

CONTRAINDICATIONS

- D** Children who have any of the following contraindications should not normally be sedated:
- abnormal airway (including large tonsils and anatomical abnormalities of upper or lower airway)
 - raised intracranial pressure
 - depressed conscious level
 - history of sleep apnoea
 - respiratory failure
 - cardiac failure
 - neuromuscular disease
 - bowel obstruction
 - active respiratory tract infection
 - known allergy to sedative drug / previous adverse reaction
 - child too distressed despite adequate preparation
 - older child with severe behavioural problems (as they have a higher failure rate)
 - informed refusal by the parent / guardian / child.

- D** Children who have any of the following additional contraindications should not be sedated with nitrous oxide:
- intracranial air (e.g. after skull fracture)
 - pneumothorax, pneumopericardium
 - bowel obstruction
 - pneumoperitoneum
 - pulmonary cysts or bullae
 - lobar emphysema
 - severe pulmonary hypertension
 - nasal blockage (adenoid hypertrophy, common cold)
 - pregnancy.

RECOVERY AND DISCHARGE

- After the procedure, the patient may be discharged if the following criteria are met:
 - For a hospital setting**
 - airway patent and stable unsupported
 - easily rousable
 - oxygen saturation > 95% breathing air
 - haemodynamically stable
 - hydration adequate, no bleeding, urine output adequate
 - returned to normal level of responsiveness and orientation for age and mental status, can walk unaided (if appropriate)
 - no nausea and vomiting
 - pain controlled.
 - For non-hospital setting**
 - airway patent and stable unsupported
 - easily rousable
 - returned to normal level of responsiveness and orientation for age and mental status, can walk unaided (if appropriate)
 - no nausea and vomiting
 - pain controlled.

PREPARING FOR SEDATION

It is essential that consent is obtained prior to the procedure and this should include an explanation of the procedure, the sedation technique proposed and possible adverse effects. Written informed consent should be obtained from the child (in the light of the Children (Scotland) Act 1995) where appropriate or from the parent or legal guardian.

PARENTAL INVOLVEMENT

- C** Parental involvement in the preparation of the child and during the procedure has a sedative-sparing effect and may greatly reduce the distress caused by separation anxiety.

FACILITIES AND PERSONNEL

- D** Sedation in children should only be performed in an environment where the facilities, personnel and equipment to manage paediatric emergency situations are immediately available.

- Sedation of children for diagnostic or therapeutic procedures should not be undertaken in general medical practice and out-of-hours centres.

- D** The roles and responsibilities of the “operator” (the person carrying out the procedure) and the sedation practitioner may be merged to some extent but the guiding principle should always be that the operator should not be the person responsible for monitoring the child during the procedure.

- A medically or dentally qualified person should be identified to hold overall responsibility for the care of the sedated child until they are discharged.

This Quick Reference Guide provides a summary of the main recommendations in the SIGN guideline on paediatric safe sedation. This guideline is applicable to all children under 16 years of age undergoing painful or non-painful diagnostic or therapeutic procedures in the hospital, community, general medical or dental practice settings.

The recommendations are graded **A B C D** to indicate the strength of the supporting evidence.

Good practice points are provided where the guideline development group wishes to highlight specific aspects of accepted clinical practice.

Details of the evidence supporting these recommendations can be found in the full guideline, available on the SIGN website: www.sign.ac.uk



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Safe Sedation of Children Undergoing Diagnostic and Therapeutic Procedures
 Quick Reference Guide



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CLINICAL ASSESSMENT

D Children requiring sedation should receive a full pre-procedure clinical assessment and only children who are normally healthy or have mild systemic disease, should be considered suitable for sedation as out patients.

Children with contraindications to sedation should not be sedated. Extra caution should be exercised when sedating neonates and children under 5 years of age. Consideration should be given to the use of a general anaesthetic or anaesthetist-supervised sedation as an alternative.

FASTING

D The child should be fasted as for a general anaesthetic (6 hours for solids or bottle milk, 4 hours for breast milk, 2 hours for clear fluids), except when nitrous oxide is the only sedative used.

MONITORING

C Observations from all children undergoing sedation should be recorded using a standardised template. All recordings, prescriptions and reactions should be documented on this chart and continued until discharge criteria are met.

SEDATION PRINCIPLES

D Sedative drug combinations should be avoided in children as they are often associated with deeper levels of sedation and with more adverse effects.

D If a child becomes disinhibited by sedative agents and becomes restless, uncooperative or unmanageable, elective or urgent procedures should be abandoned and re-scheduling for general anaesthesia considered. For emergency procedures, arrangements to convert to a general anaesthetic should be considered when appropriate.

D The sedation practitioner must be able to manage and recover a patient who enters a deeper level of sedation than intended.

- General anaesthetic agents should not be used to sedate children.
- An individualised dosing of sedative, based on age, weight, co-morbidity, procedure and presence of other drugs should be devised for each child. Dosage of nitrous oxide inhalation sedation should be incrementally titrated according to the patient's response.
- The least distressing route of administration of the sedative agent should be used.
- The sedative prescription should always be double-checked by another person to ensure dosages are correct.
- For repeated procedures, consideration should be given to using sedation as part of a behaviour modification programme to sequentially reduce fear and anxiety with the aim of weaning the child from the need for sedation.

SEDATION TECHNIQUES

SEDATION FOR PAINLESS PROCEDURES

D Non-pharmacological techniques should be used for painless procedures whenever possible.

SEDATION FOR PAINFUL PROCEDURES

For painful procedures, appropriate analgesia should be given first to prevent pain before considering sedation. Consideration should be given first to the use of analgesics that do not have sedative properties.

D Inhaled nitrous oxide produces the most rapid onset and offset of analgesia and may be appropriate for painful procedures in children who are able to cooperate.

Opioids may be used for painful procedures but should not be used to sedate children undergoing painless procedures. Whenever opioids are given to children, the specific antagonist naloxone should be immediately available.

SEDATION FOR SPECIFIC PROCEDURES

MEDICAL PAEDIATRICS: GASTROINTESTINAL

A General anaesthesia should be the first choice for paediatric gastrointestinal endoscopy.

MEDICAL PAEDIATRICS: ONCOLOGY

D For brief procedures that are painful or distressing a combination of behavioural techniques and local anaesthesia is recommended.

C For distressing, repeated or prolonged oncology procedures, a general anaesthetic is recommended, particularly in young children.

MEDICAL PAEDIATRICS: CARDIOLOGY

D For non-painful cardiology procedures, behavioural methods, sleep deprivation and scheduling post-feeding may be sufficient for many children.
General anaesthesia is recommended for cardiac catheterisation procedures in children.

MEDICAL PAEDIATRICS: NEPHROLOGY

D Renal biopsy should be carried out under general anaesthesia or with an anaesthetist administering the sedation and monitoring the child.

DENTISTRY

D Attempts should be made to persuade the child to have dental treatment under local anaesthesia using the "tell-show-do" technique, positive reinforcement and other acclimatisation methods before dental sedation is contemplated.

C Nitrous oxide/oxygen sedation (inhalation sedation), titrated to the individual child's needs, is recommended for use in all dental settings but particularly General Dental Practice and the Community Dental Service.

D Children undergoing inhalational sedation in a dental surgery should be monitored visually until fully recovered.

D Single agent sedation with midazolam is only recommended for intravenous dental sedation in patients over 16 years of age. Intravenous sedation should be avoided in younger children in primary or community dental practice.

D General anaesthetic drugs, combinations of sedative drugs, or other routes of administration should only be used in a hospital setting

RADIOLOGY

D Children up to the age of 4 months should be imaged when asleep, post-feeding, and with no sedation.

C For painless imaging procedures lasting less than 60 minutes, children from 4 months to 5 years of age, may be sedated using a single low-potency oral agent. Recovery may be slow, however.

D As failure of sedation is often due to only part of the dose being swallowed, the drug should be given in the radiology department by the sedation practitioner. Administration from a syringe is more successful than by spoon. The taste of some agents should be partially disguised in a small volume of sweet juice.

D Interventional procedures under radiological control should be performed under general anaesthesia with topical and infiltration local anaesthesia for puncture sites.

C Oral benzodiazepines may be used to allay anxiety in individual children for distressing procedures.

ACCIDENT & EMERGENCY

Children attending A&E departments for painful procedures can often be managed successfully with adequate sympathetic behavioural techniques (including play therapy, distraction, guided imagery) and local anaesthesia (topical, infiltration, nerve block).

Nitrous oxide is very effective in school age children who are able to cooperate and is particularly helpful as patients do not need to be fasted if nitrous oxide is used as the sole sedative/analgesic agent.

D For severe pain, opioids should be used by oral, intravenous, or nasal routes.

For repeated painful procedures, for more invasive procedures, for prolonged procedures and in the younger or distressed child, general anaesthesia is recommended.