LaFleur Brooks' Health Unit Coordinating

7th edition

Chapter 13

Medication Orders

Lesson 13.1

Administration of Medication

1. Define the terms in the vocabulary list.
2. Write the meaning of the abbreviations in the abbreviations list.
3. Identify at least four causes of medication errors and explain how the use of computer physician order entry (CPOE) with clinical decision support systems (CDSS) decreases the risk of errors.

Lesson 13.1

Administration of Medication (cont'd)

4. Compare the health unit coordinator (HUC) roles regarding medication orders with and without electronic medical records (EMRs) with CPOE.
5. Discuss two types of medicine carts and their use and identify two medications that would be found in the medication stock supply.

Adverse Drug Events (ADEs)

- Adverse drug events (ADEs):
  - 770,000+ injuries and deaths/year
  - Cost up to $5.6 million per hospital, depending on size
- Illegible doctors' handwriting and transcription errors are responsible for as much as 61% of the medication errors.

Medication Errors

- There are several causes of medication errors:
  - Wrong drug
  - Wrong dose
  - Given at wrong time or not at all
  - Incorrect route
  - Drugs with similar names

CPOE and E-prescribing

- CPOE – Computerized Physician Order Entry
  - Doctor enters orders directly into patient's EMR via computer.
    - Orders are automatically sent to the pharmacy.
- E-prescribing – process of sending a medication order or prescription from the prescriber's computer to the pharmacy computer
- Hospitals switching to CPOE system have seen errors drop 66%.

Clinical Decision Support System (CDSS)

- Provides the doctor with prompts that warn against the possibility of drug interaction, allergy, or overdose at the point of order entry

Reduced Errors

- Use of CPOE, E-prescribing, and CDSS reduces the risk of errors.
  - CPOE and E-prescribing eliminates the need to interpret doctors' handwriting.
  - CDSS assists doctors at the point of order entry, reducing the risks of:
    - Drug interactions
    - Prescribing an incorrect dose of medication
    - Prescribing a medication that the patient is allergic to

HUC Role: EMR with CPOE System

- No longer have the responsibility of interpreting doctors' handwritten medication orders
- It is still beneficial that the HUC recognize medication orders:
  - HUC has some responsibilities involving medications, such as ordering stock medications for the nursing unit and printing required computerized medication pamphlets prior to a patient’s discharge.

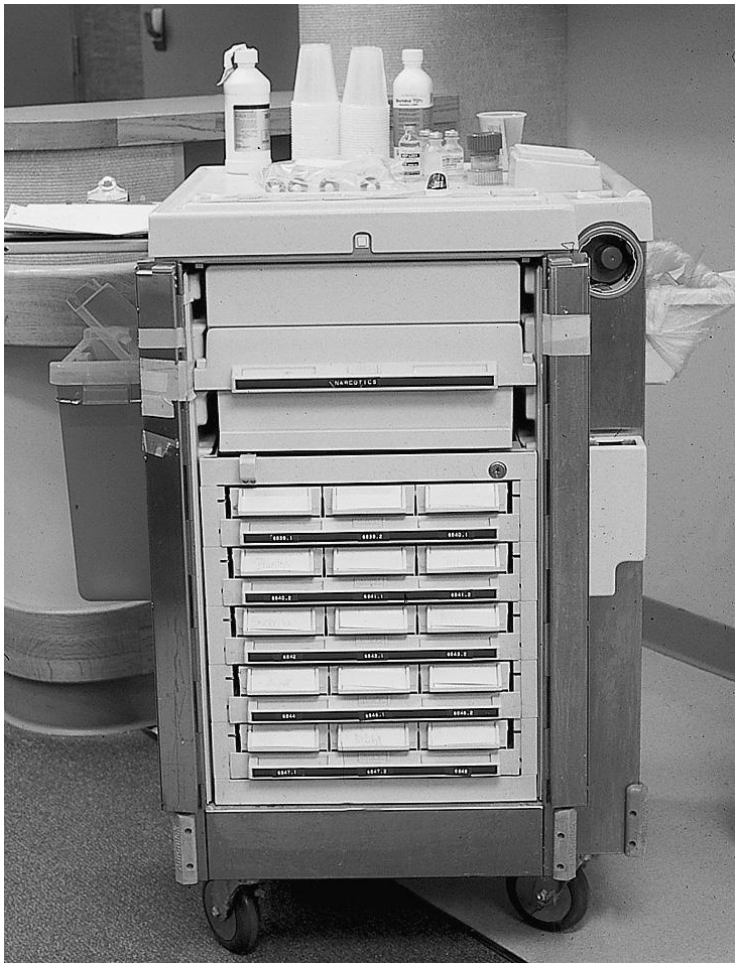
HUC Role When Paper Charts Are Used

- In many hospitals, the HUC is still transcribing handwritten and preprinted doctor's orders.
- Transcription of medication orders will vary among hospitals.
- May involve writing ordered medications on the patient's paper MAR or entering medications into the patient's computerized MAR

Types of Medicine Carts

- Unit dose medicine cart
  - Contains “unit doses” in separate drawers specifically labeled for each patient as ordered by doctor(s)
  - Pharmacist fills orders by reading computerized orders written by physician or a hard copy of physician’s orders.
- Computerized medication cart such as a Pyxis
  - Requires nurse to enter a confidential ID and password to unlock cart
  - Nurse always verifies name of the medication, dose, and patient’s name before removing the medication.

Medication Carts



Medication Carts, cont'd

Medication Stock Supply

- Hospitals store a supply of medications on nursing units, often in the computerized medication cart.
- Often called the *medication stock supply*
  - Includes many over-the-counter (OTC) drugs:
    - E.g., aspirin, acetaminophen, mineral oil, and milk of magnesia

Lesson 13.2

The Medication Administration Record (MAR)

6. Discuss the use of the medication administration record (MAR) when EMRs are used and when paper charts are used.
7. List the five components of a medication order.
8. List at least four routes by which medications may be administered.

The Medication Administration Record (MAR)

- Form used by nursing personnel to record all medications given
- Permanent part of the patient's record (both electronic or paper)
- There are currently three methods of completing MARs depending on:
  - If EMR is used
  - If EMR is not being used
  - Handwritten MAR

MAR When EMR Is Used

- Medications are entered on the MAR when the doctor writes the order; the RN or LPN enters the time that the medications are administered into each patient's computerized MAR.

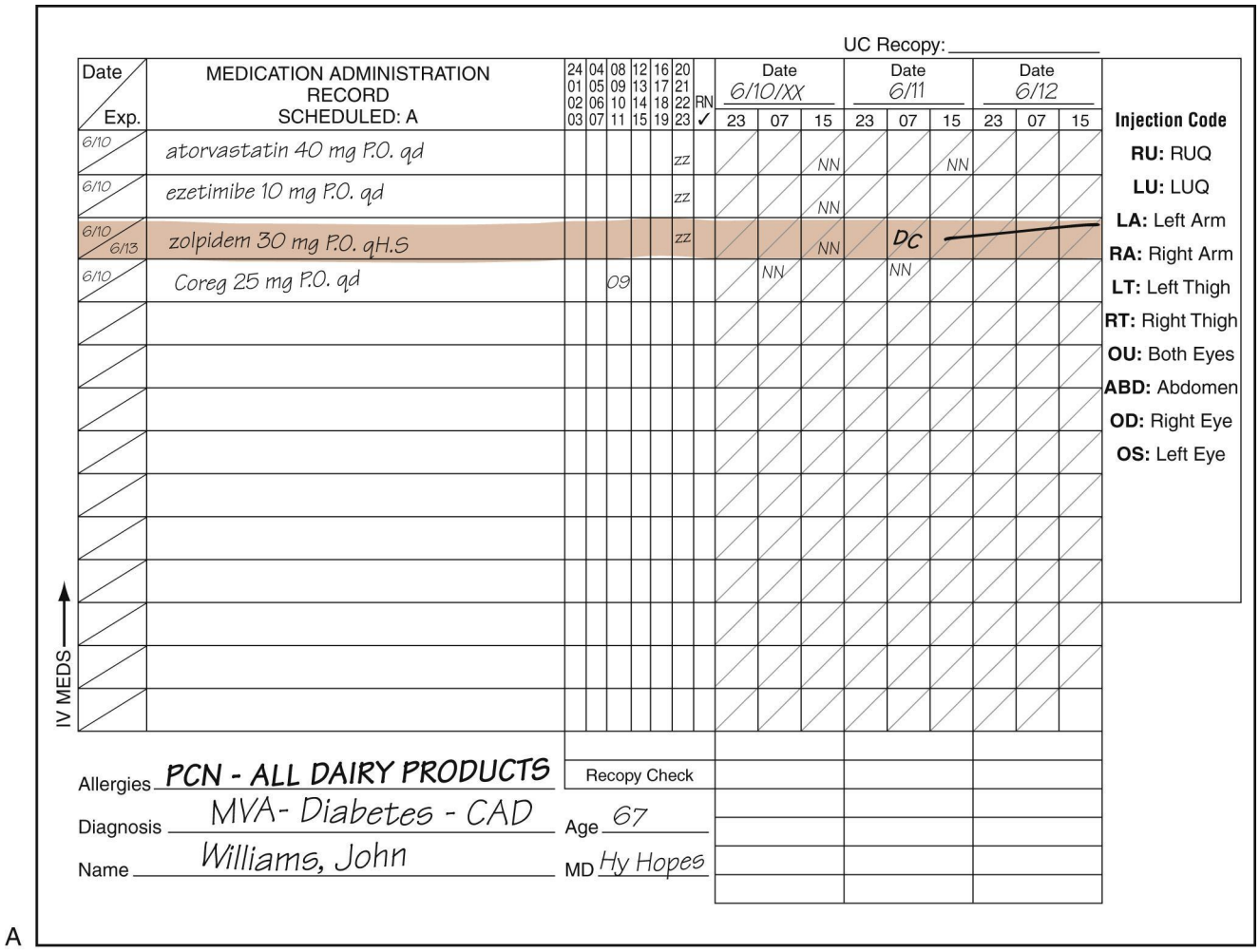
MAR Without Using the EMR

- The pharmacy prepares a printed MAR for each patient and sends it to the nursing unit each morning.
- The RN or the HUC adds to any new medications ordered, along with any changes made during the day.
- The pharmacist, after receiving the faxed physician orders, makes those changes, and the printed MAR sent the following morning reflects those changes.

Handwritten MAR

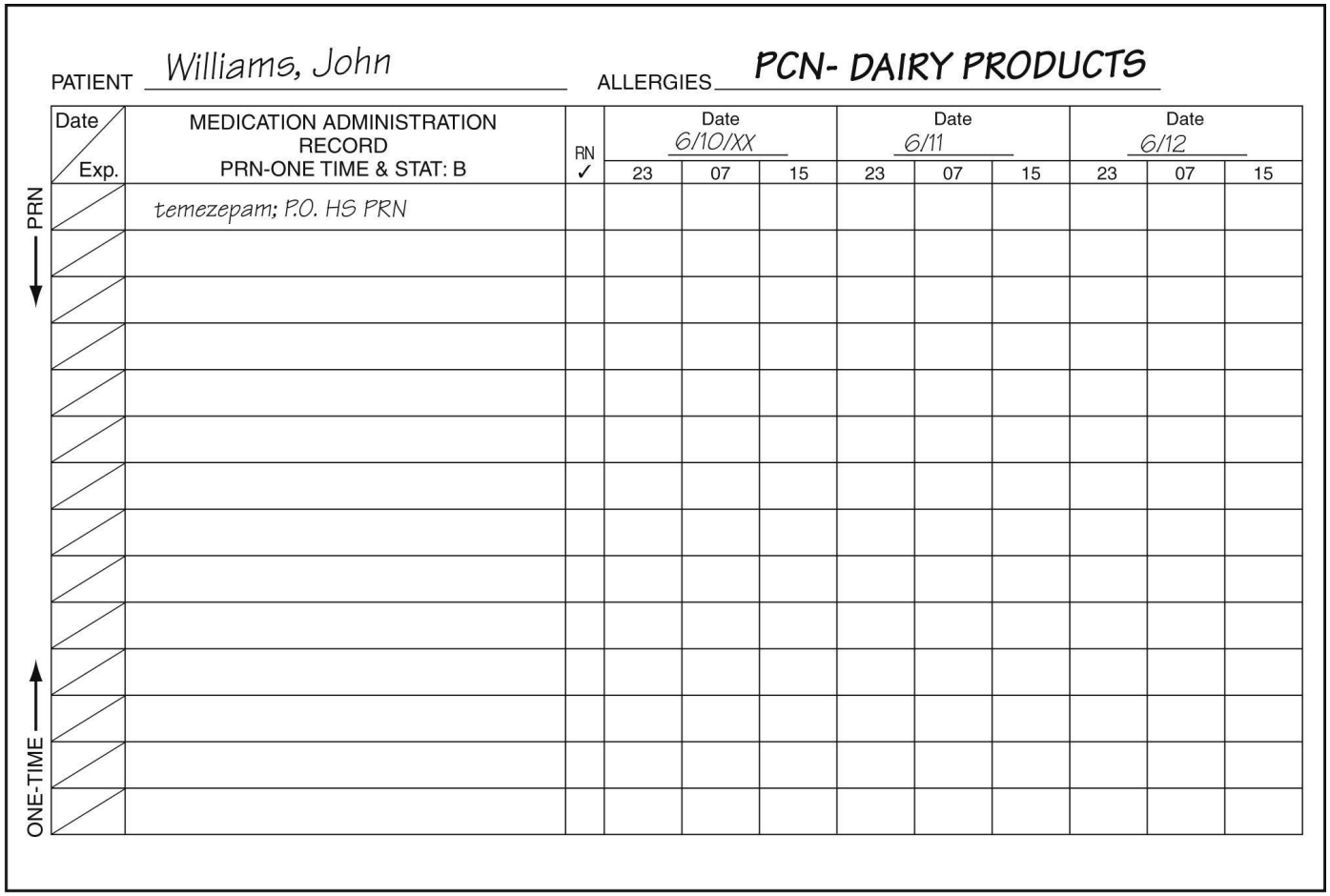
- Transcribing medication orders may require the HUC to write the order on the MAR.
- Accuracy in copying the medication order from the physicians' orders sheet onto the MAR is absolutely essential.
- The MAR is a permanent part of the patient’s medical record and needs to be written in ink.

MAR



A

MAR, cont'd



PATIENT Williams, John ALLERGIES PCN- DAIRY PRODUCTS

Date / Exp.	MEDICATION ADMINISTRATION RECORD PRN-ONE TIME & STAT: B	RN ✓	Date 6/10/XX			Date 6/11			Date 6/12		
			23	07	15	23	07	15	23	07	15
PRN	temezepam; P.O. HS PRN										
ONE-TIME											

B

Five Components of a Medication Order

1) Name of medication
2) Dose
3) Route
4) Frequency
5) Qualifying phrase

- Example: Demerol 100 mg IM q 4 hrs for pain
  (1) (2) (3) (4) (5)

Name of Medication

- Generic name – a generic drug is the same as a brand name drug in dosage, safety, strength, how it is taken, quality performance, and intended use.
  - Generic names are not capitalized.
- Brand name – the general public usually knows the drug best by this name.
  - The brand name is always capitalized and has a trademark symbol (™ or ®).

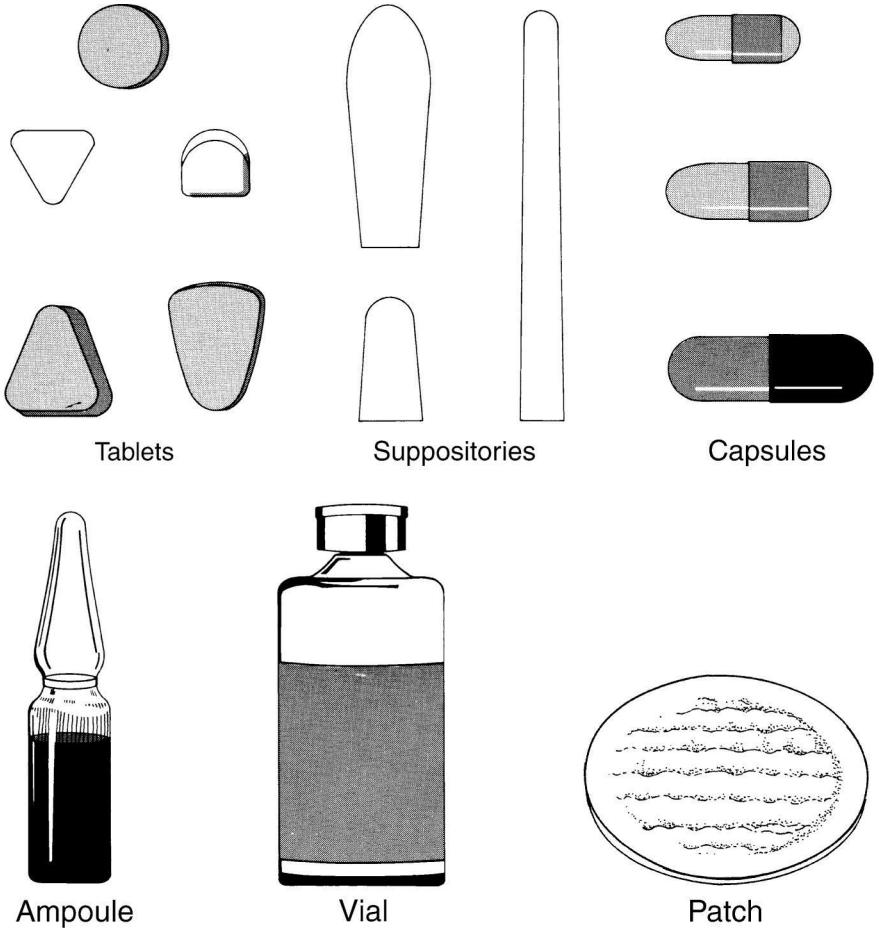
Dosage

- The dosage is the prescribed amount of medication to be taken – written in metric or apothecary system methods of weights and measures.
  - Note: The apothecary system is becoming obsolete.

Route

- This is the manner in which the medication is to be given (i.e., oral, topical).
- The route of administration should always be included in a medication order; however, when in doubt, the route of administration should always be clarified.

Medication Forms



Commonly Used Routes

- Oral (PO)
- Sublingual (Subling)
- Inhalation
- Instillation
- Rectal instillation

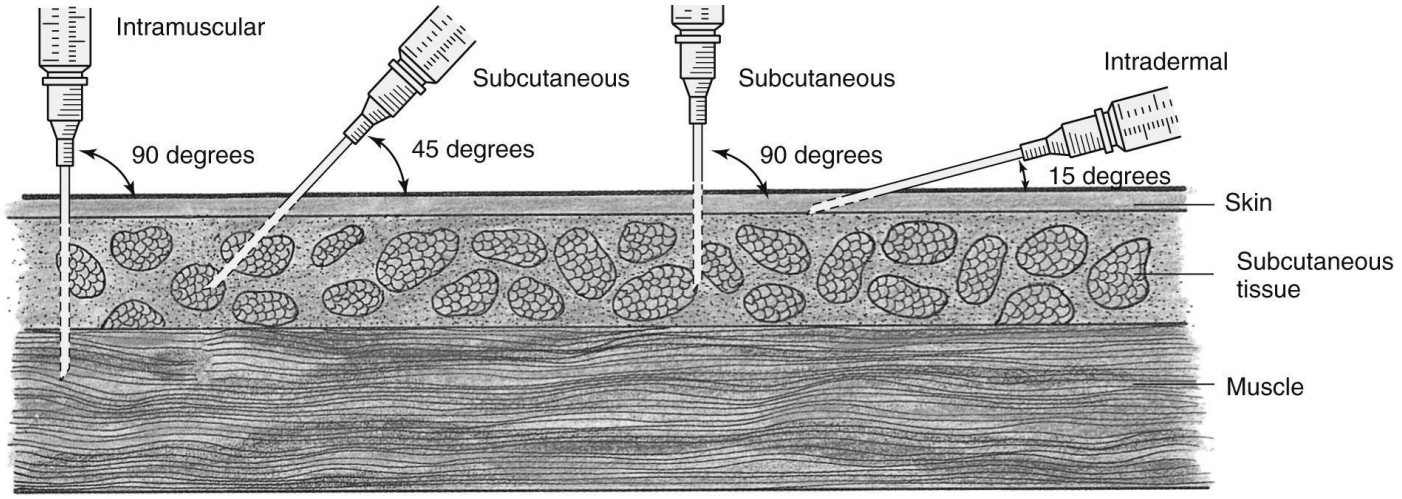
Commonly Used Routes, cont'd

- Topical
  - Applied to skin or mucous membrane
  - Various forms
- Parenteral Routes (Injectable)
  - Fluids or medications that are given by injection or intravenously
  - Three types of parenteral routes

Three Parenteral Routes

- Intradermal
- Subcutaneous (SC or SQ)
- Intramuscular

Angle of Needle Insertion for Parenteral Injections



Intravenous Piggyback (IVPB)

- Medication is added to 50-100 cc of fluid in a small bag and connected to port in main IV tubing.

Piggyback Setup

Admixture

- The result of adding a medication to a container of intravenous fluid
- A volume control administration device is another method of infusing IV medications throh 5 to 10 mL of compatible IV fluids.
  - The fluid is placed within a secondary fluid container separate from the primary fluid bag.

IV Push or IV Bolus

- IV Push or IV Bolus: method of giving a concentrated dose of medication directly into the vein
- May also be called a “loading dose”

Frequency of Administration

- Each hospital maintains a schedule of hours for administration of medications.
- Military time is usually used in place of standard time.
  - prn orders are not assigned a time as they are given as needed by the patient.

Qualifying Phrase

- Orders for specific conditions – prn orders require a qualifier, such as:
  - For minor discomfort
  - For severe pain
  - For temp >101 degrees
  - For N/V
  - For sleep if nec.

Lesson 13.3

Drug Groups and Medications

9. Describe the general purpose for provided drug groups.
10. Identify four categories of medications that are controlled substances.

Drug Groups and Medications

- Several drug groups and medications frequently prescribed for hospitalized patients
- Beneficial for HUC to have basic knowledge of medications

Drug Groups: Cardiovascular Diseases/Conditions

- Used to control or prevent certain forms of heart disease
- Extensive number of cardiovascular drugs
- Combination may be used depending on action and what they treat.
- Many of these drugs also have effects on the kidneys or renal system.

Cardiovascular Disease/Conditions

- Antianginals:
  - Treatment of chest pain caused by lack of blood to the heart
  - Examples: Nitro-Bid, Nitro-Dur, Nitrostat, Nitro-Quick, Transderm Nitro (nitroglycerine), Isordil (isosorbide dinitrate)
- Antihypertensives:
  - Treatment of high blood pressure
  - Examples: Aldactone (spironolactone), Diazide (triamterene), Norvasc (amlodipine), Vasotec (enalapril), Zestril (lisinopril)

Cardiovascular Diseases/Conditions

- Antiarrhythmics:
  - Treatment of abnormal heart rhythms
  - Examples: Lanoxin (digoxin), Disopyramide, Norpace, Procainimide (procainimide HCI, procan, procanabid, pronestyl), Tenormin (atenolol), Coreg (carvedilol), Lopressor, Toprol (metoprolol), Inderal (propranolol), Quinidine (quinidine sulfate, quinaglute, quinidex, cardioquin)
- Emergency Antiarrhythmics:
  - May be ordered stat for a patient in a cardiac emergency
  - Examples: Amiodarone, Bretylium, lidocaine

Cardiovascular Diseases/Conditions

- Diuretics:
  - Treatment of hypertension (high blood pressure)
  - Examples: HydroDIURIL (hydrochlorothiazide), Lasix – Furosemide
- Potassium Replacements:
  - Treatment of low potassium levels
  - Examples: Kaochlor, K-Lor, K-Lyte, Micro K, Slow-K (potassium chloride)

Cardiovascular Diseases/Conditions

- Antiplatelet Drugs:
  - Reduce the ability of platelets to stick together – prevent the formation of blood clots in arteries
  - Examples: Plavix (clopidogrel), Aspirin (acetylsalicylic acid), Aggrenox (dipyridamole plus aspirin), Ticlopidine, Ticlid
- Anticoagulants:
  - Thin the blood and prevent clots from forming in the blood
  - Examples: Coumadin (warfarin), Heparin, Lovenox (enoxaparin sodium injection), Innohep (tinzaparin)

Cardiovascular Diseases/Conditions

- Antihyperlipidemic Agents:
  - Treatment of high cholesterol – promotes a reduction of lipid levels in the blood
  - Examples: Lipitor (atorvastatin), Vytorin (ezetimibe/simvastatin,), Crestor rosuvastatin), Zetia (ezetimibe)

Drug Groups: Infections

- Antibiotics:
  - Used to treat many different bacterial infections (kills or slows the growth of bacteria)
  - Examples: Peni**cillin** (penicillin V, penicillin G, amoxi**cillin**, ampi**cillin**), Erythro**mycin**, Vanco**mycin**, Tetracycline, Cipro (ciprofloxacin hydrochloride), Bacitracin, Tobra**mycin**, Trimox (amoxi**cillin**), Zithromax (azithro**mycin**), Keflex (cephalexin), Augmentin (amoxi**cillin** & clavulanate), Levaquin (levofloxacin), Veetids (peni**cillin**)

Drug Groups: Respiratory Disorders

- Respiratory Drugs:
  - Used to treat respiratory disorders, or lung diseases, such as asthma, bronchitis, pneumonia, tuberculosis, and others
  - Include bronchodilators, corticosteroid inhalers, leukotriene receptor antagonists, antihistamines, and antitussives
  - Examples: Slo Bid, Slo-Phyllin, Theo-Bid, Theo-Dur, Theo-Dur Sprinkle (theophylline), Singulair, prednisone, Doxapram (doxapram hydrochloride)

Drug Groups: Convulsions

- Anticonvulsants:
  - Used to prevent or reduce the severity and frequency of seizures (convulsions)
  - Examples: Carbamazepine CBZ, Neurontin (gabapentin), Depakote (valproate), Tegretol (carbamazepine), Lamictal (lamotrigine), Topamax (topiramate)

Drug Groups: Diabetes

- Antidiabetics (insulin and oral):
  - Given to lower blood sugar
  - Types of Insulin: several types are available and are grouped according to how fast they work: rapid-acting, short-acting, intermediate-acting, and long-acting
  - Examples: NPH, Lente, Novolin R, Humulin R, LANTUS

Drug Groups: Diabetes, cont'd

- A Standing Order for Insulin:
  - Usually scheduled to be given ½ hr (ac) prior to breakfast.
  - If doctor is normalizing amount of insulin required by patient, they may order insulin to be given on a sliding scale.
- A Sliding Scale Insulin Order:
  - Contains a set of instructions for administering insulin dosages based on specific blood glucose readings.
  - This insulin may be given in addition to the daily insulin as ordered and prescribed by the doctor.

Sliding Scale Insulin Order

- Examples Using Blood Glucose Monitoring

Blood Sugar Level	Dosage or Action
200-249	5 units of regular insulin
250-299	10 units of regular insulin
300-349	15 units of regular insulin
Over 350	Call the doctor

Drug Groups: Diabetes, cont'd

- Oral Antidiabetics:
  - Used to lower blood sugar
  - Examples: Glucophage (metformin) – INN, Diabinese (chlorpropamide), Glucotrol, Glucotrol XL (glipizide), Micronase, Glynase, Diabeta (glyburide), Amaryl (glimepiride), ACTOS (pioglitazone)

Drug Groups: Pain Relievers

- Analgesics (nonnarcotic):
  - Given to reduce pain
  - Examples: Tylenol (acetaminophen), Aspirin, Ascription (acetylsalicylic acid), Ansaid (flurbiprofen), Advil, Motrin (ibuprofen), Anaprox (naproxen)

Drug Groups: Pain Relievers

- Analgesics (Narcotic):
  - Given to reduce pain
  - Examples: Tylenol 1, 2, 3, or 4 (acetaminophen with codeine), Lortab, Vicodin codeine-Contin (hydrocodone with acetaminophen), Demerol (meperidine), Roxanol (morphine sulfate), OxyFAST, OxyContin (oxycodone)

Codeine Is a Controlled Substance

CODEINE IS A CONTROLLED SUBSTANCE

Numbers that are assigned to analgesics that contain codeine differentiate the amount of codeine found in the medications. The numbers represent the following:

#1 contains gr ⅛ (8 mg) codeine
#2 contains gr ¼ (15 mg) codeine
#3 contains gr ½ (30 mg) codeine
#4 contains gr 1 (60 mg) codeine

Controlled Substances

- Class of medication as having a higher-than-average potential for abuse or addiction
- Categories based on potential for abuse or addiction:
  - Schedule I (C-I)
  - Schedule II (C-II)
  - Schedule III (C-III)
  - Schedule IV (C-IV)
  - Schedule V (C-V)

Patient-Controlled Analgesia

- Patient-controlled analgesia (PCA):
  - Allows the patient to self-administer small doses of narcotics intravenously
  - The most common narcotics used in PCA systems are meperidine and morphine.
- Some conditions associated with patients who use a PCA include severe postoperative pain and the chronic pain of a terminal illness.

Patient-Controlled Analgesia (PCA) Pump with Syringe Chamber

Drug Groups: Relaxation and/or Induce Sleep

- Sedatives or Tranquilizers:
  - Cause relaxation and reduce restlessness without causing sleep
  - Examples: Valium, (diazepam), Prosom (estazolam), Ativan (lorazepam), Xanax alprazolam),
- Sedative-Hypnotics:
  - Relieve anxiety and induce sleep
  - Examples: Prosom (estazolam), Dalmane (flurazepam), Restoril (temazepam), Ambien (zolpidem)

Drug Groups: Relieve Vomiting and Nausea

- Antiemetics:
  - Help reduce vomiting and nausea
  - Examples: Phenergan (promethazine hydrochloride), Lorazepam - Ativan, Xanax-Alprazolam, Compazine (prochlorperazine), Reglan (metoclopramide hydrochloride)

Lesson 13.4

Medication Orders

11. Explain the importance of notifying the pharmacy of changes or pending changes to a patient's total parenteral nutrition (TPN) orders.
12. Define standing, prn, one-time, short-series, and stat medication orders.
13. Name three common skin tests performed and explain the purpose of each.
14. Discuss how medications are renewed, discontinued, and changed when the EMR is used and when paper charts are used.

Total Parenteral Nutrition

- The order for TPN is a preprinted form that is filled in by the doctor and takes the place of the regular doctors' orders form.
  - A copy is sent to the pharmacy.
- The pharmacy should be notified immediately of any changes or pending changes to a patient’s TPN order.
  - The TPN solution is very expensive and is wasted if any change is ordered in the formula after it has been prepared.

Standing Medication Orders

- Standing orders in effect and administered as ordered until discontinued or changed by a doctor's order
- Examples:
  - Carvedilol 25 mg PO q day
  - Humalog Insulin units 40 q day

prn Orders

- Prn orders are administered according to patient needs until discontinued or changed by a doctor's order. Examples:
  - Lorazepam 0.5 mg PO @ HS for sleep if nec.
  - Morphine sulfate 10 mg IM q4h prn severe pain

One-Time or Short-Series Medication Orders

- One-time or short-series orders are administered one time or for a short time and then discontinued as ordered.
  - One-time example:
    - Valium 10 mg IM one hour prior to 9 a.m. dressing change
  - Short-Series example:
    - Prednisone 40 mg PO x 3 days, then 30 mg x 3 days, then 20 mg x 3 days, then 10 mg x 3 days.

Stat Medication Orders

- Stat orders are administered immediately.
- Examples:
  - Heparin 20,000 units IV push stat
  - Tylenol #4 PO stat
  - Tetracycline hydrochloride 500 mg PO now and then q6h
    - This medication order consists of two parts:
    - Part 1 calls for tetracycline hydrochloride to be given immediately.
    - Part 2 contains a standing order for the medication to be given four times a day until the doctor discontinues it.

Common Skin Tests

- Skin tests are administered intradermally or topically to detect allergens, to determine immunity, and to diagnose disease. Types of common skin tests include:
  - Allergy Skin Testing
  - PPD (purified protein derivative)
  - Cocci
  - Histoplasmin

Medication Renewal and Discontinuation Orders

- When EMR used:
  - The drugs may be discontinued automatically, and the nurse may leave a message via the computer for the doctor to renew the medication.
  - The doctor will enter a renew order, which will automatically be sent to the pharmacy and will be entered onto the patient's electronic EMR.

Medication Renewal and Discontinuation Orders, cont'd

- When paper charts are used:
  - The nurse may send a message via computer or some hospitals use a renewal stamp as a reminder of the automatic stop date.
  - The information is stamped on the physicians' orders sheet by the HUC or the patient's nurse prior to the expiration date of the medication.
  - When the doctor checks the yes or no box indicating to renew or discontinue and signs his or her name, it is regarded as an order and is transcribed as such.

Medication Renewal and Discontinuation Orders, cont'd

- When paper charts are used, cont'd:
  - If the doctor fails to check a box and sign the order, the patient's nurse will send a message via computer or place a phone call to the doctor or his or her office for an order to renew or discontinue the medication.
  - When a doctor discontinues a standing or prn order, a discontinue order is written on the doctors' orders sheet.

Drug Renewal Stamp

DOCTOR, THE Narcotic
HAS EXPIRED. DO YOU

WISH THE Demerol
RENEWED? THANK YOU.

YES ☒ NO ☐

DR's. SIGNATURE Dr. Starr

Medication Order Changes

- A patient's medication order may have to be changed for any number of reasons.
- The change may involve the dosage, route of administration, or frequency of a drug already ordered.
- When EMR is used:
  - The order change is entered into the patient's EMR by the doctor; the order is automatically sent to the pharmacy and entered onto the patient's electronic MAR.
  - Whenever this is done, it is considered a new order and should be written as such on the MAR.

Medication Order Changes, cont'd

- When paper chart is used:
  - The doctor will write the order change on the physician's order sheet, and the HUC will transcribe the order.
  - It is considered a new order and should be written as such on the MAR.
  - It is illegal to erase or cross out parts of an order or to write over an order on the MAR.
  - The old order must be discontinued according to the policy and the new order written.