

Pharmacy 492  
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# Drug Distribution Systems for Long Term Care Facilities

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# Drug Distribution

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- The process:
  - Receipt/ transcription of orders
  - Interpretation/ evaluation of orders
  - Filling/packaging and checking
  - Delivery
  - Administration

# New Orders

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- Received as written, electronic/ fax or phone orders
- Communications between:
  - Physician
  - Nursing staff
  - Consultant pharmacists

# Evaluation of orders

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- Prospective review
- Ensure appropriate:
  - Indication
  - Dosage and dosage form
  - Route of administration
  - Dosing interval
- Check allergy profile and h/o adverse drug reactions
- Assess:
  - Concomitant disease states/ medications
  - Interactions: Drugs, disease, food

# Filling and Packaging

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- Manual and semi-manual systems:
  - Vials
  - Unit dose and cassettes
  - Modified unit dose: Bingo cards
  - Medisets
- Automated systems:
  - Pyxis: medication distribution
  - Robotics and other automation: dispensing and packaging

# Traditional Vials

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- Advantages:

- Time efficient for dispensing pharmacist
- Less costly

- Disadvantages:

- Time consuming for facility
- Increased chances for errors
- More medication waste
- Difficult to track usage, compliance

# Unit Dose System

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- First used in hospitals in 1960's
- Used to decrease medication administration errors by nursing staff, and reduce medication waste
- Standard of practice in hospital setting today
- Used in some skilled nursing facilities

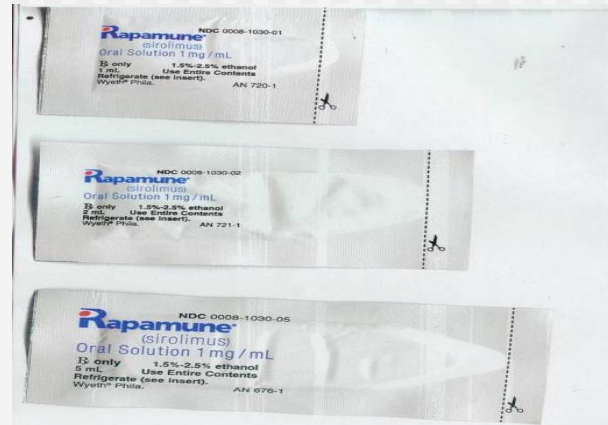
# Unit Dose/Modified Unit Dose Systems

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- Unit Dose examples:
  - Manufacturer's unit dose packs/cards
  - Medication cassettes
- Modified Unit Dose examples:
  - Bingo cards/ blister packs
  - Medisets
  - Pharmacy-prepared administration packages



# Examples of Unit Dose Packaging



# Unit Dose and Modified Unit Dose Systems

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## ■ Advantages:

- Improve accuracy, less errors
- Easy to track usage
- Less nursing time at dispensing
- Less wastage, savings to facility and patient

## ■ Disadvantage:

- More pharmacy processing time and equipment cost
- Requires more storage space and cassette cost
- No cost savings to pharmacy
- Limit nursing processing and checking ability

# Mediset System

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## ■ Advantages:

- Less waste
- More flexibility
- Less nursing time
- Ease of use for patients

## ■ Disadvantages:

- Cost
- Processing and packaging time
- Oral dosage forms only
- Difficult for nursing to check for accuracy
- More errors

# Automation

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- Speed and output efficiency
  - Ease of operation, capacity, time required
- Flexibility/ exception dose capabilities
  - 1/2 tab packaging, prn meds, dosage forms
- Labeling capabilities
- Batch processing capabilities
- Accuracy and quality assurance safeguard
- Reporting/ documentation capabilities
- Training provision and technical support

# Automation Examples

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- **Small systems:**

- Pyxis medstation
- Baxter ATC
- Script-pro 200

- **Larger systems:**

- Baker cells
- Baxter international

# Pyxis medstation

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- Used in hospitals and skilled nursing facilities
- Kept in nursing stations
- Pharmacy responsible for entering orders, and filling/stocking units with medications
- Nurses with access codes can obtain medications out of drawers
- All usages are recorded and tracked

# Baxter ATC

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- Usually installed in the pharmacy
- Medications stored in calibrated canisters
- An order is sent to the system and the medication is dispensed from the correct canister
- System packages unit dose tablets and capsules into labeled and sealed strips packs
- Found to be 99.98% accurate (vs. 92.62% for manual filling) —Kratz K. Hosp Pharm 1992

# Script-pro 200

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- Usually installed in the pharmacy
- Fills vials directly from dispensing cells
- Can print prescription and auxiliary labels



# Baker Cell

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- In pharmacy system
- Counts a 30-count vial in 3-5 seconds
- Option to use software that dispenses medication after a prescription is canned

# Quality Assurance: Automation

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- Order entry accuracy
- Backup system for downtime and system failure
- Adequate staff education and training
- Equipment service and technical support
- Error detection and safeguard

# Automation

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## ■ Advantages:

- Improve efficiency
- Improve accuracy, reduce errors
- Improve documentation
- Authorized access only, enhance security
- Reduce job stress and staff turnover
- Shorten med pass time for nurses/ caregivers

## ■ Disadvantages:

- Additional training and technical help
- Downtime, system failure and inflexibility
- Cost and space issues

# Drug Delivery and Administration

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- **Drug delivery:**

- On time delivery to

- the correct facility
    - Correct nursing area
    - Ensure emergency back-up

- **Medication administration:**

- Correct patient

- Correct medication- dose, dosage form

- Correct time

- Correct route

# Medication Administration

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- **The medication administration record (MAR):**
  - Monthly record of dispensed medications for each specific patient
  - List of medications with administration times
  - Medication dispensing nursing/ facility staff initials/ signatures
  - May include list of prn medications
  - Tracks missed doses and changes in medications

# Emergency Kit

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- Supply of short term emergency meds tailored specific to nursing facility needs
- Allows timely dispensing of urgent meds
- Contents in the kit is determined by nursing supervisor and consultant pharmacist
- The “kit” is a sealed box with full supply of medications delivered daily to the facility
- A broken seal indicated usage
- Nurse documents usage and returns records to the pharmacy for refills

# Medication distribution errors

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## ■ Human errors

### ■ Medication orders

- Omission, incorrect transcription

### ■ Interpretation/evaluation

- Dose appropriateness, concurrent meds and diseases, drug interactions

### ■ Filling and checking

### ■ Medication administration

- Correct person, dose, dosage form, route, frequency
- Missed dose documentation

# Medication distribution errors

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- System errors:
  - Inadequate staffing or untrained staff
  - Poor communication between providers, facility and pharmacy
  - Poor coordination between pharmacy and facility for drug ordering and delivery
  - Poor documentation and reporting system of patient specific concerns and human errors



# Role of Consultant Pharmacist

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- Order processing
  - Review patient health and medication profile
  - Perform prospective review
  - Consider economic issues
  - Ensure accurate order entry
  - Communicate with prescribers and other health care workers

# Role of Consultant Pharmacist

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- Medication dispensing and delivery
  - Ensure accurate packaging, labeling and timely delivery
  - Develop policy for dispensing, delivery and storage of medication in facilities
  - Track usage and monitor medication usage and returns, including initial doses, house supply stock and emergency kit contents
  - Monitor the reconciliation of controlled substance: record keeping of supply, usage and disposal
  - Ensure accuracy of MAR and documentation

# Role of Consultant Pharmacist

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- Formulate quality assurance policy for drug distribution catering to the needs of patients in each facility
- Provide patient specific recommendations on drug therapy and medication needs
- Coordinate interdisciplinary care plan sessions
- Provide drug information to staff, residence, family and other health care providers
- Ensure compliance with all applicable laws and regulations governing drug distribution