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ATI Focused Review

Management of Care:

- Complementary, alternative, and Integrative Therapies:
 - Aloe, aloe vera:
 - Topically, aloe has anti-inflammatory and analgesic properties.
 - Soothes pain, heals burns, softens.
 - Orally, aloe has laxative effects.
 - Black cohosh
 - Acts as an estrogen substitute.
 - Treats manifestations of menopause.
 - Mechanism of action is unknown.
 - Echinacea
 - Stimulates the immune system.
 - Decreases inflammation.
 - Topically heals skin disorders, wounds, and burns.
 - Possibly treats viruses (common cold, herpes simplex).
 - Used to increase T lymphocyte, tumor necrosis factor, and interferon production.

Substance Use Disorders:

- Medications to support withdrawal
 - Benzodiazepines (chlordiazepoxide, diazepam, lorazepam).
 - First-line treatment for treatment of alcohol withdrawal.
 - Intended effects:
 - Maintenance of vital signs within expected limits.
 - Decrease in the risk of seizures.
 - Decrease in the intensity of withdrawal manifestations.
 - Substitution therapy during alcohol withdrawal.
 - Adjunct medications to treatment with benzodiazepines
 - Ex. Carbamazepine, clonidine, propranolol and atenolol.
 - Intended effects:
 - Decrease in seizures: Carbamazepine
 - Depression of autonomic response (decrease in blood pressure, heart rate): clonidine, propranolol, and atenolol.
 - Decrease in craving: propranolol and atenolol.
- Abstinence maintenance (following withdrawal)
 - Disulfiram

- Intended effects:
 - Daily oral medication that is a type of aversion (behavioral) therapy.
 - Used concurrently with alcohol will cause acetaldehyde syndrome to occur.
 - Effects include nausea, vomiting, weakness, sweating, palpitations, and hypotension.
 - Acetaldehyde syndrome can progress to respiratory depression, cardiovascular suppression, seizures, and death.

Adverse effects/contraindications/side effects/interactions:

- Selective serotonin reuptake inhibitors (SSRI's)
 - Fluoxetine (citalopram, escitalopram, paroxetine, sertraline, fluvoxamine)
 - Expected pharmacological action:
 - SSRIs selectively block reuptake of the monoamine neurotransmitter serotonin in the synaptic space, thereby intensifying the effects of serotonin.
 - SSRIs are considered first-line treatment for depression. They can take 1-3 weeks or longer before pharmacological benefits take effect.
 - Therapeutic uses:
 - Major depression.
 - Obsessive-compulsive disorders.
 - Bulimia nervosa.
 - Premenstrual dysphoric disorders.
 - Panic disorders.
 - Posttraumatic stress disorder.
 - Social anxiety disorder.
 - Generalized anxiety disorder.
 - Bipolar disorder.
- Serotonin syndrome
 - Can begin 2-72 hour after starting treatment and can be lethal.
 - Manifestations:
 - Confusion, agitation, poor concentration, hostility.
 - Disorientation, hallucinations, delirium.
 - Seizures leading to status epilepticus.
 - Tachycardia leading to cardiovascular shock.
 - Labile blood pressure.
 - Diaphoresis.
 - Fever leading to hyperpyrexia.
 - Incoordination, hyperreflexia, tremors.
 - Nausea, vomiting, diarrhea, abdominal pain.
 - Coma leading to apnea (and death in severe cases).
- Serotonin-norepinephrine reuptake inhibitors (SNRIs)
 - Venlafaxine (desvenlafaxine, duloxetine, venlafaxine, levomilnacipran)
 - Expected pharmacological action:

- SNRIs block reuptake of norepinephrine as well as serotonin with effects similar to the SSRIs.
- o Therapeutic uses:
 - Major depression.
 - Generalized anxiety disorder (duloxetine, venlafaxine, desvenlafaxine, levomilnacipran unlabeled use).
 - Social anxiety disorder (venlafaxine, desvenlafaxine unlabeled use).
 - Panic disorder (venlafaxine, desvenlafaxine unlabeled use).
 - Pain due to fibromyalgia, osteoarthritis, low-back pain, diabetic neuropathy (duloxetine, unlabeled for venlafaxine, desvenlafaxine, levomilnacipran).

Medications affecting Coagulation:

- Heparins:
 - o Prototype: **Enoxaparin**
 - o Other medications: Dalteparin
 - o Expected pharmacological action:
 - Heparin prevents clotting by activating antithrombin, thus indirectly inactivating both thrombin and factor Xa. This inhibits fibrin formation. Low molecular weight heparins and activated factor Xa inhibitors only inactivate factor Xa.
 - o Therapeutic uses:
 - Conditions necessitating prompt anticoagulant activity (evolving stroke, pulmonary embolism, massive deep-vein thrombosis)
 - An adjunct for clients having open heart surgery or dialysis.
 - Low-dose therapy for prophylaxis against postoperative venous thrombosis (hip/knee or abdominal surgery).
 - o Complications:
 - Toxicity
 - Administer protamine, which binds with heparin and forms a heparin-protamine complex that has no anticoagulant properties.
 - Protamine should be administered slowly IV, no faster than 20mg/min or 50mg in 10 min.
 - Do not exceed 100 mg in a 2-hr period. Administer carefully to prevent protamine toxicity.
 - Hemorrhage:
 - Monitor vital signs.
 - Monitor platelet count.
 - Observe for bleeding: increased heart rate, decreased blood pressure, bruising, petechiae, hematomas, black tarry stools.
 - Avoid aspirin.
 - o Contraindications/precautions:
 - Heparin is pregnancy category C. Enoxaparin, dalteparin, and fondaparinux are category B.
 - Contraindicated in clients who have low platelet counts (thrombocytopenia) or uncontrollable bleeding.

- These medications should not be used during or following surgeries of the eye(s), brain, or spinal cord; lumbar puncture; or regional anesthesia.
 - Use cautiously in clients who have hemophilia, increased capillary permeability, dissecting aneurysm, peptic ulcer disease, severe hypertension, hepatic or kidney disease, or threatened abortion.
- Vitamin K Inhibitors:
 - Prototype: Warfarin
 - Purpose:
 - Antagonizes vitamin K, thereby preventing the synthesis of four coagulation factors: factor VII, IX, X, and prothrombin.
 - Therapeutic uses:
 - Prevention of venous thrombosis and pulmonary embolism.
 - Prevention of thrombotic events for clients who have atrial fibrillation or prosthetic heart valves.
 - Reduction of the risk for recurrent transient ischemic attacks or myocardial infarction.
 - Complications:
 - Hemorrhage.
 - Nursing actions:
 - Monitor vital signs.
 - Advise clients to observe for bleeding (increased heart rate, decreased blood pressure, bruising, petechiae, hematomas, black tarry stools).
 - Obtain baseline prothrombin time (PT), and monitor levels of PT and international normalized ratio (INR) periodically.
 - In the case of warfarin toxicity, discontinue administration of warfarin, and administer vitamin K1.
 - Contraindications/precautions:
 - Warfarin is pregnancy risk category D for clients with mechanical heart valves and category X for other pregnant populations due to high risk of fetal hemorrhage, fetal death, and CNS defects. Advise clients of childbearing age to postpone pregnancy, and to notify the provider if they become pregnant during warfarin therapy. If anticoagulation is needed during pregnancy, heparin or a LMW heparin can be safely used.
 - Warn clients not to breast feed while taking warfarin because it passes into the breast milk.
 - Contraindicated in clients who have low platelet counts (thrombocytopenia) or uncontrollable bleeding.
 - Contraindicated during or following surgeries of the eye(s), brain, or spinal cord; lumbar puncture; or regional anesthesia.
 - Contraindicated in clients who have vitamin K deficiencies, liver disorders, and alcohol use disorder due to the additive risk of bleeding.
 - Use cautiously in clients who have hemophilia, dissecting aneurysm, peptic ulcer disease, sever hypertension, or threatened abortion.
- Direct Thrombin Inhibitors

- o Prototype: Dabigatran
- o Other medications: Hirudin analogs (Bivalirudin, desirudin) and argatroban.
- o Purpose:
 - These medications work by binding with and inhibiting thrombin, thus preventing a thrombus from developing.
- o Therapeutic uses:
 - Dabigatran: prevents stroke or embolism in clients who have atrial fibrillation not caused by valvular heart disease. It is also used to treat and prevent DVT and PE.
 - Bivalirudin: given concurrently with aspirin for clients who undergo percutaneous coronary angioplasty or intervention.
 - Argatroban: used to prevent or treat thrombosis in clients who cannot take heparin due to heparin-induced thrombocytopenia.
 - Desirudin: administered to clients having hip replacement surgery to prevent DVT.
- o Complications:
 - Bleeding.
- o Nursing actions:
 - Teach clients to report manifestations of bleeding to the provider.
 - For severe bleeding, idarucizumab can be administered as an antidote. Dialysis or injections of recombinant factor VIIa can be used.
 - Clients undergoing elective surgery should stop taking dabigatran before surgery.
- o Contraindications/precautions:
 - Dabigatran, desirudin, argatroban are pregnancy risk category C. Bivalirudin and argatroban are pregnancy risk category B.
 - Contraindicated in clients who have active bleeding or allergy to the medication.
 - Use cautiously in clients who have liver impairment or who are at risk for bleeding.
 - Use dabigatran, bivalirudin, desirudin, and lepirudin cautiously in clients who have kidney impairment.

Bipolar Disorders:

- Mood stabilizer
 - o Prototype: Lithium carbonate
 - o Purpose:
 - Lithium produces neurochemical changes in the brain, including serotonin receptor blockade.
 - There is evidence that the use of lithium can show a decrease in neuronal atrophy and/or an increase in neuronal growth.
 - o Therapeutic uses:
 - Lithium is used in the treatment of bipolar disorders. Lithium controls episodes of acute mania and helps prevent the return of mania or depression.
 - o Complications:

- Effects with therapeutic lithium levels (some resolve within a few weeks).
- GI distress: Nausea, diarrhea, abdominal pain.
- Fine hand tremors.
- Polyuria, mild thirst.
- Weight gain.
- Renal toxicity.
- Nursing actions:
 - Administer medication with meals or milk.
 - Administer beta-adrenergic blocking agents (propranolol).
 - Adjust to the lowest possible dosage, give in divided doses, or use long-acting formulations.
 - Use a potassium-sparing diuretic (spironolactone).
 - Assist clients to follow a healthy diet and regular exercise regimen.
 - Monitor I&O.
 - Adjust dosage and keep dose low.
 - Assess baseline kidney function and monitor kidney function periodically.

Lithium Toxicity:

- Common adverse effects
 - **Lithium Level:** Below 1.5 mEq/L.
 - Manifestations:
 - Diarrhea, nausea, vomiting, thirst, polyuria, muscle weakness, fine hand tremors, slurred speech, and lethargy.
 - Client education:
 - Manifestations at low levels often improve over time.
- Early indications:
 - **Lithium Level:** 1.5 to 2.0 mEq/L.
 - Manifestations:
 - Ongoing GI distress, including nausea, vomiting, and diarrhea; mental confusion; poor coordination; coarse tremors; sedation.
 - Nursing actions:
 - Administer new dosage based on blood lithium levels.
 - If manifestations are severe, it can be necessary to promote excretion.
 - Client education:
 - Withhold medication and notify the provider.
- Advanced indications:
 - **Lithium Level:** 2.0 to 2.5 mEq/L.
 - Manifestations:
 - Extreme polyuria of dilute urine, tinnitus, involuntary extremity movements, blurred vision, ataxia, seizures, severe hypotension leading to coma and possibly death from respiratory complications.
 - Nursing actions:
 - Whole bowel irrigation may be prescribed.
- Severe toxicity:

- o **Lithium Level:** Greater than 2.5 mEq/L.
- o Manifestations:
 - Oliguria, seizures, rapid progression of manifestations leading to coma and death.
- o Nursing actions:
 - Hemodialysis.