

Drug Shortages, Practical Considerations

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Disclosures

- No financial interests to disclose



Anesthesia Drug Shortages

- Midazolam
- Thiopental
- Propofol
- Ketamine
- Fentanyl
- Ondansetron
- Ketorolac
- Calcium Chloride
- Atropine

Children's Hospital Colorado

- 318 + bed free standing children's hospital located in Aurora, Colorado
- Approximately 30,000 anesthetics/year in 36 locations including fetal, neonatal and cardiac
- 45 anesthesiologists and 20 anesthetists
- Affiliated with the University of Colorado
- Complex network of care reaching from Broomfield to Colorado Springs

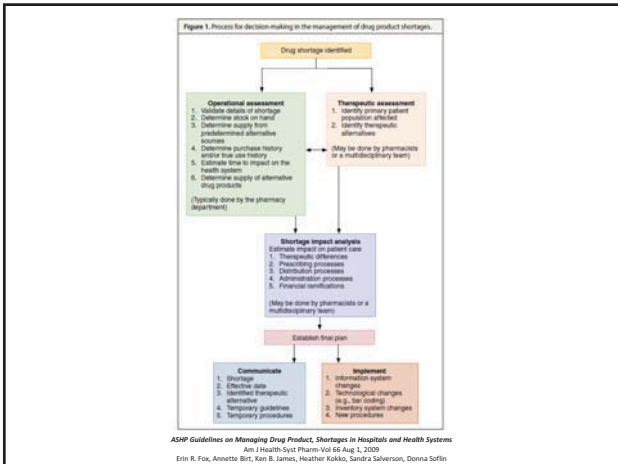
Pharmacy supply chain management via the *Omnicell Anesthesia Workstation (AWS)*

- Secure dispensing of intra-operative controlled and open stock anesthesia medications.
- Features:
 - Most medications immediately at hand
 - Securing of drawn up meds in-between cases
 - Documenting and disposing of controlled meds
 - Inventory management
 - At present, does not interface with AIMS systems



Propofol Shortage

- 7 July 2012, we were notified by our pharmacy of a serious propofol shortage in the US with both APP and Hospira abruptly stopping production.
- Our use averaged about 130 vials per day.
- A 15-20 day supply was available in the pharmacy at the time.



Operational assessment

1. Validate details of shortage
2. Determine stock on hand
3. Determine supply from predetermined alternative sources
4. Determine purchase history and/or true use history
5. Estimate time to impact on the health system
6. Determine supply of alternative drug products

(Typically done by the pharmacy department)

1. Abrupt and severe shortage
2. 2,000 vials 20 ml propofol on hand
3. Pharmedium pharmacy compounding
4. Average use is about 130 vials per day
5. 15-20 day supply remaining
6. Thiopental, methohexital, ketamine, midazolam, dexmedetomidine, etomidate

Therapeutic assessment

1. Identify primary patient population affected
2. Identify therapeutic alternatives

(May be done by pharmacists or a multidisciplinary team)

1. Primary patients:
 - IV induction including RSI
 - TIVA cases, especially those requiring neuromonitoring
 - MH susceptible patients
 - Out of OR (off site) anesthetics (MRI, oncology)
 - Niche uses (anti-emetic, emergence modification)
2. Therapeutic alternatives: consider all

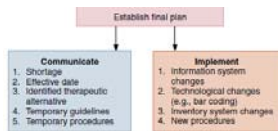
Shortage Impact analysis

Estimate impact on patient care

1. Therapeutic differences
2. Prescribing processes
3. Distribution processes
4. Administration processes
5. Financial ramifications

(May be done by pharmacists or a multidisciplinary team)

1. Dexmedetomidine and prolonged emergence, methohexital and nausea
2. No significant impact on prescribing process
3. Pharmedium propofol
 - requires refrigeration. 30 day shelf life (24 hours at room temp.)
 - too large to fit in Omnicell AWS
4. Mixing of methohexital
5. Cost of dexmedetomidine



- Communicate, communicate, communicate
- Reduce AWS PAR level from 20 to 2 and consolidate
- Investigate all therapeutic alternatives and implement as necessary
- Implement new workflow with Pharmedium refrigerated syringes
- Monitor AWS vial usage by provider

Summary

- Establish an excellent working relationship with your pharmacy.
 - Know the leadership
 - Establish quarterly meetings to discuss issues
 - Consider a pharmacy liaison to anesthesiology
- Open communication about upcoming shortages and strategize accordingly
- Consolidate shortage drugs in central location
- Over communicate with your department

