Current trends in postoperative analgesia for day-case paediatric surgery

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With more cases of paediatric surgery occurring in the day-case setting, the issues surrounding analgesia in these children are becoming more important. We must ensure good systems are in place to assess and document children’s pain post-operatively using appropriate tools. The efficacy of the peri-operative analgesia must be monitored and any break-through pain must be controlled as rapidly as possible. Any adverse effects from the analgesics themselves should be identified and treated. Clear instructions for the parents are essential.

Analgesia must always be approached in a multi-modal manner. The triad of paracetamol, NSAID and local/regional anaesthesia should be considered in all cases with opioids reserved for severe pain and rescue to avoid the sedative and emetogenic properties.

Unfortunately children are still therapeutic orphans. Many drugs given to children are not licensed for the particular indication, dosing, age or route of administration. Practitioners are left with the challenge of prescribing guided by clinical experience rather than data from clinical trials. We must be able to justify actions taken as being in accordance with a respectable and responsible body of professional opinion. However, off-label does not mean it is inappropriate. These drugs are considered to be used clinically appropriately because their benefit outweighs potential risks and no suitable alternative is currently available. It is important to access reliable and current information on any drug but not necessary to take additional steps to obtain parental consent to prescribe unlicensed or licensed drugs for unlicensed applications.

Our choice of analgesics depends on many factors:
- type and severity of pain
- comorbidities eg OSA
- concomitant medication use
- route of administration
- child’s ability to take a particular formulation
- availability of a suitable formulation for children

Paracetamol is the most widely used first-line analgesic in children and is available in multiple paediatric formulations. It has been found to have a similar efficacy to NSAIDs for mild-moderate pain and be a useful adjunct for more severe pain. Oral bioavailability is about 90%, reaching peak plasma concentrations in 30 minutes with a duration of 4 hours. Rectal absorption is highly variable and unpredictable with a bioavailability of 24-98%. The intravenous route increases dosing accuracy but time to peak analgesia is 1-2 hours. Potential harm with paracetamol is liver toxicity with risk factors including:
- doses >150mg/kg
- incorrect dosing if overweight (correct dose according to lean body weight)
- malnutrition, starvation
- intercurrent illness
- severe hepatic impairment
- young age

Intravenous use should be reserved for short-term treatment when oral or rectal dosing is not available.

NSAIDs offer up to 40% opioid-sparing effect and Ibuprofen is approved down to 3 months of age. The main safety concerns include:
- gastrointestinal bleeding
renal toxicity
- reduced platelet function
- bronchospasm if susceptible

TGA advises that ibuprofen can be safety used after tonsillectomy with a recent Cochrane Review showing no evidence for withholding NSAIDs post-op. Aspirin sensitivity is present in 2% children with asthma and caution is required if the child has severe eczema, multiple allergies or nasal polyps.

COX-2 inhibitors are used off-licence in paediatrics <18 years but there has been an increasing interest, particularly post-tonsillectomy. They have been shown to have equal efficacy to other NSAIDs or paracetamol but trials have not been large enough to confirm any reduced adverse effects and suggested dosing regimens are not evidence based.

Codeine shows a considerable inter-individual variation in it’s metabolism by CYP 2D6. There are a significant number of poor metabolisers (7-30%) which show a minimal analgesic effect. Ultra-rapid metabolisers produce significant amounts of morphine so are at risk of sedation and respiratory depression, even after appropriate doses of codeine. Multiple deaths in children have been reported on codeine and the TGA now recommends:
- not to use in children <18years after tonsillectomy +/or adenoidectomy
- only use >12years if pain not relieved by other analgesics
- use lowest dose for shortest time possible

No alternative opioids provide the ideal solution and children may need an extended length of stay in hospital to evaluate their opioid sensitivity.

Oxycodone is being increasingly used in children in both oral and intravenous formulations, but is not licences by the TGA <18years.

Tramadol, also available in oral and intravenous formulations, is unlicensed <12years but widely used in Europe in younger children. It’s safety profile in children with a history of OSA after adenotonsillectomy remains unproven.


Royal College of Paediatrics and Child Health. The use of unlicensed medicines or licensed medicines for unlicensed applications in paediatric practice. 2013.


