Worcestershire Acute Hospitals NHS Trust

Paediatric Perioperative and Recovery Unit Guidelines

This guidance does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and /or carer. Health care professionals must be prepared to justify any deviation from this guidance.

Introduction

This guideline is intended to be used as a reference for all staff involved in a paediatric surgical admission.

This guideline is for use by the following staff groups :

Recovery, Anaesthetic, Surgical and ward based staff.

Lead Clinician(s)

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Review Date This is the most current document and is to be used until a revised version is available	18th March 2029

Key amendments to this guideline

Date	Amendment	Approved by:
02.09.2015	New Document	CEC & MSC
11/08/2017	Document extended for 12 months as per TMC paper approved	TMC
December 2017	Sentence added in at the request of the Coroner	
June 2018	Document extended for 3 months as per TLG recommendation	TLG
January 2023	Document approved with no changes	Anaesthetics Governance/ SCSD Governance meeting
18th March 2026	Sip till send information included Up to date resuscitation information included	Theatre/Anaesthetic Governance meeting

PAEDIATRIC PERIOPERATIVE AND RECOVERY UNIT GUIDELINES

Introduction

This guideline is to be used to ensure structure and uniformity of management of the paediatric surgical patient in the Worcestershire Acute Hospitals NHS Trust. It includes advice and information for management of the uncooperative child or young person in the recovery room.

DETAILS OF GUIDELINE

Preoperative assessment for general anaesthesia

On the day of surgery, an anaesthetist will assess the child to ascertain if they are fit enough to undergo anaesthesia and surgery. This will involve discussion of details of anaesthesia and analgesia. It will provide an opportunity for dialogue with both carers and the patient. Preoperative medication may be prescribed at this time.

Adherence and reference to guidelines for the management of diabetes and other relevant conditions may be found on the intranet.

Premedication – please refer Paediatric Anxiolytic Premedication (WAHT-TP-103)

Topical use of anaesthetic cream. Unless otherwise indicated, ametop or EMLA are the topical anaesthetic of choice to be used. LMX is not suitable because of issues with adhesiveness of dressings.

Oral midazolam 0.3 to 0.5mg/kg (max 20mg). Onset time 20-30 minutes.

Buccal midazolam 0.2 to 0.3mg/kg (max 10mg). Onset time 10-20 minutes. Duration 1-2 hours.

Paradoxical reactions can be seen in some children.

If midazolam previously ineffective or caused paradoxical reaction discuss with consultant anaesthetist and consider alternatives. Use of second line alternative anxiolytic or sedative premedication should be discussed at consultant level. Options include clonidine, ketamine and temazepam. (WAHT-TP-103).

Fasting for General Anaesthesia and Sedation

Recent published changes to recommended clear fluid starvation periods by leading international paediatric anaesthetic bodies has promoted a reduction from a 2 hour to 1 hour period for clear fluid fasting times, unless clinically indicated.

Following surgical and anaesthetic review on admission, there should be a discussion of individual starvation times to minimize starvation times for children who may have a prolonged wait before theatre.

Solid food and milk (including formula) up to 6 hr before elective surgery
Breast milk up to 4 hr before elective surgery
Encourage patients to take clear oral fluids up to 1 hr before elective surgery.
Unless first on the list, patients should be offered a drink of water or dilute squash on arrival to the admissions area.

Thereafter, sips of water may be taken until the previous patient on the list has been transferred to theatre.

Instructions to parents/carers to be given pre-operatively as follows:
Morning operating lists
No solid food after midnight
Water or diluted squash to finish before 0730 hr
Afternoon operating lists
Light breakfast (including toast, or small bowl of cereal), to finish before 0700 hr
Water or diluted squash to finish before 1200 hr

Patients will be collected from the wards by theatre-based porter staff. One, or two (at the discretion of the anaesthetist), carers may accompany the child to the anaesthetic room. A ward-based staff member will accompany the child to allow for continuity of care. The use of trolleys or wheelchairs is to be avoided unless medically indicated.

Preparation prior to admission to recovery area

At the beginning of each shift check that:

- The paediatric anaesthetic trolley is checked against the contents list, and all items are present and emergency drugs are in date.
- The paediatric resuscitation trolley has undergone its routine check daily, as per guidelines.
- Defibrillator is in full working order and has passed daily user test.
- Suction equipment is clean, in full working order, and has passed safety tests.
- A range of appropriately sized suction catheters is available.
- Oxygen supplies (high and low flow) are in full working order.
- Emergency alarm bells are working.
- Emergency breathing systems, Mapleson’s F (Jackson-Rees' modification of the Ayre's T-piece) and Mapleson’s C are checked and in working order.
- Sharps containers are available.
- A supply of clean gowns and warming blankets are available.
- Quality control checks have been performed on near patient testing equipment such as glucometers and Hemocue.
- Guidelines and commonly used algorithms for paediatric emergencies should be readily available and regularly rehearsed.

Before each patient arrives check:

- a clean Yankauer sucker is switched on and working
- oxygen mask is connected and ready for use
- saturation monitoring is switched on and working
- ECG, blood pressure (automatic and manual) and invasive monitoring are readily available if required
- Emergency breathing systems are available with appropriate fitting facemask

Reception of the child in the Recovery Room

There should be at least one qualified PILS trained recovery member to take prime responsibility for the child for their entire stay in the recovery room. There must be at least one further PILS trained staff member in the immediate vicinity at all times.

All staff working in recovery should be familiar with the relevant procedures and personnel if there are child protection concerns that arise whilst the child is in theatre.

If medical help is required, help is available according to clinical need. This may involve use of the recovery emergency call bell, CEPOD anaesthetist, starred anaesthetist at KTC or the anaesthetist with primary responsibility for the child (this person should be involved or informed with any intervention).

The primary recovery staff member must receive handover from the anaesthetist, nursing scrub staff and on occasion surgical team to gain a full understanding of the patient history and operative procedure.

Anaesthetic to recovery handover must include the following:

- Patient name
- Age
- Operation
- Theatre number
- Underlying medical disorders
- Allergy information
- Anaesthetic technique including airway management
- Location of cannula and confirm that it has been flushed
- Intraoperative course and any complications
- Intraoperative analgesia and antiemetics given
- Drug chart with postoperative analgesia and antiemetic prescribed
- Fluid prescription chart if required
- Surgical handover should be included if there are specific surgical instructions.

Initial assessment

On arrival to the recovery unit, a thorough head to toe assessment of the child's physiological status must be conducted.

Airway assessment

Evaluated by:

- Is the child self-ventilating/requiring assisted ventilation/maintaining own airway/requiring airway support? Observe for signs of partial or complete airway obstruction ie supracostal, intercostal and subcostal retraction, inspiratory stridor, or crowing, nasal flaring, tracheal tug or decreased/absent air entry.
- Common causes of airway obstruction:
  - tongue, laryngospasm, foreign bodies such as vomit, gastric contents, mucous, blood/secretions and dislodged teeth
- Determine the need for techniques to open the airway and the continued use/insertion of airway adjuncts until the child begins to regain consciousness.
- Manual techniques:
  - chin tilt: neutral position for neonates, sniffing the morning air' for small child, jaw thrust for adolescents/adults Airway adjuncts nasopharyngeal airway, oral pharyngeal airway, laryngeal mask airway, endotracheal tube to be used with appropriate training only.
- If there are secretions/vomit/blood present in the airway, gently suction out the oral-pharynx/ naso-pharynx/trachea.

- Administer oxygen 6-10 litres/min via clear facemask.
- Attach pulse oximetry monitoring.

Observe child closely for complications of anaesthesia such as laryngospasm. Indicative symptoms include noisy or shallow respirations, paradoxical chest and abdominal movements, nasal flaring, retractions, stridor, dyspnoea and cyanosis.

In the event of laryngospasm: call for senior help, apply positive pressure ventilation and reassure child, prepare and ensure availability of propofol, suxamethonium and the paediatric airway trolley for potential use by medical staff.

Breathing assessment

Evaluated by:

Listening to inspiratory breath sounds, observing the work of breathing by noting the adequacy of tidal volume and resultant chest expansion.

Determine the rate, depth and rhythm of respirations in accordance with the child's age and clinical condition. The child's normal range should also be considered

Normal respiratory rate ranges by age: (EPALS 6th Ed)

Age	Respiratory Rate (breaths per min)
1 month	25-60 min^{-1}
1 year	20-50 min^{-1}
2 years	18-40 min^{-1}
5 years	17-30 min^{-1}
10 years	14-25 min^{-1}
>18 years	12-20 min^{-1}

Observe for signs of peripheral and central cyanosis: peripheral cyanosis: indicated by blue hands, feet and fingernail beds, central cyanosis: indicated by blue lips, tongue and mucous membranes.

Note: An anaemic child may not appear cyanotic despite the presence of profound hypoxaemia.

Note: oxygen saturation readings and maintain oxygen therapy (40% - 100%) to ensure oxygen saturation remain above 94%.

Circulation assessment

Observe the clinical presentation of the child and record: colour (central-peripheral), temperature (core/peripheral). The very young infant may demonstrate a fall in core body in response to low cardiac output.

The child's normal range should also be considered.

Normal heart rate ranges by age: (EPALS 6th Ed)

Age	Heart Rate (beats per min)
1 month	110-180 min^{-1}
1 year	100-170 min^{-1}
2 years	90-160 min^{-1}
5 years	70-140 min^{-1}

10 years	60-120 min^{-1}
>18 years	60-100 min^{-1}

Blood pressure ranges by age: (EPALS 6th Ed)

BP for age	1 month	1 year	2 years	5 years	10 years	>18 years
50th centile for SBP	75 mmHg	95 mmHg	98 mmHg	100 mmHg	110 mmHg	120 mmHg
5th centile for SBP	50 mmHg	70 mmHg	73 mmHg	75 mmHg	80 mmHg	90 mmHg
50th centile for MAP	55 mmHg	70 mmHg	73 mmHg	75 mmHg	75 mmHg	75 mmHg
5th centile for MAP	40 mmHg	50 mmHg	53 mmHg	55 mmHg	55 mmHg	60 mmHg

Monitor and record blood/fluid losses on arrival, and half hourly thereafter from wound sites and drainage systems.

moderate blood loss = <10 ml/kg/hr

significant blood loss = >10ml/kg/hr

Bandage and protect any intravenous lines.

Vital signs monitoring:

Record vital signs i.e heart rate, respiratory rate/effort and where indicated blood pressure (invasive and non-invasive). Record these on the appropriate PEWS chart for the child.

Conduct repeated assessments of vital signs every 5 minutes to evaluate trends in the patient's condition, taking into account the patient's normal range and clinical condition.

Monitor with an ECG, any child who has evidence of or is at risk of respiratory or cardiovascular instability. For example:

known or suspected heart disease
hypoxaemia and acidosis resulting from respiratory insufficiency or shock
neonates
heart-affecting drug therapy
arrhythmias experienced during the anaesthetic
electrolyte imbalances
history of lung disease/airway complications/poor oxygen saturations
intraoperatively abnormal perfusion status
improperly reversed muscle relaxants
hypothermic children

Administer volume therapy if indicated by the anaesthetist.

Fluid resuscitation consists of a 10ml/kg bolus of an isotonic solution e.g Hartmann's solution, 0.9% salineor blood as directed by medical staff.

Thermoregulation

Measure body temperature on admission, document and state route of measurement. Initiate measures to warm a hypothermic patient (core temperature below 36°C) by applying warmed blankets and utilising active warming devices such as forced air warmers. Continue oxygen therapy until patient temperature reaches normal levels. Initiate measures to cool a hyperthermic patient (temperature above 38°C) by:

Minimising clothing and blankets exposing the skin to air
increasing air circulation

Consider the use of an anti-pyretic drug such as paracetamol, if not already given in preceding 4 hours.

Consider the risk of malignant hyperthermia in patients with a rapid increase in temperature (2°C/hr), accompanied muscle rigidity, tachycardia, unstable rising blood pressure, brown or bloody urine, changes in skin colour from a flushed to mottled appearance, hypoxia and/or tachypnoea. If malignant hyperthermia is suspected, notify the anaesthetist immediately and assist in patient management as per local guidelines.

Post Operative Nausea and Vomiting

Assess patient's level of nausea and/or vomiting.

Risk factors include - previous history, sex (F>M), use of nitrous oxide, prolonged surgery, ENT/abdominal/laparoscopic/ophthalmic surgery, opioids.

In the event of vomiting in the unconscious/semiconscious patient, roll child immediately onto their side, remove any pillows, gently suction out the oral-pharynx and position the bed into Trendelenburg (head down).

Administer an anti-emetic as prescribed and monitor efficacy.

If nausea or vomiting persists, consult the anaesthetic team, and consider the use of an alternative or additional anti-emetic.

Pain management/Assessment

Assess child's incidence of pain and document pain scores in accordance with PEWS pain assessment tool.
In the event of pain:

- Determine details of intra-operative analgesia and other drugs given.
- Administer analgesics as prescribed on the medication chart and monitor effectiveness.
  Notify and involve anaesthetist at an early stage
- Involve parents and provide distraction techniques particularly if the pain is anxiety related.
- Consider possible attributing factors such as patient position, tightness of plaster cast.

Discharge criteria

Consider discharging the patient once the following targets have been met or on specific agreement with the anaesthetist/ward nurse:

- Patient has spontaneous, regular respirations and a self-supporting airway.
- The SpO2 is within normal patient limits, oxygen has been prescribed if necessary.
- Heart rate and blood pressure is stable and within pre-operative limits.
- The patient's central temperature is within normal limits and they are warm peripherally.
- Patient is awake or easily rousable.
- The PEWS (Paediatric Early Warning Score) is 2 or below. Discharge from recovery with a PEWS score > 2 requires discussion and agreement with both medical and ward staff.
- Patient is comfortable with any pain adequately controlled.
- Nausea/vomiting is absent or adequately controlled.
- Wounds are dry and exudates minimal.
- Catheters/drains are patent and drainage is within anticipated limits.

- Post operative hydration therapy has been prescribed if required.
- All medications prescribed.
- Blood components have been given and/or prescribed as needed.
- Documentation is complete, including the operation record and any notable post-operative instructions.
- All cannulas must be documented as being flushed (To remove residual anaesthetic drugs)

If the above criteria cannot be met but the recovery staff feel that the child is safe to be transferred to the ward, the anaesthetist should review the child with the ward nurse and document that the child is suitably stable for transfer. If there is any doubt about the condition of the child, an anaesthetic review must take place prior to discharge.

Handover

The Recovery Nurse must provide a comprehensive handover to the ward nurse to include any specific instructions to take place in the post-operative period.

Handover should incorporate the details on the operation record, condition of the child whilst under anaesthesia, any problems that have occurred, any analgesia, specific drugs or anti-emetics that have been administered and the current PEWS Score. All analgesics, anti-emetics and any other medicines prescribed in theatre which may affect the choice or timing of subsequent doses on the ward MUST be prescribed on the patient's prescription chart.

MANAGEMENT OF THE UNCOOPERATIVE CHILD OR YOUNG PERSON IN THE PERIOPERATIVE PERIOD

There are multiple reasons for a child to be uncooperative in the theatre environment. These include background psychological issues, emergence delirium, pain, anxiety, hypoxia, hypercarbia, airway obstruction, hypo/hyperthermia, raised ICP , a full bladder ordistress due to lack of parental presence

Therapeutic Holding

'Immobilisation, may be achieved by splinting or by using limited force. It may be a method of helping children, with their permission, to manage a painful procedure quickly and effectively. Holding is distinguished from restraint by the degree of force required and the intention.'

(Royal College of Nursing 2010)

Restraint

'The positive action of force with the intention of over-powering the child'

'Physical restraint should be used rarely and only to prevent a child harming himself or others or from damaging property'

(The Children Act, 1989)

Restraint or therapeutic holding should be used as the last resort and not the first line of intervention (RCN 2010). If restriction is used it should be for the minimum time and employing the least force necessary.

Restraint is distinguished from therapeutic holding by the degree of force required. At all times the degree of force used must be reasonable and proportionate to both the behaviour of the individual to be controlled and the nature of the harm they may cause. These judgements have to be made at the time, taking due account of all the

circumstances, including any known history of other events requiring restraint. Restraint should be planned and carefully managed including a lead person of a team trained in this to avoid injury or further distress.

There is currently no specific government guidance specifically on the restraint or therapeutic holding of children in hospital.

Guidance in Management of the Uncooperative Child

1. Call for help.

2. Protect the child - ensure padded cot sides are in place. Lower trolley to lowest level. Consider recovering child on a mattress on the floor, if necessary. Remove any monitoring or medical equipment that may be hazardous to the child.

3. Call for parents early - endeavour to have carers informed that their child is agitated before their arrival. It can be extremely distressing for carers to see their child in a distressed state from which the child may be inconsolable. Parental involvement is to be supported if they wish to be involved.

4. Endeavour to keep the area as quiet and calm as possible.

5. A lead person should be identified to coordinate the process. Identify a person to communicate and reassure the child/young person throughout.

6. Therapeutic holding and restraint should only be used if other preventative strategies such as dialogue, diversion and distraction techniques have been unsuccessful. They should be used as a last resort. Only minimal force should be used: use age-appropriate methods such as splinting and wrapping.

7. Involvement of qualified Play Specialist

All incidents of therapeutic holding should be fully documented and the Trust's procedures for reporting incidents via DATIX should be followed.

Debriefing of the child, and where appropriate, of staff and parents, should take place as soon after the incident as possible (RCN 2010).

Emergence Delirium

A child with emergence delirium (ED) is in a 'dissociated state of consciousness in which the child is irritable, uncompromising, uncooperative, incoherent, and inconsolably crying, moaning, kicking, or thrashing'.[1] ED can disrupt the surgical repair, be distressing for parents and staff and may cause parental dissatisfaction with their child's care.

There have been a wide range of reported figures for the incidence of ED in paediatric populations, ranging from 2% to 80%.

Risk Factors for Emergence Delirium:-

Rapid emergence from anaesthesia

Use of short-acting volatile anaesthetic agents

Postoperative pain

Surgery type (Otorhinolaryngological and ophthalmological procedures)

Age (particularly age 2 to 5)

Preoperative anxiety

Temperament, as reflected in children who are more emotional, more impulsive, less social, and less adaptable to environmental changes, has been identified as a risk factor for ED

Treatment of Emergence Delirium

ED usually occurs within the first 30 min of recovery from anaesthesia, is self-limited (5–15 min), and often resolves spontaneously. If however ED persists, the most common interventions are pharmacological (propofol, fentanyl, midazolam).

References

2013. Anaesthesia 2013; 68: pages 288-97.

Recovery: care of the child/young person - Clinical Guidelines, Great Ormond Street, Version 1.1, http://www.gosh.nhs.uk/health-professionals/clinical-guidelines/recovery-care-of-the-child/

Emergence delirium in children: many questions, few answers. Vlajkovic GP, Sindjelic RP. Anesth Analg Paediatric Emergence Delirium. Continuing Education in Anaesthesia, Reduque LL, Verghese ST. Critical Care & Pain Vol13, Issue 2:p39-41 (http://ceaccp.oxfordjournals.org/content/13/2/39.full)

European Paediatric Life Support 3rd Edition

The agitated child in recovery, J Shung , Southern African Journal of Anaesthesia and Analgesia Vol. 17, Iss. 1, 201

WAHT-ANA-014 Nil By Mouth (NBM) and Perioperative Medicines Use Guideline

WAHT-CG-580 Medicines Policy

Thomas M, Morrison C, Newton R, Schindler E. Consensus statement on clear fluids fasting for elective pediatric general anesthesia. Pediatr Anesth. 2018;28:411–414. https://doi.org/10.1111/pan.13370

Paediatric Preoperative Anxiolytic Medication - Paediatrics/Surgery Pathway WAHT-TP-103

Thomas M, Morrison C, Newton R, Schindler E. Consensus statement on clear fluids fasting for elective pediatric general anesthesia. Pediatr Anesth. 2018;28:411–414. https://doi.org/10.1111/pan.13370

Attach Patient Sticker here or record

NAME: . . . . . .

NHS NO:

HOSP NO:

D.O.B: D D M M Y Y Y Y Male ☐ Female ☐

PAEDIATRIC EARLY WARNING SCORE AGE 1-5 YEARS

Ward: . . . . . Cons: . . . . . .

Score	3	2	1	0	1	2	3
Heart Rate	< 65	66 - 74	75 - 89	90-140	141-155	156-165	> 166
Respiratory Rate	< 20		21 - 24	25 - 35	36 - 45	46 - 50	> 50
Conscious Level Awake Voice Pain Unresponsive				Awake A	Voice V	Responds to Pain P	Unresponsive U
Cap Refil				2 sec	3 sec		> 4 sec
Temperature	< 34°	34.1° - 35.9°		36° - 37.9°	38° - 39°	> 39.1°	
Systolic blood pressure (mmHg)		< 69	70 - 79	80 - 100	101 - 114	>115	
EXTRA SCORING							
02 Requirement					✓		
Cont Post Op Vomiting						✓	
Underlying malignant disease						✓	
1/2 hrly Bronchodilators						✓	
Unstable metabolic condition ie: DKA						✓	
Worrying/unstable condition unrecordable BP						✓	

Notes: Any abnormal measurement in observations should trigger a PEW score.

HIGH Score = 6 or above	IMMEDIATE MEDICAL REVIEW SHOULD BE SOUGHT
Score = 3 or above	Inform nurse in charge/sho/registrar as childs condition indicates
Score = 2	Increase frequency of observations, until score is reduced.
LOW Score = 0 or 1	Continue observations at current frequency, minimum of once/shift

This is not a definitive guide. If you are worried about a child please use SBAR to escalate concerns through appropriate channels, regardless of the PEWS.

ACTION TAKEN ?
X No action
Dr = Dr informed
NIC = Nurse in Charge
An = Analgesia Given
O_2 = O_2 given

PAIN SCORE

FLACC - Each category should be scored between 0 - 2 then added up to give a total score out of 10.

CATEGORY	SCORING		
	0	1	2
FACE	No particular expression or smile	Occasional grimace or frown, withdrawn	Frequency to constant quivering chin, clenched jaw
LEGS	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
ACTIVITY	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid or jerking
CRY	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
CONSOLABILITY	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractible	Difficult to console or comfort

NAUSEA & VOMITING SCORE

No nausea or vomiting	0
Nausea only	1
One episode of vomiting in last hour	2
More than one episode of retching/vomiting in one hour	3