Guidelines for the Provision of Anaesthesia Services for an Obstetric Population

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Chapter 9
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Introduction

Pregnancy and childbirth remains a risky time for both mother and baby. In recent years, we have seen the maternal mortality rate plateau. [1,2,15] However, the confidential review of every maternal death over the last seven decades continues to identify that substandard care, frequently caused by deficiencies in service provision, has led to avoidabe deaths in the majority of cases. Areas where improvements can be made to reduce the risk for mothers and babies are identified in every report. It is vital that we use this shared learning and the available evidence to shape our provision of care to pregnant and recently delivered women, both here in the UK and with the wider population globally.

Working on delivery units can be incredibly rewarding, but it can also be highly challenging and dynamic. It is not possible to identify all women or babies who are at risk of rapid deterioration, but we need to be able to respond appropriately and in a timely manner in the event of an emergency. Obstetrics accounts for a large proportion of the emergency surgery performed in hospitals.[3,4] Provision of obstetric care is by its nature, multidisciplinary. The team, which includes, obstetricians, anaesthetists, neonatologists, midwives, theatre staff, anaesthetic assistants, and others have to be able to work closely under stress in dynamic situations. To ensure that these teams can function effectively in this environment, they need to train together and have the appropriate infrastructure and necessary resources in place to deliver a high quality service.

The role of the anaesthetist on the delivery unit encompasses that of a peripartum physician and has expanded markedly in recent years. Approximately 60 per cent of women require anaesthetic intervention around the time of delivery of their baby. It is currently difficult to quantify other areas of care provided by anaesthetists on delivery suites.[5] Approximately 1 in 3 women deliver by caesarean birth; in addition, anaesthetic care is required for operative/assisted deliveries and other procedures during pregnancy or the peripartum period.[6] Anaesthetists are also involved in planning the care of high-risk women during the antenatal period.

The obstetric population is changing; over half of pregnant women are now considered to be at high risk for complications during their pregnancies. [7] In 2015, the greatest increase in fertility rate was for women aged 40 and over (a group who have been identified as at high risk of mortality) and a large proportion of pregnancies in this age group are the result of assisted conception. In the UK, one in six couples seek fertility treatment. The resulting pregnancies are associated with more complications for both women and their babies and the incidence of obesity across the UK population continues to rise.[4,8,9] The number of women who have had a previous caesarean birth is rising, increasing the risks of associated placenta accreta syndrome (PAS) and uterine rupture. The number of pregnant women with significant pre-existing conditions, e.g. congenital cardiac disease, who are proceeding with their pregnancies is increasing and they require specialised services to support them during this time. These guidelines include recommendations for areas of service where anaesthetists are expected to take a lead role, but, as a pregnant woman may present anywhere, all maternity units should be ready to recognise and manage the acutely deteriorating patient with pathways in place to obtain expert guidance when required.

Public expectations of maternity services are high; through media, internet and educational resources, pregnant women and their families are often well informed. Many are keen for a particular mode of delivery or type of analgesia. We have to deliver an anaesthetic service that is safe and effective and that also aims to meet these expectations, where appropriate. It is vital that we adopt the principles of shared decision making and that we recognise the need to support autonomy by building good relationships, respecting both individual competence and interdependence on others.[7,10]

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Aims and objectives

This chapter is intended to define the standards for the provision of anaesthetic care in all consultant-led maternity units in the UK. The guidance is intended to be used by anaesthetists and healthcare managers with service delivery responsibilities.

These recommendations are not intended to describe the best practice for clinical care; the main focus is on outlining requirements for a service to be safe and effective and to ensure robust governance and training structures to support the provision of care.

These guidelines have been developed using a process accredited by the National Institute for Health and Care Excellence in accordance with their criteria for guidance production.[11] They are evidence based and peer reviewed. There is a paucity of randomised controlled trials in the field of provision of obstetric anaesthetic services; the vast majority of data come from retrospective cohort studies and expert opinion Where available, analysis of the literature (including national and international guidance) has been undertaken to formulate these recommendations. This is alongside learning from past experience from national reports on failure of care. [12,13,14 15]

Anaesthetists may be involved at any stage of a pregnancy, therefore there are recommendations relevant to the antenatal, peripartum and postpartum periods. The workload of units vary in terms of delivery rates, acuity and the dependency of the patients they care for, but all should be able to manage acute medical or obstetric deterioration in anyone. Some units will require the resources to care for pregnant women with complex needs on a regular basis. There is no 'one size fits all' in terms of maternity units; there is evidence of considerable variation in the care delivered across the UK.[16] Our aim is for our recommendations to ensure that all units meet the standards to provide safe effective care and, through their implementation, prevent harm to their patients.

We know that the mortality rate is higher in those who do not speak English or those born outside the UK, some ethnic minority groups, those in abusive relationships, older parents and those coming from the most deprived areas. Serious pre-existing medical or psychiatric conditions are also associated with higher mortality rates[15,16,17] It is our aim to provide recommendations that address the additional specific needs of these women and describe a service that reduces the risk of poor outcomes for them.

Any service needs to be able to monitor and regulate the care being provided. It is essential to understand that this goes beyond performing routine audits; it requires developing and maintaining an organisational commitment towards high quality care and a strong safety culture in maternity units. This commitment comes from the hospital management as well as the maternity unit staff, and the unit must be provided with adequate resources, including clinicians' protected time to implement this care. We should never miss the opportunity to learn from past experience.

Glossary

Autonomously practising anaesthetists – a consultant or an SAS doctor who can function autonomously to a level of defined competencies, as agreed within local clinical governance frameworks.

Busy units – The workloads of a unit cannot be defined solely by the number of births. For an individual anaesthetic department the workload comprises: the number of women seen in the anaesthetic antenatal clinics, the number of anaesthetic procedures for labour, delivery and other operative intervention, the complexity of the case mix, the number of critically ill patients requiring anaesthetic input and the number of patients requiring obstetric anaesthetic follow up post delivery for anaesthetic related morbidity and debriefing.[18] In this document, the term 'busier units' is used to denote those units that, due to the number of anaesthetic interventions and/or other local factors, require higher levels of resources in order to deliver the necessary anaesthetic service.

Duty anaesthetist – The term 'duty anaesthetist' is used here to denote the anaesthetist who is the doctor immediately responsible for the provision of obstetric anaesthetic services during the duty period.

Lead anaesthetist – The autonomously practising anaesthetist who has overarching responsibility for the governance of the obstetric anaesthetic service in the organisation, and oversees the provision of a service that meets the standards outlined in this chapter. Individuals should be fully supported by their Clinical Director and be provided with adequate time and resources to allow them to effectively undertake the lead role.

Immediately – Within five minutes.

Obstetric unit – an NHS-clinical location in which care is provided by a team, with obstetricians taking primary professional responsibility for women at high risk of complications during labour and birth. Midwives offer care to all pregnant women in an obstetric unit, whether or not they are considered at high or low risk, and take primary responsibility for those with straightforward pregnancies during labour and birth. Diagnostic and treatment medical services, including obstetric, neonatal and anaesthetic care, are available on site 24 hours a day.[19]

Obstetrician-led care – Care in labour where the obstetrician is responsible for the pregnant woman's care. This should only be provided in an obstetric-led unit in a hospital. Much of the their care will still be provided by a midwife.[20,21]

Obstetric team – The term 'obstetric team' is used here to denote all the members of the multidisciplinary team that work in the maternity unit [22]

Session – A session typically describes a notional half day. Traditionally this would have been confined to mornings or afternoons, but increasingly hospitals are expanding the working day to accommodate a third evening session.

Supervising anaesthetist – denotes the autonomously practising anaesthetist with overall clinical responsibility for the delivery of obstetric anaesthetic services during the duty period.

Recommendations

The grade of evidence and the overall strength of each recommendation are tabulated in Appendix I.

1 Staffing Requirements

The duty anaesthetist

The duty anaesthetist is responsible for providing care to those in labour or who, in the antenatal, perinatal or postpartum period, require anaesthetic, medical or surgical attention. The duty anaesthetist can be a consultant, an SAS doctor, clinical fellow or anaesthetic trainee.

1.1 To act as the duty anaesthetist without direct supervision from an autonomously practising anaesthetist, the duty anaesthetist should meet the basic training specifications and have attained the RCoA's Initial Assessment of Competence in Obstetric Anaesthesia.[23,24]

1.2 There should be a duty anaesthetist immediately available for the obstetric unit 24/7. As their primary responsibility is to provide care to those in labour or who require medical or surgical interventions, ante or peripartum, the role should not include undertaking elective work during the duty period.[25]

1.3 Busier units (see Glossary) should consider having two duty anaesthetists available 24/7, in addition to the supervising autonomously practising anaesthetist.[25]

1.4 In units offering a 24-hour regional analgesia service, the duty anaesthetist should be resident on the hospital site where the regional analgesia is provided (not at a nearby hospital).

1.5 The duty anaesthetist should have an effective and rapid means of communication with their supervisor at all times.[26] Staff working in the maternity unit should be aware of their supervisor's identity, location and how to contact them.[26] The name(s) of the autonomously practising anaesthetist(s) covering the delivery suite and how to contact them should be clearly displayed and easily visible to all staff.

1.6 It is recognised that in smaller units, the workload may not justify having an anaesthetist exclusively dedicated to the delivery unit. If the duty anaesthetist does have other responsibilities, these should be of a nature that would allow the activity to be immediately delayed or interrupted should obstetric work arise. Under these circumstances, the duty anaesthetist should be able to delegate care of their non-obstetric patient in order to be able to respond immediately to a request for care of obstetric patients. Therefore, for example, they would not simultaneously be able to be a member of the on-call resuscitation team. If the duty anaesthetist covers general theatres, another anaesthetist should be ready to take over immediately should they be needed to care for obstetric patients.

1.7 Adequate time for formal multidisciplinary team (MDT) handovers between shifts should be built into the timetable. In the case of the anaesthetist being otherwise engaged with work at the time of the MDT labour ward handover, a briefing from the midwifery and obstetric team should be sought at the earliest opportunity to facilitate a shared mental model of the existing workload/potential patients.

1.8 A structured tool should be considered for handover between shifts and its formal documentation.[27]

1.9 The duty anaesthetist should participate in MDT delivery suite handovers and ward rounds.[12,28]

The lead obstetric anaesthetist

1.10 Every obstetric unit should have a designated lead anaesthetist (see Glossary) with specific programmed activities allocated for this role.

1.11 The lead obstetric anaesthetist should be responsible for the overall delivery of the service, including the following:

- Ensuring that evidence-based guidelines and protocols are in use and are up to date
- Monitoring staff training
- Workforce planning
- Service risk management
- Ensuring that national specifications are met
- Auditing the service against agreed standards, including anaesthetic complication rates, as set out in the RCoA QI compendium Chapter 7.

1.12 The lead obstetric anaesthetist should ensure representation of the anaesthetic department at multidisciplinary meetings for service planning and governance purposes, including labour ward forum, risk management groups and incident reviews..[25]

1.13 The lead obstetric anaesthetist should ensure that there are ongoing quality improvement projects to maintain and improve the care in their units.[29]

Consultant or other autonomously practicing anaesthetist

1.14 As a basic minimum for any obstetric unit, a consultant or other autonomously practising anaesthetist should be allocated to ensure senior cover for the full daytime working week (that is, ensuring that Monday-Friday morning and afternoon sessions (see Glossary)) are staffed.[25] This is to provide urgent and emergency care, not to undertake elective work.

1.15 In busier units, increased levels of consultant or other autonomously practising anaesthetist cover may be necessary, and reflect the level of consultant obstetrician staffing in the unit.[30] This may involve extending the working day to include senior presence into the evening session and/or increasing numbers of autonomously practising anaesthetists.

1.16 Additional programmed activities for autonomously practicing anaesthetists should be allocated for elective caesarean birth lists and antenatal anaesthetic clinics (or to review referrals if no formal clinic is in place).[25] Time is required to identify and follow up potential anaesthetic morbidity and to arrange ongoing investigation and referral.

1.17 In units where anaesthetists in training work a full or partial shift system, and/or rotate through the department every three months (or more frequently), provision of additional programmed activities for autonomously practising anaesthetists should be considered, to allow initial orientation, training and supervision into the evening.[31]

1.18 There should be a named autonomously practising anaesthetist responsible for every elective caesarean delivery list. This anaesthetist should be immediately available. The named person should have no other concurrent clinical responsibilities.

1.19 Consultant or other autonomously practising anaesthetist support should be contactable at all times and have a response time for attendance on site of not more than half an hour to attend the delivery suite and maternity operating theatre. The supervising anaesthetist should not therefore be responsible for two or more geographically separate obstetric units.

1.20 The anaesthetist's primary responsibility is care of the the woman. A separate healthcare professional should be responsible for neonatal resuscitation and the care of the newborn baby.[22,32]

Anaesthetic assistance

1.21 Women requiring anaesthesia in the peripartum period should have the same standards of perioperative care as for any surgical and medical patient.[17,33]

1.22 The anaesthetist should have a competent trained assistant immediately available for the duration of any anaesthetic intervention and this practitioner should not have any other duties.[33]

1.23 All theatre staff acting as anaesthetic assistants should comply fully with current national training standards, and be required to have attained and maintained the relevant competencies to perform the role (an example of these competencies is referenced).[34,35]

1.24 Anaesthetic practitioners who cover obstetrics should demonstrate additional knowledge and skills specific to the care of pregnant women.[34]

1.25 Anaesthetists and anaesthetic assistants working without direct supervision in obstetric theatres and on the delivery suite should be familiar with the environment and working practices of that unit and work there on a regular basis to maintain that familiarity.

Post-anaesthetic recovery staff

1.26 Those requiring postoperative recovery care should receive the same standard of care as the non-obstetric postoperative population.[17,35,36,37,38]

1.27 All staff looking after the obstetric population following anaesthesia should be familiar with the area for recovery of obstetric patients and be experienced in the use of the different early warning scoring systems for obstetric patients. They should have been trained to the same standard as for all recovery practitioners working in other areas of general surgical work, should maintain their skills through regular work on the theatre recovery unit, and have undergone a supernumerary preceptorship in this environment before undertaking unsupervised work.[35,38]

Other members of the team

1.28 An adult resuscitation team trained in resuscitation of the pregnant patient should be immediately available.[39]

1.29 There should be secretarial support for the department of anaesthesia, including the obstetric anaesthetic service.

1.30 Provision should be made to ensure access to other allied healthcare professionals, such as clinical pharmacists, dieticians, outreach nurses and physiotherapists, is available if required.[40]

1.31 Hospitals should have approved documentation defining safe staffing levels for anaesthetists and anaesthetic practitioners, including contingency arrangements for managing staffing shortfalls, and annual reviews of compliance with these should be performed.

2 Equipment, services and facilities

Equipment

2.1 Blood gas analysis (with the facility to measure serum lactate and the facility for rapid estimation of haemoglobin and blood sugar) should be available on the delivery suite.

2.2 Delivery suite rooms should be equipped with monitoring equipment to measure non-invasive blood pressure, oxygen saturation and heart rate.

2.3 Delivery suite rooms should have oxygen, suction equipment and access to resuscitation equipment. Equipment should be checked daily.

2.4 Delivery suite rooms must comply with Control of Substances Hazardous to Health (COSHH) Regulations 2002 and guidelines on workplace exposure limits on waste gas pollution.[41,42]

2.5 The standard of monitoring in the obstetric theatre should comply with the Association of Anaesthetists standards of monitoring.[43]

2.6 A fluid warmer device allowing rapid infusion of blood products and intravenous fluids should be immediately available to the delivery suite.[43,44]

2.7 In tertiary units, with a high risk population, it is recommended that there should be equipment to enable near patient estimation of coagulation.[60]

2.8 Cell salvage may be considered for women who refuse blood products or where massive obstetric haemorrhage (MOH) is anticipated but it should not be used routinely for caesarean birth. When cell salvage is required, staff who operate this equipment should have received training and maintain the appropriate skills to continue to do so.[45,46,4748]

2.9 Devices, such as warming mattresses and forced air warmers, should be available to prevent and/or treat hypothermia.[49]

2.10 A difficult intubation trolley with a variety of laryngoscopes, including video laryngoscopes; tracheal tubes (size 7 and smaller); second generation supraglottic airway devices; equipment for emergency front of neck and other aids for difficult airway management, should be available in theatre. The difficult intubation trolley should have a standard layout which is identical to trolleys in other parts of the hospital so that users will find the same equipment and layout in all sites. The OAA/DAS difficult and failed tracheal intubation algorithms should be displayed. [50,51]

2.11 Patient controlled analgesia (PCA) equipment should be available for postoperative pain relief, and staff should be trained in its use and how to look after women with PCA.[52]

2.12 Ultrasound imaging equipment should be available to anaesthetists trained in its use for central vascular access and transversus abdominis plane (TAP) blocks. Where staff have the relevant competencies, ultrasound may also be useful for other tasks.[53.54]

2.13 An intraosseous access insertion device should be immediately available

2.14 Synchronised clocks should be present in all delivery rooms and theatres to facilitate the accurate recording of events and to comply with medicolegal requirements.[55]

2.15 Resuscitation equipment as described by the Resusicitation Council UK, should be available on the delivery suite and should be checked regularly.[56,57] A resusitative hysterotomy pack containing a scalpel, surgical gloves and cord clamp should be available on all resuscitation trolleys in the Maternity Unit and areas admitting pregnant women e.g. emergency departments.[58] A range of sizes of endotracheal tubes of 7 mm internal diameter or less should also be kept on the resuscitation trolleys.[4,15,59]

Support services

2.16 There should be arrangements or standing orders in place for agreed preoperative laboratory investigations.

2.17 There should be a standard prescription or a local Patient Group Directive for preoperative antacid prophylaxis.

2.18 Haematology and biochemistry services to provide analysis of blood and other body fluids should be available 24/7 and anaesthetists should be represented on blood user groups.

2.19 A local policy should be established with the transfusion services to ensure blood products once available are transferred to the delivery suite rapidly for the management of major haemorrhage.[60,61]

2.20 O negative blood should be immediately (see Glossary) available. In order to enable immediate availability, most units will require a blood fridge in the Delivery suite.

2.21 There should be rapid availability of radiology services.

2.22 In tertiary referral centres, there should be 24-hour access to interventional radiology, CT and MRI services.[56]

2.23 Echocardiography services should be available at all times in units that routinely deal with cardiac patients.[17]

2.24 Robust and reliable local arrangements should be in place to ensure the supply and maintenance of all medicines required for obstetric anaesthesia. There must be a system for ordering, storage, recording, and auditing controlled drug use, according to legislation.[62,63,64]

2.25 There should be access to a clinical pharmacist of an appropriate competency level and expertise in obstetrics. They should advise on day-to-day medication or prescribing issues in the obstetric population, and provide input in local policies and procedures about any aspects of medicines management.[65,66] Where possible hospitals should follow national guidance for drug shortages and this should guide local practice.[67]

2.26 Preprepared drugs should be used where available, including sterile ampoules or bags of low dose local anaesthetic combined with opioid solutions for regional analgesia. Prefilled syringes of commonly used emergency drugs, e.g. suxamethonium and phenylephrine, should be used where available.[68]

2.27 Local anaesthetic solutions intended for epidural infusion should be stored separately from intravenous infusion solutions to minimise the risk of accidental intravenous administration of such drugs.[69]

2.28 Medication for life threatening anaesthetic emergencies, should be immediately available to the delivery suite, and their location should be clearly identified. There should be a clear local agreement on the responsibility for maintenance of these emergency medicines, i.e. regular checks of stock levels, integrity, and expiry dates.

2.29 Physiotherapy services should be available 24/7 for patients requiring higher levels of care.

Facilities

2.30 There should be easy and safe access to the delivery suite from the main hospital at all times.

2.31 An emergency call system should be provided.

2.32 There should be at least one fully equipped obstetric theatre within the delivery suite, or immediately adjacent to it. Appropriately trained staff should be available to allow emergency operative deliveries to be undertaken without delay.[22] The number of operating

theatres available for obstetric procedures will depend on the number of deliveries and the operative risk profile of the women delivering in the unit.

2.33 There should be medication storage facilities within maternity theatres which provide timely access to medicines when clinically required, while maintaining integrity of the medicinal product and allowing the organisation to comply with safe and secure storage of medicines regulations.[65,70]

2.34 Adequate recovery room facilities, that comply with the Association of Anaesthetists recommendations for standards of monitoring during anaesthesia and recovery, should be available within the delivery suite theatre complex.[43]

2.35 Anaesthetic machines, monitoring and infusion equipment and near patient testing devices should be maintained, repaired and calibrated by medical physics technicians.

2.36 An anaesthetic office, within five minutes of the delivery suite, should be available to the duty anaesthetic team. The room should have a computer with intra/internet access to specialist reference material and local multidisciplinary evidence-based guidelines and policies. The office space, facilities, and furniture should comply with the Association of Anaesthetists' standards.[71] This office could also be used to allow teaching, assessment and appraisal.[71]

2.37 A communal rest room in the delivery suite should be provided to enable staff of all specialties to meet.

2.38 A seminar room should be accessible for training, teaching and multidisciplinary meetings.

2.39 All hospitals should ensure the availability of areas that allow those doctors working night shifts to take rest breaks essential for the reduction of fatigue and improve safety.[28] These areas should not be used by more than one person at a time and allow the doctor to fully recline.

2.40 Standards of accommodation for doctors in training should be adhered to.[28] Where a consultant or other autonomously practising anaesthetist is required to be resident, on-call accommodation should be provided.

2.41 Hotel services should provide suitable on-call facilities, including housekeeping services for resident and non-resident anaesthetic staff. Refreshments should be available 24/7.

Guidelines

2.42 All obstetric departments should provide and regularly update multidisciplinary guidelines.

2.43 Guidelines containing standards about the following subjects should be held and easily accessible:

- provision of information to patients
- care of the obstetric patient with elevated BMI
- resuscitation of the pregnant patient
- management of epidural haematoma
- management of severe local anaesthetic toxicity[72]
- management of high regional block
- higher levels of care for the critically ill obstetric patient[86]
- conditions requiring antenatal referral to the anaesthetist

- intrauterine fetal resuscitation
- anaesthetic management of major obstetric haemorrhage
- anaesthetic management of preeclampsia and eclampsia
- modified obstetric early warning score use
- escalation strategy[12]
- staffing and supervision.

2.44 The following guidelines should be held and easily accessible for labour analgesia:

- antacid prophylaxis for labour and delivery and oral intake in labour
- regional analgesia for labour
- management of the complications of labour analgesia, including:
    - accidental dural puncture
    - post-dural puncture headache[73]
    - epidural haematoma
    - severe local anaesthetic toxicity[74]
    - high regional block
    - prolonged neuroaxial block[127,128]
- management of regional techniques in patients with coagulopathy or receiving thromboprophylaxis[75]
- intravenous opioid PCA (Including remifentanil)
- management of failed or inadequate regional block.

2.45 The following guidelines should be held and easily accessible for caesarean section anaeasthesia:

- fasting and antacid prophylaxis before elective and emergency obstetric procedures
- regional anaesthesia for caesarean section (emergency and elective)
- general anaesthesia for caesarean section (including avoiding awareness under general anaesthesia)[76]
- management of difficult or failed intubation in obstetrics[77]
- management of failed regional anaesthesia including pain during caesarean section
- antibiotic and thromboprophylaxis for caesarean section[78]
- recovery following general and regional anaesthesia[79,126]
- post caesarean section analgesia[80]
- anaesthesia for non-caesarean section obstetric procedures.

3 Special populations

General recommendations for special populations are comprehensively described in GPAS chapter 2: Guidelines for the provision of anaesthesia services for the perioperative care of elective and urgent care patients.

3.1 Care for the acutely ill obstetric patient and NICE guidance on the recognition of and response to acute illness in adults in hospitals should be implemented.[81,82]

3.2 An early warning score system, modified for use in obstetrics, with a graded response system should be used for all obstetric patients to aid early recognition and treatment of the acutely ill woman.[83,84]

3.3 All units should be able to escalate care to an appropriate level, and critical care support should be provided if required, regardless of location.[60]

3.4 Whenever possible, escalation in care should not lead to the separation of mother and baby. When separation is unavoidable the duration should be minimised.[15,40,85]

3.5 Midwives working in enhanced care areas or providing enhanced care to patients should have the appropriate training to do so.[86,87]

3.6 There should be a named consultant or other autonomously practising anaesthetist and obstetrician responsible 24/7 for all women requiring a higher level of care.[40]

3.7 Women requiring critical care in a non-obstetric facility should be reviewed daily by a maternity team that includes an obstetric anaesthetist.[4]

3.8 The obstetric anaesthetist should be informed and consulted when there is a multidisciplinary transfer of care of a pregnant or postpartum woman. This is particularly important when there is a physical transfer of care e.g. transfer to or from a critical care ward or another hospital, which should necessitate direct communication between the obstetric anaesthetist and the other anaesthetists/intensivists involved in the transfer of care.

3.9 All units should have facilities, equipment and appropriately trained staff to provide care for acutely ill obstetric patients. If this is unavailable, patients should be transferred to the general critical care area in the same hospital with staff trained to provide care to obstetric patients.[40]

3.10 All patients should be able to access level 3 critical care if required; units without such provision on site should have an arrangement with a nominated level 3 critical care unit and an agreed policy for the stabilisation and safe transfer of patients to this unit when required.[40,56] Portable monitoring with the facility for invasive monitoring should be available to facilitate safe transfer of obstetric patients to the ICU.[88]

Care for the obese woman

Obesity is associated with an increased incidence of both obstetric and medical complications.[89]

3.11 There should be a system in place for antenatal anaesthetic review of women who are morbidly obese, by a senior anaesthetist.[90] Assessment should be arranged to ensure timely delivery planning can take place.[91]

3.12 The duty anaesthetist should be informed as soon as a woman with a BMI above a locally agreed threshold is admitted.

3.13 Equipment to facilitate the care of morbidly obese women (including specialised electrically operated beds, operating tables with suitable width extensions and positioning aids such as commercially produced ramping pillows, extra-long spinal and epidural needles, weighing scales, sliding sheets, and hover mattresses or hoists) should be readily available. Staff should receive training on how to use the specialised equipment.[92] The maximum weight that the operating table can support should be known, and alternative provision made for women who exceed this.[93]

Care for women under the age of eighteen

The following recommendations apply to units that admit young women and girls under the age of eighteen years for obstetric services.

3.14 There should be a multidisciplinary protocol governing care of these patients that includes: consent, the environment in which these patients are cared for, and the staff responsible for caring for these young women.

3.15 Anaesthetists should be aware of legislation and good practice guidance relevant to children and according to the location in the UK.[94,95,96,97,98,99,100] These documents refer to the rights of the child, child protection processes and consent.

3.16 Anaesthetists must undertake at least level 2 training in safeguarding/child protection,[101] and must maintain this level of competence by regular annual updates on current policy and practice and case discussion.[102]

3.17 At least one anaesthetist in each anaesthetic department, not necessarily an obstetric anaesthetist, should take the lead in safeguarding/child protection and undertake training and maintain core level 3 competencies.[103] The lead anaesthetist for safeguarding/child protection should liaise with their multidisciplinary counterparts within the obstetric unit.

Care for women requiring specialist services

3.18 There should be policies defining how women are referred to and access specialist or tertiary services (e.g. neurosurgery, acute stroke services).[15,104, 105]

Patients who decline to have transfusion of blood and blood products

3.19 Those who refuse transfusion of blood or blood products, whether because of adherence to the Jehovah's Witness faith or for other reasons, should be identified early in the antenatal period. They should meet with an anaesthetist to discuss their specific wishes, and should receive information about the potential risks associated with their decision to ensure informed consent process.[106,107] Such conversations should be conducted with appropriate privacy to avoid the risk of coercion. Their decision should be documented and shared with the MDT to in order to plan for delivery with the appropriate equipment and resources available.

4 Training and education

4.1 All anaesthetists involved in the care of pregnant women should be competent to deliver high quality, safe care that considers the physiological changes and other specific requirements of these pregnant women.[108]

4.2 There should be a nominated anaesthetist responsible for training in obstetric anaesthesia, with adequate programmed activities allocated for these responsibilities.[56]

4.3 A process should be in place for the formal assessment of anaesthetists before allowing them to join the on-call rota for obstetric anaesthesia with distant supervision.[23,109]

4.4 In-situ simulation training can help to identify system process gaps.[110] Simulation-based learning techniques should assist anaesthetists in resolving these issues and developing the necessary technical and non-technical skills.[111,112,113,114,115,116,117,118,119,120,121]

4.5 All anaesthetists working in the maternity unit should have received training in human factors, addressing key factors including situational awareness, effective team working and communication, decision-making and the effect of biases.[122]

4.6 There should be induction programmes for all new members of staff, including locum doctors. Induction for a locum doctor should include the following and should be documented:

- Familiarisation with the layout of the labour ward
- The location of emergency equipment and drugs (e.g. MOH trolley/intralipid/dantrolene)
- Access to guidelines and protocols
- Information on how to summon support/assistance
- Assurance that the locum is capable of using the equipment in that obstetric unit

4.7 Any autonomously practicing anaesthetist providing cover for the labour ward regularly or on an ad hoc basis, must undertake CPD in obstetric anaesthesia and have enough exposure to obstetric patients to maintain appropriate skills. This could be achieved through allocation of supernumery sessions on labour ward or in elective casearian lists whilst reviewing appropriate CPD during the appraisal process.[114,123,124,125]

4.8 Any non-trainee anaesthetist who undertakes anaesthetic duties in the labour ward should have been assessed as competent to perform these duties in accordance with RCoA guidelines.[23,33,56]

4.9 Aneasthetists who primarily work on the labour ward during night time should be given opportunities to work on the labour ward during the day on weekdays.

4.10 Any anaesthetist working on labour ward should also regularly undertake non-obstetric work to ensure maintenance of a broad range of skills.

4.11 All staff working on the delivery suite should have annual resuscitation training, including the specific challenges of pregnant women.[126]

4.12 Anaesthetists should contribute to the education and updating of midwives, anaesthetic assistants, obstetricians and intensive care staff involved in the care of maternity patients.

4.13 Anaesthetists should help organise and participate in regular multidisciplinary courses and 'skills and drills' for emergencies.[2,117,118,119,127]

5 Organisation and administration

Organisation

5.1 A system should be in place to ensure that those requiring antenatal and postnatal anaesthetic referral are seen and assessed by a senior obstetric anaesthetist, usually an autonomously pracitising anaesthetist, within a suitable time frame. Where the workload is high, consideration should be given to risk stratification so that not all women are required to attend in person, by using targeted telemedicine and/or distribution of relevant literature.[32,128]

5.2 An anaesthetist should be included in the MDT antenatal management planning for those with complex medical needs.[15] Planning should be in the form of shared decision making and include consideration of the woman's wishes and preferences.

5.3 All pregnant women requiring caesarean birth should, except in an extreme emergency, be visited and assessed by an anaesthetist before arrival in the operating theatre. This should allow sufficient time to weigh up the information in order to give informed consent for anaesthesia.

5.4 There should be a local guideline on monitoring of women after regional anaesthesia and the management of postanaesthetic neurological complications.

5.5 All women who have received an anaesthetic intervention for labour and/or delivery should be reviewed postnatally. Locally agreed discharge criteria should be met before they go home and written information should be provided.[129]

5.6 There should be local guidelines on preoperative, intraoperative and postoperative care for those cases where an enhanced recovery process is appropriate.[130]

5.7 Units with high numbers of caesarean births should have specific lists to minimise disruption due to emergency work.[108,131] Any elective caesarean delivery list should have dedicated obstetric, anaesthetic and theatre staff and take place in a separate theatre to where emergency cases are undertakenConsent

5.8 All pregnant women must be assumed to have capacity unless there is evidence to the contrary, as per the Mental Capacity Act.[132]

5.9 There should be documentation of any discussions involving informed consent for any procedures undertaken by the anaesthetist.[132]

5.10 Those with potential issues with their capacity to consent should be identified early in the antenatal period. Arrangements should be made to both to maximise their capacity and to ensure that they are adequately represented and advocated for, in keeping with current legislation.[133]

The provision of analgesia on the labour ward

5.10 Obstetric units should be able to provide regional analgesia on request. Smaller units may be unable to provide a 24-hour service; those booking at such units should be made aware that regional analgesia may not always be available.[56]

5.11 Midwifery care of a pregnant woman receiving regional analgesia in labour should comply with local guidelines that have been agreed with the anaesthetic department. Local guidelines should include required competencies, maintenance of those competencies and frequency of training. If the level of midwifery staffing is considered inadequate, regional analgesia should not be provided.

5.12 Units should have local guidelines on the recognition and management of complications of regional analgesia that include training on the recognition of complications and access to appropriate imaging facilities when neurological injury is suspected. The patient's GP should be informed in the event of any of these complications.[7]

5.13 Units should provide low-dose regional analgesia.[20,134]

5.14 Regional analgesia should not be used in labour unless the obstetric team is immediately available.

5.15 There should be a locally developed regional analgesia record and a protocol for the prescription and administration of drugs.

5.16 When the anaesthetist is informed of a request for regional analgesia (and the circumstances would be suitable for this type of analgesia) the anaesthetist should attend within 30 minutes of being informed. Only in exceptional circumstances should this period be longer, and in all cases attendance should be within one hour. This should be the subject of regular audits.[29,135]

5.17 Units that provide remifentanil PCA for labour analgesia should have policies and processes in place to ensure that it is used safely, that midwives who care for women using it are familiar with its use and have received specific training. Unit staffing levels should permit continuous midwifery supervision of its use.

Emergency caesarean birth

5.18 There should be a clear line of communication between the duty anaesthetist, theatre staff and anaesthetic practitioner once a decision is made to undertake an emergency caesarean birth.

5.19 The anaesthetist should be informed about the category of urgency of caesarean birth and the indication for surgery at the earliest opportunity.[136]

5.20 A World Health Organization (WHO) checklist adapted for maternity should be used in theatre.[137]

5.21 There should be clear arrangements for contingency plans and an escalation policy should two emergencies occur simultaneously, including whom to call.

The multidisciplinary team

Teams rather than individuals deliver care to pregnant women. Effective teamwork has been shown to increase safety, while poor teamwork has the opposite effect.[83,114] It is, therefore, important that obstetric anaesthetists develop effective leadership and team membership skills, with good working relationships and lines of communication with all other professionals. This includes midwives, obstetricians, neonatologists, and professionals from other disciplines such as intensive care, physicians (including neurology, cardiology and haematology), radiology, general practitioners and surgeons.

5.22 Team briefing and the WHO checklist should be in routine use on the labour ward to promote good communication and team working and reduce adverse incidents.[136,137,138,139]

5.23 If any major restructuring of the provision of local maternity services are planned, the lead obstetric anaesthetist should be involved in that process.[25]

5.24 Anaesthesia should be represented on all committees responsible for maternity services (e.g. the Maternity Services Liaison Committee, Delivery Suite Forum, Obstetric Multidisciplinary Guidelines Committee, Obstetric Risk Management Committee).[25,56]

5.25 Hospitals should have systems in place to facilitate multidisciplinary morbidity and mortality meetings.[140]

5.26 Anaesthetists should be an integral part of locally developed networks looking at obstetric services.

Serious incidents

5.27 When members of the healthcare team are involved in a critical incident, they can be profoundly affected. A team debriefing should take place immediately after a significant

critical incident. The lead clinician should review the clinical commitments of the staff concerned promptly. Further practical and psychological support, may be necessary to assist individuals to recover from a traumatic event.

5.28 There should be local governance measures in place to respond to serious incidents. These measures should protect patients and ensure that trained safety leads carry out robust investigations. When an incident occurs, it should be reported to all relevant bodies within and beyond the hospital. A system of peer review or external evaluation of serious incident reports should be in place.[141,142]

5.29 An anaesthetist should be involved in all case reviews where the case includes anaesthetic input.[12]

6 Quality improvement, audit and research

6.1 The lead obstetric anaesthetist should audit and monitor the duty anaesthetist workload to ensure that there is sufficient provision for this within the unit. Senior management should be made aware of any deficiencies found.

6.2 There should be effective governance systems and processes in place to assess, monitor and improve the quality and safety of services with particular reference to local guidelines, reviews of adverse events, and record keeping.[25]

6.3 There should be organisational support provided to facilitate data collection and analysis in obstetric anaesthesia to assist with quality improvement and benchmarking.[143]

6.4 All cases of maternal death, significant permanent neurological deficit, failed intubation or awareness during general anaesthesia should undergo case review, with learning from this shared locally and/or nationally (by reporting to MBBRACE).[29]

6.5 Research in obstetric anaesthesia and analgesia should be encouraged. Research must follow strict ethical standards as stated by the General Medical Council (GMC) and Good Clinical Practice (GCP) guidelines.[144]

7 Patient communication and information

Its is important that a patient is acknowledged as an individual and care and services are tailored to respond to their needs, preferences and values. Part of that process is provding information, oral and written, to enable patients to have informed participation in their care.

For the obstetric population requiring anaesthetist delivered care, examples of information resources, both written and visual, are available on the public information website, www.labourpains, provided by the Obstetric Anaesthetists' Association, which includes translations of these resources in over 20 languages. The Royal College of Anaesthetists have developed a range of Trusted Information Creator Kitemark accredited patient information resources, not specific for the obstetric population, that can be accessed from our website. Our main leaflets are now translated into more than 20 languages, including Welsh.

7.1 Early on in the antenatal period women should be informed of the analgesic options available in their planned delivery location, in order that they can make informed decision about their place of birth.[56,57]

7.2 Every unit should provide, in early pregnancy, advice about pain relief and anaesthesia during labour and delivery. An anaesthetist should be involved in preparing this information and approve the final version.[132]

7.3 Pregnant women should have access to information about the differing modes of delivery

during the antenatal period and should be offered the opportunity to speak to an anaesthetist if they wish to discuss how this might affect their choices around analgesia and anaesthesia.[132,145,146,147]

7.4 Information should be made available to non-English speaking women in their native languages.[148,149]

7.5 Units should consider local demographics, such as the prevalence of particular languages, when designing information or commissioning interpreting services.

7.6 Hospitals should ensure that the individual need for information in other languages should be assessed and recorded during antenatal care so that interpreting services can be planned for.

7.7 Interpreting services should be made available for non-English speaking women, with particular attention paid to how quickly such services can be mobilised and their availability out of hours.

7.8 Face to face interpreting services should be considered as most suitable, given the practical requirements for women in labour. However, telephone based services may be able to serve a greater number of languages and be more quickly mobilised, particularly out of hours.

7.9 The use of family members to interpret or translate should be avoided unless absolutely necessary or an independent interpreter is specifically declined. It should be a rare occurrence that there is no alternative translation method available.[150,151]

7.12 All information given to women and their consent to undergo obstetric anaesthetic procedures should be clearly documented in their records.

Complaints

7.13 If complaints are made about anaesthetic aspects of care, a consultant anaesthetist should review and assess the patient's complaint, discussing her concerns and examining her where appropriate. This should be clearly documented alongside any subsequent action taken. Referral for further investigations may be required.

7.14 Complaints should be handled according to local policies.

7.15 The lead obstetric anaesthetist should be made aware of all complaints.

Financial considerations

There is a paucity of evidence regarding the financial implications of many of the recommendations we make here, The vast majority of units will already adhere to most of the standards outlinedMany of the recommendations represent a financial impact on workforce and time allowance and this should be dealt with in robust job planning and specification in each anaesthetic department and, if required, at trust or board level.

The acquisition of specific equipment, and its ongoing use and maintenance may have implications for capital and operational expenditure. Recommendations are made based on evidence that there is a cost-effective benefit to patients in terms of outcome and/or improved safety. Local business cases and action plans may need to be developed. The cost of implementing any recommendations should always be considered in relation to the financial risks and human cost of providing substandard care.

Any service implications will have to be considered against the background of the need for all NHS trusts in England and Wales to reduce expenditure.[152]. It is not the purpose of this guidance to dictate how these recommendations are met – that is to be decided locally. Individual trusts/boards and their executives will need to consider the ongoing viability of any maternity unit that continues to fail to meet these standards. The amalgamation or formalised intertrust/board

partnerships of smaller consultant-led units, for example, which are an effort to pool resources more efficiently, may require consideration if service provision consistently falls short of the expected standards.

Implementation support

The Anaesthesia Clinical Services Accreditation (ACSA) scheme, run by the RCoA, aims to provide support for departments of anaesthesia to implement the recommendations contained in the GPAS chapters. The scheme provides a set of standards, and asks departments of anaesthesia to benchmark themselves against these using a self-assessment form available on the RCoA website. Every standard in ACSA is based on recommendation(s) contained in GPAS. The ACSA standards are reviewed annually and republished approximately four months after GPAS review and republication to ensure that they reflect current GPAS recommendations. ACSA standards include links to the relevant GPAS recommendations so that departments can refer to them while working through their gap analyses.

Departments of anaesthesia can subscribe to the ACSA process on payment of an appropriate fee. Once subscribed, they are provided with a 'College guide' (a member of the RCoA working group that oversees the process), or an experienced reviewer to assist them with identifying actions required to meet the standards. Departments must demonstrate adherence to all 'priority one' standards listed in the standards document to receive accreditation from the RCoA. This is confirmed during a visit to the department by a group of four ACSA reviewers (two clinical reviewers, a lay reviewer and an administrator), who submit a report back to the ACSA committee.

The ACSA committee has committed to building a 'good practice library', which will be used to collect and share documentation such as policies and checklists, as well as case studies of how departments have overcome barriers to implementation of the standards, or have implemented the standards in innovative ways.

One of the outcomes of the ACSA process is to test the standards (and by doing so to test the GPAS recommendations) to ensure that they can be implemented by departments of anaesthesia and to consider any difficulties that may result from implementation. The ACSA committee has committed to measuring and reporting feedback of this type from departments engaging in the scheme back to the CDGs updating the guidance via the GPAS technical team.

Areas for future development

Areas of research currently identified as deficient by the GPAS CDG include:[15]

- Criteria for defining obstetric or obstetric anaesthetic workload [may be different]
- Organization of elective obstetric services
- Optimal service provision for acutely ill obstetric patients

Abbreviations

ACSA	Anaesthesia Clinical Services Accreditation scheme
BMI	Body mass index
CDG	Chapter Development Group
COSHH	Control of Substances Hazardous to Health
ECG	Electrocardiogram
GPAS	Guidelines for the Provision of Anaesthetic Services
GMC	General Medical Council
MDT	Multidisciplinary team
MOH	Massive obstetric haemorrhage
NICE	National Institute for Health and Care Excellence

OAA	Obstetric Anaesthetists' Association
PCA	Patient-controlled analgesia
RCoA	Royal College of Anaesthetists
SAS	Staff grade, associate specialist and specialty
TEG	Thromboelastography
WHO	World Health Organization

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