Safeguards to Prevent Medication Errors

Basic Medication Safety (BMS) Certification Course
King Saud bin Abdulaziz University for Health Sciences,
Ministry of National Guard – Health Affairs
Learning Objectives

• Review the best error prevention tools (Hierarchy of Effectiveness)

• Explain the role of different types of medication safety technologies

• Emphasize the advantages of Smart Pump Technology

• Explain different methodologies used to minimize the consequences of errors

• Review the medication reconciliation process

• Discuss the importance and impact of patient education
How to Select the Best Error Prevention Tool

Hierarchy of Effectiveness

1. Forcing functions & constraints
2. Automation / computerization
3. Simplification / standardization
4. Reminders, redundancies, checklists and double checks
5. Rules and policies
6. Education & access information
7. Be careful...Be vigilant

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1. Forcing Functions & Constraints

Allergy hard stop prior to medication order entry

Order entry hard stop due to allergy not yet documented
1. Forcing Functions & Constraints

Oral syringes vs. Luer lock syringes
Medications drawn up, not administered immediately, should be consistently labeled with:

- Patient name and MRN
- Medication name
- Dosage / concentration
- Date prepared
- Beyond-Use Date (BUD)
1. Forcing Functions & Constraints

Concentrated electrolytes and Paralyzing Agents: adding constraints
2. Automation / Computerization

Computerized Prescriber Order Entry (CPOE)
2. Automation / Computerization

Electronic Medication Administration Record (e-MAR)
2. Automation / Computerization

Medication Dispensing Robotics
Automated Dispensing Cabinets (ADCs)
2. Automation / Computerization

Smart Pump

Point-of-Care Barcoding
### 3. Simplification / Standardization

#### Standardized medication labels

<table>
<thead>
<tr>
<th>Code</th>
<th>Medication</th>
<th>Alert Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>26523</td>
<td>Abciximab 10 mg / 5 mL injection</td>
<td>HIGH ALERT MEDICATION</td>
</tr>
<tr>
<td>108380</td>
<td>Warfarin 3 mg tablet</td>
<td>HIGH ALERT MEDICATION</td>
</tr>
<tr>
<td>26224</td>
<td>Brettylum 500 mg / 10 mL injection</td>
<td>HIGH ALERT MEDICATION</td>
</tr>
<tr>
<td>26256</td>
<td>Atenolol 0.5 mg / mL injection</td>
<td>HIGH ALERT MEDICATION</td>
</tr>
<tr>
<td>107940</td>
<td>Cisatracurium 20 mg / 10 mL injection</td>
<td>HIGH ALERT MEDICATION / PARALYZING AGENT</td>
</tr>
<tr>
<td>111308</td>
<td>Dexmedetomidine 100 mcg / mL injection</td>
<td>HIGH ALERT MEDICATION</td>
</tr>
</tbody>
</table>
3. Simplification / Standardization

Safe Labeling of Syringes: all syringes must be labeled if not immediately administered.
4. Reminders, Redundancies, Checklists & Double-Checks

**Auxiliary medication labels**

- **HIGH ALERT MEDICATION**

- **WARNING: PARALYZING AGENT – CAUSES RESPIRATORY ARREST!**

**Chemotherapy Checklist**

1. Performed by:

2. Review copy of original document used to determine the prescribed regimen:

3. Verify the signature of consultant and to certified Nurses:

4. Check patient identification information (MRN, name):

5. Recalculate patient’s BSA, unit conversions, patient specific dose and dose adjustments:

6. Confirm diagnosis and appropriateness of chemotherapy regimen for the diagnosis:

7. Prepare chemotherapy worksheet and labels:

8. The pharmacist preparing the labels must enter their initials on order sheet:

9. The pharmacy technician must gather the patient-specific labels with medication:

10. The pharmacist must check the final product:

11. The correct drug has been used:

12. The drug was reconstituted correctly, using the correct volume and diluents:

13. The volume of drug used was accurately measured for the prescribed dose:

14. The label is correct in regards to patient:

15. Place chemotherapy preparation in plastic zip-lock bag:

16. Comment:

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RPh: Saud Al Nofal, RPh

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Saudi Medication Safety Center
5. Rules and Policies
6. Staff Education & Access to Information

- One Stop Resource: NGHA Intranet
  - Basic Medication Safety (BMS) Course
  - Micromedex
  - NGHA Drug Formulary
  - Standardized medication labels
  - APPs, protocols & guidelines

- Use of electronic devices to access information

- Medication safety messages via SMS & TV screens in hospital corridors
7. Be Careful...Be Vigilant

ALL healthcare providers are responsible and accountable for their acts and omissions.
How to Select the Best Error Prevention Tool

Hierarchy of Effectiveness

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Advances in Technology

1990

2016
Patient received DYAZIDE® (diuretic) while on Lithium

High Lithium:
- Mania
- Renal Failure,
- Hemodialysis & Death

Clinical Decision Support (CDS) software for CPOE systems assists in detecting and correcting lethal medication errors
Smart Infusion Pump Technology

• Smart pumps ensure that medications are delivered within a **safe dose range**

• Utilizing the Drug Library Keeps Your Pump SMART
Soft Limit Override

Adre.0.1
Rate: 8.4ml/h
mcg/kg/h

Dose
Rate: 9.8ml/h
mcg/kg/h

Upper limit: 13.01
14 mcg/kg/h?

Hard Limit Stop

Limit: 800...1000
1100 IU/h?

Value reached upper limit
Minimize the Consequences of Errors

- Reduce the amount of Floor Stock
- Stock the lowest concentration required for treatment
  - (e.g., 5,000 units vs. 125,000 units)
- Availability of antidotes
- Availability of Anaphylactic Kit (Adult & Pediatric)
Medication Reconciliation

- The process of comparing the medications a patient is taking (and should be taking) with newly ordered medications.

- The comparison addresses duplications, omissions, and interactions, and the need to continue current medications.

- The type of information that clinicians use to reconcile medications include (among others) medication name, dose, frequency, route, and purpose.

- More than 40% of medication errors occur during:
  - Admission, Transfer and Discharge.

National Patient Safety Goals Effective January 1, 2013
Medication Reconciliation: Five Steps

1. Develop a list of current medications
   (Best Possible Medication History – BPMH)
2. Develop a list of medications to be prescribed
3. Compare the medications on the two lists
4. Make clinical decisions based on the comparison
5. Communicate the new list to appropriate caregivers and to the patient
Impact of Medication Reconciliation

Physicians
↓ Medication prescribing errors by 70 – 80%

Pharmacists
↓ Clarifying physician orders and outpatient prescriptions

Improved Patient Safety!!
↓ Patient adverse events by 15 – 30%

↓ Time spent on medication histories and counseling
↓ Medication administration errors 45 – 65%

Future of Medication Reconciliation at MNG-HA

<table>
<thead>
<tr>
<th>Medication Type:</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Medication Types</td>
</tr>
<tr>
<td>H - Home Medications</td>
</tr>
<tr>
<td>V - Visit Orders</td>
</tr>
<tr>
<td>D - Discharge Medications</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Visit Order Type:</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
</tr>
<tr>
<td>Active Only</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medication</th>
<th>Information</th>
<th>Last Dose</th>
<th>Start</th>
<th>Stop</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atorvastatin Calcium 10 MG</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Simvastatin 10 MG Oral Tablet</td>
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</tr>
</tbody>
</table>
Patient Education

- Initiate at the time of prescribing
- Involve patients and caregivers
- Inform patients of drug name, purpose, dose, and side effects
- Encourage patients to ask questions and expect answers
- Listen to what the patient is saying, as he / she is the last independent double-check
Why is Patient Education Important?
Safe Patient Care Is Our Goal