

This guidance is supported by the Clinical Radiology Faculty
of The Royal College of Radiologists

Paediatric Imaging under General Anaesthetic

November 2021

Paediatric imaging under general anaesthetic

Overview

In March 2020, the Healthcare Safety Investigation Branch (HSIB) published a report titled *Undiagnosed Cardiomyopathy in a Young Person with Autism*.¹ The report investigated the current evidence base and guidance for anaesthesia preassessment clinics, on-day procedures which involve anaesthesia, consent for children, and the considerations for patients with special needs or who require reasonable adjustments to be made. The report investigated the impact that autism and learning difficulties have on mainstream healthcare service provision in relation to the safety risks identified, and the detection of diseases in patients with special needs.

Within this report, HSIB proposed a safety recommendation that the Royal College of Anaesthetists (RCoA) in conjunction with other stakeholders, convene a working party to provide guidance on the additional responsibilities of obtaining consent for MRI and other non-invasive diagnostic and/or therapeutic procedures under general anaesthesia in children (safety recommendation R/2020/079).¹

Consequent to this, the RCoA formed a working party involving representatives from the Association of Anaesthetists, Association of Paediatric Anaesthetists of Great Britain and Ireland (APA), Royal College of Paediatrics and Child Health (RCPCH), Royal College of Radiologists (RCR) and a lay parent representative.

The working party members are stakeholders for children to receive safe and timely imaging and are responsible for setting standards of best practice in their specialty. Working party membership involved the relevant clinical specialists and lay representation ensuring a breadth of stakeholder input.

The following is a consensus statement on best practice for requesting, vetting and consent for non-invasive diagnostic procedures under general anaesthesia in children and young people. For the purposes of this guidance, MRI and other non-invasive diagnostic procedures will be referred to as "imaging".

This guidance should be read in conjunction with the RCoA's [Guidelines for the Provision of Anaesthesia Services for the Perioperative Care of Elective and Urgent Care Patients](#), [Guidelines for the Provision of Anaesthesia Services in the Non-theatre Environment](#) and [Guidelines for the Provision of Paediatric Anaesthesia Services](#).^{2,3,4}

Background

The working party was convened in response to the death of a child undergoing an MRI scan under general anaesthesia. The HSIB investigation reported that the parents of the child that died complained that there was a lack of informed decision making and no discussion of the possibility of death under anaesthesia prior to their child's admission.

The working party agree that informed consent for imaging carried out under general anaesthesia is essential. This includes consent for the imaging and for the anaesthesia. Consent is the process of providing information to a patient and their parents and/ or carers, ensuring understanding and retention, receiving agreement to proceed and documenting the discussion that took place. Consent for anaesthesia does not require signatures but does require a record of the discussion that took place.⁵

The working party recognise that written consent is a formal record of a discussion that will have taken place between the parents and/ or carers and the relevant clinicians. Whilst it is not always necessary to have this type of written record, there are occasions where it is necessary to assure staff carrying out the procedure that properly informed discussions have already taken place in line with GMC recommendations.⁶ It is recognised that there is most likely to be a record of the consent for imaging discussions that took place, however as general anaesthesia poses the greatest risk there is also a requirement to document the discussion about the risks of anaesthesia.

Existing arrangements vary widely from centres with excellent practice to others where evidence of shared decision making is lacking. The working party agree that best practice involves clear, unambiguous communication and documentation throughout the perioperative pathway which ensures the best care for patients.

Scope

The scope of the working party was to convene a multidisciplinary group and to produce “best practice” recommendations for the process of requesting, vetting and consenting children for imaging.

This guidance refers to all radiological examinations that do not include any invasive component; that is where anaesthesia provides the most significant risk of the procedure.

Recommendations

1. The multidisciplinary team should only undertake essential imaging where the imaging result will have an impact on care and where deferral would be detrimental to the patient concerned.

Anaesthesia per se carries a risk of death of approximately 1:100,000 for healthy children having non-emergency procedures.⁷ This figure is higher in younger children and decreases with age. Many children referred for imaging have underlying health conditions and these are often the reason that the imaging is requested. Many of these underlying health conditions increase the risk associated with a general anaesthetic.

Younger children are more likely to require anaesthesia to support imaging. The requirement for general anaesthesia significantly reduces after the child's fourth birthday.

Alternatives to general anaesthesia should always be considered, these might include: sedation, play therapist involvement to facilitate awake scanning and deferral until the child is older.

2. Patients' parents and/ or carers should be provided with risk statistics whenever imaging is first suggested as a care option under general anaesthesia. The clinician requesting the imaging should contextualise the risk and should be able to explain the perceived benefits of the imaging balancing the anticipated risk of anaesthesia.⁸

An anaesthetist is not usually present when imaging is first discussed with the patient's parents and/ or carers. Therefore, the requesting clinician is responsible for informing the patient's parents and/ or carers of the benefits, side effects and potential risks relevant to the child concerned. It is important for the requesting clinician to emphasise that although modern anaesthesia is very safe, it is not risk free. The working party recommend that the broad figure of the risk of death from anaesthesia for healthy children having minor or moderate non-emergency surgery is probably between 1 in 100,000 and 1 in 1 000 000. Most of the deaths that occur around the time of surgery are not directly caused by the anaesthetic but by other reasons connected with the health of an individual or the operation they are having.⁷ Only the requesting clinician can balance this broad risk against the benefits of having the imaging. It is reasonable to reassure anxious parents and/ or carers that discussion with the anaesthesia team will occur before the imaging takes place which will help to contextualise the risk for their child.

3. Written information about risks related to anaesthesia should be provided to the patient's parents and/ or carers as early in the care pathway as possible.

It should always be emphasised that no anaesthesia is risk free. The clinicians requesting the imaging should document that this risk has been explicitly highlighted to the patient's parents and/or carers. The RCoA's [Risks associated with your anaesthetic](#) leaflet is an example of best practice.⁹

4. To allow appropriate risk/benefit weighting for imaging under general anaesthesia to take place, the referring clinician should document the anticipated benefits and consequent risks if the imaging is not undertaken.

It is recommended that the use of structured request and consent forms, completed by the referring clinician are completed. A proforma document should be considered to check that all process steps have been followed and that all relevant information is included.

Radiology departments use different systems for booking, vetting and accepting imaging requests. These systems should include a mechanism for triaging all requests where general anaesthesia is requested or is likely to be needed. There should be recognition from those requesting imaging that imaging can be achieved successfully without general anaesthesia using oral sedation, play therapy or delaying imaging until the child is older.

5. All children requiring imaging under general anaesthesia should be reviewed at a preassessment clinic. If there are underlying health conditions that may, in the opinion of the requesting clinician change the patient's risk, the requesting clinician should make a direct referral to an anaesthetic-led preassessment clinic.

All hospitals delivering anaesthesia services for children should have a preassessment clinic dedicated to paediatric patients, that is funded and resourced with appropriately trained staff.² The majority of preassessments are nurse-led in the first instance but there should be clear pathways for escalating complex referrals to an autonomously practising anaesthetist (see [Glossary](#)). For children with complex or high risk conditions it is essential that the anaesthetist assessing the child for general anaesthesia can offer a balanced view to the parents and/ or carers of the risk of anaesthesia against the benefits of the imaging as perceived by the requesting clinician. Clear and unambiguous communication between clinicians and between parents and/ or carers and clinicians is essential in this setting.

6. Patients identified as being high risk should be seen at the preassessment clinic by an autonomously practising anaesthetist and should be provided with appropriate patient information resources.

Patient information leaflets and resources should be provided during preassessment. Patient information resources can be locally produced to suit the local imaging practice or alternatively the resources available on the RCoA website regarding anaesthesia in children can be used.^{4,10} Patient information resources can be provided in written format, through web-based resources or through QR codes.

7. Consent for imaging under general anaesthesia should have two components: the consent for the imaging and the consent for the anaesthesia.

The referring clinician should explain the benefits of the imaging and the risks of deferral or delay as described in recommendation 2. The anaesthesia team should give an individualised assessment of risk of general anaesthesia. It is essential that good communication exists between both the referring clinician and the anaesthesia team. Examples of best practice include the requesting proforma referred to in recommendation 4, which includes written consent for imaging obtained by the referring clinician with full explanation of the indication, benefits and risks of

deferral so that this is clear to the radiology team vetting the referral and the anaesthesia team consenting for anaesthesia.

A record of the shared decision making discussion for higher risk children should be completed at the anaesthetic led preassessment clinic. For those children that are reviewed in a nurse-led preassessment clinic, this shared decision making discussion should take place on the day of procedure and should be recorded on the patient's anaesthetic record. The same standards of care regarding consent for imaging and anaesthesia also apply to patients requiring urgent or emergency procedures.

The clinicians requesting and delivering patient care each have a duty to obtain informed consent from the patient's parents and/ or carers in line with GMC guidance. There should be written records of these discussions at each subsequent step of the referral process; from initial request to conduct of the imaging. This should be readily available in the medical records.⁶

8. Consent for imaging and anaesthesia should be reconfirmed on the day of the procedure.

In accordance with GMC guidance, consent for imaging and anaesthesia should be reconfirmed on the day of the procedure.⁴ When obtaining consent, patient's parents and/ or carers should have an opportunity to ask any further questions. If on the day of the procedure further information is required, the radiologist and/ or anaesthetist should make contact with the referring clinician for clarification. In the event that the referring clinician is unavailable to provide further information, an agreement on whether to continue with the imaging should be made by the clinical team present on the day and the patient's parents and/ or carers. This scenario can be avoided by clear, unambiguous communication and documentation throughout the preoperative pathway.

9. Following the procedure feedback should be obtained from the patient's parents and/ or carers to support quality improvement and audit.

Obtaining patient feedback following a procedure is considered essential practice to improve the quality of care delivered. All patient feedback should be reviewed and acted upon where appropriate.¹¹

Glossary

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

References

- 1 Healthcare Safety Investigation Branch. Undiagnosed Cardiomyopathy in a Young Person with Autism 2020 (bit.ly/3x7ODdg)
- 2 Royal College of Anaesthetists. Chapter 2: Guidelines for the Provision of Anaesthesia Services for the Perioperative Care of Elective and Urgent Care Patients 2021 (bit.ly/3iz3320)
- 3 Royal College of Anaesthetists. Chapter 7: Guidelines for the Provision of Anaesthesia Services in the Non-theatre Environment 2021 (bit.ly/3gdfgji)
- 4 Royal College of Anaesthetists. Chapter 10: Guidelines for the Provision of Paediatric Anaesthesia Services 2020 (bit.ly/3iCo6ki)
- 5 Association of Anaesthetists. AAGBI: Consent for anaesthesia 2017. London, 2017 (bit.ly/3k9LgyL)
- 6 General Medical Council. Guidance on professional standards and ethics for doctors: Decision making and consent. GMC Manchester 2020 (bit.ly/37T6pq9)
- 7 van der Griend BF *et al.* Postoperative mortality in children after 101,885 anesthetics at a tertiary pediatric hospital. *Anaesth Analg* 2011; 112: 1440–7
- 8 Royal College of Anaesthetists. Risk leaflets (bit.ly/3hiTNhs)

- 9 Royal College of Anaesthetists. Risk associated with your anaesthetic. Section 15: Death or brain damage (bit.ly/2TH5jKw)
- 10 Royal College of Anaesthetists. Information for children, parents and carers (bit.ly/3ywtXWN)
- 11 Chereshneva M, Johnston C, Colvin JR, Peden CJ, eds. *Raising the Standard: RCoA quality improvement compendium*. 4th Edn. London: Royal College of Anaesthetists; 2020 (bit.ly/2Dnz3Ej)

Further reading

- Royal College of Anaesthetists. Chapter 2: Guidelines for the Provision of Anaesthesia Services for the Perioperative Care of Elective and Urgent Care Patients 2021 (bit.ly/2VWlOPn)
- Royal College of Anaesthetists. Chapter 7: Guidelines for the Provision of Anaesthesia Services in the Non-theatre Environment 2021 (bit.ly/3gdwXH3)
- Royal College of Anaesthetists. Chapter 10: Guidelines for the Provision of Paediatric Anaesthesia Services 2020 (bit.ly/3sqcFiF)

Members of the Working Party

Dr Russell Perkins (Chair), Vice President, Royal College of Anaesthetists

Dr Paul Barker, Association of Anaesthetists

Dr Deborah Bowman, Ethics committee, Royal College of Anaesthetists

Dr Simon Clark, Royal College of Paediatrics and Child Health

Dr Colin Dryden, Association of Paediatric Anaesthetists of Great Britain and Ireland

Dr Kathleen Ferguson, Association of Anaesthetists

Mrs Irene Leeman, Lay committee, Royal College of Anaesthetists

Dr Thomas Savage, Royal College of Radiologists / British Society of Paediatric Radiology

Royal College of Anaesthetists

Churchill House, 35 Red Lion Square, London WC1R 4SG

020 7092 1500 | www.rcoa.ac.uk/guidance | standards@rcoa.ac.uk

Twitter @RCoANews | **Facebook** RoyalCollegeofAnaesthetists

Version 1.0

Published December 2021

Latest review date December 2026