

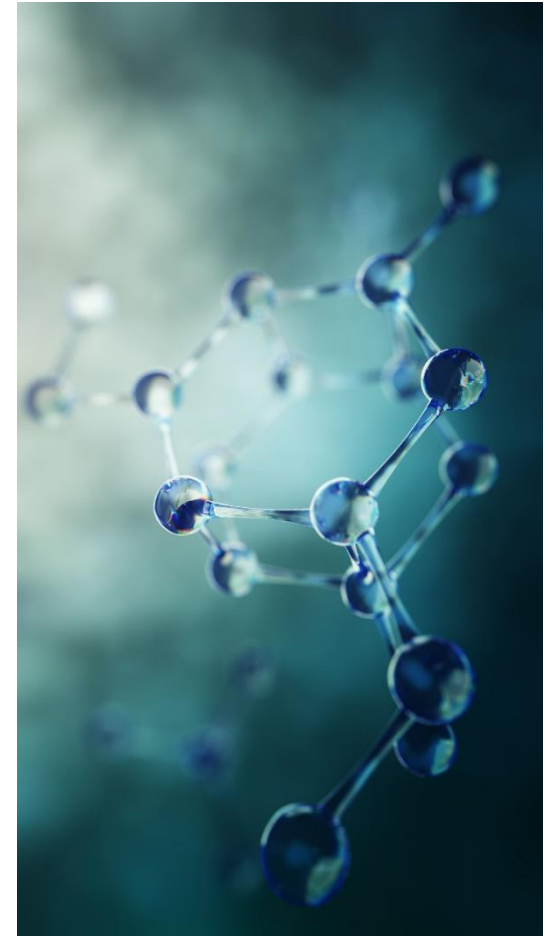
Toxicological Outbreak Investigation Course

Module 1: Course Introduction and Overview



Welcome

- Welcome to Module 1 of Toxicological Outbreak Investigation.
- In this module, we will define a toxic agent, provide an overview of the course, and describe the contents of the Toxicological Outbreak Investigation Tool Kit.



Course Purpose

- The purpose of this course is to train public health staff to recognize and respond to an acute outbreak caused by a toxic agent and to provide a refresher on outbreak investigation.
- After completing this course, you will be able to
 - Recognize factors indicating that an outbreak is potentially caused by a toxic agent
 - Identify potential challenges to investigating a toxicological outbreak
 - Define the basic steps for an outbreak investigation
 - Demonstrate how the materials in the Toxicological Outbreak Course Tool Kit can be used in an outbreak investigation

Introduction

- Outbreaks caused by non-infectious, toxic agents (for example, metals or pesticides) occur periodically throughout the United States.
- Investigating these outbreaks requires some unique considerations and skills that are different from those used to investigate infectious disease outbreaks.
- To help public health agencies investigate non-infectious disease outbreaks, CDC's National Center for Environmental Health (NCEH) has developed this course on Toxicological Outbreak Investigation.



Toxic Agents

- For this course, a toxic agent is defined as any substance that arises from outside of the human body that can cause harm to humans.
- There are millions of toxic agents in the world.
- Toxic agents can be found in many different sources, including the food you eat, the water you drink, and the places you work.



Toxic Agents

- Have you responded to outbreaks caused by toxic agents?
- What were the toxic agents?
- What challenges did you face in those investigations?



Course Modules

This course is divided into six modules.

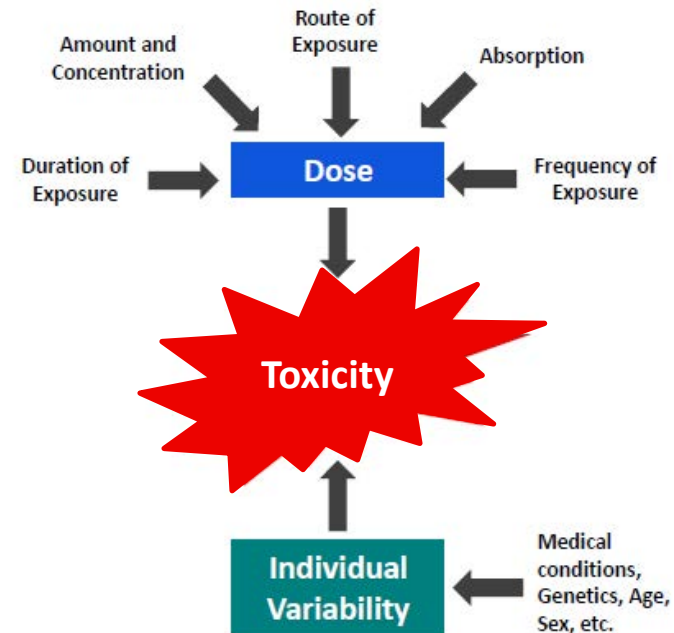
Module	Title
1	Course Introduction and Overview
2	Toxicological Principles
3	Toxicological Laboratory Principles
4	Analyzing and Interpreting Laboratory Results
5	Steps of a Toxicological Outbreak Investigation
6-7	Case Studies

Module 1: Course Introduction and Overview (Current Module)

- **Approximate time required to complete module:** 10 minutes
- **Content:** Provides a brief overview of the course structure and each module.

Module 2: Toxicological Principles

- **Approximate time required to complete module:** 60 minutes
- **Content**
 - Characteristics of toxicological outbreaks
 - Routes of exposure
 - Factors affecting toxicity
 - Dose-response
 - Half-life



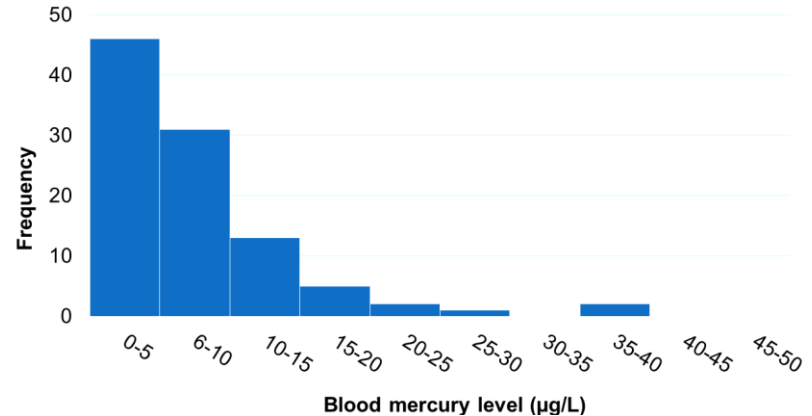
Module 3: Toxicological Laboratory Principles

- **Approximate time required to complete module:** 60 minutes
- **Content:**
 - When to collect samples
 - Guidelines for collecting, transporting, and storing samples
 - Record keeping
 - Interpreting results



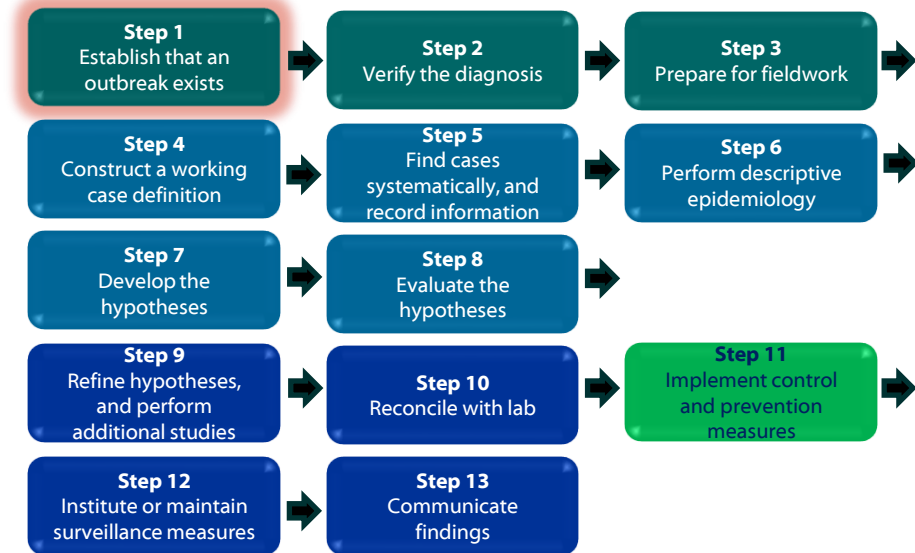
Module 4: Analyzing and Interpreting Laboratory Results

- **Approximate time required to complete module:** 60 minutes
- **Content:**
 - Handling values below limit of detection (LOD)
 - Analyzing data that are not normally distributed
 - Interpreting results



Module 5: Steps of a Toxicological Outbreak Investigation

- **Part 1:** Determining whether an investigation is needed
 - **Approximate time required to complete:** 20 minutes
 - **Content:** Review and practice steps 1–3
- **Part 2:** Conducting a toxicological outbreak investigation
 - **Approximate time required to complete:** 75 minutes
 - **Content:** Review and practice steps 4–8
- **Part 3:** Forming and communicating conclusions
 - **Approximate time required to complete:** 40 minutes
 - **Content:** Review and practice steps 9–13



Modules 6 and 7: Case Studies

- **Module 6: Case Study 1 – Domestic**
 - **Approximate time required to complete module:** 45–60 minutes
 - **Content:** Involves applying the steps of an outbreak investigation to a toxicological outbreak within the United States.
- **Module 7: Case Study 2 – International**
 - **Approximate time required to complete module:** 90–120 minutes
 - **Content:** Involves applying the steps of an outbreak investigation to a toxicological outbreak in an international setting.

Tool Kit

- A tool kit consisting of modifiable templates for commonly used forms and other resources
- The kit includes the following:
 - Qualitative Epidemiological Questions
 - Sample Line List
 - Sample Log
 - Sample Medical Record Abstraction Form
 - Sample Questionnaire
 - Toxidrome Chart

The image displays three overlapping sample forms from the Tool Kit. The top form is a questionnaire titled 'Participant (DR)' with instructions and a table for symptoms. The middle form is a medical record abstraction form titled 'Participant (DR)' with instructions and a table for symptoms. The bottom form is a toxidrome chart titled 'Toxidromes' with a table listing signs and symptoms for various toxidromes.

Table 1. Classic Toxidromes¹ x 10

Toxidrome	Signs and Symptoms	Potential Toxic Agent
Cholinergic crisis	Salivation, diarrhea, lacrimation, bronchospasm, diaphoresis, urination	Acetylcholinesterase inhibitors (e.g., organophosphates, carbamates)
Miosis, fasciculations	Weakness, rigidity, hypotension, bradycardia, urinary	Organophosphates, carbamates, organophosphates, organophosphates (e.g., pyridostigmine)
Myoclonus, rigidity	Myoclonus, rigidity, hypotension, bradycardia, urinary	Organophosphates, carbamates, organophosphates, organophosphates (e.g., pyridostigmine)
Myoclonus, rigidity	Myoclonus, rigidity, hypotension, bradycardia, urinary	Organophosphates, carbamates, organophosphates, organophosphates (e.g., pyridostigmine)

Challenge

**Which of the following are potential sources of exposure to toxic agents?
(select the best answer)**

- A. Food
- B. Drinking water
- C. The workplace
- D. All of the above

Challenge Answer

- **The correct answer is “D. All of the above.”**

Toxic agents can be found in many different sources, including the food you eat, the water you drink, and the places where you work.



Resources

- **Here are some useful resources:**

- [CDC, Principles of Epidemiology in Public Health Practice: An Introduction to Applied Epidemiology and Biostatistics, Third Edition. 2006](#)
- [CDC Field Epidemiology Manual. 2019](#)
- [PH 101 Series: Introduction to Epidemiology](#)
- [Manual for investigating suspected outbreaks of illnesses of possible chemical etiology: guidance for investigation and control. Geneva: World Health Organization; 2021. License: CC BY-NC-SA 3.0 IGO.](#)

Questions?



For more information, contact NCEH
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