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Medication Work-up

Generic Name: Morphine

Drug class: Opioid analgesic

Indication: Severe pain. Pain severe enough to require daily, around the clock long-term opioid treatment and for which alternative treatment options are inadequate (extended release). Pulmonary edema. Pain associated with MI

Dosage forms: mg, mg/kg

How to administer: PO, Rect (Adults 50 kg): Usual starting dose for moderate to severe pain in opioid-naive patients—30 mg q 3– 4 hr initially or once 24-hr opioid requirement is determined, convert to controlled-, extended-, or sustained-release morphine by administering total daily oral morphine dose every 24 hr (as Kadian or Avinza), 50% of the total daily oral morphine dose every 12 hr (as Kadian, MS Contin), or 33% of the total daily oral morphine dose every 8 hr (as MS Contin). See equianalgesic chart, Appendix B. Avinza dose should not exceed 1600 mg/day

Nursing Consideration:

- Assess type, location, and intensity of pain prior to and 1 hr following PO, subcut, IM, and 20 min (peak) following IV administration.
- Patients on a continuous infusion should have additional bolus doses provided every 15–30 min, as needed, for breakthrough pain.
- Patients taking sustained-release morphine may require additional short-acting opioid doses for breakthrough pain
- *High Alert:* Assess level of consciousness, BP, pulse, and respirations before and periodically during administration. If respiratory rate is 10/min, assess level of sedation. Physical stimulation may be sufficient to prevent significant hypoventilation. Subsequent doses may need to be decreased by 25– 50%. Initial drowsiness will diminish with continued use Geri: Assess geriatric patients frequently; older adults are more sensitive to the effects of opioid analgesics and may experience.
- Prolonged use may lead to physical and psychological dependence and tolerance. This should not prevent patient from receiving adequate analgesia. Most patients who receive morphine for pain do not develop psychological dependence. Progressively higher doses may be required to relieve pain with long-term therapy
- Assess bowel function routinely.
- *Toxicity and Overdose*: If an opioid antagonist is required to reverse respiratory depression or coma, naloxone is the antidote

Side Effects: CNS: confusion, sedation, dizziness, dysphoria, euphoria, floating feeling, hallucinations, headache, unusual dreams. EENT: blurred vision, diplopia, miosis. Resp: RESPIRATORY DEPRESSION. CV: hypotension, bradycardia. GI: constipation, nausea, vomiting. GU: urinary retention. Derm: flushing, itching, sweating. Misc: physical dependence, psychological dependence, tolerance.

Contraindications: Hypersensitivity; Some products contain tartrazine, bisulfites, or alcohol and should be avoided in patients with known hypersensitivity; Acute, mild, intermittent, or postoperative pain (extended/sustained-release); Significant respiratory depression (extended/sustained-release); Acute or severe bronchial asthma (extended/sustained-release); Paralytic ileus (extended/sustained-release). Use Cautiously in: Head trauma; intracranial pressure; Severe renal, hepatic, or pulmonary disease; Hypothyroidism; Seizure disorder; Adrenal insufficiency; History of substance abuse; Undiagnosed abdominal pain; Prostatic hyperplasia; Patients undergoing procedures that rapidly decrease pain (cordotomy, radiation); long-acting agents should be discontinued 24 hr before and replaced with short-acting agents; **Geri:** Geriatric or debilitated patients increase risk of respiratory depression); **OB, Lactation:** Avoid chronic use; has been used during labor but may cause respiratory depression in the newborn; **Pedi:** Neonates and infants 3 mo (more susceptible to respiratory depression); **Pedi:** Neonates (oral solution contains sodium benzoate which can cause potentially fatal gasping syndrome)

Generic Name: Lorazepam

Drug class: Benzodiazepine

Indication: Anxiety disorder (oral). Preoperative sedation (injection). Decreases preoperative anxiety and provides amnesia. Unlabeled Use: IV: Antiemetic prior to chemotherapy. Insomnia, panic disorder, as an adjunct with acute mania or acute psychosis.

Dosage forms: mg, mg/kg

How to administer: PO, IM, IV

Nursing Considerations:

- Conduct regular assessment of continued need for treatment.
- Pedi: Assess neonates for prolonged CNS depression related to inability to metabolize lorazepam.
- Geri: Assess geriatric patients carefully for CNS reactions as they are more sensitive to these effects. Assess falls risk.
- Anxiety: Assess degree and manifestations of anxiety and mental status (orientation, mood, behavior) prior to and periodically throughout therapy.
- Prolonged high-dose therapy may lead to psychological or physical dependence. Restrict amount of drug available to patient.

- Status Epilepticus: Assess location, duration, characteristics, and frequency of seizures. Institute seizure precautions.
- Lab Test Considerations: Patients on high-dose therapy should receive routine evaluation of renal, hepatic, and hematologic function.
- Toxicity and Overdose: If overdose occurs, flumazenil (Romazicon) is the antidote. Do not use with patients with seizure disorder. May induce seizures

Side effects: CNS: dizziness, drowsiness, lethargy, hangover, headache, ataxia, slurred speech, forgetfulness, confusion, mental depression, rhythmic myoclonic jerking in pre-term infants, paradoxical excitation. EENT: blurred vision. Resp: respiratory depression. CV: rapid IV use only—APNEA, CARDIAC ARREST, bradycardia, hypotension.GI: constipation, diarrhea, nausea, vomiting, weight gain (unusual). Derm: rashes. Misc: physical dependence, psychological dependence, tolerance

Contraindications: Hypersensitivity; Cross-sensitivity with other benzodiazepines may exist; Comatose patients or those with pre-existing CNS depression; Uncontrolled severe pain; Angle-closure glaucoma; Severe hypotension; Sleep apnea; **OB, Lactation**: Use in pregnancy and lactation may cause CNS depression, flaccidity, feeding difficulties, hypothermia, seizures, and respiratory problems in the neonate; discontinue drug or bottle-feed. Use Cautiously in: Severe hepatic/renal/pulmonary impairment; Myasthenia gravis; Depression; Psychosis; History of suicide attempt or drug abuse/substance use disorder; COPD; Sleep apnea; **Pedi:** Use cautiously in children under 12 yr. In increase doses, benzyl alcohol in injection may cause potentially fatal "gasping syndrome" in neonates; **Geri:** Lower doses recommended for geriatric or debilitated patients; Hypnotic use should be short-term.

Generic Name: Atropine

Drug Class: Therapeutic: antiarrhythmics

Pharmacologic: anticholinergics, antimuscarinics

Indication: IM: Given preoperatively to decrease oral and respiratory secretions. IV: Treatment of sinus bradycardia and heart block. IV: Reversal of adverse muscarinic effects of anticholinesterase agents (neostigmine, physostigmine, or pyridostigmine).IM, IV: Treatment of anticholinesterase (organophosphate pesticide) poisoning Inhaln: Treatment of exercise-induced bronchospasm

Dosage form: mg, mg/kg

How to administer: IV (Adults): 0.5– 1 mg; may repeat as needed q 5 min, not to exceed a total of 2 mg (q 3– 5 min in Advanced Cardiac Life Support guidelines) or 0.04 mg/kg (total vago lytic dose).

Nursing considerations:

- Assess vital signs and ECG tracings frequently during IV drug therapy. Report any significant changes in heart rate or BP or increased ventricular ectopy or angina to health care professional promptly.
- Monitor intake and output ratios in elderly or surgical patients because atropine may cause urinary retention.
- Assess patients routinely for abdominal distention and auscultate for bowel sounds. If constipation becomes a problem, increasing fluids and adding bulk to the diet may help alleviate constipation.
- Toxicity and Overdose: If overdose occurs, physostigmine is the antidote

Side effects: CNS: drowsiness, confusion, hyperpyrexia. EENT: blurred vision, cycloplegia, photophobia, dry eyes, mydriasis. CV: tachycardia, palpitations, arrhythmias. GI: dry mouth, constipation, impaired GI motility GU: urinary hesitancy, retention, impotency Resp: tachypnea, pulmonary edema Misc: flushing, decreased sweating

Contraindications: Hypersensitivity; Angle-closure glaucoma; Acute hemorrhage; Tachycardia secondary to cardiac insufficiency or thyrotoxicosis; Obstructive disease of the GI tract. Use Cautiously in: Intra-abdominal infections; Prostatic hyperplasia; Chronic renal, hepatic, pulmonary, or cardiac disease; OB, Lactation: Safety not established; IV administration may produce fetal tachycardia; Pedi: Infants with Down syndrome have increased sensitivity to cardiac effects and mydriasis. Children may have increased susceptibility to adverse reactions. Exercise care when prescribing to children with spastic paralysis or brain damage; Geri: Increased susceptibility to adverse reactions.

Generic name: Succinylcholine *HIGH ALERT*

Drug class: Therapeutic: neuromuscular blocking agents-depolarizing

Indication: Used during surgical procedures to produce skeletal muscle paralysis after induction of anesthesia and provision of opioid analgesics.

Dosage forms: mg, mg/kg

How to administer: IV (Adults): 0.6 mg/kg (range 0.3– 1.1 mg/kg) up to 150 mg total dose; additional doses depend on response, maintenance: 0.04– 0.07 mg/kg q 5– 10 min as needed.

Nursing considerations:

- Assess respiratory status continuously throughout use of succinylcholine. Succinylcholine should be used only by individuals experienced in endotracheal intubation, and equipment for this procedure should be immediately available.
- Monitor neuromuscular response to succinylcholine with a peripheral nerve stimulator intraoperatively. Paralysis is initially selective and usually occurs consecutively in the following muscles: levator muscles of eyelids, muscles of mastication limb muscles, abdominal muscles, muscles of the glottis, intercostal muscles, and the diaphragm.
- Monitor ECG, heart rate, and BP throughout use of succinylcholine.

- Assess patient for history of malignant hyperthermia before administration. Monitor for signs of malignant hyperthermia (tachycardia, tachypnea, hypercarbia, jaw muscle spasm, lack of laryngeal relaxation, hyperthermia) throughout administration.
- Observe patient for residual muscle weakness and respiratory distress during the recovery period.
- Lab Test Considerations: May cause hyperkalemia, especially in patients with severe trauma, burns, or neurologic disorders.
- Toxicity and Overdose: If overdose occurs, use peripheral nerve stimulator to determine degree of neuromuscular blockade. Maintain airway patency and ventilation until recovery of normal respirations occurs

Side effects: Resp: APNEA, bronchospasm. CV: arrhythmias, bradycardia, hypotension. FandE: HYPERKALEMIA.MS: RHABDOMYOLYSIS, muscle fasciculation. Misc: ANAPHYLAXIS,MALIGNANT HYPERTHERMIA, myoglobinemia (in children), myoglobinuria (in children), tachyphylaxis

Contraindications: Hypersensitivity to succinylcholine or parabens; Plasma pseudocholinesterase deficiency; **Pedi:** Children and neonates (continuous infusions); Personal history of malignant hyperthermia. Use Cautiously in: History of anaphylaxis to other neuromuscular blockers; Familial history of malignant hyperthermia; History of pulmonary disease, renal or liver impairment; Major trauma, burns, or underlying myopathy (risk of rhabdomyolysis and hyperkalemia, especially in children or adolescents); Glaucoma; Electrolyte disturbances; Receiving digoxin; Fractures or muscular spasm Myastheniagravis or myasthenic syndromes; **Geri:** Geriatric or debilitated patients; **OB**: Has been used in pregnant women undergoing cesarean section; **Pedi:** Children and neonates (risk of malignant hyperthermia).

Generic Name: Propofol *HIGH ALERT*

Drug Class: Therapeutic: general anesthetics

Indication: Induction of general anesthesia in children3 yr and adults. Maintenance of balanced anesthesia when used with other agents in children2 mo and adults. Initiation and maintenance of monitored anesthesia care (MAC). Sedation of intubated, mechanically ventilated patients in intensive care units (ICUs)

Dosage forms: mcg/kg/min

How to administer: IV (Adults 55 yr): Induction—40 mg q 10 sec until induction achieved (2–2.5 mg/kg total). Maintenance—100– 200 mcg/kg/min. Rates of 150– 200 mcg/kg/ min are usually required during first 10– 15 min after induction, thenpby 30– 50% during first 30 min of maintenance. Rates of 50– 100 mcg/kg/min are associated with optimal recovery time. May also be given intermittently in increments of 25– 50 mg.

Nursing considerations:

- Assess respiratory status, pulse, and BP continuously throughout propofol therapy. Frequently causes apnea lasting60 sec. Maintain patent airway and adequate ventilation. Propofol should be used only by individuals experienced in endotracheal intubation, and equipment for this procedure should be readily available.
- Assess level of sedation and level of consciousness throughout and following administration.
- When using for ICU sedation, wake-up and assessment of CNS function should be done daily during maintenance to determine minimum dose required for sedation. Maintain a light level of sedation during these assessments; do not discontinue. Abrupt discontinuation may cause rapid awakening with anxiety, agitation and resistance to mechanical ventilation.
- Monitor for propofol infusion syndrome (severe metabolic acidosis, hyperkalemia, lipemia, rhabdomyolysis, hepatomegaly, cardiac and renal failure). Most frequent with prolonged, high-dose infusions (5 mg/kg/hr for48 hr) but has also been reported following large-dose, short term infusions during surgical anesthesia. If prolonged sedation or in-creasing dose is required, or metabolic acidosis occurs, consider alternative means of sedation
- Toxicity and Overdose: If overdose occurs, monitor pulse, respiration, and BP continuously. Maintain patent airway and assist ventilation as needed. If hypotension occurs, treatment includes IV fluids, repositioning, and vasopressors.

Side effects: CNS: dizziness, headache Resp: APNEA, cough. CV: bradycardia, hypotension, hypertension. GI: abdominal cramping, hiccups, nausea, vomiting. Derm: flushing. Local: burning, pain, stinging, coldness, numbness, tingling at IV site. MS: involuntary muscle movements, perioperative myoclonia GU: discoloration of urine(green). Misc: PROPOFOL INFUSION SYNDROME, fever.

Contraindications: Hypersensitivity to propofol, soybean oil, egg lecithin, or glycerol; OB: Crosses placenta; may cause neonatal depression; Lactation: Enters breast milk; effects on newborn unknown. Use Cautiously in: Cardiovascular disease; Lipid disorders (emulsion may have detrimental effect); intracranial pressure; Cerebrovascular disorders; Hypovolemic patients (lower induction and maintenance dosage reduction recommended);Pedi: Not recommended for induction of anesthesia in children3 yr, or for maintenance of anesthesia in infants2 mo ; not for ICU or pre-procedure sedation; Geri: Lower induction and maintenance dose reduction recommended.

Generic Name: Propranolol

Drug Class: Therapeutic: anti-anginal, antiarrhythmics (Class II),antihypertensives, vascular headache suppressants.

Pharmacologic: beta blocker

Indication: Management of hypertension, angina, arrhythmias, hypertrophic cardiomyopathy, thyrotoxicosis, essential tremors, pheochromocytoma. Also used in the prevention and management of MI, and the prevention of vascular headaches. Unlabeled Use: Also used to manage alcohol withdrawal, aggressive behavior, antipsychotic-associated akathisia, situational anxiety, and esophageal varices. Post-traumatic stress disorder

Dosage Forms: mg, mg/kg

How to Administer: PO (Adults): Antianginal—80– 320 mg/day in 2– 4 divided doses or once daily as extended/sustained-release capsules. Antihypertensive—40 mg twice daily initially; (usual range 120– 240 mg/day; doses up to 1 g/day have been used); or 80 mg once daily as extended/sustained-release capsules, increase as needed up to 120 mg. InnoPran XL dosing form is designed to be given once daily at bedtime. Antiarrhythmic—10– 30 mg 3– 4 times daily. Prevention of MI—180– 240 mg/day in divided doses. Hypertrophic cardiomyopathy—20– 40 mg 3– 4 times daily. Adjunct therapy of pheochromocytoma—20 mg 3 times daily to 40 mg 3– 4 times daily concurrently with alpha-blocking therapy, started 3 days before surgery is planned. Vascular headache prevention—20 mg 4 times daily or 80 mg/day as extended/sustained-release capsules; may increase as needed up to 240 mg/day. Management of tremor—40 mg twice daily; may increase to 120 mg/day (up to 320 mg have been used)

Nursing Considerations:

- Monitor BP and pulse frequently during dose adjustment period and periodically during therapy.
- Abrupt withdrawal of propranolol may precipitate life-threatening arrhythmias, hypertension, or myocardial ischemia. Drug should be tapered over a 2-week period before discontinuation. Assess patient carefully during tapering and after medication is discontinued. Consider that patients taking propranolol for non-cardiac indications may have undiagnosed cardiac disease. Abrupt discontinuation or withdrawal over too short a period (less than 9days) should be avoided.
- Pedi: Assess pediatric patients for signs and symptoms of hypoglycemia, particularly when oral foods and fluids are restricted.
- Patients receiving propranolol IV must have continuous ECG monitoring and may have pulmonary capillary wedge pressure (PCWP) or central venous pressure (CVP) monitoring during and for several hours after administration.
- Assess for orthostatic hypotension when assisting patient up from supine position.
- Monitor intake and output ratios and daily weight. Assess patient rou-tinely for evidence of fluid overload (peripheral edema, dyspnea, rales/crackles, fatigue, weight gain, jugular venous distention).
- Assess for rash periodically during therapy. May cause Stevens-Johnson syndrome. Discontinue therapy if severe or if accompanied with fever, general malaise, fatigue, muscle or joint aches, blisters, oral lesions, conjunctivitis, hepatitis and/or eosinophilia.
- Angina: Assess frequency and characteristics of anginal attacks periodically during therapy.

- Vascular Headache Prophylaxis: Assess frequency, severity, characteristics, and location of vascular headaches periodically during therapy.
- PTSD: Assess frequency of symptoms (flashbacks, nightmares, efforts to avoid thoughts or activities that may trigger memories of the trauma, and hypervigilance) periodically throughout therapy.
- Lab Test Considerations: May cause BUN, serum lipoprotein, potassium, triglyceride, and uric acid levels.
- May cause increase ANA titers.
- May cause increase or decrease blood glucose levels. In labile diabetic patients, hypoglycemia may be accompanied by precipitous of BP.
- Toxicity and Overdose: Monitor patients receiving beta blockers for signs of overdose (bradycardia, severe dizziness or fainting, severe drowsiness, dyspnea, bluish fingernails or palms, seizures). Notify health care professional immediately if these signs occur.
- Hypotension may be treated with modified Trendelenburg position and IV fluids unless contraindicated. Vasopressors (epinephrine, norepinephrine, dopamine, dobutamine) may also be used. Hypotension does not respond to beta agonists.
- Glucagon has been used to treat bradycardia and hypotension.

Side Effects: CNS: fatigue, weakness, anxiety, dizziness, drowsiness, insomnia, memory loss, mental depression, mental status changes, nervousness, nightmares. EENT: blurred vision, dry eyes, nasal stuffiness. Resp: bronchospasm, wheezing. CV: ARRHYTH-MIAS, BRADYCARDIA,HF, PULMONARY EDEMA, orthostatic hypotension, peripheral vaso-constriction.GI: constipation, diarrhea, nausea. GU: erectile dysfunction decrease libido. Derm: ERYTHEMA MULTIFORME, EXFOLIATIVE DERMATITIS, STEVENS-JOHNSON SYN-DROME, TOXIC EPIDERMAL NECROLYSIS, itching, rash. Endo: hyperglycemia, hypoglycemia (\increase in children).MS: arthralgia, back pain, muscle cramps, myopathy. Neuro: paresthesia. Misc: ANAPHYLAXIS, drug-induced lupus syndrome.

Contraindications: Uncompensated HF; Pulmonary edema; Cardiogenic shock; Bradycardia, sick sinus syndrome, or heart block (unless pacemaker present.

Generic Name: Captopril

Drug Class: Therapeutic: antihypertensives

Pharmacologic: ACE inhibitor

Indication: Alone or with other agents in the management of hypertension. Management of heart failure. Reduction of risk of death, heart failure-related hospitalizations, and development of overt heart failure following myocardial infarction. Treatment of diabetic nephropathy in patients with Type 1 diabetes mellitus and retinopathy.

Dosage form: mg, mg/kg

How to administer: PO (Adults and Adolescents): 12.5– 25 mg 2– 3 times daily, may increase 1– 2 wk intervals up to 150 mg 3 times daily (initiate therapy with 6.25– 12.5 mg 2– 3 times daily in patients receiving diuretics)

Nursing Considerations:

- Hypertension: Monitor BP and pulse frequently during initial dose adjustment and periodically during therapy. Notify health care professional of significant changes.
- Monitor frequency of prescription refills to determine compliance.
- Assess patient for signs of angioedema (dyspnea, facial swelling).
- Heart Failure: Monitor weight and assess patient routinely for resolution of fluid overload (peripheral edema, rales/crackles, dyspnea, weight gain, jugular venous distention).
- Lab Test Considerations: Monitor renal function. May cause increase BUN and serum creatinine. If increase BUN or serum creatinine concentrations occur, may require dose reduction or withdrawal.
- May cause hyperkalemia.
- May cause increase AST, ALT, alkaline phosphatase, and serum bilirubin.
- Assess urine protein prior to and periodically during therapy for up to 1 yr in patients with renal impairment or those receiving150 mg/day of captopril. If excessive or increasing proteinuria occurs, re-evaluate ACE inhibitor therapy.
- May cause positive antinuclear antibody (ANA) titer.
- Monitor CBC with differential prior to initiation of therapy, every 2 wk for the first 3 mo, and periodically for up to 1 yr in patients at risk for neutropenia (patients with renal impairment, or collagen-vascular dis-ease) or at first sign of infection. Discontinue therapy ifneutrophilcountis1000/mm3
- May cause false-positive test results for urine acetone

Side effects: CNS: dizziness, fatigue, headache, insomnia. Resp: cough. CV: hypotension, chest pain, palpitations, tachycardia. GI: taste disturbances, abdominal pain, anorexia, constipation, diarrhea, nausea, vomiting. GU: proteinuria, impaired renal function. Derm: ANGIOEDEMA, rash, pruritis. F and E: hyperkalemia. Hemat: AGRANULOCYTOSIS, neutropenia. Misc: fever

Contraindications: Hypersensitivity; History of angioedema with previous use of ACE inhibitors; Concurrent use with aliskiren in patients with diabetes or moderate-to-severe renal impairment (CCr60 mL/min);OB: Can cause injury or death of fetus – if pregnancy occurs, discontinue immediately; Lactation: Discontinue drug or use formula.

Generic Name: Furosemide

Drug Class: Therapeutic: diuretics

Pharmacologic: loop diuretics

Indication: Edema due to heart failure, hepatic impairment or renal disease. Hypertension

Dosage Forms: mg, mg/kg

How to Administer: PO (Adults): 20– 80 mg/day as a single dose initially, may repeat in 6– 8 hr; increase dose by 20– 40 mg q 6– 8 hr until desired response. Maintenance doses may be given once or twice daily (doses up to 2.5 g/day have been used in patients with HF or renal disease). Hypertension—40 twice daily initially (when added to regimen, decrease dose of other antihypertensives by 50%); adjust further dosing based on response; Hypercalcemia—120 mg/day in 1– 3 doses.)

Nursing considerations:

- Assess fluid status. Monitor daily weight, intake and output ratios, amount and lo-cation of edema, lung sounds, skin turgor, and mucous membranes. Notify healthcare professional if thirst, dry mouth, lethargy, weakness, hypotension, or oliguria occurs.
- Monitor BP and pulse before and during administration. Monitor frequency of prescription refills to determine compliance in patients treated for hypertension.
- Geri: Diuretic use is associated with increased risk for falls in older adults. Assess falls risk and implement fall prevention strategies.
- Assess patients receiving digoxin for anorexia, nausea, vomiting, muscle cramps, paresthesia, and confusion. Patients taking digoxin are at increased risk of digoxin toxicity because of the potassium-depleting effect of the diuretic. Potassium supplements or potassium-sparing diuretics may be used concurrently to prevent hypokalemia.
- Assess patient for tinnitus and hearing loss. Audiometry is recommended for patients receiving prolonged high-dose IV therapy. Hearing loss is most common after rapid or high-dose IV administration in patients with decreased renal function or those taking other ototoxic drugs.
- Assess for allergy to sulfonamides.
- Assess patient for skin rash frequently during therapy. Discontinue furosemide at first sign of rash; may be life-threatening. Stevens-Johnson syndrome, toxic epidermal necrolysis, or erythema multiforme may develop. Treat symptomatically; may recur once treatment is stopped.
- Lab Test Considerations: Monitor electrolytes, renal and hepatic function, se-rum glucose, and uric acid levels before and periodically throughout therapy. Commonly decrease serum potassium. May cause decrease serum sodium, calcium, and magnesium concentrations. May also cause increase BUN, serum glucose, creatinine, and uric acid levels

Side effects: CNS: blurred vision, dizziness, headache, vertigo. EENT: hearing loss, tinnitus. CV: hypotension. GI: anorexia, constipation, diarrhea, dry mouth, dyspepsia, increase liver enzymes, nausea, pancreatitis, vomiting. GU: increase BUN, excessive urination, nephron calcinosis. Derm: ERYTHEMA MULTIFORME, STEVENS-JOHNSON SYNDROME, TOXIC EPIDERMALNECROLYSIS, photosensitivity, pruritis, rash, urticaria. Endo: hypercholesterolemia, hyperglycemia, hypertriglyceridemia, hyperuricemia. F and E: dehydration, hypocalcemia, hypochloremia, hypokalemia, hypomagnesemia, hyponatremia, hypovolemia, metabolic alkalosis. Hemat: APLASTIC ANEMIA, AGRANULOCYTOSIS,

hemolytic anemia, leukopenia, thrombocytopenia. MS: muscle cramps. Neuro: paresthesia. Misc: fever

Contraindications: Hypersensitivity; Cross-sensitivity with thiazides and sulfonamides may occur; Hepatic coma or anuria; Some liquid products may contain alcohol, avoid in patients with alcohol intolerance.

Generic Name: Digoxin *HIGH ALERT*

Drug Class: Therapeutic: antiarrhythmics, inotropics

Pharmacologic: digitalis glycosides

Indication: Heart failure. Atrial fibrillation and atrial flutter (slow ventricular rate). Paroxysmal atrial tachycardia

Dosage Forms: mg, mcg/kg

How to administer: IV (Adults): Digitalizing dose—0.5– 1 mg given as 50% of the dose initially and one quarter of the initial dose in each of 2 subsequent doses at 6-12 hr intervals.

Nursing Considerations:

- Monitor apical pulse for 1 full min before administering. Withhold dose and notify health care professional if pulse rate is60 bpm in an adult,70 bpm in a child, or 90 bpm in an infant. Also notify healthcare professional promptly of any significant changes in rate, rhythm, or quality of pulse.
- Pedi: Heart rate varies in children depending on age, ask physician to specify at what heart rates digoxin should be withheld.
- Monitor BP periodically in patients receiving IV digoxin.
- Monitor ECG throughout IV administration and 6 hr after each dose. Notify health care professional if bradycardia or new arrhythmias occur.
- Observe IV site for redness or infiltration; extravasation can lead to tissue irritation and sloughing.
- Monitor intake and output ratios and daily weights. Assess for peripheral edema and auscultate lungs for rales/crackles throughout therapy.
- Before administering initial loading dose, determine whether patient has taken any digitalis preparations in the preceding 2–3 wk.
- Geri: Digoxin has been associated with an increased risk of falls in the elderly. Assess for falls risk and implement prevention strategies per facility protocol.
- Lab Test Considerations: Evaluate serum electrolyte levels (especially potassium, magnesium, and calcium) and renal and hepatic functions periodically during therapy. Notify health care professional before giving dose if patient is hypokalemic. Hypokalemia, hypomagnesemia, or hypercalcemia may make the patient more susceptible to digitalis toxicity. Pedi: Neonates may have falsely elevated se-rum digoxin concentrations due to a naturally occurring substance chemically similar to digoxin. Geri:

Older adults may be toxic even when serum concentrations are within normal range; assess for clinical symptoms of toxicity even when serum levels are normal.

- Toxicity and Overdose: Therapeutic serum digoxin levels range from 0.5–2ng/mL. Serum levels may be drawn 6–8 hr after a dose is administered, although they are usually drawn immediately before the next dose. Bacteria in the GI tract can metabolize a substantial amount of digoxin before it is absorbed. Patients receiving erythromycin or tetracycline, which kill gut bacteria, can develop toxicity on their usual doses of digoxin. Geri: Older adults are at increased risk for toxic effects of digoxin (appears on Beers list) due to age-related decreased renal clearance, which can exist even when serum creatinine levels are normal. Digoxin requirements in the older adult may change and a formerly therapeutic dose can be-come toxic.
- Observe for signs and symptoms of toxicity. In adults and older children, the first signs of toxicity usually include abdominal pain, anorexia, nausea, vomiting, visual disturbances, bradycardia, and other arrhythmias. In infants and small children, the first symptoms of overdose are usually cardiac arrhythmias. If these appear, withhold drug and notify health care professional immediately.
- If signs of toxicity occur and are not severe, discontinuation of digitalis glycoside may be all that is required.
- If hypokalemia is present and renal function is adequate, potassium salts may be administered. Do not administer if hyperkalemia or heart block exists. Correct any other electrolyte abnormalities.
- Correction of arrhythmias resulting from digitalis toxicity may be attempted with lidocaine, procainamide, quinidine, propranolol, or phenytoin. Temporary ventricular pacing may be useful in advanced heart block.
- Treatment of life-threatening arrhythmias may include administration of digoxin immune Fab (Digibind), which binds to the digitalis glycoside molecule in the blood and is excreted by the kidneys

Side Effects: fatigue, headache, weakness. EENT: blurred vision, yellow or green vision. CV: ARRHYTHMIAS, bradycardia, ECG changes, AV block, SA block. GI: anorexia, nausea, vomiting, diarrhea. Hemat: thrombocytopenia. Metab: electrolyte imbalances with acute digoxin toxicity

Contraindications: Hypersensitivity; Uncontrolled ventricular arrhythmias; AV block (in absence of pacemaker); Idiopathic hypertrophic subaortic stenosis; Con-strictive pericarditis; Known alcohol intolerance (elixir only).

Generic Name: Nifedipine

Drug Class: Therapeutic: antianginals, antihypertensives

Pharmacologic: calcium channel blockers

Indication: Management of: Hypertension (extended release only), Angina pectoris, Vasospastic (Prinzmetal's) angina. Unlabeled Use: Prevention of migraine headache. Management of HF or cardiomyopathy

Dosage form: mg

How to administer: PO (Adults): 10– 30 mg 3 times daily (not to exceed 180 mg/day), or 10– 20 mg twice daily as immediate-release form, or 30– 90 mg once daily as sustained-release (CC, XL) form (not to exceed 90– 120 mg/day)

Nursing Considerations:

- Monitor BP and pulse before therapy, during dose titration, and periodically during therapy. Monitor ECG periodically during prolonged therapy.
- Monitor intake and output ratios and daily weight. Assess for signs of HF (peripheral edema, rales/crackles, dyspnea, weight gain, jugular venous distention).
- Patients receiving digoxin concurrently with nifedipine should have routine tests of serum digoxin levels and be monitored for signs and symptoms of digoxin toxicity.
- Assess for rash periodically during therapy. May cause Stevens-Johnson syndrome. Discontinue therapy if severe or if accompanied with fever, general malaise, fatigue, muscle or joint aches, blisters, oral lesions, conjunctivitis, hepatitis and/or eosinophilia.
- Angina: Assess location, duration, intensity, and precipitating factors of patient's anginal pain.
- Lab Test Considerations: Total serum calcium concentrations are not affected by calcium channel blockers.
- Monitor serum potassium periodically. Hypokalemia increases risk of arrhythmias; should be corrected.
- Monitor renal and hepatic functions periodically during long-term therapy. Several days of therapy may cause increase hepatic enzymes, which return to normal upon discontinuation of therapy.
- Nifedipine may cause positive ANA and direct Coombs' test results

Side effects: CNS: headache, abnormal dreams, anxiety, confusion, dizziness, drowsiness, jitteriness, nervousness, psychiatric disturbances, weakness. EENT: blurred vision, disturbed equilibrium, epistaxis, tinnitus. Resp: cough, dyspnea, shortness of breath. CV: ARRHYTHMIAS, HF, peripheral edema, bradycardia, chest pain, hypotension, palpitations, syncope, tachycardia.GI: increase liver enzymes, anorexia, constipation, diarrhea, dry mouth, dysgeusia, dyspepsia, GI obstruction, nausea, ulcer, vomiting. GU: dysuria, nocturia, polyuria, sexual dysfunction, urinary frequency. Derm: flushing, dermatitis, erythema multiforme, increase sweating, photosensitivity, pruritus/urticaria, rash. Endo: gynecomastia, hyperglycemia. Hemat: anemia, leukopenia, thrombocytopenia. Metab: weight gain. MS: joint stiffness, muscle cramps. Neuro: paresthesia, tremor. Misc: STEVENS-JOHNSON SYNDROME, gingival hyperplasia.

Contraindications: Hypersensitivity; Sick sinus syndrome; 2nd- or 3rd-degreeAV block (unless an artificial pacemaker is in place); Systolic BP 90 mm Hg; Coadministration with grapefruit juice, rifampin, rifabutin, phenobarbital, phenytoin, carbamazepine, or St. John's wort.

Generic Name: enoxaparin

Drug Class: Therapeutic: anticoagulants

Pharmacologic: antithrombotic, heparins (low molecular weight)

Indication: Prevention of venous thromboembolism (VTE) (deep vein thrombosis (DVT) and/or pulmonary embolism (PE)) in surgical or medical patients. Treatment of DVT with or without PE (with warfarin). Prevention of ischemic complications (with aspirin) from unstable angina and non-ST-segment-elevation MI. Treatment of acute ST-segment-elevation MI (with thrombolytics or percutaneous coronary intervention).

Dosage form: mg, mg/kg

How to Administer: Subcut (Adults): Knee replacement surgery—30 mg q 12 hr starting 12– 24 hr after surgery for 7– 10 days; Hip replacement—30 mg q 12 hr starting 12– 24 hr postop or 40 mg once daily starting 12 hr before surgery (either dose may be continued for 7– 14 days; continued prophylaxis with 40 mg once daily may be continued for up to 3 wk); Abdominal surgery—40 mg once daily starting 2 hr before surgery and then continued for 7– 12 days or until ambulatory (up to 14 days); Medical patients with acute illness—40 mg once daily for 6– 14 days.

Nursing Considerations:

- Assess for signs of bleeding and hemorrhage (bleeding gums; nose-bleed; unusual bruising; black, tarry stools; hematuria; fall in hematocrit or BP; guaiac-positive stools); bleeding from surgical site. Notify healthcare professional if these occur.
- Assess patient for evidence of additional or increased thrombosis. Symptoms de-pend on area of involvement.
- Assess location, duration, intensity, and precipitating factors of anginal pain.
- Monitor patient for hypersensitivity reactions (chills, fever, urticaria). Report signs to health care professional.
- Monitor patients with epidural catheters frequently for signs and symptoms of neurologic impairment. Delay placement or removal of catheter for at least 12hours after administration of lower doses (30 mg once or twice daily or 40 mg once daily) and at least 24 hours after administration of higher doses (0.75 mg/kg twice daily, 1 mg/kg twice daily, or 1.5 mg/kg once daily) of enoxaparin. Monitor for signs and symptoms of neurological impairment (midline back pain, sensory and motor deficits [numbness or weakness in lower limbs], bowel and/or bladder dysfunction) frequently if epidural or spinal anesthesia or lumbar puncture is done during therapy.
- Subcut: Observe injection sites for hematomas, ecchymosis, or inflammation.
- Lab Test Considerations: Monitor CBC, platelet count, and stools for occult blood periodically during therapy. If thrombocytopenia occurs, monitor closely. If hematocrit decreases unexpectedly, assess patient for potential bleeding sites.

- Special monitoring of clotting times (aPTT) is not necessary in most patients. Monitoring of the aPTT may be considered in certain patient populations (such as obese patients or patients with renal insufficiency).
- Monitoring of Antifactor Xa levels may be necessary to titrate doses in pediatric patients' Therapeutic range 0.5 – 1 unit/mL.
- May cause increase in AST and ALT levels.
- May cause hyperkalemia.
- Toxicity and Overdose: For overdose, protamine sulfate 1 mg for each mg of enoxaparin should be administered by slow IV injection

Side Effects: CNS: dizziness, headache, insomnia. CV: edema. GI: constipation increase liver enzymes, nausea, vomiting. GU: urinary retention. Derm: alopecia, ecchymoses, pruritus, rash, urticaria. F and E: hyperkalemia. Hemat: bleeding, anemia, eosinophilia, thrombocytopenia. Local: erythema at injection site, hematoma, irritation, pain. MS: osteoporosis. Misc: fever.

Contraindication: Hypersensitivity; Hypersensitivity to benzyl alcohol (multi-dose vial); Positive in vitro test for antiplatelet antibody in the presence of enoxaparin; Active, major bleeding.

Generic Name: Pantoprazole

Drug Class: Therapeutic: antiulcer agents

Pharmacologic: proton-pump inhibitor

Indication: Erosive esophagitis associated with GERD. Decrease relapse rates of daytime and nighttime heartburn symptoms on patients with GERD. Pathologic gastric hypersecretory conditions. Unlabeled Use: Adjunctive treatment of duodenal ulcers associated with Helicobacter pylori

Dosage form: mg

How to administer: PO (Adults): 40 mg once daily.

Nursing Considerations:

- Assess patient routinely for epigastric or abdominal pain and for frank or occult blood in stool, emesis, or gastric aspirate
- Lab Test Considerations: May cause abnormal liver function tests, including increase AST, ALT, alkaline phosphatase, and bilirubin.
- May cause hypomagnesemia. Monitor serum magnesium prior to and periodically during therapy

Side Effects: CNS: headache. GI: PSEUDOMEMBRANOUS COLITIS, abdominal pain, diarrhea, eructation, flatulence. Endo: hyperglycemia. F and E: hypomagnesemia (especially if treatment duration3 mo).MS: bone fracture

Contraindications: Hypersensitivity; OB: Should be used during pregnancy only if clearly needed; Lactation: Discontinue breast feeding due to potential for serious adverse reactions in infants.

Generic Name: Prednisone

Drug Class: Therapeutic: anti-inflammatories (steroidal) (intermediate acting), immune modifier

Indication: Used systemically and locally in a wide variety of chronic diseases including: Inflammatory, Allergic, Hematologic, Neoplastic, Autoimmune disorders. Suitable for alternate day dosing in the management of chronic illness. Unlabeled Use: Adjunctive therapy of hypercalcemia. Adjunctive management of nausea and vomiting from chemotherapy

Dosage Form: mg, mg/kg

How to administer: PO (Adults): Most uses—5– 60 mg/day as a single dose or in divided doses (delayed-release tablets should be administered once daily). Multiple sclerosis—200 mg/day for 1 wk, then 80 mg every other day for 1 mo. Adjunctive therapy of Pneumocystis jirovecii pneumonia in AIDS patients—40 mg twice daily for 5 days, then 40 mg once daily for 5 days, then 20 mg once daily for 10 days

Nursing Considerations:

- Indicated for many conditions. Assess involved systems before and periodically during therapy.
- Assess patient for signs of adrenal insufficiency (hypotension, weight loss, weak-ness, nausea, vomiting, anorexia, lethargy, confusion, restlessness) before and periodically during therapy.
- Monitor intake and output ratios and daily weights. Observe patient for peripheral edema, steady weight gain, rales/crackles, or dyspnea. Notify health care professional if these occur.
- Pedi: Children should have periodic evaluations of growth.
- Lab Test Considerations: Monitor serum electrolytes and glucose. May cause hyperglycemia, especially in persons with diabetes. May cause hypokalemia. Patients on prolonged courses of therapy should routinely have hematologic values, serum electrolytes, and serum and urine glucose evaluated. May decrease WBC counts. May decrease serum potassium and calcium and increase serum sodium concentrations.
- Guaiac test stools. Promptly report presence of guaiac-positive stools.
- May increase serum cholesterol and lipid values. May decrease uptake of thyroid 123I or 131I.
- Suppress reactions to allergy skin tests.
- Periodic adrenal function tests may be ordered to assess degree of hypothalamic-pituitary-adrenal axis suppression in systemic and chronic topical therapy

Side effects: CNS: depression, euphoria, headache, increase intracranial pressure (children only), personality changes, psychoses, restlessness. EENT: cataracts, increase intraocular pressure. CV: hypertension. GI: PEPTIC ULCERATION, anorexia, nausea, vomiting. Derm: acne, decrease

wound healing, ecchymoses, fragility, hirsutism, petechiae. Endo: adrenal suppression, hyperglycemia. F and E: fluid retention (long-term high doses), hypokalemia, hypokalemic alkalosis. Hemat: THROMBOEMBOLISM, thrombophlebitis. Metab: weight gain, weight loss. MS: muscle wasting, osteoporosis, avascular necrosis of joints, muscle pain. Misc: cushingoid appearance (moon face, buffalo hump), increase susceptibility to infection

Contraindications: Active untreated infections (may be used in patients being treated for tuberculous meningitis); Some products contain alcohol and should be avoided in patients with known intolerance; Lactation: Avoid chronic use

Generic Name: Levothyroxine

Drug Class: Therapeutic: hormones

Pharmacologic: thyroid preparations

Indication: Thyroid supplementation in hypothyroidism. Treatment or suppression of euthyroid goiters. Adjunctive treatment for thyrotropin-dependent thyroid cancer

Dosage Form: mcg, mcg/kg

How to administer: PO (Adults): Hypothyroidism—50 mcg as a single dose initially; may be increase 2–3 wk by 25 mcg/day; usual maintenance dose is 75– 125 mcg/day (1.5 mcg/kg/day)

Nursing Considerations:

- Assess apical pulse and BP prior to and periodically during therapy. Assess for tachyarrhythmias and chest pain.
- Children: Monitor height, weight, and psychomotor development.
- Lab Test Considerations: Monitor thyroid function studies prior to and during therapy. Monitor thyroid-stimulating hormone serum levels in adults 8 – 12 wks after changing from one brand to another.
- Monitor blood and urine glucose in diabetic patients. Insulin or oral hypoglycemic dose may need to be increased.
- Toxicity and Overdose: Overdose is manifested as hyperthyroidism (tachycardia, chest pain, nervousness, insomnia, diaphoresis, tremors, weight loss). Usual treatment is to withhold dose for 2 – 6 days then resume at a lower dose. Acute overdose is treated by induction of emesis or gastric lavage, followed by activated charcoal. Sympathetic overstimulation may be controlled by antiadrenergic drugs (beta blockers), such as propranolol. Oxygen and supportive measures to control symptoms are also used.

Side Effects: CNS: headache, insomnia, irritability. CV: angina pectoris, arrhythmias, tachycardia. GI: abdominal cramps, diarrhea vomiting. Derm: sweating. Endo: hyperthyroidism, menstrual irregularities. Metab: heat intolerance, weight loss. MS: accelerated bone maturation in children

Contraindications: Hypersensitivity; Recent MI; Hyperthyroidism

Generic Name: Levetiracetam

Drug Class: Therapeutic: anticonvulsants

Pharmacologic: pyrrolidine

Indication: Partial onset seizures (adjunct). Primary generalized tonic-clonic seizures (adjunct) (immediate-release and injection only). Myoclonic seizures in patients with juvenile myoclonic epilepsy (adjunct) (immediate-release and injection only)

Dosage Form: mg, mg/kg

How to Administer: PO, IV (Adults and Children 16 yr): 500 mg 2 times daily initially; may increase by 1000 mg/day at 2-wk intervals up to 3000 mg/day; Extended-release—1000 mg daily; may increase by 1000 mg/day at 2– wk intervals up to 3000 mg/day

Nursing Considerations:

- Assess location, duration, and characteristics of seizure activity.
- Assess patient for CNS adverse effects throughout therapy. These adverse effects are categorized as somnolence and fatigue (asthenia), coordination difficulties(ataxia, abnormal gait, or incoordination), and behavioral abnormalities (agita-tion, hostility, anxiety, apathy, emotional lability, depersonalization, depression)and usually occur during the first 4 wk of therapy.
- Monitor mood changes. Assess for suicidal tendencies, especially during early therapy. Restrict amount of drug available to patient.
- Assess for rash periodically during therapy. May cause Stevens-Johnson syndrome. Discontinue therapy if severe or if accompanied with fever, general malaise, fatigue, muscle or joint aches, blisters, oral lesions, conjunctivitis, hepatitis and/or eosinophilia.
- Lab Test Considerations: May cause decrease RBC and WBC and abnormal liver function tests

Side Effects: CNS: SUICIDAL THOUGHTS, aggression, agitation, anger, anxiety, apathy, depersonalization, depression, dizziness, hostility, irritability, personality disorder, weakness, drowsiness, dyskinesia, fatigue. Neuro: coordination difficulties (adults only). Derm: STEVENS-JOHNSON SYNDROME, TOXIC EPIDERMAL NECROLYSIS.

Contraindication: Hypersensitivity; Lactation: Lactation

Generic Name: HYDROcodone

Drug class: opioid agonists/nonopioid analgesic combinations Schedule II

Indication: Management of pain that is severe enough to warrant daily, around-the-clock , long-term opioid treatment where alternative treatment options are inadequate.

Dosage forms: PO, PO-ER

How to admin: Oral

Nursing consideration:

- Assess BP, pulse, and respirations before and periodically during administration. If respiratory rate is 10/min, assess level of sedation. Physical stimulation may be sufficient to prevent significant hypoventilation. Dose may need to be decreased by 25– 50%. Initial drowsiness will diminish with continued use.
- Assess bowel function routinely. Prevention of constipation should be instituted with increased intake of fluids and bulk, and laxatives to minimize constipating effects. Stimulant laxatives should be administered routinely if opioid use exceeds 2– 3 days, unless contraindicated.
- Pain: Assess type, location, and intensity of pain prior to and 1 hr (peak) following administration. When titrating opioid doses, increases of 25– 50% should be administered until there is either a 50% reduction in the patient's pain rating on a numerical or visual analogue scale or the patient reports satisfactory pain relief. A repeat dose can be safely administered at the time of the peak if previous dose is ineffective and side effects are minimal.
- An equianalgesic chart (see Appendix B) should be used when changing routes or when changing from one opioid to another.
- Prolonged use may lead to physical and psychological dependence and tolerance. This should not prevent patient from receiving adequate analgesia. Most patients who receive opioids for pain do not develop psychological dependence. If progressively higher doses are required, consider conversion to a stronger opioid.
- Cough: Assess cough and lung sounds during antitussive use.
- Lab Test Considerations: May cause plasma amylase and lipase concentrations.
- Toxicity and Overdose: If an opioid antagonist is required to reverse respiratory depression or coma, naloxone is the antidote. Dilute the 0.4-mg ampule of naloxone in 10 mL of 0.9% NaCl and administer 0.5 mL (0.02 mg) by direct IV push every 2 min. For children and patients weighing 40 kg, dilute 0.1 mg of naloxone in 10 mL of 0.9% NaCl for a concentration of 10 mcg/mL and administer 0.5 mcg/kg every 2 min. Titrate dose to avoid withdrawal, seizures, and severe pain

Side effects: CNS: confusion, dizziness, sedation, euphoria, hallucinations, headache, unusual dreams.

EENT: blurred vision, diplopia, miosis. Resp: respiratory depression. CV: hypotension, bradycardia. GI: constipation, dyspepsia, nausea, vomiting. GU: urinary retention. Derm: sweating. Misc: physical dependence, psychological dependence, tolerance.

Contraindications: Hypersensitivity to hydrocodone (cross-sensitivity may exist to other opioids); Significant respiratory depression; Paralytic ileus; Acute or severe bronchial asthma or hypercarbia

Generic name: glycopyrrolate

Drug Class: antispasmodics, anticholinergics

Indication: Inhibits salivation and excessive respiratory secretions when given preoperatively. Reverses some of the secretory and vagal actions of cholinesterase inhibitors used to treat nondepolarizing neuromuscular blockade. Adjunctive management of peptic ulcer disease. Oral solution: Reduce chronic severe drooling in children with neurologic conditions associated with drooling.

Dosage forms: PO, IM, IV

How to admin: PO (Adults): 1– 2 mg 2– 3 times daily. An additional 2 mg may be given at bedtime; may be up to 1 mg twice daily (not to exceed 8 mg/day). IM, IV (Adults): 100– 200 mcg q 4 hr up to 4 times daily.

Chronic Severe Drooling PO (Children 3– 16 yr): Oral solution—0.02 mg/kg 3 times daily; may increase by 0.02 mg/kg 3 times daily every 5– 7 days (not to exceed 0.1 mg/kg 3 times daily or 1.5– 3 mg/dose)

Nursing Consideration:

- Assess heart rate, BP, and respiratory rate before and periodically during parenteral therapy.
- Monitor intake and output ratios in geriatric or surgical patients; glycopyrrolate may cause urinary retention. Instruct patient to void before parenteral administration. Assess patient routinely for abdominal distention and auscultate for bowel sounds. If constipation becomes a problem, increasing fluids and adding bulk to the diet may help alleviate the constipating effects of the drug. Periodic intraocular pressure determinations should be made for patients receiving long-term therapy. Pedi: Monitor amount and frequency of drooling periodically during therapy. Assess for hyperexcitability, a paradoxical response that may occur in children. Lab Test Considerations: Antagonizes effects of pentagastrin and histamine during the gastric acid secretion test. Avoid administration for 24 hr preceding the test. May cause decrease uric acid levels in patients with gout or hyperuricemia. Toxicity and Overdose: If overdose occurs, neostigmine is the antidote.

Side Effect: CNS: headache, confusion, drowsiness. EENT: nasal congestion, blurred vision, cycloplegia, dry eyes, mydriasis. CV: tachycardia, orthostatic hypotension, palpitations. GI: dry mouth, vomiting, constipation. GU: urinary hesitancy, urinary retention. Derm: flushing.

Contraindication: Hypersensitivity; Angle-closure glaucoma; Acute hemorrhage; Tachycardia secondary to cardiac insufficiency or thyrotoxicosis; Severe ulcerative colitis; Toxic megacolon; Myasthenia gravis; Obstructive uropathy; Paralytic ileus; Concurrent use of oral potassium chloride dosage forms (oral solution only); Pedi: Injection contains benzyl alcohol and should not be given to neonates. Use Cautiously in: Patients who may have intra-abdominal infections; Prostatic hyperplasia; Chronic renal, hepatic, pulmonary, or cardiac disease; Hyperthyroidism; Down syndrome and children with spastic paralysis or brain damage (may be hypersensitive to antimuscarinic effects); OB, Lactation: Safety not established; Pedi: increase sensitivity to anticholinergic effects and adverse reactions; Geri: increase sensitivity to anticholinergic effects and adverse reactions.

Generic Name: Vecuronium

Drug class: neuromuscular blocking agents-nondepolarizing

Indication: Induction of skeletal muscle paralysis and facilitation of intubation after induction of anesthesia in surgical procedures. Facilitation of compliance during mechanical ventilation.

Dosage forms: IV

How to admin: IV (Adults and Children 10 yr): Intubation—0.08– 0.1 mg/kg (0.06– 0.085 mg/kg) if given after steady-state anesthesia achieved.

Nursing consideration: High Alert:

- Unplanned administration of a neuromuscular blocking agent instead of administration of the intended medication or administration of a neuromuscular blocking agent in the absence of ventilatory support has resulted in serious harm and death. Confusing similarities in packaging and insufficiently controlled access to these medications are often implicated in these medication errors. Dose is titrated to patient response. Vecuronium has no effect on consciousness or pain threshold. Adequate anesthesia/analgesia should always be used when vecuronium is used as an adjunct to surgical procedures or when painful procedures are performed. Benzodiazepines and/or analgesics should be administered concurrently when prolonged vecuronium therapy is used for ventilator patients, because patient is awake and able to feel all sensations. If eyes remain open throughout prolonged administration, protect corneas with artificial tears. Store in refrigerator. Most neuromuscular blocking agents are incompatible with barbiturates and sodium bicarbonate. Do not admix.

Side effects: Resp: bronchospasm. Derm: rash. Misc: allergic reactions including ANAPHYLAXIS.

Contraindications: Hypersensitivity; Hypersensitivity to bromides. Use Cautiously in: Dehydration or electrolyte abnormalities (should be corrected); Fractures or muscle spasm; Hyperthermia (increase duration/intensity of paralysis); Significant hepatic impairment; Shock; Extensive burns (may be more resistant to effects); Low plasma pseudocholinesterase levels (may be seen in association with anemia, dehydration, cholinesterase inhibitors/insecticides, severe liver disease, pregnancy, or hereditary predisposition); Obese patients; OB, Lactation: Safety not established (use only if benefit outweighs potential risk to fetus); Pedi: Children 7 wk (safety and effectiveness not established)

Generic Name: atorvastatin

Drug class: lipid-lowering agents, HMG-CoA reductase inhibitors

Indication: Adjunctive management of primary hypercholesterolemia and mixed dyslipidemia. Primary prevention of coronary heart disease (myocardial infarction, stroke, angina, and coronary revascularization) in asymptomatic patients with increased total and low-density lipoprotein (LDL) cholesterol and decreased high-density lipoprotein (HDL) cholesterol

Dosage forms: PO

How to admin: PO (Adults): 10– 20 mg once daily initially; may be increased every 2– 4 wk up to 80 mg/day. PO (Children 10– 17 yr): 10 mg/day initially, may be increased every 4 wk up to 20 mg/ day.

Nursing consideration:

- Obtain a diet history, especially regarding fat consumption.
- Lab Test Considerations: Evaluate serum cholesterol and triglyceride levels before initiating, after 2– 4 wk of therapy, and periodically thereafter. Monitor liver function tests prior to initiation of therapy and as clinically indicated. If symptoms of serious liver injury, hyperbilirubinemia, or jaundice occurs discontinue atorvastatin and do not restart. May also cause alkaline phosphatase and bilirubin levels. If patient develops muscle tenderness during therapy, CPK levels should be monitored. If CPK levels are 10 times the upper limit of normal or myopathy occurs, therapy should be discontinued.
- Monitor for signs and symptoms of immune-mediated necrotizing myopathy (IMNM) (proximal muscle weakness and increases serum creatine kinase), persisting despite discontinuation of statin therapy. Perform muscle biopsy to diagnose; shows necrotizing myopathy without significant inflammation. Treat with immunosuppressive agents.

Side effects: CNS: amnesia, confusion, dizziness, headache, insomnia, memory loss, weakness. EENT: rhinitis. Resp: bronchitis. CV: chest pain, peripheral edema. GI: abdominal cramps, constipation, diarrhea, flatus, heartburn, altered taste, drug-induced hepatitis, dyspepsia,qliver enzymes, nausea, pancreatitis. Endo: hyperglycemia. GU:erectile dysfunction.Derm:rashes, pruritus.MS: RHABDOMYOLYSIS, arthralgia, arthritis, immune-mediated necrotizing myopathy, myalgia, myositis. Misc: hypersensitivity reactions including ANGIONEUROTIC EDEMA.

Contraindications: Contraindicated in: Hypersensitivity; Active liver disease or unexplained persistent elevations in AST and ALT; OB: Potential for fetal anomalies; Lactation: May appear in breast milk. Use Cautiously in: History of liver disease; Alcoholism; Renal impairment; Concurrent use of gemfibrozil, azole antifungals, erythromycin, clarithromycin, protease inhibitors, niacin, or cyclosporine (higher risk of myopathy/rhabdomyolysis); OB: Women of childbearing age; Pedi: Children 10 yr (safety not established).

Generic Name: metoprolol

Drug class: antianginals, antihypertensives, beta blockers

Indication:

Dosage forms: IV, PO

How to admin: PO (Adults): Antihypertensive/antianginal—25– 100 mg/day as a single dose initially or 2 divided doses; may be increased in 7 days as needed up to 450 mg/day (immediate-release) or 400 mg/day (extended-release) (for angina, give in divided doses). Extended-release products are given once daily. MI—25– 50 mg (starting 15 min after last IV dose) q 6 hr for 48 hr, then 100 mg twice daily. Heart failure—12.5– 25 mg once daily (of extended-release), can be doubled every 2 wk up to 200 mg/ day. Migraine prevention—50– 100 mg 2– 4 times daily (unlabeled). IV (Adults):MI—5 mg q 2 min for 3 doses, followed by oral dosing.

Nursing consideration:

- Monitor BP, ECG, and pulse frequently during dose adjustment and periodically during therapy.
- Monitor frequency of prescription refills to determine compliance.
- Monitor vital signs and ECG every 5–15 min during and for several hours after parenteral administration. If heart rate 40 bpm, especially if cardiac output is also decreased, administer atropine 0.25–0.5 mg IV. Monitor intake and output ratios and daily weights. Assess routinely for signs and symptoms of HF (dyspnea, rales/crackles, weight gain, peripheral edema, jugular venous distention). Angina: Assess frequency and characteristics of anginal attacks periodically during therapy.
- Lab Test Considerations: May cause increase BUN, serum lipoprotein, potassium, triglyceride, and uric acid levels. May cause increase ANA titers. May cause increase in blood glucose levels. May increase serum alkaline phosphatase, LDH, AST, and ALT levels.

Side effects: CNS: fatigue, weakness, anxiety, depression, dizziness, drowsiness, insomnia, memory loss, mental status changes, nervousness, nightmares. EENT: blurred vision, stuffy nose. Resp: bronchospasm, wheezing. CV: BRADYCARDIA, HF, PULMONARY EDEMA, hypotension, peripheral vasoconstriction. GI: constipation, diarrhea, drug induced hepatitis, dry mouth, flatulence, gastric pain, heart burn, increase liver enzymes, nausea, vomiting. GU: erectile dysfunction, decreased libido, urinary frequency. Derm: rashes. Endo: hyperglycemia, hypoglycemia. MS: arthralgia, back pain, joint pain. Misc: drug-induced lupus syndrome.

Contraindications: Uncompensated HF; Pulmonary edema; Cardiogenic shock; Bradycardia, heart block, or sick sinus syndrome (in absence of a pacemaker). Use Cautiously in: Renal impairment; Hepatic impairment; Geri: increase sensitivity to beta blockers; initial dose reduction recommended; Pulmonary disease (including asthma; beta1 selectivity may be lost at higher doses); Diabetes mellitus (may mask signs of hypoglycemia); Thyrotoxicosis (may mask symptoms); Patients with a history of severe allergic reactions (intensity of reactions may be increased); Untreated pheochromocytoma (initiate only after alpha blocker therapy started); OB, Lactation, Pedi: Safety not established; all agents cross the placenta and may cause fetal/ neonatal bradycardia, hypotension, hypoglycemia, or respiratory depression.

Generic Name: Spironolactone

Drug class: diuretics, potassium-sparing diuretic

Indication: Management of primary hyperaldosteronism. Management of edema associated with HF, cirrhosis, and nephrotic syndrome. Management of essential hypertension. Treatment of hypokalemia (counteracts potassium loss caused by other diuretics).

Dosage forms: PO

How to admin: PO (Adults): 25– 400 mg/day as a single dose or 2 divided doses. HF—25– 50 mg/ day. PO (Children 1 mo): Diuretic, hypertension—1.5– 3.3 mg/kg/day (60 mg/m2 / day) as a single dose or 2– 4 divided doses. Diagnosis of primary aldosteronism— 100– 400 mg/m2 /day in 1– 2 divided doses. PO (Neonates): 1– 3 mg/kg/day divided q 12– 24 hr.

Nursing consideration:

- Monitor intake and output ratios and daily weight during therapy. If medication is given as an adjunct to antihypertensive therapy, BP should be evaluated before administering.
- Monitor response of signs and symptoms of hypokalemia (weakness, fatigue, U wave on ECG, arrhythmias, polyuria, polydipsia). Assess patient frequently for development of hyperkalemia (fatigue, muscle weakness, paresthesia, confusion, dyspnea, cardiac arrhythmias). Patients who have diabetes mellitus or kidney disease and elderly patients

are at increased risk of developing these symptoms. Periodic ECGs may be recommended in patients receiving prolonged therapy.

- Assess patient for skin rash frequently during therapy. Discontinue diuretic at first sign of rash; may be life-threatening. Stevens-Johnson syndrome or toxic epidermal necrolysis may develop. Treat symptomatically; may recur once treatment is stopped.
- Lab Test Considerations: Evaluate serum potassium levels prior to and routinely during therapy. Withhold drug and notify health care professional if patient becomes hyperkalemic. Monitor BUN, serum creatinine, and electrolytes prior to and periodically during therapy. May cause increase serum magnesium, uric acid, BUN, creatinine, potassium, plasma renin activity, and urinary calcium excretion levels. May also cause decrease sodium levels. Discontinue potassium-sparing diuretics 3 days prior to a glucose tolerance test because of risk of severe hyperkalemia. May cause false increase of plasma cortisol concentrations. Spironolactone should be withdrawn 4– 7 days before test.

Side effects: CNS: dizziness, clumsiness, headache, sedation. CV: arrhythmias. GI: GI irritation. GU: erectile dysfunction, dysuria. Endo: amenorrhea, gynecomastia (in males), breast tenderness, deepening of voice, increased hair growth (in females), sexual dysfunction. F and E: hyperkalemia, hyponatremia, hyperchloremic metabolic acidosis. Hemat: agranulocytosis, thrombocytopenia. Derm: DRUG RASH WITH EOSINOPHILIA AND SYSTEMIC SYMPTOMS (DRESS), STEVENS-JOHNSON SYNDROME, TOXIC EPIDERMAL NECROLYSIS, alopecia, pruritis. MS: muscle cramps. Misc: allergic reactions.

Contraindications: Hypersensitivity; Anuria; Acute renal insufficiency; Significant renal impairment); SCr 2.5 m g/dL (for patients with heart failure); Hyperkalemia; Addison’s disease; Concurrent use of eplerenone. Use Cautiously in: Hepatic dysfunction; Geriatric or debilitated patients or patients with diabetes mellitus (increased risk of hyperkalemia); OB, Lactation: May cause endocrine dysfunction in infants. Is tumorigenic and should not be given to nursing mothers. Alternative method of feeding should be used if spironolactone is essential.

Generic Name: Clopidogrel

Drug class: antiplatelet agents, platelet aggregation inhibitors

Indication: Reduction of atherosclerotic events (MI, stroke, vascular death) in patients at risk for such events including recent MI, acute coronary syndrome (unstable angina/non– Q-wave MI), stroke, or peripheral vascular disease.

Dosage forms: PO

How to admin: : 75 mg once daily

Nursing consideration:

- Assess patient for symptoms of stroke, peripheral vascular disease, or MI periodically during therapy.

- Monitor patient for signs of thrombotic thrombocytic purpura (thrombocytopenia, microangiopathic hemolytic anemia, neurologic findings, renal dysfunction, fever). May rarely occur, even after short exposure (2 wk). Requires prompt treatment.
- Lab Test Considerations: Monitor bleeding time during therapy. Prolonged bleeding time, which is time- and dose-dependent, is expected. Monitor CBC with differential and platelet count periodically during therapy. Neutropenia and thrombocytopenia may rarely occur. May cause increase serum bilirubin, hepatic enzymes, total cholesterol, nonprotein nitrogen (NPN), and uric acid concentrations.

Side effects: Incidence of adverse reactions similar to that of aspirin CNS: depression, dizziness, fatigue, headache. EENT: epistaxis. Resp: cough, dyspnea, eosinophilic pneumonia. CV: chest pain, edema, hypertension. GI: GI BLEEDING, abdominal pain, diarrhea, dyspepsia, gastritis. Derm: DRUG RASH WITH EOSINOPHILIA AND SYSTEMIC SYMPTOMS, pruritus, purpura, rash. Hemat: BLEEDING, NEUTROPENIA, THROMBOTIC THROMBOCYTOPENIC PURPURA. Metab: hypercholesterolemia. MS: arthralgia, back pain. Misc: fever, hypersensitivity reactions.

Contraindications: Hypersensitivity; Pathologic bleeding (peptic ulcer, intracranial hemorrhage); Concurrent use of omeprazole or esomeprazole; Impaired CYP2C19 function due to genetic variation; Use Cautiously in: Patients at risk for bleeding (trauma, surgery, or other pathologic conditions); History of GI bleeding/ulcer disease; Severe hepatic impairment; Hypersensitivity to another thienopyridine (ticlopidine, prasugrel); OB: Use only if clearly indicated; Pedi: Safety and effectiveness not established.

Generic Name: Cephalosporins

Drug class: anti-infectives

Indication: Treatment of the following infections caused by susceptible organisms: Community acquired pneumonia (adults only), Acute exacerbations of chronic bronchitis (adults only), Acute

maxillary sinusitis , Pharyngitis and tonsillitis, Uncomplicated skin and skin structure infections, Acute bacterial otitis media (children only).

Dosage forms: PO

How to admin: 300 mg every 12 hr or 600 mg every 24 hr (twice daily dosing must be used for community-acquired pneumonia or uncomplicated skin and skin structure infections).

Nursing consideration:

- Assess patient for infection (vital signs; appearance of wound, sputum, urine, and stool; WBC) at beginning of and throughout therapy. Before initiating therapy, obtain a history to determine previous use of and reactions to penicillins or cephalosporins. Persons with a negative history of penicillin sensitivity may still have an allergic response. Obtain specimens for culture and sensitivity before initiating therapy. First dose may be given before receiving results.
- Observe patient for signs and symptoms of anaphylaxis (rash, pruritus, laryngeal edema, wheezing). Discontinue drug and notify physician or other health care professional immediately if these symptoms occur. Keep epinephrine, an antihistamine, and resuscitation equipment close by in case of an anaphylactic reaction. Monitor bowel function. Diarrhea, abdominal cramping, fever, and bloody stools should be reported to health care professional promptly as a sign of pseudomembranous colitis. May begin up to several weeks following cessation of therapy.
- Lab Test Considerations: May cause positive results for Coombs' test. May cause increased serum AST, ALT, alkaline phosphatase, bilirubin, LDH, and BUN. May rarely cause leukopenia, eosinophilia, lymphocytosis, and thrombocytosis.

Side effects: CNS: SEIZURES, headache. GI: PSEUDOMEMBRANOUS COLITIS, diarrhea, vomiting, abdominal pain, nausea. GU: vaginal moniliasis, vaginitis. Derm: rash, pruritus. Misc: allergic reactions including ANAPHYLAXIS.

Contraindications: Hypersensitivity to cephalosporins; Serious hypersensitivity to penicillins. Use Cautiously in: Renal impairment (dose decrease recommended if CCr 30 mL/ min); Diabetes (suspension contains sucrose); History of GI disease, especially colitis; Geri: Dose adjustment due to age-relate decrease pin renal function may be necessary; OB, Lactation, Pedi: Pregnancy, lactation, or children 6 mo (safety not established). Suspension contains sodium benzoate, avoid use in neonates.

Generic Name: ipratropium

Drug class: anticholinergics, bronchodilator

Indication: Inhaln: Maintenance therapy of reversible airway obstruction due to COPD, including chronic bronchitis and emphysema. Intranasal: Rhinorrhea associated with allergic and nonallergic perennial rhinitis (0.03% solution) or the common cold (0.06% solution). Unlabeled Use: Inhaln: Adjunctive management of bronchospasm caused by asthma.

Dosage forms: Inhalants, intranasal

How to admin: Metered-dose inhaler (nonacute)—2 inhalations 4 times daily (not to exceed 12 inhalations/24 hr or more frequently than q 4 hr). Acute exacerbations—4– 8 puffs using a spacer device as needed. Via nebulization (nonacute)—500 mcg 3– 4 times daily. Via nebulization (acute exacerbations)—500 mcg q 30 min for 3 doses then q 2– 4 hr as needed. (Children 5– 12 yr): Metered-dose inhaler (nonacute)—1– 2 inhalations q 6 hr as needed (not to exceed 12 inhalations/24 hr). Acute exacerbations— 4– 8 puffs as needed Via nebulization (nonacute)—250– 500 mcg 4 times daily given q 6 hr. Acute exacerbations—250 mcg q 20 min for 3 doses then q 2– 4 hr as needed.

Nursing consideration:

- Assess for allergy to atropine and belladonna alkaloids; patients with these allergies may also be sensitive to ipratropium. Atrovent HFA MDI does not contain CFC or soy and may be used safely in soy or CFC-allergic patients. However, Combivent MDI should be avoided in soy or peanut-allergic patients.
- Inhaln: Assess respiratory status (rate, breath sounds, degree of dyspnea, pulse) before administration and at peak of medication. Consult health care professional about alternative medication if severe bronchospasm is present; onset of action is too slow for patients in acute distress. If paradoxical bronchospasm (wheezing) occurs, withhold medication, and notify health care professional immediately. Nasal Spray: Assess patient for rhinorrhea.

Side effects: CNS: dizziness, headache, nervousness. EENT: blurred vision, sore throat nasal only, epistaxis, nasal dryness/irritation. Resp: bronchospasm, cough. CV: hypotension, palpitations.GI: GI irritation, nausea. Derm: rash.Misc: allergic reactions

Contraindications: Hypersensitivity to ipratropium, atropine, belladonna alkaloids, or bromide; Avoid use during acute bronchospasm; Note: Atrovent HFA has replaced the discontinued Atrovent CFC (chlorofluorocarbon). Soy and CFC-allergic patients can now safely use the Atrovent HFA formulation. However, Combivent (ipratropium/albuterol combination) MDI does contain soya lecithin and is contraindicated in patients with a history of hypersensitivity to soy and peanuts. Use Cautiously in: Patients with bladder neck obstruction, prostatic hyperplasia, glaucoma, or urinary retention; Geri: May be more sensitive to effects

Generic Name: ranitidine

Drug class: antiulcer agents, histamine H_2 antagonists

Indication: Short-term treatment of active duodenal ulcers and benign gastric ulcers. Maintenance therapy for duodenal and gastric ulcers after healing of active ulcer(s). Management of gastric hypersecretory states (Zollinger-Ellison syndrome). Treatment of and maintenance therapy for erosive esophagitis. Treatment of gastroesophageal reflux disease (GERD). Heartburn, acid indigestion, and sour stomach (OTC use). IV: Prevention and treatment of stress-induced upper GI bleeding in critically ill patients.

Dosage forms: PO,IV

How to admin: PO (Adults): Short-term treatment of active ulcers—40 mg/day at bedtime or 20 mg twice daily for up to 8 wk. Duodenal ulcer prophylaxis—20 mg once daily at bedtime. GERD—20 mg twice daily for up to 6 wk; up to 40 mg twice daily for up to 12 wk for esophagitis with erosions, ulcerations, and continuing symptoms. Gastric hypersecretory conditions—20 mg q 6 hr initially, up to 160 mg q 6 hr. OTC use— 10 mg for relief of symptoms; for prevention— 10 mg 60 min before eating or take 10 mg as chewable tablet 15 minutes before heartburn-inducing foods or beverages (not to exceed 20 mg/24 hr for up to 2 wk). PO, IV (Children 1– 12 yr): Peptic ulcer—0.5 mg/kg/day as a single bedtime dose or in divided doses twice daily (maximum: 40 mg daily); GERD—1 mg/kg/day in divided doses twice daily (maximum: 80 mg daily). PO (Infants 3 mo— 1 yr): GERD—0.5 mg/kg/dose twice daily. Name /bks_53161_deglins_md_disk/famotidine 02/12/2014 03:11PM Plate # 0-Composite pg 2 # 2 2015 F.A. Davis Company CONTINUED PDF Page #2 2 PO (Infants and neonates 3 mo): GERD—0.5 mg/kg/dose once daily. IV (Adults): 20 mg q 12 hr

Nursing consideration:

- Assess heart rate, ECG, and heart sounds, especially during exercise. Report any rhythm disturbances or symptoms of increased arrhythmias, including palpitations, chest discomfort, shortness of breath, fainting, and fatigue/weakness. Report signs of agranulocytosis and neutropenia (fever, sore throat, mucosal lesions, signs of infection, bruising), aplastic anemia (unusual fatigue, weakness), or thrombocytopenia (bruising, bleeding gums, nose bleeds).
- Monitor signs of hypersensitivity reactions, including pulmonary symptoms (tightness in the throat or chest, wheezing, cough, dyspnea) or skin reactions (rash, pruritus, urticaria). Notify physician or nursing staff immediately if these reactions occur. Be alert for signs of vasculitis, including fatigue, weakness, muscle pain, joint pain, numbness, fever, loss of appetite, and weight loss. Report these signs to the physician. Assess dizziness and drowsiness that might affect gait, balance, and other functional activities. Report balance

problems and functional limitations to the physician and nursing staff, and caution the patient and family/caregivers to guard against falls and trauma. Monitor other CNS symptoms such as confusion, hallucinations, and headache. Excessive or prolonged CNS symptoms may require a reduction in dose.

- Monitor IM injection site for pain, swelling, and irritation. Report prolonged or excessive injection site reactions to the physician.

Side effects: **CNS:** confusion, dizziness, drowsiness, hallucinations, headache. **CV:** ARRHYTHMIAS. **GI:** constipation, diarrhea, nausea. **GU:** decreased sperm count, erectile dysfunction. **Endo:** gynecomastia. **Hemat:** AGRANULOCYTOSIS, APLASTIC ANEMIA, anemia, neutropenia, thrombocytopenia. **Local:** pain at IM site. **Misc:** hypersensivity reactions, vasculitis.

Contraindications: Hypersensitivity; Phenylketonuria (chewable tablets only); OB: Crosses placenta; no adequate human studies; Lactation: Discontinue breast feeding to avoid exposure of infant to serious side effects. Use Cautiously in: Renal impairment, Pedi: Injection contains benzyl alcohol which has been associated with gasping syndrome in neonates; Geri: More susceptible to adverse CNS reactions; dose decrease recommended.

Generic Name: alendronate

Drug class: bone resorption inhibitors, bisphosphonates

Indication: Treatment and prevention of postmenopausal osteoporosis. Treatment of osteoporosis in men. Treatment of Paget's disease of the bone. Treatment of corticosteroid-induced osteoporosis in patients

Dosage form: PO

How to admin: Treatment of osteoporosis 10 mg once daily or 70 mg once weekly. Prevention of osteoporosis 5 mg once daily or 35 mg once weekly. Paget's disease 40 mg once daily for 6 mo. Re-treatment may be considered for patients who relapse. Treatment of corticosteroid-induced osteoporosis in men and premenopausal women 5 mg once daily. Treatment of corticosteroid-induced osteoporosis in postmenopausal women not receiving estrogen 10 mg once daily.

Nursing consideration:

- Administer first thing in the morning with 6– 8 oz plain water 30 min before other medications, beverages, or food. Oral solution should be followed by at least 2 ounces of water. Swallow tablets whole; do not crush, break, or chew. For effervescent tablets dissolve 1 tablet in half a glass of plain room temperature water (not mineral water or flavored water). Wait at least 5 minutes after the effervescence stops, stir the solution for approximately 10 seconds and drink contents.

Side effects: CNS: headache. EENT: blurred vision, conjunctivitis, eye pain/inflammation. CV: atrial fibrillation. GI: abdominal distention, abdominal pain, acid regurgitation, constipation, diarrhea, dyspepsia, dysphagia, esophageal cancer, esophageal ulcer, esophagitis, flatulence, gastritis, nausea, taste perversion, vomiting. Derm: erythema, photosensitivity, rash. MS: musculoskeletal pain, femur fractures, osteonecrosis (primarily of jaw). Resp :asthma exacerbation.

Contraindications: Abnormalities of the esophagus which delay esophageal emptying (i.e. strictures, achalasia); Inability to stand/sit upright for at least 30 min; Renal insufficiency. OB, Lactation: Safety not established. Use Cautiously in: History of upper GI disorders; Pre-existing hypocalcemia or vitamin D deficiency; Invasive dental procedures, cancer, receiving chemotherapy or corticosteroids, poor oral hygiene, periodontal disease, dental disease, anemia, coagulopathy, infection, or poorly-fitting dentures.

Generic Name: methotrexate

Drug class: antimetabolites, immunosuppressant

Indication: Trophoblastic neoplasms, Leukemias, Breast carcinoma, Head carcinoma, Neck carcinoma, Lung carcinoma. Severe psoriasis, rheumatoid arthritis, and polyarticular juvenile idiopathic arthritis unresponsive to conventional therapy. Treatment of mycosis fungoides.

Dosage forms: PO, IM, IV

How to admin: 15– 30 mg/day for 5 days; repeat after 1 or more weeks for 3– 5 courses. Breast Cancer IV (Adults): 40 mg/m2 on days 1 and 8. Leukemia PO (Adults): Induction—3.3 mg/m2 / day, usually with prednisone. PO, IM (Adults): Maintenance—20– 30 mg/m2 twice weekly. IV (Adults): 2.5 mg/kg q 2 wk. IT (Adults): 12 mg/m2 or 15 mg. IT (Children 3 yr): 12 mg. IT (Children 2 yr): 10 mg. IT (Children 1 yr): 8 mg. IT (Children 1 yr): 6 mg. Osteosarcoma IV (Adults): 12 g/m2 as a 4-hr infusion followed by leucovorin rescue, usually as part of a combination chemotherapeutic regimen.

Nursing consideration:

- Monitor vital signs periodically during administration. Report significant changes. Monitor for abdominal pain, diarrhea, or stomatitis; therapy may need to be discontinued. Monitor for bone marrow depression. Assess for bleeding (bleeding gums, bruising, petechiae, guaiac stools, urine, and emesis) and avoid IM injections and taking rectal temperatures if platelet count is low. Apply pressure to venipuncture sites for 10 min. Assess for signs of infection during neutropenia. Anemia may occur. Monitor for increased fatigue, dyspnea, and orthostatic hypotension.

- Monitor intake and output ratios and daily weights. Report significant changes in totals. Monitor for symptoms of pulmonary toxicity, which may manifest early as a dry, nonproductive cough.
- Monitor for symptoms of gout (increased uric acid, joint pain, edema). Encourage patient to drink at least 2 L of fluid each day. Allopurinol and alkalization of urine may be used to decrease uric acid levels. Assess nutritional status. Administering an antiemetic prior to and periodically during therapy and adjusting diet as tolerated may help maintain fluid and electrolyte balance and nutritional status.
- Assess for rash periodically during therapy. May cause Stevens-Johnson syndrome. Discontinue therapy if severe or if accompanied with fever, general malaise, fatigue, muscle or joint aches, blisters, oral lesions, conjunctivitis, hepatitis and/or eosinophilia. IT: Assess for development of nuchal rigidity, headache, fever, confusion, drowsiness, dizziness, weakness, or seizures. Rheumatoid Arthritis: Assess patient for pain and range of motion prior to and periodically during therapy. Psoriasis: Assess skin lesions prior to and periodically during therapy

Side effects: CNS: arachnoiditis (IT use only), dizziness, drowsiness, headache, malaise, seizures. EENT: blurred vision, dysarthria transient blindness. Resp: PULMONARY FIBROSIS, interstitial pneumonitis. GI: HEPATOTOXICITY, anorexia, diarrhea, nausea, stomatitis, vomiting. GU: acute renal failure, infertility. Derm: ERYTHEMA MULTIFORME, STEVENS-JOHNSON SYNDROME, TOXIC EPIDERMAL NECROLYSIS, alopecia, painful plaque erosions (during psoriasis treatment), photosensitivity, pruritus, rashes, skin ulceration, urticaria. Hemat: APLASTIC ANEMIA, anemia, leukopenia, thrombocytopenia. Metab: hyperuricemia. MS: osteonecrosis, stress fracture. Misc: nephropathy, chills, fever, soft tissue necrosis.

Contraindications: Hypersensitivity; Alcoholism or hepatic impairment; Immunosuppresion; decrease bone marrow reserve; OB, Lactation: Pregnancy or lactation; Pedi: Products containing benzyl alcohol should not be used in neonates. Use Cautiously in: Renal impairment. Patients with childbearing potential; Active infections; Geri: May be more sensitive to toxicity and adverse events

Generic Name: metformin

Drug class: antidiabetics, biguanides

Indication: Management of type 2 diabetes mellitus

Dosage forms: PO, XR

How to admin: 500 mg twice daily; may increase by 500 mg at weekly intervals up to 2000 mg/day. If doses 2000 mg/day are required, give in 3 divided doses (not to exceed 2500 mg/day) or 850 mg once daily; may increase by 850 mg at 2-wk intervals (in divided doses) up to 2550 mg/day in divided doses (up to 850 mg 3 times daily); Extended-release tablets—500– 1000 mg once daily with evening meal, may increase by 500 mg at weekly intervals up to 2500 mg once daily. If 2000 mg once daily is inadequate, 1000 mg twice daily may be used. PO (Children 10 yr): 500 mg twice daily, may be increase by 500 mg/day at 1-wk intervals, up to 2000 mg/day in 2 divided doses.

Nursing consideration:

- When combined with oral sulfonylureas, observe for signs and symptoms of hypoglycemic reactions (abdominal pain, sweating, hunger, weakness, dizziness, headache, tremor, tachycardia, anxiety). Patients who have been well controlled on metformin who develop illness or laboratory abnormalities should be assessed for ketoacidosis. Assess serum electrolytes, ketones, glucose, and, if indicated, blood pH, lactate, pyruvate, and metformin levels. If either form of acidosis is present, discontinue metformin immediately and treat acidosis.
- Lab Test Considerations: Monitor serum glucose and glycosylated hemoglobin periodically during therapy to evaluate effectiveness of therapy. May cause false-positive results for urine ketones. Assess renal function before initiating and at least annually during therapy. Discontinue metformin if renal impairment occurs. Monitor serum folic acid and vitamin B12 every 1– 2 yr in long-term therapy. Metformin may interfere with absorption.

Side effects: GI: abdominal bloating, diarrhea, nausea, vomiting, unpleasant metallic taste. Endo: hypoglycemia. F and E: LACTIC ACIDOSIS. Misc: decreased vitamin B12 levels

Contraindications: Hypersensitivity; Metabolic acidosis; Dehydration, sepsis, hypoxemia, hepatic impairment, excessive alcohol use (acute or chronic); Renal dysfunction; Radiographic studies requiring IV iodinated contrast media (withhold metformin); HF. Use Cautiously in: Concurrent renal disease; Geri: Geriatric/debilitated patients (decrease doses may be required; avoid in patients 80 yr unless renal function is normal); Chronic alcohol use/abuse; Serious medical conditions (MI, stroke); Patients undergoing stress (infection, surgical procedures); Hypoxia; Pituitary deficiency or hyperthyroidism; OB, Lactation, Pedi: Pregnancy, lactation, or children <10 yr

Generic Name: Phenytoin

Drug class: antiarrhythmics, anticonvulsants, hydantoins

Indication: Treatment/prevention of tonic-clonic (grand mal) seizures and complex partial seizures. Unlabeled Use: As an antiarrhythmic

Dosage forms: PO, IV, PO XR

How to admin: Loading dose of 15– 20 mg/kg as extended capsules in 3 divided doses given every 2– 4 hr; maintenance dose 5– 6 mg/kg/day given in 1– 3 divided doses; usual dosing range 200– 1200 mg/day

Nursing consideration:

- Monitor closely for notable changes in behavior that could indicate the emergence or worsening of suicidal thoughts or behavior or depression. Assess oral hygiene. Vigorous cleaning beginning within 10 days of initiation of phenytoin therapy may help control gingival hyperplasia.
- Assess patient for phenytoin hypersensitivity syndrome (fever, skin rash, lymphadenopathy). Rash usually occurs within the first 2 wk of therapy. Hypersensitivity syndrome usually occurs at 3– 8 wk but may occur up to 12 wk after initiation of therapy. May lead to renal failure, rhabdomyolysis, or hepatic necrosis; may be fatal.
- Observe patient for development of rash. Discontinue phenytoin at the first sign of skin reactions. Serious adverse reactions such as exfoliative, purpuric, or bullous rashes or the development of lupus erythematosus, Stevens-Johnson syndrome, or toxic epidermal necrolysis preclude further use of phenytoin or fosphenytoin. Stevens-Johnson syndrome and toxic epidermal necrolysis are significantly more common in patients with a particular human leukocyte antigen.

Side effects: CNS: SUICIDAL THOUGHTS, ataxia, agitation, confusion, dizziness, drowsiness, dysarthria, dyskinesia, extrapyramidal syndrome, headache, insomnia, weakness. EENT: diplopia, nystagmus. CV: hypotension (q with IV phenytoin), tachycardia. GI: gingival hyperplasia, nausea, constipation, drug-induced hepatitis, vomiting. Derm: STEVENS-JOHNSON SYNDROME, TOXIC EPIDERMAL NECROLYSIS, hypertrichosis, rash, exfoliative dermatitis, pruritus, purple glove syndrome. Hemat: AGRANULOCYTOSIS, APLASTIC ANEMIA, leukopenia, megaloblastic anemia, thrombocytopenia. MS: osteomalacia, osteoporosis. Misc: fever, lymphadenopathy

Contraindications: Hypersensitivity; Hypersensitivity to propylene glycol (phenytoin injection only); Alcohol intolerance (phenytoin injection and liquid only); Sinus bradycardia, sinoatrial block, 2nd- or 3rd-degree heart block, or Stokes-Adams syndrome (phenytoin injection only); Concurrent use of delavirdine

Generic Name: memantine

Drug class: N- Methyl-D Aspartate Receptor Antagonist, anti-Alzheimer's agents

Indication: Moderate to severe dementia/neurocognitive disorder associated with Alzheimer's disease.

Dosage forms: PO, PO-ER

How to admin: : Immediate-release—5 mg once daily initially, weekly intervals to 10 mg/day (5 mg twice daily), then 15 mg/day (5 mg once daily, 10 mg once daily as separate doses), then to target dose of 20 mg/day (10 mg twice daily); Extended release—7 mg once daily, weekly intervals by 7 mg/day to target dose of 28 mg once daily.

Nursing consideration:

- Assess cognitive function (memory, attention, reasoning, language, ability to perform simple tasks) periodically during therapy. Lab Test Considerations: May cause anemia

Side effects: CNS: dizziness, fatigue, headache, sedation. CV: hypertension. Derm: rash.GI: diarrhea, weight gain.GU: urinary frequency. Hemat: anemia

Contraindications: Hypersensitivity. Use Cautiously in: Severe renal impairment (decrease dose); Concurrent use of it.