Course Learning Outcomes for Unit VIII

Upon completion of this unit, students should be able to:

4. Relate the characteristics of different types of drugs to their toxicity.
   4.1 Describe how the absorption of some drugs is limited.
   4.2 Explain how the routes of exposure affect the toxicity of drugs.
   4.3 Identify the toxicities associated with street drugs, and explain their affects.

Reading Assignment

Chapter 23:
Toxicology Principles in the Management of Acute Poisonings

Click here to access the Chapter 23 PowerPoint presentation. Click here to access a PDF version of the presentation.

Unit Lesson

This unit covers the management of acute poisonings. The effects and treatments of drugs, both prescription and illegal, will be discussed. The potential side effects of prescription drugs will also be discussed. You will be able to identify how the route of exposure affects the level of drugs in the body and how the absorption of drugs can be limited.

Chapter 23: Toxicology Principles in the Management of Acute Poisonings

Poisonings, both acute and chronic, are common. Both intentional and unintentional poisonings occur from prescription and illegal drugs. When studying poisonings, you should be familiar with the dose-response, target response with side effects, and the method used to limit absorption for both prescription and illegal drugs.

Acute poisonings are common and a medical team must be able to respond to the patient quickly. An assessment of the patient is needed, including tests to determine the blood levels of the drug. The medical team must then decide if they need to limit further absorption and consider if an antidote is available.

Prescription drugs are meant to induce a response in the body. But, a drug can also induce other responses, known as side effects. An example of a side effect is if you are taking antihistamines to reduce your allergy symptoms and the side effect is feeling drowsy/sleepy. Many drugs have serious side effects, for example, liver damage, kidney damage, decreased bone marrow function, and paralysis. These side effects have to be considered before taking a drug, and the benefits of taking the drug should outweigh the risk of the side effects. It should also be noted that not everyone will experience the side effects listed for a drug. Drug interactions can also occur, for example, alcohol and painkillers can lead to an overdose. One can also be allergic to a drug; the reaction can be anything from a rash to an anaphylactic reaction.

The absorption of a drug is required for systemic toxicity to occur. If the exposure is through inhalation, then the individual must be removed from the exposure. If it is dermal exposure, then the drug must be removed from the skin by washing. If an individual has ingested too much of a drug, there are some options. If a life-threatening amount of drug has been ingested, then a gastric lavage or stomach pump can be initiated. The patient can also be treated with activated charcoal; it can absorb a variety of drugs and toxic agents, limiting the further absorption (Richards & Bourgeois, 2014, p. 417). Activated charcoal is effective for aspirin, digoxin, and phenobarbital. The routes of exposure affect the level of a drug into the body. When a drug is injected intravenously, the entire dose is delivered into the blood stream, resulting in the highest levels for the
routes of exposure. Inhalation of a drug delivers it through the pulmonary system, but not all the drug is available for absorption. Absorption through the skin is dependent on the time, concentration and the nature of the substance (i.e., lipid or water solubility).

An antidote can also be used to reduce the toxicity of a drug. An antidote can directly inhibit the effects of a drug; it can alter its physical properties, reduce the effects at the site of action, and facilitate its elimination. Some examples of drugs and antidote include carbamates and atropine, and acetaminophen and N-acetylcysteine (Richards & Bourgeois, 2014, p. 418).

There are many common chemicals that can be inhaled and have an effect on the central nervous system (CNS). Some examples of these include volatile organics, aerosols with fluorocarbons, and anesthetic gases such as chloroform and nitrites. All of these examples can cause dizziness, euphoria, and CNS depression. Some of the chemicals that are inhaled are easily obtained and are commonly inhaled by teenagers (Richards & Bourgeois, 2014, p. 420).

Illegal drugs have many adverse health effects and the CNS is the system most commonly affected. The categories of illegal drugs include stimulants, depressants, hallucinogens and narcotics. Methamphetamine is an example of a stimulant. Depressants have many side effects, from relief from anxiety to coma and death. All hallucinogens target the CNS, causing hallucinations, delusions, and illusions. Cannabis and lysergic acid diethylamide (LSD) are examples of hallucinogens.

This unit covered the management of acute poisonings and the effects and treatments of drugs. You have also seen how the route of exposure affects the level of drugs in the body and how the absorption of drugs can be limited.

References


Suggested Reading

The poison control website contains useful knowledge, not only for the course, but also for your personal lives in dealing with poisons.

American Association of Poison control centers.

www.aapcc.org

The National Institute on Health - Drug Abuse has a drug chart of substances of abuse, including tobacco, alcohol, illicit and prescription drugs: listing their common and street names, how they are generally administered, and their potential health effects.


Explore the American College of Medical Toxicology website to gain further information on poison and treatment centers.

www.acmt.net

Learning Activities (Non-Graded)

Discuss whether or not you think that marijuana should be legalized. Support your argument with references.

Non-graded Learning Activities are provided to aid students in their course of study. You do not have to submit them. If you have questions, contact your instructor for further guidance and information.