Learning Objectives

- Describe gaps between current safety standards and available published tools for high-alert medications
- Apply the HAMST-R and HAMST-R PRO methodology to formulary and non-formulary agents
- Design a plan to evaluate risk reduction strategies surrounding high-alert medications at your institution

Medication Error Prevention

Neonatal Heparin Overdose—A Multidisciplinary Team Approach to Medication Error Prevention

Despite the efforts of many hospitals, system failures can result in medication errors that may be life threatening. During 2006 and 2007, nine neonates received potentially fatal doses of heparin. This paper will review contributing factors to the heparin medication errors and ways to minimize the risk of heparin overdose.

KEYWORDS: heparin, medication error, medication safety, neonate

An estimated 380,000 – 450,000 preventable adverse drug events occur in hospitals each year


EXPLORATORY AND MULTI-SITE VALIDATION STUDY OF HAMST-R

McKenzie Shenk, PharmD

Key Players with HAMs

No objective, validated tool existed to identify HAMs

TJC, NCC-MERP, ISMP, ICPS, SLAMS, TJC – MM.01.01.03, DNV GL – MM.1 (SR.9), HFAP – 25.01.20

The Joint Commission = TJC; Healthcare Facilities Accreditation Program = HFAP; Institute for Safe Medication Practices = ISMP; Indianapolis Coalition for Patient Safety, Inc. = ICPS; St. Louis Area Medication Safety Group = SLAMS; Safety Event Classification = SEC; National Coordinating Council for Medication Error Reporting and Prevention = NCC-MERP.
Development of HAMST-R

- ASHP Checklist (Section of Inpatient Care Practitioners)
  - Summer 2015
- HAMST-R Phase I: exploratory study (Eskenazi Health)
  - March 2016
- HAMST-R PRO Phase III: prospective study (national involvement)
  - Present

HAMST-Phase II

- 451 (170) # inpatient beds
- 98,834 (61,606) # of ED visits per year
- 46.9 (21.8) Pharmacist FTEs
- 3 (50) Academic Medical Center
- 3 (50) Trauma Center
- 3 (50) Rural Hospital

*Data reported as mean (SD) or as n (%); N = 7

HAMST-R Phase II

- Primary Outcome
  - Content Validity
    - CVI goal 78%
    - HAMST-R CVI 80%
- Secondary Outcome
  - Inter-Rater Reliability
    - Kendall’s Coefficient of Concordance (K)
    - K = 0.56, p < 0.001
**HAMST-R Phase I Scores**

- **Phase I HAMs**: Median (IQR): 4 (4,6)
- **Controls**: Median (IQR): 1 (0,1)
- **p<0.001**

**HAMST-R Phase II Scores**

- **Phase II HAMs**: Median (IQR): 6 (5,6)
- **Controls**: Median (IQR): 1 (0,1)
- **p<0.001**

**HAMST-R Overview**

- **Global Safety Concerns**
  - ISMP
  - Internal/Potential Errors
  - External Errors
  - Vulnerable Populations

- **Medication Use Process**
  - Prescribing
  - Transcribing
  - Storage
  - Dispensing/Preparation
  - Administration
  - Monitoring
Group Application with HAMST-R for Alteplase

- Together we will complete Questions 1 - 4
- Working in small groups at your tables, utilize HAMST-R to evaluate your two steps of the medication use process
- Determine one consensus score for each of the two questions
- Large group discussion and sharing will follow
Group Application with HAMST-R for Alteplase

• Together we will complete Questions 1 - 4
• Working in small groups at your tables, utilize HAMST-R to evaluate your two steps of the medication use process
• Determine one consensus score for each of the two questions
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**Key Takeways**

- Health-systems do not have a standard method to identify HAMs
- HAMST-R is a valid, reliable, and easy to use tool to distinguish between HAMs and non-HAMs
- HAMST-R was intended to evaluate current formulary agents

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**HAMST-R PROSPECTIVE (HAMST-R PRO)**

Joel Daniel, PharmD, MS, CPPS

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**HAMST-R PRO**

- Global Safety Concerns
  - ISMP
  - Internal/Potential Errors
  - External Errors
  - Vulnerable Populations

- Medication Use Process
  - Prescribing
  - Transcribing
  - Storage
  - Dispensing/Preparation
  - Administration
  - Monitoring
Group Application with HAMST-R PRO for ARIPiprazole lauroxil

- Together we will complete Questions 1 - 4
- Working in small groups at your tables, utilize HAMST-R PRO to evaluate your two steps of the medication use process
- Determine one consensus score for each of the two questions
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Group Application with HAMST-R PRO for ARIPiprazole lauroxil

• Together we will complete Questions 1 - 4
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Group Application with HAMST-R PRO for ARIPiprazole lauroxil

Key Takeaways

• Minor adjustments to each step of the medication use process allows for prospective review

• May need subject matter experts to review different sections

CLINICAL PEARLS FOR HAMST-R AND HAMST-R PRO
HAMST-R and Risk Reduction Strategies

- Increased awareness of risk reduction strategies or lack thereof
- Single risk reduction strategies utilized
- Risk reduction strategies may be driven from the system-level
- Independent double check was required for all HAMs
- Computerized Physician Order Entry (CPOE)
- Alerts for pharmacy and nursing

Safety Organizations’ Approach to Reducing Risk

ISMP Safe Practice Recommendations

“A single risk-reduction strategy for each high-alert medication is rarely enough to prevent harmful errors.”
ISMP Safe Practice Recommendations

- Develop/update a hospital-specific list
- Implement risk reduction strategies
- Understand the causes of errors
- Assess effectiveness of risk reduction strategies

A Comprehensive Approach

- Layer numerous strategies together to address the targeted risk
- Impact as many steps of the medication use process as possible
- Pair low-level strategies with high-level ones
- Identify published strategies
- Apply to various settings
- Balance implementation with impact on resources
- Sustain over time

ASHP Guidelines on Preventing Medication Errors in Hospitals

- “...to provide pharmacists with practical recommendations and best practices for preventing and mitigating patient harm from medication errors in the health system setting.”

This is a prepress version of guidelines that will appear in final form in ASHP at a future date. Those guidelines will replace this preliminary version when they are final.
Medication Use System

ICPS HAM Workgroup

ICPS HAM/ALADs Risk Reduction Strategies

- A: Medication errors are limited to 1/10,000 per patient day.
- B: Medication errors are limited to 1/100,000 per patient day.
- C: Medication errors are limited to 1/1,000,000 per patient day.
- D: Medication errors are limited to 1/10,000,000 per patient day.
- E: Medication errors are limited to 1/100,000,000 per patient day.
- F: Medication errors are limited to 1/1,000,000,000 per patient day.
- G: Medication errors are limited to 1/10,000,000,000 per patient day.
- H: Medication errors are limited to 1/100,000,000,000 per patient day.
- I: Medication errors are limited to 1/1,000,000,000,000 per patient day.
- J: Medication errors are limited to 1/10,000,000,000,000 per patient day.

Medication Use Process

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Think-Pair-Share

- Discuss how you can implement risk-reduction strategies to target vulnerable steps of the medication use process for alteplase and ARIPiprazole lauroxil
- Large group discussion and sharing will follow

Key Takeaways

- Implementing at least one high-level impact risk reduction strategy should be considered for each step of the medication use process for HAMs
- Conducting a gap analysis comparing best practices/evidence-based recommendations to current practice may enhance the medication safety process surrounding HAMs
Conclusions

• Before HAMST-R, institutions did not have an objective, validated tool to identify HAMs
• HAMST-R and HAMST-R PRO methodology can be used to evaluate both formulary and non-formulary agents
• Each health-system should work to develop a multi-faceted plan to address vulnerable steps in the medication use process for HAMs

HAMST-R and HAMST-R PRO

• Eskenazi Health and CoxHealth will be conducting a multi-site study over the next several months
• Project aim: to validate HAMST-R PRO
• If you are interested in participating, please obtain a business card from a presenter