Objectives:
- To compare the different types of dispensing medication systems and relate that to medication errors and medication safety.
- To elaborate on the pharmacist’s (hospital and/or clinical pharmacist) important role in medication safety.
- To discuss the algorithm for enhance medication safety.
- To elaborate on some of administrative views related to medication safety.

Outlines:
- Introduction about medication errors (ME) and medication safety.
- Discuss the advantages and disadvantages of the current distribution systems available in hospitals and relate that to medication safety.
- Algorithm and/or recommendations to increase medications safety in hospitals including administrative views.

Pharmacy Services Dept.

Outpatient Services
(Clinics, Discharge patients)
Anticoagulation, Refill, Antilipid

Inpatient Services
(hospitalized Patients)

Distribution Systems

1. Traditional System
2. Unit Dose System (UDS)
3. Combination of 1 & 2

Medicine Distribution Systems in Hospitals
Medication Errors Vs. Adverse Drug Events?
- ME: Events that occur in the use of medication, producing an unintended and usually undesirable outcome. But not all ME cause harm.
- ME that have caused patient harm can be termed “adverse drug events”.
- ME represent human errors and we must accept that, such errors are inevitable.

Many ME occurring due to system issues, that is why Medication errors also called “Drug-Use-System Errors”.

Errors are fact in our life

Preventing errors means designing the health care system at all levels to make it safer. Building safety into processes of care is a more effective way to reduce errors than blaming individuals.

Kohn et al. To error is human: IOM, 2000

I. Traditional System:
1. Floor Stock System:
   - Interpretation of physician’s orders mostly by nurses.
   - Transcription to Medication Administration Record (MAR) by nurses.
   - Distribution of drug from pharmacy is in bulk form.
   - Compounding I.V admixture mostly by nurses.

Advantages of floor stock system:
1. Availability of medicine at nursing site.
2. Reduction in the number of pharmacy personnel.
3. Reduction in the number of orders received in the pharmacy.

Disadvantages of floor stock system:
1. Increased medication errors.
2. Increased drug inventory on the pavilions.
3. Greater opportunity for pilferage.
4. Increased hazards associated with drug deterioration.
5. Lack of proper storage facilities.
6. Greater nurses time is spent on drug dispensing.
7. Minimal pharmacy doctors contact.
8. Pharmacist can not make drug monitoring.
II- Unit dose system:
- **Definition:**
  - In 1975, ASHP issued a statement of unit distribution.
  - Medications are contained in single dose packages.
  - Medications are dispensed in a ready to administer form as possible.
  - For most medications, not more than 24 hours supply of doses are delivered to or available for each patient care area at any time.
  - A patient profile is maintained in the pharmacy.

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- **Advantages of unit dose system:**
  1. Reduction of medication errors.
  2. Reduction in total cost of medication.
  3. More efficient usage of pharmacy and nursing personnel.
  4. Improved overall drug control and drug use monitoring.
  5. More accurate patient billing for drugs.

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- **Advantages of unit dose system (cont.):**
  6. Great control over pharmacy workload pattern and staff scheduling.
  7. Reduction in the size of drug inventories located in patient care areas.
  8. Greater adaptability to computerized and automated procedures.

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- **Medications use spans multiple stages:**
  - Prescribing and ordering 56%
  - Dispensing 4%
  - Transcribing 34%
  - Administering 34%
  - Monitoring

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- **Pharmacists can play a major and important role at all these stages.**
- **Two issues evolve the profession of pharmacy**
  - Adverse drug events
  - Distribution systems
What are the possible activities that pharmacist need to take in each stage to increase medication safety (i.e., reducing medication errors).

- **Prescribing Stage:**
  - Clarify and verify orders
  - Overcome authority gradient
  - Gain the trust and confidence of prescribing physicians
  - Establish protocols and order sets (Policy & Procedures).
  - Maintain open communication channels with physicians.

- **Dispensing Stage:**
  - Automate dispensing.
  - Re-organize drug storage and shelving to separate drugs with similar names.
  - Redesign workflow to achieve efficiency and to facilitate safety checking.
  - Use of computerized clinical information.
  - Be more vigilant with high-risk medications and high-risk patient, e.g., establish a system of double-checks.
  - Communicate clearly with nurses and patients.

- **Transcribing and Administering stage:**
  - Support and facilitate use of electronic medication administration records (MARs).
  - Ensure that each patient's MAR is updated in a timely manner when pharmacy service is not available.
  - Check and compare each patient's MAR at least daily to ensure that orders are interpreted correctly and carried out.
  - Support the use of bar coding for patients, orders, and drugs for administration.

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**Type of Service cost saving**

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost Saving</th>
<th>TCC Decrease</th>
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<tbody>
<tr>
<td>DUE Each $ of R.Ph salary</td>
<td>$31.92</td>
<td>↓ TCC</td>
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<tr>
<td>ADR monitoring</td>
<td>$2988.57</td>
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<td>Drug information</td>
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<td>Drug protocol management</td>
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<tr>
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<td>Admission drug history</td>
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<tr>
<td></td>
<td>$776.64</td>
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</tbody>
</table>

TCC = Total Cost of Care = TCC

Bond et al study (Pharmacotherapy June, 2000) – Cont'd
Pharmacist Impact on Medication Safety:
The Hospital Administration Perspective

- **Monitoring Stage:**
  - Therapeutic Drug monitoring services
    - Follow up laboratory results and/or blood level monitoring.
    - Screen automatic stop orders for drugs that require reactivation.
    - Perform daily review of drug profiles to spot potential problems.
    - Establish rapport and effective communication with nurses.
    - Engage patients.

- “Technically the biggest safety system in the healthcare is the minds and hearts of the workers (Pharmacists) who keep intercepting the flaws in the system and prevent patients from being hurt. They are the safety net, not the cause of injury.”
  
  *Don Berwick*

- **Conclusion:**
  - Pharmacists (hospital, community, clinical) have a key leadership role to play in terms of medication safety among their colleagues in the hospital.
  - Most medication errors are resulted due to medication systematic order process.
  - There must be a systematic approach and/or clear P&P in dispensing medications.
  - Using of computerized facilities in carry out the prescription stages increase medication safety.

Thank you