PURPOSE:
To describe the limitations associated with the first dose of an intravenous or injectable medication to be administered in the home.

CONSIDERATIONS:
1. The term “first dose” shall refer to a patient’s first known exposure to a medication.
2. All options for having the first dose of a medication administered in a hospital setting, or a physician’s office under the supervision of a physician or the physician’s designee should be considered before administering the medication in the home.
3. Several criteria must be considered in order to make the decision regarding whether the first dose of a medication can be administered in the home. The nurse should consult appropriate drug reference books and/or a pharmacist to become familiar with the medication.
   a. The patient will be evaluated for any history of an allergy or adverse response to:
      (1) The medication.
      (2) A medication in that classification.
      (3) A medication that has a known cross-allergenicity with any medication in that classification (e.g., penicillin and cephalosporin).
   b. Medication to which a patient has a known or suspected allergy or sensitivity may not be administered.
   c. The physician must be readily available by telephone during administration of the first dose.
   d. Emergency transport services and treatment must be available to the patient in the patient’s home.
4. If all the above criteria are met, then the medication will be considered appropriate for the first dose administration in the home.
5. The physician order must be obtained that specifies that the first dose is to be administered in the home. The physician order shall include orders for allergic or anaphylactic reaction, if appropriate.
6. If the criteria are not met for first dose administration in the home, the nurse’s supervisor is to be notified.
7. Use at least 2 patient identifiers prior to administering medications.
8. See MAH Policy 3-13 (Medication Administration) for list of medications that are not appropriate for first dosing in the home.
9. The patient is at least one year old and weighs at least 10 kg. (Except for the administration of palivizumab (synagis) to infants less than one year of age.)
10. The patient is clinically stable.
11. The patient is alert, cooperative and able to respond appropriately to body symptoms.
12. There is ready access to EMS personnel.
13. Physician should be available by telephone for consultation during first dose administration as needed.
14. The First Dose Checklist will be completed whenever a patient receives a first dose in the home.
15. The nurse must observe the patient for a minimum of one-half hour after the completion of the infusion.

EQUIPMENT:
None

PROCEDURE:
1. Adhere to Standard Precautions.
2. Explain procedure to patient.
3. Follow appropriate procedures. (See Medications and/or Infusion Therapy for Administration of Medication).
4. Discard soiled supplies in appropriate containers.

AFTER CARE:
1. Document in patient’s record:
   a. Medication administered, dose, time, rate and route.
   b. Patient’s response to procedure, side effects and management.
   c. Instructions given to patient/caregiver.
   d. Communication with physician.
PURPOSE:
To administer pentamidine isethionate in aerosolized form in the home in a safe manner.

CONSIDERATIONS:
1. Pentamidine isethionate administered in an aerosolized form is indicated in the prevention of pneumocystis carinii pneumonia (PCP) in high-risk, immuno-compromised patients, such as HIV-infected patients.
2. Administration of pentamidine in the aerosolized form is contraindicated in patients with a history of an anaphylactic reaction to parenteral pentamidine.
3. The potential for the development of acute PCP still exists in patients receiving aerosolized pentamidine prophylaxis. The recommended dose of aerosolized pentamidine for prevention of PCP is insufficient to treat acute PCP.
4. Patients receiving aerosolized pentamidine should be closely monitored for the development of serious adverse reactions that have occurred in patients receiving parenteral pentamidine. (See Considerations, Administration of Intravenous Pentamidine Isethionate.) The nurse should remain with the patient throughout the treatment.
5. The most frequent adverse experiences to aerosolized pentamidine are bronchospasm and cough. Other adverse experiences include: fatigue, burning sensation in back of throat and dizziness.
6. Aerosolized pentamidine is most efficiently delivered in particle sizes varying from 0.5-4 microns to reach the desired alveolar regions. The Wright-type nebulizer is designed with a series of one-way valves that act both as a baffle to trap large particles and direct exhalation to a bacterial filter. This system prevents aerosolized medication from being dispersed in the surrounding environment. Respirgard II is an example of a Wright-type nebulizer and is recommended by the Food and Drug Administration for delivery of aerosolized pentamidine.
7. Never use the nebulizer to administer a bronchodilator.
8. Aerosolized pentamidine must be dissolved only in sterile water for injection, USP. DO NOT use saline solution. Reconstitution with saline will cause the drug to precipitate. DO NOT mix the aerosolized pentamidine solution with any other drugs.
9. Follow manufacturer's guidelines for stability of reconstituted pentamidine. (PDR recommends using freshly prepared solutions and the solution is stable 48 hours in the original vial at room temperature, if protected from light.)
10. Instructions given to patient/caregiver.
11. Use at least 2 patient identifiers prior to administering medications.

CONSIDERATIONS FOR HEALTHCARE WORKERS:
1. To effectively control aerosolized medication ambient air mist, the treatment should take place in a well-ventilated room. It is desirable to have a fan blowing away from patient and nurse.
2. A NIOSH-approved (at least N95) respiratory mask, disposable gown and goggles with side shields must be worn during the treatment.
3. Registered nurses who are pregnant, have respiratory problems, external eye problems or diabetes should be offered alternate work assignments or medical screening by a physician.
4. Materials contaminated with aerosolized medication should be handled as hazardous waste.

EQUIPMENT:
Oxygen flow meter with nipple adaptor
Air compressor
Wright-type nebulizer system
Micronebulizer
Medication
Sterile water for injection, USP
Syringes with 18-gauge needles or needle less adaptors
Alcohol prep pads
Puncture-proof container
Protective eye wear
Disposable gown
Mask (HEPA Respirator)

PROCEDURE:
1. Check physician order.
2. Adhere to Standard Precautions.
3. Gather equipment.
4. Identify patient and explain procedure.
5. Position the patient:
   a. Patient should be seated on a chair with both feet on the floor. If confined to bed, place in high-Fowler's position.
   b. Instruct patient to take several slow, deep breaths through his/her mouth.
6. Reconstitute medication. When administering pentamidine use the following:
   a. 30 mg Pentamidine:
      (1) Draw up 6 mL sterile water and inject 6 mL into the 300 mg pentamidine vial.
      (2) Shake vial until all solute dissolves.
      (3) Withdraw 0.6 mL from pentamidine vial and place in nebulizer. Add 5.4 mL of sterile water to nebulizer. Total amount of solution in nebulizer is 6 mL (may be premixed by pharmacy).
   b. 150 mg Pentamidine:
      (1) Draw up 6 mL sterile water and inject 6 mL into the 300 mg pentamidine vial.
      (2) Shake vial until all solute dissolves.
(3) Withdraw 3 mL from pentamidine vial and place in nebulizer. Add 3 mL of sterile water to nebulizer. Total amount of solution in nebulizer is 6 mL (may be premixed by pharmacy).

c. 300 mg Pentamidine:
   (1) Draw up 6 mL sterile water and inject 6 mL into the 300 mg pentamidine vial.
   (2) Shake vial until all solute dissolves.
   (3) Withdraw 6 mL of solution from pentamidine vial and place in nebulizer.

7. Instruct patient to put mouthpiece in place, adjust gas flow for a full mist (6 liters/minute).

8. POSSIBLE ADVERSE REACTIONS:
   a. If bronchospasm occurs, stop therapy and administer bronchodilator per physician's order, then continue therapy. Prior to next therapy, pretreat patient with a bronchodilator per physician's order.  
      [Note: Epinephrine must also be available for possible anaphylaxis.]
   b. If coughing continues, treat as above.
   c. If fatigue occurs, allow the patient to rest. During rest breaks, the gas flow is to be turned off.
   d. If a burning sensation occurs, stop therapy and have the patient drink some liquid, then resume aerosolization. At the end of therapy have the patient drink more liquid.
   e. If dizziness occurs, stop therapy until episode has passed.

9. Instruct the patient to inhale and to exhale through the mouth into the mouthpiece.

10. Continue treatment until all medication is absorbed. Treatment time varies from 30 to 45 minutes depending upon patient tolerance.

11. Discard soiled supplies in appropriate containers.

AFTER CARE:
1. Document in patient's record:
   a. Medication administered, dose, time, rate and route.
   b. Vital signs.
   c. Patient's response to procedure, side effects and management.
   d. Instructions given to patient/caregiver.
   e. Communication with the physician.
Medications – Antithrombotic Therapy: Fragmin Administration  
SECTION: 16.03

Strength of Evidence Level: 3

PURPOSE:
To provide guidelines for the safe administration of injectable fragmin.

CONSIDERATIONS:
1. Fragmin injection is indicated for the prophylaxis of ischemic complications in unstable angina and non-Q-wave myocardial infarction, when concurrently administered with aspirin therapy.
2. Fragmin is also indicated for the prophylaxis of deep vein thrombosis (DVT), which may lead to pulmonary embolism (PE) in patients undergoing hip replacement surgery, in patients undergoing abdominal surgery who are at risk for thromboembolic complications, and in medical patients who are at risk for thromboembolic complications due to severely restricted mobility during acute illness.
3. Fragmin cannot be used interchangeably (unit for unit) with unfractionated heparin or other low-molecular-weight heparins.
4. Fragmin injection is contraindicated in patients with active major bleeding or with known hypersensitivity to the drug, heparin, or pork products, and should be used with extreme caution in patients with history of heparin-induced thrombocytopenia.
5. Fragmin, like other anticoagulants, should be used with extreme caution in patients who have an increased risk of hemorrhage; bleeding can occur at any site during therapy. An unexpected drop in hematocrit or blood pressure should lead to a search for a bleeding site.

EQUIPMENT:
- Gloves
- Sharp’s container
- Single-dose prefilled syringe Fragmin

PROCEDURE:
1. Adhere to Standard Precautions.
2. Identify patient and explain procedure.
3. Patients should be sitting or lying down and Fragmin should be administered by deep subcutaneous (SC) injection.
4. Fragmin may be injected in a U-shaped area around the navel, upper outer side of the thigh, or the upper outer quadrangle of the buttock. The injection site should be varied daily.
5. When the area around the navel or the thigh is used, using the thumb and forefinger, the patient must lift up a fold of skin while giving the injection.
6. To ensure delivery of the full dose, do not expel the air bubble from the pre-filled syringe.
7. The entire length of the needle should be inserted at a 45-90 degree angle.
8. Dispose of sharps following agency procedure.

AFTER CARE:
1. Document in patient’s medical record:
   a. Procedure and observations.
   b. Instructions given to patient.
   c. Patient’s response to procedure.
   d. Communication with physician and caregiver(s).
PURPOSE:
To safely administer antithrombotic therapy.

CONSIDERATIONS:
1. Lovenox (enoxaparin) is a low-molecular weight heparin. It is indicated for:
   a. Prophylaxis of Deep Vein Thrombosis (DVT.)
   b. Treatment of acute DVT.
   c. Complications of unstable angina.
   d. Treatment of acute ST-segment elevation myocardial infarction.
2. Under normal circumstances, there is no need for daily monitoring of the effect of Lovenox in patients with normal baseline or presurgical coagulation parameters.
3. Standard monitoring includes: periodic CBC's, including platelet count and stool occult blood tests.
4. Contraindications include patients with:
   a. Active major bleeding.
   b. Thrombocytopenia associated with a positive test for anti-platelet antibody.
   c. Hypersensitivity to enoxaparin sodium.
   d. Hypersensitivity to heparin or pork products.
5. Caution should be used with patients:
   a. Receiving other agents that affect homeostasis such as non-steroidal anti-inflammatory drugs (i.e. Toradol).
   b. Oral anticoagulants and/or platelet inhibitors (i.e. ASA).
6. Side effects following subcutaneous injection:
   a. Local irritation.
   b. Pain.
   c. Hematoma and erythema.
   d. Moderate thrombocytopenia.
   e. Fever.
   f. Nausea.
   g. Hemorrhage.
   h. Hypochromic anemia.
   i. Edema.
   j. Peripheral edema.
7. Lovenox cannot be used interchangeably (unit for unit) with other low-molecular weight heparins or infractioned (regular) heparins.
8. Lovenox is to be given subcutaneously only. DO NOT administer via IV or IM injection.

EQUIPMENT:
Alcohol prep pad
Lovenox prefilled syringe (30 mg per 0.3 mL)
Protamine Sulfate (antidote–give same dose as Lovenox), if ordered by physician

PROCEDURE:
1. Adhere to Standard Precautions.
2. Identify patient and explain procedure.
3. Lovenox is administered subcutaneously and only in the abdomen, alternating doses between the left and right anterolateral and posterolateral wall. DO NOT expel the air bubble when preparing Lovenox or medication may be lost.
4. Follow the medication administration guidelines for Subcutaneous Injection. (See Medications-Subcutaneous Injection).
5. Instruct patient to inform staff of any new back pain, abdominal pain, stiffness of the joints, coughing up of brown/red mucous, nose bleeds and headaches, and to watch for any signs of bleeding or bruising.
6. Instruct patient to avoid any over-the-counter medications containing aspirin or other salicytes.
7. Apply pressure to any observed bleeding sites and notify staff immediately.
8. Instruct patient and/or caregiver regarding administration techniques.

AFTER CARE:
1. Document in patient’s record:
   a. Medication administered, dose, time and route.
   b. Patient’s response to procedure.
   c. Instructions given to patient/caregiver.
   d. Communication with physician, as needed.
PURPOSE:
To provide safe and accurate administration of intravenous desferal.

CONSIDERATIONS:
1. Deferoxamine acts by chelating iron and preventing it from entering into chemical reactions. The principal action is on loosely bound stored iron.
2. Limited evidence indicates that concomitant administration of an acidifying agent such as ascorbic acid increases iron excretion more than Deferoxamine alone.
3. Deferoxamine has also shown activity as a chelation agent for aluminum.
4. Desferal is used as an adjunct to standard treatment measures for acute iron intoxication.
5. Desferal is an agent used to promote iron excretion in chronic iron overload secondary to multiple transfusions frequently used in the treatment of thalassemia or other chronic anemias.
6. Deferoxamine slows accumulation of hepatic iron and retards or eliminates progression of hepatic fibrosis.
7. Deferoxamine is poorly absorbed from the GI tract.
8. Administration may be accomplished by IM injection, slow IV infusion or subcutaneous infusion. Net iron excretion with continuous infusion is greater than with equal IM doses because the chelatable intracellular iron pool is constantly exposed to the drug. IM injection produces greatly increased initial levels of bound iron but its effects are shorter lasting. Studies show that Deferoxamine is widely distributed in body tissues following parenteral administration.
9. Deferoxamine and ferrioxamine are excreted principally in the urine, but to a much lesser extent in the feces via the bile. Ferrioxamine gives the urine a characteristically reddish color that is indicative of elevated iron concentrations in the urine. Iron excretion tends to be maximal in the beginning of treatment, indicating that more metal is accessible for chelation. Unlike iron, ferrioxamine can be removed by hemodialysis. Half-life after IV administration is approximately one hour.
10. Adverse reactions:
   a. Acute iron intoxication:
      (1) Generalized erythema.
      (2) Urticaria.
      (3) Hypotension (with rapid intravenous injection).
   b. Long-term therapy:
      (1) Allergic type reactions (i.e., cutaneous wheal formation, generalized itching, rash, anaphylactic reaction.
      (2) Blurred vision.
      (3) Dysuria.
      (4) Abdominal discomfort.
      (5) Diarrhea.
   c. Subcutaneous Therapy:
      (1) Localized pain, skin irritation and swelling.
      (2) Pruritus.
      (3) Erythema.

11. Precautions:
   a. Flushing urticaria, hypotension and shock have occurred with rapid intravenous administration. Give by IM, or slow SC/IV infusion. Rate of administration should not exceed 15 mg per kg per hour.
   b. Ocular disturbances:
      (1) Cataracts (rarely, following prolonged treatment).
      (2) Decreased visual acuity (i.e., impaired peripheral, color and night vision).
      (3) Retinal pigmentary abnormalities, auditory disturbances.

12. Use in pregnancy is NOT recommended due to skeletal anomalies seen in animal species.
13. Safety and efficacy in children under the age of 3 has not been established and due to the poor iron mobilization by Deferoxamine, the drug should be withheld unless significant iron mobilization (i.e., >1 mg of iron/day is demonstrated).
14. Contraindications:
   a. Severe renal disease or anuria.
   b. Primary hemochromatosis.
15. Dosage (Chronic Iron Overload):
   a. IM: 0.5-1 g daily.
   b. SC: 20-40 mg per kg per day over 8 to 24 hours. Infusions of 8 to 12 hours are usually as effective as if the same dose is given over 24 hours.
   c. IV: 1-2 g daily. Infusion rate should not exceed 15 mg per kg per hour.
   d. Pediatric Dosing: 50 mg per kg per dose IM or IV every 6 hours or up to 15 mg per kg per hour by continuous IV infusion, to a maximum of 6 g/24 hour or 2 g/dose.

EQUIPMENT:
None

PROCEDURE:
1. Adhere to Standard Precautions.
2. Identify patient and explain procedure to patient.
3. Administer Desferal as ordered by the physician.
4. Verify dosage and rate prior to administration.
5. Dispose of used supplies properly.
AFTER CARE:

1. Document in patient’s medical record:
   a. Procedure and observations.
   b. Patient’s response to procedure.
   c. Instructions given to patient and/or caregiver.
   d. Communication with physician, as needed.
PURPOSE:
To instill drops into eye for cleansing/antiseptic purposes; to dilate or contract pupil; to relieve pain or pressure, treat diseases and infections, anesthetize, stain and lubricate.

CONSIDERATIONS:
1. Medicated eye drops require a physician's order. Clarify all physicians' orders if unapproved abbreviations are used.
2. Only eye drops labeled for ophthalmic use are to be used.
3. The medication should be checked for any discoloration, cloudiness, precipitation and for the expiration date.
4. Care should be taken so that medication is not instilled into tear duct. The body will absorb the medication if this occurs.
5. Use at least 2 patient identifiers prior to administering medications.

EQUIPMENT:
Eyedrop medication
Cotton, tissue or gauze squares
Personal protective equipment, as indicated

PROCEDURE:
1. Adhere to Standard Precautions.
2. Verify medication, dosage, frequency, and site to which it is to be instilled, as ordered by physician.
3. Explain procedure to patient.
4. Instruct patient to tilt head back or lie down.
5. If there is any exudate in or around eye, clean eye before instilling eye drops. Clean eye, from the inner corner out, with gauze sponge soaked in tepid water. Use fresh gauze sponge pad for each stroke.
6. Recheck physician order for medication, dosage and site of administration (o.s. = left eye; o.d. = right eye; o.u. = both eyes). Clarify orders, if unapproved abbreviations are used.
7. Using thumb or index finger, gently pull down the lower lid so that conjunctival sac is exposed. Avoid putting pressure on the eyeball.
8. Instruct patient to tilt head back and look up and away, to prevent drop from falling directly onto cornea. Instill eyedrop(s).
9. Let drop fall into conjunctival sac. DO NOT let dropper touch eye. Release lower lid and instruct patient to close eye gently without squeezing lid shut.
10. When administering drugs that cause systemic effects: Gently press one thumb on the inner canthus for 1 to 2 minutes while the patient closes his/her eye. (This helps prevent medication from flowing into the tear duct.) Patient may blot excess fluid with tissue. A separate tissue should be used for second eye, if necessary.
11. Discard soiled supplies in appropriate container.

AFTER CARE:
1. Document in patient's record:
   a. Medication, dosage and site.
   b. Appearance of eye.
   c. Date and time medication instilled.
   d. Instructions given to patient including self-administration and possible side effects of medication.
2. Teach possible side effects of medication to patient.
3. Instruct patient/caregiver in eye drop instillation as ordered.
PURPOSE:
To treat infection or inflammation; to flush away foreign particles, secretions and chemicals.

CONSIDERATIONS:
1. Clean technique is used.
2. Be careful not to injure cornea during irrigation.
3. Warm solution to room temperature prior to irrigation.
4. Use at least 2 patient identifiers prior to administering medications.
5. Clarify all physicians' orders if unapproved abbreviations are used.

EQUIPMENT:
Irrigant and irrigation applicator/syringe
Emesis basin
Sterile 4x4 gauze sponges
Sterile cotton applicator
Towel or protective cover
Personal protective equipment, as indicated

PROCEDURE:
1. Adhere to Standard Precautions.
2. Explain procedure to patient. If contact lenses are worn, instruct patient to remove them.
3. Instruct patient to lie supine with head turned toward affected eye, place protective cover or towel under patient's head. Position emesis basin under the eye.
4. Wet 4x4 sterile gauze sponge with irrigation solution. Gently clean any secretions from eye, wiping from inner to outer canthus.
5. Draw up irrigation solution into irrigation applicator/syringe.
6. With one hand, hold open eyelid, using thumb and index finger. Avoid pressure on eyeball. With other hand, hold irrigation syringe/applicator near inner canthus. Instruct patient to look away from tip of irrigation applicator.
7. Gently flush eye from inner to outer canthus. DO NOT touch eye or eyelid with applicator/syringe tip.
8. Check lower and upper eyelid for retained foreign particles.
9. Remove any foreign particles by gently touching conjunctiva with sterile, moist cotton tipped applicator. DO NOT touch cornea.
10. Resume eye irrigation until clear of all visible foreign particles.
11. When the irrigation is complete, pat the patient's eyelid and face dry with cotton ball or facial tissue.
12. Discard soiled supplies in appropriate container.

AFTER CARE:
1. Document in patient's record:
   a. Appearance of eye before and after irrigation.
   b. Date and time of irrigation, type and volume of irrigant used, characteristics of drainage or debris removed and eye irrigated.
   c. Patient's response to procedure.
2. Instruct patient/caregiver in irrigation procedure and post procedure care and/or restrictions.
PURPOSE:
To introduce ointment into eye for pain relief or antiseptic purposes, inflammation and lubrication.

CONSIDERATIONS:
1. Only ointments labeled for ophthalmic use are to be used in the eye.
2. Medicated ointments require a physician's order. Clarify all physicians' orders if unapproved abbreviations are used.
3. Medication should be checked for discoloration and expiration date.
4. Use at least 2 patient identifiers prior to administering medications.

EQUIPMENT:
Eye ointment
Tissue or gauze sponges
Personal protective equipment, as indicated

PROCEDURE:
1. Adhere to Standard Precautions.
2. Check doctor's order for dosage, frequency and site.
3. Explain procedure to patient.
4. Instruct patient to tilt head back or lie down.
5. If there is any exudate in or around eye, clean eye before administering eye ointment. Clean eye from the inner corner out with gauze sponge or tissue soaked in tepid water. Use fresh gauze sponge pad for each stroke.
6. Recheck physician order for medication, dosage and site of administration (o.s. = left eye, o.d. = right eye, o.u. = both eyes). Clarify orders if unapproved abbreviations are used.
7. Using thumb or index finger, gently pull lower lid down so that conjunctival sac is exposed. Avoid putting pressure on eyeball.
8. Instruct patient to look up.
10. Release lower lid. Instruct patient to close eye gently without squeezing lids shut and roll eyes behind closed lids to assist in ointment distribution. The patient may blot excess ointment with tissue.
11. Discard soiled supplies in appropriate container.

AFTER CARE:
1. Document in patient's record:
   a. Medication, dosage and site.
   b. Appearance of eye.
   c. Date and time of medication applied.
   d. Instruction regarding possible side effects of medication.
   e. Instruction in self-administration given.
2. Instruct patient/patient caregivers in eye ointment administration, as ordered.
PURPOSE:
To provide guidelines for the safe administration of Fluorouracil also known as 5-FU.

POLICY:
1. Antineoplastic and biologic agents may be administered via bolus, intermittent, or continuous infusion according to established medical and nursing standards of practice and the specific agent manufacturer’s labeled use and directions.
2. Patency of the vascular access device shall be established prior to administration of each antineoplastic and biologic agent.
3. The registered nurse shall be knowledgeable of the disease process, drug classifications, pharmacological indications, actions, method of administration, rate of delivery, treatment goals, and drug properties.
   - Only a registered nurse skilled and competent in the administration of antineoplastic and biologic agents shall administer these medications
   - The nurse shall be knowledgeable of the indications for use, appropriate dosage and diluents, monitoring parameters, side effects, toxicities, incompatibilities, stability, storage requirements, and potential complications of antineoplastic and biologic agents
4. Antineoplastic and biologic agents shall be prepared in a controlled environment. All antineoplastic and biologic agents, administration sets, and other equipment used in the preparation of these agents shall be considered hazardous wastes and shall be disposed of according to the organization’s policy.
   - A chemo-spill kit shall be available when preparing, transporting, and administering these agents.

CONSIDERATIONS:
1. Fluorouracil is used for the palliative treatment of carcinoma of the rectum, colon, breast, liver, pancreas and stomach that is not amenable to surgery or radiation.
2. The dosage of Fluorouracil is based on the actual body weight or if the patient is obese or is retaining fluid, on the ideal body weight. The recommended total daily dose should not exceed 800 mg; however, therapeutic protocols utilize doses up to 2,000 mg daily.
3. Several dosing regimens have appeared in the literature; however, the clinical and hematologic response and tolerance of the patient must be balanced to achieve the optimum therapeutic response with a minimum of adverse effects.

Clinicians should consult published protocols for the dosage of Fluorouracil and other chemotherapeutic agents and the method and sequence of administration.

4. General Dosage:
   a. Initial Dosage: A dose of 12 mg/kg IV once daily for 4 successive days. If no toxicity is observed, give 6 mg/kg on the sixth, eighth, tenth and twentieth days. No therapy is given on the fifth, seventh, ninth and eleventh days, and then a single weekly maintenance dose of 10-15 mg/kg IV begun after toxicity (if any) from initial course has subsided. Dosages recommended are based on actual body weight unless patient is obese or retaining fluid. Maximum single recommended dose is 800 mg/day.
   b. Poor risk patients for Fluorouracil include inadequate nutritional state, history of pelvic irradiation, previous use of alkylating agents or widespread involvement of bone marrow by metastatic tumors. These poor risk patients should have initial dosages reduced by 50%, with therapy discontinued in the presence of toxicity. The total daily dose should not exceed 400 mg.
5. It is not known whether Fluorouracil is excreted into breast milk; however, nursing is not recommended while receiving therapy.
6. Adverse Reactions:
   a. Gastrointestinal Effects:
      (1) Anorexia, nausea and vomiting are common adverse effects and occur generally in the first week of therapy. These effects can be alleviated by antiemetics and usually subside within 2 or 3 days following therapy.
      (2) Therapy should not be continued, however, in the presence of stomatitis, which may be present as early as the fourth, but usually on the fifth to eighth day. Stomatitis is the earliest sign of specific toxicity.
   b. Hematologic Effects:
      (1) Leukopenia, usually occurring from days 9 to 14 after the start of the therapy is the most common hematologic reaction and can be delayed up to as late as day 25. Pancytopenia and agranulocytosis have also been reported. Hematologic functions typically return to baseline levels within 30 days following termination of therapy.
   c. Dermatologic Effects:
      (1) Dermatitis often as a maculopapular rash on the extremities and less frequently on the trunk is the most common dermatologic effect and is usually
reversible and responsive to symptomatic treatment.

(2) Reversible alopecia also frequently occurs. Other non-specific skin reactions may occur and tend to be intensified by exposure to sunlight and other ultraviolet rays.

d. Cardiovascular Effects:
   (1) Cardiotoxic effects rarely occur, but include myocardial ischemia and angina. The exact mechanism is not known at this time; however, it is thought to be due to coronary artery vasospasm. Therapy should be terminated in the presence of cardiotoxicity.

e. Neurotoxicity:
   (1) Disorientation, confusion, euphoria, ataxia, nystagmus, headache and acute cerebellar syndrome have been reported up to 1 to 3 months after initiation of therapy. These reactions are usually dose related and are reversible but may also persist after therapy is terminated.

f. Ocular Effects:
   (1) Photophobia and lacrimation often occur within 15 minutes of administration and all usually subside within 2 to 3 weeks after discontinuation of therapy.

EQUIPMENT:
Infusion device
Fluorouracil (5-FU)
Chemo spill kit
Chemo sharp’s container
Gloves
Syringes

PROCEDURE:
1. Verify orders with physician obtaining:
   a. Dose, route and duration.
   b. Order for antiemetic therapy.
   c. Recommended laboratory orders include:
      (1) Baseline CBC with differential and liver function (i.e., bilirubin and liver enzymes).
      (2) Determine specific physician parameters for appropriate treatment protocols.

2. Review patient’s medical record, prior history and assessment with close attention to nutritional status, potentially serious infections and adverse reactions.

3. Adhere to Standard Precautions.

4. Identify patient and explain procedure.


6. Check site of administration for patency and/or infiltration.

7. Administer Fluorouracil as directed by physician.

8. If the therapy is a continuous infusion, the pump will be programmed by the pharmacist. The pharmacist will complete a pump verification form with the Rx attached and the pump settings. The RN is to review the pump settings against the pump verification sheet and if correct, sign and date sheet. If incorrect, contact pharmacy to verify Rx and settings.

9. Monitor patient closely for side effects that might require immediate physician contact and withholding of therapy. Those side effects include, but are not limited to:
   a. Any sign of infection and immunosuppression (i.e., fever, chills, sore throat).
   b. Stomatitis, intractable vomiting or diarrhea
   c. Gluceration or bleeding (black tarry stools or unusual bruising).
   d. Chest pain.
   e. Excessive lacrimation.

AFTER CARE:
1. Document in patient’s record:
   a. Procedure and observations.
   b. Patient’s response to procedure.
   c. Instructions given to patient/caregiver.
   d. Communication with physician.
PURPOSE:
To reduce pain and inflammation in joint tissues and surrounding structures, and suppress the disease process.

CONSIDERATIONS:
1. Gold injections are usually indicated for rheumatoid arthritis.
2. Gold, i.e., gold sodium thiomalate, aurothioglucose and auranopi are preferably given intramuscularly into gluteus muscles. Z-track method can also be used to lessen irritation to tissues.
3. The patient should recline for 10 to 20 minutes after the injection.
4. The color of gold is pale yellow. Discard if color has darkened.
5. Baseline lab values: protein urine test, complete blood count and platelet count are recommended prior to initial dose. Check with physician for protein urine tests and routine blood work. Complete blood work is recommended every 2 weeks.
6. First dose of gold is routinely administered in a controlled environment, e.g., hospital, physician's office, clinic, etc.
7. Instructions given to patient/caregiver.
8. Use at least 2 patient identifiers prior to administering medications.

EQUIPMENT:
Medication per physician's orders
Syringe (3 mL syringe)
Alcohol prep pad
Two 19- to 23-gauge needles, 1-2 inch
Puncture-proof container
Gloves
Urine dipsticks and anaphylaxis kit recommended

PROCEDURE:
1. Check doctor's order for medication, correct dose and route of administration.
2. Adhere to Standard Precautions.
3. Identify patient and explain procedure.
4. Check urine for protein. DO NOT give injection if urine is positive for protein. Notify physician.
5. Give injection using intramuscular method. (See Medications- Intramuscular Injection Administration.)
6. Patient should be observed for 15 to 30 minutes after administration of gold for possible anaphylactic reaction. Other side effects are dermatitis, stomatitis, depression of granulocytes and platelets, hepatitis, neuritis, proteinuria, rare nephrotic syndrome and exfoliative dermatitis. Report any side effects to physician.
7. Explain to patient that gold storage in the skin may lead to chrysiasis (a bronze or blue-gray color).
8. Instruct patient to report sore throat, fever or bruising to physician.

AFTER CARE:
1. Document in patient's record:
   a. Medication administered, dose, time, route and site.
   b. Patient's response to procedure, side effects and management.
   c. Instructions given to patient/caregiver.
   d. Communication with the physician, as needed.
PURPOSE:
For anticoagulant therapy in treatment of deep vein thrombosis, myocardial infarction, embolism and prevention of embolism.

CONSIDERATIONS:
1. Heparin prolongs the blood clotting time.
2. Heparin injection must be given subcutaneously into fatty tissue. The most common site is the abdominal fat pad.
3. Adverse side effects are irritation and mild pain at injection site, hemorrhaging, excessively prolonged clotting time and thrombocytopenia.
4. Hypersensitive reactions may include chills, fever, itching, rhinitis, burning feet and conjunctivitis.
5. The injection site should not be massaged after the injection, as small blood vessels may rupture and a hematoma develop.
6. DO NOT aspirate to check for blood because it may damage tissue and cause a hematoma.
7. Applying ice to injection site prior to injection will decrease irritating effects of heparin injection.
8. Patient/caregiver can be taught to administer heparin.
9. Instructions given to patient/caregiver.
10. Use at least 2 patient identifiers prior to administering medications.

EQUIPMENT:
Heparin
Alcohol prep pad
Gauze
Syringes (24- to 27-gauge needle, 1/2-7/8 inch)
Puncture-proof container
Gloves

PROCEDURE:
1. Check physician's order for activated partial thromboplastin time (APTT) tests to be drawn, dosage of heparin, frequency and route of administration.
2. Adhere to Standard Precautions.
3. Identify patient and explain procedure.
4. Observe and assess for signs of bleeding and bruising. If present, hold dose and notify physician.
5. Draw up heparin after having injected equal amount of air into container. Recheck heparin dosage. Remove needle from syringe and attach new needle.
6. Select injection site. (See Medications-Subcutaneous Injection.)
   [Note: Site of injections of heparin must be rotated each time.]
7. Clean site with alcohol prep pads by starting at the center and moving outward in circular motion. Allow to air dry.
8. Pinch skin to elevate subcutaneous tissue; insert needle at 45-90 degree angle, depending on amount of fatty tissue and needle size. Once needle is inserted, skin may be released. DO NOT aspirate.
9. Inject heparin slowly.
10. Hold sterile gauze/antiseptic wipe over site and withdraw needle. Press site for a few seconds. DO NOT massage site.
11. Discard soiled supplies in appropriate containers.

AFTER CARE:
1. Document in patient's record:
   a. Medication administered, dose, time, route and site.
   b. Patient's response to procedure, side effects and management.
   c. Instructions given to patient/caregiver.
   d. Communication with the physician.
Medications – Immune Globulin Intravenous (IGIV) Administration

Strength of Evidence Level: 3

PURPOSE:
To provide accurate and safe administration of Immune Globulin Intravenous (IGIV) in the home setting.

CONSIDERATIONS:
1. Physician's orders must include amount and type of drug, rate of infusion and route.
2. IGIV may be used in primary immunodeficiency states, secondary immunodeficiency related to immunosuppressive therapy or conditions in which impaired antibody formation has occurred.
3. This drug is contraindicated in patients with selective IgA deficiency, which possess antibody to IgA. It is also contraindicated in patients who have had a severe, systemic reaction during the administration of IGIV.
4. The patient is at risk of developing inflammatory reactions with rapid infusion of IGIV. The reaction may result in rise in temperature, chills, nausea and vomiting. These reactions are rare, but may lead to shock. Nurse/patient/caregiver must never rush the infusion of IGIV.
5. Vital signs, including blood pressure, should be monitored throughout the administration of IGIV.
6. Do not dilute IGIV with IV drugs. Give IGIV through a separate infusion line. No other medications or fluids should be mixed with the IGIV preparation.
7. Adverse reactions are rare but generally become apparent 30 minutes to 1 hour after beginning the infusion. Reactions consist of facial flushing, feelings of chest tightness, chills, fever, dizziness, nausea, diaphoresis and hypotension. If the above occurs, stop infusion and notify physician.
8. Before beginning the infusion, be sure solution is clear and at about room temperature. All parenteral products must be inspected visually for particles and discoloration.
9. Use vented infusion line only.
10. Emergency equipment (epinephrine and an ambu bag) must be readily available should anaphylaxis occur.
11. If symptoms of shock or respiratory distress occur during or following medication administration, stop the infusion and start normal saline infusion. (See Anaphylactic Shock for treatment guidelines.)
12. Use at least 2 patient identifiers prior to administering medication.
13. Per Joint Commission recommendations, all tubes and catheters should be labeled to prevent the possibility of tubing misconnections.

EQUIPMENT:
- Gloves
- Infusion set
- Medication
- Syringes, needles, or needle less adaptors
- Tape
- Alcohol prep pads
- Venipuncture equipment (if needed, angiocatheters, catheter adaptor plugs, tourniquet, antimicrobial wipes and transparent adhesive dressing)
- Normal saline (1000 mL IV solution and for flushing IV tubing)
- Heparin flush (100 units/mL, or as prescribed)
- Emergency equipment: Epinephrine Hydrochloride 1:1000, TB syringe and needle, Ambu Bag
- Puncture-proof container
- Impervious trash bag

PROCEDURE:
1. Adhere to Standard Precautions.
2. Identify patient and explain procedure and purpose.
3. Assess venous access. If no central line, start peripheral IV according to Administration of Intravenous Therapy in the Home or Peripheral Intravenous Infusion: Insertion and Maintenance of Heparin Lock or Catheter Injection Port, if IV is to remain in place.
4. If necessary, prepare powdered form of IGIV according to manufacturer's guidelines. DO NOT shake. Excessive shaking will cause foaming.
5. Set rate to infuse as ordered by physician. Usually, the initial infusion is set to a flow rate of 0.01-0.02 mL/kg/minute for 30 minutes, then increase slowly to 0.04 mL/kg/minute for the remainder of the infusion.
6. Observe site frequently for redness, swelling or pain.
7. Monitor vital signs every fifteen minutes during first hour of infusion. If there are no changes, monitor vital signs every 30 minutes for remainder of infusion. If symptoms of shock or respiratory distress occur, stop infusion and start normal saline infusion. (See Anaphylactic Shock.)
8. After infusion is complete, flush venous access with 5 mL normal saline and heparin flush (appropriate for type of access or remove peripheral IV according to Intravenous Therapy Administration).
9. Discard soiled supplies in appropriate containers.

AFTER CARE:
1. Review patient/caregiver teaching on signs/symptoms of reaction and emergency steps to take.
2. Document in patient's record:
   a. Medication administered, dose, time, rate and route.
   b. Type and appearance of venous access site.
   c. Vital signs before, during and after infusion.
   d. Patient's response to procedure, side effects, and management.
e. Instructions given to patient/caregiver.
f. Communication with the physician, as needed.
PURPOSE:
To provide accurate and safe administration of inotropic agents.

CONSIDERATIONS:
1. The goal of inotropic agents is to enhance cardiac output.
2. Patients who cannot be weaned from intravenous to oral therapy may require continuous infusion of inotropic agents, such as dobutamine, and milrinone.
3. The decision to continue intravenous infusions at home should not be made until all attempts to achieve stability have failed.
4. Specific physician orders for inotropic agents must be obtained. The dose should be titrated and regulated in the acute care setting prior to patient discharge.
5. Milrinone and dobutamine may be administered on a continuous or intermittent basis.
6. Doses may be adjusted based on patient response, under the direction of a physician.
7. Clinicians should consult with pharmacist about the existence of incompatibilities prior to administration of medications. Clinicians should be aware of the following incompatibilities:
   a. Dobutamine:
      (1) Heparin.
      (2) Alkaline solutions such as Sodium Bicarbonate.

EQUIPMENT:
Prescribed medication(s) per specific physician’s order
Infusion device(s), pump, administration sets
Syringes
Tape
Intravenous start kit, if peripheral IV access is required
Alcohol prep pads
Gloves
Saline flush
Puncture-proof container
Impervious trash bag

PROCEDURE:
1. Adhere to Standard Precautions.
2. Identify patient and explain procedure.
3. Perform cardiac assessment prior to administration of inotropic agents to include, but not limited to:
   a. Blood pressure: if systolic blood pressure decreases more than 10 mm Hg from baseline.
   b. Pulse: if pulse increases more than 10 to 15 beats per minute, or rhythm and quality has changed from baseline.
   c. Respiratory Rate: if severity of shortness of breath impedes treatment regime.
   d. Presence or absence of edema and/or jugular vein distention.
   e. Changes in sensorium or level of consciousness.
   f. Weight gain or loss.
4. Notify physician of any abnormal findings or changes from previous assessment.
5. Follow the specific procedures for the appropriate venous access device.
6. Obtain lab work per physician orders.
7. Administer inotropic agents as prescribed by the ordering physician.
8. Observe patient for adverse reactions and report changes in patient’s condition to physician.

AFTER CARE:
1. Document in patient’s record:
   a. Procedure and observations.
   b. Instructions given to patient/caregiver.
   c. Response to procedure.
   d. Communication with physician.
PURPOSE:
To introduce medication through epidermis into dermis.

CONSIDERATIONS:
1. The intradermal technique is used to inject small amounts (0.01-0.1 mL) of fluid for diagnostic purposes, usually to determine sensitivity to various substances.
2. Ventral forearm surface is usual site. Commonly used skin antigens are histoplasmin and tuberculin purified protein derivative.
3. Prior to tuberculin (TB) testing, obtain a negative history for mantoux reaction, BCG immunization or symptoms of active TB. Immunocompromised patients may have a negative TB purified protein derivative (PPD) test, yet have active TB infection.
4. A TB test is administered by Mantoux technique, that is, the intradermal injection of PPD.
5. Allergy skin testing is usually not done in the home.
6. For intradermal injections, select a 25- to 27-gauge needle with a short bevel. The needle length can be 3/8-5/8 inches.
7. Use at least 2 patient identifiers prior to administering medications.

EQUIPMENT:
Medication
1 mL tuberculin syringe (25- to 27-gauge needle, 1/2-7/8 inches)
Alcohol prep pad
Puncture-proof container
Gloves

PROCEDURE:
1. Adhere to Standard Precautions.
2. Identify patient and explain procedure.
3. Verify medication to be given and assemble equipment.
4. Find antecubital space, then measure 3-4 finger widths distal from antecubital space toward hand for injection site on ventral aspect of the forearm.
5. Cleanse site with alcohol prep pad by starting at the center and moving outward in a circular motion. DO NOT rub area too hard; rubbing may cause irritation that could hinder reading of the test. Allow alcohol to dry.
6. Stretch skin slightly with thumb, hold patient's forearm in one hand and with other hand hold syringe between thumb and forefinger.
7. Place the syringe so the needle is almost flat against the skin, making sure the bevel of the needle is up.
8. Insert the needle (at a 15-degree angle) to 1/8 inch below the skin surface and point of needle is still visible through skin.
9. Inject medication slowly. If using PPD tuberculin, use 0.1 mL. Expect resistance, which means needle is properly placed. If needle moves freely, the needle has been inserted too deeply. Withdraw needle slightly and try again. While medication is being injected a small white blister, wheal, or bleb should be forming (about 6 mm to 10 mm in diameter).
10. Withdraw needle and apply gentle pressure to site. DO NOT massage site as it may interfere with test result.
11. Discard soiled supplies in appropriate containers.

AFTER CARE:
1. Read test at appropriate time according to medication instructions.
2. Reading PPD skin test:
   a. The skin test is usually read 48 to 72 hours after injection.
   b. The induration (hardened tissue) only is significant. Erythema (redness) without induration is not significant. The tuberculin skin test is measured crosswise to the axis of the forearm.
   c. Only the induration should be measured. A TB skin test with erythema but no induration is non-reactive.
   d. A TB skin test is recorded in millimeters (mm), not positive or negative. A TB skin test with no induration is recorded as 00 mm.
3. The Centers for Disease Control and Prevention (CDC) support the following classification of the TB reaction:
   a. A TB reaction of 5 mm or more is considered positive in the following groups:
      (1) Persons who have had a close, recent contact with a patient with infectious TB.
      (2) Persons who have a chest X-ray with lesions characteristic of an old healed TB lesion.
      (3) Persons who have a known human immunodeficiency virus (HIV) or are at risk for HIV.
   b. A tuberculin reaction of 10 mm or more is considered positive for those who did not meet the preceding criteria but may have other risk factors for TB such as:
      (1) Intravenous drug users.
      (2) Residents in long term care facilities.
      (3) Persons with poor access to healthcare.
      (4) Persons with multiple medical problems that may increase the risk of TB once infection is present.
      (5) Foreign-born persons coming from countries with a high prevalence of TB.
4. Document in patient's record:
   a. Medication administered, dose, time, route and site.
   b. Results of test.
   c. Instructions given to patient/caregiver.
   d. Communication with physician, as needed.
Purpose:
To clarify and standardize the processes and responsibilities to facilitate competent and compliant assessment of the patient’s drug regimen.

Procedure:
1. At Start of Care, the Therapist completes the agency admission paperwork, including documentation of all medications (prescription, over-the-counter, and herbal supplements) being utilized by the patient.
2. The Therapist will assess and identify the presence of:
   - Medication related patient/caregiver knowledge deficits
   - Significant side effects
   - Compliance with drug regimen
   - Effectiveness of drug therapies
3. The Therapist will review the medication profile for evidence of:
   - Potential drug interactions
   - Potential duplicate drug therapy
4. When a problem or significant potential problem is identified, the Therapist will document such, and will seek resolution through use of resources including facility discharge orders/instructions, patient teaching materials, professional reference materials. Whenever necessary, the Therapist will communicate with Clinical Supervisor or the Physician to resolve problems. Discrepancies must be clarified with the attending Physician with documentation in the medical record of the Physician’s response within 24 hours from identified problem.
5. The Therapist may request the Clinical Supervisor/Registered Nurse direct resolution of the problem through:
   - Communication with the Physician,
   - Obtaining orders for Nursing services,
   - Communication/instruction with the Patient/Caregiver, and/or
   - Communication/instruction with Therapist
6. On an ongoing basis, (throughout the remainder of the therapy-only case, or upon discharge by Nursing from an existing therapy case) the Therapist assuming comprehensive assessment responsibilities will assess for any changes to the patient’s drug regimen, including:
   - New medication(s)
   - Discontinued medication(s)
   - Change in dosing/schedule/administration of current medication and will document changes by updating the medication profile.
7. On an ongoing basis (at a minimum, the required comprehensive assessment update time points, and when the drug regimen changes), the Therapist assuming comprehensive assessment responsibilities, will reassess for and document:
   - Accuracy of the medication profile
   - Presence of knowledge deficits
   - Presence of significant side effects
   - Presence of ineffective drug therapy
   - Presence of noncompliance with drug therapy
   - Potential drug interactions (SOC and with drug regimen changes)
   - Potential duplicate drug therapy (SOC and with drug regimen changes)
8. The therapist will contact the Clinical Supervisor, Agency Nursing, or the Physician upon identification of unresolved medication issues.
PURPOSE:
To introduce medication into muscle, bypassing subcutaneous tissue and fat.

CONSIDERATIONS:
1. Muscles have fewer nerve endings but more blood vessels. The disadvantages of the intramuscular route are the possibility of damage to nerves, blood vessels or bone.
2. If the medication is accidentally introduced into the bloodstream, the medication will be absorbed more rapidly.
3. Body size, nutritional status and the medication's character (thick or irritating) shall determine the amount of medication injected into one site (2 mL is maximum limit).
4. Patient and caregiver can be taught intramuscular injections.
5. Rotate injection sites to avoid tissue trauma to same site.
6. For intramuscular injections, select a 20 to 25-gauge needle with a medium bevel. The needle length can be 1-1 1/2 inches.
7. A filter needle should be used to draw up medication from an ampule and then replaced with appropriate size needle for injection.
8. Instructions given to patient/caregiver.
9. Use at least 2 patient identifiers prior to administering medications.

EQUIPMENT:
- Medication
- Syringe (20- to 25-gauge needle 1-3 inches)
- Alcohol prep pad
- Puncture-proof container
- Gloves
- Gauze
- Filter needle, if necessary

PROCEDURE:
1. Check doctor's order for medication, dosage and route of administration.
2. Adhere to Standard Precautions.
3. Identify patient and explain procedure.
4. Draw up medication after having injected equal amount of air into vial. If using an ampule, no air is to be injected. Recheck medication dosage. Select appropriate injection needle: 1-1 1/2 inch needle (22- to 27-gauge for aqueous solution or 18- to 25-gauge for viscous or oil-based solution) for adults; 5/8- to 1-inch needle for children.
5. Select injection site (deltoid, vastus lateralis or gluteal) with no bruises, induration, atrophy or signs of infection.
6. Assist patient to comfortable position: lying supine with knee slightly flexed (vastus lateralis site), or seated or supine with hand on hip or lower arm flexed across abdomen or lap (deltoid site). Drape for privacy, as needed.
7. Clean site with alcohol prep pad by starting at the center and moving outward in circular motion.
8. For Z-track administration, pull skin 2.5 to 3.5 cm down or laterally just below site with nondominant hand. Hold this position until medication is injected.
9. Otherwise, insert needle at 90-degree angle through the skin and into the muscle.
10. Inject at rate of 1 mL/10 seconds.
   [Note: Aspiration of IM is not indicated for immunizations and vaccinations. Aspiration may be indicated for injections that include large molecule injections i.e. Penicillin. If there is no blood aspirated, medication may be injected. If there is blood aspirated, withdraw needle, discard medication and syringe properly and repeat procedure, choosing another injection site.]
11. Withdraw needle smoothly, release skin, and place gauze gently on site. Apply gentle pressure. DO NOT massage site.
12. For ventrogluteal and vastus lateralis sites, encourage leg exercises. For deltoid site, encourage arm exercises.
13. Dispose of used supplies, remove gloves and perform hand hygiene.

AFTER CARE:
1. Document in patient's record:
   a. Medication administered, dose, time, route and site.
   b. Patient's response to procedure, side effects and management.
   c. Instructions given to patient/caregiver.
   d. Communication with the physician, as needed.

REFERENCES:
PURPOSE:
To administer intravenous antifungal agents in the home in a safe manner.

CONSIDERATIONS:
1. Intravenous administration of antifungal agents is never initiated in the home. The patient must be stabilized on dosage and frequency prior to going home. A caregiver must be educated in the procedure and possible adverse reactions and be present during and after the infusion.
2. The need for a homecare registered nurse to be present for the administration of Amphotericin B will be determined by physician’s order and the homecare team.
3. Amphotericin B shall be infused by means of an infusion control pump.
4. Antifungal agents are generally light sensitive and require special handling:
   a. Fluconazole: DO NOT remove unit from overwrap until ready to use.
   b. Amphotericin B: Refrigerate vials. Reconstituted solution may be stored at room temperature for 24 hours or kept refrigerated and used within one week. Reconstitution must be done with sterile water; bacteriostatic agents or saline cannot be used.
   c. There are new formulations of antifungals (i.e. liposomal). Refer to specific drug information related to handling of these drugs.
5. Amphotericin B is not compatible with normal saline. Access device should be flushed with 3-5 mL of D5W prior to beginning and at end of infusion. Then, flush with heparin.
6. Due to incidence of thrombophlebitis, antifungal agents are best administered via a central line.
7. Febrile reactions, shaking, chills, flushing, headache, malaise, anorexia, generalized body pains, nausea, vomiting, abdominal pain/cramps and diarrhea are common side effects of intravenous antifungal agents.
8. Laboratory work should be ordered on a regular basis to monitor for toxicity: hypokalemia, hypomagnesemia, proteinuria, nephrotoxicity, hepatotoxicity, thrombocytopenia, normocytic/normochromic anemia and bacterial super-infection.
9. Recommended laboratory studies are:
   a. Baseline and weekly CBC, creatinine, BUN, electrolytes and liver function.
   b. Baseline and twice-weekly potassium, calcium and magnesium.
10. Monitor intake, output and weight on a regular basis. Renal insufficiencies are typically reversible by discontinuing the medication.
11. Generally, severe reactions can be mitigated by giving aspirin or acetaminophen, anti-histamines, or anti-emetics prior to administration of antifungal agents.
   a. Intravenous adrenal corticosteroid administered prior to or during Amphotericin B infusion may decrease febrile reactions.
   b. Meperidine has been used to relieve shaking chills and fevers.
12. The rate of infusion is frequently dictated by the ability of the patient to tolerate the therapy. Amphotericin B should not be infused in less than 1 hour.
13. Under no circumstances should a total dose of 1.5 mg/kg be exceeded. Amphotericin B overdoses can result in cardio-respiratory arrest.
14. Use at least 2 patient identifiers prior to administering medications.
15. Per Joint Commission recommendations, all tubes and catheters should be labeled to prevent the possibility of tubing misconnections.

EQUIPMENT:
Infusion set with needle or needle less adaptor
D5W 250-500 mL, or as ordered
Antifungal agent
Medications to control side effects, as ordered:
Aspirin or acetaminophen
(Prochlorperazine) Compazine
Anaphylaxis kit (when Amphotericin B ordered or as ordered by MD)
5 mL syringe
3 mL syringe
Tape
Alcohol prep pads
2x2 gauze or transparent, adhesive dressing
Sterile saline syringe
Heparin flush (100 units/mL, or as prescribed)
Gloves
Impervious trash bag
Puncture-proof container
Commercial spill-kit

PROCEDURE:
1. Adhere to Standard Precautions.
2. Identify patient and explain procedure.
4. Take and record vital signs: temperature, pulse, respiration and blood pressure.
5. Pre-medicate patient, if ordered.
6. Assess patency of venous access.
7. Assemble infusion set with antifungal agent and initiate infusion.
8. Set infusion rate per physician orders.
9. Monitor vital signs every 30 minutes during infusion and upon completion.
10. If side effects occur the usual medical/and or nursing management includes:
   a. Fever and headache: Aspirin or acetaminophen.
   b. Shaking and chills: Warm blankets, meperidine may be required.
   d. Phlebitis or extravasation: Discontinue the infusion and apply warm compresses to the area.

11. When infusion is complete, flush venous access device with 5 mL of D5W and heparin (amount appropriate for type of device). (See No. 5 of Considerations.)

12. Discard soiled supplies in appropriate containers.

AFTER CARE:
1. Document in patient's record:
   a. Medication administered, dose, time, rate and route.
   b. Type and appearance of venous access site.
   c. Patient's response to procedure, side effects and management.
   d. All vital signs.
   e. Instructions given to patient/caregiver.
   f. Communication with the physician, as needed.
PURPOSE:
To provide safe administration of IV chemotherapy in the home.

CONSIDERATIONS:
1. All chemotherapy solutions should be premixed in a controlled setting under a laminar flow hood (done in a pharmacy setting).
2. Syringes and IV sets with Luer-Lok™ type fittings are to be used to prevent separation and spills.
3. Medications should not be mixed. Separate syringes are to be used for each medication.
4. Nurses performing this procedure should have successfully completed an agency-approved chemotherapy course prior to the administration of IV chemotherapeutic agents.
5. Chemotherapy protocols are individualized.
6. Specific orders for each chemotherapeutic dose to be given must be obtained from the physician prior to administration. Verbal or telephone orders for chemotherapy should be discouraged.
7. Blood levels must be drawn, reported to physician, and approved for hematopoietic safety 24 to 48 hours prior to the time of chemotherapy administration. (Done by MD office staff)
8. Prior to administration of each new antineoplastic drug, instruct patient about the drug, type, method of administration and possible side effects.
9. Some medications are potent vesicants that may cause severe tissue damage if extravasation occurs. Be prepared to administer prompt treatment. (See Medications - Nursing Management of Extravasation.)
10. Investigative research continues on the necessary precautions to be taken for safe handling of antineoplastic agents. Follow precautions. (See Medications- Safe Handling of Antineoplastic Agents) as well as individual agency policy.
11. Use at least 2 patient identifiers prior to administering medications.
12. Per Joint Commission recommendations, all tubes and catheters should be labeled to prevent the possibility of tubing misconnections.

EQUIPMENT:
Disposable, surgical, unpowdered gloves
Disposable gown (lint-free, low-permeability fabric with a closed front, long sleeves, and elastic or knit closed cuffs)
Plastic face shield or splash goggles
Supplies specific to each type of drug, route of administration, and type of venous access (See Infusion Therapy.)
Impervious trash bag, labeled cytotoxic or hazardous waste
Puncture-proof container
Alcohol wipes
Antimicrobial wipes
Commercially prepared spill kit
Self-adhesive bandage

PROCEDURE:
1. Adhere to Standard Precautions.
2. Explain procedure to patient.
3. Don protective garments, disposable gown, gloves, etc.
4. Assemble supplies and equipment.
5. IV administration of a chemotherapeutic agent through a central venous catheter:
   a. Cleanse injection port with antimicrobial wipe.
   b. Attach syringe and open tubing clamp, if used.
   c. Flush catheter tubing with 10 mL normal saline.
   d. Infuse chemotherapeutic agents, as prescribed. Flush tubing with 10 mL normal saline after administration of each drug.
   e. After all chemotherapy has been given, flush central venous catheter with 10 mL normal saline and heparinize catheter as ordered by physician.
6. IV administration of a chemotherapeutic agent through an implanted vascular access device (IVAD):
   a. If non-coring needle and extension tubing are not in place, access IVAD according to procedure. (See Infusion Therapy.)
   b. Cleanse injection port of extension tubing with antimicrobial wipe.
   c. Attach syringe and open tubing clamp.
   d. Confirm non-coring needle placement by obtaining a blood return. Flush tubing with 10 mL normal saline.
   e. Infuse chemotherapeutic agents, as prescribed. Flush with 10 mL normal saline after each drug administration.
   f. After all chemotherapy has been given, flush with 10 mL normal saline and heparinize IVAD, as ordered by physician.
7. Discard soiled supplies in appropriate containers.

AFTER CARE:
1. Document in patient's record:
   a. Medication administered, dose, time, rate and route.
   b. Type and appearance of venous access site.
   c. Type of blood return and frequency of assessing blood return.
   d. Instructions given to patient/caregiver.
   e. Communication with physician.
2. Report of blood values is to be placed in patient's chart.
Medications – BLANK
Strength of Evidence Level: Blank
PURPOSE:
To assure the safe administration of intermittent central line or peripheral intravenous (IV) medications supplied in a syringe.

CONSIDERATIONS:
1. Only nurses who have completed an approved IV therapy course and achieved competency as designated by the agency may administer IV push medications.
2. All medications should be stored at the temperature (i.e., refrigerated, frozen) indicated on the medication label per manufacturer guidelines.
3. Allow refrigerated medication syringe to stand at room temperature for 15 to 30 minutes prior to infusion or at a time interval designated by the pharmacist. Allow frozen medication syringes to thaw in the refrigerator for the proceeding 24-hour period and then warm to room temperature as above.
4. Prior to the initiation of therapy, the nurse administering the medication/therapy shall assess the appropriateness of the order, verify the medication label for correct name, drug, dose and expiration date, be knowledgeable of the use, possible side effects and nursing interactions required for the specific medication/therapy.
5. If the patient or caregiver will be administering the medication/therapy, they must be taught the correct method and schedule for administration, how to read and check medication labels for correct name, drug, dose and valid expiration date and when to contact nurse/pharmacist/physician in case of questions, problems or complications.

EQUIPMENT:
None

PROCEDURE:
1. Obtain a detailed physician’s order for IV push medication.
2. Adhere to Standard Precautions.
3. Identify patient and explain procedure. (using 2 patient identifiers)
4. Prepare a clean working area.
5. Gather and organize all of the supplies.
6. Check the syringe label for:
   a. Correct medication.
   b. Correct dose.
   c. Expiration date.
   d. Inspect syringe for discoloration or precipitate.
7. Wash hands using agency-approved hand hygiene.
8. Open clamp, if one is present, on line or extension.
9. Clean the needle less connector with an alcohol prep and allow to dry.
10. Attach saline flush to cap and flush.
11. Clean the cap with an alcohol prep.
12. Attach medication syringe to cap. Slowly inject the medication at the prescribed rate.
13. After the medication syringe is empty, remove it.
14. Wipe cap with alcohol, allow to dry and flush IV with normal saline. If a compatible continuous IV solution is infusing, this step may be omitted.
15. Wipe cap with alcohol, allow to dry and flush IV with heparin (if required). Remove syringe.
16. Close clamp or IV extension and secure.
17. Discard ALL used supplies per agency policy.

AFTERCARE:
1. Document in patient’s record:
   a. Medication administered, dose time, rate and route.
   b. Type and appearance of venous access site.
   c. Patient’s response to procedure, side effects and management.
   d. Instructions given to patient/caregiver.
   e. Communication with physician.
Medication Disposal

It is very important to discard any unused, prescription medication in a safe way. In order to do that, Meridian At Home recommends the following:

Guidelines:

1. Caregivers must educate patients and families on the proper disposal of prescription medications.

2. The following are guidelines for the safe disposal of prescription medications that should either be disposed of by the caregiver or taught to the patient/family:
   a. Prior to disposing of any prescribed medication, the medication must be removed from the original container. Before discarding the empty container, eliminate all Protected Health Information (PHI), including the patient’s name. This can be done with a black permanent marker or by scratching out or removing the prescription label.
   b. After the medication is removed from the container:
      1. **Solid medications (e.g. pills and capsules):** add a small amount of water to pills or capsule in order to partially dissolve them into a slurry. Mix the slurry with kitty litter, coffee grounds, flour, cornmeal or table salt.
      2. **Liquid medications (e.g. gels and creams):** mix liquid medications with kitty litter, coffee grounds, flour, cornmeal or table salt to create a distasteful, pungent mixture in order to discourage consumption. **NEVER mix medications with toxic chemicals.**
      3. **Blister paks:** wrap packages in multiple layers of opaque duct tape.
   c. Once the unused medications have either been mixed with the above substances and/or sealed with duct tape, seal them in an impermeable, nondescript container to be disposed of. Make sure the container can be sealed or closed, and tape the container with packing or duct tape.
   d. Discard the above container into the patient’s household garbage. Do NOT place the container into the household recycling bin.
   e. Medicines recommended for disposal by flushing are as follows:

(Source: FDA US Food and Drug Administration, March 2010)

- Actiq
- Avinza
- Daytrana
- Demerol
- Diastat/Diastat AcuDial
- Dilaudid
- Dolophine Hydrochloride
- Duragesic
- Embeda
- Exalgo
- Fentora
- Kadian
- Methadone Hydrochloride
- Methadose
- Morphine Sulfate
- MS Contin
- Onsolis
- Opana
- Opana ER
- Oramorph SR
- Oxycontin
- Percocet
- Percodan
- Xyrem

Intravenous (IV) narcotic drugs should be aspirated with a syringe from their original container or bags and flushed down the toilet.

f. When disposing of any controlled substance, disposal will be conducted by a licensed healthcare practitioner and witnessed by at least one other individual. The method by which the narcotic was disposed must be documented in the patient’s clinical record.
PURPOSE:
To instruct the patient/caregiver in the correct usage of a metered dose inhaler (MDI) for the effective delivery of inhaled medications.

CONSIDERATIONS:
1. An MDI gives one dose of medicine with each puff. The inhaler must be used correctly to effectively deliver the medicine into the throat and lungs. If used incorrectly, the medicine may be left on the tongue and back of oral cavity.

EQUIPMENT:
Inhaler
Spacer (optional)

PROCEDURE:
1. Adhere to Standard Precautions.
2. Instruct the patient to perform the following;
   a. Shake the inhaler five or six times.
   b. Remove the mouthpiece cover.
   c. If using a spacer, place it over the mouthpiece at the end of the inhaler.
   d. Put your lips and teeth over the mouthpiece/spacer being careful not to block the mouthpiece with your tongue.
   e. Breathe in slowly. As you do so, squeeze the top of the canister once. (If using a spacer, squeeze the top of the canister first, and then breathe in slowly).
   f. Keep inhaling even after you finish the squeeze.
   g. Continue inhaling slowly and deeply.
   h. After inhaling, remove the mouthpiece/spacer from your mouth and hold your breath for up to 10 seconds.
   i. If you need another dose of medication, repeat the previous steps.
   j. Replace the mouthpiece cover and store equipment.
   k. Rinse your mouth, gargle with water, and spit out. DO NOT swallow.
3. For cleaning of equipment. (See Cleaning and Disinfection of Respiratory Therapy Equipment)

AFTER CARE:
1. Document in patient's record:
   a. Instructions given to patient/caregiver.
   b. Patient/caregiver understanding and return demonstration

REFERENCE:
POLICY:
The nurse will address preventive measures, identify signs and symptoms of, and promptly intervene when infiltration and extravasation are suspected.

If a vesicant medication or solution must be administered peripherally it will be done with the collaboration of the licensed independent practitioner (LIP), nurse, and patient and/or caregiver.

Risk factors include:
- Multiple manipulations of infusion delivery system
- Large gauge and length of catheter
- Failure to stabilize VAD adequately
- Patient age, condition, acuity
- Administration of irritating infusates/solutions (acid/alkaline; H and high osmolarity)
- Infusion history
- Inadequate VAD insertion technique
- Inadequate care and maintenance practices
- Extended dwell time

PREVENTION:
- Use the smallest-gauge and shortest catheter to accommodate the prescribed therapy
- Avoid placing catheter in areas of flexion
- Consider a central vascular access device (CVAD) for infusates with a pH less than 5 or greater than 9, or osmolarity greater than 600 mOsm, or final dextrose concentration greater than 10%
- Infuse irritating infusates into large peripheral veins; avoid use of veins in hand, fingers
- Stabilize catheter to minimize movement at the insertion site
- Ensure patency of VAD prior to infusion, including assessment of brisk blood return upon aspiration
- Check patency of VAD during vesicant administration, aspirating for blood return every 3-4 mL
- Administer vesicants through the lowest injection port of a free-flowing compatible solution
- Instruct patient to immediately report any pain, burning, or swelling with infusion administration
- Teach home care patients to secure administration set on skin to avoid pulling at VAD insertion site and how to perform activities of daily living (ADL) while protecting catheter site and infusion

ASSESSMENT:
General
- Do not rely on alarms from electronic infusion devices (EIDs) to detect infiltration or extravasation
- Teach patient and/or caregiver signs and symptoms to report and the importance of immediate reporting

Short Peripheral and Midline Catheters
Assess all short peripheral and midline catheters for immediate or delayed signs and symptoms of infiltration/extravasation including, but not limited to:
- Changes in skin color, including blanching, bruising, or redness surrounding insertion site
- Edema in any direction from the insertion site
- Changes in skin temperature, including coolness or warmth
- Pain, burning, or stinging with injection or infusion
- Development of blisters
- Impaired ability to move fingers, hand, or entire extremity
- Numbness, tingling, and other signs of paresthesia in the extremity
- Fluid leakage from insertion site
- Slowed capillary refill

Central Vascular Access Devices
Assess for immediate or delayed signs and symptoms of infiltration and extravasation including, but not limited to:
- Loss of blood return upon aspiration
- Resistance to syringe injection
- Altered or stopped fluid flow by gravity
- Leaking from the insertion site
- Edema in the neck, shoulder, or chest surrounding the CVAD exit site
- Pain or discomfort of any kind at the insertion site, tip location, or along the CVAD’s venous pathway

INTERVENTIONS
Infiltration (nonvesicant solutions)
• Discontinue infusion immediately and remove catheter
  o Apply pressure at site to prevent bleeding and achieve hemostasis
• Institute appropriate supportive treatments as needed, such as elevation of the extremity or thermal applications
• Teach patient to report any progression of signs and symptoms such as changes in extremity mobility, sensation, elevated temperature, and signs of infection

Extravasation (vesicant solutions)
• Discontinue infusion immediately
• If catheter must be removed:
  o Aspirate for infused medication before removing catheter
  o Apply gentle pressure at site to prevent bleeding and further tissue damage
• Notify LIP and obtain specific orders to treat the extravasation
• Treatment of extravasation depends on the type of medication and severity of the complication and may include thermal manipulation, use of antidotes, and surgical interventions
  o Check drug manufacturer’s directions for us
  o Thermal application
    - Application of heat or cold based on specific vesicant medication
    - Cooling is recommended for alkylating agents, anthracyclines, antitumor antibiotics, and taxanes; use has been reported with propofol, vancomycin, nafcillin, doxycycline, calcium, potassium, promethazine, and parenteral nutrition solution
    - Heat is recommended for plant alkaloids, vasoconstricting agents (eg, dopamine, dobutamine, epinephrine)
  o Antidotes for treatment of extravasation injuries include:
    - Sodium thiosulfate for alkylating agents
    - Dexrazoxane (Tetect®) for anthracyclines
    - Hyaluronidase for plant alkaloids, dextrose, electrolytes (eg, calcium, potassium, sodium bicarbonate), and antibiotics (eg, nafcillin, vancomycin)
    - Phentolamine for vasopressor agents, including dobutamine, dopamine, epinephrine, metaraminol, norepinephrine, phenylephrine
• Reassess vascular access needs

Replace short peripheral catheter in opposite extremity
• Continue to monitor site, as clinically significant complications can result from infiltration or extravasation
• Observe site for signs and symptoms of compartment syndrome, nerve injury, blisters, skin sloughing, tissue necrosis, functional and sensory loss

Document in patient’s permanent medical record:
• MD notification
• Date and time of infiltration/extravasation
• Catheter type and size
• Whether insertion site is new or preexisting
• Drug administered, method of administration, and estimated volume of fluid that escaped into the tissue
• Patient complaints or experience during the extravasation
• Appearance of access site
• Treatment measures taken and outcome

Complete Occurrence Report according to organizational policy.

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<td>Moderate-severe pain</td>
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<td>Infiltration of any amount of blood products, irritant, or vesicant</td>
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Medications – Oral Medication Administration

Strength of Evidence Level: 3

PURPOSE:
To provide safe and accurate medication administration.
To instruct patient/caregiver about oral medication administration and medication regime.

EQUIPMENT:
Written patient medication guides (to be left in the home)
Appropriate teaching aids
Appropriate medication containers, i.e., original container, daily or weekly container, etc.

PROCEDURE:
1. Obtain a physician’s order for the patient’s medications. It should include:
   a. Name of the patient.
   b. Name of the medicine.
   c. Medication dose, route and frequency.
2. Use at least 2 patient identifiers prior to administering medications.
3. Check the patient’s known allergies.
4. During each nursing visit assess what oral medications the patient is taking and what oral medications are ordered. Be sure to include over-the-counter medications the patient may be using. Inform the physician of any over-the-counter medications that are not written on the patient’s medication record and that may have been prescribed by another physician.
5. Instruct the patient/caregiver on the schedule of the medication, the dosage, purpose and side effects.
6. During each nursing visit assess oral medication compliance (via pill counts, review of patient calendars, interviewing the patient/family member, etc.), side effects, effectiveness and the patient's/caregiver's knowledge of the medication, purpose and side effects.
7. Provide patient/caregiver with instructional medication handouts, teaching guides and educational material to keep. Topics should include:
   a. Medication's name.
   b. What it is for.
   c. What it looks like.
   d. Directions for taking the medication.
      (1) How much to take.
      (2) With meals or on empty stomach.
      (3) The same time each day.
      (4) The number of hours between doses.
   e. Special precautions or side effects.
   f. The side effects to report to the physician or nurse.
   g. Storage of medication in original containers.
      Note if medications must be stored away from light, moisture, etc.
8. Teach and assist the patient/caregiver to establish compliance with oral medication administration on each visit in the following manner:
   a. Fit the medication into the patient's daily routine.
   b. Use calendars or checklists with the medication times marked. Use large print, if needed.
   c. Schedule the medications around usual routines like meals, using cues or clues.
   d. Utilize medication containers as applicable, i.e., daily container, morning cup, afternoon cup, labeled egg carton, pillbox, etc.
   e. Use color code charts to coincide with a color dot on medication bottles.
   f. Request liquid form if tablets cannot be swallowed or crushed.
9. Report to the physician therapeutic effects of the medications, any adverse side effects and/or difficulty with patient/caregiver's medication compliance.
10. Encourage the patient to use the same pharmacist for all medications.
11. Provide the patient (or family as needed) with written information on the medications the patient should be taking when he or she leaves the organization's care.
12. Explain the importance of managing medication information to the patient.

AFTER CARE:
1. Document in patient's record:
   a. Medication administered, dose, time and route.
   b. Teaching and instructions given to patient/caregiver.
   c. Patient's response to teaching.
   d. Communication with the physician.
PURPOSE:
To insert medication into the rectum.

CONSIDERATIONS:
1. Suppositories should be firm for insertion.
2. Hold suppository under cold running water until it becomes firm, or place it in refrigerator for several minutes.
3. Use at least two patient identifiers prior to administering medications.

EQUIPMENT:
Suppository medication
Water-soluble lubricant
Personal protective equipment, as indicated
Tissues, washcloth/towel, as needed

PROCEDURE:
1. Adhere to Standard Precautions.
2. Identify patient and explain procedure.
3. Assemble equipment.
4. Provide privacy for patient.
5. Position the patient in a left lateral position to decrease likelihood of suppository being expelled and expose anus.
7. Remove suppository wrapper.
8. Lubricate suppository and gloved finger with water-soluble lubricant.
9. Separate the patient's buttocks to expose anus. Ask patient to breathe deeply to relax anal sphincter. Gently insert the suppository into rectum, tapered end first. Using forefinger, direct suppository along the rectal wall toward the umbilicus, advancing it 3 inches or about the length of forefinger until it has passed the internal anal sphincter.
10. Gently hold patient's buttocks together until the urge to defecate subsides.
11. Clean excess lubricant from anus.
12. Urge patient to retain suppository at least 20 minutes.
13. Discard soiled supplies in appropriate containers.

AFTER CARE:
1. Document in patient's record:
   a. Medication administered, dose, time and route.
   b. Results from suppository.
   c. Patient's response to procedure.
   d. Instructions given to patient/caregiver.
   e. Communication with the physician.
PURPOSE:
To provide a safe environment for nurses, patients and caregivers during administration of IV/IM/SC chemotherapy in the home.

CONSIDERATIONS:
1. Nurses administering IV/IM/SC chemotherapy in the home should have specialized education in the administration of antineoplastic agents.
2. All chemotherapy solutions should be premixed in a biological safety cabinet (BSC)-Class II Type B, or Class III (done in a pharmacy).
3. Syringes and IV sets with luer-lok type fittings are to be used to prevent separation and spills.
4. Proper aseptic technique must be used in the preparation and administration of antineoplastic drugs in order to protect the patient, the family, and the nurse.
5. All equipment used in drug preparation and administration and any unused drug(s) should be treated as cytotoxic waste and disposed of according to individual agency's policies as well as local, state, and federal regulations.
6. Use at least two patient identifiers prior to administering medications.
7. Per Joint Commission recommendations, all tubes and catheters should be labeled to prevent the possibility of tubing misconnections.
8. DO NOT eat or drink in areas where antineoplastic agents are prepared or administered.
9. The National Institute for Occupational Safety and Health (NIOSH) recommends the use of two pairs of gloves when handling antineoplastic agents unless nurse has chemo gloves (Nitrile gloves).

EQUIPMENT:
Disposable, surgical, latex, unpowdered gloves that cover the gown cuff (unless the manufacturer of the antineoplastic agent specifies a particular glove material)
Disposable gown (lint-free, low-permeability fabric with a closed front, long sleeves, and elastic or knit closed cuffs)
Plastic face shield or splash goggles – use whenever splash, sprays or aerosols are generated
Disposable, absorbent pads
Alcohol wipes
Puncture-proof container
Labeled, impervious trash bags
4x4 gauze pads
Soap
Paper towels
Commercially prepared spill kit

PROCEDURE:
1. Administration Safety:
   a. Adhere to Standard Precautions.
   b. Identify patient and explain procedure.
   c. Avoid skin contact. Don gloves.
   d. Place drugs and supplies on a surface lined with a disposable, absorbent pad.
   e. Use luer-lok fittings and/or tape connections securely to prevent disconnection or drug leakage.
   f. If unable to remain with the patient during the entire infusion, a control device must be used for patient safety.
   g. Administer chemotherapy as ordered. (See Administration of Intravenous Chemotherapeutic Agents.)
2. Disposal:
   a. Follow local, state and Environmental Protection Agency (EPA) recommendations for disposal of hazardous waste, and chemotherapeutic medications and supplies.
   b. DO NOT dispose of unused drugs or contaminated solutions in drains or toilets. Use the original vial, IV bag/bottle, or other closed container for liquid waste. Unused drugs should be picked up by or returned to the dispensing vendor.
   c. DO NOT clip needles, crush, or disassemble syringes, or IV tubing. Dispose of all contaminated equipment intact to prevent aerosolization, leaks and spills.
   d. Place used needles/syringes in a puncture-proof container.
   e. DO NOT use protective clothing that has been contaminated. Discard gloves and other contaminated equipment in an impervious plastic bag that has been labeled with a distinctive warning label. Dispose of bags according to individual agency's policy and local, state and federal regulations.
   f. Wash hands thoroughly after handling drugs and equipment.
3. Accidental Exposures:
   a. Remove contaminated gloves or gown immediately and discard properly.
   b. Wash skin contaminated with an antineoplastic agent with soap (not a germicidal agent) and water.
   c. Flood an eye that is accidentally exposed to an antineoplastic agent with water for at least 5 minutes. Seek medical attention immediately.
   d. Teach the patient and caregiver what to do if an accidental exposure to chemotherapy occurs.
   e. Document any exposure according to individual agency's policy.
4. Spills:
   a. A commercially prepared spill kit should be in the home with instructions on its use in the event of a spill.
b. If a spill occurs, it should be cleaned up immediately. Follow spill kit instructions. The patient and caregiver should be instructed to call the nurse immediately to report a spill.

c. Use a disposable, absorbent pad beneath the IV tubing, syringe, or other likely site of a spill.

d. If a spill occurs on the patient/caregiver's clothing or sheets, wash these articles in hot water separate from other articles.

e. If a spill occurs on an unprotected piece of furniture, i.e., sofa or mattress, scrub the area with detergent solution and water, rinse with clean water and dispose of contaminated materials. This procedure should be performed wearing double, unpowdered, gloves.

f. If a patient is receiving a continuous infusion via a pump, a plastic mattress pad should be used to protect the bed in case of a spill.

g. Document any spill according to individual agency's policy.

5. Handling of patient excreta:
   a. Instruct the patient, family and other caregivers that handling of patient excreta requires special handling for the first 48 hours after chemotherapy. [Note: If patient is receiving Thiotepa, this period is extended to 72 hours.]
   b. Wear disposable, surgical, unpowdered gloves and a disposable gown when handling body secretions such as blood, vomitus or excreta from patients who received chemotherapy within the previous 48 hours (72 hours with Thiotepa).
   c. Instruct the patient and the family to use care when handling the vomitus or excreta of the patient for 72 hours after treatment and to use good hand washing techniques.

AFTERCARE:

1. Document in patient's record:
   a. Procedure and observations.
   b. Instructions given to patient/caregiver.
   c. Response to procedure.
   d. Communication with physician.
PURPOSE:
To introduce medication into subcutaneous fat.

CONSIDERATIONS:
1. The subcutaneous route is used to inject 0.5-1.5 mL of medication into subcutaneous tissue, including insulin, heparin and some narcotics, such as morphine and dilaudid.
2. Common subcutaneous sites are outer aspects of arms, thighs and abdomen. Less common are upper back and upper buttock.
3. Rotate injection sites to avoid trauma to same site.
4. Subcutaneous injections can be taught to patient and caregiver.
5. For subcutaneous injections, select a 25- to 27-gauge needle with a medium bevel. The needle length can be 1/2 to 7/8 inches.
6. A filter needle should be used to draw up medication from an ampule and then replaced with appropriate size needle for injection.
7. Instructions given to patient/caregiver.
8. Use at least 2 patient identifiers prior to administering medications.

EQUIPMENT:
Medication
Alcohol wipe
Antiseptic wipes
Gauze
Syringes (25- to 27-gauge needle, 1/2 to 7/8 inch)
Puncture-proof container
Gloves
Filter needle, if necessary

PROCEDURE:
1. Check doctor's order for dosage, frequency and route of administration.
2. Adhere to Standard Precautions.
3. Identify patient and explain procedure.
4. Draw up medication after having injected equal amount of air into container. Recheck medication dosage.
5. Select injection site.
6. Clean site with alcohol wipe/antiseptic wipe by starting at the center and moving outward in circular motion; allow to air dry.
7. Pinch up skin to elevate subcutaneous tissue.
8. Insert needle at 45 degree angle, depending on amount of fatty tissue and needle size.
9. Once needle is inserted, skin can be released.
10. If agency policy requires, pull back on plunger to aspirate. If there is no blood aspirated, medication may be injected slowly.
11. If there is blood aspirated, withdraw needle, discard medication and syringe properly and repeat procedure. For insulin and heparin injections, it is not recommended to aspirate to check for blood.
12. Hold gauze over site and withdraw needle. Press site for a few seconds. DO NOT rub the injection site after SQ heparin administration because it may cause bruising or bleeding.
13. Discard soiled supplies in appropriate containers.

AFTER CARE:
1. Document in patient's record:
   a. Medication administered, dose, time, route and site.
   b. Patient's response to procedure, side effects and management.
   c. Instructions given to patient/caregiver.
   d. Communication with the physician.
PURPOSE:
Topical medications introduce medication through the skin, by absorption.

CONSIDERATIONS:
1. Topical medications include transdermal systems, pastes, aerosol sprays, ointments, lotions and creams.
2. Topical medications are used primarily for localized effect, though some medications, i.e., nitroglycerine, Fentanyl, and scopolamine, have a systemic effect in transdermal systems.
3. Topical medications are difficult to deliver in precise doses.
4. It is not necessary to apply large amounts of topical medication and ointment to skin, as it may be irritating to skin, stain clothes and be unnecessarily expensive.
5. Plastic film or transparent dressing may be used to cover some topical medications, i.e., cortisone ointment to increase absorption and protect clothing. Plastic film is not to be used with all topical medications. Follow manufacturer’s recommendations.
6. Transdermal systems or "patches" can be placed on any area of skin except below elbows and knees.
7. Consult package insert for rate of absorption, side effects, duration, etc., e.g., Fentanyl patches take up to 72 hours to reach maximum effect. Fentanyl patches should be disposed of by folding the adhesive side of the patch together so that it sticks to itself.
8. Always clean the skin with soap and water or debride the tissue of old medication and encrustation before applying new medication.
9. When applying the next dose, apply to different skin site, rotate the area of application to avoid skin irritation
10. Instructions given to patient/caregiver.
11. Use at least 2 patient identifiers prior to administering medications.

EQUIPMENT:
Topical medication
Plastic wrap and tape (optional)
Gloves
Tongue depressor (optional)
Soap
Water

PROCEDURE:
1. Adhere to Standard Precautions.
2. Identify patient and explain procedure.
3. Verify medication usage and instructions.
4. Wash off old topical medication with soap and water and dry area thoroughly.
5. Expose skin area where topical ointment or patch is to be applied. Provide patient privacy. Wash with soap and water, dry area thoroughly.
6. Apply topical medication using gloves, if necessary per manufacturer’s directions.
7. Apply plastic film or transparent dressing, if indicated by medication manufacturer’s instructions.
8. Discard soiled supplies in appropriate containers.

AFTER CARE:
1. Document in patient’s record:
   a. Medication administered, dose, time, route and site.
   b. Patient's response to procedure, side effects and management.
   c. Instructions given to patient/caregiver.
   d. Communication with the physician.
Medications – Vaginal Medications Administration

Strength of Evidence Level: 3

PURPOSE:
To apply a medication to the vagina.

CONSIDERATIONS:
1. Examine the perineum for excoriation before administering the medication. If any excoriation is present, withhold the medication and consult the doctor. Administration of medication could cause a burning sensation.
2. Store suppository/cream in a cool place. Many of these medications have a base that melts at warm temperature.
3. The vagina has no sphincter. The patient should remain in a lying position for 30 minutes to keep the medication within the vaginal tract.
4. Use at least 2 patient identifiers prior to administering medications.

EQUIPMENT:
Vaginal suppository/cream as prescribed
Water-soluble lubricant
Cotton balls
Towel or washcloth
Small basin of soapy, warm water
Protective bed covering
Gloves

PROCEDURE:
1. Adhere to Standard Precautions.
2. Identify patient and explain procedure.
3. Ask patient to empty bladder. Assist to lie down. Drape bed linen over legs, leaving only perineum exposed. With knees flexed and legs spread apart, place bed protector under buttocks.
4. Assemble equipment. Unwrap suppository and lubricate with lubricant or fill applicator with cream and lubricate tip of applicator.
5. If any vaginal discharge is observed, cleanse area with warm soapy water. Cleanse the right and left side of the perineum and finally the center, wiping from front to back, using a clean part of the washcloth for each stroke.
6. With one hand gently separate the labia and inspect the perineum for any irritation. Gently insert the lubricated suppository or applicator and insert cream.
7. Instruct the patient to remain lying down for about 30 minutes. Cleanse perineum as necessary.
8. Discard soiled supplies in appropriate containers.
9. If applicator is reusable, wash according to manufacturer's guidelines and return it to container.

AFTER CARE:
1. Document in patient's record:
   a. Medication administered, dose, time, route and site.
   b. Condition of perineum and labia.
   c. Patient's response to procedure, side effects and management.
   d. Instructions given to patient/caregiver.
   e. Communication with the physician.
PURPOSE:
To provide accurate and safe administration of intravenous vancomycin.

CONSIDERATIONS:
1. Vancomycin is used to treat serious or severe infections when other antibiotics are ineffective or contraindicated, including those caused by susceptible organisms, particularly gram positive organisms including Staphylococci, Methicillin-resistant Staph aureus, Staph epidermidis and diphtheroid organisms; Group A β-hemolytic strep, Streptococcus pneumoniae, Enterococci, Corynbacterium and Clostridium.
2. Vancomycin is administered intravenously for treatment of infections. Recommended dosing is as follows:
   a. Adults: 1 g IV every 12 hours.
   b. Children: Over 1 month old 40 mg/kg of body weight equally divided between every 8 or 12 hrs.
3. Patient-specific dosing is adjusted based on weight, serum levels, clearance of the drug, and the volume of distribution of administered drug.
4. Vancomycin is primarily excreted via the renal pathway. Patients with renal impairment will likely need their dose and dose interval adjusted to reduce toxic effects of the drug.
5. Adverse Effects:
   a. Renal: Geriatric and neonatal patients are at a greater risk of nephrotoxicity; increased serum Cr and BUN, decreased Cr Clearance and (rare) interstitial nephritis.
   b. Ototoxicity: Damage to eighth cranial nerve. Hearing loss and permanent deafness has occurred. Rarely, vertigo, dizziness and tinnitus.
   c. Redman’s Syndrome: Presenting with sudden decrease in blood pressure and accompanied by flushing and/or maculopapular rash or erythematous rash on the face, neck, chest and upper extremities. Redman’s syndrome is usually associated with too rapid of infusion of medication and extending the infusion period may eliminate or reduce the extent of the reaction. Wheezing, dyspnea, angio-edema, urticaria and pruritis may also occur.
   d. Hematological: Leukopenia, eosinophilia and rarely, thrombocytopenia.
   e. Miscellaneous: Anaphylaxis, drug fever, chills, nausea, phlebitis.
6. Vancomycin should not be given IM due to the risk of tissue necrosis. Administer via the IV route with particular attention to preventing infiltration or extravasation of drug into the surrounding tissue.
7. Vancomycin doses should be infused over at least 60 minutes to decrease the likelihood of adverse effects.
8. Concomitant use of other ototoxic and/or nephrotoxic drugs should be avoided due to the risk of additive toxicity.
9. Concomitant administration of Vancomycin with anesthetic agents in children has been associated with erythema and histamine-like flushing.
10. Vancomycin trough levels, BUN and creatinine should be obtained periodically as necessary.
11. Levels should not be drawn from the same vascular access device through which the dose was administered without flushing with a volume sufficient to clear the drug from the line.

EQUIPMENT:
None

PROCEDURE:
1. Verify orders with physician:
   a. Route (IV only), dose and duration of therapy.
   b. Recommend laboratory orders as necessary.
2. Review patient’s medical record and prior history.
3. Adhere to Standard Precautions.
4. Identify patient and explain procedure.
5. Initiate therapy using appropriate vascular access device and administer drug solution over at least 60 minutes. Utilize appropriate control device based on dosage.
6. During therapy, closely monitor the patient for the following problems and contact the physician promptly for:
   a. Increases in serum Cr and/or BUN, and increases in Vancomycin trough levels.
   b. Any reported signs of ototoxicity.
   c. Any signs of hypersensitivity.
7. Teach patient to check access site daily for phlebitis and irritation and to report any pain at infusion site to avoid extravasation.
8. Review and discuss actions and side effects with the patient and/or caregiver and document on the patient visit record.
9. Dispose of supplies properly.

AFTER CARE:
1. Document in patient’s medical record:
   a. Procedure and observations.
   b. Patient’s response to procedure.
   c. Instructions given to patient and/or caregiver.
   d. Communication with physician.
## Oral Dosage Forms That Should Not Be Crushed

**John F. Mitchell, PharmD, FASHP**

Last updated: April 9, 2010

<table>
<thead>
<tr>
<th>Drug Product</th>
<th>(active ingredient)</th>
<th>Dosage Form</th>
<th>Reasons/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accutane</td>
<td>(isotretinoin)</td>
<td>Capsule</td>
<td>Mucous membrane irritant</td>
</tr>
<tr>
<td>Aciphex</td>
<td>(rabeprazole)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Actiq</td>
<td>(fentaNYL)</td>
<td>Lozenge</td>
<td>Slow-release</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Note:</strong> this lollipop delivery system requires the patient to slowly allow dissolution</td>
</tr>
<tr>
<td>Actonel</td>
<td>(risedronate)</td>
<td>Tablet</td>
<td>Irritant</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Note:</strong> chewed, crushed, or sucked tablets may cause oropharyngeal irritation</td>
</tr>
<tr>
<td>Adalat CC</td>
<td>(NIFEdipine)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Adderall XR</td>
<td>(amphetamine salts)</td>
<td>Capsule</td>
<td>Slow-release (a)</td>
</tr>
<tr>
<td>AeroHist Plus</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Afeditab CR</td>
<td>(NIFEdipine)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Afinitor</td>
<td>(everolimus)</td>
<td>Tablet</td>
<td>Mucous membrane irritant</td>
</tr>
<tr>
<td>Aggrenox</td>
<td>(combination)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Alavert Allergy Sinus 12 Hour</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Allegra-D</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Alfen Jr</td>
<td>(guaiFENesin)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Capsule</td>
<td>Slow-release (a)</td>
</tr>
<tr>
<td>Alophen</td>
<td>(bisacodyl)</td>
<td>Tablet</td>
<td>Enteric-coated</td>
</tr>
<tr>
<td><strong>ALPRAZolam ER</strong></td>
<td><strong>ALPRAZolam</strong></td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Altoprev</td>
<td>(lovastatin)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Brand</td>
<td>Drug Formulation</td>
<td>Dosage Form</td>
<td>Administration</td>
</tr>
<tr>
<td>---------------</td>
<td>------------------------------</td>
<td>--------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Ambien CR</td>
<td>(zolpidem)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Amibid DM</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Amitiza</td>
<td>(lubiprostone)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Amrix</td>
<td>(cyclobenzaprine)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Aplenzin</td>
<td>(buproprion)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Apriso</td>
<td>(mesalamine)</td>
<td>Capsule</td>
<td>Slow-release (a)</td>
</tr>
<tr>
<td>Note:</td>
<td></td>
<td></td>
<td>maintain pH at less than or equal to 6.0</td>
</tr>
<tr>
<td>Aptivus</td>
<td>(tipranavir)</td>
<td>Capsule</td>
<td>Note: oil emulsion within spheres; taste</td>
</tr>
<tr>
<td>Aquatab C</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Aquatab D</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Arthrotec</td>
<td>(diclofenac)</td>
<td>Tablet</td>
<td>Enteric-coated</td>
</tr>
<tr>
<td>Asacol</td>
<td>(mesalamine)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Ascriptin A/D</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Enteric coated</td>
</tr>
<tr>
<td>Azulfidine EN</td>
<td>(sulfasalazine)</td>
<td>Tablet</td>
<td>Enteric-coated</td>
</tr>
<tr>
<td>Augmentin XR</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release (b,h)</td>
</tr>
<tr>
<td>AVINza</td>
<td>(morphine)</td>
<td>Capsule</td>
<td>Slow-release (a; not pudding)</td>
</tr>
<tr>
<td>Avodart</td>
<td>(dutasteride)</td>
<td>Capsule</td>
<td>Note: drug may cause fetal abnormalities; women who are, or may become, pregnant, should not handle capsules; all women should use caution in handling capsules, especially leaking capsules</td>
</tr>
<tr>
<td>Bayer EC</td>
<td>(aspirin)</td>
<td>Caplet</td>
<td>Enteric-coated</td>
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<tr>
<td>Bayer Low Adult</td>
<td>(aspirin)</td>
<td>Tablet</td>
<td>Enteric-coated</td>
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<tr>
<td>Bayer Regular</td>
<td>(aspirin)</td>
<td>Caplet</td>
<td>Enteric-coated</td>
</tr>
<tr>
<td>Bellahist-D LA</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Biaxin-XL</td>
<td>(clarithromycin)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Bidex A</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Bidhist-D</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Biltricide</td>
<td>(praziquantel)</td>
<td>Tablet</td>
<td>Taste (h)</td>
</tr>
<tr>
<td>Brand Name</td>
<td>Type</td>
<td>Formulation</td>
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<tr>
<td>--------------------</td>
<td>-------------------------------</td>
<td>------------------------</td>
<td></td>
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<tr>
<td>Bisa-Lax</td>
<td>(combination)</td>
<td>Tablet</td>
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</tr>
<tr>
<td>Biohist LA</td>
<td>(combination)</td>
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<tr>
<td>Bisac-Evac</td>
<td>(bisacodyl)</td>
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</tr>
<tr>
<td>Bisacodyl</td>
<td>(combination)</td>
<td>Tablet</td>
<td></td>
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<tr>
<td>Boniva</td>
<td>(ibandronate)</td>
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<tr>
<td>Bromfed PD</td>
<td>(combination)</td>
<td>Capsule</td>
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</tr>
<tr>
<td>Budeprion SR</td>
<td>(combination)</td>
<td>Tablet</td>
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</tr>
<tr>
<td>Calan SR</td>
<td>(verapamil)</td>
<td>Tablet</td>
<td></td>
</tr>
<tr>
<td>Carbatrol</td>
<td>(carBAMazepine)</td>
<td>Capsule</td>
<td></td>
</tr>
<tr>
<td>Cardene SR</td>
<td>(nicardipine)</td>
<td>Capsule</td>
<td></td>
</tr>
<tr>
<td>Cardizem</td>
<td>(diltiazem)</td>
<td>Tablet</td>
<td></td>
</tr>
<tr>
<td>Cardizem CD</td>
<td>(diltiazem)</td>
<td>Capsule</td>
<td></td>
</tr>
<tr>
<td>Cardizem LA</td>
<td>(diltiazem)</td>
<td>Tablet</td>
<td></td>
</tr>
<tr>
<td>Cardura XL</td>
<td>(doxazosin)</td>
<td>Tablet</td>
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</tr>
<tr>
<td>Cartia XT</td>
<td>(diltiazem)</td>
<td>Capsule</td>
<td></td>
</tr>
<tr>
<td>Cefaclor ER</td>
<td>(combination)</td>
<td>Tablet</td>
<td></td>
</tr>
<tr>
<td>Ceftin</td>
<td>(cefuroxime)</td>
<td>Tablet</td>
<td></td>
</tr>
<tr>
<td>Cefuroxime</td>
<td>(combination)</td>
<td>Tablet</td>
<td></td>
</tr>
<tr>
<td>CellCept</td>
<td>(mycophenolate)</td>
<td>Capsule, Tablet</td>
<td></td>
</tr>
<tr>
<td>Charcoal Plus</td>
<td>——</td>
<td>Tablet</td>
<td></td>
</tr>
<tr>
<td>Chlor-Trimeton 12-H</td>
<td>(combination)</td>
<td>Tablet</td>
<td></td>
</tr>
<tr>
<td>Cipro XR</td>
<td>(ciprofloxacin)</td>
<td>Tablet</td>
<td></td>
</tr>
<tr>
<td>Claritin-D 12 Hour</td>
<td>(combination)</td>
<td>Tablet</td>
<td></td>
</tr>
<tr>
<td>Claritin-D 24 Hour</td>
<td>(combination)</td>
<td>Tablet</td>
<td></td>
</tr>
<tr>
<td>Colace</td>
<td>(docusate)</td>
<td>Capsule</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** chewed, crushed, or sucked tablets may cause oropharyngeal irritation

**Note:** although not in the PI, the drug has a coating that is intended to release the drug over approximately 3 hours

**Note:** use suspension for children

**Note:** use suspension for children

**Teratogenic potential:** (i)
<table>
<thead>
<tr>
<th>Brand Name</th>
<th>Generic Name</th>
<th>Form</th>
<th>Dosage Formation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colestid</td>
<td>colestipol</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Concerta</td>
<td>methylphenidate</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Commit</td>
<td>nicotine</td>
<td>Lozenge</td>
<td>Note: integrity compromised by chewing or crushing</td>
</tr>
<tr>
<td>Cotazym-S</td>
<td>pancrelipase</td>
<td>Capsule</td>
<td>Enteric-coated (a)</td>
</tr>
<tr>
<td>Covera-HS</td>
<td>verapamil</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Creon 5, 10, 20</td>
<td>pancrelipase</td>
<td>Capsule</td>
<td>Slow-release (a)</td>
</tr>
<tr>
<td>Crixivan</td>
<td>indinavir</td>
<td>Capsule</td>
<td>Taste Note: capsule may be opened and mixed with fruit puree (e.g., banana)</td>
</tr>
<tr>
<td>Cymbalta</td>
<td>duloxetine</td>
<td>Capsule</td>
<td>Slow-release (a); Note: may add contents of capsule to apple juice or applesauce but NOT chocolate</td>
</tr>
<tr>
<td>Cytoxan</td>
<td>cyclophosphamide</td>
<td>Tablet</td>
<td>Note: drug may be crushed but company recommends using injection</td>
</tr>
<tr>
<td>Cytovene</td>
<td>ganciclovir</td>
<td>Capsule</td>
<td>Skin irritant</td>
</tr>
<tr>
<td>Dallergy</td>
<td>combination</td>
<td>Tablet</td>
<td>Slow-release (b, h)</td>
</tr>
<tr>
<td>Dallergy - JR</td>
<td>combination</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Deconamine SR</td>
<td>combination</td>
<td>Capsule</td>
<td>Slow-release (b)</td>
</tr>
<tr>
<td>Depakene</td>
<td>divalproex</td>
<td>Capsule</td>
<td>Slow-release; mucous membrane irritant (b)</td>
</tr>
<tr>
<td>Depakote</td>
<td>divalproex</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Depakote ER</td>
<td>divalproex</td>
<td>Tablet</td>
<td>Slow-release</td>
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<tr>
<td>Detrol LA</td>
<td>tolterodine</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Dexilant</td>
<td>dextansoprazole</td>
<td>Capsule</td>
<td>Slow-release (a)</td>
</tr>
<tr>
<td>Dilacor XR</td>
<td>diltiazem</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Dilitrate-SR</td>
<td>isosorbidie</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Dilt-CD</td>
<td>diltiazem</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Dilt-XR</td>
<td>diltiazem</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Diltia XT</td>
<td>diltiazem</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Product Name</td>
<td>Description</td>
<td>Formulation</td>
<td>Dosage Form</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------------------</td>
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<td>---------------</td>
</tr>
<tr>
<td>Ditropan XL</td>
<td>(oxybutynin)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Divalproex ER</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Doxidan</td>
<td>(bisacodyl)</td>
<td>Tablet</td>
<td>Enteric-coated (c)</td>
</tr>
<tr>
<td>Drisdol</td>
<td>(ergocalciferol)</td>
<td>Capsule</td>
<td>Liquid filled (d)</td>
</tr>
<tr>
<td>DriHist SR</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Drixoral Cold/Allergy</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Drixoral Nondrowsy</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Drixoral Allergy Sinus</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Droxia</td>
<td>(hydroxyurea)</td>
<td>Capsule</td>
<td>Note: exposure to the powder may cause serious skin toxicities; healthcare workers should wear gloves to administer</td>
</tr>
<tr>
<td>Drysec</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Dulcolax</td>
<td>(bisacodyl)</td>
<td>Tablet</td>
<td>Enteric-coated (c)</td>
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<td>DuraHist</td>
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<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>DuraHist D</td>
<td>(combination)</td>
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<td>Slow-release (h)</td>
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<tr>
<td>DynaCirc CR</td>
<td>(isradipine)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Duraphen II DM</td>
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<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Duraphen Forte</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Duratuss A</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Dynex</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Easprin</td>
<td>(aspirin)</td>
<td>Tablet</td>
<td>Enteric-coated</td>
</tr>
<tr>
<td>EC-Naprosyn</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Enteric-coated</td>
</tr>
<tr>
<td>Ecotrin Adult Low Strength</td>
<td>(aspirin)</td>
<td>Tablet</td>
<td>Enteric-coated</td>
</tr>
<tr>
<td>Ecotrin Maximum Strength</td>
<td>(aspirin)</td>
<td>Tablet</td>
<td>Enteric-coated</td>
</tr>
<tr>
<td>Ecotrin Regular Strength</td>
<td>(aspirin)</td>
<td>Tablet</td>
<td>Enteric-coated</td>
</tr>
<tr>
<td>Ed A-Hist</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release (b)</td>
</tr>
<tr>
<td>Drug Name</td>
<td>Active Ingredient</td>
<td>Formulation</td>
<td>Description</td>
</tr>
<tr>
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<td>E.E.S. 400</td>
<td>(erythromycin)</td>
<td>Tablet</td>
<td>Enteric-coated (b)</td>
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<td>Effer-K</td>
<td>(potassium bicarbonate)</td>
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<td>Effervescent tablet (f)</td>
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<td>Effervescent Potassium</td>
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<tr>
<td>Effexor XR</td>
<td>(venlafaxine)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Embeda</td>
<td>(morphine sulfate)</td>
<td>Capsule</td>
<td>Slow-release (a)</td>
</tr>
<tr>
<td>E-Mycin</td>
<td>(erythromycin)</td>
<td>Tablet</td>
<td>Enteric-coated</td>
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<td>Enablex</td>
<td>(darifenacin)</td>
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<td>Slow-release</td>
</tr>
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<td>Entocort EC</td>
<td>(budesonide)</td>
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<td>Enteric-coated (a)</td>
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<td>Equetro</td>
<td>(carBAMazepine)</td>
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<td>Ergomar</td>
<td>(ergotamine)</td>
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<td>Sublingual form (g)</td>
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<td>Ery-Tab</td>
<td>(erythromycin)</td>
<td>Tablet</td>
<td>Enteric-coated</td>
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<td>Erythromycin</td>
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<td>Tablet</td>
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<td>Erythromycin Base</td>
<td>——</td>
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<td>Erythromycin</td>
<td>——</td>
<td>Capsule</td>
<td>Enteric-coated Pellets (a)</td>
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<td>Delayed-Release</td>
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<td>Evista</td>
<td>(raloxifene)</td>
<td>Tablet</td>
<td>Taste; teratogenic potential (i)</td>
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<td>Extendryl Jr</td>
<td>(combination)</td>
<td>Capsule</td>
<td>Slow-release</td>
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<tr>
<td>Extendryl Sr</td>
<td>(combination)</td>
<td>Capsule</td>
<td>Slow-release (b)</td>
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<tr>
<td>Feen-a-mint</td>
<td>(bisacodyl)</td>
<td>Tablet</td>
<td>Enteric-coated (c)</td>
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<td>Feldene</td>
<td>(piroxicam)</td>
<td>Capsule</td>
<td>Mucous membrane irritant</td>
</tr>
<tr>
<td>Fentora</td>
<td>(fentaNYL)</td>
<td>Tablet</td>
<td>Note: buccal tablet; swallow whole</td>
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<tr>
<td>Feosol</td>
<td>(ferrous sulfate)</td>
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<td>Enteric-coated (b)</td>
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<td>Feratab</td>
<td>(ferrous sulfate)</td>
<td>Tablet</td>
<td>Enteric-coated (b)</td>
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<td>Fergon</td>
<td>(ferrous gluconate)</td>
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<td>Enteric-coated</td>
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<td>Fero-Grad 500 mg</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release</td>
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<td>Ferro-Sequels</td>
<td>(combination)</td>
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<td>Slow-release</td>
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<td>Flagyl ER</td>
<td>(metroNIDAZOLE)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Name</td>
<td>Active Ingredients</td>
<td>Formulation</td>
<td>Notes</td>
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<td>Fleet Laxative</td>
<td>(bisacodyl)</td>
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<tr>
<td>Flomax</td>
<td>(tamsulosin)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Focalin XR</td>
<td>(dexamethasone)</td>
<td>Capsule</td>
<td>Slow-release (a)</td>
</tr>
<tr>
<td>Fosamax</td>
<td>(alendronate)</td>
<td>Tablet</td>
<td>Mucous membrane irritant</td>
</tr>
<tr>
<td>Gleevec</td>
<td>(imatinib)</td>
<td>Tablet</td>
<td>Taste (h)</td>
</tr>
<tr>
<td>GlipiZIDE</td>
<td>(glipiZIDE)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Glucophage XR</td>
<td>(metFORMIN)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Glucotrol XL</td>
<td>(glipiZIDE)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Glumetza</td>
<td>(metFORMIN)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Guaifed</td>
<td>(combination)</td>
<td>Capsule</td>
<td>Slow-release</td>
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<tr>
<td>Guaifed-PD</td>
<td>(combination)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>GuaifEDesin Pseudoephedrine</td>
<td>————</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Guaifex DM</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
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<tr>
<td>Guaifex GP</td>
<td>(combination)</td>
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<tr>
<td>Guaifex PSE</td>
<td>(combination)</td>
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<td>Slow-release (h)</td>
</tr>
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<td>GuaiMAX-D</td>
<td>(combination)</td>
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<td>Slow-release</td>
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<tr>
<td>Halfprin 81</td>
<td>(aspirin)</td>
<td>Tablet</td>
<td>Enteric-coated</td>
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<tr>
<td>Hista-Vent DA</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Hydrea</td>
<td>(hydroxyurea)</td>
<td>Capsule</td>
<td>Note: exposure to the powder may cause serious skin toxicities; healthcare workers should wear gloves to administer.</td>
</tr>
<tr>
<td>Imdur</td>
<td>(isosorbide)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Inderal LA</td>
<td>(propranolol)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Indocin SR</td>
<td>(indomethacin)</td>
<td>Capsule</td>
<td>Slow-release (a,b)</td>
</tr>
<tr>
<td>Innopran XL</td>
<td>(propranolol)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Intelence</td>
<td>(etravirine)</td>
<td>Tablet</td>
<td>Note: tablet should be swallowed whole and not crushed; tablet may be dispersed in water</td>
</tr>
<tr>
<td>Drug Name</td>
<td>Active Ingredient</td>
<td>Formulation</td>
<td>Dosage Form</td>
</tr>
<tr>
<td>---------------------------</td>
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<td>Intuniv</td>
<td>guanFACINE</td>
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<td>Invega</td>
<td>paliperidone</td>
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<td>Isoptin SR</td>
<td>verapamil</td>
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<td>Isordil Sublingual</td>
<td>isosorbide</td>
<td>Tablet</td>
<td>Sublingual form (g)</td>
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<td>Isoxorbide Dinitrate Sublingual</td>
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<td>Tablet</td>
<td>Sublingual form (g)</td>
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<td>Kadian</td>
<td>morphine</td>
<td>Capsule</td>
<td>Slow-release (a)</td>
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<tr>
<td>Kaletra</td>
<td>combination</td>
<td>Tablet</td>
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<tr>
<td>Kapidex</td>
<td>dexlansoprazole</td>
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<td>Slow-release (a)</td>
</tr>
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<td>Keppra</td>
<td>levetiracetam</td>
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<td>Taste</td>
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<td>K-Lyte</td>
<td>potassium</td>
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<td>Slow-release</td>
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<td>Ketek</td>
<td>telithromycin</td>
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<td>Klor-Con</td>
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<td>Klor-Con M</td>
<td>potassium</td>
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<td>Slow-release (b, h)</td>
</tr>
<tr>
<td>Klotrix</td>
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<tr>
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<td>K-Lyte</td>
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<td>Effervescent tablet (f)</td>
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<td>K-Lyte CL</td>
<td>potassium</td>
<td>Tablet</td>
<td>Effervescent tablet (f)</td>
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<td>Effervescent tablet (f)</td>
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<td>potassium</td>
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<td>LaMICtal XR</td>
<td>lamoTRlgine</td>
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<td>ambrisentan</td>
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<td>Levbid</td>
<td>hyoscyamine</td>
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<tr>
<td>Drug Name</td>
<td>Active Ingredient(s)</td>
<td>Formulation</td>
<td>Release Type</td>
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<td>Lialda</td>
<td>mesalamine</td>
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<td>Liquibid-PD</td>
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<tr>
<td>Lithobid</td>
<td>lithium</td>
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<td>Lodrane 24</td>
<td>brompheniramine</td>
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<td>Slow-release</td>
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<td>Lodrane 24D</td>
<td>combination</td>
<td>Capsule</td>
<td>Slow-release</td>
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<td>LoHist 12 Hour</td>
<td>brompheniramine</td>
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<td>Slow-release</td>
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<td>Lovaza</td>
<td>combination</td>
<td>Capsule</td>
<td>Note: contents of capsule may erode walls of styrofoam or plastic materials</td>
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<td>Luvox CR</td>
<td>fluvoxamine</td>
<td>Capsule</td>
<td>Slow-release</td>
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<td>Slow-release (h)</td>
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<td>pyridostigmine</td>
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<td>Metadate ER</td>
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<td>Metadate CD</td>
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<td>Methylin ER</td>
<td>methylphenidate</td>
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<td>Metoprolol ER</td>
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<td>Micro K Extencaps</td>
<td>potassium chloride</td>
<td>Capsule</td>
<td>Slow-release (a,b)</td>
</tr>
<tr>
<td>Miraphen PSE</td>
<td>combination</td>
<td>Tablet</td>
<td>Slow-release</td>
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<td>Modane</td>
<td>combination</td>
<td>Tablet</td>
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<td>Moxatag</td>
<td>amoxicillin</td>
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<td>Slow-release</td>
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<td>extended-release</td>
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<td>Motrin</td>
<td>ibuprofen</td>
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<td>Taste (e)</td>
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<td>MS Contin</td>
<td>morphine</td>
<td>Tablet</td>
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<tr>
<td>Mucinex</td>
<td>guaiFENesin</td>
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<tr>
<td><strong>Drug</strong></td>
<td><strong>Form</strong></td>
<td><strong>Route</strong></td>
<td><strong>Release</strong></td>
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<td>Myfortic</td>
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<td>Nasatab LA</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
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<td>NexIUM</td>
<td>Capsule</td>
<td>Slow-release (a)</td>
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<td>Tablet</td>
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<td>Nicotinic Acid</td>
<td>Capsule</td>
<td>Slow-release (h)</td>
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<td>Tablet</td>
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<tr>
<td>Nifediac CC</td>
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<td>Slow-release</td>
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<td>Nifedical XL</td>
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<td>Slow-release</td>
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<tr>
<td>Nitrostat</td>
<td>Tablet</td>
<td>Sublingual route (g)</td>
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<tr>
<td>Norpace CR</td>
<td>Capsule</td>
<td>Slow-release form within a special capsule</td>
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<td>Oracea</td>
<td>Capsule</td>
<td>Slow-release</td>
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<tr>
<td>Oramorph SR</td>
<td>Tablet</td>
<td>Slow-release (b)</td>
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<td>OxyCONTIN</td>
<td>Tablet</td>
<td>Slow-release</td>
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</tr>
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<td></td>
<td></td>
<td><strong>Note:</strong> tablet disruption may cause a potentially fatal overdose of oxyCODONE</td>
<td></td>
</tr>
<tr>
<td>Pancrease MT</td>
<td>Capsule</td>
<td>Enteric-coated (a)</td>
<td></td>
</tr>
<tr>
<td>Pancrecarb</td>
<td>Capsule</td>
<td>Enteric-coated (a)</td>
<td></td>
</tr>
<tr>
<td>Pancrelipase</td>
<td>Capsule</td>
<td>Enteric-coated (a)</td>
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<td>Panocaps</td>
<td>Capsule</td>
<td>Enteric-coated (a)</td>
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<td>Panocaps MT</td>
<td>Capsule</td>
<td>Enteric-coated (a)</td>
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<td>Paxil CR</td>
<td>Tablet</td>
<td>Slow-release</td>
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<td>Pentasa</td>
<td>Capsule</td>
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<td>PhenaVent D</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
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<tr>
<td>PhenaVent LA</td>
<td>Capsule</td>
<td>Slow-release</td>
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<tr>
<td>Pre-Hist-D</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
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<td>Plendil</td>
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<tr>
<td>Drug Name</td>
<td>Active Ingredient(s)</td>
<td>Formulation</td>
<td>Dosage Form</td>
</tr>
<tr>
<td>----------------------------</td>
<td>----------------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td><strong>Prevacid</strong></td>
<td>(<em>lansoprazole</em>)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td><strong>Prevacid SoluTab</strong></td>
<td>(<em>lansoprazole</em>)</td>
<td>Tablet</td>
<td>Note: Orally disintegrating do not swallow; dissolve in water only and dispense via dosing syringe or NG tube</td>
</tr>
<tr>
<td><strong>Prevacid Suspension</strong></td>
<td>(<em>lansoprazole</em>)</td>
<td>Suspension</td>
<td>Slow-release</td>
</tr>
<tr>
<td><strong>PriLOSEC</strong></td>
<td>(<em>omeprazole</em>)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td><strong>PriLOSEC OTC</strong></td>
<td>(<em>omeprazole</em>)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td><strong>Procardia XL</strong></td>
<td>(<em>NIFEdipine</em>)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td><strong>Propecia</strong></td>
<td>(<em>finasteride</em>)</td>
<td>Tablet</td>
<td>Note: women who are, or may become, pregnant, should not handle crushed or broken tablets</td>
</tr>
<tr>
<td><strong>Proquin XR</strong></td>
<td>(<em>ciprofloxin</em>)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td><strong>Proscar</strong></td>
<td>(<em>finasteride</em>)</td>
<td>Tablet</td>
<td>Note: women who are, or may become, pregnant, should not handle crushed or broken tablets</td>
</tr>
<tr>
<td><strong>Protonix</strong></td>
<td>(<em>pantoprazole</em>)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td><strong>PROzac Weekly</strong></td>
<td>(<em>FLUoxetine</em>)</td>
<td>Tablet</td>
<td>Enteric-coated</td>
</tr>
<tr>
<td><strong>QDALL</strong></td>
<td>(<em>combination</em>)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td><strong>QDALL AR</strong></td>
<td>(<em>combination</em>)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td><strong>Ralix</strong></td>
<td>(<em>combination</em>)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td><strong>Ranexa</strong></td>
<td>(<em>ranolazine</em>)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td><strong>Razadyne ER</strong></td>
<td>(<em>galantamine</em>)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td><strong>Renagel</strong></td>
<td>(<em>sevelamer</em>)</td>
<td>Tablet</td>
<td>Note: tablets expand in liquid if broken or crushed</td>
</tr>
<tr>
<td><strong>Requip XL</strong></td>
<td>(<em>ropinirole</em>)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td><strong>Rescon</strong></td>
<td>(<em>combination</em>)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td><strong>Rescon JR</strong></td>
<td>(<em>combination</em>)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td><strong>Rescon MX</strong></td>
<td>(<em>combination</em>)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td><strong>Respa-1st</strong></td>
<td>(<em>combination</em>)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td><strong>Respa-DM</strong></td>
<td>(<em>combination</em>)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Product</td>
<td>Type</td>
<td>Formulation</td>
<td>Dosage Form</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
<td>------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Respahist</td>
<td>(combination)</td>
<td>Capsule</td>
<td>Slow-release (a)</td>
</tr>
<tr>
<td>Respaire SR</td>
<td>(combination)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Revlimid</td>
<td>(lenalidomide)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Ritalin LA</td>
<td>(methylphenidate)</td>
<td>Capsule</td>
<td>Slow-release (a)</td>
</tr>
<tr>
<td>Ritalin SR</td>
<td>(methylphenidate)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>R-Tanna</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Rythmol SR</td>
<td>(propafenone)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Ryzolt</td>
<td>(traMADol)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>SEROquel XR</td>
<td>(QUEtiapine)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Sinemet CR</td>
<td>(levo/carbidopa)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Sinuvent PE</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Slo-Niacin</td>
<td>(nicotinic acid)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Solodyn</td>
<td>(minocycline)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Somnote</td>
<td>(chloral hydrate)</td>
<td>Capsule</td>
<td>Liquid filled</td>
</tr>
<tr>
<td>Sprycel</td>
<td>(dasatinib)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Strattera</td>
<td>(atomoxetine)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Strattera</td>
<td>(atomoxetine)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Strattera</td>
<td>(atomoxetine)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Sudafed 12 hour</td>
<td>(combination)</td>
<td>Capsule</td>
<td>Slow-release (b)</td>
</tr>
<tr>
<td>Sudafed 24 hour</td>
<td>(combination)</td>
<td>Capsule</td>
<td>Slow-release (b)</td>
</tr>
<tr>
<td>Sular</td>
<td>(nisoldipine)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Symax Duotab</td>
<td>(hyoscyamine)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Symax SR</td>
<td>(hyoscyamine)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Tasigna</td>
<td>(nilotinib)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Brand Name</td>
<td>Active Ingredient(s)</td>
<td>Form</td>
<td>Administration</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------------</td>
<td>------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Taztia XT</td>
<td>(diltiazem)</td>
<td>Capsule</td>
<td>Slow-release (a)</td>
</tr>
<tr>
<td>Tegretol-XR</td>
<td>(carbamazepine)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Temodar</td>
<td>(temozolomide)</td>
<td>Capsule</td>
<td>Slow-release</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Note: accidentally opened or damaged capsules require rigorous precautions to avoid inhalation or contact with the skin or mucous membranes (i)</td>
</tr>
<tr>
<td>Tessalon Perles</td>
<td>(benzonatate)</td>
<td>Capsule</td>
<td>Note: swallow whole; local anesthesia of the oral mucosa; choking could occur</td>
</tr>
<tr>
<td>Theo-24</td>
<td>(theophylline)</td>
<td>Capsule</td>
<td>Slow-release; Note: contains beads that dissolve throughout the GI tract</td>
</tr>
<tr>
<td>Theochron</td>
<td>(theophylline)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Tiazac</td>
<td>(diltiazem)</td>
<td>Capsule</td>
<td>Slow-release (a)</td>
</tr>
<tr>
<td>Topamax</td>
<td>(topiramate)</td>
<td>Tablet</td>
<td>Taste</td>
</tr>
<tr>
<td>Toprol XL</td>
<td>(metoprolol)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Touro CC-LD</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Touro LA-LD</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
</tr>
<tr>
<td>Toviaz</td>
<td>(fesoterodine)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Tracleer</td>
<td>(bosentan)</td>
<td>Tablet</td>
<td>Note: women who are, or may become, pregnant, should not handle crushed or broken tablets</td>
</tr>
<tr>
<td>Trental</td>
<td>(pentoxifylline)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Treximet</td>
<td>(combination)</td>
<td>Tablet</td>
<td>Note: unique drug matrix enhances rapid drug absorption</td>
</tr>
<tr>
<td>Tylenol Arthritis</td>
<td>(acetaminophen)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Ultram ER</td>
<td>(tramadol)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Note: tablet disruption may cause a potentially fatal overdose of drug</td>
</tr>
<tr>
<td>Ultrace</td>
<td>(pancrelipase)</td>
<td>Capsule</td>
<td>Enteric-coated</td>
</tr>
<tr>
<td>Uniphyl</td>
<td>(theophylline)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
<tr>
<td>Urocit-K</td>
<td>(potassium citrate)</td>
<td>Tablet</td>
<td>Wax-coated; prevents upper GI release</td>
</tr>
<tr>
<td>Uroxatral</td>
<td>(alfuzosin)</td>
<td>Tablet</td>
<td>Slow-release</td>
</tr>
</tbody>
</table>

Note: women who are, or may become, pregnant, should not handle crushed or broken tablets.

Note: unique drug matrix enhances rapid drug absorption.

Note: tablet disruption may cause a potentially fatal overdose of drug.
<table>
<thead>
<tr>
<th>Brand Name</th>
<th>Component</th>
<th>Formulation</th>
<th>Administration</th>
<th>Adverse Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valcyte</td>
<td>valGanciclovir</td>
<td>Tablet</td>
<td></td>
<td>Teratogenic and irritant potential (i, b)</td>
</tr>
<tr>
<td>Verapamil SR</td>
<td>----------</td>
<td>Tablet</td>
<td>Slow-release (h)</td>
<td></td>
</tr>
<tr>
<td>Verelan</td>
<td>verapamil</td>
<td>Capsule</td>
<td>Slow-release (a)</td>
<td></td>
</tr>
<tr>
<td>Verelan PM</td>
<td>verapamil</td>
<td>Capsule</td>
<td>Slow-release (a)</td>
<td></td>
</tr>
<tr>
<td>VesiCare</td>
<td>solifenacin</td>
<td>Tablet</td>
<td>Enteric coated</td>
<td></td>
</tr>
<tr>
<td>Videx EC</td>
<td>didanosine</td>
<td>Capsule</td>
<td>Slow-release</td>
<td></td>
</tr>
<tr>
<td>Voltaren XR</td>
<td>diclofenac</td>
<td>Tablet</td>
<td>Slow-release</td>
<td></td>
</tr>
<tr>
<td>VoSpire ER</td>
<td>albuterol</td>
<td>Tablet</td>
<td>Slow-release</td>
<td></td>
</tr>
<tr>
<td>Votrient</td>
<td>pazopanib</td>
<td>Tablet</td>
<td></td>
<td>Note: crushing significantly increases the AUC and Tmax</td>
</tr>
<tr>
<td>Wellbutrin SR, XL</td>
<td>buPROPion</td>
<td>Tablet</td>
<td>Slow-release</td>
<td></td>
</tr>
<tr>
<td>Xanax XR</td>
<td>ALPRAZolam</td>
<td>Tablet</td>
<td>Slow-release</td>
<td></td>
</tr>
<tr>
<td>Zenpep</td>
<td>pancrelipase</td>
<td>Capsules</td>
<td>Slow-release (b):</td>
<td></td>
</tr>
<tr>
<td>Zolinza</td>
<td>vorinostat</td>
<td>Capsule</td>
<td>Note: irritant; avoid contact with skin or mucous membranes; avoid contact with crushed or broken tablets</td>
<td></td>
</tr>
<tr>
<td>ZORprin</td>
<td>aspirin</td>
<td>Tablet</td>
<td>Slow-release</td>
<td></td>
</tr>
<tr>
<td>Zyban</td>
<td>buPROPion</td>
<td>Tablet</td>
<td>Slow-release</td>
<td></td>
</tr>
<tr>
<td>Zyflo CR</td>
<td>zileuton</td>
<td>Tablet</td>
<td>Slow-release</td>
<td></td>
</tr>
</tbody>
</table>
(a) Capsule may be opened and the contents taken without crushing or chewing; soft food such as applesauce or pudding may facilitate administration; contents may generally be administered via nasogastric tube using an appropriate fluid provided entire contents and washed down the tube.

(b) Liquid dosage forms of the product are available; however, dose, frequency of administration and manufacturers may differ from that of the solid dosage form.

(c) Antacids and/or milk may prematurely dissolve the coating of the tablet.

(d) Capsule may be opened and the liquid contents removed for administration.

(e) The taste of this product in a liquid form would likely be unacceptable to the patient; administration via nasogastric tube should be acceptable.

(f) Effervescent tablets must be dissolved in the amount of diluent recommended by the manufacturer.

(g) Tablets are made to disintegrate under the tongue.

(h) Tablet is scored and may be broken in half without affecting release characteristics.

(i) Skin contact may enhance tumor production; avoid direct contact.

Disclaimer: This listing is not meant to represent all products, either by generic or trade name. The author encourages manufacturers, pharmacists, nurses, and other health professionals to notify him of any changes or updates. 1.

1. Correspondence regarding this list may be addressed to:
   John F. Mitchell, Pharm.D., FASHP
   Email: rxmitchell@att.net

2. The generic name is provided merely as a reference point and is only listed for single ingredient medications; it should not be assumed that drugs with the same generic are equivalent to the specific brand name listed relative to crushing or chewing. If questions arise, please check with your pharmacist.

3. Two official USP terms are used to designate special-release medication forms: "extended release" and "delayed release". Others such as "sustained release", "controlled release", etc. are commonly used on package labeling. The term "Slow-release" is being used here to signify all such drugs with a special-release mechanism.

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<table>
<thead>
<tr>
<th>Do Not Use</th>
<th>Potential Problem</th>
<th>Use Instead</th>
</tr>
</thead>
<tbody>
<tr>
<td>U (unit)</td>
<td>Mistaken for “0” (zero), the number “4” (four) or “cc”</td>
<td>Write &quot;unit&quot;</td>
</tr>
<tr>
<td>IU (International Unit)</td>
<td>Mistaken for IV (intravenous) or the number 10 (ten)</td>
<td>Write &quot;International Unit&quot;</td>
</tr>
<tr>
<td>Q.D., QD, q.d., qd (daily)</td>
<td>Mistaken for each other</td>
<td>Write &quot;daily&quot;</td>
</tr>
<tr>
<td>Q.O.D., QOD, q.o.d, qod (every other day)</td>
<td>Period after the Q mistaken for &quot;I&quot; and the &quot;O&quot; mistaken for &quot;I&quot;</td>
<td>Write &quot;every other day&quot;</td>
</tr>
<tr>
<td>Trailing zero (X.0 mg)*</td>
<td>Decimal point is missed</td>
<td>Write X mg</td>
</tr>
<tr>
<td>Lack of leading zero (.X mg)</td>
<td></td>
<td>Write 0.X mg</td>
</tr>
<tr>
<td>MS</td>
<td>Can mean morphine sulfate or magnesium sulfate</td>
<td>Write &quot;morphine sulfate&quot;</td>
</tr>
<tr>
<td>MSO₄ and MgSO₄</td>
<td>Confused for one another</td>
<td>Write &quot;magnesium sulfate&quot;</td>
</tr>
</tbody>
</table>

* Applies to all orders and all medication-related documentation that is handwritten (including free-text computer entry) or on pre-printed forms.

*Exception: A “trailing zero” may be used only where required to demonstrate the level of precision of the value being reported, such as for laboratory results, imaging studies that report size of lesions, or catheter/tube sizes. It may not be used in medication orders or other medication-related documentation.

---

**Additional Abbreviations, Acronyms and Symbols**

(For possible future inclusion in the Official “Do Not Use” List)

<table>
<thead>
<tr>
<th>Do Not Use</th>
<th>Potential Problem</th>
<th>Use Instead</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; (greater than) &lt; (less than)</td>
<td>Misinterpreted as the number “7” (seven) or the letter “L”</td>
<td>Write &quot;greater than&quot; Write &quot;less than&quot;</td>
</tr>
<tr>
<td></td>
<td>Confused for one another</td>
<td></td>
</tr>
<tr>
<td>Abbreviations for drug names</td>
<td>Misinterpreted due to similar abbreviations for multiple drugs</td>
<td>Write drug names in full</td>
</tr>
<tr>
<td>Apothecary units</td>
<td>Unfamiliar to many practitioners</td>
<td>Use metric units</td>
</tr>
<tr>
<td></td>
<td>Confused with metric units</td>
<td></td>
</tr>
<tr>
<td>@</td>
<td>Mistaken for the number “2” (two)</td>
<td>Write &quot;at&quot;</td>
</tr>
<tr>
<td>cc</td>
<td>Mistaken for U (units) when poorly written</td>
<td>Write &quot;ml&quot; or &quot;milliliters&quot;</td>
</tr>
<tr>
<td>µg</td>
<td>Mistaken for mg (milligrams) resulting in one thousand-fold overdose</td>
<td>Write &quot;mcg&quot; or &quot;micrograms&quot;</td>
</tr>
</tbody>
</table>
### Look Alike/Sound Alike Medications

<table>
<thead>
<tr>
<th>Drug</th>
<th>Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Concentrated Roxanol &amp; Morphine oral liquid</strong></td>
<td>Roxanol is a concentrated form of oral morphine solution (20 mg/ml) which has often been confused with the standard concentration (listed as 10mg/5ml or 20 mg/5ml). Accidental selection of the wrong concentration and labeling the product by volume, not milligrams, contribute to these errors. For Example, “10 mg” has been confused with “10 ml”. If concentrated product is used, this represents a 20-fold overdose.</td>
</tr>
<tr>
<td><strong>2. Celebrex &amp; Celexa &amp; Cerebyx</strong></td>
<td>Patients affected by a mix-up between these three drugs may experience a decline in mental status, lack of pain or seizure control, or other serious adverse events.</td>
</tr>
<tr>
<td><strong>3. Dilaudid (hydromorphone) &amp; Morphine (Astramorph, Duramorph, Infumorph)</strong></td>
<td>Some health care providers have mistakenly believed that hydromorphone is the generic equivalent for morphine. These medications are NOT interchangeable. Confusion has resulted in episodes of respiratory arrest due to potency differences between these drugs.</td>
</tr>
<tr>
<td><strong>4. Insulin products:</strong> Lantus &amp; Lente Humulin &amp; Humalog Novolin &amp; Novolog Novolin 70/30 &amp; Novolog Mix 70/30</td>
<td>Similar names, strengths and concentration ratios of some products (e.g., 70/30) have contributed to medication errors. Mix ups have also occurred between the 100 unit/ml and 500 units/ml insulin concentrations.</td>
</tr>
<tr>
<td><strong>5. Avandia (Rosiglitazone) &amp; Coumadin (Warfarin)</strong></td>
<td>Poorly handwritten orders for Avandia (used for type II diabetes) have been misread for Coumadin (used to prevent blood clot formation) leading to potentially serious adverse events.</td>
</tr>
<tr>
<td><strong>6. Catapres (Clonidine) &amp; Klonopin (Clonazepam)</strong></td>
<td>The generic name for catapres (Clonidine) can easily be confused as the trade name for Klonopin (clonazepam).</td>
</tr>
<tr>
<td><strong>7. Zyprexa (olanzapine) &amp; Zyrtec (cetirizine) &amp; Toradol</strong></td>
<td>Zyrtec (an antihistamine) and Zyprexa (an antipsychotic) have been frequently mixed up due to the similarity in names.</td>
</tr>
<tr>
<td><strong>8. Tramadol &amp; Trazadone &amp; Toradol</strong></td>
<td>Drugs are mixed up due to similar names &amp; dosages. Tramadol (opioid analgesic), Trazadone (antidepressant) and Toradol which is a non-steroidal anti-inflammatory.</td>
</tr>
<tr>
<td><strong>9. Prilosec &amp; Prozac</strong></td>
<td>Drugs are mixed up due to sound alike names &amp; dosages. Prilosec (proton pump inhibitor) vs Prozac (antidepressant drug).</td>
</tr>
<tr>
<td><strong>10. Zantac (Ranitidine) &amp; Xanax (Alprazolam) &amp; Ativan (Lorazepam)</strong></td>
<td>Name similarity has led to medication errors, especially with alprazolam and lorazepam. Both are anxiolytics and are available in 0.5mg, 1mg and 2 mg tablets.</td>
</tr>
<tr>
<td><strong>11. Zantac &amp; Zyrtec &amp; Zocor</strong></td>
<td>Name similarity has led to medication errors. Three different drugs for the treatment of duodenal ulcer (Zantac), antihistamine (Zyrtec) and antihyperlipidemic agent (Zocor). Similar dosage strengths for Zestril and Zocor.</td>
</tr>
<tr>
<td><strong>12. OxyContin® (contains oxycodone hydrochloride controlled – release tablets) MS Contin® (morphine sulfate prolonged controlled release)</strong></td>
<td>Name similarity has led to medication errors. Both medications are used for the same purpose but dosing is not interchangeable. Must consult Pharmacy to switch from one to the other.</td>
</tr>
<tr>
<td><strong>13. Hydrocodone &amp; Oxycodone</strong></td>
<td>Hydrocodone is used orally as a narcotic analgesic and antitussive often in combination with acetaminophen. Oxycodone is available as a single ingredient medication in immediate release and controlled release.</td>
</tr>
<tr>
<td><strong>14. Flagyl (metronidazole) &amp; Glucophage (Metformin)</strong></td>
<td>Generic name similarity has led to medication errors. One is an antibiotic (Flagyl) and the other is an oral antidiabetic agent (Glucophage).</td>
</tr>
<tr>
<td><strong>15. Zestril &amp; Zyprexa &amp; Zetia</strong></td>
<td>Name similarity has led to medication errors. Antihypertensive (Zestril) vs antipsychotic (Zyprexa) vs antihyperlipidemic agent (Zetia). Similar dosage strengths for Zestril and Zyprexa.</td>
</tr>
<tr>
<td><strong>16. Advicor &amp; Advair</strong></td>
<td>Name similarity has led to medication errors. One is an inhaler (Advair) and the other is an antihyperlipidemic combination product (Advicor).</td>
</tr>
</tbody>
</table>

### Actions:
- Maintain awareness of look alike/sound alike drug names
- Whenever possible, determine the purpose of the medication before administering or providing medication teaching.
- Accept verbal or telephone orders (for above look alike/sound alike) medications only when truly necessary. Read back ALL verbal telephone orders to ensure accuracy. Spell the product name and state its indication.
- Clearly specify the dosage form and drug strength.
- Educate patients for the potential of medication “mix-ups” especially with known problematic drug names.

Reference – Medispan Validation/Drug Education; Medication Reference Guide

Updated 10/18/2013
REFERENCES


