

## Decreasing Pharmaceutical Waste

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- Pharmaceutical waste is defined as un-utilized medication leftover from case preparation or management and includes medication left in syringes and opened containers.
  - o Common in pediatric anesthesia
- **Routine/unavoidable waste** is the drug left over after the administration of the required dose to the patient<sup>1</sup>.
- **Preventable/avoidable waste** is the drug drawn up, but not used during the case<sup>1</sup>.
- **Typical amounts of drug wasted**<sup>2</sup>: adrenaline (100%), lidocaine (94%), atropine (70%), succinylcholine (66%), midazolam (64%), morphine (57%), and propofol (55%).

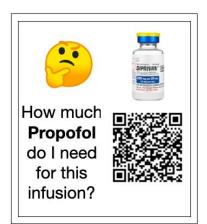
- **Cost of waste** = amount of wasted drug x unit price.
  - Affected by unit price, availability, packaging/pre-administration cost, prevalence of use, shelf-life.<sup>3</sup>

## Environmental cost

- Propofol is toxic to aquatic organisms, does not degrade in water, soil, or anaerobic conditions, and requires incineration > 1000°C for destruction<sup>4, 5</sup>
- EPA's Sewer Ban (Aug '19) requires controlled substances to be disposed via incineration as flushing of controlled substances is now illegal in states that have implemented the rule.

## **Strategies to Decrease Pharmaceutical Waste**

Individual	• Plan ahead – draw up medications after seeing patient
	• Return unused medications to pharmacy for recirculation
	• Join your hospital's <b>P&amp;T committee</b> and be a voice for sustainability in your institution!
System	• Form a multidisciplinary team to address medication waste
	• Partner with pharmacy to learn about supply chain, product substitution, repackaging, regulatory hurdles
	• If possible, dispense less & save more!
	• Coordinate with pharmacy to aliquot multiple doses for multiple patients in sterile fashion (e.g.,
	dexmedetomidine, bupivacaine)
	• Stock <b>prefilled syringes</b> over vials for emergency rescue drugs (e.g., succinylcholine, atropine,
	epinephrine, and phenylephrine)
	• <b>Restrict or decrease usage of expensive drugs</b> <sup>7</sup> : tweak the workspace (e.g., move the drug away from the
	OR), make it harder to order the drug (e.g., add steps in EHR, multiple clicks, pre-approvals, etc.)
	• Implement convenient environmentally appropriate disposal bins around the OR/Facility <sup>8</sup>
Education	• Offer <b>Decision making tools</b> (links in the electronic ordering system, screensavers, laminated cards)
	• Propofol volume prediction calculator to optimize syringe size (see QR code below)
	• Develop curricula for trainees around pharmaceutical waste and engage in discussion during conferences
Research/	• Study usage patterns across service lines and optimize medication supplies to individual areas
QI	o Cardiac ORs vs. General ORs vs. NORA suites



## References

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