

PHARMACOTHERAPY II LEARNING OBJECTIVES

Unit I

Information Literacy/Drug Information

1. Apply the concepts of information literacy to find the answer to a specific drug information question.
2. Evaluate the information found based on information literacy standards.
3. Provide drug information to a mock patient using lay language.

Pain Management

Acute Pain and Persistent Pain:

Given a patient who presents with acute pain or persistent pain, decide when pharmacotherapy is indicated and initiate appropriate management. Specific objectives to be achieved by the student include:

1. Apply the World Health Organization (WHO) analgesic ladder for pain relief and prescribe drugs accordingly, including route of administration, scheduling of medications, titration of drug doses, and use of adjunctive medications.
2. Define the mechanism of action of COX-2 inhibitors and explain how it sets them apart from traditional NSAIDs.
3. Differentiate between the effects of acetaminophen, aspirin, traditional NSAIDs, and COX-2 inhibitors with respect to bleeding risk and other significant adverse effects.
4. Appropriately prescribe medications in the management of acute and chronic pain.
5. Differentiate drug responsiveness of myofascial and neuropathic pain syndromes.
6. Differentiate between allergic reactions and dose-related toxicities of analgesics.

Arthritis

Rheumatoid Arthritis:

1. Describe the functional classification of RA.
2. Describe non-pharmacologic treatment modalities for RA.
3. Recognize and teach patients the potential adverse effects of commonly used DMARDs.
4. Appropriately monitor patients on DMARD therapy.

Osteoarthritis:

1. Describe the advantages and disadvantages of acetaminophen, NSAIDs, nonacetylated salicylates, COX-2 inhibitors, tramadol, opioids, intraarticular glucocorticoids, topical analgesics, intraarticular hyaluronic acid and glucosamine in the treatment of osteoarthritis.
2. Discuss the osteoarthritis treatment algorithm and the place in therapy of medications commonly used to treat osteoarthritis.

Unit II

Neurologic Disorders

Alzheimer's Dementia:

1. Describe the proposed pathogenesis of Alzheimer's dementia and where drug classes might work to slow or counteract the process.
2. Explain the mechanism of action, dose titration and potential adverse effects of cholinesterase inhibitors.
3. Describe pharmacologic and nonpharmacologic therapy for noncognitive symptoms of AD.
4. Monitor the efficacy of therapy and progression of disease.

Headaches:

Given a patient who presents with headaches, decide when pharmacotherapy is indicated and initiate appropriate therapy. Specific objectives to be achieved by the student include:

1. Appropriately prescribe abortive medication used in the treatment of mild, moderate and severe migraines.
2. Appropriately prescribe prophylactic agents for management of migraine headaches.
3. Appropriately prescribe antiemetics to restore gastric motility, permit absorption of analgesics, and to prevent nausea and vomiting associated with migraines.

4. Recognize the signs of medication overuse headache, and take steps to discontinue offending agents when appropriate.
5. Educate patients on the appropriate use of abortive therapies and realistic responses to prophylactic agents.
6. Appropriately prescribe treatment for cluster headaches.
7. Initiate treatment for tension headaches.

Seizure Disorders:

1. Monitor the use of anticonvulsants and other drugs used to treat seizure disorders.
2. Evaluate the effectiveness of antiepileptic drugs.
3. Recognize conditions where it is important to do therapeutic drug monitoring of anticonvulsant plasma levels.
4. Evaluate the advantages and disadvantages of combination drug therapy.
5. Evaluate the risk of birth defects if these drugs are taken during pregnancy.

Status Epilepticus:

Given a patient with status epilepticus, decide when pharmacotherapy is indicated and delineate emergency management. Specific objectives to be achieved by the student include the following:

1. Appropriately initiate therapy with benzodiazepines and/or other anticonvulsant medications, taking into consideration other anticonvulsant drugs the patient may already be taking, including: diazepam, lorazepam, fosphenytoin.

Meningitis & Encephalitis:

Given a patient presenting with meningitis, decide when pharmacotherapy is indicated and delineate emergency management. Specific objectives to be achieved by the student include the following:

1. Determine the most likely pathogen by patient age group.
2. Select and administer the appropriate antibiotic therapy.
3. Determine appropriate monitoring modalities.
4. Recognize signs of therapeutic response and treatment failure and adjust drug therapy accordingly.
5. Determine appropriateness of conversion from emergent to maintenance therapy.
6. List the viruses most commonly associated with encephalitis, and provide recommendations for therapy as appropriate.

Parkinson's disease:

Given a patient with Parkinson's disease, delineate appropriate follow-up monitoring and management. Specific objectives to be achieved by the student include:

1. Monitor the use of drugs commonly used in the treatment of tremor, akinesia and rigidity associated with Parkinson's disease.
2. Evaluate the effectiveness of anticholinergics, carbidopa/levodopa, dopamine agonists, MAOB inhibitors, and COMT inhibitors in the treatment of tremor, akinesia and rigidity associated with Parkinson's disease.
3. Differentiate between the following: adverse effects of antiparkinson drugs that are related to dose, long-term use of antiparkinson drugs, or worsening of Parkinson's disease itself.

Multiple Sclerosis:

1. Appropriately treat acute MS exacerbations.
2. Describe the purpose, dosing regimens and potential adverse effects of immunomodulators in treating MS.
3. Explain the principles of MS symptom management.

Ophthalmology

Conjunctivitis:

Given a patient who presents with conjunctivitis, decide when pharmacotherapy is indicated and initiate appropriate management. Specific objectives to be achieved by the student include:

1. Select specific therapy used in primary treatment of causative organism (or presenting symptoms).
2. Appropriately prescribe the commonly used drugs.

Glaucoma:

Given a patient with glaucoma, where therapy has been previously initiated, delineate appropriate follow-up monitoring and management. Specific objectives to be achieved by the student include:

1. Recognize and teach patients the potential adverse effects of prescription and over-the-counter drugs on primary open angle glaucoma and angle closure glaucoma.
2. Monitor patients with concurrent medical conditions for adverse effects and drug interactions associated with ophthalmic therapies.

Unit III**Anemia**

Given a patient who presents with anemia, decide when pharmacotherapy is indicated and initiate appropriate management. Specific objectives to be achieved by the student include:

1. Recognize and appropriately manage deficiencies in iron, folic acid, and B12.
2. Appropriately manage anemia in chronic renal failure and appropriately utilize erythropoietin.
3. Monitor erythropoietin treatment for anemia in chronic renal failure.

Human Immunodeficiency Virus (HIV)

Given a patient with Human Immunodeficiency Virus (HIV) where therapy has been previously initiated, delineate appropriate follow-up monitoring and management. Specific objectives to be achieved by the student include:

1. Monitor appropriate level of treatment: i.e., therapy for opportunistic infections and/or malignancies; antiretroviral treatment; hematopoietic stimulating factors; and prophylaxis of opportunistic infections.
2. Recognize the signs/symptoms of drug resistance, drug allergy, and/or toxic reactions.
3. Recognize potential drug-drug interactions with medications prescribed for concurrent diagnoses.
4. Select appropriate laboratory studies to aid in monitoring patient response.
5. Recognize when a specialist should be consulted.

Total Parenteral Nutrition

Given a patient with parenteral malnutrition, where therapy has been previously initiated, delineate appropriate follow-up monitoring and management. Specific objectives to be achieved by the student include:

1. Appropriately use anthropometric measurements and physical examination in assessing nutritional status.
2. Appropriately order standard laboratory tests in the assessment of nutritional status.
3. Assess the effectiveness of standard methods for determining the energy requirements of hospitalized patients.
4. Understand the usefulness of total parenteral nutrition solutions as vehicles for drug delivery.
5. Monitor for the complications associated with refeeding syndrome.

Dose Adjustment in Renal & Hepatic Impairment

Given a patient who presents with renal or hepatic impairment, decide when dose adjustment is indicated and adjust the dose as needed. Specific objectives to be achieved by the student include:

1. Calculate an estimated creatinine clearance for a given patient.
2. Determine an appropriate dosage adjustment based on a calculated creatinine clearance.
3. Describe the significance of renal clearance of a drug metabolite.
4. For a medication that undergoes hepatic metabolism, determine when dosage adjustment is indicated.

Genitourinary Disorders

Given a patient who presents with epididymitis, prostatitis, lower urinary tract infection, decide when pharmacotherapy is indicated and initiate appropriate management. Specific objectives to be achieved by the student include:

Lower Urinary Tract Infection:

1. Select specific pharmacologic agent for primary treatment of causative organism (or presenting symptoms).
2. Appropriately prescribe commonly used drugs.
3. Determine an appropriate duration of treatment (e.g. 3 days, 7 days, 10 days, or chronic prophylaxis).
4. Identify and decide when to use second line pharmacologic therapy.
5. Recognize treatment failure.

Pyelonephritis

1. Select specific antibiotics for primary treatment of causative organisms.
2. Differentiate need for inpatient vs. outpatient therapy.
3. Appropriately prescribe commonly used drugs with appropriate duration of treatment.

Prostatitis/Epididymitis:

1. Select specific antibiotics for primary treatment of causative organisms.
2. Differentiate need for inpatient vs. outpatient therapy.
3. Appropriately prescribe commonly used drugs.
4. Recognize and appropriately manage treatment failure.
5. Identify and decide when to use second line pharmacologic therapy.

Erectile Dysfunction/ Benign Prostatic Hypertrophy/Incontinence

1. Discuss common drug categories that can exacerbate or contribute to erectile dysfunction.
2. Compare and contrast the pharmacologic mechanisms of action of various treatments for erectile dysfunction.
3. Describe which patients should be prescribed phosphodiesterase 5 inhibitors cautiously.
4. Discuss pharmacologic classes drugs that can exacerbate voiding symptoms in patients with benign prostatic hyperplasia.
5. Compare and contrast the mechanism of action, indications, onset, duration of action, and adverse effects of finasteride and alpha-adrenergic antagonists for treatment of benign prostatic hyperplasia.
6. Discuss common drug categories that can exacerbate or contribute to urinary incontinence.
7. Compare and contrast the mechanism of action, indications, and adverse effects of various treatments for treatment of urinary incontinence.

Unit IV

Endocrine Disorders

Given a patient who presents with hypothyroidism or diabetes mellitus, decide when pharmacotherapy is indicated and initiate appropriate management. Specific objectives to be achieved by the student include:

Diabetes Mellitus:

1. Appropriately initiate therapy in patients with type 1 and type 2 diabetes mellitus.
2. Develop a strategy to appropriately monitor the use of oral hypoglycemic agents and insulin based on blood glucose levels.
3. Teach the patient the treatment objectives for diabetes mellitus.
4. Teach the patient about two or three non-pharmacologic treatment strategies for diabetes mellitus.
5. Teach the patient the side effects of insulin and discuss ways to minimize these effects.
6. Teach the patient the appropriate times of administration (with regard to meals) of insulin and oral hypoglycemic agents.
7. Appropriately adjust medications based on blood glucose and Hemoglobin A1C levels.

Diabetic Ketoacidosis:

Given a patient with diabetic ketoacidosis, decide when pharmacotherapy is indicated and delineate emergency management. Specific objectives to be achieved by the student including the following:

1. Management of dehydration, fluid and electrolyte losses, and hyperglycemia of a patient with DKA.
2. Recognize and manage the expectant course of a patient with DKA.

Hypothyroidism:

1. Initiate and appropriately titrate thyroid replacement therapy.
2. Describe how pregnancy alters the management of thyroid disorders.

Hyperthyroidism:

Given a patient with hyperthyroidism, where therapy has been previously initiated, delineate appropriate follow-up monitoring and management. Specific objectives to be achieved by the student include:

1. Appropriately monitor and manage the patient with side effects or complications of ablation, surgical therapy, or medical management.
2. Appropriately monitor the patient for subsequent development of post-treatment hypothyroidism.

Obesity:

1. Discuss the relative order in therapy for behavior modification, prescription medication, and surgery in the treatment of obesity.
2. Discuss the most common side effects seen with weight-management pharmacotherapy that are of importance to the patient and prescriber.
3. Describe the amount of weight loss required to affect glycemic control, physical immobility or osteoarthritis in obese patients.

Toxicology

1. Discuss the presentation and management of acetaminophen overdose.
2. Describe the presentation and management of other common overdoses, including salicylate, tricyclic antidepressant, iron and drugs of abuse.
3. Describe antidote therapy and indications for use.

Reporting Adverse Drug Events/Medication Errors

1. Define the terms medication error, adverse drug event and adverse drug reaction and describe how the terms relate to each other.
2. Discuss how to recognize an adverse drug reaction.
3. Describe which adverse drug reactions should be reported to the FDA.
4. Describe prescriber problems related to medication errors.
5. Compare the two approaches to looking at medication errors, the person approach vs. the systems approach, and describe which one is the most constructive approach.