Module 2: Cardiovascular and Respiratory Systems

MODULE 2: AT A GLANCE

CARDIOVASCULAR AND RESPIRATORY SYSTEMS

WEEK 2

WEEK 3

WHAT'S HAPPENING THIS MODULE?

Module 2: Cardiovascular and Respiratory Systems is a 2-week module, Weeks 2 and 3 of the course. In this module, you will examine how patient factors may influence pharmacokinetic and pharmacodynamic processes of pharmacotherapeutics used in the treatment of cardiovascular and respiratory disorders. You will also explore and suggest drug therapy plans for asthma and analyze the stepwise approach for asthma treatment and management.

INTRODUCTION

Alterations of the cardiovascular system can cause serious adverse events and may lead to death when not treated in a timely and safe manner. Unfortunately, many patients with cardiovascular disorders are unaware until complications appear. In clinical settings, patients often present with symptoms of several cardiovascular disorders, making it essential for you, as the advanced practice nurse, to be able to recognize these symptoms and recommend appropriate drug treatment options.

This week, you examine the impact of patient factors that may lead to changes in pharmacokinetic and pharmacodynamic processes on patient drug therapy for cardiovascular disorders. You also explore ways to improve drug therapy plans for cardiovascular disorders based on patient factors and overall health needs.

LEARNING OBJECTIVES

Students will:

- Analyze the influence of patient factors on pharmacokinetic and pharmacodynamic processes
- Analyze the impact of changes in pharmacokinetic and pharmacodynamic processes on patient drug therapies
- Evaluate drug therapy plans for cardiovascular disorders

PHARMACOTHERAPY FOR CARDIOVASCULAR DISORDERS

...heart disease remains the No. 1 killer in America; nearly half of all Americans have high blood pressure, high cholesterol, or smoke—some of the leading risk factors for heart disease…

—Murphy et al., 2018

Despite the high mortality rates associated with cardiovascular disorders, improved treatment options do exist that can help address those risk factors that afflict the majority of the population today.

As an advanced practice nurse, it is your responsibility to recommend appropriate treatment options for patients with cardiovascular disorders. To ensure the safety and effectiveness of drug therapy, advanced practice nurses must consider aspects that might influence pharmacokinetic and pharmacodynamic processes such as medical history, other drugs currently prescribed, and individual patient factors.

Reference: Murphy, S. L., Xu, J., Kochanek, K. D., & Arias, E. (2018). Mortality in the United States, 2017. Retrieved from https://www.cdc.gov/nchs/products/databriefs/db328.htm

RESOURCES

Be sure to review the Learning Resources before completing this activity.
Click the weekly resources link to access the resources.

WEEKLY RESOURCES

To Prepare

- Review the Resources for this module and consider the impact of potential pharmacotherapeutics for cardiovascular disorders introduced in the media piece.
- Review the case study assigned by your Instructor for this Assignment.
- Select one the following factors: genetics, gender, ethnicity, age, or behavior factors.
- Reflect on how the factor you selected might influence the patient's pharmacokinetic and pharmacodynamic processes.
- Consider how changes in the pharmacokinetic and pharmacodynamic processes might impact the patient's recommended drug therapy.

- Think about how you might improve the patient's drug therapy plan based on the pharmacokinetic and pharmacodynamic changes. Reflect on whether you would modify the current drug treatment or provide an alternative treatment option for the patient.

BY DAY 7 OF WEEK 2

Write a 2- to 3-page paper that addresses the following:

- Explain how the factor you selected might influence the pharmacokinetic and pharmacodynamic processes in the patient from the case study you were assigned.
- Describe how changes in the processes might impact the patient's recommended drug therapy. Be specific and provide examples.
- Explain how you might improve the patient's drug therapy plan and explain why you would make these recommended improvements.

Reminder: The College of Nursing requires that all papers submitted include a title page, introduction, summary, and references. The College of Nursing Writing Template with Instructions provided at the Walden Writing Center offers an example of those required elements (available at https://academicguides.waldenu.edu/writingcenter/templates/general#s-lg-box-20293632Links to an external site.). All papers submitted must use this formatting.

SUBMISSION INFORMATION

Before submitting your final assignment, you can check your draft for authenticity. To check your draft, access the **Turnitin Drafts** from the **Start Here** area.

1. To submit your completed assignment, save your Assignment as **WK2Assgn_LastName_Firstinitial**
2. Then, click on **Start Assignment** near the top of the page.
3. Next, click on **Upload File** and select **Submit Assignment** for review.

NURS_6521_Week2_Assignment_Rubric

Criteria	Ratings				Pts
This criterion is linked to a Learning OutcomeExplain how the factor you selected might influence the pharmacokinetic and pharmacodynamic processes in the patient from the case study you were assigned.	**25 to >22.5 pts** **Excellent** The response accurately and completely explains in detail how the factor selected might influence the pharmacokinetic and pharmacodynamic processes in the patient.	**22.5 to >19.75 pts** **Good** The response provides a basic explanation of how the factor selected might influence the pharmacokinetic and pharmacodynamic processes in the patient.	**19.75 to >17.25 pts** **Fair** The response inaccurately or vaguely explains how the factor selected might influence the pharmacokinetic and pharmacodynamic processes in the patient.	**17.25 to >0 pts** **Poor** The response inaccurately and vaguely explains how the factor selected might influence the pharmacokinetic and pharmacodynamic processes in the patient, or is missing.	25 pts

NURS_6521_Week2_Assignment_Rubric

Criteria	Ratings				Pts
This criterion is linked to a Learning OutcomeDescribe how changes in the processes might impact the patient's recommended drug therapy. Be specific and provide examples.	**30 to >26.7 pts** **Excellent** The response accurately and completely describes in detail how changes in the processes might impact the patient's recommended drug therapy. ... Accurate, complete, and aligned examples are provided to support the response.	**26.7 to >23.7 pts** **Good** The response accurately describes how changes in the processes might impact the patient's recommended drug therapy. ... Accurate examples may be provided to support the response.	**23.7 to >20.7 pts** **Fair** The response inaccurately or vaguely describes how changes in the processes might impact the patient's recommended drug therapy. ... Inaccurate or vague examples are provided to support the response.	**20.7 to >0 pts** **Poor** The response inaccurately and vaguely describes how changes in the processes might impact the patient's recommended drug therapy, or is missing. ... Inaccurate and vague examples may be provided to support the response, or is missing.	30 pts

NURS_6521_Week2_Assignment_Rubric

Criteria	Ratings				Pts
This criterion is linked to a Learning OutcomeExplain how you might improve the patient's drug therapy plan, and explain why you would make these recommended improvements.	**30 to >26.7 pts** **Excellent** The response accurately and clearly explains in detail how to improve the patient's drug therapy plan. ... The response includes an accurate and detailed explanation to support the recommended improvements.	**26.7 to >23.7 pts** **Good** The response accurately explains how to improve the patient's drug therapy plan. ... The response may include an accurate explanation to support the recommended improvements.	**23.7 to >20.7 pts** **Fair** The response inaccurately or vaguely explains how to improve the patient's drug therapy plan. ... The response may include an inaccurate, vague, or misaligned explanation to support the recommended improvements.	**20.7 to >0 pts** **Poor** The response inaccurately and vaguely explains how to improve the patient's drug therapy plan, or is missing. ... The response may include an inaccurate and vague explanation to support the recommended improvements, or is missing.	30 pts

NURS_6521_Week2_Assignment_Rubric

Criteria	Ratings				Pts
This criterion is linked to a Learning OutcomeWritten Expression and Formatting - Paragraph Development and Organization: Paragraphs make clear points that support well developed ideas, flow logically, and demonstrate continuity of ideas. Sentences are carefully focused--neither long and rambling nor short and lacking substance.	**5 to >4.45 pts** **Excellent** Paragraphs and sentences follow writing standards for flow, continuity, and clarity.	**4.45 to >3.95 pts** **Good** Paragraphs and sentences follow writing standards for flow, continuity, and clarity 80% of the time.	**3.95 to >3.45 pts** **Fair** Paragraphs and sentences follow writing standards for flow, continuity, and clarity 60%–79% of the time.	**3.45 to >0 pts** **Poor** Paragraphs and sentences follow writing standards for flow, continuity, and clarity less than 60% of the time.	5 pts

NURS_6521_Week2_Assignment_Rubric

Criteria	Ratings				Pts
This criterion is linked to a Learning OutcomeWritten Expression and Formatting - English writing standards: Correct grammar, mechanics, and proper punctuation	**5 to >4.45 pts** **Excellent** Uses correct grammar, spelling, and punctuation with no errors	**4.45 to >3.95 pts** **Good** Contains a few (1–2) grammar, spelling, and punctuation errors	**3.95 to >3.45 pts** **Fair** Contains several (3–4) grammar, spelling, and punctuation errors	**3.45 to >0 pts** **Poor** Contains many (≥ 5) grammar, spelling, and punctuation errors that interfere with the reader's understanding	5 pts

NURS_6521_Week2_Assignment_Rubric

Criteria	Ratings				Pts
This criterion is linked to a Learning OutcomeWritten Expression and Formatting - The paper follows correct APA format for title page, headings, font, spacing, margins, indentations, page numbers, running head, parenthetical/in-text citations, and reference list.	**5 to >4.45 pts** **Excellent** Uses correct APA format with no errors	**4.45 to >3.95 pts** **Good** Contains a few (1–2) APA format errors	**3.95 to >3.45 pts** **Fair** Contains several (3–4) APA format errors	**3.45 to >0 pts** **Poor** Contains many (≥ 5) APA format errors	5 pts
Total Points: 100					

LEARNING RESOURCES

Required Readings

- Rosenthal, L. D., & Burchum, J. R. (2021). *Lehne's pharmacotherapeutics for advanced practice nurses and physician assistants* (2nd ed.) St. Louis, MO: Elsevier.

- Chapter 33, “Review of Hemodynamics” (pp. 285–289)
- Chapter 37, “Diuretics” (pp. 290–296)
- Chapter 38, “Drugs Acting on the Renin-Angiotensin-Aldosterone System” (pp. 297–307)
- Chapter 39, “Calcium Channel Blockers” (pp. 308–312)
- Chapter 40, “Vasodilators” (pp. 313–317)
- Chapter 41, “Drugs for Hypertension” (pp. 316–324)
- Chapter 42, “Drugs for Heart Failure” (pp. 325–336)
- Chapter 43, “Antidysrhythmic Drugs” (pp. 337–348)
- Chapter 44, “Prophylaxis of Atherosclerotic Cardiovascular Disease: Drugs That Help Normalize Cholesterol and Triglyceride Levels” (pp. 349–363)
- Chapter 45, “Drugs for Angina Pectoris” (pp. 364–371)
- Chapter 46, “Anticoagulant and Antiplatelet Drugs” (pp. 372–388)

Required Media

Cardiovascular Disorders

- Meet Dr. Norbert Myslinski as he discusses ACE inhibitors, angiotensin inhibitors, beta-blockers, calcium channel blockers, and diuretics as different categories of hypertension drugs. What potential drugs might be best recommended for patients suffering from hypertension? (8m)

- Walden University. (n.d.). *Instructor feedback*Links to an external site.. https://cdn-media.waldenu.edu/2dett4d/Walden/WWOW/1001/pulse_check/instructor_feedback/index.html#/

[Music] One of the missions

of this course is to straddle the basic sciences

and the clinical sciences. Many years ago,
Sir William Osler said, "One cannot become
a competent clinician "without the full knowledge
of human physiology "and pathology. "Without it,
one flounders along "in an aimless fashion,
never able to gain "an accurate conception
of disease, "practicing a sort
of popgun pharmacy, "hitting now the malady
and again the patient, he himself
not knowing which." This week,
Dr. Norbert Myslinski examines how categories of drugs
working through different mechanisms can provide
a synergistic effect creating more treatment options. So often in hospitals
and the doctors' offices and also in medical schools
and nursing schools and dental schools,
there is this dichotomy between the two. I mean, you first learn

the basic sciences, then you forget about those
and you go to the clinics, I think you learn
the real stuff, but we want to do
with this course is to produce a bridge between the two. And make the understanding
of the clinical portions more relevant by knowing
the basic science-- knowing the basic science
that we have. Another way in which groups
are important is synergism. In pharmacology,
we have a concept where the effect
of two different drugs is greater than the sum
of the individual drugs and which is very important
when you combine different drugs and especially when you have
groups of drugs or categories that work via
different mechanisms of action. You may have a same end result
of different categories of drugs, but they work
via different mechanisms. And if you do that,
you're more likely to get a synergistic effect

than if they all worked via the same mechanism. Some drugs work
via same mechanism no matter what
their effects are, okay? For instance, aspirin. Aspirin has many effects,
all right? Aspirin is an analgesic
that alleviates pain. Aspirin is anti-inflammatory,
alleviates inflammation. Aspirin is an anticoagulant
for the blood. Aspirin also is antipyretic. It decreases
body temperature, okay? But how does it do it? It has many effects. By the way, all drugs
have multiple effects. No drug only has one effect. All drugs have
more than one effect. But how does aspirin do
all these different effects? Via the same mechanism. And that's
through the inhibition of a certain compound
in the body called prostaglandins. So inhibition of the synthesis
of prostaglandins produces all of them. Okay? There are many different types
of prostaglandins and therefore we have
different effects in there, Okay? So if we have

two different drugs, they work via the inhibition
of prostaglandins. Say, aspirin and Tylenol, right? They're not going to have
a synergistic effect. They'll have an additive effect,
right? But if you have, for instance,
a narcotic like morphine, okay? And then you also have Tylenol,
you can have a synergistic effect
with those two. Although with Tylenol
and aspirin, there is a ceiling. You can take
two or three tablets and that's the maximum
pain relief you're going to get. No matter if you take five
or 10 after that, you may have gastric distress,
but it's more of an effect, it's a ceiling. With morphine though
there is no ceiling. You just keep going,
going, going, you get more
and more pain relief, you know, until your respiration
shuts down and you die. So if we look at hypertension,
that silent killer. That's one disorder

that we have a wealth of groups and categories of drugs working
via many different mechanisms. So we can have
a very nice synergistic effect. We can tailor-make
their pharmacotherapy, you know, so they can control
their blood pressure with the least amount
of side effects and they can function
in society. For example, you have
your ACE inhibitors, you have
your angiotensin inhibitors, you have your beta-blockers,
you have your calcium-channel blockers,
you have your diuretics, all of them can
reduce blood pressure, all of them work
via different mechanisms. There are two types
of blood vessels that go up, which is the carotids
and the vertebrals and then they go into
a little area here and distributed throughout

the brain and one of the most

common causes of disability that we have is stroke. Now, stroke is when you have

a deprivation of oxygen going to a part of the brain. And that's usually

due to one of three things. Either there is a buildup

of a clot in that blood vessel, a primary site,

so the blood stops going to that area

or you have a clot that breaks off

from a different part of your body, more likely

from the left side of heart because you may have

atherosclerosis, build up of fatty tissues

and clots there and if one breaks off,

it can go into your brain and to clog a blood vessel,

that will be quick or you can have

a weak blood vessel wall so that it blows up

like a balloon, a balloon is aneurysm

and eventually it bursts and when it bursts

then you have a stroke in that part

of the area of brain. Now, the symptoms of a stroke
on many patients that nurses treat
for chronic time periods, the symptoms of a stroke
can be quite varied. You know, as many functions
that are functions of the brain depending upon
where the stroke is, depending upon
where the stroke is, okay? For instance, if it happens here
at the back of the brain, you'll have a lot
of visual symptoms because this is where
the brain processes visual information,
occipital lobes. If you have one over here
in the temporal lobes, that process is hearing, okay? So you'd have
hearing problems, okay? If you have a stroke
that affects this part over here,
this is somatosensory cortex, you may have a problem
with the feeling, touch, and pressure

in different parts of your body. Over here is the motor cortex
and that has to do with movement. So you may have problems
with movement of your body. Okay, so it all depends upon
where that injury is and it's very interesting
because when there is a stroke, the main part dies and then
the other parts around it shut down and unless
treatment is given quickly and drugs can be given that can
dissolve a clot real quickly, okay, the part
that sort of are not dead yet, but they are affected
around there if not treated quickly
then that part may also die. And so when you first
have a stroke your symptoms involve
not only the dead part, but also the part back here
sort of shut down, all right? If you're treated quickly,
if you have the signs of a stroke you have
what we call a brain attack then you get right there
to the emergency center, you can dissolve the clot,

and then you can have reversal of some of the symptoms. Like dysfunction of all these ones around, the dysfunctional ones can come back and we can have reversal of the symptoms, but if you don't get the treatment, these will eventually die too and the others-- those symptoms will stay around for a very long time. And so it all depends upon where the dysfunction is and that determines what kind of symptoms we have. Captioning performed by Aegis Communications