Royal College of Anaesthetists

# Chapter 7

## Guidelines for the Provision of Anaesthesia Services (GPAS)

# Guidelines for the Provision of Anaesthesia Services in the Non-theatre Environment 2023

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## Declarations of interest

All chapter development group (CDG) members, stakeholders and external peer reviewers were asked to declare any pecuniary or non-pecuniary conflict of interest, in line with the guidelines for the provision of anaesthetic services (GPAS) conflict of interest policy as described in the GPAS chapter development process document.

The nature of the involvement in all declarations made was not determined as being a risk to the transparency or impartiality of the chapter development. Where a member was conflicted in relation to a particular piece of evidence, they were asked to declare this and then, if necessary, remove themselves from the discussion of that particular piece of evidence and any recommendation pertaining to it.

## Medicolegal implications of GPAS guidelines

*GPAS guidelines are not intended to be construed or to serve as a standard of clinical care. Standards of care are determined based on all clinical data available for an individual case and are subject to change as scientific knowledge and technology advance and patterns of care evolve. Adherence to guideline recommendations will not ensure successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care aimed at the same results. The ultimate judgement must be made by the appropriate healthcare professional(s) responsible for clinical decisions regarding a particular clinical procedure or treatment plan. This judgement should only be arrived at following discussion of the options with the patient, covering the diagnostic and treatment choices available. It is advised, however, that significant departures from the national guideline or any local guidelines derived from it should be fully documented in the patient's case notes at the time the relevant decision is taken.*

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## Promoting equality and addressing health inequalities

The Royal College of Anaesthetists (RCoA) is committed to promoting equality and addressing health inequalities. Throughout the development of these guidelines, we have:

- given due regard to the need to eliminate discrimination, harassment and victimisation, to advance equality of opportunity, and to foster good relations between people who share a relevant Protected Characteristic (as defined in the Equality Act 2010) and those who do not share it
- given regard to the need to reduce inequalities between patients in access to, and outcomes from healthcare services and to ensure services are provided in an integrated way where this might reduce health inequalities.

## GPAS Guidelines in context

The GPAS documents should be viewed as 'living documents'. The GPAS guidelines development, implementation and review should be seen not as a linear process, but as a cycle of interdependent activities. These in turn are part of a range of activities to translate evidence into practice, set standards and promote clinical excellence in patient care.

Each of the GPAS chapters should be seen as independent but interlinked documents. Guidelines on the general provision of anaesthetic services are detailed in the following chapters:

- Chapter 1: Guidelines for the Provision of Anaesthesia Services: The Good department
- Chapter 2: Guidelines for the Provision of Anaesthesia Services for the Perioperative Care of Elective and Urgent Care Patients.
- These guidelines apply to all patients who require anaesthesia or sedation, and are under the care of an anaesthetist. For urgent or immediate emergency interventions, this guidance may need to be modified as described in Chapter 5: Guidelines for the Provision of Emergency Anaesthesia.

The rest of the chapters of GPAS apply only to the population groups and settings outlined in the 'Scope' section of these chapters. They outline guidance that is additional, different or particularly important to those population groups and settings included in the 'Scope'. Unless otherwise stated within the chapter, the recommendations outlined in chapters 1–5 still apply.

Each chapter will undergo yearly review, and will be continuously updated in the light of new evidence.

Guidelines alone will not result in better treatment and care for patients. Local and national implementation is crucial for changes in practice necessary for improvements in treatment and patient care.

## Aims and objectives

The objective of this chapter is to promote current best practice in service provision for anaesthetic care provided in the non-theatre environment. The guidance is intended for use by anaesthetists with responsibilities for service delivery and healthcare managers.

This guideline does not comprehensively describe clinical best practice in anaesthetic care in the non-theatre environment but is primarily concerned with the requirements for the provision of a safe, effective, well-led service, which may be delivered by many different acceptable models. The guidance on provision of anaesthetic care in the non-theatre environment applies to all settings

where this care is undertaken, regardless of funding. All age groups are included within the guidance unless otherwise stated, reflecting the broad nature of this service.

A wide range of evidence has been rigorously reviewed during the production of this chapter, including recommendations from peer-reviewed publications and national guidance where available. However, both the authors and the Chapter Development Group (CDG) agreed that there is a paucity of level 1 evidence relating to service provision for anaesthetic care in the non-theatre environment. In some cases, it has been necessary to include recommendations of good practice based on the clinical experience of the CDG. We hope that this document will act as a stimulus for future research.

The recommendations in this chapter will support the RCoA's Anaesthesia Clinical Services Accreditation (ACSA) process.

## Scope

### Target audience

All staff groups providing anaesthesia to patients under the care of an anaesthetist in the non-theatre environment, including (but not restricted to) anaesthetists, operating department practitioners, anaesthesia associates, nurses, allied health professionals and pharmacy staff.

### Target population

All ages of patients undergoing anaesthesia in the non-theatre environment under the care of an anaesthetist.

### Healthcare setting

All non-theatre settings within the hospital in which anaesthesia services are provided.

### Clinical management

Key components needed to ensure provision of high-quality anaesthesia services in the non-theatre environment.

Areas of provision considered:

- levels of provision of service, including (but not restricted to) staffing, equipment, support services and facilities
- areas of special requirement including:
  - children
  - patients with additional needs
  - the emergency department (ED)
  - the radiology department
  - interventional radiology
  - magnetic resonance imaging (MRI)
  - electroconvulsive therapy (ECT)
  - direct current (DC) cardioversion
  - radiotherapy
  - dental procedures

- gastrointestinal procedures
- training and education
- research and audit
- organisation and administration
- patient information.

### Exclusions

- Exclusive provision of services by a specialty other than anaesthesia.
- Patients undergoing anaesthesia within a critical care setting.
- Patients undergoing anaesthesia in a non-hospital environment.

## Introduction

There are increasing numbers of diagnostic and therapeutic procedures performed outside the main theatre environment, in both elective and emergency situations. These procedures may require anaesthetic involvement through haemodynamic monitoring during the procedure, sedation, regional anaesthesia or general anaesthesia. The challenge for anaesthesia is to develop a framework that supports and regulates the safe delivery of care.

Commercial and NHS healthcare providers are expanding non-theatre environments to deliver surgical and diagnostic procedures. This framework guidance should be applied to all non-theatre services that require anaesthetic interventions.

The complexity and challenges of providing anaesthesia care in the non-theatre environment should be acknowledged through appropriate regulation of healthcare providers and training and certification of anaesthesia providers. All clinical personnel assisting with anaesthesia should be certified resuscitation providers.

Facilities delivering anaesthesia and sedation by anaesthetic providers should develop a culture of safety that reflects Guidelines for the Provision of Anaesthetic Services (GPAS) guidelines. Patients expect uniformly high standards of service provision wherever the service is provided and whoever is the provider.

The development of deep sedation techniques and general anaesthesia with total intravenous anaesthesia (TIVA)/target-controlled infusion techniques may remove the requirement for complex gas delivery systems and anaesthetic machines. The safe delivery of anaesthesia through preoperative assessment, case selection, anaesthesia delivery, recovery and postoperative care should not be compromised because of cost pressures.

The physical environment can be challenging for the safe provision of anaesthesia when compared with the main theatre environment. The anaesthesia providers should develop safe practice guidelines that consider the assessment, induction, recovery and discharge of patients. In addition, procedure-specific risks such as radiation exposure and infection control should be considered. Compliance with the surgical safety checklist is obligatory.[1] Complication management should be written into patient pathways with consideration of access to other medical, surgical, and critical care services.

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## Recommendations

The grade of evidence and the overall strength of each recommendation are tabulated in Appendix I. If sedation is performed without an anaesthetist present, the professionals should adhere to the guidelines of their own Colleges and the Academy of Medical Royal Colleges.[2,3,4,5]

For the purpose of these guidelines, deep sedation should be held to the same standards as anaesthesia. Detailed recommendations are detailed in *Guidelines for the Provision of Anaesthesia Services for the Perioperative Care of Elective and Urgent Care Patients.*

## 1 Staffing requirements

1.1 A clinical lead(s) (see Glossary) for anaesthesia in the non-theatre environment should be appointed with adequate time provided within their job plan to develop the service, train staff, and ensure that safety standards are upheld.[2,5,6] The anaesthesia clinical lead for the non-theatre environment should create local consensus guidelines for the staffing of each non-theatre area where anaesthesia is delivered.

1.2 An escalation policy should be in place and should be understood by all medical, healthcare professional and managerial staff. This should include the names and method of contact, which should be prominently displayed in appropriate areas. Internal hospital telephone switchboards should have ready access to rotas and methods of contacts.[7]

1.3 The non-theatre environment involves multiple clinical teams working together. There should be an anaesthesia clinical lead to coordinate, collaborate, and communicate between clinical teams and to offer effective, explicit leadership.[5]

1.4 A dedicated, appropriately trained anaesthetic assistant, who is familiar with that specific environment, should be available in all non-theatre environments where anaesthesia or deep sedation is undertaken by an anaesthetist.[8,9]

1.5 Patients recovering from anaesthesia or all depths of sedation including mild sedation (see Glossary) in a non-theatre environment should receive the same standard of care as that required in an operating theatre.[10,11]

1.6 The requirements for non-theatre anaesthesia services out of hours should be locally agreed and sufficient staffing should be in place to deliver all aspects of the emergency workload without compromising patient safety.[12]

1.7 If a radiology department provides an emergency interventional service for which anaesthesia services may be required, plans for staffing this anaesthetic service should be made, particularly outside normal working hours. Clear referral pathways for anaesthetic support for interventional radiology should be provided for all hours the service is offered.[13,14,15,16]

1.8 Anaesthesia for non-theatre environment should be delivered by a competent individual with appropriate supervision; the level of supervision should reflect the severity of the case and the seniority of the individual in accordance with the RCoA's Guidance on Supervision Arrangements for Anaesthetists.[17]

1.9 Anaesthetists in training should be given the appropriate level of responsibility according to their competence and level of training, to gain the experience of non-theatre environment and to enable them to function as a consultant later in their career. Anaesthetists in training must be appropriately supervised at all times; rotas and staffing arrangements should be in place to facilitate this training.[18]

## 2 Facilities, equipment, medication and services

### Facilities

2.1 Access to lifts for easy trolley transfer should be available.

2.2 Procedure rooms should be large enough to accommodate equipment and personnel, with enough space to move about safely and to enable easy access to the patient at all times.[19]

2.3 Environments in which patients receive anaesthesia or sedation should have full facilities for resuscitation available, including a defibrillator, suction, oxygen, airway devices, an escalating plan of airway intervention equipment, including equipment required to manage a difficult airway and a means of providing ventilation.[20]

2.4 The anaesthetist should consider all environmental factors when planning administration of anaesthesia or sedation.[21]

2.5 When rooms are darkened, hindering direct observation of the patient, an alternative light source should be available to facilitate patient observation and documentation.[21]

2.6 Transfer of a patient from the procedure room to other areas within the institution should be possible to arrange if necessary.

2.7 A recovery area or equivalent should be available for each patient at the end of the procedure.[19]

2.8 A telephone and facilities to allow access to online information, such as electronic patient records, local guidelines and clinical decision aids, should be available.[21]

### Equipment

2.9 Equipment for the minimum standards of monitoring should be available at all sites where patients receive anaesthesia or sedation.[22] For patients receiving conscious sedation, this should include pulse oximetry.

2.10 Continuous waveform capnography should be available for all patients undergoing general anaesthesia and moderate or deep sedation.[22,23]

2.11 The anaesthetist should ensure that an adequate supply of oxygen is available before starting any procedure. Many of the sites where anaesthesia is provided outside the main operating theatres do not have piped oxygen; if anaesthesia is provided frequently in such a location, the use of the location should be reviewed, or piped oxygen provided. The organisational culture should enable anaesthetists to raise concerns if safety and monitoring standards are compromised.[21]

2.12 Where piped oxygen is used, back-up cylinders should always be available and should be appropriately stored.

2.13 All anaesthetic equipment should be standardised (where possible) in all areas providing anaesthetic services, including equipment for resuscitation and life support with the exception of any equipment that needs to be magnetic-resonance (MR) safe. All anaesthetic equipment should be subjected to a standardised programme of maintenance.[21]

2.14 All staff should be provided with opportunities to familiarise themselves with all equipment by attending formal training sessions.[21] Training sessions should be documented accordingly.

2.15 Equipment standards where anaesthesia is planned, including with controlled ventilation, should replicate the facilities available in the main theatre suites and should be commensurate with local hospital anaesthetic facilities.[21,24]

2.16 All anaesthetic equipment should be checked prior to use in accordance with the Association of Anaesthetists published guidelines.[25] Anaesthetic machine checks should be recorded in a logbook and on the anaesthetic chart.

2.17 All procedures should be compliant with National Safety Standards for Invasive Procedures (NatSSIPs) and the Safe Surgery Checklist.[26,27] An appropriate 'pre-list check' of the anaesthesia systems, facilities, equipment, supplies and resuscitation equipment should be performed prior to the start of each list.[21]

2.18 Appropriate equipment should be available to monitor a patient's temperature, to minimise heat loss and to provide active patient warming.[24]

2.19 All patient trolleys should be capable of being tipped into the head-down position and should be easily transferrable to the rest of the hospital.[24] The exception to this is the MR safe trolleys.

### Medication

2.20 A standardised list of anaesthesia medications should be available wherever anaesthesia or sedation is undertaken. A full range of emergency medications, including specific reversal agents such as naloxone, sugammadex and flumazenil, should be available.[28]

2.21 In remote locations where anaesthesia is undertaken, medications to treat rare situations, such as dantrolene for malignant hyperthermia or intralipid for local anaesthetic toxicity, should be immediately (see Glossary) available and located in a designated area.[28]

2.22 There must be a system for ordering, storage, recording and auditing of controlled drugs in all areas where they are used, in accordance with legislation.[24,29,30,31,32]

2.23 Robust systems should be in place to ensure reliable medicines management, including storage facilities, stock review, supply, expiry checks and access to appropriately trained pharmacy staff to manage any drug shortages.[24,33]

2.24 All local anaesthetic solutions should be stored separately from intravenous infusion solutions, to reduce the risk of accidental intravenous administration of such drugs.[24,34]

2.25 Drug labels should be used to identify syringes and infusions that contain medications.[24,35] A robust system of communication between the anaesthetists, nursing staff and proceduralists, including confirmation of medications, should be in place to avoid miscommunication and miscalculation errors.[28]

2.26 Local guidelines should consider mitigating the risk of drug overdose for drugs that are available in different strengths. Stocking medications in only one strength (e.g., ketamine and midazolam) can decrease the incidence of medication errors.

2.27 Prefilled syringes supplied by the pharmacy should be considered, especially in areas where anaesthesia is delivered in an emergency.[36]

### Services

2.28 Patients should be appropriately monitored by trained staff during their recovery from anaesthesia or sedation.[24]

2.29 The care of the patient should remain the responsibility of the anaesthetist up to discharge for ambulatory procedures or ward transfer for inpatient procedures.

## 3 Areas of special requirement

### Children

Children presenting for anaesthesia outside the operating room may present challenges relating to the procedure, the environment, or physical, physiological and psychological challenges. Children often require repeat treatments or investigations. Minor procedures and diagnostic tests may be performed with sedation techniques. In addition, anaesthesia may be required for more invasive procedures in children.[37,38]

Detailed recommendations for children's services are comprehensively described in *GPAS Chapter 10: Guidelines for the Provision of Paediatric Services*.[39]

3.1 Children should always be managed in accordance with RCoA and Association of Paediatric Anaesthetists of Great Britain and Ireland recommendations.[39,40]

3.2 Each facility should develop written policies, designating the types of paediatric operative diagnostic and therapeutic procedures requiring anaesthesia.

3.3 The paediatric anaesthetist should consider the patient's age and physical capacity, the complexity of the procedure and the status of the surgical facility before administering anaesthesia. Children with learning and/or communication difficulties requiring sedation or anaesthesia should be cared for as per the recommendations of *GPAS Chapter 10: Guidelines for the Provision of Paediatric Services*.[39]

3.4 Irrespective of the site of care delivery (theatre or non-theatre), children should receive the same standard of anaesthetic care or sedation as applied to procedures performed in theatre.[40]

3.5 Equipment available in remote sites should replicate equipment available in the main paediatric facility.

3.6 Guidance for paediatric sedation should be developed for the local context by a multidisciplinary team.

3.7 Paediatric sedation should be managed in accordance with recognised national guidelines.[41,42]

### Patients with additional needs, including learning disabilities and neurodiversity

3.8 Where necessary, premedication or sedation should be considered for patients with additional needs, including those with extreme anxiety.[43]

3.9 Where possible, reasonable adjustments to processes and environments should be made to reduce anxiety and avoid the need for elaborate premedication of patients. Such adjustments may include admission directly to the procedure room, wearing outdoor clothes, and/or not performing observations.[43,44]

3.10 All patients with complex needs should have a suitable preoperative assessment and multidisciplinary planning and an anaesthetist should be involved in the best-interest discussions regarding individual risk.[43,45] Learning disability liaison teams or equivalent should be involved early in care planning.

3.11 Consideration should be given to providing additional flexibility in the timing of lists to allow adequate time for patients with learning disabilities.[43,45]

3.12 Where it is offered, policies should be in place for home sedation for patients who will not leave their homes, in conjunction with the ambulance service. This should involve a risk assessment, a detailed plan and emergency contingencies.[44,45,46]

3.13 Policies should be in place for in-car or entrance-hall sedation for patients who will leave home but who have difficulties entering the hospital environment.[45]

3.14 Policies should be in place for the safe administration of anxiolytic premedication within the admissions area or anaesthetic room.[44,45,46]

3.15 Any preprocedure sedation that occurs outside a normal clinical environment should have all the anaesthetic equipment that is required for monitoring and airway support plus a trained assistant available. There should be formal training in the pathways used.

3.16 Bespoke plans should be clearly communicated and documented with contingencies and escalation.

3.17 If a patient with additional needs requires multiple procedures to be conducted during a single anaesthetic, appropriate logistical planning should be considered, including arrangements for safe transfer to other non-theatre sites where applicable.

3.18 Safe recovery of patients with learning disabilities should be planned in advance. Patients should ideally be recovered in an area with lower levels of noise and lighting and should have a familiar presence, such as their carer, present.[43]

3.19 Appropriate exposure should be given to anaesthetists during their training to develop skills in reasonable adjustments and anxiolysis. Allied professionals specialising in this area should also be given training.[44,45]

Further recommendations on communication with patients, including those with complex needs, can be found in section 9 of this Chapter.

### The emergency department

Patients requiring anaesthesia in the ED are frequently critically ill or injured. Their physiological derangement and sensitivity to anaesthetic agents, coupled with the potential for increased difficulty in tracheal intubation, requires the presence of an anaesthetist competent to manage these challenges in a timely and effective manner.[47]

3.20 In a designated major trauma centre, the receiving trauma team should include an anaesthetist with appropriate airway and damage control resuscitation competencies to manage trauma patients.[48,49]

3.21 The safe management of unstable patients depends on close liaison between emergency physicians, anaesthetists and intensivists.[50,51] Local collaboration and leadership through committee structure or working groups should ensure the following:

- clear guidelines are easily accessible to all staff regarding fixed contact points for anaesthetic support, channels of escalation, equipment availability, medication use and periprocedural care.[52] Major trauma and neuroscience centres should consider producing generic guidance on specific clinical presentations to support rotating clinicians with limited experience

- all anaesthetic staff providing support to the ED within the context of their job plan should be offered a tour of the ED as part of their induction
- ED support staff should be regularly trained to assist with advanced airway interventions such as tracheal intubation
- advanced airway interventions should be clearly recorded in patient notes in a structured format that facilitates review, debrief and continuous quality improvement work
- audit and discussion of complications should be undertaken regularly by the multidisciplinary team.

3.22 Emergency airway management in the ED should follow the recommendations of the collaborative working framework of the Royal College of Emergency Medicine and the Faculty of Intensive Care Medicine.[53,54]

3.23 The use of an emergency induction checklist is recommended. Airway and resuscitation equipment should be organised as per the equipment governance recommendations of the collaborative framework of the Royal College of Emergency Medicine and the Faculty of Intensive Care Medicine.[54]

3.24 Local and national guidelines should be adhered to for patients requiring interhospital transfer to the regional trauma centre.[55] Equipment for transfer should be organised in accordance with the recommendations of the collaborative framework of the Royal College of Emergency Medicine and the Faculty of Intensive Care Medicine.[54]

3.25 Transfer of patients within the hospital to the intensive care unit, radiology department or the operating theatre is not without risk and will require the use of a tipping transfer trolley, oxygen cylinders, suction, a transport ventilator, infusion pumps, monitor with adequate battery life, and a portable defibrillator, if appropriate. Local guidelines, together with use of a formal intrahospital transfer form, should be considered to mitigate procedure-specific issues.

3.26 Procedural sedation and analgesia in the ED should follow the recommendations from the RCoA and the Royal College of Emergency Medicine.[36] Medications and medication safety systems in the ED should align with the recommendations of the collaborative framework of the Royal College of Emergency Medicine and the Faculty of Intensive Care Medicine.[54]

### The radiology department

Patients requiring general anaesthesia in the radiology department are of all ages and comorbid conditions, requiring everything from planned elective care to emergency care for life-threatening conditions. Increasingly complex, lengthy procedures are performed in the radiology department at all times, and this represents a more challenging environment in which to provide anaesthesia compared with an operating theatre.[5]

3.27 Exposure to ionising radiation should be kept to a minimum using screens and personal protective equipment such as lead gowns and thyroid shields. Remote secondary monitors in screened viewing areas should be provided and staff should remain as distant from the imaging source as possible if they remain in the x-ray environment.[56,57]

3.28 Anaesthetists who work regularly within the radiology department should be issued with personal dosimeters by their employer to monitor their radiation exposure and to ensure that levels remain within statutory dose limits.[58]

3.29 The anaesthetist accompanying transferred patients to the radiology department should be suitably skilled and experienced to manage all eventualities in an isolated environment and should be accompanied by a dedicated trained assistant.[7]

3.30 As not all radiology tables tilt into a head-down position, a tipping trolley should be available for patients who require general anaesthesia.

### Interventional radiology

Recommendations on the provision of mechanical thrombectomy services can be found in *Chapter 14: Guidelines for the Provision of Neuroanaesthesia Services*.[59]

3.31 The provision of anaesthesia services should be considered when designing interventional radiology services and there should be agreement about the level of provision and protocols to request anaesthetic support for both elective and emergency cases.

3.32 Procedure-specific agents, such as those required to manipulate coagulation, intracranial pressure or arterial blood pressure, should be available.[60]

3.33 Interventional vascular radiology may involve treating unstable patients with severe haemorrhage. Such patients may include those with significant gastrointestinal bleeding or patients with postpartum haemorrhage.[61,62,63] Equipment to deal with these situations should be immediately available. This includes a variety of intravascular catheters, rapid infusion devices, blood and fluid warming devices, and patient warming devices.

3.34 The local protocol for major haemorrhage should be available and should be rehearsed periodically as a team by formal simulation or other training sessions.

### Magnetic resonance imaging

3.35 National guidelines for the management of patients in the MRI suite should be available and followed.[64,65,66]

3.36 There should be locally agreed protocols and pathways for the provision of anaesthetic services in MRI both in and out of hours.

3.37 Anaesthetic equipment that is used in the MRI room should be MR safe or conditional.[5,66]

3.38 Remote monitoring of the patient with a secondary screen in the control room should be available to allow the anaesthetic team to monitor the patient from outside of the magnetic field.

3.39 Particular consideration should be given to the problems of using infusion pumps. All non-essential pumps and equipment should be removed from the patient before entering the magnetic field. MR safe or conditional infusion pumps or the use of a protective MR capsule for standard pumps should be available wherever anaesthesia is provided regularly. Infusions with extra-long giving sets can be used when MRI-specific pumps are not available.

3.40 All staff involved with transferring a patient to the MRI scanner should understand the unique problems caused by monitoring and anaesthetic equipment in this environment. It is not acceptable for inexperienced staff unfamiliar with the MR environment to escort or manage a patient in this environment, particularly out of hours.[64,65,67]

3.41 The patient and all staff should have an MRI safety and exclusion questionnaire completed before entering the magnetic field.

3.42 In the event of an adverse incident in the MRI scanning room, the patient should be removed from the scanning room without delay and immediate access to an anaesthetic preparation room or resuscitation area is required.[5]

### Anaesthesia for electroconvulsive therapy

3.43 Anaesthesia for ECT is frequently performed in remote locations. Ideally, a consultant or an autonomously practising anaesthetist (see Glossary) should provide general anaesthesia. Appropriately trained recovery and operating department staff should be provided, and the guidance provided for anaesthetic provision in remote sites should be followed.[68]

3.44 The ECT clinic should adhere to the ECT Accreditation Service (ECTAS) or Scottish ECT Accreditation Network (SEAN) standards for administration of ECT and have been assessed and accredited by ECTAS or SEAN.[68]

3.45 There should be a clinical lead (see Glossary) for ECT who is responsible for provision of the service in each anaesthetic department. The named consultant should be responsible for determining the optimal location for provision of anaesthesia for patients of American Society of Anesthesiologists classification III or above. Contingency plans for transfer to an acute care facility should also be in place.[68,69]

3.46 The ECT clinical lead should streamline the preassessment and consent processes for all ECT patients by setting up a collaborative system with ECT clinics and experienced anaesthetists. The mental capacity issues that affect informed consent should be acknowledged.

3.47 Anaesthetists should have specialised knowledge of the effect of concurrent medications, anaesthetic agents, anaesthetic techniques and equipment on the conduct and efficacy of ECT, as well as the specific anaesthetic contraindications.[69,70]

3.48 Standards specific to ECT clinics should be available, including a minimum of four rooms: a waiting room, treatment room, recovery area and post-ECT waiting area.[68] The clinic should have a reliable source of oxygen supplied either by pipeline or cylinder with a reserve supply immediately available.

3.49 Recommendations for standards of monitoring during anaesthesia and recovery are stipulated by the Association of Anaesthetists and should be adhered to for all patients undergoing ECT.[22]

### Anaesthesia for direct current cardioversion

The disturbance of physiological rhythm, the reduction in cardiac performance and the risk of embolic phenomena all place patients requiring DC cardioversion at risk of serious complications when undergoing both anaesthesia and DC cardioversion.[2]

Detailed recommendations for cardiac procedures can be found in *Guidance on the Provision of Anaesthesia Services for Cardiac Procedures*.

3.50 External pacing equipment should be immediately available before beginning DC cardioversion.[2]

3.51 Facilities to check recent serum electrolytes, in particular potassium and preferably magnesium, as well as the patient's anticoagulation status and a recent ECG should be available before beginning a DC cardioversion. A preprocedural echocardiogram is likely to provide useful information such as the presence of thrombus within the cardiac chambers.[71]

3.52 The anaesthetist should not be responsible for performing the cardioversion; an appropriately trained physician, cardiologist or supervised nurse specialist is responsible for this role.[50]

### Anaesthesia for radiotherapy

3.53 Anaesthesia may be required for radiotherapy, to facilitate patient positioning and to alleviate pain. Owing to the unique nature of the procedures involved in radiotherapy, the remoteness of the location and the lack of direct access to the patient, only appropriately experienced anaesthetists familiar with the therapy should embark on anaesthesia for these patients.[72]

3.54 Anaesthetists should be familiar with the specific needs of patients with cancer, including the following:

- the adverse effects of high concentrations of oxygen in the presence of some antineoplastic agents, for example bleomycin, and should adjust their technique accordingly.[73,74] Recent evidence confirms the association between unnecessarily high intraoperative fraction of inspired oxygen and increased risk of major respiratory complications and 30-day mortality. Inspired oxygen levels may require adjustment to maintain an acceptable level of tissue oxygenation[74]
- the interference of nitrous oxide with vitamin B12 and folate metabolism.[75]

3.55 Patients with tumours of the lower body may be amenable to regional anaesthesia. Equipment and facilities to instigate, monitor and manage regional blockade should be available.[73]

### General anaesthesia and sedation for dental procedures

3.56 General anaesthesia for dentistry should be administered only by anaesthetists in a hospital setting as defined by the Department of Health report reviewing general anaesthesia and conscious sedation in primary dental care.[76]

3.57 Patients undergoing sedation or general anaesthesia by an anaesthetist should have appropriate preoperative assessment with appropriate risk stratification.

### Gastrointestinal procedures

3.58 Standards of service provided to patients receiving endoscopic procedures supported by anaesthetic staff in the non-theatre environment should be comparable to other anaesthetic services.

3.59 Anaesthetic staff providing care in the endoscopy suite should be familiar with the facility, equipment and techniques.

3.60 Preoperative assessment of elective patients receiving anaesthesia or sedation from anaesthetic personnel should be of a comparable standard to other anaesthesia services.

3.61 The risks of serious adverse events during emergency endoscopy are elevated when compared with elective procedures. Local protocols should include specific guidelines for emergency endoscopy and the involvement of the anaesthetic team.

3.62 A patient-centred safety checklist should be used for patients receiving endoscopy under sedation.[77]

3.63 Monitoring of patients receiving anaesthesia or sedation for endoscopy provided by anaesthetic personnel should be comparable to other anaesthesia services.

3.64 High-flow nasal oxygen therapy should be available for anaesthesia-delivered sedation or general anaesthesia for endoscopic procedures.

3.65 The post-anaesthetic recovery facilities when provided for patients following anaesthesia delivered sedation or anaesthesia should be comparable to those provided in theatre environments. The provision of a handover checklist can improve the transfer of care in the recovery setting conveying pertinent clinical and procedural information.

3.66 Critical incidents should be reviewed at regular intervals and should be analysed for trends and learning for the procedural team and wider hospital. This can involve a review of all hospital-related procedural sedation critical events.

## 4 Training and education

4.1 All anaesthetists should be fully familiar with all remote areas of anaesthetic provision prior to undertaking anaesthetic procedures in that location (e.g. as part of their induction process).[26] This should include familiarisation with the layout of the hospital and the location of emergency equipment and drugs, access to guidelines and protocols, information on how to summon support/assistance, and assurance that the anaesthetist is capable of using the equipment in that hospital. All staff inductions should be documented.

4.2 At all times, anaesthetists in training should be supervised at an appropriate level (1–4), which varies depending on their stage of training, their previous experience and capability, their familiarity with the specific remote site, and the complexity of the procedure.[78]

4.3 All anaesthetists with a job plan including sessions in non-theatre anaesthesia should be able to demonstrate continued competency through maintenance of an appropriate level of experience, and ongoing participation in relevant continuing professional development.[2,3,79]

4.4 There should be regular multidisciplinary in-situ simulation training to standardise clinical practice. Non-theatre anaesthesia requires collaborative working across many specialties. Non-technical skills are an important element of working across multiple teams and improve the performance and outcomes of non-theatre services.[80]

4.5 Training and education in the safe delivery of sedation techniques in the non-theatre environment should be provided. The non-theatre environment is a high-risk environment with a recognised increase in morbidity and mortality. Evaluation of individual and team situational awareness should reduce reported complications.[81,82]

4.6 Hospitals should consider involving an anaesthetist in the training of 'non-anaesthetic sedation practitioners'.[2,3]

## 5 Organisation and administration

5.1 Patient safety is, as always, of paramount importance. Particular attention should be paid to teamwork, communication, the use of checklists and procedure brief when working in less familiar environments. At the team briefing, an explicit plan should be agreed for requesting help if required, recognising the risk of, and preparing adequately for, high blood loss, and life-threatening loss of the airway or respiratory function.[83]

5.2 Many patients undergoing elective procedures outside the operating theatre can be managed as day cases and should be assessed accordingly in conjunction with local guidelines. All patients should undergo an appropriate risk assessment and level of preoperative assessment in line with the GPAS recommendations in *Guidelines for the*

Provision of Anaesthesia Services for the Perioperative Care of Elective and Urgent Care Patients.[24,84]

5.3 Hospitals should have a system for multidisciplinary involvement in reporting and regular audit of critical incidents and near misses. A risk register should be maintained for all remote locations in the hospital.

5.4 Environmental hazards such as radiation exposure, MR fields and lack of a scavenging system should be considered by staff before the start of each list. Volatile agent scavenging canisters, air-oxygen mixtures and avoidance of nitrous oxide can mitigate environmental risks. Consider TIVA where adequate scavenging cannot be achieved. Personnel who are pregnant may be particularly at risk in these environments and should follow local occupational health policy.[85]

5.5 In remote offsite locations, such as psychiatric hospitals where anaesthesia is provided for ECT, advanced plans should be made to manage patient transfer if required. If there is any concern about the safety of the procedure being undertaken by any staff members at a remote location (e.g. ECT in a psychiatric hospital), arrangements should be made to perform the procedure in an operating theatre environment.

5.6 Documentation to the standard used in the operating theatre should be kept for all patients and this should include the grade and specialty of the doctor performing and supervising the anaesthetic, together with the name of the supervising consultant designated to provide direct or indirect advice.[24] Access to the electronic patient record and medical notes should be available at all remote sites.

5.7 The department of anaesthesia should be involved in the design and planning of any service requiring the provision of anaesthesia or deep sedation. A regular review of the remote location performance, critical incidents and further improvements should be held.[86]

5.8 Patients meeting discharge criteria following anaesthesia or sedation should be discharged into the care of a responsible third party. Verbal and written instructions for post-procedural care should be provided if a procedure has been performed outlined in Chapter 6: Guidelines for the Provision of Anaesthesia Services for Day Surgery.[87]

### Sedation

The RCoA recognises the definitions of minimal, moderate and deep sedation as outlined in the Academy of Medical Royal Colleges guidance on safe sedation.[2,3] Deep sedation equates to general anaesthesia and the recommendations outlined in Chapter 2: Guidelines for the Provision of Anaesthesia Services for the Perioperative Care of Elective and Urgent Care Patients should be followed.

The RCoA does not provide recommendations for sedation provided by non-anaesthetists and they are encouraged to follow the guidance of their own Colleges and the Academy of Medical Royal Colleges.[2,3,24]

5.9 A named anaesthetist should be responsible for liaising with consultants in other departments who have responsibility for sedation, to establish local guidelines and training for the provision of safe sedation by non-anaesthetists.[2,3,88]

5.10 All institutions where sedation is practised should have a sedation committee. This committee should include key clinical teams using procedural sedation and there should be a nominated clinical lead for sedation. In most institutions, the sedation committee should include an anaesthetist, at least in an advisory capacity.

5.11 Each facility should develop written policies, designating the types of operative, diagnostic and therapeutic procedures requiring anaesthesia or sedation.

5.12 Guidelines for the management of rare emergencies should be prominently displayed at all sites where sedation is administered.

5.13 Mis-selection of high-strength midazolam during conscious sedation is defined as a 'never event' by the Department of Health.[89] Hospitals should report these incidents and any other incidents involving over-sedation to the National Reporting and Learning System.

5.14 All patients undergoing procedural sedation should have oxygen saturation monitoring from the administration of sedation to discharge from recovery. Supplemental oxygen should be available and used, as necessary.[54]

5.15 Pulse oximetry, ECG, automated non-invasive blood pressure monitoring and wherever there is loss of verbal contact, continuous waveform capnography, should be considered and continued into the recovery period.[22]

5.16 As a result of the continuum of depth of anaesthesia, individuals administering moderate sedation should be able to rescue patients who enter deep sedation. Those administering deep sedation should be adequately trained to rescue patients who enter a state of general anaesthesia. This requires skilled anaesthetic assistance and equipment and involves the potential for airway intervention and support of both ventilation and cardiovascular function.[90]

5.17 Sedation practitioners should maintain a logbook of cases performed and adverse incidents reported.

## 6 Financial considerations

Part of the methodology used in this Chapter in making recommendations is a consideration of the financial impact for each of the recommendations. Very few of the literature sources from which these recommendations have been drawn have included financial analysis.

The vast majority of the recommendations are not new recommendations but they are a synthesis of existing recommendations. The current compliance rates with many of the recommendations are unknown, so it is not possible to calculate the financial impact of the recommendations in this Chapter being widely accepted into future practice. It is impossible to make an overall assessment of the financial impact of these recommendations with the currently available information.

## 7 Research, audit and quality improvement

Non-theatre anaesthetic practice should adhere to the same standards of safety, audit and quality improvement as operating room practice, especially as morbidity and mortality rates can be higher in the non-theatre environment.[19] Clinical governance procedures should follow the guidelines of *Guidelines for the Provision of Anaesthesia Services: The Good Department*.

7.1 There should be local multidisciplinary audit programmes analysing systems, outcomes and patient experience relating to anaesthesia and sedation in the non-theatre environment.

7.2 Audit programmes should be under regular review by a clinical lead and those relating to sedation should be coordinated by a hospital sedation committee.[2,3]

7.3 Regular feedback should be provided to anaesthetic staff and they should be encouraged to participate in quality improvement activities.

7.4 Compliance with agreed guidelines should be audited, such as World Health Organization surgical safety checklist compliance, equipment and monitoring standards, and anaesthetic record keeping.[1,91]

7.5 Anaesthesia departments should participate in relevant audit and research activities of national bodies such as the Health Services Research Centre and National Confidential Enquiry into Patient Outcome and Death.[91]

7.6 All episodes of anaesthesia in the non-theatre environment should be captured in a structured record within clinical notes.

7.7 Regular multidisciplinary team review should be encouraged, with appropriate service improvement initiatives and shared learning.

7.8 Contribution to airway registries, such as the Difficult Airway Society Database and Emergency Medicine Airway Registry, should be encouraged.

## 8 Implementation support

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

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

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

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

## 9 Patient information

The Royal College of Anaesthetists has developed a range of Trusted Information Creator Kitemark-accredited patient information resources that can be accessed from the RCoA website, including information on sedation, resources for children and young people and accessible resources. Our main leaflets are now translated into more than 20 languages, including Welsh.

Patients with learning and other difficulties may need special assistance and consideration, with specific strategies put in place to aid communication. Further recommendations for patients with additional needs are found in section 3 of this document.

9.1 All patients (and relatives where appropriate and relevant) should be fully informed about the planned procedure and should be encouraged to be active participants in decisions about their care. Recommendations about the provision of information and consent processes outlined in *Guidelines for the Provision of Anaesthesia Services for the Perioperative Care of Elective and Urgent Care Patients* should be followed.[24]

9.2 Although separate written consent for anaesthesia is not mandatory in the UK, there should be a written record of all discussions with patients undergoing sedation or anaesthesia about methods of induction, associated risks and side effects.[2,66]

9.3 In situations where rolling consent is used (e.g. radiotherapy treatment), appropriate documentation should be kept as part of the patient record, including dates for review of consent. This should be included in the trust's policy on consent.

9.4 Information regarding planned procedures outside the operating theatre and the requirement for sedation or anaesthesia should be given to the patient in advance of their admission. Details on fasting times and medications to continue or omit should be included. The patient needs to be aware that they require a competent adult to escort them home after receiving sedation or alternatively require an inpatient hospital stay.[2]

9.5 Information given to patients should include what to expect in the anaesthetic room and the treatment room.[92]

9.6 Preoperative assessment and information should be given as per surgical procedures.[44]

9.7 Patients from non-English speaking groups may require interpreters. Hospitals should have arrangements in place to provide language support, including interpretation and translation (including sign language and Braille). This information should comply with the NHS England Accessible Information Standard.[93]

9.8 The relevant mental capacity legislation must be complied with.[94,95,96] Staff should have regular training in its application and have defined access to patient advocates. This is a rapidly changing area and clinicians should have access to expert advice.

9.9 Hospitals should have local policies in place for the identification, support and safeguarding of vulnerable adults.[97]

## Areas for future development

- A more detailed national audit of critical incidents associated with anaesthesia in the non-theatre environment should be considered.
- Paediatric surgical techniques and practices are evolving, and it is likely that the demand for out of theatre surgical procedures and radiological investigations will increase.
- The use of open MRI scanners for claustrophobic patients as an alternative to anaesthesia or sedation is available in some hospitals. Current evidence shows that the image quality is not yet comparable to that of enclosed MRI scanners. However, with further research and improvements this may become a consideration for the future.

## Abbreviations

| | |
|---|---|
| ACSA | Anaesthesia Clinical Services Accreditation |
| CDG | Chapter Development Group |
| DC | Direct Current |
| ECT | Electroconvulsive Therapy |
| ECTAS | ECT Accreditation Service |
| ED | Emergency Department |
| GPAS | Guidelines for the Provision of Anaesthetic Services |
| MR | Magnetic Resonance |
| MRI | Magnetic Resonance Imaging |
| NHS | National Health Service |
| RCoA | Royal College of Anaesthetists |
| SEAN | Scottish ECT Accreditation Network |
| TIVA | total intravenous anaesthesia |

## Glossary

**Clinical lead** – doctors undertaking lead roles should be autonomously practising doctors who have competence, experience and communication skills in the specialist area equivalent to consultant colleagues. They should usually have experience in teaching and education relevant to the role and they should participate in quality improvement and continued professional development activities. Individuals should be fully supported by their clinical director and should be provided with adequate time and resources to allow them to undertake the lead role effectively.

**Autonomously practising anaesthetist** – a consultant or a staff grade, associate specialist or specialty (SAS) doctor who can function autonomously to a level of defined competencies, as agreed within local clinical governance frameworks.

**Deep sedation** – describes a state where the patient cannot easily be roused but responds purposefully to repeated or painful stimulation. It may be accompanied by clinically significant ventilatory depression. The patient may require assistance maintaining a patent airway and positive pressure ventilation.

**Immediately** – unless otherwise defined, 'immediately' means within five minutes.

**Minimal sedation** – is a drug-induced state during which the patient responds normally to verbal commands. Cognitive function and physical coordination may be impaired but airway reflexes, ventilatory and cardiovascular functions are unaffected.

**Magnetic-resonance compatible** – equipment that is designated as MR compatible is MR safe, functions normally in the MR environment and does not interfere with the correct operation of the MRI equipment provided that instructions concerning its proper use are correctly followed.

**Moderate sedation/mild sedation** – a state where a purposeful response to verbal commands, either alone (conscious sedation) or accompanied by light tactile stimulation, is maintained.

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## Appendix 1: Recommendations grading

The grading system is outlined in the methodology section of this chapter. The grades for each of the recommendations in this chapter are detailed in the table below:

| Recommendation Number | Level of Evidence | Strength of Recommendation |
|---|---|---|
| 1.1 | C | Strong |
| 1.2 | C | Strong |
| 1.3 | C | Strong |
| 1.4 | C | Strong |
| 1.5 | C | Strong |
| 1.6 | C | Strong |
| 1.7 | C | Strong |
| 1.8 | C | Strong |
| 1.9 | M | Strong |
| 2.1 | GPP | Strong |
| 2.2 | B | Strong |
| 2.3 | C | Strong |
| 2.4 | B | Strong |
| 2.5 | B | Strong |
| 2.6 | GPP | Strong |
| 2.7 | B | Strong |
| 2.8 | B | Moderate |
| 2.9 | C | Strong |
| 2.10 | C | Strong |
| 2.11 | B | Strong |
| 2.12 | GPP | Strong |
| 2.13 | B | Moderate |

| Recommendation Number | Level of Evidence | Strength of Recommendation |
|---|---|---|
| 2.14 | B | Strong |
| 2.15 | C | Strong |
| 2.16 | C | Strong |
| 2.17 | C | Strong |
| 2.18 | C | Strong |
| 2.19 | C | Strong |
| 2.20 | B | Strong |
| 2.21 | B | Strong |
| 2.22 | M | Mandatory |
| 2.23 | C | Strong |
| 2.24 | C | Strong |
| 2.25 | C | Strong |
| 2.26 | GPP | Aspirational |
| 2.27 | C | Moderate |
| 2.28 | C | Strong |
| 2.29 | GPP | Strong |
| 3.1 | C | Strong |
| 3.2 | GPP | Strong |
| 3.3 | GPP | Strong |
| 3.4 | C | Strong |
| 3.5 | GPP | Strong |
| 3.6 | GPP | Strong |
| 3.7 | C | Strong |
| 3.8 | C | Moderate |

| Recommendation Number | Level of Evidence | Strength of Recommendation |
|---|---|---|
| 3.9 | C | Moderate |
| 3.10 | C | Strong |
| 3.11 | C | Moderate |
| 3.12 | C | Moderate |
| 3.13 | C | Moderate |
| 3.14 | C | Strong |
| 3.15 | GPP | Strong |
| 3.16 | GPP | Strong |
| 3.17 | GPP | Moderate |
| 3.18 | C | Moderate |
| 3.19 | C | Moderate |
| 3.20 | C | Strong |
| 3.21 | C | Strong |
| 3.22 | C | Strong |
| 3.23 | GPP | Strong |
| 3.24 | C | Strong |
| 3.25 | GPP | Strong |
| 3.26 | C | Strong |
| 3.27 | C | Strong |
| 3.28 | C | Strong |
| 3.29 | C | Strong |
| 3.30 | GPP | Strong |
| 3.31 | GPP | Strong |
| 3.32 | C | Strong |

| Recommendation Number | Level of Evidence | Strength of Recommendation |
|---|---|---|
| 3.33 | C | Strong |
| 3.34 | GPP | Strong |
| 3.35 | C | Strong |
| 3.36 | GPP | Strong |
| 3.37 | C | Strong |
| 3.38 | GPP | Strong |
| 3.39 | GPP | Strong |
| 3.40 | C | Strong |
| 3.41 | GPP | Strong |
| 3.42 | C | Strong |
| 3.43 | C | Strong |
| 3.44 | C | Strong |
| 3.45 | C | Strong |
| 3.46 | GPP | Strong |
| 3.47 | C | Strong |
| 3.48 | C | Strong |
| 3.49 | C | Strong |
| 3.50 | C | Strong |
| 3.51 | C | Strong |
| 3.52 | C | Strong |
| 3.53 | C | Strong |
| 3.54 | C | Strong |
| 3.55 | C | Moderate |
| 3.56 | C | Strong |

| Recommendation Number | Level of Evidence | Strength of Recommendation |
|---|---|---|
| 3.57 | GPP | Strong |
| 3.58 | GPP | Strong |
| 3.59 | GPP | Strong |
| 3.60 | GPP | Strong |
| 3.61 | GPP | Strong |
| 3.62 | C | Strong |
| 3.63 | GPP | Strong |
| 3.64 | GPP | Strong |
| 3.65 | GPP | Strong |
| 3.66 | GPP | Strong |
| 4.1 | C | Strong |
| 4.2 | C | Strong |
| 4.3 | C | Strong |
| 4.4 | B | Strong |
| 4.5 | C | Strong |
| 4.6 | C | Moderate |
| 5.1 | C | Strong |
| 5.2 | C | Strong |
| 5.3 | GPP | Strong |
| 5.4 | C | Moderate |
| 5.5 | GPP | Strong |
| 5.6 | C | Strong |
| 5.7 | C | Strong |
| 5.8 | C | Strong |

| Recommendation Number | Level of Evidence | Strength of Recommendation |
|---|---|---|
| 5.9 | C | Strong |
| 5.10 | GPP | Strong |
| 5.11 | GPP | Strong |
| 5.12 | GPP | Strong |
| 5.13 | C | Strong |
| 5.14 | C | Strong |
| 5.15 | C | Strong |
| 5.16 | C | Strong |
| 5.17 | GPP | Strong |
| 7.1 | GPP | Strong |
| 7.2 | C | Strong |
| 7.3 | GPP | Moderate |
| 7.4 | C | Moderate |
| 7.5 | C | Moderate |
| 7.6 | GPP | Strong |
| 7.7 | GPP | Moderate |
| 7.8 | GPP | Moderate |
| 9.1 | C | Strong |
| 9.2 | C | Strong |
| 9.3 | GPP | Aspirational |
| 9.4 | GPP | Strong |
| 9.5 | C | Strong |
| 9.6 | C | Strong |
| 9.7 | C | Strong |

| Recommendation Number | Level of Evidence | Strength of Recommendation |
|---|---|---|
| 9.8 | M | Mandatory |
| 9.9 | C | Strong |

## About these guidelines

### Methodology

The process by which this chapter has been developed has been documented within the GPAS Chapter Development Process Document, which is available on request.

The evidence included in this chapter is based on a systematic search of the literature. Abstracts were independently screened by two investigators and reviewed against inclusion and exclusion criteria. Data were extracted by one investigator in accordance with predefined criteria. The review objective was to determine the key components needed to ensure provision of high-quality perioperative services for patients who have undergone surgery and/or interventions which involve anaesthesia.

### Search strategy

Searches were performed on Embase (1980 to 2015), Ovid MEDLINE (1946 to present), CINAHL and Cochrane Library, for the literature search strategy, outcomes, databases, criteria for inclusion and exclusion of evidence (for the full Neuroanaesthetic services chapter search protocol please contact the RCoA). A hand search of the literature was also conducted by the authors using the reference lists of relevant original articles and review articles.

The literature search was performed in January 2022.

The authors and researcher independently reviewed the abstracts and titles of the studies found in the initial search. After agreement on the primary selection of papers, full-text versions were accessed and reviewed against the following predefined inclusion and exclusion criteria. The full-text papers were also reviewed by the CDG for suitability. The final list of publications used can be found in the references.

### Inclusion criteria

The literature review considered studies that included the following patient population with all of the inclusion criteria listed below:

- all patients undergoing elective or emergency anaesthesia
- all staff groups working within Neuroanaesthetic care, under the responsibility of an anaesthetic clinical director, including (but not restricted to) consultant anaesthetists, autonomously practising anaesthetists, anaesthetists in training, nurses, operating department practitioners, surgeons, pharmacists, general practitioners, radiologists and radiographers.

### Exclusion criteria

The literature review used the following exclusion criteria:

- provision of neuroanaesthesia provided by a speciality other than anaesthesia.

### Data extraction and analysis

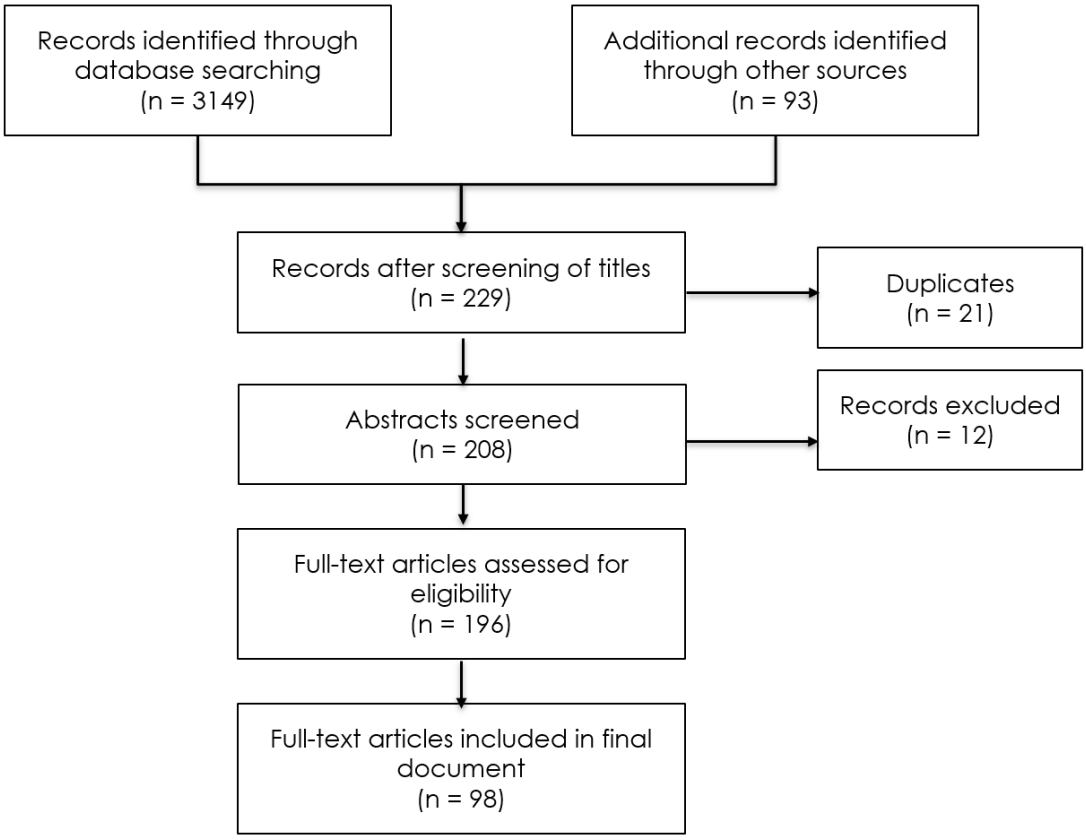
Data were extracted by the authors using a proforma. The study characteristics data included:

- the journal and country of publication
- the number of patients recruited into the study
- the study design
- patient characteristics
- outcome data
- the logic of the argument
- author's conclusions
- reviewer's comments.

The patient characteristics data extracted were: age, gender and type of surgery. The analysis considers studies that included any clinical outcome, including (but not restricted to) survival, length of stay – critical care or hospital, morbidity, adverse effects and complications.

The results of the literature review can be seen below:

### Preferred Reporting Systems for Systematic Review and Meta-analysis (PRISMA) flow chart



# Chapter 7
# Guidelines for the Provision of Anaesthesia Services in the Non-theatre Environment 2023

The evidence that is included in this chapter has been graded according to a grading system adapted from NICE and outlined below:

| Level | Type of evidence | Grade | Evidence |
|---|---|---|---|
| **Ia** | Evidence obtained from a single large/multicentre randomised controlled trial, a meta-analysis of randomised controlled trials or a systematic review with a low risk of bias | **A** | At least one randomised controlled trial as part of a body of literature of overall good quality and consistency addressing the specific recommendation (evidence level I) without extrapolation |
| **Ib** | Evidence obtained from meta-analyses, systematic reviews of RCTs or RCTs with a high risk of bias | **B** | Well-conducted clinical studies but no high-quality randomised clinical trials on the topic of recommendation (evidence levels Ib, II or III); or extrapolated from level Ia evidence |
| **IIa** | Evidence obtained from at least one well-designed controlled study without randomisation | | |
| **IIb** | Evidence obtained from at least one well-designed quasi-experimental study | | |
| **IIc** | Evidence obtained from case control or cohort studies with a high risk of confounding bias | | |
| **III** | Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies | | |
| **IV** | Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities | **C** | Expert committee reports or opinions and/or clinical experiences of respected authorities (evidence level IV) or extrapolated from level I or II evidence. This grading indicates that directly applicable clinical studies of good quality are absent or not readily available. |
| **UG** | Legislative or statutory requirements | **M** | This grading indicates that implementation of this recommendation is a statutory requirement, or is required by a regulatory body (e.g. CQC, GMC) |
| | | **GPP** | Recommended good practice based on the clinical experience of the CDG. |

**Adapted from Eccles M, Mason J. How to develop cost-conscious guidelines. *Health Technology Assessment* 2001;5(16) and Mann T. Clinical guidelines: using clinical guidelines to improve patient care within the NHS. *Department of Health*, London 1996.**

## Strengths and limitations of body of evidence

Most of the published evidence on perioperative care anaesthesia services is descriptive. There are publications describing aspects of this process based on expert opinion.

The limitations of the evidence are:

- the 'unmeasurables' (attitudes, behaviour, motivation, leadership, teamwork)
- few randomised controlled trials (RCTs); studies frequently use mixed populations of emergency and elective patients, or all emergency patients grouped together despite different underlying diagnoses
- papers often examine a single intervention within complex system or bundle
- papers are often examining small numbers and/or patients from a single centre
- poor use of outcome measures, frequently concentrating on easily measured short-term outcomes which are not patient centred
- generally, a paucity of long-term follow up
- there is no standard definition used of 'high risk'
- use of different risk-scoring systems
- decrease in outcome over time and geography when 'good papers' are used in quality improvement programmes
- application of international studies in systems with either more or less resources than the UK into NHS practice
- older studies may no longer be applicable within the NHS
- very few studies included any analysis of financial implications
- evidence was mainly based on literature graded III and IV.

## Methods used to arrive at recommendations

Recommendations were initially drafted based on the evidence by the authors for the chapter. These were discussed with the CDG, and comments were received both on the content and the practicality of the recommendations. The level of evidence that was the basis for each recommendation was graded according to a grading system, and the recommendation was then graded taking into account the strength of the evidence and the clinical importance using a recommendations criteria form.

Recommendations were worded using the following system of categorisation:

| Strength | Type of evidence | Wording |
|---|---|---|
| **Mandatory** | The evidence supporting the recommendation includes at least one with an 'M' grading | Wording should reflect the mandatory nature of the recommendation i.e. 'must' |
| **Strong** | Confidence that for the vast majority of people, the action will do more good than harm (or more harm than good) | Wording should be clearly directive 'should' or 'should not' |
| **Weak** | The action will do more good than harm for most patients, but may include caveats on the quality or size of evidence base or patient preferences | Wording should include 'should be considered' |
| **Aspirational** | While there is some evidence that implementation of the recommendation could improve patient care, either the evidence or the improvement is not proven or substantial | Wording should include 'could' |
| **Equipoise** | There is no current evidence on this recommendation's effect on patient care | Wording should include 'there is no evidence of this recommendation's effect on patient care' |

## Consultation

The chapter has undergone several rounds of consultation. The multidisciplinary CDG formed the first part of the consultation process. The authors and GPAS Editorial board identified key stakeholder groups. Where stakeholders are represented by an association or other medical college, they were asked to nominate delegates to join the CDG. The GPAS Chapter Development Process Document (available on request) explains the recruitment process for those CDG members who were not directly nominated. The CDG members were involved in drafting the recommendations, and were provided with an opportunity to comment on all subsequent drafts of the chapter.

The chapter underwent peer review. Peer reviewers were identified by the GPAS Editorial Board, Clinical Quality and Research Board (CQRB) or through the Clinical Leaders in Anaesthesia Network. Nominees were either anaesthetists of consultant grade or were nominated by a key stakeholder group. Nominees had not had any involvement in the development of GPAS to date and were asked to comment upon a late draft of the chapter.

Following peer review, the chapter was reviewed by the College's CQRB and PatientsVoices@RCoA. Comments from all groups were considered and incorporated into a consultation draft.

The consultation draft of this chapter was circulated for public consultation from TBC. As well as being made available on the College's website and promoted via Twitter and the President's newsletter to members, the draft was also circulated to all key stakeholder groups identified by the

authors and the College. A list of organisations contacted by the College is available from the GPAS team at the College: GPAS@rcoa.ac.uk.

## The editorial independence of GPAS

The development of GPAS is wholly funded by the Royal College of Anaesthetists. However, only the GPAS technical team and the GPAS researcher are paid directly by the College for their work on GPAS: the GPAS Editors' employing organisation receives 2 programmed activities (PA) backfill funding. All funding decisions by the College are made by the chief executive officer, in collaboration with the senior management team and College Council.

The authors of the chapters are all fellows of the Royal College of Anaesthetists. Members of College Council cannot act as chair of any CDG, as this individual has the deciding vote under the consensus method of decision making used in the chapters. Where College Council members have been involved in chapter development, this has been declared and recorded.

All persons involved in the development of GPAS are required to declare any pecuniary or non-pecuniary conflict of interest, in line with the GPAS conflict of interest policy as described in the GPAS Chapter Development Process Document (available on request). Any conflicts of interest are managed on a case-by-case basis to maintain the transparency and impartiality of the GPAS document. The conflicts, and the way they were managed, are outlined at the beginning of the chapter.

### The role of the GPAS Editorial Board and CQRB

The overall development of the entire GPAS document is overseen by the CQRB of the Royal College of Anaesthetists, which includes representatives from all grades of anaesthetist and from clinical directors, and which includes a PatientsVoices@RCoA representative.

Responsibility for managing the scope of the document and providing clinical oversight to the project technical team is delegated by the CQRB to the GPAS Editorial Board, which includes individuals responsible for the various internal stakeholders (see above for membership). On the inclusion/exclusion of specific recommendations within each chapter, the Editorial Board can only provide advice to the authors. In the event of disagreement between the authors, the majority rules consensus method is used, with the GPAS Editor holding the deciding vote.

Both of these groups, along with PatientsVoices@RCoA, review each chapter and provide comment prior to public consultation and are responsible for signoff before final publication. In the event of disagreement, consensus is reached using the majority rules consensus method, with the chair of CQRB holding the deciding vote.

## Updating these guidelines

This chapter will be updated for republication in January 2025.

Guidelines will be updated on an annual basis. The researcher will conduct the literature search again using the same search strategy to uncover any new evidence and members of the public will be able to submit new evidence to the GPAS project team. Where new evidence is uncovered, the lead author will decide whether the recommendations that were originally made are still valid in light of this new evidence.

If new evidence contradicts or strengthens existing recommendations, the authors decide whether or not to involve the remainder of the CDG in revising the recommendations accordingly.

If new evidence agrees with existing recommendations, then a reference may be added but no further action is required.

If there is no new evidence then no action is required.

This chapter is due to be fully reviewed for publication in January 2028.

Every five years guidance will be submitted to a full review involving reconvening the CDG (or appointment of a new, appropriately qualified CDG), and the process described in the methodology section of this chapter begins again.

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