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Acetaminophen is among the most commonly used analgesics in the pediatric population, reducing perioperative opioid requirements¹. Pediatric studies extensively validate safety in IV doses not exceeding 15 mg/kg². There are several case reports of life-threatening pediatric IV acetaminophen overdoses in the perioperative period³.

In a mixed adult and pediatric hospital during a six month period, three perioperative overdoses occurred after administration of IV acetaminophen in children between 5-11 years old. Pediatric and adult operating rooms at this institution are located on the same floor and share the same recovery area. The IV acetaminophen formulation is currently only available as 1 gram in a standard 100 ml bottle (figure). In two cases, the entire vial was administered as an infusion by gravity instead of disposing of the remainder of the appropriate dose. In the third case, an Alaris IV medication pump was used but malfunctioned, resulting in overdose. None of the patients required N-acetyl cysteine therapy based on the Rumack-Matthew nomogram(4), and liver damage was not reported. These were considered sentinel events.

In a root cause analysis it was decided to use suppository preparations or the institution's electronic pharmacy interface to request a unit dose (15 mg/kg) syringe, limiting the number of full acetaminophen vials dispensed. This resulted in a new policy (table) which was instituted in September 2013. Since then, no more acetaminophen overdoses recurred.

IV acetaminophen is useful as an opioid-sparing analgesic in perioperative children when appropriately administered. However, despite staff education on dosing and infusion, human error and infusion pump malfunction can still lead to avoidable overdoses which may be more prevalent in a mixed adult-pediatric patient population as opposed to in a children's hospital setting. Our protocol serves as a multi-layered safety barrier in a mixed adult-pediatric hospital against future IV acetaminophen overdose medical errors.

References:

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2. Lavonas EJ et al. Therapeutic acetaminophen is not associated with liver injury in children: a systematic review. *Pediatrics*. 2010; 126:e1430.
3. Campbell S et al. Potentially life-threatening intravenous acetaminophen overdose in a 3-month-old (40 weeks' post-menstrual age), 2.3 kg baby girl. *Open Journal of Pediatrics* 2013; 3, 186-187.
4. Rumack BH et al. Acetaminophen poisoning and toxicity. *Pediatrics* 1975; 55(6):871-6.

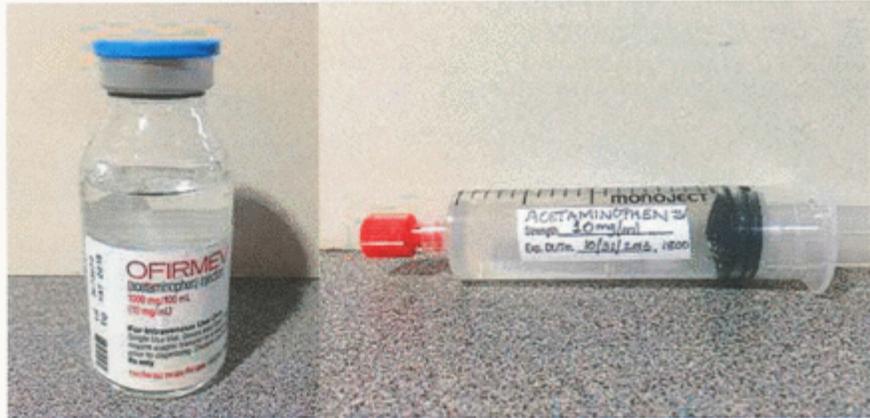
Table

New policy on IV acetaminophen administration

Weight-based alerts on the automated dispensing cabinet

If under 40 kgs, a pharmacy order for weight-based dose specific syringe is required

If over 25 kgs, rectal acetaminophen is recommended barring contraindications



Acetaminophen vial

Weight-based dose specific syringe