Review correct **procedure and precautions** for the following routes of **administration**:
- Enteral feeding tube, flush after each medication
- IM, subcut injections, angle of insertion
- IV therapy, including IVP and IVPB
- Long-acting (SR, XR) medications, do not crush
- Medications that cause gastrointestinal irritation such as oral prednisone, administer with milk or food
- PCA Pump, troubleshooting
- Rectal Suppository, distance for insertion with an adult patient
- Transdermal patch, optimal sites, including the deltoid, proper removal and disposal
- Obtain alternate form rather than crush XR tablet

Review **monitoring and precautions** related to:
- Symptoms of allergy
- When patient reports an allergy, ask the patient to describe symptoms experienced
- Such as benzodiazepines and COPD
- Such as caution patient with diabetes re: as carbohydrate sources in fruits and breads

Review **indications, action of medications, adverse effects, monitoring, precautions, and patient teaching implications** related to:

**Analgesics, such as**
- Acetaminophen (Tylenol®), risk of liver damage with daily dose greater than 3,500 mg
- Morphine, adverse effect of respiratory depression
- Need for bowel program with opioids
- Naloxone (Narcan®) to reverse opioids
- Monitor pain relief, obtain additional or changed orders if needed to manage pain

**Antibiotics, such as**
- Vancomycin, monitoring with peaks and troughs; vesicant properties
- Piperacillin/tazobactam (Zosyn®), indications of anaphylaxis

**Anticoagulants, such as**
- Heparin, calculating dosage with vial and with pre-filled syringe, laboratory monitoring
- Enoxaparin (Lovenox®), longer effect as compared with heparin
- Warfarin (Coumadin®), laboratory monitoring with PT and INR, be alert for and report bleeding, risk of fall-related injury due to bleeding

**Bronchodilators, such as** albuterol (Proventil®), adverse effects of tachycardia, anxiety

**Cardiovascular Medications, such as**
- ACE inhibitor enalapril (Vasotec®), monitor for dizziness with changes in position with first dose
- Atorvastatin (Lipitor®), need to monitor liver function
- Beta blockers such as metoprolol (Lopressor®), need to monitor BP
- Clonidine (Catapres®), tablet calculation
- Digoxin (Lanoxin®), risk of toxicity with hypokalemia
- Diltiazem-SR (Cardizem®-SR), indications of toxicity: hypotension and bradycardia
- Enalapril (Vasotec®), dizziness with changes in position at first dose
- Furosemide (Lasix®), effect of electrolyte depletion

- **Diabetic Medications, such as**
  - Insulin preparations, including lispro (Humalog®), peak action = 30 minutes; rotate injection sites, use sliding scale protocol
  - Metformin (Glucophage®), hold when patient is NPO; monitor liver function

- **Glucocorticosteroids, such as** prednisone, adverse effect of GI irritation, give with food or milk

- **Iodinated contrast media (ICM),** risk for kidney damage, monitor serum creatinine

- **Psychoactive Medications, such as** fluoxetine (Prozac®), need to taper when discontinuing

- **Reversal Agents/Antidotes, such as**
  - Flumazenil (Romazicon®) to reverse benzodiazepines
  - Naloxone (Narcan®) to reverse opioids
  - Vitamin K to reverse warfarin (Coumadin®)

- **Sedatives/Anxiolytics, such as**
  - Long-acting benzodiazepines such as diazepam (Valium®), risk for falling with elderly
  - Lorazepam (Ativan®), risk with COPD due to respiratory depression and CO₂ retention
  - Midazolam (Versed®), have flumazenil available

**Review IV Therapy monitoring, such as**
- Potassium chloride, maximum safe rate = no more than 10 mEq/hr
- Recognizing and managing infiltration, extravasation, phlebitis
- Troubleshooting the IV infusion pump – downstream occlusion, malfunction

**Review Calculations, including**
- IV drip rate, drops per minute

  \[
  \text{Volume to be infused (mL) over 1 hour} = \text{gtts/min} \\
  \text{Drop factor constant}
  \]

  \[
  \text{Common drop factors} \\
  60 \text{ gtt/mL - minidrip set} \quad \text{Drop factor constant} \quad 1
  \]
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10 gtt/mL – regular drip set  6
15 gtt/mL – regular drip set  4

- Pounds to kilograms
- Number of tablets, or number of milliliters to obtain ordered dose
- Use of protocols such as insulin sliding scale and heparin protocol
- Calculate total amount received on a shift, given doses

Review laboratory tests used to monitor medication therapy
- Activated partial thromboplastin time (aPTT), heparin monitoring; heparin protocol
- Prothrombin time (PT)/International normalized ratio (INR), warfarin (Coumadin®) monitoring
- Liver Function Tests, monitoring statins, metformin (Glucophage®)
- Peaks and troughs, vancomycin
- Serum creatinine, to monitor potential complication of iodinated contrast media (ICM)
- Serum electrolytes, depleted by diuretics
- Serum glucose, in insulin sliding scale
- Serum potassium, low value = risk of digoxin toxicity