

Oral analgesia pre-medication: a practice with multiple benefits

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Background/Context

Oral paracetamol is not thought to be any less effective than intravenous (IV) forms when given in the immediate pre-operative period¹ and is given as standard practice in many centres locally for paediatric patients. Potential benefits include adequate pain relief, reduced cost, reduced carbon footprint²⁻⁴ and fewer intra-operative drug errors with IV paracetamol.

Problem

We noticed a trend in our institution for giving IV pain relief intra-operatively to children presenting for surgery. Whilst some anaesthetists did use pre-operative oral paracetamol, there were several anecdotal reasons that IV paracetamol was often chosen instead including logistical barriers such as nursing staff (time and willingness to administer), patients not weighed prior to pre-op visit by anaesthetist and habit.

The cost of IV medicines is higher than oral formulations and the associated carbon footprint of IV medicines is higher due to the requirement for sterilisation as well as increased packaging which contributes to carbon emissions from transport.

Strategy for change

We sent an information sheet to our anaesthetic department on the potential benefits of prescribing pre-operative oral analgesia. We identified a number of lists suitable for pre-operative analgesia such as orthopaedics, ENT and urology over a one week period. Anaesthetists were encouraged to prescribe oral analgesic pre-medication for all suitable patients.

We collected data on dosage prescribed, any issues encountered (either patient or logistical) and whether the anaesthetists found the process acceptable compared to giving IV analgesia intra-operatively.

We also collected data on the cost of different forms of medicines and consumables and spoke to nursing staff on the wards about how they administer oral medication, their waste processes and how to make the process of administering oral pre-medication easier for them.

Measure of improvement

We collected data for 43 cases over 20 lists. 86% of patients were prescribed oral analgesia pre-operatively. Reasons for not prescribing included long cases (where intra-operative analgesia was preferred), patient arriving late and not weighed or first case on list and sent for immediately. In cases where pre-operative analgesia was prescribed: 2 children spat out the pre-med and 4 required a second dose IV due to pre-med being given too early.

On evaluation: 100% of anaesthetists found the process of prescribing pre-operative oral analgesia acceptable; 100% would consider integrating this into daily practice.

Many expressed surprise at how easy it was to do with more willingness from the nursing staff than expected. There were no adverse effects and no requirement for rescue analgesia in recovery was reported.

Paracetamol form:	Oral	IV
Cost of medicines (£) (n=37)	5.56	36.40
Total cost (inc consumables) (£)	7.69	97.36
Weight of consumables (g)	306	2455

Fig 1: Savings of cost and waste over 37 included cases using data from pharmacy and our own weight calculations

There were significant projected cost savings when giving oral medicines vs IV. If all elective cases (excluding cardiac, MRI, hepatobiliary and oncology) were given oral paracetamol in our institution this would represent an approximate cost saving of £20,000 annually and approximately 476kg of consumables diverted from clinical waste. We hope that life cycle analyses will allow us to soon calculate the CO2 equivalent saving²⁻⁴.

Interestingly, if a sharp needle is used instead of a dispensing pin for drawing up IV paracetamol the cost of consumables drops by almost 90%.

Lessons learnt

In summary, this pilot shows that administering analgesia pre-operatively to children is acceptable to anaesthetists involved in their care, we had no reported adverse effects and the potential for significant cost and environmental benefit is worth considering.

On speaking to nursing staff, round doses make it easier to administer e.g. 200mg rather than 195mg.

We would encourage you to look at your processes for prescribing and the consumables used to see where cost and environmental savings can be made.

References:

1. Mallama, M., Valencia, A., Rijs, K., Rietdijk, W.J.R., Klimek, M. and Calvache, J.A. (2021), A systematic review and trial sequential analysis of intravenous vs. oral peri-operative paracetamol. *Anaesthesia*, 76: 270-276. <https://doi.org/10.1111/anae.15163>
2. McAlister S, Ou Y, Neff E, et al. The Environmental footprint of morphine: a life cycle assessment from opium poppy farming to the packaged drug. *BMJ Open* 2016;6:e013302. doi: 10.1136/bmjopen-2016-013302
3. <https://www.gaspanaesthesia.com/pharmaceuticals>
4. <https://www.gaspanaesthesia.com/paracetamol-project>

