

# MSOS Member Briefings

3/16/2017

## MSOS Member Briefings March 2017

*Moderated by:*

E. Robert Feroli, PharmD, FASHP



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## Error Reduction Strategies to Prevent Inadvertent IV Administration of Inhaled Medications

Randi M Trope DO, MBA, FAAP, FCCP  
Pediatric Medication Safety Officer

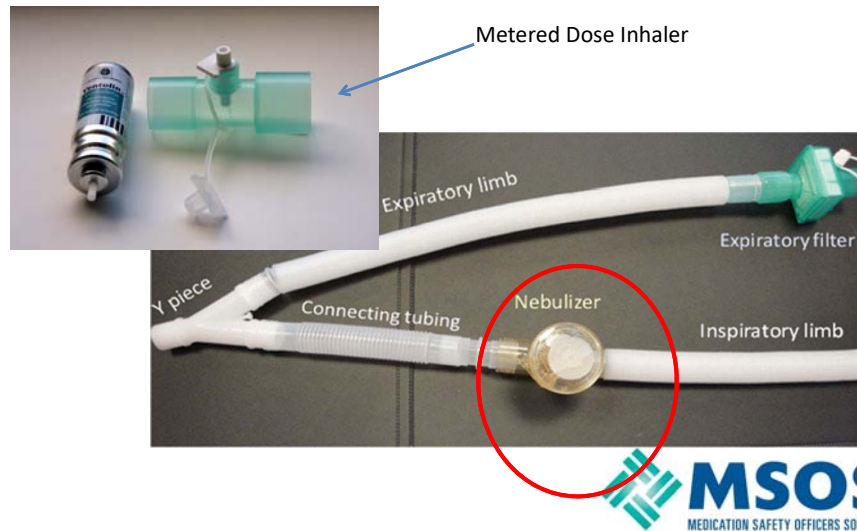


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## Inhaled medications in mechanically ventilated patients



## Continuous inhaled aerosolized medications: The Aeroneb



Albuterol:  
Concentration: 2.5 mg/ mL  
Dose: 0.3 - 1 mg/kg/hour (max 30 mg/hour)

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## Background




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## Determination of use

- Maintenance of competency
- Limitation to pediatric tertiary care centers



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## Prescribing challenges

- Continuous albuterol via face mask versus ventilator
- Limiting to two hospitals

- ALBUterol Continuous Nebulization - Peds - 2.5 mG/Hr for patients 5 kG to less than 10 kG
- ALBUterol Continuous Nebulization - Peds - 5 mG/Hr for patients 10 kG to less than 15 kG
- ALBUterol Continuous Nebulization - Peds - 7.5 mG/Hr for patients 15 kG to less than 20 kG
- ALBUterol Continuous Nebulization - Peds - 10 mG/Hr for patients 20 kG to less than 30 kG
- ALBUterol Continuous Nebulization - Peds - 15 mG/Hr for patients 30 kG to less than 40 kG
- ALBUterol Continuous Nebulization - Peds - 20 mG/Hr for patients 40 kG and over

ALBUterol Continuous Nebulization for Ventilator – Peds



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## Dispensing Challenges

- Use proper Aerogen syringe and NOT an IV syringe
  - Label similar to oral medications
  - Label clearly state to USE BLUE AEROGEN SYRINGE
  - Walked to IV room and prepared in hood.
    - IV room used to seeing yellow labels, white label
    - Is also a reminder to use a different syringe
- Package within different type bag than IV meds



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## Administration Challenges

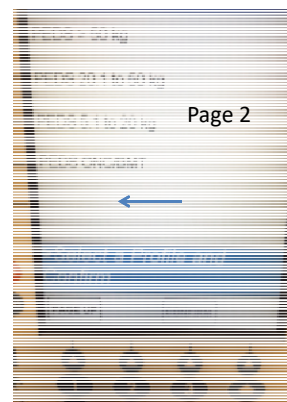
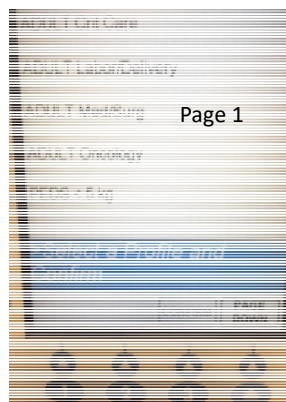
- Tubing for syringe
- Pump usage
  - Same or different than the IV pump used
  - Pump location
  - Pump programming



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## Pump Programming: To Wifi or not to Wifi???

- Respiratory profile
- Dedicated pumps off network



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**Clinical Advisory:**

Inhaled Medication  
NOT FOR IV USE  
Respiratory Only at  
CCMC & SI Hospitals

Continuous/Bolus - Non-Anesthesia Drugs																Clinical Ads. Name		
Drug Name Therapy Concentrations	Profile		Module		Conc. Limits	Dosing Units	Continuous				Bolus			Bolus Dose Administration Rate				
	Action	P	S	Soft Min			Soft Max	Hard Max	Initial Value	Soft Min	Soft Max	Hard Max	Initial Value	Soft Min	Soft Max		Hard Max	Initial Value
ALBUTEROL INHALATION 2.5 mg / 1 mL	RESP		X	n/a	Continuous	0.3	1											Resp
	<30kg				>30 kg:	5	30											
	>30kg		X		mg/kg/hour													
					mg/hour													



## Alternative options to continuous nebulization

- Why risk the possibility of inadvertent IV administration?
  - Intermittent nebulization
    - Heavy workload for respiratory staff
    - Can not give higher doses over longer than 20 minutes
    - Higher likelihood of late or missing doses
  - Intravenous options
    - Terbutaline
    - Aminophylline



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## Summary

Limiting use to certain hospitals

Pharmacy reinforcement during verification to limited use


Respiratory only access to specialty tubing

Separate profile with limited drugs and special clinical advisories

Reinforcing limited use in order browse

Specialty Aerogen Syringe  
Print on oral med label  
Hand delivered to prep area  
Delivery to floor in blue bag

Physically separate pump from IV use pump and different location in patient room

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## References

Slide 2:

1. <http://anesthesiology.pubs.asahq.org/article.aspx?articleid=1934460>
2. <http://www.respond2articles.com/ANA/forums/thread/741.aspx>

Slide 3:

1. <http://www.medicalexpo.com/prod/aerogen/product-85303-553333.html>
2. <https://www.hamilton-medical.com/Products/Mechanical-ventilators/HAMILTON-G5/HAMILTON-G5-features.html>

Slide 7:


1. <https://www.tri-anim.com/syringes-for-aerogen-solo-group-33415-3864.aspx>

Slide 8

1. <https://www.tri-anim.com/tube-set-aerogen-solo-continuous-nebulization-pharm-34021-3741.aspx>
2. <https://www.youtube.com/watch?v=EgEFLM0QjWI>

Slide 12:

1. <https://stratog.rcog.org.uk/tutorial/human-factors/the-swiss-cheese-model-8888>

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## Questions?



Knowledge and Compassion  
**Focused on You**

## D-Free in the ED

**Removing HYDRomorphine from the ED to  
Improve Patient Safety**

Bonnie Levin, PharmD, MBA  
AVP, Pharmacy Services  
MedStar Health  
Bonnie.levin@medstar.net



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## MedStar Health

- Ten hospitals in Maryland and Washington, D.C.
- 30,000 Associates
  - 7,000 RNs
  - 1,100 Residents
- 4,300 Physicians, including 2,000 employed by MedStar
- More than 150 ambulatory sites
- Private, Not-for-Profit organization with 20 health-related organizations besides hospitals
- \$5B in revenues



## Background

- Three adverse events noted by ED leadership with IV HYDROMorphone
  - Two different facilities
- RCA: common themes identified
  - Lack of knowledge of 1:7 morphine dosing equivalent
  - Stacking (doses given too close together)
  - Escalating (giving increasing doses)
  - Use in high risk patients
  - Appropriate dosing for narcotic naïve patients



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## Background

- **RCA Recommendations:**
  - Remove HYDROmorphine from ED Pyxis
  - Revise ED pain order sets:
    - remove q15 minute IV opioid dosing. Restrict to q 1 hour dosing x 1
    - show lower starting doses for morphine and warnings to reduce dose for at risk patients
  - Revise nursing policy from 60 minutes to 30 minutes reassessment post IV opioid administration
  - Create a training module for physicians to educate about safer narcotic dosing and at risk patient types
  - Recommend capnography when available for monitoring high risk patients who receive IV opioids



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## Intervention Timeline

- **April/May 2014:**
  - Email alerts
  - Education
  - Safety Moments in EDs, Emergency Medicine Leadership Council- all 9 MSH EDs
- **August 2014:**
  - Continued education
  - $\geq 2$ mg HYDROmorphine order statements removed from CPOE
  - HYDROmorphine (IV) removed from two EDs' Pyxis machines
  - Available from pharmacy - creates "speed bump" (~30-60min)
- **October 2014:**
  - 3<sup>rd</sup> ED went D-Free



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## Methods

### Data types:

- Clinical Data (EMR)
  - Orders
  - Pyxis withdrawals
  - eMAR documentation
  - Naloxone usage
- HCAHPS Survey
- Patient Safety Event Reports
- Staff survey for acceptance and unintended consequences (i.e. increased workload, other safety events, etc.)



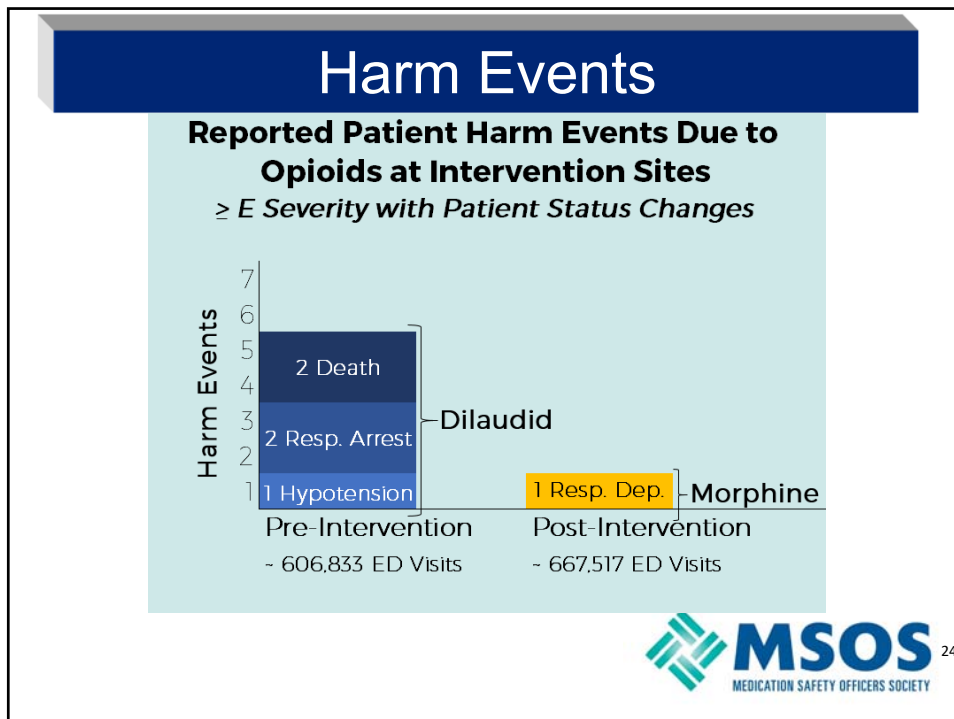
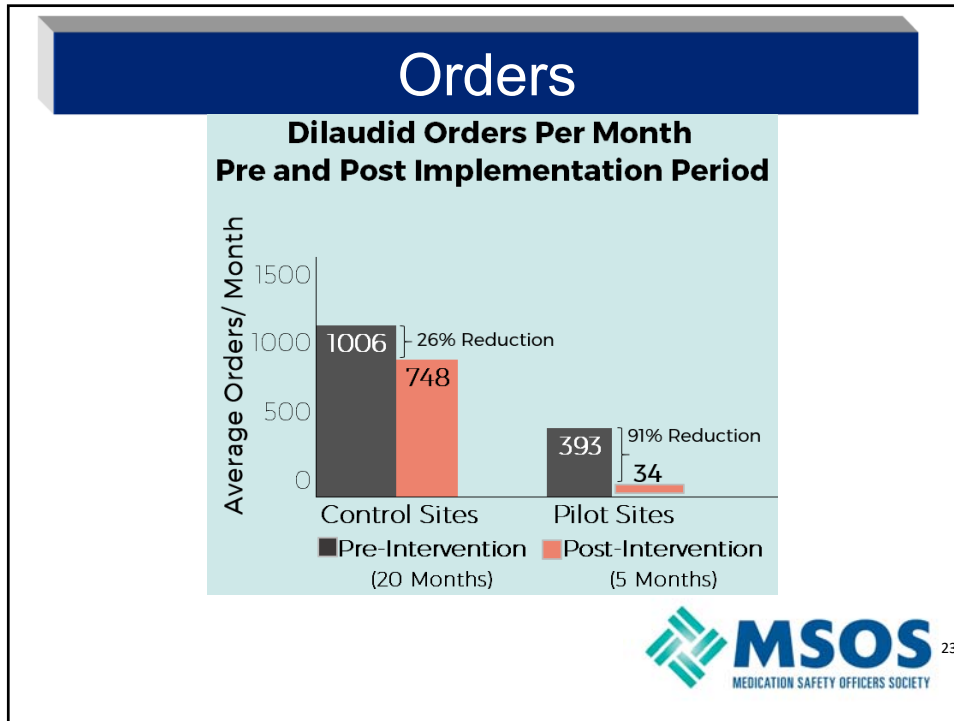
## Results

- EMR Data
  - 6 Emergency Departments
    - 3 Pilot sites (P1-P3), 170 – 867 beds
    - 3 Controls (C1-C3), 301 - 380 beds
  - 6/30/13 – 12/31/14
  - 48,046 orders
    - Excluded -PRN, non-IV/IM, pediatric, duplicate, non-ED
    - Morphine 21,615
    - HYDROmorphine 19,493
    - Naloxone 389
    - **Final count: 41,497 orders**



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## Other Results

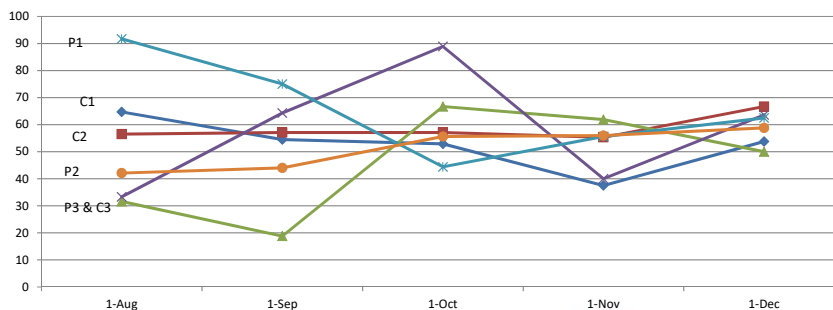
- 55% overall reduction in HYDROmorphine (pilot and control)
- Consistent number of pain doses
- Significant drop in HYDROmorphine doses  $\geq 2$  mg
- Increased use of PO opioids and APAP/ibuprofen
- Carry-over effect on inpatient: 10% reduction of HYDROmorphine use
- PSEs:
  - 1.4 PSEs/10,000 Morphine Orders
  - 7.7 PSEs/10,000 HYDROmorphine Orders



## HCAHPS Survey Results

- ED Survey question #13, “How often was your pain well controlled?”
- Limitation: selection bias

HCAHPS responses since D-Free intervention



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## Staff Survey-Preliminary Results

- 47 responses from initial two pilot sites
- 12 RN, 28 Attending, 7 Physician Assistant
- Since the removal of HYDROmorphine from the ED Pyxis.....
  - 91.3% HYDROmorphine is never ordered on a shift
  - 69% have 1-4 patients request HYDROmorphine per shift
  - 85% easier/no change in treating morphine allergies
  - 80% easier/no change in treating severe pain
  - 71% easier/no change in treating opioid tolerance
  - 81% increased/no change in prescribing consistency



## Overall Results

- Doses of IV HYDROmorphine declined at all sites
- Doses of IV HYDROmorphine declined more substantially at pilot sites
- Reduced utilization of high dose strength
- No clear change on patient experience
- Overall reduced risk by using more morphine
  - ~4.1 PSEs may have been prevented



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## HYDROmorphine – Additional Recommendations

- Remove HYDROmorphine IV stock from ED
- Add lower dose one-off order sentences, viewable in ED, to include 0.2mg dose , and 0.5mg dose
- Take HYDROmorphine IV off over-ride on all nursing units
- Discern alert to fire when prescriber orders HYDROmorphine IV in patient with any of the following risk factors: age >55, COPD, OSA, asthma, etc.
- Add alerts to “Special Instructions” and Pyxis: IV HYDROmorphine equivalent in potency to 7mg IV morphine.



## Questions?



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## Is there fat in that SALAD? Preventing errors between conventional and alternative dosage forms

Julie L. Kindsfater, PharmD, BCPS  
Drug Policy Coordinator, Sr.  
February 2017



### Beware of look-alike formulations

... all that's white is not propofol!

<p>Propofol (Diprivan) <i>Sedative</i></p> 	<p>Bupivacaine liposome (Exparel) <i>Local anesthetic</i></p> 
<p>Clevidipine (Cleviprex) <i>Non-formulary antihypertensive</i></p> 	<p>Rotaglide <i>Surgical lubricant</i></p> 

**Ensure your patients' safety by:**

- Separating storage of these products
- Verifying drug names
- Labeling all medications, medication containers (syringes, cups, basins, etc.), and other solutions (both on and off the sterile field) unless immediately administered
- Discarding any unlabeled products that are not immediately administered



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## Safeguards

### 1. Formulary considerations and constraints (prospective review)



### 2. Segregated storage



### 3. Differentiation

### 4. Barcode verification on preparation



### 5. Labeling



## Safeguards



### 6. Unique dose limits on order entry and smart pump

### 7. Barcode medication administration



amphotericin B 50 MG SOLR Medications 0.25 mg/kg  
dextrose 5 % SOLN Base 250 mL  
Weight: 48.1 kg

### 8. Hyperlink to IV guidelines in eMAR

References: [Med Admin Guidelines](#)  
[Micromedex](#)

### 9. Safety posters, newsletter articles, education



### 10. Retrospective review



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Michael R. Cohen, RPh, MS, ScD (hon.), DPS (hon), FASHP  
President, ISMP



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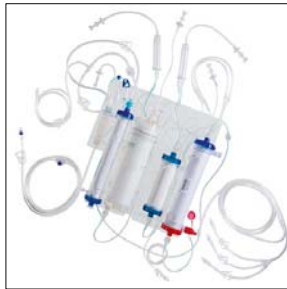


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## Very high concentration heparin used in error



## Launch of Global Patient Safety Challenge – Medication Safety

Bonn Germany March 29<sup>th</sup> 2017

- Promote international cooperation to influence guidance for regulators, manufacturers and practitioners to improve safety of labeling, packaging, drug naming.
- Lack of medication error reporting programs globally
- Common for drug preparation by nurses in clinical areas; no good way to report information when errors occur
- Influence global standards for bar coding, use of technology for compounding
- Influence use of prefilled syringes and premixed parenteral solutions of high alert drugs
- Actions for health professionals and patients (med rec., etc)



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## Applications for the new ISMP International Safe Medication Management Fellowship (2 years full time at Horsham PA Office)

Applications accepted starting on  
April 3, 2017.  
More information coming soon.



July 30, 2015 • Volume 30 Issue 15

### Acute Care

## ISMP Medication Safety Alert!

Engaging the Healthcare Community About Safe Medication Practices

#### Update on implementation of the new ENFit enteral connectors

**Special ALERT**

**Loss of drug potency**

Some hospital pharmacists have been in touch with us recently to report potency issues with certain medications prepared in ampules in 10 mL or 5 mL 50 syringes. One of the medications is fertAM, celecoxib injection diluted to 10 mg per mL for pediatric use, which was prepared in a hospital pharmacy. One hospital sent 3 syringes of diluted fertAM, 10 mg/mL, to an outside laboratory for testing. Of the three, the potency had declined to 87% on average, and by day 6, the potency was at 58%. Another hospital tested syringes of fertAM, 5 mg/mL, in 3 mL syringes and found a range of potencies between 90% and 100%. Nothing at two other laboratories showed similar results. A third hospital reported inadequate patient analgesia, also with diluted fertAM.

We spoke with a BD representative, who confirmed that an issue exists. The issue may be related to the fact that our dispensers from a secondary supplier that offer "pH sensitive" medications such as fertAM.

**10th Annual ISMP Cheers Awards**

Each year, ISMP celebrates individuals and organizations that have set a standard of excellence in the prevention of medication errors during the previous 12 months. Nominations for this year's CHEERS Award will be accepted through September 11. Join us for a gala at The Chateau in New Orleans on December 8 as we celebrate this year's winners! Please visit [www.ismp.org/Cheers](http://www.ismp.org/Cheers) to submit a nomination, register for the gala (link on Support), or make a donation to support ISMP medication safety efforts.



Figure 1. New ENFit enteral connector (left) and old Luer lock connector (right).



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## BD stopper issue

- BD in the process of returning to the legacy stopper material for all 3 mL & 5 mL offerings.
- Not yet completed.
- Offering the 3 mL & 5 mL syringe with the Legacy stopper material with alternative SKU (Stock Keeping Unit) numbers (309658 & 309649 respectively) and will have same pricing structure.
- Pharmacy convenience tray package offering, which aligns with batch filling; was converted for 3 and 5 mL and 30 mL syringes in July 2015. The 1 mL, 10 mL, 20 mL and 60 mL had not converted to the alternative stopper source.



## ISMP High Alert Drug Self-Assessment Tool

**Coming Soon!**

### ISMP Medication Safety Self-Assessment for High-Alert Medications

Looking for a way to meet regulatory and accreditation requirements for managing high-alert medications and conducting proactive risk assessments on high-risk processes?

Then be on the lookout for the latest ISMP self-assessment, targeted for release in early 2017.

The ISMP Medication Safety Self-Assessment for High-Alert Medications will help inpatient and outpatient healthcare facilities to:

- Evaluate safety practices regarding high-alert medications
- Identify opportunities for improvement
- Meet regulatory and accreditation requirements related to high-alert medications and proactive risk assessment
- Compare their progress over time
- Create their own safety-focused initiatives

**New!** Participants will be able to respond to just the sections that cover categories of high-alert medications used in their facilities. Choose just one or all 11 of the high-alert medication included in the assessment! Participants also will be able to track and submit sections for each drug category separately over time.

**Issues:**

- Neonates for Blanking Agents
- Anticoagulants
- Centralized Electrolytes
- Magnesium Sulfate
- Chemotherapy
- Medications for Non-ecologic Use
- Liquid-Solvent Medications
- Spinals
- Spinals and/or Local Anesthetics via the Neuraxial Route
- Medically and Mentally Sedated

For more information:  
www.ismp.org  
@ISMP | 800.541.2125  
316.942.7792

The ISMP Medication Safety Self-Assessment for High-Alert Medications is available to all ISMP members.  
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## TJC considering standard requiring metric weight (Kg or g) for pediatric patients

- Recommendation to weigh pediatric/neonatal patients in kilograms in literature for more than 20 years.
- A patient safety issue since FDA-approved dosing of pediatric/neonatal medications is based on the patient's weight in kilograms.
- Serious medication errors have occurred in these populations because patients are still weighed in pounds throughout the continuum of care, including the emergency department.
- Many organizations recommend weighing the pediatric/neonatal patients in kilograms, including ISMP.
- There has been no formal method to hold organizations accountable for weighing pediatric/neonatal patients in kilograms.
- Stakeholder call focused on barriers to implementation, best practices, and possible actions The Joint Commission can take.



## Questions?



- Don't forget to mark you calendar:
  - LIVE MSOS Member Meeting at the ASHP Medication Safety Collaborative on Sunday, June 4, 2017 from 12:30-1:30pm in Room 101G Minneapolis Convention Center
  - Our next MSOS Briefings webinar on Thursday, June 15, 2017 from 1-2pm EDT.

