Review correct **procedure and precautions** for the following routes of **administration**:

- Ear drops, positioning after administration
- Enteral feeding tube, importance of flushing after each medication
- Eye drops, patient teaching
- IM, subcut injections, angle of insertion; rotate subcut sites
- IV therapy, including IVP and IVPB
- Long-acting (SR, XR) medications, do not crush, obtain alternate form if needed
- Medications that cause gastrointestinal irritation such as oral potassium chloride and prednisone
- PCA Pump, monitoring to assess adequate pain relief; identifying malfunction
- Rectal Suppository, insertion
- Transdermal Patch, correct site

Review **monitoring and precautions** related to:

- Medication Allergy, importance of asking patient to describe his reaction to a medication for which he indicates he has an allergy
- Drug/Disease Interactions, lorazepam (Ativan®)/COPD
- Drug/Food Interactions, grapefruit juice with many medications

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

- **Analgesics**, such as morphine, adverse effects of respiratory depression and constipation
- **Antibiotics**, such as
  - Aminoglycosides, gentamicin, laboratory monitoring
  - Levofoxacin (Levaquin®), symptoms of allergic reaction
  - Vancomycin (Vancocin®), vesicant properties
- **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
- **Anticonvulsants**, such as
  - Divalproex (Depakote®), black box warning re: hepatic failure
  - Gabapentin (Neurontin®), also used to treat peripheral neuropathy, need to taper when discontinuing
- **Bronchodilators**, such as albuterol (Proventil®), adverse effects of tachycardia, anxiety
- **Cardiovascular Medications**, such as
  - Atorvastatin (Lipitor®), pertinent laboratory tests = liver function
  - Beta blockers such as labetalol (Normodyne®), need to taper when discontinuing and metoprolol (Lopressor®), monitor BP
  - Clonidine (Catapres®), calculating dosage using tablets
  - Digoxin (Lanoxin®), pertinent laboratory values, serum potassium
  - Diltiazem-SR (Cardizem®-SR), toxic effects, do not crush
  - ACE inhibitor enalapril (Vasotec®), possible effects of first dose = dizziness upon standing
- **Diabetic Medications**, such as
  - Insulin preparations, including lispro (Humalog®), patient teaching about self-administration, time of onset of rapid-acting insulin
Metformin (Glucophage®), hold when patient is NPO, caution with hepatic impairment

- **Glucocorticosteroids, such as** prednisone, adverse effect of GI irritation, give with food or milk
- **Iodinated contrast media (ICM)**, laboratory monitoring = serum creatinine
- **Psychoactive Medications, such as** fluoxetine (Prozac®), need to taper when discontinuing
- **Reversal Agents/Antidotes, such as**
  - Flumazenil (Romazicon®), reversal agent for benzodiazepines
  - Naloxone (Narcan®), reversal agent for opioids
  - Protamine sulfate, antidote for heparin
- **Sedatives/Anxiolytics, such as**
  - Long-acting benzodiazepines, risk for falling with elderly patients
  - Lorazepam (Ativan®), effects of respiratory depression and CO₂ retention
  - Midazolam (Versed®), have flumazenil available

Review IV Therapy monitoring, such as
- Potassium chloride, maximum safe rate = 10 mEq/hr
- Recognizing infiltration, extravasation, phlebitis, and treating these complications
- Troubleshooting the IV infusion pump, downstream occlusion message, recognizing malfunction

Review Calculations, including
- IV drip rate, calculating drops per minute
  \[\text{Volume to be infused (mL) over 1 hour} = \text{gtts/min}\]
  \[\text{Drop factor constant}\]

<table>
<thead>
<tr>
<th>Common drop factors</th>
<th>Drop factor constant</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 gtt/mL - minidrip set</td>
<td>1</td>
</tr>
<tr>
<td>10 gtt/mL – regular drip set</td>
<td>6</td>
</tr>
<tr>
<td>15 gtt/mL – regular drip set</td>
<td>4</td>
</tr>
</tbody>
</table>
- Total dosage received with morphine drip plus rescue boluses
- 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

Review laboratory tests used to monitor medication therapy
- Activated partial thromboplastin time (aPTT), use with heparin
- Prothrombin time (PT), use with warfarin
- International normalized ratio (INR), use with warfarin
- Liver Function Tests, use with statins, divalproex (Depakote®), metformin (Glucophage®)
- Peaks and troughs, use with antibiotic therapy
- Serum creatinine, use with iodinated contrast media
- Serum electrolytes, use digoxin (Lanoxin®) and furosemide (Lasix®)
- Serum glucose, monitoring effect of insulin