



Guidelines

for the provision of

Anaesthetic Services

The Royal College of Anaesthetists
2004



Introduction

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In 1994 the Royal College of Anaesthetists published 'Guidance for Purchasers' to help both anaesthetists with managerial responsibilities and other healthcare managers. It defined some standards for provision of anaesthetic services. In 1999 it was revised and re-titled 'Guidelines for the Provision of Anaesthetic Services'.

By 2004 its scheduled revision takes account of changing patterns of the delivery of anaesthetic services. While paying attention to current, and even 'best guessing' future changes in the structure and delivery of healthcare, the editors have tried to adhere to the basic principles of using the experience of individual specialists and also of sub-specialist anaesthetic organisations as their main resources. The editors join me in recording our gratitude to them; the participation of all of them contributes to the document being the collective statement from our profession. It details areas necessary to ensure the maintenance and development of a comprehensive anaesthetic service for our patients, and for the continuing education and professional development of the staff to underpin this service.

By using the College website, the 2004 version of 'Guidelines for the Provision of Anaesthetic Services' will be published in sections, beginning with the general principles on the delivery of all anaesthetic services, followed by those dealing with specialist areas of anaesthetic care. Each section has a broadly similar format, but adds suggestions to the 1994 and 1999 versions of how to audit levels of service provision by providing direct hyperlinks to the relevant sections in another of our publications: 'Raising the Standard: A Compendium of Audit Recipes'.

The document contains what it says it does, that is, 'Guidelines'. It does not override the clinical judgement of individual anaesthetists exercised in

the best interests of patients. Inevitably there will be areas of disagreement. Some will find the documents too explicit; others will be disappointed by omissions of what they believe to be perfectly reasonable requirements. The authors have tried to steer a course between these, distinguishing between on the one hand what is mandatory, and on other hand what are the standards to which the service should aim. They also take the view that these standards should be tested at all times in light of the experience of those who deliver the service and by future developments. To account for this, as an internet publication, sections can be amended by what is learned from the authors of subsequent specialist sections and by how readers respond (please email comments to website@rcoa.ac.uk).

The principal editors are grateful for the help of all those individuals who redrafted, validated and scrutinised the final drafts. Their names are acknowledged and recorded. As with many projects someone does the hard work; for this project, John Curran, the Council member charged with this task, and I would like to mention especially Helen Wise, a senior anaesthetic trainee who has masterminded it all, and Edwina Wilson of our Professional Standards Directorate, who as well as being part of the co-ordination of the project also undertook the editorial processes involved in its publication.



Key Points on the provision of Anaesthetic Services

When considering the provision of anaesthesia, the Royal College of Anaesthetists recommends that the following areas should be addressed. The goal is to ensure a comprehensive, quality service dedicated to the care of patients and to the education and professional development of staff. The provision of adequate funding to provide the services described should be considered.

Summary

- Guidelines and standards appropriate to general and specific aspects of anaesthetic practice issued by the Royal College of Anaesthetists (RCOA) and the Association of Anaesthetists of Great Britain and Ireland (AAGBI) should be referred to when considering the provision of all anaesthetic services.^{1,2}
- The anaesthetic service must be consultant led, with a clinical director and lead clinicians who are responsible for each component of the service.³
- Departments of anaesthesia must have an identified consultant who is responsible for ensuring that all lists are covered by suitably trained anaesthetists. Wherever possible consultant anaesthetists will be re-allocated to cover for colleagues' absences.⁴
- A lead anaesthetist should be part of a Theatre Management Group, aimed at facilitating optimal theatre efficiency.^{4,6}
- All patients must undergo appropriate pre-operative assessment and be seen by an anaesthetist before operation.⁷
- Dedicated skilled assistance for the anaesthetist must be provided in every situation where anaesthesia and sedation are administered.⁷
- Appropriately trained and competent staff must provide care for all patients recovering from anaesthesia or sedation.^{7,8}
- Trainee rotas must be compliant with the 'New Deal' and current European Working Time Directives (EWTD).⁹⁻¹¹
- Departments of anaesthesia should provide an acute pain service and either have or provide access to a non-acute ('chronic') pain service with nominated lead consultants.¹²
- All anaesthetic and monitoring equipment must comply with standards set by the AAGBI.¹³
- All equipment should be maintained according to manufacturers' specifications.^{13,14}
- A comprehensive range of drugs and other agents required for safe practice of anaesthesia must be agreed, with their supply maintained at all times.¹⁴
- Appropriate accommodation, facilities, secretarial and administrative support must be provided for staff working in departments of anaesthesia.^{15,16}
- Appropriately trained staff, dedicated equipment and satisfactory personal insurance arrangements must be available for inter-hospital transfers.^{17,18}
- Departmental guidelines for anaesthetic practice should be in place, observed and reviewed in accordance with good medical practice and sources of national guidance.³

- A college tutor or consultant-in-charge of training must be appointed to organise and co-ordinate anaesthetic training. The college tutor is the representative of the RCoA in a given hospital or trust.¹⁹
- Workload, experience and supervision of trainee staff must satisfy the requirements of the RCoA.¹⁹
- All staff in clinical contact with patients must be appropriately trained in resuscitation skills.²⁰
- A system must be in place to ensure that revalidation requirements as outlined by the General Medical Council (GMC) can be met by all medical staff.^{3,21}
- Adequate arrangements, including time for preparation of documentation, must be made for annual appraisal of all anaesthetists.^{3,21-25}
- All staff should fulfill the continuing education and professional development (CEPD) requirements of the RCoA and the GMC.^{1,22-26}
- All anaesthetists should participate fully in the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) and where possible information should be provided for other national and local audits.^{1,27}
- A critical incident reporting system must be in place and regular audit, critical incident and managerial meetings should be held and appropriately recorded.³
- A system must be in place for dealing effectively with complaints.^{3,28}
- There must be effective mechanisms for the 'hand-over' both of the care of individual patients, and of overall services providing continuity of care.²⁹

Introduction

Departments of anaesthesia will be expected to provide adequately staffed and appropriate services anywhere that anaesthesia or sedation are provided. The main areas in which they have a responsibility are:

- Elective and emergency surgery: the service will include pre-operative assessment and preparation of patients, and care during and after anaesthesia.
- Obstetric services: antenatal advice and information, analgesia during and following childbirth, the provision of anaesthesia when needed, the provision of resuscitation skills and care for those mothers requiring critical care.
- Intensive care and high-dependency care: in all hospitals providing acute medical and surgical services there must be access to appropriate critical care facilities. These should have full-time cover and be sufficiently comprehensive to serve the needs of the patients, so that transfer of patients once treatment has been started is exceptional.
- Services provided for children.
- In some units, provision of anaesthesia for specialist surgery such as cardiothoracic, neurosurgical, and transplant procedures.
- Provision of anaesthesia for day case surgery. This will include the selection of suitable patients using medical and social criteria, the choice and planning of suitable facilities and techniques, and the provision of post-operative care and support.
- Provision of a service for the relief of acute pain and either provision of or access to a service for the management of 'chronic' pain.
- Participation in resuscitation services.
- Provision of anaesthetic services in non-theatre environments, including sites where anaesthesia for electroconvulsive therapy, imaging services and community dentistry are administered.

Levels of provision of service

1 Staffing requirements

- 1.1 Departments of anaesthesia will be consultant led with a clinical services director and lead clinicians, and named consultants responsible for the individual components of the service. They should enjoy the respect of their consultant and other colleagues; this contributes to the best interests of patients.
- 1.2 All medical services to patients, including anaesthetic services, provided in the National Health Service (NHS) are the responsibility of consultants. Patients treated in the independent sector, or in any other healthcare facility, are entitled to an equivalent standard.
- 1.3 Trainee and non-consultant career grade (NCCG) or Staff and Associate Specialist (SAS) anaesthetists providing anaesthetic services must be supervised by a consultant. Supervision is a professional function of consultants who will decide the appropriate level of supervision for each circumstance.¹⁹
- 1.4 The provision of qualified and competent assistance for anaesthetists is an essential part of the provision of the anaesthetic service. Skilled assistance for anaesthetists from either nurses or operating department practitioners/assistants who have undergone appropriate training is required in every situation where anaesthetics are administered.
- 1.5 The level of anaesthetic service for emergency activities, including surgery, must be provided by competent anaesthetists with consultant supervision.
- 1.6 Trainee rotas must meet the requirement of the 'New Deal', and from August 2004, be compliant with the current European Working Time Directive (EWTD).
- 1.7 Departments of anaesthesia occasionally need to appoint locum staff. National guidance details procedures for the appointment of locum consultants, and a robust mechanism should be in place to cover for absences of all staff.

2 Equipment, support services and facilities

- 2.1 Wherever general and regional anaesthesia is administered there must be access to an appropriate range of laboratory and radiological services.

Pre-operative support services

- 2.2 An anaesthetist is expected to visit the patient both before and, particularly for those undergoing major procedures, after surgery. Both visits should ideally be carried out by the anaesthetist who administers

the anaesthetic. Local pre-admission procedures and written information^{5,33,34} do not replace the final pre-operative meeting between anaesthetist and patient. Further details are available in chapter two of this document (Guidelines on the provision of anaesthetic services for pre-operative care).

Equipment

- 2.3 All equipment used to provide anaesthesia, including monitoring equipment, should comply with the recommendations of the AABGI. Health and Safety principles must be observed and compliance with 'Control of substances hazardous to health' (COSHH) regulations ensured. Equipment must be serviced regularly and maintained to a standard of safe working order.¹⁴ Further details are available in chapter three of this document (Guidelines on the provision of anaesthetic services for intra-operative care).

Post-operative support services

- 2.4 Patients leaving the operating theatre will require specific care in a fully staffed recovery facility ordinarily located in the theatre complex. Further details are available in chapter four of this document (Guidelines for the provision of anaesthetic services for post-operative care).

Pain services

- 2.5 All hospitals should provide appropriate services for the relief of pain. Acute pain services, primarily managing pain after surgery, may have wider roles including liaison with outreach and critical care staff. They also need the support of appropriately trained recovery, ward and other support staff to maintain continuity.
- 2.6 Non-acute (chronic) pain is usually managed by consultant anaesthetists as part of a multidisciplinary pain team that often includes psychologists, physiotherapists and occupational therapists, as well as psychiatrists, surgeons and physicians. This service requires consultant input, accommodation and secretarial support. Anaesthetists often play a major role in the management of pain caused by cancer, especially in hospitals without organised palliative care services. (Please refer to later sections for specific details of pain management services: in process of revision).

Guidelines

- 2.7 Departmental guidelines for all areas of anaesthetic practice, locally determined in accordance with national guidelines, should be established, followed and regularly reviewed.

3 Areas of special requirement

Specialist services, for example paediatric anaesthesia, have unique requirements. These are dealt with in later chapters of this document (in process of revision).

4 Training and education

Arrangements for trainee anaesthetists

- 4.1 Training of anaesthetists is organised under the overall guidance of the RCoA; responsibility for delivery lies with the Postgraduate Dean. Training, consisting of both theoretical and practical components, is usually provided by departments of anaesthesia working within a 'School of Anaesthesia', but can also be obtained from external experience. It is facilitated by local consultant staff and is led by a College Tutor who is appointed by the RCoA.
- 4.2 Trainees registered with the RCoA will be included in comprehensive regional training programmes. These should include experience in anaesthesia for all specialties. It is important to appreciate that when teaching technical aspects of anaesthetic practice there is a need to ensure that sufficient time is available for this purpose. The result may be some limitation in the surgical throughput.
- 4.3 The Schools of Anaesthesia to which all trainees are attached provide access to comprehensive programmes of lectures and tutorials directed towards the RCoA examination system. These courses may be regionally based, or may necessitate visits to the RCoA for courses.
- 4.4 All departments of anaesthesia must organise and run programmes of educational activities. These will include lectures and tutorials on relevant topics, and meetings and seminars on such matters as mortality and morbidity, critical incident reporting, clinical audit, research and journal review clubs.
- 4.5 All trainees undergo a process of assessment, appraisal and guidance to ensure that they are making good progress in their careers and are continuing to attain well-recognised clinical and academic goals, including passing examinations set by the RCoA. Assessment and appraisal are conducted by the consultant staff, usually led by the College Tutor, and appropriate time must be allocated for this.

Other teaching arrangements

- 4.6 Instruction of house officers in the pre-operative preparation of patients for surgery, resuscitation techniques and basic critical care principles is commonly undertaken by departments of

anaesthesia. Departments should be encouraged to take part in 'Foundation Programmes for Medical Graduates'³³ and in training of medical students. The latter are required to receive training in the principles of anaesthesia and resuscitation, and are increasingly being taught basic clinical skills, including fluid management and pain relief, by anaesthetists.

- 4.7 Anaesthetists provide a wide range of training for non-medical hospital staff, including nurses, midwives, operating department assistants and paramedics.
- 4.8 All hospital staff and those in clinical contact with patients must be trained in at least basic resuscitation skills, so that the initiation of resuscitation is not unduly delayed while awaiting the arrival of staff trained in advanced life support. Such training has to be repeated at predefined intervals. Resuscitation Training Officers should supervise this process.

Continuing Professional Development (CPD)

- 4.9 The RCoA believes it is a professional obligation of all anaesthetists to take part in and demonstrate evidence of CEPD.²³ Its stance underpins the GMC's revalidation process and the concept of appraisal.²⁶ To achieve the goals of CEPD, anaesthetists must undertake educational activities including attendance at local, regional and national educational meetings. Study leave must be properly funded and educational opportunities provided within the hospital.

5 Research and audit

Audit

- 5.1 Audit of all areas of anaesthetic practice requires time and incurs a financial cost, for which a budget is necessary. It should include critical incident reporting, risk management and outcome measures.
- 5.2 Hospital data collection systems are an essential support tool in providing the information required for audit, and must be in place and regularly updated to the highest standards of current technology. The RCoAs audit 'recipes' provide templates to plan audit programmes.³⁰ As part of audit, patients' attitudes and comments about the anaesthetic service should be sought.
- 5.3 All consultants should participate as required in the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) and the Confidential Enquiry into Maternal and Child Health (CEMACH).²⁷

Research

5.4 Innovation and improvement in anaesthetic practice for the benefit of patients is facilitated by research. Audits and similar practices cannot replace the fundamental purposes of research, which requires sufficient time and resources. All areas of practice should have opportunities to further their research aims. All doctors should learn how to evaluate research findings applicable to their own practice.

6 Organisation and administration

6.1 The obligation to communicate effectively with colleagues^{7,29} is important in the chain of responsibility that provides continuing care for patients. This can be discharged both verbally and by reference to documents such as the anaesthetic record sheet and patients' notes. Lead clinicians for components of the anaesthetic service, such as routine anaesthesia, critical care, obstetric anaesthesia and pain management should ensure that communication is managed in a way that meets the needs of appropriate confidentiality,³⁴ protects the needs of patients and maintains the efficiency of the overall service.

6.2 There should be a system to ensure the effective and economic use of anaesthetic resources in terms of:

- staffing
- equipment
- consumables such as drugs and disposable devices.

6.2 The organisation of theatre services must match the needs of patients, surgeons, anaesthetists, nurses and paramedical staff. This will include 24-hour availability of an emergency theatre service to minimise the need to use out-of-hours services for situations other than true emergency surgery.

6.3 Optimal theatre efficiency may be facilitated with the support of appropriate planning and management, diagnostic tools, human resources and service redesign, and implemented by a Theatre Management Group. Anaesthetists must play a key role in this process, to ensure clear communication between all the managerial and clinical staff involved in daily running of theatres. Those managing the anaesthetic service should co-operate with surgical and other

directorates to optimise the treatment of patients and encourage best use of available facilities.⁴⁻⁶

6.4 A number of anaesthetists also undertake local, regional and national duties in the fields of education, research and administration. This may occasionally involve them being away from their clinical duties on periods of professional leave. Such activities have the mutual benefit of forming part of CEPD and attracting recognition for the employing trust. These activities should be reflected in job planning and appropriate staffing levels.

6.5 Departments of anaesthesia require an appropriate level of secretarial assistance to maintain an administrative and organisational base, and to release anaesthetists from clerical tasks.

6.6 Departments of anaesthesia also need accommodation for teaching purposes, for educational activities and access to books and current medical literature, information technology and internet facilities.

6.7 When staff are required to be resident or working out-of-hours in the hospital, living and working conditions should meet at least the minimum nationally agreed standards. These include accommodation meeting minimum standards for human habitation and building requirements, and access to good quality hot and cold food at any time.¹⁶

7 Patient information

7.1 Patients have a right to information about their condition and the treatment options available to them, and all doctors have a duty to inform patients in sufficient detail about these options. Patients should be provided with adequate information about anaesthesia, pain relief and any other services provided by anaesthetists so that they can make informed decisions about their treatment and care. However information is conveyed, it is a duty of the anaesthetist administering the anaesthetic to explain what is proposed and gain at least implied consent to treatment.

7.2 Leaflets and internet-based material produced by the Joint [Patient Information Project](#) of the RCoA and the AAGBI may be offered to patients who are to undergo anaesthesia.^{31,32}

**Click here to link to
Audit Recipe Book Section 13:
Delivery of Anaesthetic Services**

**Click here to link to
the Departmental Portfolio
by the JCGP**

References

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- 28 The NHS Complaints procedure (www.nhs.uk/england/aboutTheNHS/complaincompliment.cmsx).
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Other website links

- **The National Institute for Clinical Excellence (NICE)** (www.nice.org.uk/)
- **The Commission for Healthcare Audit and Inspection (CHAI)** (www.healthcarecommission.org.uk/Homepage/fs/en)
- **The Departmental Portfolio by the JCGP** ([www.rcoa.ac.uk/docs/departmentalportfolio\(Sept02\).pdf](http://www.rcoa.ac.uk/docs/departmentalportfolio(Sept02).pdf))



Guidance on the provision of anaesthetic services for Pre-operative Care

When considering the provision of anaesthesia, the Royal College of Anaesthetists recommends that the following areas should be addressed. The goal is to ensure a comprehensive, quality service dedicated to the care of patients and to the education and professional development of staff. The provision of adequate funding to provide the services described should be considered.

Summary

- A care pathway for pre-operative assessment should be available for all patients undergoing elective surgery.^{1,2,3}
- Pre-operative assessment should take place early in the patient's journey so that all requirements for essential resources and obstacles can be anticipated before the day of the operation²⁻⁴. This may be difficult in the case of emergency surgery.
- All patients must be met by an anaesthetist before undergoing an operation that requires general or regional anaesthesia provided by an anaesthetist.¹
- Ideally, the anaesthetist who will actually give the anaesthetic should visit the patient before the operation.¹
- Sufficient time must be made available in the patient care pathway for the anaesthetist to cover the essential points of pre-operative assessment; job plans should incorporate adequate programmed activities for pre-operative anaesthetic visiting and assessment.^{1,2,4}
- Each trust should have agreed written policies, protocols or guidelines on the following aspects of pre-operative care:
 - ◆ pre-operative fasting^{1,3}
 - ◆ thromboprophylaxis (including timing of administration of thromboprophylactic agents in patients undergoing regional anaesthesia)⁵⁻⁷
 - ◆ pre-operative investigations^{1,3}
 - ◆ pre-operative blood ordering schedule.^{3,9,10}
- All patients should be fully informed about the planned procedure.^{8,11}
- All patients undergoing elective procedures should be provided with easily understood information material covering anaesthesia and post-operative pain relief before admission to hospital.^{12,13}

Introduction: The importance of pre-operative anaesthetic care

- Pre-operative assessment is an important part of patient care; it establishes that the patient is fully informed and consents to undergo the procedure, and is as fit as possible for the surgery and anaesthetic.
- Good pre-operative assessment and screening enable identification of all essential resources and obstacles to discharge for patients, and thereby minimise late cancellation of operations, assisting overall patient care and efficiency of operating lists.
- Business planning by trusts and anaesthetic departments should ensure that necessary time and resources are directly targeted towards pre-operative assessment.
- Pre-operative consultation by an anaesthetist is essential for the medical assessment of a patient

before anaesthesia for surgery or any other procedure. Nursing and other trained staff play an essential role when, by working to agreed protocols, they screen patients for fitness for anaesthesia and surgery.

- Pre-assessment clinics are not a substitute for consultation with the anaesthetist responsible for providing care on the day of surgery. Pre-operative consultation by an anaesthetist is essential for the medical assessment of a patient before anaesthesia for surgery or any other procedure.
- Anaesthetists should develop a plan for the anaesthetic and discuss it with the patient, or responsible adult in the case of children.
- These guidelines apply to the care of all patients who require anaesthesia or sedation provided by an anaesthetist. In exceptional circumstances, such as emergency surgery, these guidelines may need to be modified and the reasons for so doing should be documented in the patient's record.

Levels of provision of service

1 Staffing requirements

- 1.1 All patients who are to undergo a procedure requiring the services of an anaesthetist must be assessed by an anaesthetist before the procedure.
- 1.2 Anaesthetists need time to cover the following essential points in the pre-operative anaesthetic assessment:
 - correct identification of the patient
 - interview and medical case notes review for past medical and anaesthetic history
 - examination, including airway assessment
 - obtaining results of relevant investigations
 - discussion and explanation of the anaesthetic technique
 - instructions for pre-operative fasting, proposed pain relief method, expected sequelae, and possible major risks (where appropriate)
 - establishing the patient's understanding of and consent to the procedure (see 7.1 to 7.4)
 - documentation of details of discussion in the anaesthetic record
 - prescription and ordering of any pre-operative medication.
- 1.3 An anaesthetic pre-operative assessment service must involve consultant anaesthetists. When patients attend a dedicated pre-operative assessment clinic, an anaesthetist should attend or be available and this should be recognised as a commitment of anaesthetists.

- 1.4 Local protocols should determine the grade and experience of the nurse accompanying the patient to the operating department.

2 Support services and facilities

- 2.1 Patients should be admitted to a ward or alternative facility in sufficient time for the operating list for which they are scheduled. This is essential to enable the anaesthetist who will be administering the anaesthetic to complete an adequate pre-operative assessment as detailed in 1.2. If patients are not available in sufficient time for the anaesthetist to conduct a satisfactory pre-operative assessment, it is possible that surgery will be delayed or postponed until such a time as an assessment is possible.
- 2.2 There must be a locally agreed hospital policy for pre-operative investigations, pre-operative fasting schedules and continuation of regular medication.
- 2.3 There must be a locally agreed protocol for administration of thromboprophylactic agents to patients undergoing surgery, including identification of low, moderate and high risk patients and a recommended prophylactic method for each group. This should include reference to those patients likely to receive regional anaesthesia.⁷
- 2.4 Patients should be adequately clerked before their final anaesthetic assessment, and the findings documented. Such clerking may be undertaken efficiently in a pre-admission clinic.
- 2.5 Written guidelines should cover the policy for collection of patients from the ward, as well as the hand-over by ward staff to a designated member of the operating department staff.
- 2.6 Operating lists should be made available to the anaesthetist well before the list starts.
- 2.7 Operating lists should include details of the patient's operation, date of birth or age, hospital identification number and the ward on which they are located. A robust system must be in place for the identification to and by the surgeon as to the side of the operation.
- 2.8 The whole operating team must agree to any change to a published operating list.
- 2.9 Anticipated difficulty with anaesthesia should be brought to the attention of the anaesthetist as early as possible before surgery. This includes any planned ICU admissions, the need for special skills such as that of fibre-optic intubation, or known history of anaesthetic complications.

2.10 A pre-operative blood-ordering schedule should be agreed with the local transfusion service for each procedure .

3 Areas of special requirement

Children

3.1 The special needs of children must be considered at all stages of peri-operative care. (Please refer to the later chapter Guidelines for the provision of paediatric anaesthetic services: under revision).¹⁴

Elderly patients

3.2 Pre-operative assessment of some elderly patients may need cross-specialty advice involving anaesthetists, surgeons and physicians. The development of this team approach requires time and resources that must be recognised and provided by management.¹⁵

3.3 A team of senior surgeons, anaesthetists and physicians needs to be closely involved in the care of elderly patients who have poor physical status and high operative risk.¹⁶

Patients with Diabetes Mellitus

3.4 Diabetes is the most common endocrine disease encountered before surgery. Fasting times, the surgical stress response and inactivity can all have a negative impact on blood sugar control.

3.5 Fasting times for patients with diabetes should be kept to a minimum; they should ordinarily be first on the operating list.

3.6 Regular per-operative measurement of blood sugar levels is essential.

3.7 Locally agreed regimens for blood sugar control of diabetic patients should be in place.

4 Training and education

4.1 Training of anaesthetists includes attaining the competency to perform medical assessment of a patient before anaesthesia for surgery or other procedures.

4.2 The RCoA has established essential knowledge, skills, attitudes and workplace objectives needed in the area of pre-operative assessment in training to attain a Certificate of Completion of Specialty Training (CCST) in anaesthesia.¹⁷

4.3 The pre-operative assessment service should enable multidisciplinary training for medical students, nurses, specialist doctors in training and allied health professionals.³ Educational materials are available to facilitate this.¹⁸

5 Research and audit

5.1 The NHS Modernisation Agency has outlined measurable key performance indicators in theatre management and pre-operative assessment.³

5.2 Regular audits of the following aspects of pre-operative care may include:

- effectiveness of pre-operative information provided to patients
- pre-operative documentation of consultation by anaesthetists
- consent to anaesthesia
- effectiveness of pre-operative assessment services
- adequacy of surgical clerking
- pre-operative visiting
- pre-operative airway assessment
- pre-operative fasting in adults
- pre-operative medication
- thromboprophylaxis
- choice of technique: general, local or regional anaesthesia.

6 Organisation and administration

6.1 Business planning by trusts and anaesthetic departments should ensure that necessary resources, including time are targeted towards pre-operative assessment.

6.2 Pre-operative screening requires careful co-ordination and communication with individual surgeons, medical records and outpatients' clinics. Contact with the patient's general practitioner may establish the need for appropriate pre-operative investigation or treatment, to select admission time and to avoid postponement or cancellation. An identified individual should be responsible for overseeing the adequacy of these processes.²

7 Patient information

Consent

7.1 The competent patient has a fundamental right, under common law, to give, or to withhold, consent to examination, investigation and treatment.⁸

7.2 No other person can consent to treatment on behalf of any other adult.¹⁹

7.3 Doctors may treat a patient who is not competent, without consent, provided it is necessary and in the patient's best interests. Where a patient is not competent, there should be a mechanism for appropriate documentation as to why a procedure under consideration is in the patient's best interests.

This should include any evidence obtained from discussion with the family or other carers relating to whether a patient might reasonably have consented if competent.

- 7.4** In the case of children under the age of 16 years, consent should be given by the parent or guardian. In England and Wales, a child who is deemed 'Gillick-competent' under the age of 16 years may give, but not withhold, consent.^{20,21}

Information

- 7.5** Patients should be fully informed about the planned procedure.
- 7.6** All patients undergoing elective procedures should be provided with easily understood information materials covering anaesthesia and post-operative pain relief before admission to hospital.^{12,13}

- 7.7** The anaesthetist should explain what the patient will experience before and after anaesthesia,⁸ and include any choices of anaesthetic technique and details of post-operative management.

- 7.8** The anaesthetist should invite and answer questions from the patient, or the patient's relatives if appropriate.

- 7.9** The anaesthetist should document in the patient's case notes that the above has been properly performed.

Patients consenting to be subjects of research

- 7.10** A patient's consent to participate in research projects should be obtained by those conducting the study and not by the anaesthetist providing care for the operation. Consent must be obtained on a separate signed document and approval should be sought from the anaesthetist who will be delivering the anaesthetic to the patient.³

**Click here to link to
Audit Recipe Book Section 1:
Preoperative Care**

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Guidance on the provision of anaesthetic services for Intra-operative Care

When considering the provision of anaesthesia, the Royal College of Anaesthetists recommends that the following areas should be addressed. The goal is to ensure a comprehensive, quality service dedicated to the care of patients and to the education and professional development of staff. The provision of adequate funding to provide the services described should be considered.

Summary

- An appropriately trained and experienced anaesthetist must be present throughout the conduct of all general and regional anaesthetics and procedures requiring sedation given by an anaesthetist;¹ this is the main determinant of the safety of patients during anaesthesia.²
- An anaesthetic assistant who is trained, competent and holds an appropriate nationally recognised qualification must be present throughout the entire anaesthetic procedure, and provide exclusive assistance to the anaesthetist.³
- All anaesthetic equipment must be checked before use according to the Association of Anaesthetists of Great Britain and Ireland (AAGBI) published guidelines.⁴
- The recommended standards of monitoring must be met for every patient.¹
- Within each theatre suite there must be at least one portable storage unit with specialised equipment for management of the difficult airway.⁵
- Policies and equipment must be in place to protect patients and staff from cross-infection.⁶
- Fully resourced, dedicated daytime emergency and trauma lists should be provided.⁷
- If appropriate resources are not available the level of clinical activity should be limited to ensure a safe provision of intra-operative care.⁸

Introduction: The importance of intra-operative anaesthetic care

- General anaesthesia is a state of induced, reversible loss of consciousness, during which the patient will be unaware of their surroundings and of painful stimuli.
- Regional and local anaesthesia are states in which parts of the body are rendered insensible to painful stimuli. These states may be accompanied by sedation which alters the patient's level of consciousness.
- The effects of anaesthesia and of the surgical procedure may have profound physiological consequences for the patient, and require monitoring and if needed correction throughout anaesthesia.
- The continuous presence of an appropriately trained and experienced anaesthetist is essential as the main determinant of patient safety during anaesthesia.²
- Monitors with appropriately set alarms may detect critical incidents and provide an early warning of the consequences of an error.
- The safe provision of anaesthesia requires the help of competent anaesthetic assistance at all times.
- Anaesthetic equipment is subject to frequent, repetitive use and needs regular servicing according to manufacturer's specification to prevent malfunction.

- Careful and regular in-service checks of anaesthetic equipment and of drugs minimise the risks posed by anaesthesia.
- The anaesthetic record is an important medical document, which should contain the relevant physiological measurements and relevant observations during every anaesthetic.

Levels of provision of service

1 Staffing requirements

- 1.1 All anaesthetists and anaesthetic assistants, including locum and agency staff, must undergo a proper induction process.⁹
- 1.2 An appropriately trained and experienced anaesthetist must be present throughout the conduct of all general and regional anaesthetics and procedures requiring sedation by an anaesthetist.¹
- 1.3 Under the present system of healthcare provision in the UK, one anaesthetist cannot provide direct care for more than one patient receiving general or regional anaesthesia, or sedation.
- 1.4 As soon as the care of the patient is transferred to the anaesthetist, an anaesthesia assistant who is trained, competent and holds an appropriate national qualification must provide exclusive assistance to the anaesthetist.²
- 1.5 The anaesthetic assistant must be immediately available throughout the entire anaesthetic procedure.²

2 Equipment, support services and facilities

Equipment

General

- 2.1 Facilities for monitoring, ventilation of patients' lungs and resuscitation including defibrillation must be available at all sites where patients are anaesthetised.
- 2.2 The following ancillary anaesthetic equipment must also be available at all sites where patients are anaesthetised:
 - oxygen supply
 - facemasks
 - suction
 - airways (e.g. 'Guedel')
 - laryngoscopes
 - tracheal tubes and connectors
 - intubation aids (e.g. bougies, forceps etc)
 - laryngeal mask airways
 - heat-moisture exchange filters

- self-inflating bag
- trolley/bed/operating table that can be rapidly tilted head-down.

- 2.3 In each theatre suite there must be at least one portable storage unit with specialised equipment for management of the difficult airway.⁴ In addition, a fibre-optic laryngoscope should be readily available.
- 2.4 User manuals should be available as needed for anaesthetic equipment.
- 2.5 All anaesthetic equipment must be checked before use according to the AAGBI published guidelines.⁴ Anaesthetic machine checks should be recorded in a logbook or on the anaesthetic chart.
- 2.6 No anaesthetic machines should be able to supply a hypoxic gas mixture.^{10,11}
- 2.7 All anaesthetists and anaesthetic assistants should receive systematic training in the use of new equipment.⁴
- 2.8 A named consultant should oversee the provision of anaesthetic equipment.¹²
- 2.9 There must be a planned maintenance and replacement programme for all anaesthetic equipment.¹²
- 2.10 Appropriate equipment must be available to minimise heat loss by the patient and to provide active warming.¹³
- 2.11 Additional specialised equipment is needed for babies and young children.

Monitoring

- 2.12 The recommended standards of monitoring, instrumental or otherwise, must be met for every patient.¹
- 2.13 The following equipment must be available to monitor the anaesthetic machine:
 - oxygen analyser
 - device to display airway pressure whenever positive pressure ventilation is used, with alarms that warn if the pressure is too high or too low
 - vapour analyser whenever a volatile anaesthetic agent is in use
 - capnograph.
- 2.14 The following equipment must be available to monitor the patient:
 - pulse oximeter
 - non-invasive blood pressure monitor
 - electrocardiograph
 - capnograph

- a means of measuring the patient's temperature
- a nerve stimulator when a muscle relaxant is used.

2.15 Some patients will require additional monitoring equipment, such as invasive pressure which should be readily available, and cardiac output monitors to which there should be access.¹

2.16 All monitors should be fitted with audible alarms.

Support services

2.17 Local standards and guidelines for patient care should be developed, building on those published nationally.

2.18 Guidelines for the management of rare emergencies, such as malignant hyperthermia, anaphylaxis and peri-arrest arrhythmias, must be displayed prominently.⁸

2.19 Policies and equipment must be in place to protect patients and staff from cross-infection, including the safe disposal of sharps.⁵

2.20 Anaesthetic sites must have scavenging systems that meet the [Health & Safety Executive's](#) occupational exposure standards for anaesthetic agents.¹⁴

2.21 All anaesthetic records must contain the relevant portion of the recommended anaesthetic data set for every anaesthetic¹⁵ and be kept as a permanent document in the patient's case notes.

2.22 Services must be available for:

- haematology
- blood transfusion
- chemical pathology, including blood gas analysis
- chest radiology
- electrocardiography.

2.23 There should be policies in place for the safe and rational use of blood and blood products.¹⁶⁻²⁰

Facilities

2.24 The anaesthetic room and operating theatre must conform to Department of Health building standards.²¹

2.25 There must be policies and facilities in place to protect patients and staff who are hypersensitive to latex-containing products.²²

2.26 A system must be in place to allow the presence of parents or carers at induction of anaesthesia in children.²³

3 Training and education

3.1 Please refer to Chapter 1 ('Key points in the provision of anaesthetic services') for further details of education and training requirements in anaesthesia services.

4 Research and audit

4.1 There should be a multi-disciplinary programme for auditing intra-operative care.

4.2 There should be a system in place to allow reporting and regular audit of critical incidents and near-misses.⁹

4.3 Systematic audit should include the pattern of work in operating theatres.⁷

5 Organisation and administration

5.1 If appropriate resources are not available the level of clinical activity should be limited to ensure a safe provision of intra-operative care.⁸

5.2 Fully resourced, dedicated daytime emergency and trauma lists should be provided.⁷

5.3 Up-to-date, clear and complete information about operating lists must be available. Any changes must be agreed by all relevant parties, to ensure that the correct operation is performed on (the correct side of) the correct patient.²⁴

5.4 There must be a policy and procedure in place to confirm the patient's identity, the planned procedure and the side and site of surgery, before induction of anaesthesia.⁸

6 Patient information

6.1 Information to patients should include what to expect in the anaesthetic room and operating theatre.²⁵

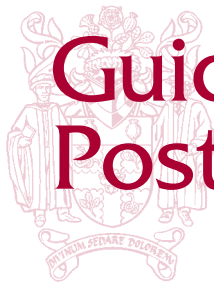
6.2 Patients from non-English speaking groups may need interpreters.

6.3 Patients with learning and other difficulties may need special assistance and consideration.

**Click here to link to
Audit Recipe Book Section 2:
Intraoperative Care**

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Guidance on the provision of anaesthetic services for Post-operative Care

When considering the provision of anaesthesia, the Royal College of Anaesthetists recommends that the following areas should be addressed. The goal is to ensure a comprehensive, quality service dedicated to the care of patients and to the education and professional development of staff. The provision of adequate funding to provide the services described should be considered.

Summary

- After general or regional anaesthesia, all patients should recover in a specially designated area, which should conform to Department of Health (DH) and Association of Anaesthetists of Great Britain and Ireland (AAGBI) guidelines in respect of design and equipment.¹⁻³
- Until they have regained control of their airway, demonstrated cardiovascular stability and are able to communicate, patients must be cared for in the recovery area by appropriately trained staff, on a one-to-one basis.¹
- An appropriate standard of monitoring should be maintained until the patient has recovered from anaesthesia and good records made to support effective 'hand-over' to ward staff.^{1,4}
- Agreed criteria for discharge of patients from the recovery room to the ward should be in place.¹
- All patients should receive effective control of pain and post-operative nausea and vomiting (PONV). Local guidelines should be available for the treatment of acute pain and PONV. Scoring systems for pain, PONV and sedation should be in place.^{1,5}
- Where emergency surgery is performed, the recovery unit should be open and staffed by appropriately trained resident or on-call personnel.⁵
- There should be a specially designated area for the recovery of children.^{1,6}
- For particular categories of patients visits should be made by an anaesthetist within 24 hours of discharge from the recovery unit.^{7,8}
- Requirement for High Dependency Unit (HDU) or Intensive Care Unit (ICU) facilities should be assessed and facilities made available for all patients deemed to need these after surgery.^{9,10}

Introduction: The importance of post-operative anaesthetic care

- All patients who have undergone an operation, under either general or regional anaesthesia, are at risk of compromise to their airway, breathing and circulation.
- Transport of patients, especially between hospitals, immediately after anaesthesia can be hazardous.
- Most patients can be managed in a recovery room, but some may need to be transferred to a critical care environment (ICU/HDU).
- The purpose of the post-anaesthetic recovery area is to provide care until patients can be safely discharged awake to a general ward or home in a stable condition, or be transferred to a critical care environment (ICU/HDU) if further close monitoring and care are necessary.
- If adequate standards of care are not provided serious complications can occur.

Levels of provision of service

1 Staffing requirements

- 1.1 Until patients can maintain their airway, breathing and circulation they must be nursed on a one-to-one basis.
- 1.2 At least two appropriately trained staff should be present in the recovery room when there is a patient who does not fulfil the criteria for discharge to the ward.
- 1.3 With the exception of circumstances as detailed in 1.2, it is difficult to give guidance on the exact numbers of staff required for any particular recovery area. The staffing levels will depend on factors such as the case-mix, numbers of patients and the number of operating lists per session. If the workload is spread unevenly throughout the week, this will have an effect on the deployment of staff and may encourage the use of part-time staff.
- 1.4 During whatever hours of the day emergency surgery is undertaken, the recovery unit should be continuously open and adequately staffed.
- 1.5 After agreed criteria for recovery have been met, an appropriately trained member of staff must accompany patients who are to be transferred to the ward. Relevant information must be given at hand-over.
- 1.6 The anaesthetist should ensure hand-over to the recovery room staff. This includes information relevant to after-care. The anaesthetist is responsible for ensuring that the endotracheal tube is removed safely. Nurses who are trained in the management of laryngeal mask airways may remove them, although an anaesthetist should be immediately available.¹
- 1.7 Adequate provision should be made for a member of the anaesthetic team to visit the following groups of patients within 24 hours following their operation:
 - those graded as 'American Society of Anaesthesiologists (ASA) Physical Status 3, 4 or 5'
 - those receiving epidural analgesia in a general ward
 - those discharged from recovery with invasive monitoring *in situ*
 - those for who a request is made by other medical or nursing colleagues.

2 Equipment, support services and facilities

- 2.1 The size, design and facilities of the recovery area should meet the AAGBI and DH guidelines.
- 2.2 The recovery room should be sited within the operating department and away from the admission area to the department. Similarly, the routes that patients take to individual theatres, to the recovery room and to the wards, should as far as is possible not cross. It is particularly important to make careful provision in this respect when patients are children.
- 2.3 The recovery area should be situated as close to the operating theatres as possible, and if there are several operating suites each should have a fully equipped recovery area.
- 2.4 An emergency call system must be in place and understood by relevant staff.
- 2.5 There should be enough recovery trolleys of an acceptable design. Where it can be done without compromising safety, patients undergoing major surgery may be transferred to a bed immediately after surgery.
- 2.6 Oxygen and suction should be present in every recovery bay and ideally be delivered by pipeline.
- 2.7 Currently acceptable standards of patient monitoring⁴ should be available for all patients. This includes pulse oximetry, and non-invasive blood pressure monitoring. An electrocardiograph (ECG), nerve stimulator, thermometer and capnograph should be readily available. Ideally there should be compatibility between operating theatre, recovery room and ward equipment.
- 2.8 All drugs, fluids and equipment (including a defibrillator) required for resuscitation and management of anaesthetic and surgical complications should be immediately available in every recovery area.
- 2.9 In every recovery area emergency boxes or drugs for use for management of cardio-vascular collapse, anaphylaxis and malignant hyperthermia must be available and regularly maintained. There should be wall mounted algorithms for the treatment of these conditions.
- 2.10 The range of drugs and the means of their delivery should be subject to regular review. The methods of delivery include devices for epidural, patient controlled analgesia (PCA) and other drug administration.
- 2.11 Devices such as forced warm air blowers should be available.
- 2.12 Locally devised protocols should be available for discharge criteria, analgesia and treatment and prevention of nausea and vomiting.

- 2.13 The need for X-rays in the recovery room should be carefully weighed against the hazard to staff and other patients, for whose protection appropriate precautions must be taken.

3 Areas of special requirement

Children

- 3.1 Particular provision should be made for the care of children.⁶

Critically ill patients

- 3.2 Some patients may require ventilatory support or a longer than usual period of observation and treatment in the immediate post-operative period. When critically ill patients are held in the recovery area because of a lack of availability of appropriate facilities elsewhere, this should only occur if recovery staff are appropriately trained, and the recovery area is appropriately equipped to enable full monitoring and treatment. It cannot be assumed that it is safe to use the recovery facility as an extension of critical care, and local policies and procedures should govern this issue.

Specialist surgical units

- 3.3 Specialised units such as those involved in cardiothoracic surgery, neurosurgery and transplant surgery should have their own policies and staffing requirements.

4 Training and education

- 4.1 All specialist recovery staff should be appropriately trained, to nationally recognised standards.
- 4.2 At least one member of staff present at any given time should be certified as an ALS provider.
- 4.3 Core skills and education of recovery staff must be maintained as a programme of Continuing Professional Development (CPD).

5 Research and audit

- 5.1 Regular revision and audit of standards of care, guidelines and protocols and critical incident reporting are essential in the ongoing development and improvement of post-anaesthetic patient care. There should be regular meetings of staff to discuss these issues.

6 Patient information

- 6.1 Information provided to patients about their anaesthetic should include what to expect in the recovery room.
- 6.2 Some patients, adults or children need may need interpreters, parents or other members of their family to be with them. This need is best determined by nursing staff, who are also sensitive to the need for privacy of other patients in the recovery room.

**Click here to link to
Audit Recipe Book Section 3:
Post-operative Care**

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Guidance on the provision of anaesthetic services for Head and Neck Surgery

When considering the provision of anaesthesia, the Royal College of Anaesthetists recommends that the following areas should be addressed. The goal is to ensure a comprehensive, quality service dedicated to the care of patients and to the education and professional development of staff. The provision of adequate funding to provide the services described should be considered.

Summary

- Patients undergoing urgent Head and Neck procedures to relieve a compromised airway resulting from trauma or after surgery must have quick access to a dedicated emergency theatre at all times.¹⁻³
- Upper airway problems are common, and Head and Neck services should be provided by anaesthetists competent in the advanced management of the difficult airway.⁴
- Anaesthetists should always work with appropriately trained and skilled assistants, and have access to a range of difficult airway apparatus including fibre-optic intubation equipment and trans-cricothyroid jet ventilation.^{4,5}
- Access to a critical care facility must be available when required.⁶
- The treatment of neonates, young children with significant co-morbidity and children with complex surgical conditions should only take place in units with specialist paediatric facilities.⁷

Introduction: The importance of head and neck anaesthetic care services

- Head and neck surgery includes a wide spectrum of surgical interventions, ranging from short day-case procedures to very long and complex operations.^{8,9}
- Anaesthesia for surgery of the head and neck is likely to include the disciplines of ear, nose and throat, maxillofacial and dental surgery. In some instances, such as surgery on the base of skull and for craniofacial surgery, formal integration with a neurosurgical and plastic surgical service may be required.
- The patient population undergoing head and neck surgery ranges from neonates and young children to the elderly.¹⁰
- Patients requiring major Head and Neck surgery frequently have extensive and debilitating co-morbid problems and may need repeated admissions for treatment.⁹
- Conditions that require head and neck surgery affect patients of all ages, and a significant proportion are children. The treatment of neonates, young children with significant co-morbidity and children with complex surgical conditions should only take place in units with specialist paediatric facilities. Simple procedures such as teeth extraction, the excision of tonsils or adenoid tissue and the insertion of grommets are frequently carried out on children in a general hospital setting.
- The indications for head and neck surgery vary widely from minor infective and inflammatory disorders to extensive malignant disease. In the latter case, surgical excision and reconstruction, often using free tissue transfer, requires complex peri-operative anaesthetic management. This kind of surgery often takes time not easily accommodated within the time constraints of a normal operating list.

- Cancer of the upper digestive tract form the majority of Head and Neck oncology, and these patients are typically older and commonly have serious co-existing cardiovascular and respiratory disease, reflecting the social risk factors for their malignancy. Adequate facilities should be available for pre-operative assessment.
- Patients undergoing long and complex surgery or who have significant underlying medical problems will need the provision of post-operative intensive or high dependency care.
- Many patients with intra-oral malignancy, craniofacial disorders and traumatic facial injuries present with a predicted difficult intubation. This aspect of the service mandates that the full range of human and other resources necessary to manage difficult airways, including fibre-optic intubation equipment, are always available.
- It is common for head and neck surgery to encroach upon the airway, or in the case of a tracheostomy, require changing of the airway during surgery. It is therefore essential that there is close liaison and good teamwork between surgeons, anaesthetists and operating department practitioners (ODPs).
- Patients presenting with impending airway obstruction may need emergency surgery. The ability to provide this service means dictates that a dedicated, appropriately staffed and equipped theatre be available 24 h a day.¹¹
- All community dental work requiring general anaesthesia is now carried out in a hospital setting. There are estimated to be 65,000 children and young people with severe learning disabilities in the UK, and a significant proportion of those needing dental treatment will be referred for general anaesthesia.
- A significant proportion of head and neck surgery is of a routine nature and much of the service is ideally provided for by a dedicated day-case facility.

Levels of provision of service

1 Staffing requirements

- 1.1 Anaesthesia for Head and Neck surgery should be consultant led, and all regular sessions should have assigned to them a named consultant or Staff/Associate Specialist anaesthetist who is skilled and experienced in the provision of this service.
- 1.2 In large departments it may be desirable to appoint a Lead Anaesthetist for Head and Neck services, who could provide specialist medical supervision

and liaison with the Lead Clinician for the department and the theatre management team.

- 1.3 Where scheduled operations cannot be accommodated within normal list times, consideration should be given to anaesthetic team-work, allowing for appropriate rest periods, both during and following such procedures.
- 1.4 Anaesthetists must always be supported by dedicated, appropriately skilled assistants, and the recovery facilities should be staffed during all operating hours and have appropriate anaesthetic support, until the patient meets agreed discharge criteria.
- 1.5 There should be adequate levels of appropriately experienced medical and non-medical staff to provide 24 hour cover for emergency head and neck surgery.
- 1.6 Where a paediatric service is being provided, all of the medical and assisting non-medical staff, including recovery room staff, must have relevant and recent training in paediatric anaesthesia and resuscitation.

2 Equipment, support services and facilities

- 2.1 There should be a full range of equipment relating to the management of the difficult airway available within the Head and Neck theatre suite. In particular, equipment for fibre-optic intubation and trans-cricothyroid jet ventilation must always be available. Suitable theatre based sterilization equipment should allow for the quick turn-around of fibre-optic endoscopes.
- 2.2 There should be clear, written guidelines regarding the management of common or serious airway problems and advanced airway procedures.
- 2.3 The use of lasers during head and neck surgery is common, and therefore training and safety equipment including laser-protected endotracheal tubes, goggles and theatre door screening need to be provided.
- 2.4 Patients returning to the ward who have had a tracheostomy or other airway surgery, should be cared for in designated post-operative observation areas, by adequate levels of nursing staff who are skilled in the care of the surgical airway. The location of this area should also facilitate the quick return to theatre should the need arise.
- 2.5 Patients who have undergone complex head and neck surgery may require transfer to an appropriate level of critical care facility. Additional equipment necessary to achieve this safely, including portable non-invasive

and invasive monitoring, emergency transfer packs and portable ventilators may also be required.

- 2.6** Adequate facilities should be available for the pre-operative anaesthetic assessment of patients undergoing major head and neck surgery.

3 Areas of special requirement

- 3.1** When providing head and neck anaesthetic services for children, there will be a number of special requirements as covered in the guidance on the provision of paediatric services.
- 3.2** The community dental service will need to cater for patients with learning disabilities undergoing general anaesthesia for dental procedures. This vulnerable group of patients require design, access, communication and peri-operative care around their individual needs. (Further details will be available in the section for anaesthesia in a non-theatre environment for anaesthetic service provision for community dentistry (in preparation).
- 3.3** Particular emphasis should be placed on the need for specialist post-operative ward care. Wherever possible, patients who have had airway related surgery, should be looked after in the early post-operative period on dedicated wards with adequate levels of medical and nursing staff who are familiar with the recognition and management of related airway problems.
- 3.4** Where major head and neck surgery is carried out there may be a regular elective requirement for post-operative high dependency and intensive care.

4 Training and education

- 4.1** Patients requiring head and neck procedures should be managed by anaesthetists who have had an appropriate level of training in this field, and who have acquired the relevant knowledge and skills needed to care for patients undergoing peri-airway surgery.
- 4.2** In order to maintain the necessary repertoire of skills, consultant anaesthetists providing a head and neck service should have a regular commitment to the specialty, and adequate time must be made for them to participate in a range of relevant continuing medical education activities.
- 4.3** Head and neck surgery provides an excellent opportunity for the formal and systematic training of anaesthetists in the use of advanced methods for airway management, including fibre-optic intubation techniques and trans-cricothyroid jet ventilation. Where possible additional equipment

such as monitors, video recorders and airway simulators should be made available to facilitate this important aspect of anaesthetic education.

5 Research and audit

- 5.1** In addition to routine audit and the reporting of critical incidents, any morbidity relating to airway management should be presented at departmental clinical governance meetings, and documented for audit purposes.

6 Organisation and administration

- 6.1** A pre-operative assessment clinic with the facility to arrange pre-admission anaesthetic consultation for those patients with complex airway problems or severe co-morbidity should exist.
- 6.2** Where necessary integration with other surgical specialties, such as neurosurgery and plastic surgery, may be needed to formalise joint operating lists.
- 6.3** The ability of anaesthetists with other specialist interests, such as neuroanaesthesia and intensive care medicine, to contribute towards the provision, planning and implementation of the service should be recognised.
- 6.4** Any day-time emergency lists should be organised and staffed by senior anaesthetists and surgeons working to a fixed sessional pattern who have no conflicting clinical commitments.
- 6.5** Where major elective head and neck surgery requiring post-operative critical care is undertaken, the funding for and provision of these beds must be planned to meet the demands of the service, so that unnecessary cancellations can be minimised and the use of theatre resources optimised.
- 6.6** When very long operations are scheduled on a regular basis, it will be necessary to arrange the funding and resources to support long duration lists.

7 Patient Information

- 7.1** It is not uncommon in head and neck anaesthesia to use techniques such as inhalational induction and awake fibre-optic intubation. When such techniques are planned, it is especially important to fully inform patients of exactly what to expect.
- 7.2** Specific information regarding what to expect in the immediate post-operative period is also particularly relevant to head and neck surgery. Examples would include the need to breath through the mouth in nasal surgery, the inability to open the mouth when wires are used for dental occlusion, and blurred

vision following the administration of topical eye preparations. Such procedure specific explanations should ideally be supported by written information.

7.3 As part of a 'difficult airway follow-up',⁴ patients should be informed about any airway problem encountered and be advised to bring it to the attention of anaesthetists any future pre-operative assessment.

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Guidance on the provision of anaesthetic services for Acute Pain Management

When considering the provision of anaesthesia, the Royal College of Anaesthetists recommends that the following areas should be addressed. The relief of pain should be a fundamental objective of any health service. Good practice should ensure provision of an evidence-based, high quality, adequately resourced service dedicated to the care of patients and to the continuing education and development of staff. The provision of adequate funding to provide the services described should be considered.

Summary

The following points of service provision are consistent with the 'Pain Management Services: Good Practice,' a joint publication of the Royal College of Anaesthetists and The Pain society, May 2003.¹

Effective and safe management of acute pain in hospitals requires:

- The provision of services for acute pain management in all hospitals.
- Adequate resources to provide an appropriate number of fixed sessions or programmed activities for direct patient care by consultants. There is a need for nurses, other healthcare professionals, secretarial and administrative staff, as well as appropriate accommodation, facilities and equipment.
- Recognition that anaesthetists who have fixed sessions or programmed activities for direct patient care need to job plans that differ from those of the majority of anaesthetists, who work in operating theatres, obstetric and critical care units.
- Close liaison between pain management services and other healthcare groups (including primary care and palliative care services) to provide an individualised, interdisciplinary approach to the management of pain for each patient.
- Specific arrangement for the pain management of vulnerable groups of patients, such as the elderly, children, those who are physically or intellectually disabled and those whose first language is not English.
- Equity of access and service provision for all patients taking into account clinical, socio-economic and cultural factors.
- An active programme of education in the presentation and management of pain, for all health professionals who care for patients with acute pain in all healthcare sectors.
- Good governance arrangements including audit of pain management services.

Introduction: The importance of Acute Pain Management services

- Acute pain is commonly associated with recent surgery, injury and some disease states (such as myocardial infarction, ureteric colic, acute pancreatitis and sickle cell disease); and is an important component of the pain associated with cancer. Poor pain relief is a common cause of complaint.
- Surveys of patients continue to indicate that acute pain is often inadequately unrelieved.²
- The adverse effects of unrelieved acute pain can be psychological, physiological and socio-economic.
- While the relief of the suffering associated with acute pain is first and foremost a humanitarian matter, effective acute pain management is likely to improve the quality of clinical care by preventing some complications, reducing hospital stay, promoting patient recovery and reducing

the development of chronic pain syndromes.^{3,4,5,6} From these, socio-economic benefits are likely to accrue including more efficient use of hospital beds because 'pain-free' patients leave hospital sooner.^{6,7}

- The increasing proportion of day case surgery has skewed the in-patient case-mix and increased the need for additional in-patient acute pain activity. Day-case and short-stay surgery require the provision of safe and effective acute pain management to reduce the need for visits to general practitioners or return to hospital because of unrelieved pain.⁸ It should be recognised that as more surgery is done on a day case basis, the relative proportion of in-patient surgery requiring the full attention of the acute pain service will increase significantly.
- Chronic pain services have for many years used a multidisciplinary, inter-professional approach to match therapies with individual patients' needs. In the recent past, this approach has been adopted by acute pain services. This approach fits well with the modern day skill mix and patient-centred approach of the NHS.
- The provision of an organised multi-disciplinary acute pain team is an effective method of providing high quality pain relief in a hospital setting.⁹ Adoption of this approach was recommended in the UK in the 1990s^{10,11} and has been endorsed by guidelines developed in Australia and the USA.^{12,13}
- The objectives of an acute pain service should include:
 - ◆ Establishment of a system for regular assessment and individual treatment of acute pain.
 - ◆ Provision of specialist care and advice for difficult acute pain problems such as management of patients already taking strong analgesics for cancer and chronic non-malignant pain, and those who are problem drug users.
 - ◆ Seamless liaison with other healthcare teams responsible for the shared care of patients with acute pain. This may extend to ensuring their spiritual needs are provided for.
 - ◆ Provision of back-up arrangements, education programmes and appropriate guidelines or protocols to ensure that there is continuous cover for acute pain management round the clock, seven days a week.
 - ◆ Information, education and reassurance for patients, presented in a way they can understand.

- ◆ Education for nursing, medical staff and other allied healthcare professionals leading to increased awareness of both the consequences of unrelieved acute pain and the techniques available to relieve pain.
- ◆ Continuing audit and evaluation of the service and the needs of patients.

Levels of provision of service

1 Staffing requirements

The staffing of an acute pain service should be based on the following considerations.

- 1.1 The acute pain service should be led by a named doctor with expertise in acute pain management, who takes responsibility for co-ordinating the provision of a safe and effective service. The medical personnel staffing acute pain services in the UK are frequently consultant anaesthetists. It is essential that these clinicians have defined fixed sessions or direct programmed activities for acute pain as part of their job plans. The job plans for the consultants in acute pain management should reflect the different nature of the work when compared with anaesthetists working in the operating theatres, obstetric units and critical care units.
- 1.2 There should be dedicated clinical nurse specialists who:
 - advise on pain management and undertake a programme of regular review of acute pain problems.
 - undertake education of ward-based staff informally in clinical areas and as part of a formal educational programme for all disciplines in conjunction with medical colleagues.¹³
 - are responsible for the day-to-day organisation of the acute pain service.
- 1.3 The provision of effective acute pain management can be optimised by collaboration with colleagues from the physiotherapy and pharmacy departments. Additionally, clinical psychologists will allow other avenues of acute pain management to be explored.
- 1.4 To ensure patient safety and continuous service, staffing levels should be sufficient to provide prospective cover for all personnel. Education, training, staffing arrangements and the provision of guidelines or protocols must ensure safe practice when core staff are not on duty.
- 1.5 Recovery (post-anaesthetic) ward staff must be trained in basic pain management, as this is pivotal to successful management of post-operative pain.

- 1.6 Provision must be made for access to specialist pain management staff for expert advice when difficulties with pain management arise.
- 1.7 In non-surgical clinical areas (A&E, outpatient clinics e.g. fracture clinic and interventional radiology suites) there should be staff with knowledge and skills sufficient to provide safe and effective acute pain relief for patients with non-surgical acute pain to the same standard as for patients with postoperative pain.
- 1.8 There should be strong links in each hospital between acute and chronic pain management services to ensure early access to appropriate pain services and seamless care for patients whilst in hospital and after discharge. Many hospitals offer an integrated pain service.
- 1.9 There should be sufficient administrative and clerical staff to support the service.

2 Equipment, support services and facilities

Equipment

- 2.1 Appropriate equipment should be provided to ensure safe and effective utilisation of pain relieving techniques in adults and children. This equipment includes specialised delivery devices, 'spinal' (epidural and intrathecal) infusion, patient controlled analgesia (PCA) and monitoring equipment. To safeguard patient safety these pumps and other devices should be dedicated for use in acute pain management only. It is essential that staff have formal training in the use of medical equipment. The service should ensure that there are maintenance contracts and a rolling replacement programme for equipment.

Drugs

- 2.2 For PCA devices and 'spinal' infusions drugs should be supplied in clearly identifiable, aseptically prepared containers. There must be mechanisms to ensure that they are not inadvertently administered by other routes. It is preferable that the solutions are prepared in a central unit and not made up by staff in clinical areas. The recovery ward should have a suitable stock of necessary drugs and equipment to ensure that optimal postoperative pain relief is established before patients return to surgical wards or are discharged. This should be available at all sites where out-of-hours operating occurs. In non-surgical clinical areas, drugs and equipment should be sufficient to provide safe and effective acute pain relief for patients with acute pain to the same standard as for patients with postoperative pain. Treatments available should range from simple medication to more complex interventions

such as neural blockade and PCA. More complex techniques require staff with appropriate knowledge and skills to ensure their safe and effective application.

Facilities

- 2.3 Dedicated office space should be provided for the acute pain service, as well as administrative, secretarial and information technology support. Critical care facilities should be available for appropriate patients. There should be storage space for PCA devices, pumps and educational materials.

Clinical guidelines or protocols

- 2.4 Appropriate guidelines and protocols should be promulgated, widely disseminated and readily available in all clinical areas, including non-surgical clinical areas. Pain and its relief must be assessed and documented on a regular basis. As a minimum such clinical guidelines should address the assessment of acute pain, drug prescribing for acute pain, clinical management of acute pain in different situations including PCA and spinal (epidural and intrathecal) infusion techniques and the requirements for documenting acute pain. Pain intensity should be regarded as a 'vital sign' and recorded as regularly as other vital signs such as pulse and blood pressure. The response to treatment and side effects should also be clearly documented. The prescription of pain-relieving drugs and techniques should be reviewed regularly to ensure that pain relief is adequate and appropriate to the level of pain experienced by the patient.

3 Areas of special requirement

- 3.1 Specific arrangements must be made for the management of pain relief in children to the same standard as adults and by appropriately trained staff.¹⁵
- 3.2 Specific arrangements must be made for the management of patients:
 - with special needs, by virtue of their vulnerability or disability, including the elderly, physically and intellectually disabled and non-English speakers
 - with drug and substance misuse problems,
 - with opioid tolerance as a consequence of long-term opioid consumption,
 - with chronic pain who develop acute pain problems.
- 3.3 Specific arrangements must be made for the management of patients undergoing day case surgery, to provide effective pain relieving medication to take home, with straightforward instructions about the use of the drugs and advice on how to obtain further help if necessary.

4 Training and education

- 4.1 Education is a key factor in the provision of effective acute pain management. Ultimately, changes in clinical practice and behaviour depend upon the quality and quantity of education and training. Undergraduate education and training in acute pain management has hitherto been assessed as inadequate.^{16,17}
- 4.2 All personnel involved in acute pain management should be trained adequately to ensure the delivery of a safe and effective service. Such training should include communication skills, the use of assessment techniques, the application of appropriate management strategies and the use of relevant equipment.
- 4.3 There should be an ongoing programme of continuing education and professional development for all staff in pain management services. Funding should be provided for these activities.
- 4.4 Education and training of medical, nursing and allied health-professionals is a primary role of an acute pain service.^{17,18} It is important to update this training in order to maintain competencies to assure and improve quality of care.
- 4.5 It is essential for the future welfare of patients that trainee anaesthetists are guaranteed training time in pain management sufficient to meet the requirements of training in pain as specified in by Royal College of Anaesthetists.

5 Research and audit

- 5.1 There should be a regular and systematic audit of results, outcomes, complications and side effects of treatment. Areas in which audit can be conducted include:
- audit of the quality of the service, efficacy and safety, monitoring of vital signs, patient satisfaction and complications including postoperative nausea and vomiting
 - pain management in the emergency department
 - pain management for of patients not undergoing surgery
 - provision of information to patients
 - education and training.

- 5.2 Whenever possible, in addition to audit, there should be clinical research focussing on properly designed and conducted investigations with a preference for randomised, controlled trials.

6 Organisation and administration

- 6.1 In 2000 the Clinical Standards Advisory Group made wide-ranging recommendations to healthcare providers on the provision of appropriate pain services.⁷ These recommendations remain relevant today.
- 6.2 Delivering high quality acute pain management is a matter of Clinical Governance that addresses the needs and expectations of patients and their carers, and is a risk management issue.¹⁹ Acute pain services therefore require the allocation of funding.
- 6.3 Purchasing and commissioning organisations should ensure that the relief of acute pain is specified as part of the contracting process. This will require identified funding for designated staff, equipment and facilities.
- 6.4 Inpatients may receive considerable input from the acute pain service and this work needs to be formally recognised and recorded so that appropriate funding can be allocated.
- 6.5 The effectiveness and efficiency of such a service requires close links with other local pain services (chronic, cancer and haematological), other medical specialities and primary care services.²⁰

7 Patient information

- 7.1 Patients should be able to make an informed decision about the sort of pain-relieving technique they choose. Recent recommendations from the Department of Health for obtaining consent require that patients are given information about pain and its management in verbal and written form and in a way that they can understand. This should take into account minorities whose native language is not English or who have communication difficulties e.g. deafness, blindness. Medical and nursing staff should be available for advice and discussion.

**Click here to link to Audit
Recipe Book Section 11:
Acute Pain**

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Guidance on the provision of anaesthetic services for Chronic Pain Management

The treatment of pain should be a fundamental objective of any health service. Good practice should ensure provision of a high quality, adequately resourced service dedicated to the care of patients in pain and to the ongoing education and development of staff. The provision of adequate funding to provide the services described should be considered.

Summary

- The multidisciplinary management of patients with chronic pain has been shown to alleviate pain, aid the restoration of normal function and reduce the socio-economic burden to the individual, the health service and the community at large.^{1,2}
- Effective and safe management of chronic pain requires:
 - ◆ provision of core services for chronic pain management in all district general and specialist hospitals. Specialised pain management services should be organised regionally. Formal links should be established between hospitals on a regional basis so that all appropriate treatments can be offered to patients who need them.³⁻⁶
 - ◆ strong links within each hospital between acute and chronic pain management services to ensure early access to appropriate pain services and seamless care for patients whilst in hospital and after discharge.³⁻⁶ Many hospitals offer an integrated pain service.
 - ◆ co-operation between chronic pain management services and palliative care services within the hospital and in the community.³
 - ◆ close liaison should be between pain management services and other healthcare groups (including primary care and other secondary care disciplines) in order to provide the individualised inter-disciplinary approach to the management of pain for each patient.^{3,4}
- ◆ adequate funding to provide appropriate time allocated to direct clinical care for consultant specialising in pain management, other healthcare professionals, secretarial and administrative staff, and adequate accommodation, facilities and equipment.³⁻⁶
- ◆ adequate provision of time and funds for continuing professional development of all staff.^{3,10}
- ◆ provision of pain management programmes (PMPs), including cognitive behavioural programmes, which aim to promote restoration of normal physical and psychological function, encourage self-management and decrease the inappropriate use of healthcare resources by patients with chronic pain.^{3,4,8}
- ◆ equity of access and service provision for all patients.
- Anaesthetists who have sessions in chronic pain management or who work full-time in pain management need to have job plans that differ substantially from those of most anaesthetists who work in operating theatres, and obstetric units.⁴⁻⁷
- Specific arrangements should be made for the treatment of vulnerable patients^{3,4,9}

such as children, older people, those with physical or intellectual impairment and those from ethnic backgrounds whose first language may not be English.

- There should be an active programme of education in the understanding of pain and its presentation and management for all health professionals who care for

patients with pain, in both the primary and secondary care sectors.^{3-6,10}

- There should be good governance arrangements, including audit of pain management services.^{3-6,10}
- There is a largely unmet need for research into the causes and treatment of chronic pain.³

Introduction: The importance of Chronic Pain Management services

- Chronic pain is defined as pain that has persisted for longer than three months or past the expected time of healing following injury or disease. Epidemiological studies have revealed that a significant proportion of the population suffer from chronic pain caused by a wide range of conditions.¹¹⁻¹⁵ Unrelieved chronic pain is a major problem for individual patients and a massive socio-economic burden for the health service and the community.¹⁶
- Patients often present with complex multidimensional problems requiring multidisciplinary management that involves doctors, specialist nurses, clinical psychologists, physiotherapists and occupational therapists.¹⁷
- Patients who will benefit from specialist pain management are drawn from all branches of surgery and medicine, rheumatology, gastroenterology, neurology, health care of the elderly, rehabilitation medicine, occupational health, oncology, palliative medicine, psychiatry, addiction medicine, paediatrics and very importantly, primary care.
- There is strong evidence that the multidisciplinary pain management approach is of benefit in improving the quality of life of patients and in lessening the socio-economic burden of unrelieved chronic pain.¹⁻³ Pain management has been a leading specialty in the rigorous pursuit of evidence of effectiveness of treatments by the use of systematic reviews and randomised controlled trials.¹⁸ Complementary medicine techniques may be offered but only when supported by adequate evidence.
- The objectives of a chronic pain service include:
 - ◆ alleviation of pain; this is not always possible because any pain that is described as chronic has already proved resistant to treatment
 - ◆ alleviation of psychological and behavioural dysfunction and distress
 - ◆ reduction of disability and restoration of function
 - ◆ optimisation of medication
 - ◆ reduction in use of healthcare services in primary and secondary care, surgical operations and treatments such as physiotherapy
 - ◆ attention to social, family and occupational issues
 - ◆ education for nursing, medical staff and other allied health care professionals
 - ◆ continuing audit and evaluation of the service and the needs of patients
 - ◆ research into the epidemiology, causes and management of chronic pain.
- Widespread provision of basic core services and the selective provision of more advanced specialist services are necessary to address the problem of chronic pain. Pain management services are required to provide both hospital and community care to patients with a wide range of different conditions.⁴⁻⁶
- In 2000 the Clinical Standards Advisory Group Report on 'Services for Patients with Pain' made wide-ranging recommendations to Health Authorities, Primary Care Groups and Trusts on the provision of appropriate pain services.³ These recommendations remain relevant.

Levels of provision of service

1 Staffing requirements

- 1.1 The delivery of high quality multidisciplinary pain services requires the allocation of fixed sessions for all involved healthcare personnel rather than an *ad hoc* or informal approach.
- 1.2 A chronic pain service should employ the following personnel:
 - Medical practitioners – nearly all chronic pain services are run by consultant anaesthetists. Doctors play a central role in the assessment, formulation of a management plan and the

delivery of various treatments for patients. Doctors' leadership of the team includes responsibility for the education of staff and patients. Staff and Associate Specialist doctors with appropriate experience and competencies are well placed to provide excellent contributions to managing the pain service.

- Nurse specialists and nurse consultants play a key role in pain management. They may, for example, see outpatients independently for assessment or follow up, see ward patients, supervise medication, provide transcutaneous electrical nerve stimulators (TENS) or supervise patients with implanted devices such as spinal cord stimulators.
 - Clinical psychologists with special training in pain management are an essential component of a pain management service. They offer individual psychological approaches and participate in pain management programmes.
 - Physiotherapists can make an important contribution to the assessment and management of patients with chronic pain. They play an important role in functional restoration programmes.
 - Occupational therapists can help patients regain normal function and assist patients who wish to return to work.
- 1.3 The appointment of nurse specialists, clinical psychologists, physiotherapists and occupational therapists should be appropriate for the case-load, types of patients and the range of treatments employed in each service.
- 1.4 Medical and nursing staff should be available for the management of in-patients with chronic pain. In-patients cared for by a consultant from another specialty may receive a considerable amount of care and treatment from the pain management team. This work should be formally recorded and recognised so that appropriate funding can be allocated. Some pain medicine consultants will offer support to palliative medicine and there should be appropriate recognition for this work.
- 1.5 Pain management is a consultant-delivered service and in most hospitals this is done solely by consultant anaesthetists without any significant contribution by trainee or non-consultant career grade staff. This should be reflected in job plans and has implications for the provision of cover out of hours and during consultant absences.

- 1.6 It should be recognised that the work of consultant anaesthetists in pain management is very different from that of anaesthetists who work in the operating theatre, obstetric unit or critical care unit. Working in a chronic pain clinic entails a considerable amount of correspondence, dictation, preparation of reports, telephone calls, case conferences and other clinical administration. Normally consultant anaesthetists in other clinical arenas do not have this additional workload. Due regard should be taken of this workload in consultant job plans. The working arrangements for pain specialists should resemble those of consultant physicians in terms of job plan, support services and accommodation.
- 1.7 Special problems exist for consultant anaesthetists who divide their time between pain services and anaesthesia. Their job plans should take into account the additional demands of this combination. The individual consultant and the clinical director should devise an appropriate allocation of sessions between operating theatre-based anaesthesia and pain management to ensure maintenance of competency in all spheres of the consultant's clinical activity. Continuing professional development is required in both clinical areas.
- 1.8 Clinical governance arrangements are often difficult for single handed practitioners. Consultants working on their own, or with too little allocated time may experience considerable difficulty providing an effective and safe service for patients; patients may therefore experience unacceptably long waiting times and the doctors experience considerable stress and job dissatisfaction.
- 1.9 There is a requirement for consultant backup on a 24 hour, seven day a week basis in major specialist centres that run pain management programmes or care for patients with implanted drug delivery systems and spinal cord stimulators.

2 Equipment, support services and facilities

Equipment

- 2.1 The management of some chronic pain patients involves the use of specialised equipment such as an image intensifier or radiofrequency lesion generator. Centres that provide specialist services will require more equipment such as spinal cord stimulators and implantable drug delivery systems. Specific consideration will have to be given to equipment when formulating budgets as identified in the National Specialised Services Definitions Set for Specialised Pain Management Services.¹⁹ There should be maintenance contracts and a rolling replacement programme for equipment.

Support services

- 2.2 Pharmacy:** Chronic pain relief may need the use of drugs outside marketing authorisation²⁰ and patients should be informed of the risks. Although some general practitioners (GPs) with a special interest may be involved in individual patients' care, GPs may be reluctant to prescribe follow-up treatment because of budgetary constraints. The cost of continuing care will rest with the hospital pharmacy or the pain service. This must be recognised in contracts with Primary Care Trusts to avoid compromise of the care of patients. Local guidelines for prescribing and information sheets for patients may be helpful when drugs are used beyond licence.
- 2.3 Information technology:** The pain service should be provided with up-to-date electronic systems for maintaining patient bookings, medical records, outcome information and other audit data.

Facilities

- 2.4** Chronic pain services are delivered in the following environments:
- out-patient clinics in a hospital setting or in a primary care facility (out-reach clinics)
 - in-patient wards
 - operating theatre or other treatment facility
 - pain management programmes – inpatient or outpatient
 - oncology and palliative care units within the hospital or on external sites.
- 2.5** Appropriate outpatient facilities include rooms for consultation, examination and treatment that are provided on a regular basis. There must be access for wheelchairs and disabled patients.
- 2.6** There should be designated operating theatre and radiology sessions for performance of diagnostic and therapeutic procedures.
- 2.7** Office accommodation should be provided for all staff. This accommodation should be in a separate area that provides security for patient records and information enabling the service to be compliant with data protection legislation and patient confidentiality.
- 2.8** For appropriate patients there should be provision of individual and group PMPs including cognitive behavioural therapy. Not every hospital can offer this facility. The medical director of these programmes is usually a consultant anaesthetist but services are provided primarily by clinical psychologists, physiotherapists and occupational therapists working as part of the interdisciplinary

team.⁸ These programmes may vary in length and intensity depending on the patient's individual needs. Standards for physiotherapists and occupational therapists working in PMPs are available.^{21,22} Accommodation will be required for resident programmes.

- 2.9** Some patients may need overnight admission to a hospital, especially if the patient has undergone a specialised procedure or the pain service has a heavy workload. Access to appropriate recovery (post-anaesthetic) areas should be available for patients following major interventions. Those centres that do have designated inpatient facilities should ensure that appropriate arrangements are in place for adequate medical cover on a 24 hour basis.

3 Areas of special requirement

Services for pain in patients with cancer

- 3.1** The provision of pain relief for patients with cancer requires close collaboration between palliative care, primary care and pain services for both 'in-patients' and 'out-patients'.^{23,24} Up to 15% of patients with cancer-related pain will benefit from specialised pain management services. To ensure the best possible pain relief for this group of patients, both acute and chronic pain services should be involved in the management of patients with cancer-related pain. The demands made on pain management services will vary with the size and expertise of the local palliative care and oncology services.
- 3.2** For patients with cancer-related pain, anaesthetists are able to use a range of specialist knowledge and skills including the use of medication, interventions (such as neural blockade) and the implantation of specialised devices for drug delivery.
- 3.3** Patients with pain due to cancer may be treated in the hospital as inpatients or outpatients and outside the hospital in a palliative care unit or in their own home.
- 3.4** Consultant anaesthetists providing specialist advice and services to palliative care units will require appropriate sessional recognition in their job plans.

Other areas of special requirement

- 3.5** Pain management services should make special provision for vulnerable and potentially disadvantaged groups such as older people, children, people with learning difficulties, and patients from diverse ethnic backgrounds whose first language may not be English. Patients with impaired hearing or vision should have their special needs addressed. Particular difficulties may be encountered with those who habitually use drugs, prisoners and survivors of torture.

- 3.6** There may be a need for specialised multidisciplinary clinics for certain conditions or patient groups such as patients with sickle cell disease, acute low back pain or chronic pelvic pain.

4 Training and education

- 4.1** All personnel involved in chronic pain management should be trained adequately to ensure the delivery of a safe and effective service.¹⁰ Such training should include communication skills, the use of assessment techniques, the application of appropriate management strategies, and the use of relevant equipment.
- 4.2** There should be an ongoing programme of continuing education and professional development for all staff in pain management services. Funding should be provided for these educational activities. Whenever appropriate the educational activities should be integrated with those of related departments.
- 4.3** Training in the management of chronic pain forms an integral part of the training programme for anaesthetists and there is provision for up to 12 months of advanced training in pain management for anaesthetists within the programme leading to a Certificate of Completion of Specialist Training (CCST) in anaesthesia. Regional Advisers in Pain Management have been appointed by the Royal College of Anaesthetists to supervise the provision of pain training. There is a need for post-CCST or 'out-of-programme' training in which doctors can undergo training in pain management after entry onto the specialist register.
- 4.4** Trainee anaesthetists may experience difficulty in obtaining access to pain clinics for training purposes. It is essential for the future welfare of patients with pain that anaesthetic trainees are guaranteed training time in pain management. Lack of adequate exposure during basic and specialist anaesthetic training will limit the understanding of those who in the future may need to refer patients for pain management, reduce recruitment to the specialty and have potentially deleterious effects on the long-term provision of pain relief services.

5 Research and audit

- 5.1** There should be regular evaluation and audit of results, outcomes, complications and side effects of treatment. Whenever appropriate the audit activities should be integrated with those of related departments, e.g. anaesthesia, orthopaedics or palliative medicine.
- 5.2** Whenever possible there should be clinical research focussing on properly designed and conducted

investigations with a preference for randomised, controlled trials.

- 5.3** Pain management services in the UK are ideally set up to conduct multi-centre trials to establish a robust evidence base for treatment. Managers should support consultants who are engaged in research.

6 Organisation and administration

- 6.1** Each pain management service should be led by a named doctor with special expertise in pain management and who will take responsibility for co-ordinating the provision of a safe and effective service.
- 6.2** Chronic pain services should have designated management support. Managerial, secretarial, clerical and IT support staff should be available to underpin inpatient and outpatient work in the same proportion that they are available for other medically-based specialities.
- 6.3** There should be an identifiable budget for the pain management service.
- 6.4** The organisation of the service should encourage close co-operation with related specialties. This will include, when appropriate, joint clinics with other doctors who have a special interest in a specific groups of patients (e.g. paediatricians, psychiatrists (including specialists in addiction medicine), gynaecologists, rheumatologists, neurosurgeons, orthopaedic and spinal surgeons, palliative medicine specialists). Useful links may be established with rehabilitation medicine specialists, occupational health specialists and employment advisors.
- 6.5** The organisation of clinics should take account of the fact that patients with complex chronic pain problems require thorough assessment so the time spent on the initial consultation may be quite prolonged. Many centres allocate 45 minutes or longer to each new patient. This will limit the number of patients that can be seen during a single consulting session. Comparison should be made with the time allocated to new patients in specialties such as psychiatry.
- 6.6** There should be agreed referral and discharge policies with established lines of communication between the pain service and primary care physicians and the pain service and all the relevant secondary care services.
- 6.7** The chronic pain service should be responsive to the needs of patients and primary care professionals. Input should be sought from patients, whenever possible through established hospital mechanisms.

7 Patient information

- 7.1** Patients must be able to make an informed decision about the pain management treatments that they choose; medical and nursing staff should be available for discussion.
- 7.2** Patients must be given information about pain and its management in verbal and written form and in a way that they can understand. This should take into account minorities whose native language is not English or who have communication difficulties e.g. deafness, blindness. Written information should be available for both patient and purchaser explaining the treatments available in the pain management unit.

**Click here to link to
Audit Recipe Book Section 12:
Chronic Pain Services**

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Guidance on the provision of Paediatric Anaesthetic Services

When considering the provision of anaesthesia, the Royal College of Anaesthetists recommends that the following areas should be addressed. The goal is to ensure a comprehensive, quality service dedicated to the care of patients and to the education and professional development of staff. The provision of adequate funding to provide the services described should be considered.

Summary

- Anaesthesia services for children require specially trained clinical staff together with equipment, facilities and an environment appropriate to the needs of children.¹
- The service should be led at all times by consultants who regularly anaesthetise children.^{2,3}
- At all times, there must be adequate trained assistance;⁴ skilled assistance for paediatric anaesthesia should be provided by staff specifically trained for the task.
- In a life-threatening emergency where transfer is not feasible, the most senior appropriately experienced anaesthetist available should undertake anaesthesia.⁵
- Paediatric resuscitation equipment must be available wherever and whenever children are treated and staff must receive regular retraining in paediatric life support.¹
- There should be a properly staffed¹ and funded acute pain service that covers the needs of children.
- Paediatric High Dependency and Intensive Care services should be available as appropriate for the type of surgery performed.^{6,7}
- Parents (or carers) should, wherever possible, be involved in all aspects of care and decisions regarding the management of their children.^{8,9,10,11}

Introduction: The importance of Paediatric anaesthesia services

- Children comprise 25% of the population. Many will require anaesthesia to allow treatment for a variety of surgical conditions involving ENT, orthopaedic, dental, plastic, cardiothoracic, ophthalmic and paediatric surgery.
- Children who undergo anaesthesia and surgery have special requirements. They are not small adults; they differ physiologically, emotionally and socially. Doses of drugs and fluids need to be precisely calculated and anaesthetic equipment for smaller children differs from that used in older children and adults.
- Wherever and whenever children undergo anaesthesia and surgery, their particular needs must be recognised and they should be managed in separate facilities and looked after by staff with appropriate experience and training.
- Most surgical procedures performed on children will be elective, relatively straightforward and performed in district general hospitals, usually on fit infants and children.
- Children with significant acute or chronic medical problems, those undergoing more complex procedures, neonates and small infants are usually referred to specialist units or tertiary paediatric centres.¹²⁻¹⁵
- Nevertheless, district general hospitals should have arrangements for managing and treating simple

surgical emergencies; in addition they should be able to resuscitate and stabilise seriously ill children of all ages, prior to their transfer.

- At all times anaesthesia in children should be undertaken or supervised by consultants who have undergone appropriate training in paediatric anaesthesia (see section 4: Training and Education).
- All consultant anaesthetists with a CCST will have obtained basic paediatric anaesthetic training (or equivalent) as SpRs, following which they should, as a minimum, have been competent to provide anaesthesia for straightforward elective and emergency surgery for children of ASA categories 1 and 2 who have reached their fifth birthday; unless there is no requirement to anaesthetise children it is expected that this competence will need to be sustained through regular exposure, CME and/or refresher courses. However, there will be consultants who have acquired more advanced competences thus allowing provision of a more extensive anaesthetic service; these competences will still require to be sustained through the same mechanisms.

Levels of provision of service

1 Staffing requirements

- 1.1 Children should be anaesthetised by consultants who have regular and relevant paediatric practice sufficient to maintain core competencies. Children may also be anaesthetised by Staff or Associate Specialist (SAS) anaesthetists, provided they fulfil the same criteria and there is a nominated supervising consultant anaesthetist. When trainees anaesthetise children, they should be supervised by a consultant with appropriate experience.
- 1.2 The level of supervision of a trainee will vary according to their ability and experience, the complexity and location of the procedure, the presence of any relevant co-morbidity and the age of the patient. For example, while Senior House Officers (SHOs) with limited experience require direct supervision, experienced SpRs who have undergone a period of paediatric anaesthetic higher training might be supervised by a consultant outside the hospital. If clinical supervision of a trainee is being provided by a SAS anaesthetist, the trainee must always have unimpeded access to a consultant.¹⁶
- 1.3 When a child undergoes anaesthesia, the anaesthetist must be assisted by staff (operating department practitioners/assistants/anaesthetic nurses) who have specific paediatric skills and training.

- 1.4 In the period immediately following anaesthesia, the child should be managed in the recovery ward or post-anaesthesia care unit on a one-to-one basis, by designated staff who undergo regular paediatric resuscitation training. A registered children's nurse should be directly involved with the organisation and training of staff in this area and a member of staff trained and competent in advanced paediatric life support should always be on shift
- 1.5 Children should be nursed on a ward where there are at least two registered children's nurses on duty for every shift that the child is present.

2 Equipment, support services and facilities

Equipment

- 2.1 A full range of monitoring devices, paediatric anaesthetic equipment and disposable items for general and regional anaesthesia should be available in theatres and all other areas where children are anaesthetised.¹⁷ This should include a full range of disposable equipment including the following which should be appropriate for use in children of all sizes and ages:
 - blood pressure cuffs
 - intravenous cannulae
 - temperature probes
 - pulse oximetry.
- 2.2 Resuscitation drugs and equipment, including an appropriate defibrillator, should be routinely available at all sites where children are to be anaesthetised.
- 2.3 Anaesthetic machines should incorporate ventilators, which have controls and bellows permitting their use over the entire age range together with the facility to provide pressure controlled ventilation.
- 2.4 There should be appropriate thermostatic control of the operating room; temperature monitoring and patient warming devices should be available in both the operating room and recovery area.
- 2.5 Intravenous fluids should normally be administered only by volumetric infusion pumps.

Support services

- 2.6 Paediatric High Dependency and Intensive Care services should be available as appropriate for the type of surgery performed.^{6,7}
- 2.7 Children undergoing anaesthesia and surgery as day cases or in-patients will benefit from the input of play-specialists who can help in the preparation of the child for surgery.¹

- 2.8** On-site haematology, chemical pathology and blood transfusion services should meet the requirements of infants and children with particular reference to the removal and analysis of small blood samples. The use of routine pre-operative blood testing should be kept to a minimum, unless there are specific clinical indications.
- 2.9** There should be pharmacy staff with specialised paediatric knowledge available to provide advice and ensure safe and effective management of drugs in children.¹ Where appropriate, intravenous injections and infusions for children should be prepared in the pharmacy under controlled conditions. Copies of a recognised paediatric pharmacopoeia should be widely available and used in all ward and theatre areas.¹⁸
- 2.10** There should be a properly staffed and funded acute pain service (APS) which covers the needs of children and undergoes regular audit.* Analgesia guidelines appropriate for children should be readily available and pain scoring should be performed routinely on any child who has undergone a surgical procedure. A member of the acute pain service should attend paediatric wards daily, and all children who have had major surgery should be assessed regularly.
- 2.11** Particular care is required when infants and children undergo investigations or surgical procedures under sedation alone. Recommended guidelines for the conduct of paediatric sedation have been published by The Scottish Intercollegiate Guidelines Network.¹⁹

**see Chapter 6: Guidelines for the provision of anaesthetic services for acute pain management*

Facilities

- 2.12** Children should be separated from and not managed directly alongside adults, whether this be in the operating theatre department, the post-anaesthesia care unit (recovery), a critical care unit, in-patient wards or the day care unit.^{8,20} Theatre design, the appearance of the anaesthetic and recovery areas and working practices should all reflect the emotional and physical needs of children.¹ If there are genuine problems imposed such as by the need to use older buildings or the need of children to be cared for close to a facility that is essential for any aspect of their care, efforts should be made to comply with the overall need for separation from adult patients.
- 2.13** Recovery areas for children should be separate or screened from those used by adults and provided with paediatric airway and resuscitation equipment.

- 2.14** In the Accident and Emergency department there should be a separate area for children together with all the necessary resuscitation equipment and protocols, required for managing the seriously ill child.¹
- 2.15** Resident accommodation should be available for parents of children who require overnight admission to hospital.

3 Areas of special requirement

Intensive Care: care of the critically ill child

- 3.1** Children may require admission to critical care facilities, as a planned part of their care, for example after surgery, because of trauma or an acute illness or because of extreme prematurity or illness at birth. Paediatric intensive care is provided in designated units, staffed by doctors and nurses with specialised training.^{7,21} Most paediatric intensive care units are based at children's hospitals or tertiary paediatric centres and serve a defined geographical area; they must comply with national standards.^{7,22} Children who require intensive care following an operation should therefore undergo their surgery in one of these hospitals/units with a designated paediatric intensive care unit (PICU).
- 3.2** However, arrangements for the immediate care of critically ill children should be in place in any hospital which manages children. It must be recognised that this need can arise suddenly and unpredictably in the accident and emergency department, the operating theatre or the in-patient wards. In-house arrangements are therefore required for providing emergency treatment, initiating intensive care and stabilising critically ill children, prior to their transfer to a PICU.⁵
- 3.3** In all Accident and Emergency departments receiving children, neonatal and paediatric resuscitation equipment should be readily available together with all the necessary equipment, drugs and infusions necessary to resuscitate, stabilise and prepare an infant or child for PICU transfer. Resuscitation equipment should also be available in all other sites where children undergo treatment.¹
- 3.4** There should be hospital protocols for management of critically ill children. These include the management of head injuries, the indications for CT scanning, management of acute upper airway obstruction, suspected meningococcal septicaemia, seizures, severe asthma, poisoning and major 'burns'. Clinical management of these children, in tertiary or non-tertiary settings, will require close co-operation by and multidisciplinary teamwork between nurses, paediatricians, surgeons, anaesthetists, intensivists, and other relevant

clinicians. Both during and following the initial stages of resuscitation of a critically ill or 'collapsed' child, it is important that further stabilisation and management is not left within the sole remit of the anaesthetist.

- 3.5** A critically ill child may require short-term admission to an adult critical care facility while awaiting arrival of the PICU retrieval team. There may also be occasions when a child requires a very short period of intensive care; these may not require transfer to a PICU, provided there is a suitable facility within the hospital and the episode will last only a few hours.
- 3.6** Transfer of critically ill children to specialist care services is normally undertaken by a paediatric emergency transfer team operating from the appropriate PICU.²² When this is not feasible (e.g. because the transfer is urgent and the transfer team is not immediately available) the general hospital making the referral may have to undertake the transfer of a critically ill child who is 'intubated and ventilated'. This may occur, particularly, in the case of the child who presents at a district hospital, with a serious head injury and an expanding intracranial haematoma requiring urgent surgical decompression by a neurosurgeon. Under these circumstances:
- there should be a designated consultant with responsibility for transfers
 - functioning portable monitors, transfer equipment, drugs and relevant guidelines must be available
 - patients should be accompanied by a doctor, normally with two years post-registration experience and relevant experience in paediatric life support. Both should be accompanied by a suitably trained assistant.
- 3.7** Portable transfer monitors and equipment with appropriate staff will also be required when transferring a critically ill child between different departments of a hospital (e.g. Accident and Emergency department to CT scan or ICU).

Day care surgery and anaesthesia

- 3.8** Day care surgery is particularly appropriate for children, provided the operation is not complex or prolonged and the child is healthy with no significant co-existing medical illness.
- 3.9** The management and care of day cases should comply with standards contained in the report 'Just for the Day',²⁰ irrespective of whether children are managed in a specialist paediatric unit or an adult unit adapted for children.

- 3.10** Selection for day care surgery should be made according to surgical, anaesthetic, medical and social criteria.
- 3.11** The lower age limit for day case surgery depends on the facilities and experience of staff and the medical condition of the infant. Preterm or ex-preterm neonates should not be considered for day case surgery unless they are medically fit and healthy and have reached 60 weeks post-conceptual age. Infants with a history of chronic lung disease or 'apnoeas' should be managed in a centre equipped with facilities for post-operative ventilation.^{9,10}
- 3.12** Parents and children should be provided with good quality information which includes fasting guidelines and what to do if the child becomes unwell before or after the operation. There should be clear discharge criteria following day care surgery; they must include drugs for pain relief and clear instructions for their use.

4 Training and Education

- 4.1** Children who undergo anaesthesia must be managed by staff who have received appropriate training and whose competency in anaesthesia and resuscitation is adequate for the management of the children they serve.
- 4.2** Consultants with a substantial commitment to paediatric anaesthesia, including full-time paediatric anaesthetists, are usually appointed to posts in specialist children's hospitals or tertiary paediatric units. They will normally have satisfactorily completed 12 months advanced paediatric anaesthesia training in a tertiary centre during years 3–5 of the SpR training programme.²³
- 4.3** Some consultants are appointed to posts with a designated sub-specialty interest in paediatric anaesthesia at district general hospitals. In many instances, they are nominated as the lead consultant for paediatric anaesthesia. Typically, they might undertake at least one paediatric list or equivalent per week and are responsible for co-ordinating and overseeing anaesthetic services for children, with particular reference to equipment, protocols, guidelines, pain management, resuscitation services, sedation, teaching etc. These individuals would normally be expected to require at least six months or equivalent of full-time dedicated paediatric anaesthesia training in a specialist paediatric unit during SpR years 3–5 to gain the necessary competencies.²³ They should also have advanced training in life support for children and have maintained the skills so learnt.

- 4.4** In paediatrics, as in all areas of anaesthetic practice anaesthetists must recognise and work within the limits of their professional competence. Some anaesthetists working in district general hospitals do not have a regular paediatric commitment; they may, in the absence of a separate paediatric rota, have to provide out-of-hours cover for emergency surgery in children. Anaesthetic involvement may also be required in the management of critically ill children who, on presentation, require intubation, resuscitation and initiation of intensive care before the arrival of a retrieval team and eventual transfer to a PICU. Whilst virtually all career grade anaesthetists, as trainees, will have received some formal training in paediatric anaesthesia, several years may have elapsed since this was obtained. It is important that such consultants obtain training in paediatric resuscitation and are able to maintain these skills. In addition there should be arrangements for undertaking regular supernumerary attachments to paediatric lists (see below), or secondments to specialist centres/ paediatric simulator work, in order to update and maintain paediatric knowledge and skills.
- 4.5** There must be arrangements which are fully funded to enable all consultant and career grade staff who provide anaesthesia or anaesthetic cover for children to participate in CME which relates to paediatric anaesthesia and resuscitation. In particular, consultants who have no fixed paediatric lists but have to provide out-of-hours cover should be encouraged to undertake regular annual CME which involves supervised work with a paediatric anaesthetic colleague.
- 4.6** Arrangements should also be made between specialist paediatric units and district general hospitals to facilitate CME/Continuing Education and Professional Development (CEPD) and refresher training in paediatric anaesthesia. The establishment of regional groups/networks of paediatric anaesthetists may facilitate joint CME.
- 4.7** Where appropriate, joint appointments may be considered, allowing designated consultants from district general hospitals a regular commitment within a dedicated tertiary paediatric centre in order to maintain and develop their skills.

5 Research and Audit

- 5.1** Audit plays a vital role in the quality assurance process and in measuring performance. Simple indicators such as unplanned inpatient admission following day case surgery or unplanned admission to the intensive care unit following surgery can easily be measured and the reasons documented.

The information can be analysed and compared with accepted norms. A number of suggested topics, specifically relating to paediatric anaesthesia or adaptable from those suggested for adult anaesthesia, are set out in the Royal College of Anaesthetists document 'Raising the Standard: a compendium of audit recipes'.²⁴

- 5.2** There should be departmental audit and morbidity meetings relating to paediatric anaesthesia. Where appropriate, this should be multidisciplinary and incorporate input from parents, guardians and patients.
- 5.3** Audit activity should include the regular analysis of critical and report untoward incidents. Serious events and near misses will need to be investigated thoroughly and reported to the National Patient Safety Agency in line with national requirements.
- 5.4** There should be an audit of all children transferred between hospitals and this should be monitored by the hospital paediatric or other appropriate committee.

6 Organisation and Administration

- 6.1** There should be a hospital committee consisting of a paediatrician, anaesthetist, surgeon, pharmacist and registered children's nurse. Local protocols should define surgery possible in that particular hospital with regard to such matters as the age and condition of patients, extent of elective and emergency surgical provision, staffing, local environmental constraints and thresholds for transfer to a larger or tertiary unit. This committee should be responsible for the overall management, improvement, integration and audit of anaesthetic and surgical services for children.
- 6.2** When children are admitted for surgery, their overall care should be supervised by a specialist paediatric surgeon or paediatrician. Where this is not the case, a named paediatric medical consultant should oversee care in conjunction with the child's surgeon.⁸
- 6.3** Children who undergo surgery should normally be concentrated on designated paediatric operating lists, ideally in a separate children's theatre area.
- 6.4** In hospitals where children undergo anaesthesia, there should be evidence-based guidelines and protocols relating to resuscitation, peri-operative care and the management of conditions such as anaphylaxis and malignant hyperpyrexia.
- 6.5** All patients should be assessed before their operations by an anaesthetist; both the parents and the child should be given the opportunity to ask questions.

- 6.6 There should be systems to ensure the safe use and prescription of drugs in children. There should be awareness of the implications of using 'off-label' and 'unlicensed' drugs for children. Copies of approved paediatric formularies (e.g. Medicines for Children) should be available.¹⁸
- 6.7 Parents (and others in *loco parentis*) should be involved in the care process. This includes physical and psychological preparation of the patient for surgery. A child centred approach to anaesthesia and surgery should be employed, with as far as possible:
- segregation between adults and children in the operating department, post-anaesthesia care unit, day care unit, in-patient wards and the accident and emergency department
 - provision for parents to accompany children, both to the anaesthetic room and into recovery areas.¹ There may be exceptions to this; for example, anticipated difficulty in tracheal intubation or rapid sequence induction.
- 6.8 Arrangements should be in place with a specialist paediatric unit for the transfer of sick infants or children.
- 6.9 It is recommended that regional networks are developed, with the establishment of close links between departments of anaesthesia and critical care in district general hospitals and the corresponding departments in tertiary paediatric centres.⁹ This should facilitate provision of advice (when required), the production of evidence based protocols and guidelines and the arrangement of clinical attachments.

7 Patient Information/Consent

- 7.1 Before the admission of a child for elective surgery, parents should receive full written information together with a contact telephone number should they have further questions. Written information should be based on or make reference to that provided in 'Anaesthesia Explained' and the information leaflets relating to paediatric anaesthesia that are available from the Royal College of Anaesthetists.²⁵
- 7.2 Anaesthetists should be aware of legislation including the 1989 Children Act, rights of the child, child protection issues and the process of obtaining consent.²⁶
- 7.3 Although separate written consent for anaesthesia is not mandatory, there should be discussions with the child and/or parent about methods of induction and provision of post-operative pain relief including the use of suppositories. Where special techniques such as epidural blockade, invasive monitoring and blood transfusions are anticipated there should normally be written evidence that these have been discussed with the child (when appropriate) and with parents.
- 7.4 In infants and younger children, consent for medical and surgical treatment is obtained from the parent or the legal guardian; minors age 16 and over can consent to medical treatment. Nevertheless, there are some children under the age of 16 who have sufficient maturity and understanding to decide whether to undergo surgery (see 'Patient Information', section 7 of chapter 2: Guidelines for the provision anaesthetic services for pre-operative care).

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Guidance on the provision of Critical Care Services

When considering the provision of anaesthesia, the Royal College of Anaesthetists recommends that the following areas should be addressed. The goal is to ensure a comprehensive, quality service dedicated to the care of patients and to the education and professional development of staff. The provision of adequate funding to provide the services described should be considered.

Summary

- Delivery of Critical Care Services should be in accordance with the recommendations in *Comprehensive Critical Care*.¹ The following statements are derived from this document:
 - ◆ Patients requiring Level 3 and Level 2 care are best managed by a medical team with specialist training and dedicated sessions in Critical Care.
 - ◆ There must be a sufficient number and an appropriate mix of Critical Care beds for the designated population.
 - ◆ Critical Care Units must be properly staffed and equipped for the expected case mix.
 - ◆ All staff providing Critical Care (medical, nursing and allied health professionals) must be appropriately trained.
 - ◆ The Critical Care Services should share responsibility for all critically ill patients in the hospital.
 - ◆ Critical Care outpatient follow-up clinics should be established.
- ◆ Critical Care Services must be subject to national external clinical audit by participation in the Intensive Care National Audit & Research Centre (ICNARC) Case Mix Program or an equivalent programme.
- Patients requiring Level 3 and Level 2 care require designated Critical Care facilities.²
- Any new Critical Care facility should be built in accordance with the recommendations of HBN 27.³
- A Critical Care Outreach Service is essential to identify and support ward patients who are, or are at risk of, becoming critically ill. The Critical Care Outreach Service has an additional important role in education, data collection and audit.⁴
- Collection of requisite information for the Contract Minimum Dataset is mandatory in designated areas of the hospital which care for critically ill patients.⁵

Introduction: the importance of adult critical care services

- Critical Care is required to support patients with organ failure which occurs as a complication of acute illness or as a sequela of a planned treatment regimen.
- Admission to a Critical Care Unit may be necessary either because of unexpected illness or as part of planned care pathway, e.g. following major surgery
- Different levels of care are required by critically ill patients, designated according to clinical need alone.²
- ‘Level 3’ care is required by the following patients:
 - ◆ Those requiring advanced respiratory support alone or basic respiratory support together with support of at least two other organ systems.
 - ◆ Those needing monitoring or support for two or more organ systems, one of which may be basic or advanced respiratory support.
 - ◆ Those with chronic impairment of one or more organ systems sufficient to restrict daily activity (co-morbidity) and who require support for an acute reversible failure of another organ system.
- ‘Level 2’ care is required by the following patients:
 - ◆ Those needing single organ system monitoring and support.
 - ◆ Those needing pre-operative optimisation.
 - ◆ Those needing extended postoperative care.
 - ◆ Those needing a greater degree of observation and monitoring than standard ward care.
 - ◆ Those moving to step-down care.
 - ◆ Those with major uncorrected physiological abnormalities.
- ‘Level 1’ care is required by the following patients:
 - ◆ Those who have recently been discharged from higher levels of care.
 - ◆ Those in need of additional monitoring, clinical input or advice.
 - ◆ Those requiring critical care outreach service support.
 - ◆ Those requiring staff with special expertise and/or additional facilities for at least one aspect of critical care delivered in a general ward environment.
- Any site receiving unselected medical admissions must have at least level 2 plus short term level 3 stabilisation and transfer; and any site with open access full Accident and Emergency, major general surgery, consultant led obstetrics unit, or any of these must have full level 3 facilities.
- Critical Care is a multi-professional specialty and requires co-operative working amongst a large number of disciplines and support staff.^{1,6}
- Critical Care is an essential component of other services.¹ This must be taken into account when establishing Local Delivery Plans (and other contracts) for services that might require Critical Care support.⁷
- New developments in medicine, surgery and interventional radiology often produce an unexpected demand for Critical Care Services for which funding may not have been identified.
- The Critical Care Service and specialty requires continuing audit and research to ensure the best possible patient care and most efficient use of resources.
- The intensive care environment can be extremely distressing for both relatives and conscious patients. Support and information for patients and their relatives should be readily available.

Levels of provision of service

1 Staffing requirements

- 1.1 The Critical Care Service should be led by an appropriately trained consultant as its director, supported by trained consultants with clearly identified Critical Care sessions. During office hours the responsible consultant should not have other clinical duties. The time (as Direct Clinical Care Programmed Activities [PAs]) necessary to provide adequate consultant availability will be dependent upon local workload but should include the requirement for routine evening and weekend working. Additional time (as PAs) is required for hand over, joint ward rounds and on-call availability. Additional PAs may be required for outreach and outpatient clinics, sufficient programmed activities (as Supporting PAs) will be required for teaching, audit, and professional development. Either remunerated time or a responsibility supplement is required for management activities (e.g. for the Clinical Director).
- 1.2 The Critical Care Unit should have dedicated medical cover present in the facility 24 hours per day, 7 days per week. Currently this will most commonly be a trainee, who will normally provide cover on shift working basis. The trainee’s primary responsibilities should to for the critical care unit, but it is recognised

under current staffing levels in the United Kingdom that in District General Hospitals, a trainee's duties may be shared between critical care, anaesthetic services and cardiac arrest or resuscitation team duties.

- 1.3 It is accepted that there will be a need, particularly in smaller intensive care units, for the first line of call at night to be drawn from a pool of resident doctors comprised of trainees and non-trainees, not all of whom may be attached to intensive care during the day. Local arrangements must be made in these circumstances to ensure that appropriate lines of reporting are in place, that the cover is provided by those with adequate competencies and that an appropriate skill mix is always available.
- 1.4 The roster must ensure that adequate time is available to ensure that handover between shifts is complete and unhurried. The use of information technology to assist the process is strongly encouraged.
- 1.5 Medical cover should comply with nationally agreed working hours without the need for internal cover or 'permanent locum' posts.
- 1.6 The number of Critical Care beds that can be looked after by one team will depend on the mix of Level 3 and Level 2 patients, and the number of emergency and elective procedures. In general, one consultant with one or more trainees should be responsible for no more than eight Level 3 patients. This is currently under review.
- 1.7 The nursing staff establishment should be appropriate for the anticipated case mix of patients and provide the required nursing care 24 hours per day, 365 days per year.¹ The establishment must take into account holiday, study, maternity and sick leave.⁸
- 1.8 Beds should be staffed flexibly according to the level of care needed by individual patients rather than the number of beds within a unit.^{1,9}
- 1.9 An appropriate number and mix of Allied Health Professionals and Professionals in Healthcare Science are required to deliver services such as physiotherapy, clinical pharmacy, radiography, dietetics, occupational therapy, technical support and speech and language therapy.^{1,6,10}
- 1.10 There should be adequate administrative, secretarial, health care assistant, cleaning and other support staff to ensure proper functioning of the service. All units need dedicated administrative support staff whose role includes some aspects of data collection and processing.

2 Equipment, support services and facilities

Equipment

- 2.1 The requirement for appropriately trained staff familiar with all the equipment in use is essential and cannot be over-stressed; medical, nursing and other staff should receive appropriate training and familiarisation before being permitted to use equipment. Regular review and revalidation is essential. Failure to provide adequate training is a major risk for a Trust.
- 2.2 All equipment should conform to the relevant safety standards and must be regularly serviced. A programme for the replacement of capital equipment must be in place.
- 2.3 The minimum monitoring available for each Level 3 bed space must consist of:
 - continuous ECG display with heart rate and respiratory rate monitoring
 - continuous monitoring of oxygenation using pulse oximetry or equivalent
 - continuous invasive and non-invasive arterial blood pressure monitoring
 - continuous central venous and pulmonary arterial pressure monitoring
 - continuous monitoring of ventilatory volumes
 - continuous monitoring of inspired oxygen concentration
 - capnography
 - continuous monitoring of central temperature
 - cardiac output measurement.
- 2.4 Patients requiring Level 2 care may require less monitoring than those patients considered to need Level 3 care.
- 2.5 Each bed space must be equipped to allow evacuation of the patient in the event of fire. Emergency evacuation equipment must include a portable supply of oxygen and self-inflating non rebreathing bag with reservoir.
- 2.6 Support for appropriate circulatory, ventilatory and renal failure must be available. Level 3 patients require ventilators able to manage severe acute lung disease. Each bed space at which a patient may be ventilated must have equipment immediately available to provide temporary ventilatory support in the case of ventilator or service failure. As a minimum this will include an oxygen source (e.g. a cylinder) and equipment for manual ventilation.
- 2.7 Laboratory facilities near to the Critical Care Unit are essential; they should facilitate arterial blood gas analyses, and measurement of haemoglobin

and electrolyte concentrations. Other biochemical, haematological and microbiological analyses may be useful. A proper quality control system must be in place. There must be on site access to appropriate laboratory facilities, including blood transfusion.¹¹

- 2.8** All Critical Care Units (or the Medical Engineering Department) must keep a detailed equipment service record.

Support Services

- 2.9** Critical Care Services should have regular ward rounds with the consultants in microbiology.
- 2.10** There must be appropriate access to other services including echocardiography and imaging, and a recognized process for obtaining advice and support from other specialties.
- 2.11** A Critical Care Outreach Service should be provided as part of a hospital-wide approach to critical illness.
- 2.12** In consultation with referring specialties, the Critical Care Service must develop guidelines for patient referral and management.
- 2.13** The Critical Care Service should have direct input into the identification and management of critically ill patients in the hospital, perhaps using an Early Warning Scoring system.
- 2.14** The Critical Care Service requires direct input into:
- the provision of emergency resuscitation, via membership of the Trust's Resuscitation Committee
 - the major incident response, by membership of the Trust's Major Incident Committee.
- 2.15** The Critical Care Service should be involved in arranging and supervising the intra- and inter-hospital transport of critically ill patients.
- 2.16** The Critical Care Service should include an outpatient Critical Care follow-up clinic, to manage the physical and psychological sequelae of critical illness.

Facilities

- 2.17** Critical Care should be provided in a properly staffed and managed Critical Care facility designed in accordance with HBN 27.³
- 2.18** The hospital must provide sufficient numbers of Critical Care beds to care for all Level 3 and Level 2 patients.
- 2.19** There should be sufficient Critical Care beds available so that no elective patient is cancelled on more than one occasion because of lack of a

Critical Care bed. The immediate availability of beds for emergency admissions should be sufficient to satisfy greater than 95% of requests.

- 2.20** Wherever possible all Critical Care beds should be in adjacent locations.

3 Areas of special requirement

- 3.1** If Critical Care facilities are full, or if a patient requires specialist treatment at a regional centre, or requires admission from a distant hospital, arrangements for transfer will be made by the Critical Care Service. On occasions, a stable patient in the Critical Care Unit will be moved to allow admission of a referred patient too unstable to transfer. The Critical Care consultant on duty will be responsible for these decisions and any necessary communication. Safe transfer requires the provision of a suitably trained and equipped team to deliver or transfer the patient following communication between the referring and receiving Critical Care consultants.¹²
- 3.2** Children have their own Critical Care needs. These are not addressed in this document.

4 Training and education

- 4.1** Training in the care of the critically ill patient should be provided for all medical staff undergoing basic or higher training in the major specialties (anaesthesia, general and acute medicine, emergency medicine, paediatrics or surgery).
- 4.2** Continuing professional development (CPD) is essential for all Critical Care staff. This is part of the revalidation process and a professional requirement for consultants and other medical staff.
- 4.3** Inter-disciplinary and inter-professional training is important for all involved in the delivery of Critical Care.

5 Research and Audit

- 5.1** Access to the Critical Care facility must be subject to regular audit and review.
- 5.2** The performance and process of the Critical Care Service must be evaluated. This should normally be undertaken by participation in the national case mix programme of the Intensive Care National Audit & Research Centre (ICNARC) or an equivalent organisation.
- 5.3** There should be a commitment to participation in research and development in Critical Care.
- 5.4** Consent to take part in research projects must be

obtained in accordance with the advice of the Research Ethics Committee. Whenever possible this will be from the patient. When the patient cannot give consent, then assent is usually required from the family.

- 5.5 Documentation of all the above must be filed in the patient's case notes.

6 Organisation and administration

- 6.1 A suitably qualified consultant from the Critical Care Service will be responsible for all patients referred for Critical Care. For those patients who are admitted electively, as part of their surgical management consultation will be required before the operation to ensure the availability of a Critical Care bed and the suitability of the patient for the proposed critical care. When emergency admission is required, the Critical Care consultant on-call will assess the patient prior to or within a short time of admission to the Critical Care unit. Only the Critical Care consultant should refuse a request for admission to the Critical Care Unit. Management of the patient within the unit will occur in conjunction with the service(s) requesting admission for Critical Care. Discharge from the unit to the ward will be the responsibility of the Critical Care consultant and provision must be made to review the patient to ensure a safe transition to the ward or lower level of Critical Care. The Critical Care consultant must ensure that the referring consultant (or team) is informed of the patient's discharge, preferably in advance.
- 6.2 The patient's individual care plan should cover:
- the requirement, or otherwise, for immediate resuscitation.
 - a review of the current and past history.
 - the investigations and intervention necessary to identify, monitor and correct the primary problem.
 - those interventions necessary to support failing organs.
 - an explanation to the patient (if possible) and relatives of the pathophysiology, the likely outcome and complications of the disease and therapy.
 - regular appropriate consultant review of patient progress and regular communication with the referring team.
- 6.3 Each Critical Care Unit must be part of a Critical Care network or regional grouping. The network or group is normally responsible for assessing the overall needs of the critically ill patients in the network and in planning overall service development and investment. The network or group must work with commissioners and purchasers of Critical Care Services to provide appropriate Critical Care Services for the network.
- 6.4 Each trust must have a Critical Care Delivery Group. This must include key professions and specialties that use and deliver the service. A designated Executive Director, often one who can provide advice on service planning, should take lead responsibility for Critical Care Services on behalf of the NHS Trust Board. Similar arrangements should exist in independent hospitals.
- 6.5 A system is required to ensure the effective and economic use of the Critical Care Service. This will cover personnel, capital equipment and consumables. The service provided must match the requirement of patients needing Critical Care.
- 6.6 The Department of Health, as part of the Contract Minimum Data Set (CMDS), currently requires mandatory collection of a limited amount of data on Level 3 or Level 2 patients receiving care in specified areas of a hospital.⁵ The data does not, by itself, provide enough information to perform comprehensive clinical audit for Critical Care units. The data set is undergoing revision.
- 6.7 The Critical Care Service should provide an annual report which summarises the activities of the service. The report should highlight strengths and weaknesses, and offer possible developments and solutions.
- 6.8 The Critical Care Service must hold regular Clinical Governance meetings covering, as a minimum, aspects of clinical audit, including mortality, evidence based practice, near misses, and complaints. The Critical Care Outreach Service and the Critical Care follow-up clinic may inform aspects of governance.
- 6.9 Close liaison and combined audit is required with other specialties to ensure the best possible management of both patients and Critical Care resources.
- 6.10 Prompt and regular communication is required with the patients' relatives, general practitioners, and referring specialities.
- 6.11 Critical Care Outreach Services will require their own resources. These will include administrative and technical support.
- 6.12 Outpatient and other follow-up programs must be developed. These programs should aim to identify and help manage the longer-term sequelae of Critical Care admission.

7 Patient information

- 7.1** The Critical Care Delivery Group should review the requirements for display material within the critical care unit to describe the service, and to explain the purpose and operation of common pieces of equipment, for example, ventilators and monitors. The Group should also take responsibility for ensuring a means of providing written information covering topics such as general information about the critical care service, facilities available, descriptions of the staff likely to be involved in care, important telephone numbers, relevant local and national organisations, chaplaincy services.¹³
- 7.2** Consent to proposals for treatment and invasive procedures is also a difficult area for patients on the intensive care unit. National guidelines for good practice on consent should be observed.^{14,15} Local guidelines for consent should be centred around the following principles:
- respect for patient autonomy,
 - provision of information (including for the next-of-kin when a patient lacks capacity) and
 - formal documentation of the decision-making and rationale for treatment in any circumstance.¹³
- 7.3** Examples of the type of information that should be provided to patients and relatives on the intensive care unit are available from the Intensive Care Society.¹³

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Critical Care Services**

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Guidance on the provision of Ophthalmic Anaesthesia Services

When considering the provision of anaesthesia, the Royal College of Anaesthetists recommends that the following areas should be addressed. The goal is to ensure a comprehensive, quality service dedicated to the care of patients and to the education and professional development of staff. The provision of adequate funding to provide the services described should be considered.

Summary

- There should be a named lead clinician responsible for ophthalmic anaesthesia services.¹
- Patients undergoing procedures involving local anaesthesia using a sharp needle technique and those requiring intravenous sedation must have an anaesthetist immediately available in the theatre suite.¹
- Local anaesthesia using topical or sub Tenon's block does not require the immediate availability of an anaesthetist in the theatre suite.¹
- On local anaesthetic lists without an anaesthetist present patients must be monitored by trained professionals during establishment of local anaesthesia and throughout the operative procedure.¹
- Patients do not need to be starved for cataract surgery under local anaesthesia or when hypnotic or sedative drugs are used in low doses to produce only anxiolysis. Patients do need to be starved when conscious or deeper planes of sedation are employed, or when using combinations of drugs or infusions.¹
- Needle-based local anaesthetic blocks should be performed or directly supervised only by a surgeon or anaesthetist who has been specifically trained. This training should be provided for trainees and new staff and overseen by an expert.¹
- Preadmission anaesthetic assessment by appropriately trained staff is highly desirable because of the high proportion of day case patients, and significant incidence of medical co-morbidity.¹⁻³
- Attention should be paid to current guidelines for day case anaesthesia.³⁻⁵
- Paediatric patients should have their procedures where possible as day cases.^{6,7}
- Paediatric patients should be on designated paediatric lists where possible and anaesthetised by an appropriately trained and experienced anaesthetist.^{7,8}
- Children under five years old should normally be anaesthetised by a consultant or under the direct supervision of a consultant.⁸
- The elderly and systemically sick must be anaesthetised in an appropriate environment with arrangements in place to gain prompt access to inpatient medical and critical care if required.⁹
- Departments should have protocols covering the prioritising of patients requiring urgent procedures based on surgical need and medical fitness for anaesthesia. Many procedures can wait to be done in routine hours.^{10,11}

Introduction: The importance of anaesthetic services for ophthalmic surgery

- Ophthalmic surgery is undertaken within multidisciplinary units, such as general hospitals, in isolated units and in large single speciality centres, as inpatient or day cases. All environments require appropriate staffing levels, skill mix and facilities.
- Anaesthesia for ophthalmic surgery is a recognised subspecialty of anaesthetic practice. Anaesthetic services are provided for a wide age range of patients, from neonates to the very elderly.
- Ophthalmic surgery is often required for ocular manifestations of systemic disease and there is a relatively high incidence of patients with uncommon medical conditions.
- There is an increasing trend towards day case services and use of local anaesthesia (LA) for ophthalmic procedures. Local anaesthesia can be provided topically (by use of eye drops), by sharp needle technique (peri-bulbar and retrobulbar blocks) and blunt needle techniques (sub Tenons).

Levels of provision of service

1 Staffing requirements

- 1.1 All intraocular surgery performed under LA should be carried out in a facility which is appropriately staffed for resuscitation.¹
- 1.2 Lists under local anaesthetic (LA) which do not require the immediate presence of an anaesthetist in the theatre suite do require the presence of an appropriately trained anaesthetic nurse, ophthalmic theatre nurse or operating department practitioner (ODP) to monitor the patient during establishment of local anaesthesia and throughout the operative procedure. This should be his/her sole responsibility.
- 1.3 Dedicated skilled assistance for the anaesthetist must be provided in every situation where anaesthesia or sedation is employed.¹²
- 1.4 If inpatients are cared for in isolated/single speciality units there must be appropriate medical cover and nursing care.

2 Equipment, support services and facilities

Equipment

- 2.1 All intraocular surgery performed under LA should be carried out in a facility which is appropriately

equipped for resuscitation. Oxygen and suction must be available.¹

- 2.2 Minimum anaesthesia monitoring standards should be adhered to.^{1,12}
- 2.3 All anaesthetic equipment and monitoring should conform to the current standards and should be regularly checked, maintained and in good working order.^{13,14}
- 2.4 Appropriate facilities for monitoring in the postoperative period must be available.^{13,15}

Support Services

- 2.5 **Preadmission assessment:** Preadmission anaesthetic assessment is highly desirable.¹ Patients are often elderly and have concomitant systemic disease requiring optimisation prior to surgery. There is a relatively high incidence of uncommon conditions which may need forward planning or correspondence with other units. Preadmission assessment also plays a part in allocating patients appropriately to LA or general anaesthetic (GA) techniques and selecting patients for day case. This process requires careful assessment by appropriately trained staff underpinned by guidelines on patient selection.

Facilities

- 2.6 Isolated units must have appropriate facilities for the care they aim to provide.
- 2.7 Ophthalmic surgery under both general and local anaesthesia is often provided as a day case service and the facilities available should be compliant with the current day case recommendations.
- 2.8 Facilities and staffing in the operating facility must allow for physical infirmity of patients. There should be comfortable patient access to the theatre suite, e.g. wheelchair if required. There should be adequate staff to help patients on and off operating tables with gentleness and dignity. There should be devices available to adjust patient position for maximum comfort and surgical access.

Guidelines and protocols

- 2.9 There must be a robust procedure for checking the laterality of the eye to be operated on prior to local anaesthetic block. This should include the eye being marked by the responsible surgical team prior to admission to the surgical suite. On arrival in the anaesthetic room the consent form must be checked. This must be done by the anaesthetist or surgeon performing the block and an ODP or theatre nurse. The patient must be asked to confirm on which eye they expect to have the operation.

- 2.10** Guidelines and protocols should exist on the following:
- Patient selection for day-case procedures.
 - Patient selection for procedures under LA.
 - Sedation of patients for ophthalmic procedures.
 - Scheduling of urgent procedures in-and out-of-hours.

3 Areas of special requirement

Children

- 3.1** Children should be anaesthetised where possible on a day case basis.⁶ An appropriately trained and experienced anaesthetist should anaesthetise children.^{7,8} There should be designated paediatric operating lists exclusively for children where possible. Children under five years old must be anaesthetised by, or under the direct supervision, of a consultant.⁸

Procedures performed with only local anaesthesia

- 3.2** Cataract surgery should be performed under LA where possible. When choosing a local anaesthetic technique attention must be paid to the physical condition of the patient with respect to ability to lie comfortably on the operating table for the anticipated duration of the block and operating procedure. A trained surgeon or anaesthetist must administer needle based blocks. Only sub Tenon's and topical anaesthesia do not require intravenous access for the procedure or the immediate presence of an anaesthetist in the theatre suite, although at least one member of staff trained in advanced life support must be present. Procedures under sharp needle techniques such as peribulbar and retrobulbar anaesthesia do require intravenous access and the immediate presence of an anaesthetist in the theatre suite. Many units in this country are not starving patients for LA procedures and this may be considered reasonable practice.^{1,16}

Procedures requiring sedation

- 3.3** All patients receiving intravenous sedation require an anaesthetist to be immediately available in the theatre.¹ Patients do not need to be starved when hypnotic or sedative drugs are used in low doses to produce simple anxiolysis. Patients do need to be starved when conscious or deeper planes of sedation are employed, or when using combinations of drugs such as opioid analgesics with benzodiazepines or low dose propofol infusion. In view of the risk of unexpectedly deeper sedation, it is desirable to develop local protocols in conjunction with the department of anaesthesia for sedation of patients undergoing ophthalmic procedures.^{1,16}

Patients with systemic illness

- 3.4** Patients requiring general anaesthesia who are systemically unwell should undergo operation in a facility with full medical back-up. In isolated units this may mean making arrangements for the operation to be done at a local multidisciplinary unit. Protocols must be in place for transfer to multidisciplinary units for the patients who become sick in isolated units and require inpatient medical or critical care.

4 Training and education

- 4.1** There should be a structured training program in place to ensure that anaesthetists and ophthalmologists new to local anaesthetic techniques learn the anatomy of the orbit and are formally trained to perform invasive eye blocks. The training should be overseen by an expert. Only when a trainee's competence has been assessed by an experienced practitioner should they practise independently on patients.
- 4.2** All trainee anaesthetists should undergo competency-based assessment appropriate to their level of training on the knowledge, skills, attitudes and behaviour appropriate to ophthalmic anaesthesia.¹⁷
- 4.3** All anaesthetists working in ophthalmic services should have access to continuing educational and professional development facilities for advancing their knowledge and practical skills associated with ophthalmic anaesthesia.
- 4.4** All ophthalmic theatre nurses, anaesthetic nurses and ODPs must have up-to-date basic life support training and ophthalmic nurses should be trained in cardiopulmonary resuscitation.¹

5 Research and audit

- 5.1** Research in ophthalmic anaesthesia should be encouraged and time set aside for this activity.
- 5.2** Ophthalmic anaesthesia should be included in departmental audit programmes, including ongoing audit of complications and adverse events.¹

6 Organisation and administration

- 6.1** In multidisciplinary units there should be a named lead clinician responsible for ophthalmic anaesthesia services. In single speciality centres the anaesthetic department should follow the same structure as outlined in the Guidelines for Provision of Anaesthetic Services document. This should include a lead paediatric anaesthetist if children are treated. The service should be consultant led.

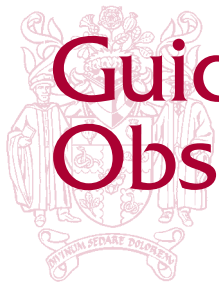
6.2 Many procedures do not have to be performed out-of-hours. Anaesthetists and surgeons together should devise departmental protocols for the handling of patients requiring urgent procedures, to allow prioritisation from both surgical and anaesthetic perspectives. The eye condition, American Society of Anesthesiologists (ASA) grade and age of patients need to be considered when arranging out-of-hours surgery. This is particularly important in isolated units.

7 Patient information

7.1 Patient information covering procedures for the day of admission and details of local or general anaesthetic must be available prior to admission. It should be available in large print or Braille if required.

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Guidance on the provision of Obstetric Anaesthesia Services

When considering the provision of anaesthesia, the Royal College of Anaesthetists recommends that the following areas should be addressed. The goal is to ensure a comprehensive, quality service dedicated to the care of patients and to the education and professional development of staff. The provision of adequate funding to provide the services described should be considered.

Summary

- Many of the following points are drawn from the joint Obstetric Anaesthetists' Association (OAA) and Association of Anaesthetists of Great Britain and Ireland (AAGBI) *Guidelines for Obstetric Anaesthesia Services*, May 2005.¹
- Each obstetric unit should have a nominated consultant in charge of obstetric anaesthesia services with programmed activities (PAs) allocated for this, in addition to those for clinical 'sessions.' As a basic minimum for any consultant led obstetric unit, there should be 10 consultant anaesthetic PAs per week, and where elective lists are run daily this would mean at least 15 PAs.
- There should be a named consultant anaesthetist with responsibility for Caesarean section lists.
- Each obstetric unit with an anaesthetic service should have a nominated consultant anaesthetist responsible for training in obstetric anaesthesia.
- A process should be in place for the formal assessment of trainees prior to allowing them to go 'on-call' for obstetric anaesthesia with distant supervision.
- Provision should be made for those who cover delivery suite on-call, but do not have regular sessions there, to spend time in the delivery suite in a supernumerary capacity with one of the regular obstetric anaesthetic consultants.
- Antenatal education: women should have access to information, in an appropriate language, about all types of analgesia and anaesthesia available, including information about related complications. Patient information leaflets are available at www.oaa-anaes.ac.uk.
- Parturients requiring anaesthesia have the right to the same standards of peri-operative care as other surgical patients. Skilled anaesthetic assistance and post-anaesthetic recovery care are of particular importance in obstetrics.
- Guidelines should be available to obstetricians and midwives on conditions requiring antenatal referral to the anaesthetist.
- There should be at least one fully equipped obstetric theatre within the delivery suite.
- Anaesthetists should help organise and participate in regular multidisciplinary 'fire drills' of emergency situations including haemorrhage and collapse.
- Access to Level III critical care must be available for all obstetric patients and preferably available on-site. Portable monitoring with facility for invasive monitoring must be available to facilitate transfer of obstetric patients to the ICU.
- Anaesthetists should have some managerial responsibility and should be involved in planning decisions that affect the delivery of maternity services.

Introduction: The importance of obstetric anaesthetic services

- Anaesthetists are involved in the care of over 60% of pregnant women.²
- There have been changes in staffing, training and working time legislation affecting obstetric anaesthetic services.^{3,4}
- Obstetric anaesthetic consultants are involved increasingly in the assessment of patients, teaching, training, administration, research and audit.⁵
- There is a need for a dedicated obstetric anaesthesia service for all consultant led obstetric units. The anaesthetic pre-assessment of high-risk women necessitates the early involvement of senior anaesthetists and transfer to intensive care facilities for high-risk cases.^{6,7} This is supported by the Clinical Negligence Scheme for Trusts (CNST).⁸
- The Caesarean section rate in the UK and age of parturients with medical conditions are both increasing.⁹
- Anaesthetic delay can be a factor in some stillbirths and infant deaths.¹⁰
- There have been concerns about the staffing of isolated obstetric units, the level of experience of anaesthetic staff on-call, and the reduction of exposure to emergency general anaesthesia in obstetrics.^{7,11}

1 Staffing requirements

The duty anaesthetist

- 1.1 The term 'duty anaesthetist' will henceforth be used to denote an anaesthetist who has been assessed as competent to undertake duties on delivery suite under a specified degree of supervision (see section 4: Training and Education). It follows that consultant support and on-call availability is essential 24 hours per day.
- 1.2 The duty anaesthetist should be immediately available for the obstetric unit 24 hours per day. The duty anaesthetist should not be primarily responsible for elective obstetric work.
- 1.3 In the busier units (i.e. one of the following: > 5000 deliveries/year, epidural rate > 35%, Caesarean section rate > 25%, tertiary referral centres/centres with a high proportion of high risk cases) it may be necessary to have two duty anaesthetists available 24 hours per day, in addition to the supervising consultant.
- 1.4 In units that offer a 24 hour epidural service, the duty anaesthetist should be resident on site, (i.e. not at a nearby hospital). Details of accommodation that should be offered are given in section 2.
- 1.5 If the duty anaesthetist has other responsibilities, these should be of a nature that would allow the activity to be delayed or interrupted should obstetric work arise, to allow provision of analgesia as well as anaesthesia to parturients.
- 1.6 Although the difficulties of smaller units are appreciated, it is strongly recommended that the duty anaesthetist for delivery suite should not be solely responsible for the ICU or cardiac arrests as that anaesthetist could be urgently required in two places simultaneously. Equally, if the duty anaesthetist covers general theatres, there must be another anaesthetist to take over immediately should they be needed on delivery suite. The lead clinician should audit and monitor the feasibility of such arrangements.
- 1.7 Where duty anaesthetists work on a shift pattern, adequate time for formal hand-over between shifts must be built into the timetable. Ideally the timetable of different professional groups should be compatible: e.g. anaesthetic and obstetric shifts should start/finish at the same time to allow multidisciplinary hand-over.

Consultant responsibilities

- 1.8 Each obstetric unit should have a nominated consultant in charge of obstetric anaesthesia services with programmed activities (PAs) allocated for this, in addition to those for clinical 'sessions'. The nominated consultant should be responsible for the organisation and audit of the service, for maintaining and raising standards, through provision of evidence based guidelines, and for risk management.
- 1.9 Previous recommendations of a minimum of one fixed, consultant session per 500 deliveries are no longer adequate. As a basic minimum for any consultant led obstetric unit, there should be 10 consultant anaesthetic PAs per week.¹
- 1.10 In units in which trainee anaesthetists work a full or partial shift system consideration should be given to providing additional consultant PAs to allow training and supervision into the evening, on one or more occasions per week. The number of such additional hours should be increased where there is a high turnover of trainees (i.e. a 3 month interval or more frequent).
- 1.11 Extra consultant PAs should be available to units which are busier than average (see above). Tertiary referral units which are likely to have a higher than average proportion of sick mothers should also have extra consultant PAs.

- 1.12 There should be at least one consultant PA available per week for antenatal referrals whether or not a formal clinic is run.
- 1.13 When formal elective Caesarean section lists are necessary there should be a separate consultant available, particularly in busier units.
- 1.14 There should be a named consultant responsible for every elective Caesarean section operating list.
- 1.15 Anaesthesia for elective caesarean sections should only be performed by trainees in isolated units when there is a consultant anaesthetist in the same building.
- 1.16 When there is no consultant anaesthetist available to cover the delivery suite, there should be a nominated consultant to cover who must be instantly able to leave a list to attend the delivery suite if necessary.
- 1.17 Each unit should display prominently the name of the consultant anaesthetist responsible for the delivery suite at that time. That consultant should not be more than half an hour away from the delivery suite at any time. The names of all consultants covering the delivery suite should be prominently displayed and contact numbers readily available.
- 1.18 There should be a named consultant anaesthetist and obstetrician responsible for all High Dependency Unit (HDU) patients 24 hours per day
- 1.19 It is part of the lead consultant obstetric anaesthetist's role to ensure there is an ongoing audit programme in place to audit complication rates.

Anaesthetic assistance

- 1.20 Parturients requiring anaesthesia have the right to the same standards of peri-operative care as all other surgical patients. Skilled anaesthetic assistance is of particular importance in obstetrics.
- 1.21 In the United Kingdom anaesthetic assistance may be provided by an operating department practitioner or nurse (ODP/N) or a registered nurse. Whatever the background, the training for all anaesthetic assistants must comply fully with current national qualification standards.¹³ If such a person is not available for any reason, a registered nurse or midwife with current and effective registration, who has received equivalent anaesthesia training to a nationally or regionally recognised standard, may be employed to perform such duties. Employment of anaesthetic assistants without national accreditation is unacceptable.¹³
- 1.22 The anaesthetic assistant should assist the anaesthetist on a regular basis, not only occasionally, to ensure maintenance of

competence. Such a person thus employed should have no other duties in the operating department at that time, (i.e. the midwife attending the mother and baby cannot also assist the anaesthetist).

Post-anaesthetic recovery staff

- 1.23 The training undergone by staff in recovery, whether these are midwives, nurses or ODP/Ns, must be to the level recommended for general recovery facilities.^{13,14} A midwife with no additional training is not adequately trained for recovery duties
- 1.24 Where non midwifery staff work in recovery as a team with midwives it is important that basic midwifery care is given (e.g. checking the uterus and lochia).
- 1.25 When high dependency care is required the midwife/nurse to patient ratio must be at least one midwife/nurse to two patients. Appropriately trained staff should be available 24 hours per day.

Other staff

- 1.26 A trained adult and neonatal resuscitation team should be available.
- 1.27 There must be adequate secretarial support for the antenatal anaesthetic assessment clinic and other duties of the consultant obstetric anaesthetist – teaching, research, audit, appraisal activities and other administrative work.
- 1.28 There should be a suitably trained senior member of either, nursing, midwifery or ODP staff with overall responsibility for the safe running of obstetric theatres, who ensures that current standards in all aspects of theatre work are met. He or she must have considerable experience of working in theatre and must undertake the role on a regular basis. This individual should ensure all staff who work in theatre are appropriately trained and undergo regular appraisal and continuing professional development (CPD).

2 Equipment, support services and facilities

For the efficient functioning of the obstetric anaesthetic service, the following equipment, support services and facilities are essential. The standards of equipment and monitoring must be of the same standard as that of non-obstetric anaesthetic service.

Equipment

- 2.1 Blood gas analysis and the facility for rapid estimation of haemoglobin (e.g. HemoCue®) and blood sugar should be available on the delivery suite.

- 2.2** The delivery suite rooms must be equipped with monitoring equipment for the measurement of non-invasive blood pressure. There should also be readily available equipment for monitoring electrocardiogram (ECG), oxygen saturation, temperature and invasive haemodynamic monitoring if required.
- 2.3** All delivery suite rooms must have oxygen, suction equipment and access to resuscitation equipment.
- 2.4** Delivery suite rooms must have active scavenging of waste anaesthetic gas to comply with COSHH guidelines on anaesthetic gas pollution.¹⁵
- 2.5** A supply of O rhesus negative blood should be available in the delivery suite at all times for emergency use.
- 2.6** The standard of monitoring in the obstetric theatre must allow the conduct of safe anaesthesia for surgery as detailed by the AAGBI.¹⁶
- 2.7** A blood warmer allowing the rapid transfusion of blood and fluids, and warm air blower/blankets must be available.
- 2.8** A difficult intubation trolley with a variety of laryngoscopes, tracheal tubes, laryngeal masks and other aids for airway management must be available in theatre.
- 2.9** Patient controlled analgesia (PCA) equipment and infusion devices must be available for post-operative pain relief.
- 2.10** The maximum weight that the operating table can support must be known and alternative provision made for women who exceed this. It is recommended that the obstetric operating table should be able to safely support a minimum weight of 160 kilograms.
- 2.11** Ideally all women who have received regional analgesia, anaesthesia or general anaesthesia for labour and delivery should be reviewed following delivery. Women must fulfil locally agreed discharge criteria before going home.
- 2.12** Haematology and biochemistry services must be available to provide rapid analysis of blood and other body fluids and to make blood and blood products for transfusion available without delay according to clinical need.
- 2.13** Pharmacy services are required for the provision of necessary routine and emergency drugs. The provision of sterile pre-mixed low dose local anaesthetic combined with opioid solutions for regional analgesia should be available as well as other sterile opioid solutions used for patient controlled analgesia.
- 2.14** Physiotherapy services should be available 24 hours a day 365 days a year for patients requiring high dependency care.
- 2.15** An Acute Pain Service should be available for advice on post-operative pain relief in the maternity unit.
- 2.16** There must be rapid availability of radiological services.
- 2.17** Medical physics technicians are required to maintain repair and calibrate anaesthetic machines, monitoring and infusion equipment.
- 2.18** Hotel services must provide suitable on-call facilities including housekeeping for resident and non-resident anaesthetic staff. Refreshments must be available throughout the 24-hour period.

Support services

- 2.11** A system should be in place to ensure that women requiring antenatal referral to the anaesthetist are seen and assessed by a senior anaesthetist within a suitable time frame, preferably in early pregnancy.
- 2.12** All women requiring Caesarean section should, except in extreme emergency, be visited and assessed by an anaesthetist before arrival in the operating theatre. In many units mothers will be admitted on the day of surgery. The mothers must be seen preoperatively by an anaesthetist.
- 2.13** There should be arrangements for prescription of pre-operative antacid prophylaxis and for laboratory investigations.
- 2.21** There should be at least one fully equipped obstetric theatre within the delivery suite. Where this is not possible a lift, which can be commandeered for the rapid transfer of women to theatre, must be available. The number of operating theatres required should depend on the number of deliveries and operative risk profile of the women delivering in the unit.
- 2.22** An operating theatre with appropriately trained staff must be readily available for women requiring emergency Caesarean section.
- 2.23** There must be easy and safe access to the delivery suite from the main hospital at all times of the day.
- 2.24** Adequate recovery room facilities including the ability to monitor systemic blood pressure, ECG and oxygen saturation must be available within the delivery suite theatre complex.¹⁶

Facilities

- 2.25** A fully equipped HDU should be available in units caring for high-risk obstetric patients. High dependency care should be available on or near the delivery suite with appropriately trained staff, or if this is unavailable, women should be transferred to a general HDU in the same hospital.
- 2.26** Access to the ICU must be available for all obstetric patients and preferably available on-site. Portable monitoring with facility for invasive monitoring must be available to facilitate transfer of obstetric patients to the ICU.
- 2.27** For obstetric units on site but not part of the main hospital, adequate links or transport arrangements must be in place to allow the safe transfer of obstetric patients to the main theatres or ICU.
- 2.28** An anaesthetic office, in proximity to the delivery suite, should be available to the duty anaesthetic team. The room should hold a computer with intra/internet access for the audit of the anaesthetic service, and access to up-to-date information. A library of specialist reference books and/or journals and local multidisciplinary evidence based guidelines must be available. The office space, facilities and furniture should comply with the standards recommended by the AAGBI guidelines.¹⁷
- 2.29** There should be a separate anaesthetic consultant's office available to allow teaching, assessment and appraisal which should comply with AAGBI guidelines.¹⁷
- 2.30** A communal rest room in the delivery suite should be provided to enable staff of all specialities to meet. A seminar room(s) must be available for training, teaching and multidisciplinary meetings.
- 2.31** All hospitals should ensure the availability of 'on-call' rooms for those doctors working night shifts, to allow them to take rest breaks.¹⁸
- 2.32** Standards of accommodation for doctors in training must be adhered to.¹⁹ Where a consultant is required to be resident, the on-call accommodation provided should be commensurate with their status.²⁰

Guidelines and protocols

- 2.33** All obstetric departments should provide and regularly update the following protocols, which should be readily accessible:
- Conditions requiring antenatal referral to the anaesthetist.
 - Management of major haemorrhage.
 - Management of pre-eclampsia and eclampsia.
 - Management of failed/difficult intubation.
 - Management of high regional block.

- Management of regional anaesthesia including:
 - ◆ regional block for analgesia
 - ◆ regional blocks for surgery
 - ◆ inadequate regional block.
- Management of accidental dural puncture.
- Management of postdural puncture headache.
- Severe hypotension during regional block.
- Admission and discharge criteria from/to HDU.
- Management of regional techniques in patients on thromboprophylaxis.
- Antacid prophylaxis and fasting policies for labour and delivery.
- Oral intake during labour.
- Management of postoperative pain.
- Resuscitation of the pregnant patient.

3 Areas of special requirement

Regional analgesia

- 3.1** Most consultant obstetric units should be able to provide regional analgesia on request at all times. Smaller units may be unable to supply dedicated cover at all times; women booking at such units should be made aware that epidural analgesia may not always be available.
- 3.2** The anaesthetist is responsible for ongoing regional analgesia in labour and must be able to assess the mother as required.
- 3.3** Midwifery care of a parturient receiving epidural analgesia in labour should comply with local guidelines. The midwife must be trained to an agreed standard in regional analgesia and be aware of potential complications and their management. The midwife must be able to assess and document sensory block height. If the level of midwifery staffing is considered inadequate epidural block should not be instituted.
- 3.4** Units should have guidelines for management of epidural blocks and there should be appropriate levels of medical and midwifery staff for delivery of the service. Units should be able to provide low dose regional analgesia.²¹
- 3.5** Regional analgesia should not be used in labour unless an obstetric team is immediately available in the same hospital to treat emergencies.
- 3.6** There should be a locally agreed regional analgesia record and a protocol for the prescription and administration of epidural drugs.
- 3.7** The time from the anaesthetist being informed about an epidural until they are able to attend the mother

should not normally exceed 30 minutes, and must be within 1 hour. This should be an auditable standard.

Emergency Caesarean sections

3.8 There should be a clear line of communication between the duty anaesthetist, theatre staff and ODP/N once a decision is made to undertake an emergency Caesarean section. The anaesthetist should be informed about the category of urgency of Caesarean section.²²

3.9 There should be clear guidelines available for whom to call if two emergencies occur simultaneously. Anaesthetists in other parts of the hospital may need to be summoned if the second anaesthetist is attending from home.

Complaints

3.10 If complaints are made about aspects of care a consultant anaesthetist should review and assess the mother's complaint, discussing her concerns and examining her where appropriate. This should be documented. Referral for further investigations may be required. Complaints should be handled according to local policies.

4 Training and education

4.1 Each obstetric unit with an anaesthetic service should have a nominated consultant responsible for training in obstetric anaesthesia. This consultant may or may not be the lead clinician for obstetric anaesthesia. Adequate PAs should be allocated for these responsibilities.

4.2 An appropriate training programme, as defined by the RCoA, should be in place for anaesthetic trainees according to their grade.²³⁻²⁵

4.3 A process should be in place for the formal assessment of trainees prior to allowing them to go on call for obstetric anaesthesia with distant supervision.¹ This assessment applies to:

- SHOs new to obstetric anaesthesia
- more experienced trainees who are working in the UK for the first time
- newly appointed SpRs who have not successfully completed a formal assessment.

4.4 There should be induction programmes for all new members of staff including locums. Locums should be assessed prior to undertaking unsupervised work.

4.5 Any doctor providing anaesthetic cover on delivery suite must ensure that their own knowledge and skills are kept up to date. This should include regular multidisciplinary meetings and attendance at appropriate CPD activities.

4.6 Any non-trainee anaesthetist who undertakes anaesthetic duties in the labour ward must have been assessed as competent to perform these duties in accordance with OAA and RCoA guidelines.^{1,23-25} Such a doctor must work regularly in the labour ward but must also regularly undertake non-obstetric anaesthetic work to ensure maintenance of a broad range of anaesthetic skills.

4.7 Provision should be made for those who cover delivery suite on-call, but do not have regular sessions there, to spend time in the delivery suite in a supernumerary capacity with one of the regular obstetric anaesthetic consultants. The frequency of these sessions will vary for each individual.

4.8 Assistance for the anaesthetist should be trained to the standards recommended by the AAGBI.¹³

4.9 The recovery staff within a maternity unit should be trained to the same standard as all recovery nurses, whether they are ODPs or midwives.¹³ Recovery skills should be regularly updated with time spent in a general recovery unit.

4.10 All staff working on the delivery suite should have regular resuscitation training including the specific problems of pregnant patients.

4.11 Midwives expected to care for patients with epidurals in situ should be trained to local guidelines before they top up epidurals or look after such patients.

4.12 Anaesthetists should contribute to the education and update of midwives, ODAs, ODPs, anaesthetic nurses and obstetricians, covering the scope and limitations of obstetric anaesthesia services.

4.13 Anaesthetists should help organize and participate in regular multidisciplinary 'fire drills' of emergency situations including haemorrhage and collapse.

4.14 Midwives should be trained in HDU care particularly in a tertiary referral unit with high-risk cases.

4.15 Maintenance of standards of postoperative care requires continuous update, and staff should work in a theatre recovery unit on a regular basis.

4.16 All staff must be given regular access to CPD opportunities.

5 Research and audit

5.1 There should be an ongoing audit programme in place to audit anaesthetic complication rates (e.g. accidental dural puncture) and problems.

5.2 Delays in elective cases should be audited.

6 Organisation and administration

- 6.1 It is important that obstetric anaesthetists develop good working relationships and lines of communication with all other professionals including those whose care may be needed for difficult cases. This includes midwives and obstetricians, as well as professionals from other disciplines such as intensive care, neurology, cardiology, haematology, and other physicians and surgeons.
- 6.2 An obstetric anaesthetist should take part in regular multidisciplinary 'labour ward forum' meetings.²⁶
- 6.3 A clear line of communication from the duty anaesthetist to the on-call consultant should be assured at all times.
- 6.4 The theatre manager should be responsible for maintaining communication with staff groups, and ensuring competent staffing and suitable equipping of all theatres.²⁷
- 6.5 Larger units and those with high Caesarean Section rates should have elective Caesarean section lists with dedicated obstetric, anaesthetic and theatre staff, to minimise disruption due to emergency work.
- 6.6 Anaesthetists must have some managerial responsibility and should be involved in planning decisions that affect the delivery of maternity services. Anaesthesia should be represented on the Maternity Services Liaison Committee, Labour Suite Working Party, Labour Ward Forum, obstetric directorate and any other bodies involved in the planning and delivery of such services.^{1, 26}
- 6.7 There should be a suitably trained senior member of either, nursing, midwifery or ODP/N staff with overall responsibility for the safe running of obstetric theatres, who ensures that current standards in all aspects of theatre work are met. He or she must have considerable experience of working in theatre and must undertake the role on a regular basis. This individual should ensure all

staff who work in theatre are appropriately trained and undergo regular appraisal and continuous professional development.

7 Patient information

- 7.1 Parturients and purchasers of services should be informed of the level of availability of anaesthesia and regional analgesia in each unit.
- 7.2 Antenatal education: when feasible women should have access to information, in an appropriate language, about all types of analgesia and anaesthesia available, including information about related complications.
- 7.3 This should be a detailed unbiased explanation about pain relief and operations under regional and general anaesthesia. Women planned for Caesarean section should receive written information about anaesthesia for the procedure when they are booked for the procedure.
- 7.4 It should be documented that women have received information. It is still necessary to give the patient an explanation at the time of the proposed procedure
- 7.5 There is no difference between the principle of obtaining consent for obstetric anaesthesia and any other medical treatment.²⁸
- 7.6 The patient is entitled to receive an explanation of the proposed procedure in appropriate language. Interpreters should be made available to women who do not speak English; when feasible these should not be family members. The explanation should include the nature and purpose of the proposed procedure, as well as any material risks attached to it. The patient should have the opportunity to ask any questions.
- 7.7 All explanations given to the patient should be clearly documented.
- 7.8 The setting up of a patient advocate system should be encouraged.

**Click here to link to
Audit Recipe Book Section 8:
Obstetric Services**

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Guidance on the provision of services for Neuroanaesthesia and Neurocritical Care

When considering the provision of neuroanaesthesia and neurocritical care services, the Royal College of Anaesthetists recommends that the following areas should be addressed. The goal is to ensure a comprehensive, quality service dedicated to the care of patients and to the education and professional development of staff. The provision of adequate funding to provide the services described should be considered.

Summary

- Neuroanaesthesia should only take place in designated neuroscience centres.¹
- There should be sufficient numbers of clinical programmed activities in consultants' job plans to provide cover for all elective neurosurgical operating lists and interventional neuroradiology sessions and also to provide adequate emergency cover.^{1,2}
- Staffing levels in the operating theatre should be sufficient to allow neuroanaesthetists to work in teams during long and complex operations.³
- There should be a designated consultant lead for neurocritical care and sufficient consultant sessions to provide daytime and out of hours cover.⁴
- There should be sufficient numbers of neurocritical care beds to allow timely access for patients from within an agreed geographical area. Management of critically ill patients outside the critical care unit should take place only in exceptional circumstances.⁴⁻⁶
- The care of head-injured patients is an integral part of neuroanaesthesia and neurocritical care. Units accepting head-injured patients must have specific arrangements in place, including evidence-based protocols, appropriately trained staff and sufficient resource to allow timely access for those requiring life-saving surgery.^{1,4,5,7-9}
- Protocols and appropriate facilities should be in place for transfer of critically ill neuroscience patients between hospitals, and within neuroscience units.^{10,11}
- There should be appropriate support facilities to allow delivery of a safe and high quality service.⁴

Introduction: The importance of neuroanaesthesia and neurocritical care services

- Anaesthesia for neurosurgery – neuroanaesthesia – is based in recognised neuroscience centres, which allow the grouping together of the interrelated specialties required to support neurosurgery. These centres, whether they be in Specialist, Teaching or District General Hospitals, should provide neurosurgical, neurological, neuroradiological and other supporting specialist and general services necessary for the management of patients with neurological disease.
- The provision of adequate numbers of neurocritical care beds is a prerequisite for the delivery of such specialist services.
- The centralisation of neuroscience practice is essential to ensure critical mass for delivery of efficient and high quality clinical care. The pace of development, and the scope of procedures being undertaken in neurosurgery and interventional neuroradiology, continues to increase the specialist nature of neuroanaesthesia and neurocritical care.

- The clinical service should provide:
 - ◆ anaesthesia for neurosurgery – intracranial, complex spinal and associated surgery
 - ◆ anaesthesia for neuroradiology – diagnostic and interventional procedures
 - ◆ neurocritical care – pre- and post-operative management of complex elective cases and the management of critically ill patients, such as those with severe head injury, intracranial haemorrhage, severe neurological disease and those who develop systemic complications secondary to their neurological condition.

Levels of provision of service

1 Staffing requirements

Neuroanaesthesia

- 1.1 The organisation of cover for neuroanaesthesia and neurocritical care requires a specific group of consultant anaesthetists (neuroanaesthetists) who may be part of, or closely affiliated with, a general department of anaesthesia and intensive care. A neuroanaesthesia service requires adequate provision of consultant programmed activities to support elective and emergency workload
- 1.2 There should be immediate availability of a resident anaesthetist for 24 hours each day, to manage post-operative and emergency patients. In neuroscience units with a substantial caseload, this will require the provision of a resident anaesthetist dedicated to this group of patients. Out of hours, consultants should be available for immediate telephone advice and be able to attend the hospital within 30 minutes.
- 1.3 There should be sufficient programmed activities to ensure consultant cover of all neurosurgical operating lists and interventional neuroradiology sessions. Adequate arrangements for cross covering annual and study leave should be incorporated into consultants' job plans. Adequate consultant cover is also required to provide general anaesthesia and sedation for diagnostic radiology sessions, including CT and MRI scans.
- 1.4 Consultants working in neuroanaesthesia should have sufficient regular programmed activities within this field to ensure that their specific skills and experience are maintained. A minimum of one day per week is likely to be required to fulfill this requirement.
- 1.5 Allocation of a single neuroanaesthetist to an operating list with long neurosurgical cases is insufficient and a team of anaesthetists should service long and complex operations. Comprehensive hand over arrangements must be in place to ensure continuity of care during long cases.

Neurocritical Care

- 1.5 The Royal College of Nursing suggests that the nurse:patient ratio for a patient requiring level 3 and level 2 care should be 1:1 and 1:2 respectively, but the actual nursing establishment to support neurocritical care services may be higher. It may not be possible to leave level 2 patients with neurological disorders alone even when they are physiologically normal and an allowance to cover the need for closer supervision of such patients should be made when calculating the nursing establishment.
- 1.6 Allied Health Professionals are key members of the multi-professional team and a sufficient establishment is crucial to the delivery of high quality neurocritical care services.
- 1.7 Consultants responsible for the care of neuroscience patients requiring critical care support should have the knowledge, skills and experience needed to treat this group of patients, irrespective of whether the services are provided in a dedicated neurocritical care unit or within the context of a general intensive care unit. There should be a designated lead consultant for neurocritical care (or director of neurocritical care) and this consultant should have programmed activities allocated to this function.
- 1.8 Although the management of patients requiring neurocritical care is closely shared with the neurosurgical team, a minimum of 10 daytime clinical consultant programmed activities is required to cover a small neurocritical care unit (4-8 beds). In larger units it may be necessary for two consultants to be available during weekdays for all or part of the day. However, the consultant establishment for neurocritical care should be reviewed locally so that it reflects local conditions, including the skill mix of other members of the multi-professional team. It has been recommended that, in large and busy units, there may be a requirement for up to 30 consultant programmed activities per week.⁴
- 1.9 In large units it may be appropriate to allocate consultant programmed activities to provide support to patients throughout the hospital via an outreach service.

1.10 There should be a resident doctor with appropriate skills and competences immediately available for neurocritical care 24 hours each day.

1.11 Staffing levels must be sufficient to enable an appropriately qualified and experienced doctor and trained assistant to accompany critically ill patients during transfer between neurocritical care and operating theatres, CT and MRI scanners and angiography suites

2 Equipment, support services and facilities

Equipment

2.1 There is a high incidence of difficult intubation in neurosurgical units carrying out complex cervical spinal surgery. Specific equipment to manage the difficult airway, including the provision of sufficient numbers of fiberoptic laryngoscopes, should be available.

Support services

2.2 The demand for critical care beds in neuroscience centres is high and the actual number and configuration of level 3 and level 2 beds should be determined locally. However, capacity should be sufficient to allow access by critically ill patients in an appropriate time scale, e.g. within 4 hours for those who require life-saving surgery. The Society of British Neurological Surgeons recommends the provision of 10 designated level 2 and level 3 beds per million population for neurosurgical patients and the Association of British Neurologists additionally estimates that between 5–7 neurocritical care beds per million population are required to support the care of neurology patients.^{4–6}

2.3 A 24 hour acute pain service should be provided for post-operative neurosurgical patients.

2.4 24 hour a day neuroradiology support should be provided for interpretation of neuro-imaging. On-line review of CT scans from referring hospitals and within the neuroscience centre should be available locally, and consideration should be given to the provision of such access in the homes of consultants who provide cover to neurocritical care out-of-hours.

2.5 There should be on-site laboratory provision, or point of care testing, for arterial blood gases, serum electrolytes and activated clotting time, to allow safe management of patients in the operating theatre, during endovascular procedures and on the neurocritical care unit.

2.6 Rapid access to other biochemical and haematological investigations, blood transfusion and CSF microscopy should also be provided.

2.7 Expert neuropathological expertise should be available on request, with the ability to carry out 'frozen section' examinations on-site.

2.8 Pre-admission clinics for elective neurosurgery should be available with input from the department of neuroanaesthesia.

2.9 For stand-alone neuroscience centres, local arrangements should be in place for specialist opinion and review of patients by other disciplines. Named consultants should be identified in 'core' specialties to facilitate such liaison. There should be same day availability of cardiac echo investigations (including TOE) and ultrasound scanning. To avoid the transfer of critically ill patients, this should be provided at the bedside for patients on the neurocritical care unit.

Guidelines

2.10 Neurocritical care outcome can be improved by the delivery of management guidelines based on expert consensus. All members of the neurocritical care multi-professional team should input to the development of local protocols, which should cover all the common pathologies managed by that unit. Protocols for the management of severe head injury are particularly important and guidance for management in the acute phase should be developed in collaboration with clinicians from referring hospitals.

2.11 Local guidelines should be agreed between clinicians in the neuroscience unit and referring hospitals for transfer of patients, and audited as a routine.

Facilities

2.12 Critically ill patients often require transfer to and from the operating theatre, CT and MRI scanners and angiography suites. Theatres, ICU and radiological facilities should therefore be in the closest possible proximity and preferably on the same floor. Adequate provision should be made for monitoring patients during such transfer. Local guidance should be developed for the intra-hospital transfer of critically ill neuroscience patients, based on guidance from the Intensive Care Society.¹¹

3 Areas of special requirement

Children

- 3.1 Children requiring neurosurgery need specific arrangements. Whilst specialist paediatric neurosurgical units exist, many children are treated in adult neuroscience centres. However, paediatric neurosurgeons and anaesthetists should be involved in the management of children requiring neurosurgical intervention wherever that care is delivered. In providing neuroanaesthesia for children, appropriate planning is necessary and this might include shared responsibility between neuroanaesthetists and paediatric anaesthetists.
- 3.2 All children under the age of 16 requiring neurocritical care should be managed in a paediatric intensive care unit.
- 3.3 Detailed guidance for the management of children has been issued and applies equally to those requiring neurosurgical intervention (**see Chapter 8: Guidance on the provision of paediatric anaesthetic services*).

4 Training and education

- 4.1 The specialist nature of neuroanaesthesia dictates that it is a consultant-delivered specialty. Trainees receive only a limited exposure based on a clinical attachment during years 1 or 2 of training, with some having longer attachments forming part of years 3–5. Because of the limited time that trainees spend on neuroanaesthesia attachments, each department should develop structured training programmes to cover all core topics. Trainees should also be encouraged to attend other training opportunities within the neuroscience unit, such as grand rounds, and radiology and pathology cases conferences and mortality and morbidity meetings.
- 4.2 Fellowship posts should be identified to allow additional training for those who wish to follow a career in neuroanaesthesia or neurocritical care. These should be suitable for trainees who wish to take time out of training programme or for those who are post-CCT. Such posts should provide similar or enhanced levels of teaching, training and access to study leave as regular training posts.

5 Research and audit

- 5.1 Departments of neuroanaesthesia and neurocritical care should be encouraged to develop research interests, even if not part of an academic department. Research collaboration with other neuroscience disciplines is good practice.
- 5.2 Audit programmes should be developed locally but should include continuous audit of transfer of brain injured patients, neurocritical care capacity and demand, rates of readmission to ICU and caseload of trainees. In general, local practice should be audited against national and expert consensus guidelines.

6 Organisation and administration

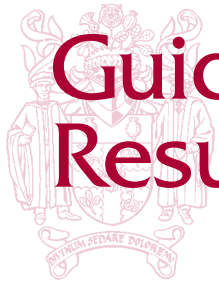
- 6.1 Much of neurosurgery involves acute work with a high degree of urgency. The provision of associated services must recognise this need and inappropriate delay cannot be allowed to occur due to the lack of key personnel or facilities. Laboratory services, neuroradiology and availability of operating theatre time must all be organised to cope with these demands.
- 6.2 Departments of neuroanaesthesia and neurocritical care, even if part of a large general department, must be provided with adequate secretarial and administrative support. Consultants with lead responsibility for neuroanaesthesia and neurocritical care should have programmed activities allocated to this function. Appropriate levels of administrative support, including data collection and analysis, should be available for neurocritical care.
- 6.3 Consultants in neuroanaesthesia and neurocritical care should be involved in the planning of neuroscience services at a local and regional level.
- 6.4 A lead consultant responsible for patient transfer should be identified both in the neuroscience unit and in referring hospitals.

7 Patient information

- 7.1 Each department should provide written information specific to neurosurgical procedures, including relevant risks. Information for relatives of patients requiring neurocritical care should also be available, including contact details of relevant charities and helplines.

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Guidance on the provision of anaesthetic services for Resuscitation

When considering the provision of anaesthesia, the Royal College of Anaesthetists recommends that the following areas should be addressed. The goal is to ensure a comprehensive, quality service dedicated to the care of patients and to the education and professional development of staff. The provision of adequate funding to provide the services described should be considered.

Summary

- Recognition of the patient at risk of cardiac arrest, and prompt, effective treatment to prevent it occurring, is more likely to improve outcome than changing the way resuscitation is undertaken.¹
- Anaesthetists play a significant role as resuscitation team members and in the resuscitation training of doctors, nurses and paramedics.
- National standards for clinical practice and training in cardiopulmonary resuscitation have been published elsewhere.²
- The majority of in-house resuscitation training in the UK is undertaken by resuscitation training officers (RTOs) but the instructor body on a Resuscitation Council (UK) ALS course will usually include anaesthetists.³
- All resuscitation attempts should be included in continuous audit.⁴
- The resuscitation services in a trust should be co-ordinated by a Resuscitation Committee.²

Introduction: The importance of anaesthetic services for resuscitation

- The incidence of in-hospital cardiac arrests is 1–5 per 1,000 admissions. Approximately 17% of these patients will be resuscitated successfully and will survive to hospital discharge.⁵
- A resuscitation attempt typically includes chest compressions and ventilation of the lungs, the delivery of electric shocks to restart the heart, and the injection of drugs.
- Anaesthetic departments make a considerable contribution to the resuscitation services in most hospitals. Anaesthetists are valuable members of the resuscitation team because they are highly skilled with most of the interventions used during a resuscitation attempt.⁶
- Anaesthetists are often involved in training other doctors and nurses in advanced life support (ALS).
- Anaesthetists are often involved in training clinical staff to recognise patients at risk of cardiac arrest and to initiate preventative treatment.
- Anaesthetists are skilled in airway management and will be involved in teaching these skills to hospital staff and to paramedics.
- The chair of the hospital resuscitation committee is most commonly a consultant anaesthetist.

Levels of provision of service

1 Staffing requirements

- 1.1 In many UK hospitals the resuscitation team will include an anaesthetist or the resident doctor from the critical care unit (who is commonly an anaesthetist). The essential requirement however, is for the presence of an individual, appropriately trained and assessed in advanced airway management skills. This core role

on the team, which necessitates immediate availability at all times, is increasingly being taken by other clinical staff.

- 1.2 If a resuscitation attempt is initially successful, the patient will usually require transfer to the critical care unit. This transfer will normally be undertaken by an anaesthetist or another doctor from the critical care unit.
- 1.3 The majority of in-house resuscitation training in the UK is undertaken by resuscitation training officers (RTOs) but the instructor body on a Resuscitation Council (UK) ALS course will usually include anaesthetists.
- 1.4 Instructors need to maintain their knowledge and skills and need to teach regularly (two courses each year) to maintain their instructor status.
- 1.5 The time needed for anaesthetists to teach on these courses must be taken into consideration when planning the departmental workload. It is inappropriate for instructors to be expected to use their own study leave to deliver resuscitation training.
- 1.6 One consultant anaesthetist should take a lead role in resuscitation – this individual should be a member of the Trust Resuscitation Committee and is often the Chair. In large trusts, this role may carry a significant workload and should be supported with appropriate administrative time.

2 Equipment, support services and facilities

Equipment

- 2.1 Relatively little equipment is required by the resuscitation team.
- 2.2 The defibrillator-monitor (typical cost is approximately £5,000) is central to the resuscitation attempt and these must be located strategically to enable shock delivery within three minutes of a patient arrest anywhere in the hospital.⁷
- 2.3 Other equipment is required for airway management and intravenous access – these items are relatively inexpensive.
- 2.4 A comprehensive list of the equipment required for adult and paediatric resuscitation is given on the Resuscitation Council (UK) website (www.resus.org.uk).
- 2.5 Additional equipment (e.g. transport monitor, ventilator) will be required for transferring the resuscitated patient to the critical care unit.
- 2.6 Equipment for training, including adult and paediatric manikins, airway management trainers,

an ECG monitor and rhythm simulator and at least one defibrillator dedicated for training should be available. Training defibrillators should be the same as those used in the clinical areas of the institution.²

Support services

- 2.7 Every hospital should have at least one RTO, who is responsible for co-ordinating the teaching and training of staff in resuscitation.
- 2.8 The role of the RTO and the facilities required to deliver resuscitation training are detailed in Cardiopulmonary Resuscitation – Standards for Clinical Practice and Training: A Joint Statement from the Royal College of Anaesthetists, the Royal College of Physicians of London, the Intensive Care Society, and the Resuscitation Council (UK).²
- 2.9 Other members of the resuscitation team will usually include general medical trainees and ward nursing staff.

Facilities

- 2.10 Resuscitation trainers must have access to a designated training room that will accommodate at least 10 people and all the relevant training equipment.

3 Areas of special requirement

- 3.1 **Paediatric resuscitation.** The typical causes of cardiac arrest in children are different from those of adults and there is some variation in the resuscitation techniques used in children and the newborn. Most hospitals have a separate paediatric cardiac arrest team – an anaesthetist will be a key member. Training in paediatric resuscitation is delivered typically by RTOs, paediatricians and anaesthetists. Regular members of the paediatric resuscitation team should have completed either the Advanced Paediatric Life Support (APLS) or the European Paediatric Life Support (EPLS) course. Anaesthetists comprise a significant proportion of the faculty on these courses.
- 3.2 **Trauma resuscitation.** Many hospitals have a trauma team for the resuscitation of seriously injured patients. Airway management can be particularly challenging in these patients and the anaesthetist has a vital role to play in the trauma team. Anaesthetists will also be responsible for intra- and inter-hospital transfer of injured and critically ill patients – this can involve considerable resources in terms of time and personnel. Anaesthetists who are expected to resuscitate patients with major injuries should have received advanced trauma life support (ATLS) training. Senior anaesthetists are frequently involved in ATLS training for doctors of all disciplines.⁸

3.3 Prevention of in-hospital cardiac arrest. The majority of patients sustaining in-hospital cardiac arrest show signs of physiological deterioration in the hours leading up to the event. If these critically ill patients are recognised and treated promptly many cardiac arrests could be prevented. Many hospitals have established medical emergency teams or outreach systems that are called to patients showing signs of deterioration. Anaesthetists/intensive care physicians are frequently members of these teams and are also involved in training doctors and nurses in the recognition and treatment of critically ill patients.

3.4 Ethics. Every hospital should have an ethical resuscitation policy. This is normally based on Decisions Relating to Cardiopulmonary Resuscitation – A Joint Statement from the British Medical Association (BMA), the Resuscitation Council (UK) and the Royal College of Nursing (RCN).⁹ Anaesthetists/intensive care physicians usually make a significant contribution to the preparation of the local ethical resuscitation policy.

4 Training and education

4.1 All anaesthetists in training are expected to undertake specific training in resuscitation. For the majority, this means undertaking courses in ALS, ATLS and APLS/EPLS. Personnel who work in maternity services are also required to have training in Newborn Life Support (NLS). This includes anaesthetists who regularly work in this capacity.

4.2 These courses are normally funded through existing study leave budgets but it is not uncommon for trainees to fund some of these courses themselves. The provider certificates are valid for four years. Regular updating of resuscitation knowledge is required; this may be achieved by completing another course, attending a specific revalidation course or by in-house training.

4.3 The faculty on these life support courses frequently include several anaesthetists – this represents a considerable workload for the average anaesthetic department and must be taken into account when planning requirements for permanent staff.

4.4 Most prehospital resuscitation in the UK is undertaken by paramedics. These individuals require training in intravenous cannulation and basic and advanced airway management. Paramedics are taught these skills by anaesthetists during elective surgical lists.

5 Research and audit

5.1 All resuscitation attempts should be included in continuous audit. There are international recommendations for the core data that require collection to enable meaningful audit of resuscitation practice.⁴ As members of the resuscitation team, anaesthetists will participate in resuscitation audit. The Resuscitation Committee is responsible for evaluating and presenting resuscitation audit data and the anaesthetic lead for resuscitation will feed the results of the audit back to the anaesthetic department.

5.2 The recent European legislation on consent in research makes prospective controlled trials in resuscitation very difficult.¹⁰ Nevertheless, anaesthetists are encouraged to participate in resuscitation research and they are responsible for many of the UK studies published in this field.

6 Organisation and administration

6.1. The resuscitation services in a trust are co-ordinated by a Resuscitation Committee, which typically meets quarterly. The anaesthetic lead for resuscitation will be a key member of this committee and will frequently be the Chair. In large trusts this will represent a significant time commitment and should be recognised in job planning. Much of the day-to-day resuscitation training will be delivered by resuscitation training officers but more advanced training, especially for the medical emergency team systems, is often delivered by anaesthetists.

7 Patient information

7.1 A model information leaflet that accompanies the Decisions Relating to Cardiopulmonary Resuscitation document has been produced by Age Concern in conjunction with the RCN, RC(UK), and BMA. This can be downloaded from www.resus.org.uk. Many trusts have produced their own patient information leaflets based on the national document.

**Click here to link to
Audit Recipe Book Section 7:
Resuscitation**

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Glossary

AAGBI	Association of Anaesthetists of Great Britain and Ireland
ALS	Advanced Life Support
APAGBI	Association of Paediatric Anaesthetists of Great Britain and Ireland
ASA	American Society of Anaesthesiologists
CEMACH	Confidential Enquiry into Maternal and Child Health
CEPD	Continuing Education and Professional Development
CVP	Central Venous Pressure
DH	Department of Health
ECG	Electrocardiogram
EWTD	European Working Time Directive
GMC	General Medical Council
HDU	High Dependency Unit
ICS	Intensive Care Society
ICU	Intensive Care Unit
JCGP	Joint Committee on Good Practice (RCoA)
NCCG	Non-consultant career grade
NCEPOD	National Confidential Enquiry into Patient Outcome and Death
NHS	National Health Service
PCA	Patient Controlled Analgesia
PONV	Post-operative Nausea and Vomiting
PSC	Professional Standards Committee (RCoA)
RCoA	Royal College of Anaesthetists
SAS	Staff and Associate Specialist



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Documents with the College's 'imprimatur' often have a Council member who feels responsible. I accept this, but not the credit; the artificers of this project from beginning to end are Helen Wise, a Consultant Anaesthetist in Poole, and Edwina Wilson of the College's Professional Standards Directorate.

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For all the currently available chapters a principal advisor was invited to use a preliminary draft revision of the 1999 edition to present a more robust version. The comments of Council members and of an independent reviewer were then used to produce a revised version. Before the proof-reading stage, each section was read again by David Levy, an anaesthetist, to check for consistency of style. Finally, they are now available to download from the College website.

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