do this audit?

Extremes of blood pressure either hypertension or hypotension are associated with adverse outcomes. There are levels of blood pressure and associated co-morbidities that the majority of authors agree require treatment pre-operatively. No elective patient should be operated upon with untreated grade 3 hypertension, i.e. systolic > 180 and diastolic > 110 ^{1,2} or inadequately treated hypertension associated with end organ dysfunction, e.g. the presence of coronary or cerebrovascular disease, impairment of renal function, signs of left ventricular hypertrophy, or heart failure.³ In addition, all causes of secondary hypertension should be investigated and treated before elective surgery e.g. pheochromocytoma or hyperaldosteronism.⁴

Severe peri-operative hypertension is a major threat to hypertensive patients, especially increases of blood pressure in excess of about 20% of the pre-operative value. Consequences of pressure surges include bleeding from vascular suture lines, cerebrovascular haemorrhage, and myocardial ischaemia or infarction. The mortality rate of such events may be as high as 50%.⁵

Post-operative hypotension leading to end organ dysfunction, e.g. decreased urine output < 0.5 mls/kg/hr, decreased level of consciousness, myocardial ischaemia, capillary refill > 2 seconds needs immediate management with fluid +/- vasopressors/inotropes.⁶

Best practice: research evidence or authoritative opinion

- D No patients with untreated grade 3 hypertension, untreated secondary hypertension or inadequately treated hypertension and end organ dysfunction should proceed to elective surgery.
- D Grade 3 hypertensive patients receiving urgent or emergency surgery should not have a rise in pressure of greater than 20% in the peri-operative and post-operative period.
- D No hypertensive patients with end organ dysfunction should have hypotension left untreated.

Suggested indicators

- D % patients with blood pressure recorded pre-operatively.
- D % patients receiving elective surgery despite contraindications.
- D % grade 3 hypertensive patients having urgent or emergency surgery with BP rise $> 20\%$.
- D % hypertensive patients with end organ dysfunction with hypotensive episode not treated within 10 minutes.

Proposed standard or target for best practice

- D 100% patients have their blood pressure recorded pre-operatively.
- D 100% patients have surgery appropriately deferred if they have a hypertensive contraindication.
- D 100% grade 3 hypertensive patients having urgent or emergency surgery do not have a blood pressure rise $> 20\%$.
- D 100% hypotensive patients with end organ dysfunction are treated within 10 minutes.

Suggested data to be collected

- D Pre-operative BP (+/- end organ dysfunction).
- D Elective or emergency classification and operation.
- D Age.
- D Treatment for hypertension prescribed (Yes/No).
- D Time to treatment of hypotension with end organ dysfunction.
- D Grade 3 hypertensive patients having urgent or emergency surgery with hypertensive episodes $> 20\%$ (% of patients).

Common reasons for failure to meet standard

- D Ignorance of standards.
- D Lack of departmental guideline.
- D Inadequate pre-operative assessment.
- D Failure to invasively monitor high risk patients.

CPD and Curriculum mapping

CPD matrix codes: **2A03, 2A06**

Training curriculum competence: **PO_BK_10**

References

- 1 Eagle KA et al. ACC/AHA guideline update for perioperative cardiovascular evaluation for noncardiac surgery—executive summary. A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee to Update the 1996 Guidelines on Perioperative Cardiovascular Evaluation for Noncardiac Surgery). *Circulation* 2002;**105**:1257–1267.
- 2 Goldman L, Caldera DL. Risks of general anesthesia and elective operation in the hypertensive patient. *Anesthesiology* 1979;**50**:285–292.
- 3 Nahar T, Devereux RB. Hypertension, cardiac hypertrophy and the effects of anaesthesia. In: Baillière's Clinical Anaesthesiology. *Baillière Tindall*, London 1997;**11**:675–703.
- 4 Howell SJ, Sear JW, Foëx P. Review: hypertension, hypertensive heart disease and perioperative cardiac risk. *Br J Anaesth* 2004;**92**:570–583.
- 5 Foëx P, Sear JW. The surgical hypertensive patient *Contin Educ Anaesth Crit Care Pain* 2004;**4**(5): 139–143.
- 6 Dobbs RE, Parvizi J, Lewallen DG. Perioperative Morbidity and 30-Day Mortality After Intertrochanteric Hip Fractures Treated by Internal Fixation or Arthroplasty. *J Arthroplasty* 2005;**20**(8):963–966.



3-5

Post-operative nausea and vomiting (PONV)

Dr A Kumar, Dr W Brampton

Why do this audit?

PONV remains an unpleasant side effect of anaesthesia and surgery. It unfavourably influences the degree of patient satisfaction and is rated high among anaesthesia outcomes that patients want to avoid.¹ Despite continued attempts at addressing this, PONV remains a difficult problem to prevent. It continues to contribute to patient discomfort and increased resource utilisation. Prevention and management of PONV is one of the components of an enhanced recovery package.

Best practice: research evidence or authoritative opinion

The incidence of PONV depends upon case-mix. Overall, after a general anaesthetic using inhalational agents and opioids without prophylactic anti-emetics, it is around 30%.² Some patients have a higher risk of developing PONV and scoring systems have been developed to estimate risk.^{3,4} Once PONV has developed, a sub-group of patients will suffer 'clinically important' PONV with significantly impaired recovery.⁵ This can be simplified, for audit purposes, to those with a visual analogue severity of nausea score of ≥ 75 mm on a 100mm scale (VAS) or vomiting ≥ 3 times.

It has been demonstrated that targeted administration of PONV prophylaxis to those with increased risk of PONV reduces its incidence.^{6,7} Moderate to high risk patients for PONV are targeted for prophylactic anti-emetics with the largest number of agents given to those at highest risk. However, compliance of anaesthetists to these guidelines remains low.⁸

An alternative strategy would be to administer PONV prophylaxis to all patients irrespective of their risk for developing PONV.⁹

PONV is multifactorial in origin. A multimodal approach that includes pharmacological and non-pharmacological interventions has been found to be effective.^{2,10}

In addition P6 acupuncture has been demonstrated to be of benefit¹¹ as is the use of propofol for anaesthetic maintenance and avoidance of nitrous oxide.^{10,12}

Suggested indicators

- D % patients should be assessed for risk of PONV.
- D % patients receiving PONV prophylaxis as per local guidelines.
- D % patients receiving treatment for PONV as per local guidelines.

Proposed standard or target for best practice

- D A 100% compliance with each indicator is ideal but impossible to achieve. The aim should be to measure the baseline levels of compliance of standards. Then implement locally agreed changes aimed at improvement using PDSA cycle methodology. Compliance should improve towards 100%.
- D Incidence of PONV should be lower than predicted by risk scoring.
- D Incidence of 'clinically important' PONV⁵ should be $< 20\%$ of all PONV patients. The incidence of PONV should decrease as compliance with the above standards increase.

Suggested data to be collected

- D Has a pre-operative PONV risk assessment been performed?
- D Were intra-operative anti-emetics given in accordance with local guidelines?
- D What is expected incidence of PONV during the first 24 hrs based upon risk score?
- D What is actual incidence of PONV during the first 24 hrs?
- D How severe was nausea on 100 mm VAS (≥ 75 mm is 'clinically important')?
- D How many times did patient vomit (≥ 3 is 'clinically important')?
- D What anti-emetic treatment was given in the post-operative period?
- D Did the patient feel PONV was well or badly managed and why?
- D Do the anaesthetists know what the PONV guidelines recommend?
- D Do the anaesthetists know the local PONV incidence?

Common reasons for failure to meet standard

Poor compliance with existing PONV guidelines. Reasons including:^{13,14}

- D absence or poor dissemination of local guideline on PONV prophylaxis
- D overly complex guideline that is difficult to apply
- D no individual or team with an interest in reducing incidence of PONV
- D complacency or lack of knowledge amongst anaesthetists about PONV, its impact on patient satisfaction and upon resource utilisation.

Related audits

Delivering enhanced recovery: helping patients to get better after surgery. DH, 2010

(www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_119382.pdf)

CPD and Curriculum mapping

CPD matrix codes: **IA02, II05, 2A03**

Training curriculum competence: **PO_BS_08**

References

- 1 Myles PS et al. Patient satisfaction after anaesthesia and surgery: results of a prospective survey of 10,811 patients. *Br J Anaesth* 2000;**84**(1):6–10.
- 2 Kranke P, Eberhart LH. Possibilities and limitations in the pharmacological management of postoperative nausea and vomiting. *Eur J Anaesthesiol* 2011;**28**(11):758–765.
- 3 Van Den Bosch JE et al. Assessing the applicability of scoring systems for predicting postoperative nausea and vomiting. *Anaesthesia* 2005;**60**(4):323–331.
- 4 Eberhart LH et al. Evaluation of three risk scores to predict postoperative nausea and vomiting. *Acta Anaesthesiol Scand* 2000;**44**(4):480–488.
- 5 Wengritzky R et al. Development and validation of a postoperative nausea and vomiting intensity scale. *Br J Anaesth* 2010;**104**(2):158–166.
- 6 Pierre S. Risk scores for predicting postoperative nausea and vomiting are clinically useful tools and should be used in every patient: Pro – ‘don’t throw the baby out with the bathwater’. *Eur J Anaesthesiol* 2011;**28**(3):160–163.
- 7 Apfel CC, Roewer N. Risk Assessment of Postoperative Nausea and Vomiting. *Int Anesthesiol Clin* 2003;**41**(4):13–32.
- 8 Kooij FO et al. Decision support increases guideline adherence for prescribing postoperative nausea and vomiting prophylaxis. *Anesth Analg* 2008;**106**(3):893–898.
- 9 Eberhart LH. Risk scores for predicting postoperative nausea and vomiting are clinically useful tools and should be used in every patient: Con – ‘life is really simple, but we insist on making it complicated’. *Eur J Anaesthesiol* 2011;**28**(3):155–159.
- 10 Apfel CC et al. A factorial trial of six interventions for the prevention of postoperative nausea and vomiting. *N Engl J Med* 2004;**350**(24):2441–2451.
- 11 Lee A, Fan Lawrence LTY. Stimulation of the wrist acupuncture point P6 for preventing postoperative nausea and vomiting. Cochrane Database of Systematic Reviews 2009, Issue 2. Art No: CD003281.
- 12 Fernández-Guisasola J et al. Association between nitrous oxide and the incidence of postoperative nausea and vomiting in adults: a systematic review and meta-analysis. *Anaesthesia* 2010;**65**(4):379–387.
- 13 Grol R, Grimshaw J. From best evidence to best practice: effective implementation of change in patients’ care. *Lancet* 2003;**362**(9391):1225–1230.
- 14 Frenzel JC, Kee SS, Ensor JE, Riedel BJ, Ruiz JR. Ongoing provision of individual clinician performance data improves practice behavior. *Anesth Analg* 2010;**111**(2):515–519.



3.6

Record keeping

Dr A Kennedy, Dr C Oliver

Why do this audit?

Good record keeping of the post-operative period is important as it enables effective communication between healthcare professionals, ensuring post-operative orders and prescriptions are followed.

Medical records are not only used for primary, but also for secondary clinical purposes including reporting the activity of hospital services, monitoring the performance of hospitals and research.¹

Poor medical records are not acceptable and can compromise medical care.² They also expose the hospital to an increased risk if there is litigation,² as documentation may be relied upon in medico-legal cases or for diagnoses of complications.

The quality of record keeping is often considered to reflect quality of care.³ As careful monitoring during the post-operative period is essential and you should keep paper or electronic audit trails to demonstrate good management decision-making.⁴

Best practice: research evidence or authoritative opinion

The Health Informatics Unit at the Royal College of Physicians, London, reviewed standards published by the medical Royal Colleges, specialist societies, GMC, medical defence organisations, and in the research literature.

Following wide consultation with the profession, medical records should comply with the generic standards of medical record-keeping published in 'A Clinicians Guide to Record Standards – Part 2: Standards for the structure and content of medical records and communications when patients are admitted to hospital'.⁵

The General Medical Council states: 'You must keep clear, accurate, legible records... and these records must be made at the same time, or soon afterwards.'⁴

The Medical Protection Society states: 'Records that secure continuity of care will be adequate for evidential purposes, in the event of a complaint, claim or disciplinary action. Abbreviations must be unambiguous and universally understood. Any alteration to both written and electronic records should be immediately apparent to avoid any accusation that there has been an attempt to mislead or deceive.'⁶

Suggested indicators

- D % of patients with complete medical record available at all times.
- D % of patient's records with every page that includes patient's name, identification number (NHS number) and location in the hospital.
- D % of records which have a standardised structure and layout.
- D % of records which are viewable in chronological order and reflect continuum of patient care.
- D % of records where every entry is dated, timed (24-hour clock), legible and signed by the person making the entry. The name and designation of the person making the entry should be legibly printed against their signature.

Proposed standard or target for best practice

- D All the above indicators should be true for 100% of patients or records and meet local and national standards on record keeping.

Suggested data to be collected

- D Retrospective audit comparing post-operative patient record keeping with local and national standards.
- D Special attention should be paid to cases which returned to theatre, required unplanned post-operative HDU/ICU admission from recovery or where complications arose.



Common reasons for failure to meet standard

- D Missing medical records.
- D Illegibility of handwritten record and illegibility of signature.
- D Failure to date and sign records.
- D Inaccurate recording of information and insufficient detail.
- D Lack of equipment in recovery (e.g. for invasive monitoring).
- D Inadequate documentation of post-operative instructions from anaesthetist or surgeon.

Related audits

- 2.4 Anaesthetic records
- 3.1 Recovery room staffing and monitoring provision

CPD and Curriculum mapping

CPD matrix codes: **IG01**

Training curriculum competence: **IO_BS_06**

References

- 1 Carpenter I, et al. Medical records and record-keeping standards. *Clin Med* Aug;7(4):328–331.
- 2 Callum KG et al. The 2002 Report of the National Confidential Enquiry into Perioperative Deaths. Section 5 – Postoperative care. *NCEPOD*, London 2002 (<http://www.ncepod.org.uk/pdf/2002/02full.pdf>).
- 3 Utting JE. Pitfalls in anaesthetic practice. *Br J Anaesth* 1987;59:888–890.
- 4 The General Medical Council. Management for Doctors – Keeping Records. *GMC*, London 2006 (http://www.gmc-uk.org/guidance/ethical_guidance/management_for_doctors.asp).
- 5 Health Informatics Department, Royal College of Physicians. A Clinicians Guide to Record Standards – Part 2: Standards for the structure and content of medical records and communications when patients are admitted to hospital. *Academy of Medical Royal Colleges*, London October 2008 (http://www.rcplondon.ac.uk/sites/default/files/clinicians-guide-part-2-standards_o.pdf)
- 6 The Medical Protection Society. Medical Records – An MPS Guide. *MPS* June 2011 (<http://www.medicalprotection.org/uk/booklets/MPS-guide-to-medical-records>).

3-7

Discharge protocols

Dr R E Murphy

Why do this audit?

Discharge from recovery should occur in a timely fashion and to an appropriate destination in order to maintain patient safety and comfort whilst maximising efficient use of services. Discharge protocols are used to assess the fitness of patients to return to the ward or other clinical areas. Regular revision and audit of standards of care, guidelines and protocols are essential in the development and improvement of post-anaesthetic patient care.¹

Best practice: research evidence or authoritative opinion

The importance of post-anaesthesia recovery facilities in ensuring patient safety has been stressed by the Royal College of Anaesthetists (RCoA),¹ the Association of Anaesthetists (AAGBI),² and in reports from the National Confidential Enquiry into Perioperative Deaths.³

The RCoA and AAGBI advise that agreed criteria for discharge of patients from the recovery room to the ward should be in place.^{1,2}

Following a discharge, protocol can assist the nurses (and anaesthetists) to ensure patient safety, comfort (freedom from pain and emesis) and adequacy of documentation. Furthermore, following discharge protocols may improve efficiency of the unit with appropriate and timely discharges; discharge criteria based on the Aldrete's scoring system⁴ have been shown to be associated with a significantly reduced post-anaesthesia care unit (PACU) length of stay in comparison with time-based criteria.⁵

Suggested indicators

- D % patients discharged from recovery to a general ward satisfying post-anaesthesia discharge criteria.
- D % patients not meeting criteria who are reviewed by an anaesthetist prior to discharge.
- D % patients who do not satisfy the criteria who are discharged to a safe destination in the opinion of the auditor: This would usually be an HDU or ICU, but may be a general ward in some circumstances (e.g. a patient with poorly controlled nausea or mild pain despite best efforts).
- D Adequate documentation of fitness for discharge and ongoing care requirements.
- D Time spent in the post-anaesthetic care unit (PACU) despite the patient fulfilling the discharge protocol criteria.

Proposed standard or target for best practice

- D PACU should have a protocol for discharge from recovery.
- D 100% of staff should be aware of and familiar with the discharge protocol.
- D 100% of patients should be assessed using the protocol.
- D 100% of patients meeting the discharge protocol requirements should be discharged from PACU in a timely manner.
- D 100% of patients failing to meet discharge protocol requirements should be reviewed by an anaesthetist.
- D 100% of patients failing to meet discharge protocol should be discharged to an appropriate, safe destination.

Suggested data to be collected

- D Presence of discharge protocol.
- D Staff awareness and familiarity with the locally agreed discharge protocol.
- D Recovery room length of stay.
- D Discharge destination and presence of ongoing plan in notes.
- D Compliance with discharge protocol.
- D Reason(s) for failing to meet discharge criteria.
- D Adequacy of completion of local discharge protocol documentation.
- D Time spent in PACU post patient satisfying discharge protocol criteria.
- D Communication with anaesthetist in PACU.

(Factors which may affect discharge of patients: patient's age and ASA status, procedure, anaesthetist and grade, type of anaesthetic including regional blocks, pain and nausea scores on arrival and discharge from PACU, recovery nurse or person taking responsibility for discharge.)

Common reasons for failure to meet standard

- D Persistent pain.
- D Persistent PONV.
- D Post-PACU destination unable to accept patient in a timely fashion despite patient meeting discharge protocol criteria.
- D Lack of HDU/ICU bed.

Related audits

- 3.1 – Recovery room staffing and monitoring provision.
- 3.5 – Post-operative nausea and vomiting (PONV).
- 3.6 – Record keeping.
- 3.8 – Unplanned admission of elective surgical patients to HDU/ICU.
- 11.3 – Pain management in the recovery room.

CPD and Curriculum mapping

Training curriculum competence: PO_BK_13, PO_BS_11

References

- 1 Guidance on the provision of anaesthetic services for postoperative care. RCoA, London 2004 (<http://www.rcoa.ac.uk/node/710>).
- 2 Immediate postanaesthetic recovery. AAGBI, London 2002 (<http://www.aagbi.org/pdf/Postanaes2002.pdf>).
- 3 Campling EA et al. The report of the National Confidential Enquiry into Perioperative Deaths 1993/1994. NCEPOD, London 1996 (<http://www.ncepod.org.uk/>).
- 4 Aldrete JA, Kroulik D. A postoperative recovery score. *Anesth Analg* 1970;49:924–933.
- 5 Troung L, Moran JL, Blum P. Post anaesthesia care unit discharge: a clinical scoring system versus traditional time-based criteria. *Anaesth Intens Care* 2004;32(1):33–42.



3.8

Unplanned admissions of elective surgical patients to HDU/ICU

Dr J F Silsby

Why do this audit?

Anticipation of the requirement for post-operative admission to a critical care area well in advance of surgery helps with resource allocation and with the planning of staffing levels. Unplanned admissions can have a significant impact on the efficient running of a critical care area and may even prompt premature discharge or non-clinical transfer of other patients. Elective surgery should be postponed if the appropriate level of post-operative care is unlikely to be available.

Best practice: research evidence or authoritative opinion

With adequate pre-operative assessment, most post-operative admissions should be anticipated well in advance. An accurate and structured pre-operative consultation should identify the vast majority of patients who will require intensive care.^{1,2} There is little in the literature on the % of elective surgical procedures which result in unplanned HDU/ICU admission. However, we do know from the ICNARC database (December 1995 to July 2005)³ that unplanned surgical admissions after elective surgery comprised 30.8% of HDU/ICU surgical admissions. More recent data from the ICNARC database (1 January 2010 to 31 December 2010)⁴ suggests nationally there has been improvement, with unplanned admissions following elective surgery now comprising 10.7% of surgical admissions.

Suggested indicators

D % admissions to ICU or HDU following elective surgery which are unplanned.

Proposed standard or target for best practice

The number of unplanned admissions should be low. Less than 5% could be taken as a gold standard. Units should audit their own current data before setting a realistic goal. The key would be to see improvement in a unit's starting point.

Suggested data to be collected

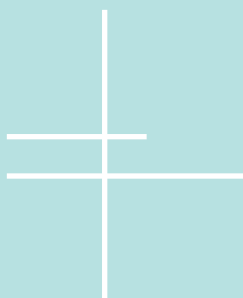
- D Primary reason for unplanned admission (surgical complications/complexity or anaesthetic complications/complexity)
- D Grade of senior surgeon/anaesthetist involved.
- D Time spent in PACU (if any) before HDU admission.
- D Adequacy of pre-operative assessment. Percentage of patients who were reviewed in (preferably) anaesthetist-led pre-operative assessment clinics.
- D Sequelae of unplanned admission; cancellation of other elective cases, premature discharge of HDU patients, non-clinical transfers.⁵

Common reasons for failure to meet standard

- D Inadequate pre-operative assessment by inexperienced and/or junior staff.
- D Surgical failure to communicate or anticipate the extent of the required surgery.
- D Anaesthetist failing to alert ICU/HDU after pre-operative assessment.
- D Surgical or anaesthetic problems resulting from inexperience or avoidable mishap.
- D Unavoidable issues relating to complexity of case (anaesthetic or surgical)

Related audits

4.9 – ICU/HDU admission after emergency surgery.



CPD and Curriculum mapping

CPD matrix codes: 2A03, 2C01, 2C03, 2C04, 2C07, 3C00

References

- 1 Varon AJ et al. Preoperative intensive care unit consultations: accurate and effective. *Crit Care Med* 1993;**21**(2):234–239.
- 2 Forrest JB et al. Multi-centre study of General Anesthesia. III. Predictors of Severe Perioperative Adverse Outcomes. *Anesthesiology* 1992;**76**:3–15.
- 3 ICNARC Case Program Database. *ICNARC*, London (<http://www.icnarc.org>).
- 4 Personal request. *ICNARC*, London (<http://www.icnarc.org>).
- 5 Goldfrad C, Rowan K. Consequences of discharges from intensive care at night. *Lancet* 2000;**355**:1138–1142.



3-9

Post-operative visiting

Dr G K Simpson, Dr M B Walburn

Why do this audit?

Post-operative care is an important aspect of an anaesthetist's role,¹ although it has not been previously well defined beyond the immediate post-operative period,² despite being a legal requirement in some countries.³ Therefore post-operative visiting of patients on the ward may be highly variable and depend on the individual anaesthetist. Most early post-operative complications are due to alterations in physiology which anaesthetists are well trained to manage. Adequate pain management may reduce morbidity⁴ and the early transfer of high risk patients to intensive care may reduce mortality.⁵ This audit may demonstrate the requirement for both individual and systemic changes, to ensure the delivery of high quality post-operative care.

Best practice: research evidence or authoritative opinion

College guidance on the provision of anaesthesia services for post-operative care, stipulates groups of patients that should be visited within 24 hours of their operation.⁶ An anaesthetist should consider appropriate local or nationally agreed guidelines when planning an anaesthetic, and ensure arrangements are made for the continuing care of the patient where necessary, including the provision of appropriate post-operative care.⁷ Although an in-hospital post-anaesthetic follow-up of 21,116 patients identified major complications in 0.37% (minor complications 8.15%),⁸ there is a higher incidence of emergencies in ASA 4 patients and those operated on out-of-hours, the outcome for whom, may be improved by an appropriate post-operative review.⁵

Suggested indicators

- D The percentage of patients listed below who are visited post-operatively by an anaesthetist.
- D The percentage of patients listed below who are visited post-operatively by their own anaesthetist:
 - ◆ American Society of Anaesthesiologists (ASA) Physical Status 3, 4 or 5
 - ◆ those receiving epidural or patient controlled analgesia in a general ward
 - ◆ patients discharged from recovery with invasive monitoring *in-situ*
 - ◆ complicated intra-operative course
 - ◆ those for whom a request is made by other medical, nursing or other clinical colleagues
 - ◆ those for whom there is any other appropriate need.

Proposed standard or target for best practice

- D 100% of patients, listed above should be visited by an anaesthetist, within 24 hours of discharge from recovery, ideally by their own anaesthetist.

Suggested data to be collected

The following data to be collected and interpreted over short periods (days, weeks), followed by a cycle of design, implementation, testing, impact measurement and retesting of changes (Plan, do, study, act):

- D Anaesthetist and grade.
- D Day and time of surgery.
- D Patient category (above list).
- D Time from end of surgery and visit.
- D Post-operative interventions initiated.
- D Patient's opinion of the value of visit.
- D Anaesthetist's opinion of value of visit.
- D Reasons for failure to visit.

Consider the following questions:

- D Are there systems in place that ensure post-operative visiting takes place?
- D Are there barriers to post-operative visiting and what are they?
- D Are there variations in practice?
- D Are there variations in knowledge of guidelines, standards, and the importance of post-operative visiting?

Common reasons for failure to meet standard

- D Patient already discharged.
- D Excessive workload.
- D Multiple site working.
- D Friday operating lists.
- D On-call duties.
- D Annual/study leave.
- D Attitude of anaesthetist.

CPD and Curriculum mapping

Training curriculum competence: PO_BS_11

References

- 1 Guidance on the (new) 2003 contract and job planning for consultant anaesthetists. *AAGBI*, London 2005 (<http://www.aagbi.org/sites/default/files/jobplanning05.pdf> – under review).
- 2 The anaesthesia team 3. *AAGBI*, London 2010 (http://www.aagbi.org/sites/default/files/anaesthesia_team_2010_0.pdf).
- 3 Zvara DA et al. The importance of the postoperative anaesthetic visit: do repeated visits improve patient satisfaction or physician recognition? *Anesth Analg* 1996;**83**:793–797.
- 4 Rally FE. Postoperative care. *Can J Anaesth* 1996;**43**:759–763.
- 5 Lee A et al. Early postoperative emergencies requiring an intensive care team intervention. *Anaesthesia* 1998;**53**:529–535.
- 6 Guidance on the provision of anaesthesia services for post-operative care (revised 2009) *RCoA*, London 2009 (<http://www.rcoa.ac.uk/node/710>).
- 7 The Good Anaesthetist, standards of practice for career grade anaesthetists. *RCoA*, London February 2010 (<http://www.rcoa.ac.uk/node/1955>).
- 8 Burnham M, Craig DB. A post anaesthetic follow-up program. *Can Anaesth Soc J* 1980;**27**:164–168.



3.10

Handover of responsibility for patients in the post-anaesthetic care unit (PACU)

Dr S Chadwick, Dr A Norman

Why do this audit?

Effective handover of a patient's care in the recovery room is essential for the continuity, quality and safety of patient care.

Best practice: research evidence or authoritative opinion

The Association of Anaesthetists guidelines¹ state that 'the anaesthetist must formally hand over care of a patient to a recovery room nurse or other appropriately trained member of staff'.

Much of this is an informal process.² Handover between nurses has been extensively analysed.³ With the introduction of shiftworking patterns there has been some work on handover between doctors⁴ although there is very little published on handover between different professions.⁵ Systems exist for a standardised transfer of information between healthcare professionals.⁶

Suggested indicators

- D Patient details, operation and theatre.
- D Underlying medical disorder.
- D Allergy information.
- D Anaesthetic technique including airway management.
- D Peri-operative course and complications.
- D Appropriate prescription charts available.
- D Post-operative plan documented.
- D Plan for continued invasive monitoring documented.
- D Immediate concerns for the patient.

Proposed standard or target for best practice

- D 100% of handovers should include patient name, operation and theatre.
- D 100% of handovers should include information on the patient's underlying medical disorders.
- D 100% of handovers should include information on a patient's allergies.
- D 100% of handovers should include information on the anaesthetic technique used including airway management.
- D 100% of handovers should have all appropriate prescription charts available including medication, fluids and analgesia.
- D 100% of handovers should have a post-operative plan documented.
- D 100% of handovers should have a plan for continuing invasive monitoring if required.

Suggested data to be collected

Quality of handover assessed by PACU staff using criteria from SBAR system:⁷

S:

- D patient details
- D operation type
- D theatre
- D allergy status.

B:

- D medical background.

A:

- D type of anaesthetic
- D uneventful procedure or any intra-operative complications and management.

R:

- D airway management in PACU
- D prescription charts in use and completeness
- D documented post-operative plan
- D documented plans for continued invasive monitoring if appropriate
- D data collected monthly and fed back to individuals and department. PDSA cycles used to develop a reliable handover process.

Common reasons for failure to meet standard

- D Poor professionalism.
- D Poor compliance to standards.
- D Time constraints.
- D Inadequate staffing levels.
- D Lack of understanding/communication.

CPD and Curriculum mapping

CPD matrix codes: **II03, II05**

Training curriculum competence: **PO_BS_05**

References

- 1 Immediate postanaesthetic recovery. *AAGBI*, London 2002 (<http://www.aagbi.org/sites/default/files/postanaes02.pdf>).
- 2 Smith AF et al. Interprofessional handover and patient safety in anaesthesia: observational study of handovers in the recovery room. *Br J Anaesth* 2008;**101**(3):332–337.
- 3 Sherlock C. The patient handover: a study of its form, function and efficiency. *Nurs Standard* 1995;**9**:33–36.
- 4 Horn J, Bell MDD Moss E. Handover of responsibility for the anaesthetised patient-opinion and practice. *Anaesthesia* 2004;**59**:658–663.
- 5 Anwari JS. Quality of handover to the postanaesthesia care unit nurse. *Anaesthesia* 2002;**57**:488–493.
- 6 Quality and Service Improvement Tools. *NHS Institute for Innovation and Improvement* (http://www.institute.nhs.uk/option,com_quality_and_service_improvement_tools/Itemid,5015.html).
- 7 Institute for Healthcare Improvement. SBAR: Situation-Background-Assessment-Recommendation (<http://www.ihl.org/explore/SBARCommunicationTechnique/Pages/default.aspx>).



3.11

Patient satisfaction with anaesthesia

Dr R Moonesinghe, Dr S Barnett

Why do this audit?

Patient satisfaction has been highlighted as an outcome which is essential for measuring the quality of healthcare in numerous DH reports.^{1,2} Both the quality improvement drive and revalidation agenda support the use of patient satisfaction to measure performance for departments and/or individual doctors.³

Best practice: research evidence or authoritative opinion

There are a number of psychometrically developed and validated patient satisfaction measures in the literature, which have been shown to be acceptable to patients and which are able to provide useful information on the quality of care. Simply asking a patient if they are 'satisfied' with their care or using a non-psychometrically developed instrument runs the risk of biased results, as patients may be inclined to provide 'positive' answers in order to please staff and avoid negative repercussions.⁴

Suggested indicators

A psychometrically developed and validated questionnaire should ideally be used. One example is provided here⁵ although there are numerous others which measure the patient's perception of either the quality of recovery^{6,7,8} or the overall anaesthetic care.^{5,9}

Proposed standard or target for best practice

Measurement of patient satisfaction at baseline, and then re-auditing to assess if improvement.

Suggested data to be collected**Anaesthesia-related discomfort**

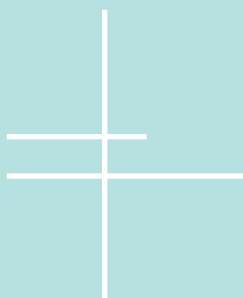
- D Drowsiness
- D Pain at the site of surgery
- D Thirst
- D Hoarseness
- D Sore throat
- D Nausea or vomiting
- D Feeling cold
- D Confusion or disorientation
- D Pain at the site of the anaesthetic injection
- D Shivering

Satisfaction with anaesthesia care

- D Information given by the anaesthetist before the operation
- D Waking up from anaesthesia
- D Pain therapy after surgery
- D Treatment of nausea and vomiting after the operation
- D Care provided by the department of anaesthesia in general

Common reasons for failure to meet standard

No specific standards exist, but misleading results may be obtained using non-validated tools. Poor patient satisfaction with specific areas of anaesthesia care (e.g. pain control).



Related audits

3.5 – Post-operative nausea and vomiting (PONV)
 11.3 – Pain management in the recovery room
 11.8 – Patient satisfaction (pain)

CPD and Curriculum mapping

CPD matrix codes: 1105

References

- 1 Darzi A. High quality care for all: NHS Next Stage Review final report. DH, London June 2008 (http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_085825).
- 2 Transparency in Outcomes – a framework for the NHS. DH, London 2010 (http://www.dh.gov.uk/en/Consultations/Closedconsultations/DH_117583).
- 3 Moonesinghe SR, Tomlinson AA. Quality improvement and revalidation: two goals, same strategy? *Br J Anaesth* 2011;**106**(4):447–450.
- 4 Fung D, Cohen MM. Measuring patient satisfaction with anesthesia care: a review of current methodology. *Anesth Analg* 1998;**87**(5):1089–1098.
- 5 Bauer M et al. Measuring patient satisfaction with anaesthesia: perioperative questionnaire versus standardised face-to-face interview. *Acta Anaesthesiol Scand* 2001;**45**(1):65–72.
- 6 Myles PS et al. Development and psychometric testing of a quality of recovery score after general anesthesia and surgery in adults. *Anesth Analg* 1999;**88**(1):83–90.
- 7 Myles PS et al. Validity and reliability of a postoperative quality of recovery score: the QoR-40. *Br J Anaesth* 2000;**84**(1):11–15.
- 8 Royse CF et al. Development and feasibility of a scale to assess postoperative recovery: the post-operative quality recovery scale. *Anesthesiology* 2010;**113**(4):892–905.
- 9 Caljouw MA, van BM, Boer F. Patient's satisfaction with perioperative care: development, validation, and application of a questionnaire. *Br J Anaesth* 2008;**100**(5):637–644.

