



Section 8: Obstetric services

Edited by

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Adequacy of staffing

Dr S M Kinsella, Dr B Walton

Why do this audit?

The core contribution of anaesthetists to labour ward routine is recognised. The Confidential Enquiries into Maternal Deaths (CEMD) 1999¹ also highlighted the need for more anaesthetic pre-assessment of high risk cases during pregnancy and earlier intrapartum involvement of the senior anaesthetist in high risk cases. A rising caesarean section rate,² ageing parturient population, increased demand for regional analgesia, and working hours restrictions mean that adequate staffing levels may be difficult to predict and provide for any individual Obstetric Unit.

Best practice: research evidence or authoritative opinion

CEMD¹ stressed the importance of a dedicated obstetric anaesthesia service including adequate consultant cover and appropriate experience of the trainee covering the labour ward. Detailed requirements have been suggested by the Association of Anaesthetists of Great Britain and Ireland/Obstetric Anaesthetists' Association.³

Suggested indicators

Provision of staff as specified by the AAGBI/OAA:³

- a basic minimum for any consultant-led obstetric unit of 10 consultant anaesthetic PAs/sessions per week.
- an on call consultant anaesthetist responsible for the unit at other times. This includes daytime hours when the regular consultant anaesthetist is on leave.
- a duty anaesthetist available immediately 24 h/day. If a trainee, they should have at least 1 year's anaesthetic experience and have undergone a formal assessment before being allowed on call.
- a second anaesthetist, available if needed particularly at predictably busy times, e.g. 0800–1230.⁴
- a multidisciplinary resuscitation team for maternal emergencies 24 h/day.
- a suitably trained anaesthetic assistant at every theatre procedure who does not have other duties in theatre.⁵

% occasions during the audit period that the attending anaesthetist considered that attending the maternity unit was detrimental to the care of a patient elsewhere.

Proposed standard or target for best practice

Staffing levels should be as described above.

100% of cases in theatre should have a suitably trained assistant present.

On 100% occasions the anaesthetist should attend within an appropriate period of time and without compromising the care of a patient elsewhere (see also 8.6 Response times for provision of intrapartum analgesia and anaesthesia).

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| Suggested data to be collected | <p>Nominal staffing levels.</p> <p>Actual staffing levels including during periods of leave of regular staff.</p> <p>Experience of trainees covering labour ward.</p> <p>Time from intervention request to attendance.</p> <p>Details of occasions where the anaesthetist had a conflict of responsibility as above.</p> <p>Suggested audit frequency – yearly.</p> |
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| Common reasons for failure to reach standards | <p>Funding and recruitment problems.</p> <p>Provision of anaesthetic services on multiple sites within a hospital.</p> <p>Exceptional and unpredictable changes in workload.</p> |
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| Related audits | 8.6 – Response times for provision of intrapartum analgesia and anaesthesia |
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|-------------------|---|
| References | <ol style="list-style-type: none"> 1 Department of Health. Confidential Enquiries into Maternal Deaths. Why mothers die 1997–1999. <i>RCOG Press</i>, London 2001. 2 Royal College of Obstetricians and Gynaecologists Clinical Effectiveness Support Unit. The national sentinel caesarean section audit report. <i>RCOG Press</i>, London 2001. 3 Association of Anaesthetists of Great Britain and Ireland and Obstetric Anaesthetists' Association. Guidelines for obstetric anaesthesia services. <i>AAGBI</i>, London 2005 (see: www.aagbi.org/pdf/Obstetric.pdf). 4 Wee MYK, Yentis SM, Thomas P. Obstetric anaesthetists' workload. <i>Anaesthesia</i> 2002;57:493–500. 5 Association of Anaesthetists of Great Britain and Ireland. The anaesthesia team. <i>AAGBI</i>, London 2005 (see: http://www.aagbi.org/pdf/the_anaesthesia_team.pdf). |
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Timely anaesthetic involvement in the care of high risk mothers

Dr S Francis, Dr A E May

Why do this audit?

Team management is essential to good obstetric practice, in particular with high risk mothers. This audit may be applied to several areas and we suggest that one of the following is chosen:

- women with medical disease (e.g. cardiac disease, diabetes, severe asthma, haematological disorders and neurological disease)
- women with pregnancy induced hypertension (PIH)
- women with significant obstetric haemorrhage.

Best practice: research evidence or authoritative opinion

Successive reports of the Confidential Enquiries into Maternal Deaths in the United Kingdom¹⁻³ have recommended 'timely anaesthetic involvement'. The 1985-87 report recommended 'flagging' women with cardiac disease and diabetes. These recommendations have been repeated and extended in later reports. Women with PIH and significant haemorrhage should also receive joint care from an early stage.¹⁻³

Suggested indicators

% mothers with a medical problem known to the obstetric team who arrived on labour ward having had previous anaesthetic consultation. Cardiac disease, diabetes, severe asthma or other respiratory disease, neurological disease and thrombocytopenia should be included.

A particular group may be audited more closely. For example, % cardiac patients who are New York Heart Association grade 2 (NY2) or worse who were seen by an obstetric anaesthetic consultant before labour begins. A management plan for delivery should be set out in the notes.

% mothers with significant PIH who were known to the anaesthetist within 1 h after arrival on the labour ward. A unit policy should exist for criteria for informing the anaesthetist.

% cases where significant obstetric haemorrhage occurred and where the anaesthetist was involved at an early stage in the opinion of the auditor and the anaesthetist. Again, a unit policy should exist, for example 1,000 ml loss and still bleeding.

Proposed standard or target for best practice

All the above indicators should be true in 100% cases.

Suggested data to be collected

Data for the audit on medical problems may be obtained from retrospective review of the notes. The other two topics would require monitoring of labour ward activity looking for relevant patients and questioning the anaesthetist and midwives about the timing of anaesthetic involvement.

Common reasons for failure to reach standards

Poor communication between staff within the maternity hospital.
Failure to recognise the relevance of medical disease.
Poor data collection in the antenatal period.
Lack of organised route of access to an anaesthetic opinion antenatally.

References

- 1 Department of Health. Report on Confidential Enquiries into Maternal Deaths in the United Kingdom 1994–1996. *HMSO*, London 1998.
- 2 Department of Health. Report on Confidential Enquiries into Maternal Deaths in the United Kingdom 1997–1999. *HMSO*, London 2001.
- 3 Department of Health. Report on Confidential Enquiries into Maternal Deaths in the United Kingdom 2000–2002. *HMSO*, London 2004.

Information about obstetric anaesthesia and analgesia

Dr J Middle, Dr M Wee

Why do this audit?

The *Changing childbirth* report made explicit the right of women to be involved in the decisions regarding all aspects of their care during pregnancy and childbirth.¹ One of the priorities of the report is to enable women to make informed decisions about their care.² Women require access to evidence-based information to enable them to make these decisions.³ Changing legal and public expectations demand that we adapt our current practice and improve the accuracy and timing of information provided.⁴

Best practice: research evidence or authoritative opinion

When?

Women should have access to information antenatally, which should be available whenever and wherever it is needed. It should be in an appropriate lay language, about all types of analgesia and anaesthesia available, including information about related complications. 1 in 5 women will have caesarean section (CS) and therefore written information should be received about anaesthesia for CS when CS is booked.³ Women should still receive an explanation at the time of the proposed procedure.⁵

How?

Leaflets should be written in patient friendly language with lay and healthcare personnel input. A study in 2003 showed patients receiving the Obstetric Anaesthetists' Association (OAA) leaflet *Pain relief in labour*, in addition to the usual information at booking, were more knowledgeable than those receiving only standard booking information.⁶ During labour, patient recall and satisfaction can be improved by using written information cards about regional anaesthesia to reinforce information given both antenatally and during labour.⁷ Communication and information should be provided in a form that is accessible to all, including those whose first language is not English, those who cannot read and those with learning difficulties.³ Interpreters should be made available to women who do not speak English. When feasible these should not be family members.⁵

Who by?

Patients should have access to health professionals with more detailed specialist knowledge if they desire.⁸ Information can be given to women at high risk in anaesthetic pre-assessment clinics.

How much?

Women should be informed of the level of availability of anaesthesia and regional analgesia in each unit.⁵ Anaesthetists should be flexible in their disclosure of information when obtaining consent for regional anaesthesia and consider the particular wishes of each patient rather than following rigid guidelines.⁹ The patient should have the opportunity to ask any questions. Information given should be documented. Good practice advice in preparation and use of written patient information should be followed.¹⁰

Suggested indicators

% mothers receiving antenatal education on analgesia and anaesthesia.

% mothers receiving written information to reinforce this.

Existence of unit information cards to improve knowledge and satisfaction.

% mothers who can answer questions about anaesthetic options before they are in labour (e.g. 36-week clinic).

% non-English speaking mothers receiving written information on analgesia and anaesthesia in relevant language.

% non-English speaking mothers where an interpreter was available during delivery.

% mothers satisfied with level of information they were given antenatally and during labour.

% mothers satisfied with information given at time of complication and afterwards.

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| Proposed standard or target for best practice | <p>> 75% mothers to receive education and written information as above.</p> <p>> 75% non-English speaking mothers receiving written information on analgesia and anaesthesia in relevant language.</p> <p>> 50% mothers at the 36 week clinic to answer questions correctly.</p> <p>> 50% cases an interpreter was available during delivery of non-English speaking mothers.</p> <p>100% of units should have unit information card to improve mothers' knowledge and satisfaction.</p> <p>A target of > 80% women to be satisfied they were given sufficient information both antenatally and during labour.</p> |
| Suggested data to be collected | <p>Mothers may be questioned on admission to 36 week clinic.</p> <p>Note the source of their information and ease with which it was accessed.</p> <p>Examine notes and epidural/anaesthetic chart for documentation of information given antenatally.</p> <p>Mothers may be seen postpartum to assess satisfaction.</p> <p>Suggested audit frequency – yearly.</p> |
| Common reasons for failure to reach standards | <p>Non-attendance at antenatal classes.</p> <p>Inadequate availability of patient information leaflets.</p> <p>Inadequate availability of patient information leaflets in foreign languages.</p> <p>Inadequate availability of patient information in other media forms.</p> <p>Insufficient or non-availability of interpreter services.</p> |
| Related audits | <p>I.1 – Patient information about anaesthesia</p> |
| References | <ol style="list-style-type: none"> 1 Department of Health. Changing childbirth. Report of the Expert Maternity Group. Part 1. HMSO, London 1993. 2 Bekker H et al. Informed decision making. An annotated bibliography and systematic review. <i>Health Technol Assess</i> 1999;3:1–150. 3 National Collaborating Centre for Women's and Children's Health. Caesarean section: Clinical guideline. <i>NCC-WCH</i>, London 2004. 4 Kelly GD et al. Consent for regional anaesthesia in the United Kingdom: what is material risk? <i>Int J Obstet Anesth</i> 2004;13(2):71–74. 5 Royal College of Anaesthetists. Guidance on the provision of obstetric anaesthesia services. <i>RCoA</i>, London 2005 (see: www.rcoa.ac.uk/docs/GPAS-Obs.pdf). 6 Stewart A et al. Assessment of the effect upon maternal knowledge of an information leaflet about pain relief in labour. <i>Anaesthesia</i>. 2003;58(10):1015–1019. 7 White LA et al. Written information about epidural analgesia for women in labour: did it improve knowledge? <i>Int J Obstet Anesth</i> 2004;12(2):93–97. 8 Association of Anaesthetists of Great Britain and Ireland. Consent for anaesthesia. <i>AAGBI</i>, London 2006 (see: www.aagbi.org/pdf/Consent.pdf). 9 Bethune L et al. Complications of obstetric regional analgesia: how much information is enough? <i>Int J Obstet Anesth</i> 2004;13(1):30–34. 10 Royal College of Anaesthetists. Raising the standard: Information for patients. <i>RCoA</i>, London 2003 (see: www.rcoa.ac.uk/index.asp?PageID=126). |

Pain management in labour

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Why do this audit?

It is a basic humanitarian aim to provide women with appropriate pain relief in labour if wished for. Women may wish for different degrees of pain relief, using either non-pharmacological or pharmacological methods, and these choices should be respected. NICE is currently investigating standards for intrapartum care including analgesia, due to report in 2007 (see: www.nice.org.uk/page.aspx?o=63356).

Women who deliver in certain places such as at home or in midwifery-led birthing units may not have access to regional analgesic techniques. All women should be aware of the types of analgesia available in their chosen place of delivery.

Best practice: research evidence or authoritative opinion

The *Changing childbirth* report supported the right of women to choose options for their labour and delivery.¹

Maternal satisfaction with labour analgesia is often high,^{2,3} although women who use several types of analgesia have the most dissatisfaction.⁴ In a large survey, maternal dissatisfaction with epidural analgesia was linked to an increase in the duration of labour and increase in the need for forceps delivery.⁴

Motor block in the legs is a prominent side effect when high-concentration local anaesthetic is used for maintaining epidural analgesia.

Attention to detail in the way in which satisfaction is gauged is important to bring out subtle problems.⁵

Suggested indicators

Rate of regional anaesthesia may fluctuate with time in a particular unit, but because of different population characteristics, there is no 'right' value for this.⁶

It is desirable that women do not use any other analgesia after commencement of regional analgesia.

Satisfaction with pain relief; dissatisfaction with side effects of pain relief.

Proposed standard or target for best practice

> 90% satisfaction rate for non-regional analgesia.

> 95% satisfaction rate with regional analgesia

< 5% women who use other analgesia after commencement of regional analgesia.

Suggested data to be collected

Overall analgesia provision – split into nulliparous and parous women.

- Pharmacological and non-pharmacological analgesia use.

- Type of regional analgesia – spinal/combined spinal epidural/epidural using concentrated local anaesthetic doses for maintenance (> 0.125% bupivacaine or equivalent)/low concentration epidural for maintenance (≤ 0.125% bupivacaine or equivalent).⁷

Post-delivery follow up assessment.

- Satisfaction with pain relief; dissatisfaction with side effects of non-regional analgesia (e.g. sedation, nausea, loss of control) and regional analgesia (e.g. motor block, itch) (follow up visit also an opportunity for audit of anaesthetic complications: see audit 8.12).

- Women who were not given regional analgesia, even though requested.

Where applicable – rate of transfer of women into main unit for regional analgesia from birthing areas where it is not available.⁸

Common reasons for failure to reach standards

- Poor individualised advice to women on likely requirement for analgesia.
- Poor selection or antenatal education of women who need subsequent transfer to main unit for regional analgesia.
- Poor selection or delayed referral leading to women who deliver before effective regional analgesia can be established.
- Lack of midwifery staff to care for women with regional analgesia.
- Inadequate input by anaesthetist into regional analgesia management once it has been established.
- Use of high concentration local anaesthetics to maintain epidural analgesia.

Related audits

- 8.3 – Information about obstetric anaesthesia and analgesia
- 8.6 – Response times for provision of intrapartum analgesia and anaesthesia
- 11.2 – Patient information on pain management

References

- 1 Department of Health. Changing childbirth. Report of the Expert Maternity Group. Part 1. HMSO, London 1993.
- 2 Capogna G et al. Maternal expectations and experiences of labour pain and analgesia: a multicentre study of nulliparous women. *Int J Obstet Anesth* 1996;**5**:229–235.
- 3 Anim-Somuah M, Smyth R, Howell C. Epidural versus non-epidural or no analgesia in labour. Cochrane Database of Systematic Reviews 2005, Issue 4. Wiley, London 2005 (see: www.cochrane.org/reviews/en/ab000331.html).
- 4 Morgan BM et al. Analgesia and satisfaction in childbirth (the Queen Charlotte's 1000 mother survey). *Lancet* 1982;**ii**:808–810.
- 5 Robinson PN, Salmon P, Yentis SM. Maternal satisfaction. *Int J Obstet Anesth* 1998;**7**:32–37.
- 6 Yentis SM, Robinson PN. Definitions in obstetric anaesthesia: how should we measure anaesthetic workload and what is 'epidural rate'? *Anaesthesia* 1999;**54**:958–962.
- 7 Burnstein R, Buckland R, Pickett JA. A survey of epidural analgesia for labour in the United Kingdom. *Anaesthesia* 1999;**54**:634–640.
- 8 Pickett JA, Oppenheimer CA, May AE. Does midwifery-led intrapartum care require anaesthetic services? *Int J Obstet Anesth* 1996;**5**:152–155.

Consent given by women during labour

Dr M Girgis, Dr M Wee, Dr S Yentis

Why do this audit?

The right of the patient to give or withhold consent is important in obstetric anaesthesia, despite obvious difficulties during labour. For consent to be morally and legally valid, the patient must receive sufficient information to make an informed decision. With the trend towards greater maternal autonomy and the ever-increasing litigious environment, failure to provide adequate quality or quantity of information may prove costly, both financially and in terms of maternal dissatisfaction. This audit looks at intrapartum consent, but another valid topic would be the quality of consent for women having elective caesarean section. Information in the form of leaflets, other information media and interpreter services in non-English languages should be available, either using internet resources or in person.

Best practice: research evidence or authoritative opinion

When?

Information about epidural analgesia and the options for anaesthesia for caesarean section during labour should be given antenatally, reinforced by written information.¹ Intrapartum consent is not optimal² but may be necessary and valid.

How?

A written information card used intrapartum reinforces the information given and improves the level of knowledge in the patient.³ Verbal consent is legally valid but may be difficult to prove later. Written consent is ideal, with the discussed risk/benefit options recorded.^{4,5} All explanations should be documented either on purpose-designed epidural/anaesthetic charts or by using pre-printed labels inserted in the record.⁶

How much?

Disclosure of adverse events more common than 1:100 is often quoted, with open discussion of other risks.^{4,5} Legal principles that apply to the process of informed consent have changed in recent years. Patients should now be given the information that they wish to receive, not the information that health professionals may consider reasonable for them.⁷ Recent case law (Chester vs Afshar), allowed the claimant to recover damages for a complication the surgeon should have but didn't warn the patient about,⁸ even though she would have probably had the operation anyway. This emphasises the patients' autonomy in decision making. Women differ in their requirements for antenatal information about regional anaesthesia and its complications. Anaesthetists should be flexible and consider the particular wishes of each patient, rather than follow rigid guidelines when disclosing information in order to obtain consent.⁹ The OAA/AAGBI recommend full antenatal explanation of available options followed by intrapartum discussion of the proposed intervention.⁶ Refer to audit 1.2 on consent for anaesthesia and the AAGBI guidelines on consent.¹⁰

Suggested indicators

- % mothers receiving antenatal education on analgesia and anaesthesia.
- % mothers receiving written information to reinforce this, including risk estimates.
- For a more detailed audit, % mothers who can answer questions about anaesthetic options before they are in labour (e.g. at 36 week clinic).
- Existence of a unit policy on informed consent during labour:¹⁰
- Existence of a unit information card to aid consent obtained during labour.
- % mothers for whom written or verbal consent for an anaesthetic intervention in labour has been documented.
- % of mothers with itemised documentation of risks that were discussed or mentioned.
- % postpartum mothers satisfied with the consent they gave during labour.

Proposed standard or target for best practice

- > 80% mothers to receive education and written information as above.
- > 50% mothers at the 36 week clinic to answer questions correctly.
- Each unit should have a policy on informed consent during labour which should take account of the situation of a woman who has received drugs affecting mental state.
- 100% of units should have unit information card for use in obtaining consent in labour.
- 100% mothers to have documentation of consent during labour for the anaesthetic intervention as in the unit policy (verbal or written).
- 100% of mothers to be satisfied that they gave informed consent.

Suggested data to be collected

- Mothers may be questioned on admission or at the 36 week clinic. The source of their information and whether written or verbal may be noted. Three simple questions may be used to test their understanding. The epidural or anaesthetic record may be examined for evidence of informed consent.
- Mothers may be seen postpartum to assess satisfaction with the consent process.
- Recommended audit frequency – yearly.

Common reasons for failure to reach standards

- Non-attendance at antenatal classes.
- Non-availability of information media.
- Non-participation by anaesthetists in antenatal classes.
- Lack of multidisciplinary input into the consenting process.
- Urgency of case precludes full discussion.
- Lack of interpreter services or access to ethnic languages media.

Related audits

- 1.2 – Consent to anaesthesia
- 8.3 – Information about obstetric anaesthesia and analgesia

References

- 1 Swan HD, Borshoff DC. Informed consent – recall of risk information following epidural analgesia in labour. *Anaesth Intens Care* 1994;**22**:139–141.
- 2 Scott WE. Ethics in obstetric anaesthesia. *Anaesthesia* 1996;**51**:717–718.
- 3 White LA et al. Written information about epidural analgesia for women in labour: did it improve knowledge? *Int J Obstet Anesth* 2003;**12**(2):93–97.
- 4 Bush OJ. A comparison of informed consent for obstetric anaesthesia in the USA and UK. *Int J Obstet Anesth* 1995;**4**:1–6.
- 5 Lanigan C, Reynolds F. Risk information supplied by obstetric anaesthetists in Britain and Ireland to mothers awaiting elective caesarean section. *Int J Obstet Anesth* 1995;**4**:7–13.
- 6 Association of Anaesthetists of Great Britain and Ireland and Obstetric Anaesthetists' Association. Guidelines for obstetric anaesthesia services. AAGBI, London 2005 (see: www.aagbi.org/pdf/Obstetric.pdf).
- 7 Kelly GD et al. Consent for regional anaesthesia in the United Kingdom: what is material risk? *Int J Obstet Anesth* 2004;**13**(2):71–74.
- 8 White SM, Baldwin TJ. Consent for anaesthesia. *Anaesthesia* 2003;**58**(8):760–774.
- 9 Bethune L et al. Complications of obstetric regional analgesia: how much information is enough? *Int J Obstet Anesth* 2004;**13**(1):30–34.
- 10 Association of Anaesthetists of Great Britain and Ireland. Consent for anaesthesia. AAGBI, London 2006 (see: www.aagbi.org/pdf/Consent.pdf).

Response times for provision of intrapartum analgesia and anaesthesia

Dr E Pickering, Dr A Holdcroft

Why do this audit?

When the condition of mother or baby requires an urgent operative or instrumental delivery, it is important that satisfactory arrangements exist for immediate access to an anaesthetist and a staffed operating theatre. Delay may result in unnecessary morbidity and mortality. There has been a change in response to operative delivery from being strictly time defined to a more rational clinical activity through the re-classification of non-elective caesarean section (CS) into three grades of urgency from Grade 1 (= immediate threat to the life of the woman or fetus) to Grade 2 (= maternal or fetal compromise which is not immediately life threatening) and Grade 3 (= no maternal or fetal compromise but needs early delivery).^{1,2}

Where there is a 24-h demand on epidural (including combined spinal epidural) service for pain relief during labour, women should be able to choose the service based on information on how long they will have to wait before an epidural provides adequate pain relief.

Best practice: research evidence or authoritative opinion

Fetal emergency: In the case of fetal hypoxia occurring suddenly, an acute short episode of asphyxia of the order of 20 min will lead to a depressed baby which once resuscitated may suffer only mild encephalopathy.³ If there is ongoing asphyxia during labour the time available for delivery without permanent serious cerebral damage may be shortened. National guidelines recommend that the time from decision to delivery at CS with fetal compromise should not exceed 30 min.²

Maternal emergency: Life threatening maternal emergencies such as massive blood loss require a prompt response time.^{4,5} In maternal emergencies the response time must be compatible with full recovery of cerebral function.

On demand epidural for pain relief: Where a 24-h epidural service is offered, the time from the anaesthetist being informed about an epidural until being able to attend the mother should not normally exceed 30 min, and must be within 1 h except in exceptional circumstances.⁴ Women who require CS should take preference over those who request epidural analgesia for labour.

Suggested indicators

% CS at urgency Grades 1, 2 and 3.
 % CS for fetal distress or maternal emergency in which the decision to delivery interval is \leq 30 min.
 % women who are attended by the anaesthetist within 30 or 60 min of requesting epidural analgesia.

Proposed standard or target for best practice

100% urgency Grade 1 CS for acute fetal or maternal emergency in which delivery is made within 30 min of the decision.
 > 80% of women should be seen by the anaesthetist within 30 min of being requested to provide epidural analgesia, and 100% by 60 min.

Suggested data to be collected

For all CS for fetal distress

- Grade of urgency of CS.^{1,2}
- Time of decision to deliver.
- Time anaesthetist was informed.

- Time of arrival of patient in theatre.
- Time anaesthesia commenced.
- Time patient adequately anaesthetised.
- Time of skin incision.
- Time of delivery.
- Apgar score at 1 and 5 min.

For maternal emergencies

- Time between call and arrival of anaesthetist.

For epidural for pain relief

- Time anaesthetist called.
- Time anaesthetist arrived.
- Time epidural sited.
- Time first epidural dose administered.
- Time woman comfortable.
- Specific reasons for delay in establishing epidural for labour; e.g. coagulation results not available.

Common reasons for failure to reach standards

- Slow response time from all parties.
- Lack of communication.
- Anaesthetist unavailable and reason for this.

For CS

- Failure to establish regional nerve block, or inappropriate attempt to establish regional nerve block.
- Obstetric theatre already in use and second theatre and anaesthetist not immediately available.

For epidural in labour

- Stage of labour.
- Woman not fully prepared, e.g. coagulation results not available.

Related audits

8.8 – Technique of anaesthesia for caesarean section

References

- 1 Lucas DN et al. Urgency of caesarean section: a new classification. *J Roy Soc Med* 2000;**93**:346–350.
- 2 National Institute for Clinical Excellence. Clinical guideline 13. Caesarean section. *NICE*, London 2004.
- 3 Rosenbloom L. Dyskinetic cerebral palsy and birth asphyxia. *Dev Med Child Neurol* 1994;**36**:285–289.
- 4 Association of Anaesthetists of Great Britain and Ireland and Obstetric Anaesthetists' Association. Guidelines for obstetric anaesthesia services. *AAGBI*, London 2005 (see: www.aagbi.org/pdf/Obstetric.pdf).
- 5 Confidential Enquiry into Maternal and Child Health. Why mothers die 2000–2002. *CEMACH*, London 2004.

Monitoring and regional analgesia

Dr E Pickering, Dr A Holdcroft

Why do this audit?

Before regional analgesia: It is important to establish that mother and baby have normal physiological parameters before introducing a regional block. This process should include a pain assessment, e.g. uterine rupture may cause pain leading to a request for epidural analgesia.

During regional analgesia: Maternal and fetal monitoring is essential as hypotension and blockade of cardiac sympathetic nerves may occur, which could result in maternal or fetal compromise.¹ Monitoring the level of the nerve block will allow assessment of adequacy of block and act as an early warning of high blockade. Bladder distension should be excluded regularly. With the use of neuraxial opioids, respiratory depression is a possibility.

Best practice: research evidence or authoritative opinion

The OAA, AAGBI and Royal College of Nursing have recommended minimum standards of care.^{2,3} Maternal and fetal desaturation during labour has been reported.⁴⁻⁶ Oxygen saturation and ECG monitors may be required if the maternal or fetal condition in labour requires it. There should be a unit policy on minimum monitoring, covering the use of intrathecal analgesia, epidural infusions, drugs co-administered with local anaesthetics, and ambulatory epidurals.^{2,3}

Suggested indicators

Existence of a unit policy on minimum monitoring.

For labour:

% women who have documented pulse, blood pressure and fetal heart rate within 30 min prior to insertion of regional analgesia.

% women having a bolus epidural injection (initial or top-up) who have:

- Blood pressure and pulse record every 5 min for 20 min or at other locally agreed explicit frequency.
- Continuous fetal heart rate monitoring for 20 min at least.
- Continuous presence of anaesthetist (initial block) or trained midwife (top-ups) for 20 min.

% women with established regional analgesia who have:

- Half hourly measurement of pulse and blood pressure.
- Hourly assessment of nerve block and bladder size.
- Continuous presence of midwife or person able to maintain verbal contact (excludes dangerous respiratory depression or loss of consciousness).
- Fetal heart rate monitoring as in unit policy. This may require continuous monitoring or, particularly if ambulatory, at less frequent intervals.

Availability for use on the labour ward (if required) of pulse oximeter and ECG monitor.

For caesarean section and regional anaesthesia:

% of women in whom the fetal heart rate is monitored during initiation of a regional nerve block and until the skin preparation

% of women who have the following monitoring during induction, maintenance and recovery: continuous ECG, continuous oximetry, non-invasive blood pressure capable of 1-min cycles.

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| Proposed standard or target for best practice | <p>There should be a unit policy as above.</p> <p>100% women with regional analgesia should be monitored as above.</p> <p>100% of occasions when required during labour there should be a pulse oximeter and ECG monitor available.</p> |
| Suggested data to be collected | <p>Retrospective audit of records of all women receiving regional analgesia over specified time period detailing the monitoring used.</p> <p>Equipment availability.</p> <p>Critical incidents related to monitoring regional analgesia.</p> |
| Common reasons for failure to reach standards | <p>Distractions by emergencies.</p> <p>Inadequate staffing levels.</p> <p>Appropriate equipment unavailable.</p> <p>Inadequate training in monitoring (e.g. unable to interpret sickness severity).</p> |
| Related audits | 2.2 – Pre-anaesthesia equipment checks |
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Technique of anaesthesia for caesarean section

Dr I F Russell

Why do this audit?

The majority of women now wish to be awake for their caesarean section (CS) but unfortunately successful litigation against obstetric anaesthetists for failed regional anaesthesia (RA) has increased. Each unit should know its own rates and the failure rates for RA in order to take appropriate remedial action. By agreement of the Standing Joint Committee of The Royal College of Anaesthetists and the Royal College of Obstetrics and Gynaecology (RCOG), data on CS and anaesthesia is now collected by the RCOG. This allows denominator data for various anaesthetic techniques to be obtained.

Best practice: research evidence or authoritative opinion

There is unequivocal evidence that RA is safer than general anaesthesia (GA) for CS.¹ Despite the very significant increase in CS numbers, the proportion of direct maternal deaths due to anaesthesia has declined considerably. This is almost entirely due to the greater use of RA for elective and emergency CS.^{1,2} The death rate due to GA for CS has not changed significantly from the 1982–1984 triennium¹ and the dictum of Moir (slightly modified) is as appropriate today as it was in 1981: there is only one certain way of avoiding death from GA and that is by the substitution of an appropriate form of RA.³

Results from national surveys^{2,4} on anaesthesia for CS indicate what can be achieved and these data have been used to set the audit targets. The results of the surveys are as follows.

For elective (Grade 4 urgency)⁵ CS:

- Overall 91% of CS are performed under RA (range 70–100%)⁴
- 50% of units achieve > 88% RA²
- 25% of units achieve > 93% RA²
- 10% of units achieve > 96% RA²

For emergency (combined Grade 1 to 3 urgency)⁵ CS:

- Overall 77% of CS are performed under RA (range 30–100%)⁴
- 50% of units achieve > 72% RA²
- 25% of units achieve > 81% RA²
- 10% of units achieve > 88% RA²

In addition, national data collected (but not published) by the Sentinel Report⁴ suggest that at least 54% of Grade 1 CS can be performed under RA.⁵ This is very similar to the figure from the National Obstetric Anaesthesia Database.⁶

Suggested indicators

- % elective (Grade 4) CS done under RA.
- % Grade 2 and 3 CS done under RA.
- % Grade 1 CS done under RA.
- % conversion from RA to GA for Grade 4 CS.
- % conversion from RA to GA for Grade 2 and 3 CS.
- % conversion from RA to GA for Grade 1 CS.

Proposed standard or target for best practice

- > 95% RA for elective (Grade 4) CS.
- > 85% RA for emergency (combined Grades 1 to 3) CS.
- < 1 % RA to GA conversion rate in elective CS.
- < 3% RA to GA conversion rate in emergency CS. (This figure of 3% includes regional anaesthetics for labour converted to GA for CS.)

Suggested data to be collected

- Number of CS, grade of CS, type of anaesthetic and reason for its use.
- Name and grade of anaesthetist and surgeon.
- Conversion rate to GA and reason (e.g. technical difficulty, poor block, maternal request, fetal reasons, surgical reasons).
- In particular, the data collected should allow units to identify reasons for a low RA rate (or high RA to GA conversion rate) for Grade 1 CS, since this is the group most at risk from GA.

Common reasons for failure to reach standards

- Lack of a dedicated obstetric anaesthetist.
- Staff inexperience.
- Poor/slow communication between staff.
- Misunderstanding/misclassifying the urgency of 'emergency' cases⁴ – only Grade 1 cases have any urgency likely to affect choice/conduct of anaesthesia.
- Inappropriate assessment of block – sharp pin prick and cold sensations are poor predictors of adequacy of a block. Touch should be used.⁷
- Inadequate epidural top ups.
- A high number of so called 'maternal requests' for GA.
- 'Traditional' beliefs about obstetric pathology and RA (e.g. placenta praevia, severe PET and eclampsia, back surgery or backache, transverse lie). Recent guidance is quite explicit – placenta praevia is not a contraindication for RA.⁵
- Recommended audit frequency: continuous data collection (needed for workload and practice data).

Related audits

- 8.6 – Response times for provision of intrapartum analgesia and anaesthesia

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Pain relief after caesarean section

Dr E Pickering, Dr A Holdcroft

Why do this audit?

For the first few postoperative days, adequate pain relief should be provided after caesarean section (CS) in order to allow the mother to recover her mobility both to facilitate infant care and prevent thromboembolism.

Analgesic drug efficacy is important for patient comfort¹ but maternal side effects and complications can be life threatening² and drugs may transfer to the neonate during breast feeding.

Opioids provide good pain relief. They can be given by many routes including subarachnoid, epidural, intravenous, intramuscular, subcutaneous and oral. They are associated with unwanted side effects, particularly sedation, pruritus and respiratory depression.^{1,2}

Pain relief provided by non-steroidal anti-inflammatory drugs (NSAIDs) has been shown to reduce opioid requirements.^{3,4} However, this group of drugs also has side effects.

Best practice: research evidence or authoritative opinion

It has been suggested that patients after surgery should have a pain score of 3 cm or less on a Visual Analogue Scale (VAS) of 0–10 cm.⁵

Drugs which do not have significant effects on the fetus must be used, particularly in breast feeding women.

NICE guidelines for CS⁶ recommend:

- women should be offered perioperative subarachnoid diamorphine (0.3–0.4 mg) or epidural diamorphine (2.5–5 mg) if CS performed by regional anaesthesia.
- if there are no contraindications, regular NSAIDs should be used as an adjunct to opioid therapy.
- women who have received opioids should be monitored for respiratory rate, sedation and pain scores¹ and prescribed an anti-emetic and laxative.²

Suggested indicators

% women who are prescribed regular NSAIDs after CS unless there are contraindications, e.g. pre-eclampsia, haemorrhage, coagulation disorders, asthma.

% women who received subarachnoid or epidural opioids if regional anaesthesia used.

% of higher risk women (e.g. those who have severe pain or have contraindications to standard analgesics) who have formal pain management plan.

% women who have documented hourly observations of respiratory rate, sedation and pain intensity scores in those who have received opioids.

% women who were satisfied or very satisfied with the management of pain after CS on daily follow up.

Proposed standard or target for best practice

- > 90% women to have a worst pain score of < 3 on a VAS of 0–10.
- 100% women to be prescribed regular NSAIDs (unless there are contraindications).
- 100% women received intrathecal or epidural opioids if CS performed by regional anaesthesia.
- 100% women to have documented hourly observations of respiratory rate, sedation and pain scores in those who have received opioid analgesia.
- > 90% women to be satisfied with pain management.

Suggested data to be collected

- Observations as above including pain intensity scores.
- Relevant critical incidents.
- Drug prescribing (including midwives) and their administration.
- Opioids given via the subarachnoid or epidural route during or post CS.
- % of women requiring continuous epidural analgesia for postoperative pain relief and associated complications.
- Patient satisfaction with pain management.

Common reasons for failure to reach standards

- Lack of follow up postoperatively.
- Staff shortages causing delay in giving analgesia and lack of observations.
- Lack of explanation to patient about available analgesia.

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Monitoring of obstetric patients in recovery and high dependency unit

Dr E Pickering, Dr A Holdcroft

Why do this audit?

It is known that maternal mortality may occur in the post partum or recovery period.¹

High dependency care (HDU) is necessary for sick parturients.²

Minimum recovery facilities and HDU facilities have been defined.²⁻⁴

This audit will establish whether suitable care is being given to women at a critical time in their obstetric care.

Best practice: research evidence or authoritative opinion

There is no level 1 or 2 evidence for best practice in management of the critically ill pregnant woman.

Postoperative and HDU standards have been developed by the Association of Anaesthetists of Great Britain and Ireland and the Obstetric Anaesthetists' Association.^{2,4} These standards include:

- for each bed – oxygen outlet and breathing system for 100% oxygen administration, electrical sockets, pulse oximeter, ECG monitor, suction unit, blood pressure measurement. Easily available disposables (IV cannulas, giving sets, tape, blood test bottles, IV fluid).²
- for the area as a whole – defibrillator, emergency drug box, intubation equipment, telephone and/or emergency buzzer.
- for all staff in the area – training in recovery care² and training in cardiopulmonary resuscitation. Minimum nursing ratio of one to one (recovery) and one to two (HDU) at all times, available 24 h.
- for all women with a live infant, facilities for breast feeding (or use of breast pump) should be available.

A professional framework for acute trauma care in pregnancy has also been developed.⁵

Suggested indicators

Existence of the facilities to above 'standard' of care in all areas in which women recover after caesarean section (CS) or where parturients are sick

% women who have the observations below documented on a suitable chart.

Existence of protocol for discharge from recovery area and % women who meet the discharge criteria before leaving the area.

Proposed standard or target for best practice

Any area in which women recover after CS meets the above specification

100% of beds in recovery HDU meet the above specification

100% women have the following observations to documented on a suitable chart at least every 15 min during recovery stay:

- oxygen saturation, respiratory rate, heart rate and rhythm, blood pressure, temperature, level of consciousness, pain score, sensory level of regional blockade, blood loss from wound, vagina and drain, IV infusion running correctly
- in addition they should not be left alone at any time.

There should be a protocol for discharge from this area and 100% women should meet the criteria before leaving the area.

Any area in which sick parturients are managed should meet the same criteria as above plus antenatal fetal monitoring, assessment and facilities to conduct labour. In addition staff should be trained in the physiological and pharmacological effects of pregnancy, including cardiopulmonary resuscitation of pregnant women, and be able to give IV drugs.

100% sick parturients to have the same observations as for post CS documented on a suitable HDU chart. In addition hourly urine output should be recorded.

Suggested data to be collected

Information as above during a nominated audit period.
Critical incident analysis in these areas according to the standards above.

Common reasons for failure to reach standards

Inadequate training of staff.
Lack of equipment or suitably trained staff.
Failure to realise the importance of the recovery period, changes related to pregnancy and the requirements for the fetus and neonate.

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- 1 Confidential Enquiry into Maternal and Child Health. Why mothers die 2000–2002. RCOG Press, London 2004.
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Airway and intubation problems during general anaesthesia for caesarean section

Dr G Lyons

Why do this audit?

Maternal mortality due to anaesthesia occurs mainly in association with general anaesthesia (GA) for caesarean section (CS).¹ GA for CS is in decline and opportunities for instruction by experienced staff during daytime hours are rare. Obstetric GA skills are becoming harder to maintain.² An audit of difficult and failed intubation will assess what effect decreasing experience and training is having on this dangerous complication of GA for CS.

The 1997–1999 Confidential Enquiries into Maternal Deaths revealed an increased number of deaths directly relating to anaesthesia, mainly due to airway management issues.²

Best practice: research evidence or authoritative opinion

Failure to intubate occurs in 1:250 to 1:300 GA for CS.^{3–5} Difficulties with intubation occur with 1:30 to 1:100 GA for CS. A difficult intubation can be defined as any intubation where the anaesthetist recorded it as difficult or had to use an intubating aid.³

Suggested indicators

% failed intubation at CS.
 % difficult intubation at CS.
 % GA CS used for teaching, consultant instructing.

Proposed standard or target for best practice

Failed intubation incidence should be no more than 1:250.
 Difficult intubation should be no greater than 1:30.
 100% GA for elective CS should be used for teaching GA skills.

Suggested data to be collected

For each intubation at GA for CS:

- preoperative Mallampati⁶ score or other recognised simple predictive clinical test
- Cormack & Lehane⁷ grade at laryngoscopy
- description of difficulty if any, use of intubation aids, use of failed intubation drill, outcome
- whether consultant teaching occurred
 - ◆ in hours/out-of-hours
 - ◆ elective/emergency.

Common reasons for failure to reach standards

Trainees and consultants inexperienced in GA for CS.
 Disproportionate number of cases anaesthetised by trainees – most are emergencies.
 Trainee or consultant not available for teaching.

Related audits

- 1.6 – Preoperative airway assessment
- 8.8 – Technique of anaesthesia for caesarean section
- 14.7 – Airway management training for novice anaesthetists

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Audit programme for anaesthetic complications and side effects

Dr M Girgis, Dr M Wee

Why do this audit?

There are a number of potentially serious complications that can occur after anaesthetic intervention during pregnancy. It is therefore important to recognize and treat them promptly.

Best practice: research evidence or authoritative opinion

For regional anaesthesia (RA): The dural tap rate may vary from 2% in novices or for difficult epidurals to < 0.26% with good technique and supervision.¹² It is accepted that narrow gauge pencil point needles reduce the incidence of postdural puncture headache (PDPH) after spinal.^{3,4} A Cochrane review of epidural blood patches (EBP) for prophylaxis and treatment of PDPH decided current evidence is insufficient and precludes 'reliable assessments of the potential benefits and harms of this intervention.¹⁵ EBP remains the gold standard treatment for PDPH, with between 67–75% receiving complete relief after the first blood patch, although the headache returned in 31% and 28% required more than one EBP.^{6,7} There is little evidence to support the use of prophylactic EBP in PDPH prevention.⁸ There are many possible neurological complications after central neuroaxial blockade including nerve root damage, spinal haematoma, cauda equina syndrome, meningitis and epidural abscess. The incidence of complications after spinal blockade is 1:13,000 for neurological complications and incidence after obstetric epidural blockade is 1:25,000.^{9,10} Spinal haematoma after obstetric epidural blockade carried an incidence of 1:200,000.¹¹

For general anaesthesia (GA): Incidence of recall of < 0.5% and dreaming < 5% in patients with an inspired isoflurane concentration of 1%.^{12,13} See also Audit 8.11: Airway and intubation problems during general anaesthesia for caesarean section.

Suggested indicators

% of women followed up after receiving an anaesthetic intervention.

For RA procedures:

% of women having an obstetric epidural who have a dural puncture

% of women who have PDPH after spinal or regional anaesthesia

% of women receiving EBP

% of women with immediate neurological complications

% of women left with long-term (> 6 months duration) neurological complications.

For GA procedures:

% of women who report awareness after GA section

% suffering from sore throats.

For all procedures:

% suffering from postoperative nausea and vomiting (PONV).

Proposed standard or target for best practice

100% of patients having an anaesthetic intervention should be followed up.

For RA:

< 1% of epidurals should have a dural puncture

< 1% of spinal anaesthesia should be followed by severe PDPH.

For GA:

< 0.4 incidence of recall

< 5% should have dreaming during GA.

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| Suggested data to be collected | <p>% of patients followed up. Grade of anaesthetist, experience and supervision level at procedure.</p> <p>For RA:</p> <p>Number of known dural taps, number of PDPH. Gauge and type of needle and number of attempts. Management and outcome of PDPH. % receiving EBP, % who have second EBP, % patients followed-up after EBP at 3 months.</p> <p>Recommended audit frequency – continuous.</p> <p>For GA:</p> <p>Incidence of recall or dreaming when questioned, record of machine check, incidence of PONV and sore throat.</p> <p>Recommended audit frequency – continuous.</p> <p>Induction agents and dosages used, end-tidal concentration of N₂O and volatile agent.</p> <p>Recommended audit frequency – yearly intermittent audit over a period.</p> |
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| Common reasons for failure to reach standards | <p>Poor supervision of trainees and lack of senior input.</p> <p>No mechanism for follow up of patients.</p> <p>Lack of competency based training in RA.</p> <p>Failure to check anaesthetic equipment according to AAGBI guidelines.</p> |
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| Related audits | 8.11 – Airway and intubation problems during general anaesthesia for caesarean section |
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