

Topic title: *Introduction to Clinical Toxicology*

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STUDY GUIDE FOR REMOTE LEARNING

I. INTRODUCTION

*“All substances are POISONS. There is none which is not a poison.
The right dose differentiates a poison from a remedy.” - Paracelsus*

Paracelsus, the “father of modern toxicology” is often quoted for the concept that the “dose makes the poison.” However, with the recent advances in the field of toxicology, another important concept has emerged. The timing of exposure to a toxicant during the critical windows of vulnerability during pregnancy may result in adverse effects to the developing fetus.

Clinical toxicology is the study of toxic or adverse effects of agents such as drugs and chemicals in the body. It is focused on diseases associated with short-term (acute) and long-term exposure (chronic) to various drugs and toxic chemicals.

For the purpose of this course, we will focus our attention to the emergency management of acute poisoning which may happen accidentally or intentionally.

II. LEARNING OBJECTIVES

The main objective of this session is to apply the principles of clinical toxicology to the management of a poisoned patient. Specifically, the student should be able to:

- A. Understand the basic concepts in clinical toxicology, toxicokinetics and toxicodynamics
Describe the common agents of poisoning in the Philippines
- B. Identify toxic syndromes (toxidromes) associated with xenobiotics frequently involved in poisoning
- C. Apply the general principles in the management of acute poisoning
- D. Explain the mechanism of antidotal therapy
- E. Explain the special considerations for poisoned pediatric and pregnant patients.
- F. Understand the link of chronic chemical exposure and human disease.

III. KEY CONCEPTS

ACTIVITIES:

This module is designed for 1.5 hours task time. This will include a video lecture by the faculty..

Independent learning activities by the students include answering the self-assessment quiz and reading the required references. The student may download required references via VPN through the UPM library portal for free after they have registered with Access Medicine. The links have been provided in this study guide.

KEY CONCEPTS AND OUTLINE:

- A. Introduction to clinical toxicology, toxicokinetics and toxicodynamics
 - 1. What is poisoning? What are the potential scenarios for the occurrence of poisoning?
 - 2. What is “dose”?
 - 2. What are the important toxicokinetic and toxicodynamic principles that may be useful in the management of poisoning?
 - 3. What are the common agents of poisoning in the Philippines

- B. The toxidrome approach to the diagnosis of acute poisoning
 - 1. How will the toxidrome approach help in the diagnosis of the “unknown poison”?
 - 2. What are the most common toxidromes?

- C. Apply the general principles of in the management of acute poisoning
 - 1. How will you perform emergency stabilization of a poisoned patient?
 - a. What measures constitutes the ABCDE of emergency stabilization?
 - b. What will you do if the patient presents with frank seizures?
 - c. What will you recommend for coma of unknown etiology?

 - 2. What are the important points in the clinical evaluation of a poisoned patient?
 - a. What are the important clues to consider in the circumstances surrounding poisoning?
 - b. How will you perform the physical examination of a poisoned patient?
 - c. What laboratory and toxicological tests will your order?

 - 3. How will you prevent the absorption of a poison?
 - a. How will you decontaminate the patient?
 - b. How will limit gastrointestinal absorption?

4. How will you enhance elimination of absorbed substances?
 - a. What are the methods to enhance elimination of the absorbed poison?
 - b. What indications for immediate dialysis regardless of the initial clinical condition?

5. What are the different mechanisms of antidotal therapy?
 - a. What is pharmacologic versus a physiologic antidote?
 - b. How will you explain the mechanism of antidotal therapy for each of the following?
 - Inert complex formation?
 - Accelerated detoxification?
 - Reduction in concentrations to a more toxic compound?
 - Competitive inhibition at the receptor site
 - Bypassing the effect of the poison
 - Antibodies Interacting with poison

6. What are the important disposition and supportive measures?
 - a. What are the special consideration for a pediatric patient?
 - b. What are the special consideration for a pregnant patient?
 - c. What additional consideration should be made for deliberate poisoning?

IV.RESOURCES/REFERENCES:

A. References:

Olson K.R., & Vohra R (2018). Emergency evaluation and treatment. Olson K.R., & Anderson I.B., & Benowitz N.L., & Blanc P.D., & Clark R.F., & Kearney T.E., & Kim-Katz S.Y., & Wu A.B.(Eds.), *Poisoning & Drug Overdose*, 7e. McGraw-Hill. <https://accessmedicine.mhmedical.com/content.aspx?bookid=2284§ionid=248383147>

Olson K.R. (2017). Management of the poisoned patient. Katzung B.G.(Ed.), *Basic & Clinical Pharmacology*, 14e. McGraw-Hill. <https://accessmedicine.mhmedical.com/content.aspx?bookid=2249§ionid=175225256>