N322 Pharmacology
Proctored ATI Remediation Template

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Assessment Name: Introduction to Pharmacology
Semester: Spring 2024

Instructions:
1. Download the report from your ATI product for the assessment you are completing this remediation template for
2. The report will be broken down into three (3) aspects:
    a. Categories
        i. These categories mimic the NCLEX-RN categories and include the following:
            1. Management of Care
            2. Safety and Infection Control
            3. Health Promotion and Maintenance
            4. Psychosocial Integrity
            5. Basic Care and Comfort
            6. Pharmacological and Parenteral Therapies
            7. Reduction of Risk Potential
            8. Physiological Adaptation
    b. Subcategories
    c. Topics
3. Complete the template on the following page by doing the following:
    a. Main Category
        i. Subcategories for each main category
            1. Topics for each subcategory → these will be the content areas you will be remediating on
                a. Provide three (3) critical points to remember for each topic → these will come from the Focused Review module(s) within your ATI product
    b. ***NOTE: You must remediate on all subcategories AND topics within the main categories listed under the "Topics to Review" section of the ATI report for this assessment.***
4. In the event you need additional space within the table, please add rows into the table to accommodate this
    a. In the event, you need less space within the table than what is provided, you may delete those rows from the table to accommodate this OR put "N/A" → There may be main categories that you don't have to remediate on and that is OK – you can either delete the table OR put "N/A"
5. An example is provided below:

SAMPLE Main Category: Management of Care
SAMPLE Subcategory: Case Management
SAMPLE Topic: Anemias: Discharge Teaching for a Client Who is Recovering from Sickle Cell Crisis • SAMPLE Critical Point #1: Anemia is the abnormally low amount of circulation RB, Hgb concentration, or both. • SAMPLE Critical Point #2: When a patient is going through sickle crisis, the nurse should monitor oxygen saturation to determine a need for oxygen therapy. • SAMPLE Critical Point #3: A patient should have their hemoglobin checking in 4 to 6 weeks to determine efficacy.
Proctored ATI Grading Scale – RN Pediatric Health 2023

Level 3= 90 points

- ***Remediation = 10 points:***
- *Minimum 1-hour Focused Review*
- *For each topic missed, complete an active learning template and/ or identify three critical points to remember.* ***Must be a full sentence, not just bullet points.***

Level 2 = 80 points

- **Remediation = 10 points:**
- *Minimum 2-hour Focused Review*
- *For each topic missed, complete an active learning template and/ or identify three critical points to remember.* ***Must be a full sentence, not just bullet points.***

Level 1 = 70 points

- **Remediation = 10 points:**
- *Minimum 3-hour Focused Review*
- *For each topic missed, complete an active learning template and/ or identify three critical points to remember.* ***Must be a full sentence, not just bullet points.***

Below Level 1 = 60 points

- **Remediation = 10 points:**
- *Minimum 4-hour Focused Review*
- *For each topic missed, complete an active learning template and/ or identify three critical points to remember.* ***Must be a full sentence, not just bullet points.***

6. Once the template is completed ***and*** at least the minimum remediation time has been completed within the Focused Review module(s) in ATI, upload the template to the corresponding dropbox in E360.
7.

Main Category: Management of Care

Subcategory: Safe medication administration and error reduction

Topic: Nurses are responsible for having knowledge of federal, state (nurse practice act), and local laws, and facilities' policies that govern prescribing and dispensing medications; preparing and administering medications; and evaluating clients' responses to medications.

- Nurses should develop and maintain an up-to-date knowledge base of medications they administer, including uses, mechanisms of action, routes of administration, safe dosage range, adverse effects, precautions, contraindications, and interactions.
- Nurses can help reduce adverse events related to medications by determining the accuracy of medication prescriptions, reporting all medication errors, safeguarding and storing medications, following legal mandates when administering controlled substances, calculating medication doses accurately, and understanding the responsibilities of other members of the health care team regarding medications.
- Use verbal prescriptions only for emergencies and follow the facility's protocol for telephone prescriptions. Nursing students cannot accept verbal or telephone prescriptions.

Topic: Medication Reconciliation

- The Joint Commission requires policies and procedures for medication reconciliation. Nurses compile a list of each client's current medications, including all medications with their dosages and frequency. They compare the list with new medication prescriptions and reconcile it with the provider to resolve any discrepancies. This process should take place at admission, when transferring clients between units or facilities, and at discharge.

- Medications have a pharmacological action, therapeutic use, body system target, chemical makeup, and classification for use during pregnancy.
- Medications can have specific risks and manifestations of toxicity. They develop after taking a medication for a lengthy period or when toxic amounts build up due to faulty metabolism or excretion.

Topic: Social determinants of health (SDOH)

- To fully implement safe medication administration and error prevention, the nurse should determine the SDOH for each individual client. Clients are born into SDOH conditions in the environment in which they live. These conditions affect their daily life and, eventually, their health.
- Social determinants of health account for 90% of health outcomes, whereas medical care accounts for only 10 to 15%. It is imperative that a member of the client's healthcare team (nurse, pharmacist) collect the necessary data relating to the 6 determinants of health.
- Health care team members should not only gather the necessary data regarding SDOH but should act on the findings to ensure safe medication practices for all clients.

Subcategory: Medication

Topic: Bipolar disorders

- Bipolar disorders are primarily managed with mood-stabilizing medications (lithium carbonate). Other medications used to treat bipolar disorders include antiepileptic drugs (AEDs) (valproic acid, carbamazepine, lamotrigine, oxcarbazepine, and topiramate).
- Atypical antipsychotics (olanzapine) can be useful in early treatment to promote sleep and to decrease anxiety and agitation. These medications also demonstrate mood-stabilizing properties. Antipsychotics approved for treatment of bipolar depression include lurasidone and quetiapine, and a combination medication that includes olanzapine and fluoxetine.
- Antidepressant medications (bupropion, sertraline) can be useful during the depressive phase. These are typically prescribed in combination with a mood stabilizer to prevent rebound mania.

Topic: Cardiac glycosides and heart failure

- Heart failure results from inadequate pumping of the heart muscle with manifestations caused by the heart's inability to meet the circulation needs of the whole body. Decreased tissue perfusion results in fatigue, shortness of breath, weakness, and activity intolerance.
- Heart failure causes a reduction in cardiac output (CO) and affects heart rate, stroke volume (SV), preload, and afterload. There are two types of heart failure: left-sided (with pulmonary manifestations [dyspnea, cough, and oliguria]) and right-sided (systemic congestion with peripheral edema, jugular vein distention, weight gain).
- Diuretics, ACE inhibitors, angiotensin II receptor blockers (ARBs), and beta-adrenergic blockers are the medications of choice for treatment of heart failure. Cardiac glycosides are indicated if these medications are unable to control manifestations.

Topic: Medications effecting coagulation

- Pharmaceutical agents that modify coagulation are used to prevent clot formation or break apart an existing clot. These medications work in the blood to alter the clotting cascade, prevent platelet aggregation, or dissolve a clot. All carry a significant risk of bleeding.

- The goal of medications that alter coagulation is to increase circulation and perfusion, decrease pain, and prevent further tissue damage.
- The groups of medications used include oral and parenteral anticoagulants, antiplatelet medications, and thrombolytic agents. Anticoagulant medications include heparins, vitamin K antagonists, direct thrombin inhibitors, and direct factor Xa inhibitors.

Subcategory:

Topic: Connective tissue disorders

- Rheumatoid arthritis (RA) is a chronic, progressive disorder with autoimmune and inflammatory components. Pharmacological management relieves manifestations and can slow disease progression. Categories of medications in this section include disease-modifying antirheumatic medications (DMARDs), glucocorticoids, and nonsteroidal anti-inflammatory drugs (NSAIDs), which can be used individually or in combination to manage RA.
- Gout (aka gouty arthritis) is a painful type of arthritis that is caused by elevated levels of uric acid, which can accumulate and cause localized inflammation in synovial areas. Gout can result in severe joint pain caused by crystallization of sodium urate in the synovial space. Antigout medications act either by reducing inflammation or decreasing blood uric acid levels. Categories of medications in this section include anti-inflammatory agents, NSAIDs, glucocorticoids, and agents for hyperuricemia.
- Fibromyalgia is a syndrome characterized by muscle pain and fatigue. There are three FDA-approved medications for treating this syndrome: pregabalin, duloxetine, and milnacipran. Other medications used to treat fibromyalgia syndrome (but not FDA-approved for this use) include amitriptyline, cyclobenzaprine, tramadol, NSAIDs, and opioids. In addition, medications that facilitate sleep (zolpidem) and treat restless leg syndrome (gabapentin) are sometimes prescribed for manifestations of this condition.

Topic: Medications affecting the reproductive tract

- Medications that affect the reproductive system include hormones that stimulate puberty (estrogen, progesterone, and testosterone), replace a hormonal deficiency, or prevent pregnancy (which includes oral contraceptives, the hormonal patch, ring, and injection).
- Medications that are used to treat benign prostatic hyperplasia (BPH) include 5-alpha reductase inhibitors and alpha1 adrenergic antagonists. Phosphodiesterase type 5 (PDE5) inhibitors are used to treat erectile dysfunction and BPH.
- Estrogens are hormones needed for growth and maturation of the female reproductive tract, development of secondary sex characteristics, and are active in the follicular phase of the menstrual cycle. Estrogens block bone resorption and reduce low-density lipoprotein (LDL) levels. At high levels, estrogens suppress the release of a follicle-stimulating hormone (FSH) needed for conception.

Main Category: Safety and Infection Control

Subcategory: Medications for infections

Topic: antibiotics affecting the bacterial cell wall

- Antibiotics that affect the cell wall are bactericidal. This group of antibiotics includes penicillin's, cephalosporins, carbapenems, and monobactams.
- Penicillin's destroy bacteria by weakening the bacterial cell wall. Considered a beta-lactam antibiotic.
- Wear an allergy identification bracelet. Because of cross sensitivity, being allergic to one penicillin should be considered allergic to all other penicillin's.

Topic: Medications affecting blood pressure

- Blood pressure is controlled in a variety of ways with many medications that are used alone or in combination. Guidelines for pharmacological management of hypertension are found in The Eighth Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure released in 2013 by the U.S. Department of Health and Human Services

Angiotensin-converting enzyme (ACE) inhibitors reduce production of angiotensin II by blocking the conversion of angiotensin I to angiotensin II and increasing levels of bradykinin, leading to the following.

- Vasodilation (mostly arteriole)
- Excretion of sodium and water, and retention of potassium by actions in the kidneys
- Reduction in pathological changes in the blood vessels and heart that result from the presence of angiotensin II and aldosterone
- Contraindicated in clients who have a history of allergy to or angioedema from ACE inhibitors, in bilateral renal artery stenosis, or in clients who have a single kidney.
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Topic: Antibiotics affecting protein synthesis

- Antibiotics affecting protein synthesis are bacteriostatic (tetracyclines and macrolides) or bactericidal (aminoglycosides) and are used to treat various respiratory, gastrointestinal (GI), urinary, and reproductive tract infections. These medications work by suppressing the replication and growth of the bacteria.
- Tetracyclines are broad-spectrum antibiotics that inhibit micro-organism growth by preventing protein synthesis (bacteriostatic).

- If this medication is given to treat an STD, clients should abstain from intercourse until they finish their medication, manifestations have resolved, and partners have been treated.

Subcategory: Physiological integrity

Topic: Fluid imbalances

- Body fluids are distributed between intracellular fluid (ICF) and extracellular fluid (ECF) compartments. ICF lies within body cells and constitutes two-thirds of the total body fluids in adults. ECF is comprised of intravascular (plasma), interstitial (fluid that surrounds the cells), lymph, and transcellular fluids (cerebrospinal, pericardial, pancreatic, pleural, intraocular, biliary, peritoneal, and synovial fluids).
- Fluid can move between compartments (through selectively permeable membranes) by a variety of methods (diffusion, active transport, filtration, osmosis) to maintain homeostasis. Fluid imbalances that the nurse should be familiar with are fluid volume deficit and fluid volume excess.
- Fluid overload is an excess of fluid or water (with water intoxication). This includes hemodilution, which makes the amount of blood components (blood cells, electrolytes) seem lower.

Topic: Airflow Disorders

- Asthma is a chronic inflammatory disorder of the airways. It is an intermittent and reversible airflow obstruction that affects the bronchioles. The obstruction occurs either by inflammation or airway hyper-responsiveness leading to bronchoconstriction.
- Medication management usually addresses both inflammation and bronchoconstriction. These same medications can also be used to treat the manifestations of chronic obstructive pulmonary disease (COPD).
- Bronchodilators can further be broken down into Short-Acting Beta$_2$ Agonists (SABAs) which are adrenergic or sympathomimetics used for acute symptom relief and Long-Acting Beta$_2$ Agonists (LABAs) which are adrenergic or sympathomimetics used for long term management.

Topic: Medications affecting cardiac rhythm

- Medications affecting cardiac rhythm act by altering cardiac electrophysiologic function to treat or prevent dysrhythmias.
- Electrophysiological changes can include prolonging the AV node; increasing or reducing conduction speed; altering ectopic pacemakers and SA node; reducing myocardial excitability; lengthening effective refractory period; and stimulating the autonomic nervous system.
- There are four main classification groups of antidysrhythmics: sodium channel blockers, beta-adrenergic blockers, potassium channel blockers, and calcium channel blockers.

Subcategory: Medications affecting coagulation

Topic: Endocrine disorders

- The endocrine system is made up of glands that secrete hormones, which act on specific receptor sites. Hormones target receptor sites to regulate response to stress, growth, metabolism, and homeostasis.
- An endocrine disorder usually involves the oversecretion or undersecretion of hormones, or an altered response by the target area or receptor.
- Thyroid hormone preparations are a synthetic form of thyroxine (T_4), a form of

liothyronine (T_3), or a combination of T_3 and T_4, that increase metabolic rate, protein synthesis, cardiac output, renal perfusion, oxygen use, body temperature, blood volume, and growth processes.

Main Category: Health Promotion and Maintenance
Subcategory: Gastrointestinal disorders
Topic: Gastrointestinal therapeutic procedures • Gastrointestinal therapeutic procedures are performed for maintenance of nutritional intake, and treatment of gastrointestinal obstructions, obesity, and other disorders. • Nurses caring for clients who have gastrointestinal therapeutic procedures should be knowledgeable about include enteral feedings, total parenteral nutrition (TPN), abdominal paracentesis, nasogastric decompression, bariatric surgeries, and ostomies. • Pneumonia can occur secondary to aspiration of feeding and can be a life-threatening complication. Tube displacement is the primary cause of aspiration of feeding.
Subcategory: Medications affecting the neurologic
Topic: Depressive disorders • Depressive disorders are a widespread problem, ranking high among causes of disability. Clients who have major depression can require hospitalization with close observation and suicide precautions until antidepressant medications reach their peak effect. • Antidepressant medications are classified into five main groups: selective serotonin reuptake inhibitors (SSRIs), serotonin-norepinephrine reuptake inhibitors (SNRIs), atypical antidepressants, tricyclic antidepressants (TCAs), and monoamine oxidase inhibitors (MAOIs). • Atypical antipsychotic medications to treat depression are used as monotherapy, and adjunct therapy for depression, and bipolar depressive disorders. **Topic: Bone disorders** • Calcium and Vitamin D are necessary for the proper functioning of the heart, bones, nerves, muscles, and for blood coagulation. They can be given as supplements when dietary intake is insufficient. Other medications are also used for prevention and treatment of osteoporosis and prevention of fractures. • Medication classifications include calcium supplements, selective estrogen receptor modulators (also known as estrogen agonists/antagonists), bisphosphonates, and calcitonin. • Calcium supplements are contraindicated in clients who have hypercalcemia, renal calculi, hypophosphatemia, digoxin toxicity, and ventricular fibrillation **Topic: Diabetes Miletus**

- Diabetes mellitus is a chronic illness that results from an absolute or relative deficiency of insulin, often combined with a cellular resistance to insulin’s actions. Various insulins are available to manage diabetes. These medications differ in their onset, peak, and duration.
- Oral antidiabetic medications work in various ways to increase available insulin or modify carbohydrate metabolism. Newer injectable medications are used to supplement insulin or oral agents to manage glucose control.
- Beta blockers can mask SNS response to hypoglycemia (tachycardia, tremors), making it difficult for clients to identify hypoglycemia. Beta blockers also impair the body’s natural ability to breakdown glycogen stores to raise blood glucose levels.

Subcategory: pharmacological principals

Topic: Adverse effects, interactions, and contraindications

- To ensure safe medication administration and prevent errors, the nurse must know why a medication is prescribed and its intended therapeutic effect. In addition, the nurse must be aware of potential side/adverse effects, interactions, contraindications, and precautions.
- Every medication has the potential to cause side and adverse effects. Side effects occur when the medication is given at a therapeutic dose. Discontinuation of the medication is usually not warranted. Adverse effects are undesired, inadvertent, and unexpected severe responses to the medication. Adverse effects can occur at both therapeutic and higher-than-therapeutic doses. Providers will discontinue the medication immediately. Adverse effects are reported to the FDA using the MedWatch program.
- Contraindications and precautions of specific medications refer to client conditions that make it unsafe or potentially harmful to administer these medications.

  Response to medications differs for individuals based on multiple factors (age, sex, disease process, and ethnic/genetic variations). These factors can be responsible for many expected and unexpected adverse effects.

Topic: Growth factor

- Blood cells and platelets are produced in the body by the biological process hematopoiesis. In the body, this process is naturally controlled by hormones, also known as hematopoietic growth factors.
- Genetically engineered products are available for therapeutic purposes.

- Monitor blood pressure frequently, because adjustments in antihypertensive medication can also be required as treatment progresses.

Main Category: Physiological Integrity

Subcategory: basic care and comfort

Topic: Pain management

- Effective pain management includes the use of pharmacological and nonpharmacological pain management therapies. Invasive therapies (nerve ablation) can be appropriate for intractable cancer-related pain.
- Nurses have a priority responsibility to measure the client's pain level on a continual basis and to provide individualized interventions. Depending on the setting and route of analgesia administration, the nurse might be required to reassess pain 10 to 60 min after administering medication.
- Undertreatment of pain is a serious health care problem. Consequences of undertreatment of pain include physiological and psychological components. Acute/chronic pain can cause anxiety, fear, and depression. Poorly managed acute pain can lead to chronic pain syndrome.

Topic: Vitamins and minerals

- Vitamins and minerals have important roles in the body, including the production of red blood cells, building bones, making hormones, regulating body fluid volume, and supporting nerve cell function. Vitamin and mineral deficiencies can increase the risk for health problems (anemias, heart disease, cancers, and osteoporosis).
- Expected Pharmacological Action: Iron preparations provide iron needed for RBC development and oxygen transport to cells. During times of increased growth (in growing children or during pregnancy) or when RBCs are in high demand (after blood loss), the need for iron can be greatly increased. Iron is poorly absorbed by the body, so relatively large amounts must be ingested orally to increase Hgb and Hct levels.
- Manifestations of iron toxicity include severe GI manifestations, shock, acidosis, and liver and heart failure. The chelating agent deferoxamine, given parenterally, is used to treat toxicity. Gastric lavage is used to remove iron from the stomach.

Topic: Medications affecting urinary output

- Indications for medications that affect urinary output include management of blood pressure; excretion of edematous fluid related to heart failure and kidney and liver disease; and prevention of kidney failure.
- Assess/monitor for manifestations of dehydration: dry mouth, increased thirst, oliguria, and lethargy and report findings to the provider
- Teach clients to observe and report manifestations of hypokalemia (nausea, vomiting, fatigue, leg cramps, and general weakness).

Subcategory:

Topic: Chronic neurologic disorders

- Chronic neurologic disorders include Parkinson's disease and seizure disorders.

Medications administered for chronic neurologic disorders are used to manage manifestations and improve quality of life.

- Cholinesterase inhibitors prevent the enzyme cholinesterase from inactivating acetylcholine (ACh), thereby increasing the amount of ACh available at receptor sites. Transmission of nerve impulses is increased at all sites responding to ACh as a transmitter.
- Avoid eating foods that contain tyramine (avocados, soybeans, figs, smoked meats, dried or cured fish, cheese, yeast products, beer, chianti wine, chocolate, caffeinated beverages). Continue to avoid these foods for 2 weeks after stopping medication.

Topic: Medications effecting urinary output

- Indications for medications that affect urinary output include management of blood pressure; excretion of edematous fluid related to heart failure and kidney and liver disease; and prevention of kidney failure.
- Medications include high-ceiling loop diuretics, thiazide diuretics, potassium-sparing diuretics, and osmotic diuretics.
- **Client education:**
  Teach clients to consume high-potassium foods (bananas, potatoes, dried fruits, nuts, spinach, citrus fruit).
  Teach clients to observe and report manifestations of hypokalemia (nausea, vomiting, fatigue, leg cramps, and general weakness).

Topic: Medications affecting cardiac rhythm.

- Electrophysiological changes can include prolonging the AV node; increasing or reducing conduction speed; altering ectopic pacemakers and SA node; reducing myocardial excitability; lengthening effective refractory period; and stimulating the autonomic nervous system.
- There are four main classification groups of antidysrhythmics: sodium channel blockers, beta-adrenergic blockers, potassium channel blockers, and calcium channel blockers.
- Toxicity is major concern for antidysrhythmic medications. Medication toxicity can lead to increased cardiac dysrhythmias.

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