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## Week 5: Pharmacology

### Module 4: Adverse Drug Events

#### Lesson: Would You Take the Risk? Understanding Medication Problems

| Lesson Overview                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| <p>Students investigate why medication problems occur and learn that not all medication-related problems are caused by mistakes. They use evidence from the module to distinguish between medication errors and adverse drug reactions and determine appropriate responses to different situations. Students revise their initial ideas as they gather evidence and apply their understanding to new situations.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Learning Targets                                                                                                                                                                                                                                                                                                                                                                                                     | Vocabulary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p>Distinguish between a medication error and an adverse drug reaction.</p> <p>Use evidence to determine what caused a medication problem.</p> <p>Decide what action a patient should take based on the situation.</p>                                                                                                                                                                                               | <p><b>Medication Error</b><br/>a mistake in prescribing, giving, or taking medicine.</p> <p><b>Adverse Drug Reaction</b><br/>a harmful effect caused by the drug itself, not a mistake.</p> <p><b>Side Effect</b><br/>a secondary effect of a drug that can be helpful or harmful.</p> <p><b>Allergic Reaction</b><br/>a type of adverse reaction caused by the immune system.</p>                                                                                                                                                                                                                                                                                                         |
| Materials                                                                                                                                                                                                                                                                                                                                                                                                            | Instructional Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p>Module</p> <p>Student response sheets</p> <p>Whiteboard or chart paper</p>                                                                                                                                                                                                                                                                                                                                        | <p>Students learn that medication-related problems may result from human mistakes or from the body's response to a medication. Many students believe all medication problems are caused by mistakes or that all side effects are dangerous. Through the module, students learn that adverse drug reactions can occur even when a medication is prescribed, dispensed, and taken correctly. The key idea is that some medication problems result from human error, while others result from how a medication interacts with the body. This lesson prepares students for future learning about patient safety, medical decision-making, and evaluating risks and benefits of treatments.</p> |



## Learning Experience

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| 8 min  | Opening     | <p>Display and read the following scenario: “Three patients are having medication-related problems. Jordan started a new medication yesterday. The pharmacist explained exactly how to take it, and Jordan followed all directions. Later that evening, Jordan began feeling dizzy. Maya takes a medication every morning. One day she accidentally takes two doses instead of one. Alex was prescribed a medication to take daily but forgot to take it for three days. All three patients are experiencing medication-related problems.</p> <p>Which situation would concern you most? What do you think each person should do?”</p> <p>Give students time to think independently before discussing.</p> <p>Ask:</p> <ul style="list-style-type: none"><li>• Which situation concerns you most?</li><li>• Do you think these problems happened for the same reason or different reasons?</li><li>• How should each person respond?</li></ul> <p>Do not confirm answers. Explain that students will use evidence from the module to investigate what causes medication problems.</p> <p>Students read the scenario, select the situation they find most concerning, write what they would recommend and why, discuss their thinking with a partner, share ideas with the class, and record an initial prediction.</p> <p>Sentence Frame:</p> <p>“I think medication problems happen because _____.”</p> |
| 15 min | Module      | <p><b>Focus:</b></p> <p>Students gather evidence to determine the difference between medication errors and adverse drug reactions and recognize that some problems can occur even when medications are used correctly.</p> <p><b>Guiding Questions:</b></p> <ul style="list-style-type: none"><li>• What causes a medication error?</li><li>• What causes an adverse drug reaction?</li><li>• When is no one at fault?</li></ul> <p>Quick Checks:</p> <ul style="list-style-type: none"><li>• “Was this caused by a mistake or by the body’s reaction?”</li><li>• “Can a medication cause problems even if it is used correctly?”</li></ul> <p>Sentence Frame:</p> <p>“A medication error happens when _____.”</p> <p>“An adverse drug reaction happens when _____.”</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 15 min | Application | <p>Tell students: “You are part of a hospital medication safety team. A community health organization has asked your team to review four patient situations and provide recommendations. Your job is to determine what caused each problem and recommend an appropriate response using evidence from the module.”</p> <p>Display the situations one at a time.</p> <p><b>Situation A</b></p> <p>A patient receives the wrong antibiotic because the prescription was entered incorrectly.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |



### **Situation B**

A patient takes a newly prescribed medication exactly as directed and develops a mild rash.

### **Situation C**

A patient stops taking a medication after three days because they feel better, but their symptoms return.

### **Situation D**

A patient takes a medication correctly but develops severe breathing problems shortly afterward.

Remind students that all evidence used should come from the module.

Students:

#### **Step 1: Investigate the Cause**

Read each situation carefully. Determine whether the problem is a medication error or an adverse drug reaction. Identify evidence from the module that supports the classification.

#### **Step 2: Evaluate the Risk**

Determine whether the situation appears mild, moderate, or severe. Discuss evidence that supports the level of concern.

#### **Step 3: Make a Recommendation**

Decide what response is most appropriate. Support the recommendation using evidence from the module.

#### **Step 4: Defend Your Decision**

Select the most challenging situation. Share and justify reasoning with classmates. Compare explanations and evaluate evidence used by other groups.

Sentence Frames:

"This situation is a \_\_\_\_\_ because \_\_\_\_\_."

"The evidence from the module shows \_\_\_\_\_."

"We recommend \_\_\_\_\_ because \_\_\_\_\_."

### **Teacher Answer Key**

#### **Situation A**

Classification: Medication Error

Evidence: The module identifies receiving the wrong drug as a medication error caused by a mistake in the medication process.

Reasonable Recommendation: Contact healthcare professionals immediately so the medication can be corrected.

#### **Situation B**

Classification: Adverse Drug Reaction

Evidence: The module explains that rashes can occur as adverse drug reactions even when a medication is used correctly.

Reasonable Recommendation: Contact a healthcare provider and monitor symptoms according to medical advice.

#### **Situation C**

Classification: Medication Error

Evidence: The module identifies inappropriate adherence, including stopping medication on your own, as a medication-related mistake.

Reasonable Recommendation: Contact the prescribing healthcare provider and discuss how to continue treatment safely.

#### **Situation D**

Classification: Adverse Drug Reaction

|       |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                    | <p>Evidence: The module identifies severe breathing problems and anaphylaxis as severe adverse drug reactions that require immediate medical attention.</p> <p>Reasonable Recommendation: Seek emergency medical care immediately.</p>                                                                                                                                                                                                                                            |
| 2 min | Reflection         | <p>"How has your thinking about medication problems changed since the beginning of the lesson?"</p>                                                                                                                                                                                                                                                                                                                                                                               |
| 2 min | Career Connections | <p>Pharmacists, physicians, nurses, and other health science professionals regularly investigate medication-related problems. They must determine whether a situation was caused by a medication error or an adverse drug reaction before deciding how to respond. They use evidence to make decisions that help protect patient safety and improve health outcomes. Understanding the cause of a medication problem is an important part of health science and patient care.</p> |