Hazardous Materials for First Responders

4th Edition

Chapter 7 — Terrorist Attacks, Criminal Activities and Disasters

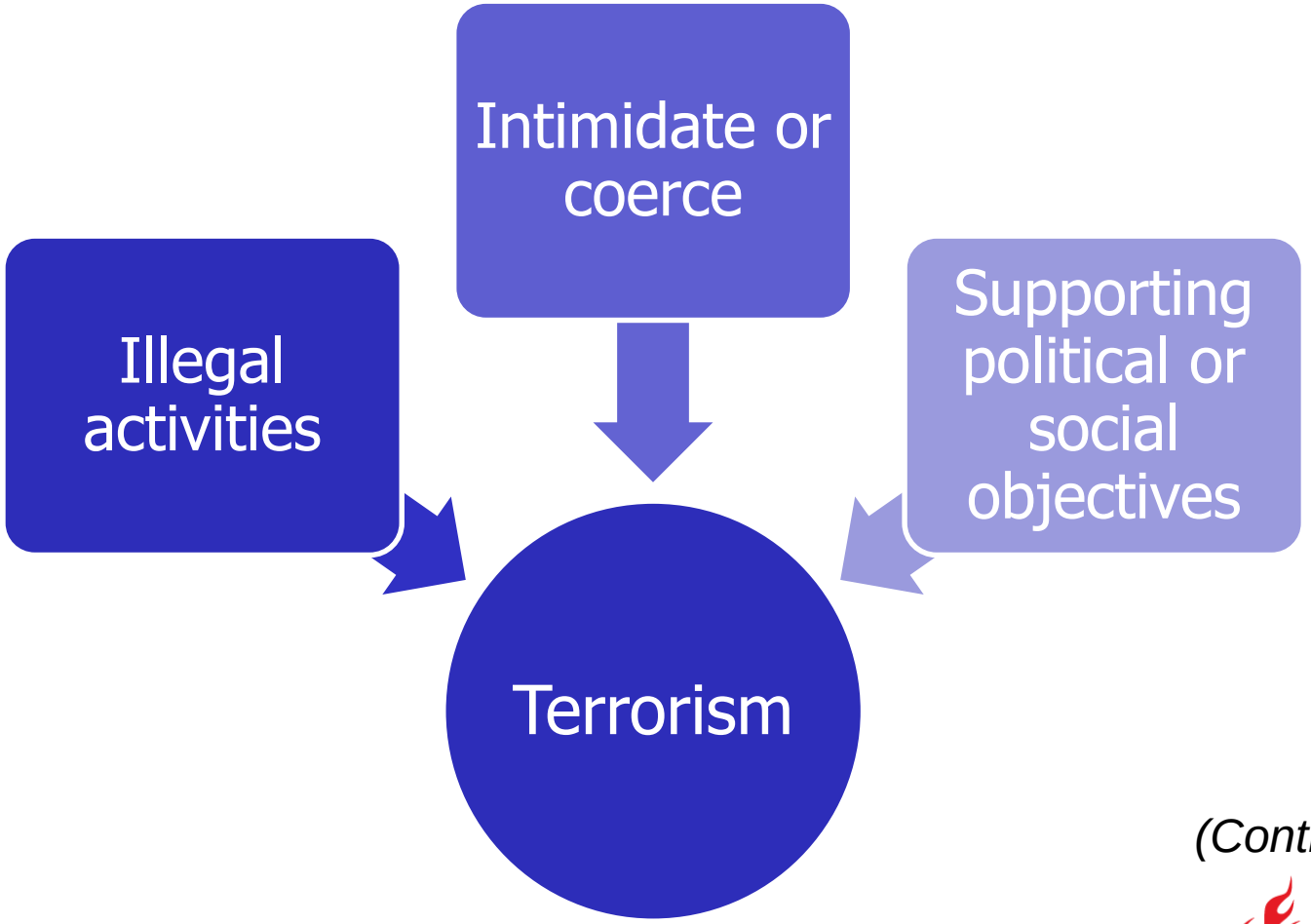
HAZ MAT FOR FIRST RESPONDERS

ifsta
International Fire Service Training Association

Learning Objective 1

Define terrorism.

Three elements make up the U.S. Federal Bureau of Investigation's (FBI) definition of terrorism.



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Terrorism is designed to cause disruption, fear, and panic.

Courtesy of U.S. Department of Defense

REVIEW QUESTION

What is the definition of terrorism?

Learning Objective 2

Distinguish between a terrorist attack and a routine emergency.

There are several key differences between routine emergencies and a terrorist attack.

Intent

- Cause damage
- Inflict harm
- Kill

Severity and complexity

- Casualties
- Contamination
- Securing scene

Crime scene management

- Preserve evidence

Command structure

- Unified command required

Secondary device/attacks

- Armed resistance
- Weapons
- Booby traps

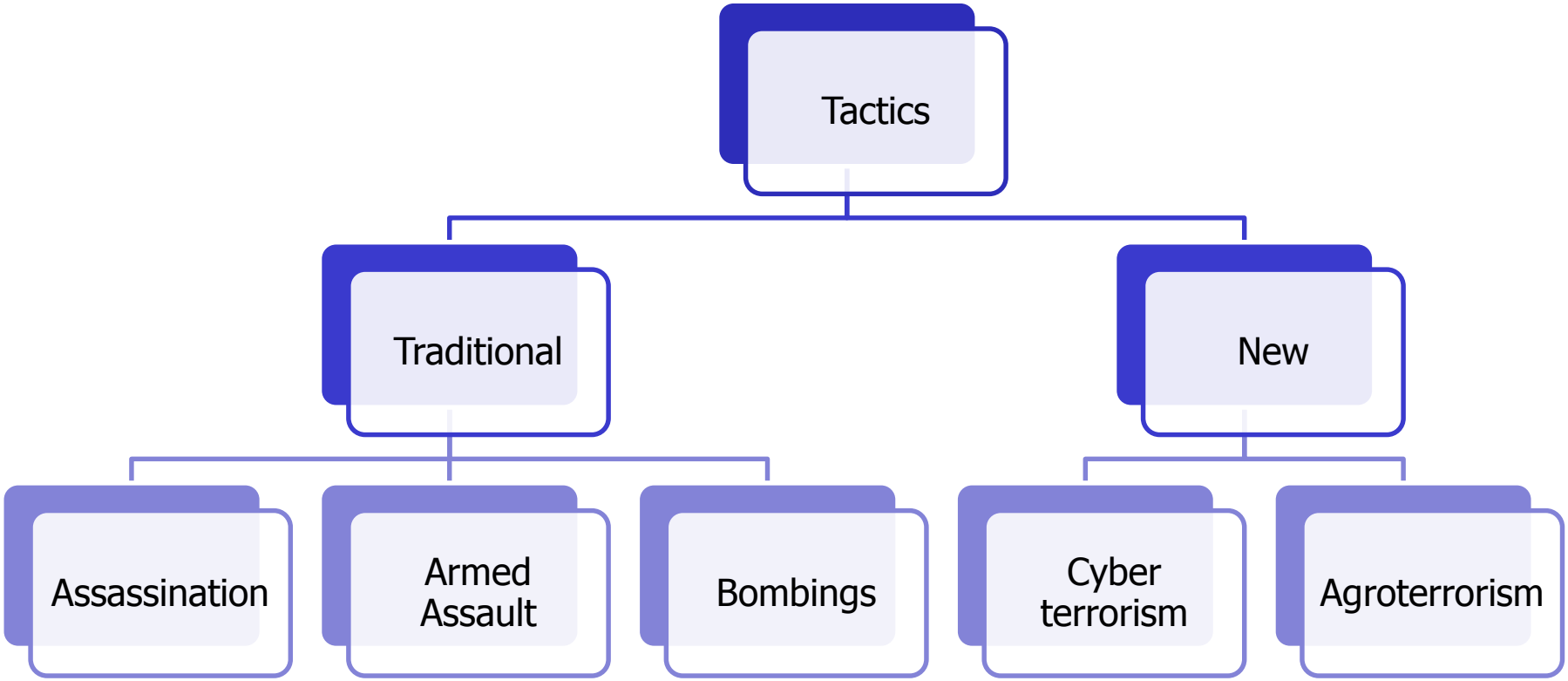
REVIEW QUESTION

How is a terrorist attack different from a routine emergency?

Learning Objective 3

Discuss terrorist tactics and types of attacks.

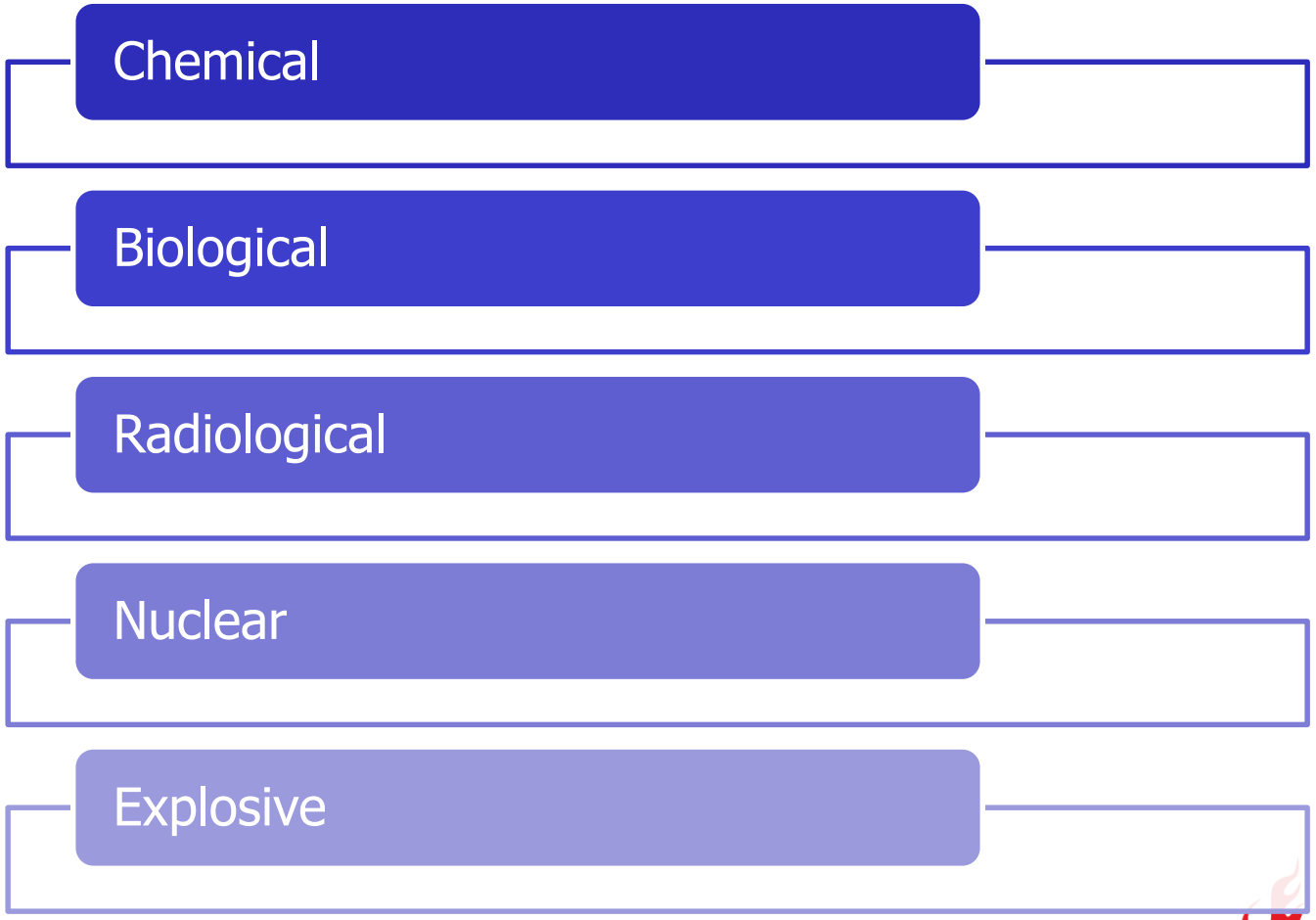
Terrorist tactics traditionally involve conventional weapons but now include WMDs.



DISCUSSION QUESTION

What are cyber terrorism and agroterrorism?

The different types of terrorist attacks typically involve WMDs.

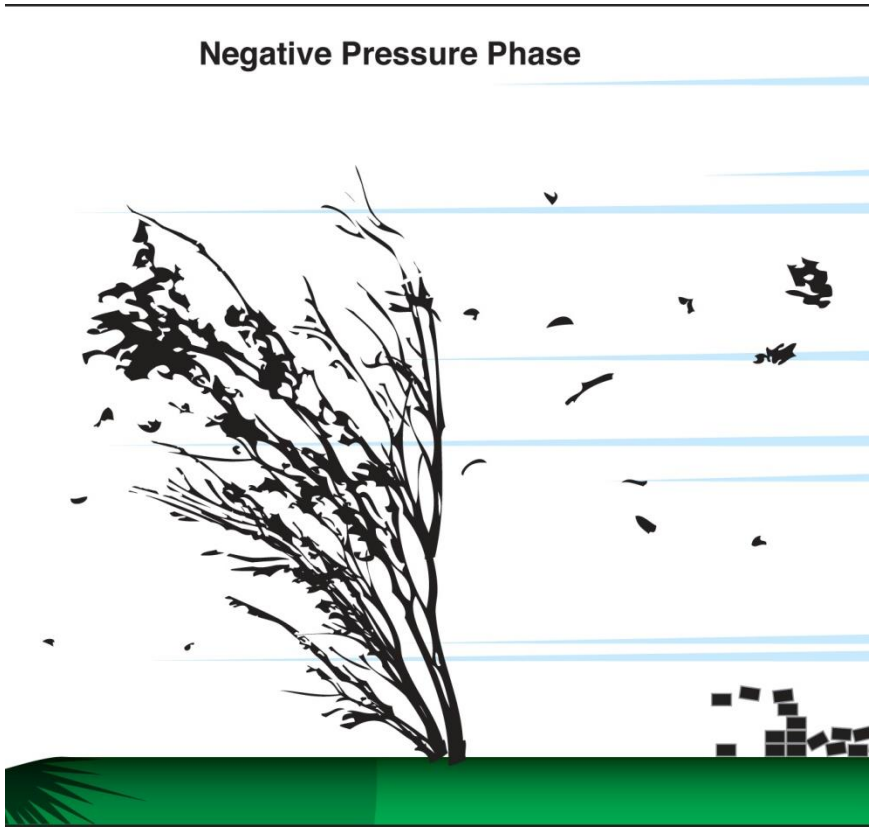


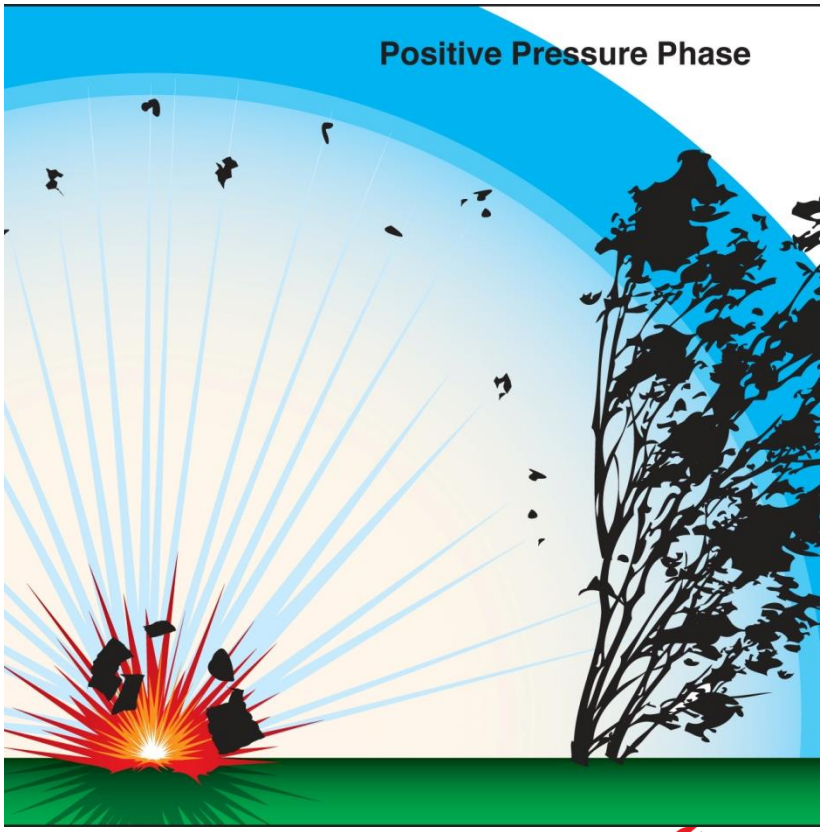
Learning Objective 4

Discuss explosive attacks.

Explosive devices are designed to kill, maim, or destroy.

An explosion results in a shock front and a two phase blast-pressure wave.

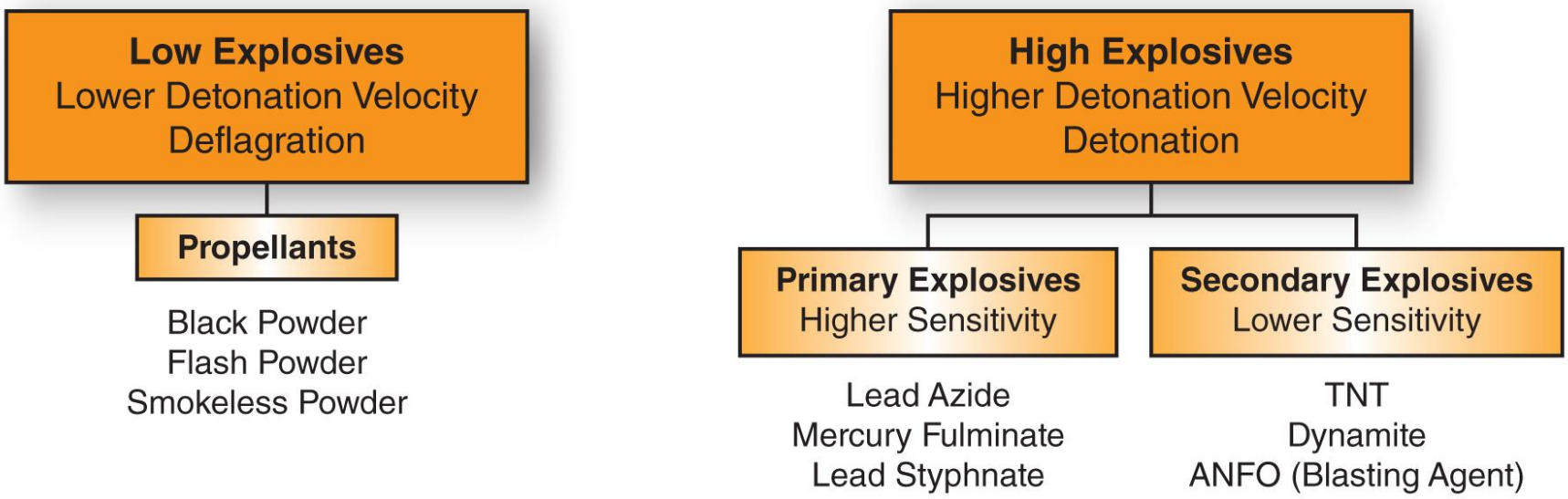




DISCUSSION QUESTION

What determines the size of an incident?

Explosives are classified in two main ways important to first responders.



REVIEW QUESTION

Describe the different classifications of explosives.

There are a variety of types of explosives a first responder may encounter.

Commercial/ Military explosives

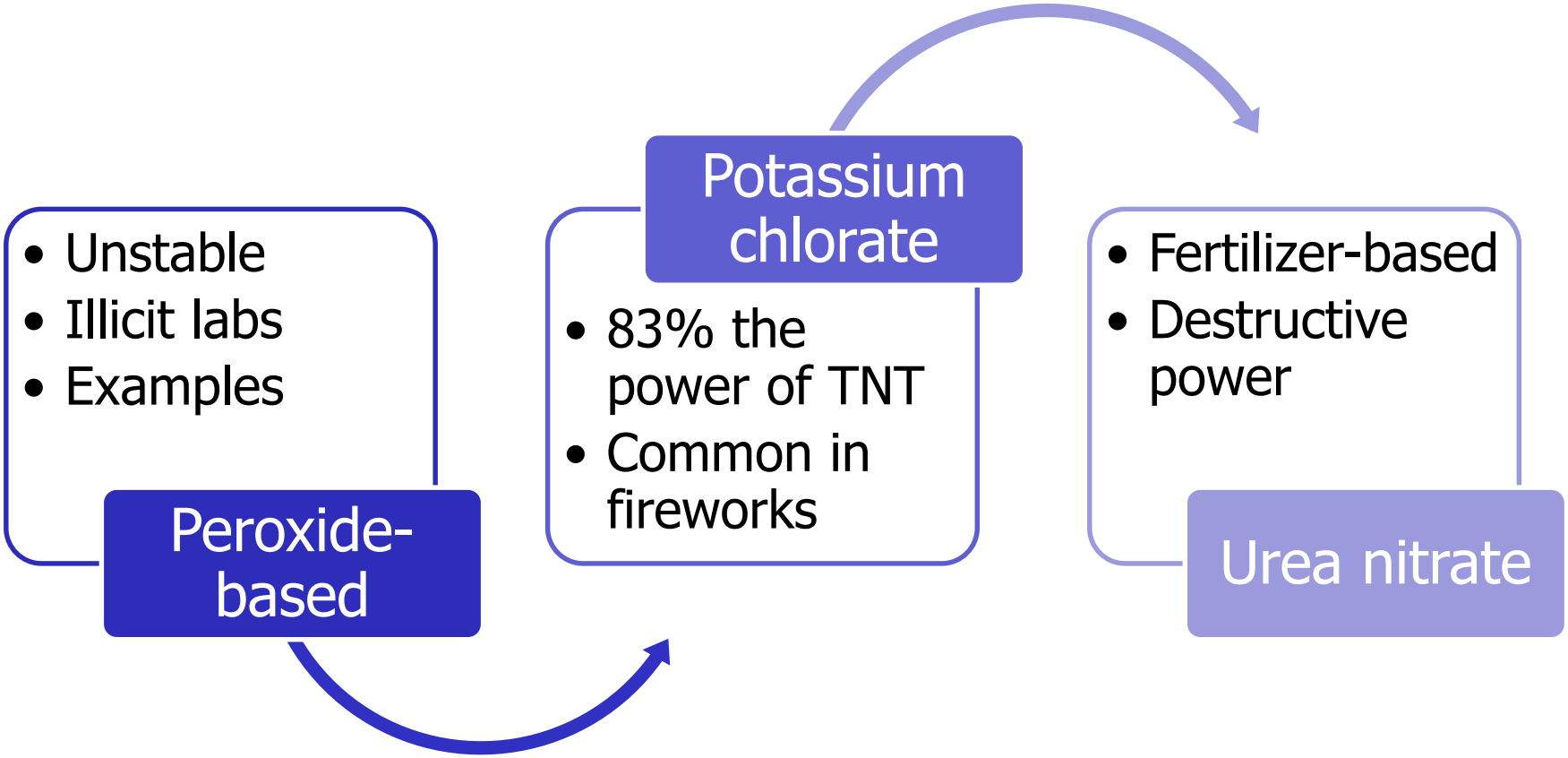
Homemade/ Improvised Materials

Improvised Explosive Devices (IEDs)

DISCUSSION QUESTION

What types of military munitions may also be used by criminals or terrorists?

Homemade/improvised explosive materials are typically made by combining an oxidizer with a fuel.



Improvised explosive devices (IEDs) are usually constructed for a specific target.

IEDs are typically categorized by their container type.

Vehicle bombs

Pipe bombs

(Continued)

IEDs are typically categorized by their container type.

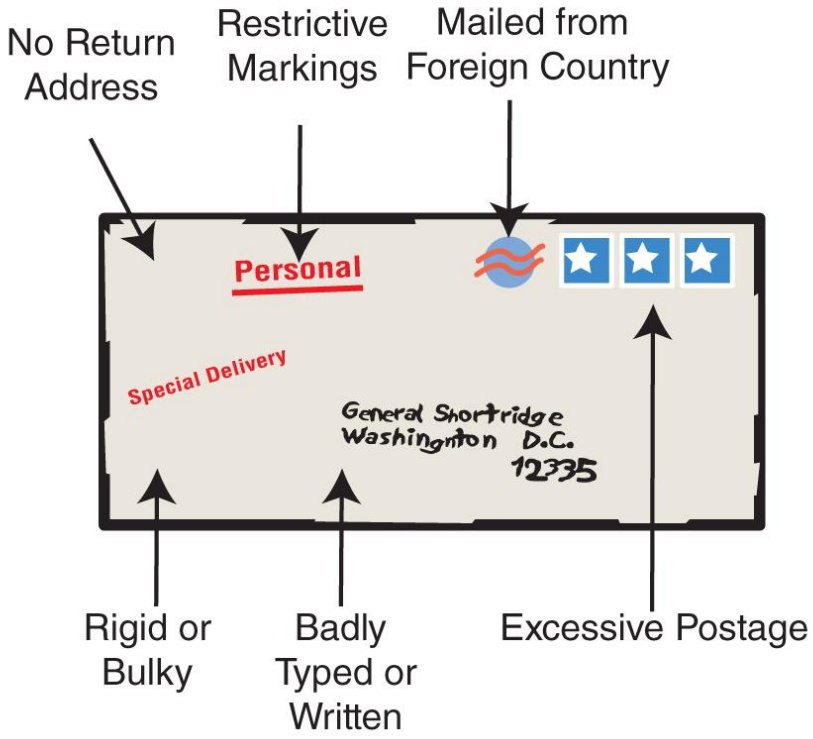
Satchel, backpack, knapsack, duffle bag, briefcase, or box bombs

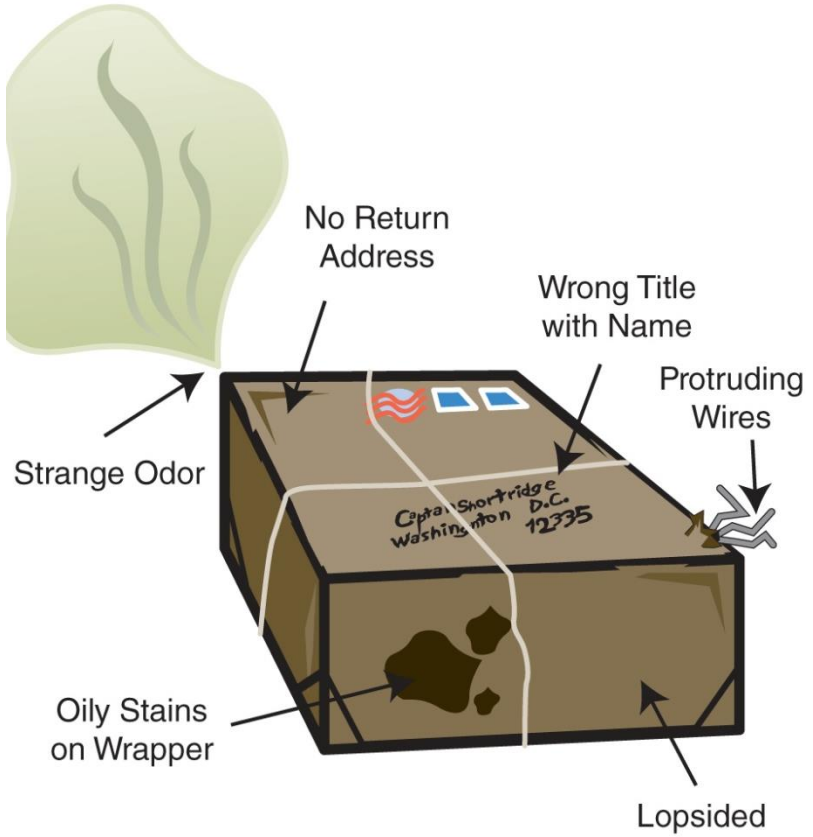
Courtesy of August Vernon

Person-borne bombs

Courtesy of August Vernon

Mail, package, or letter bombs carry common indicators.

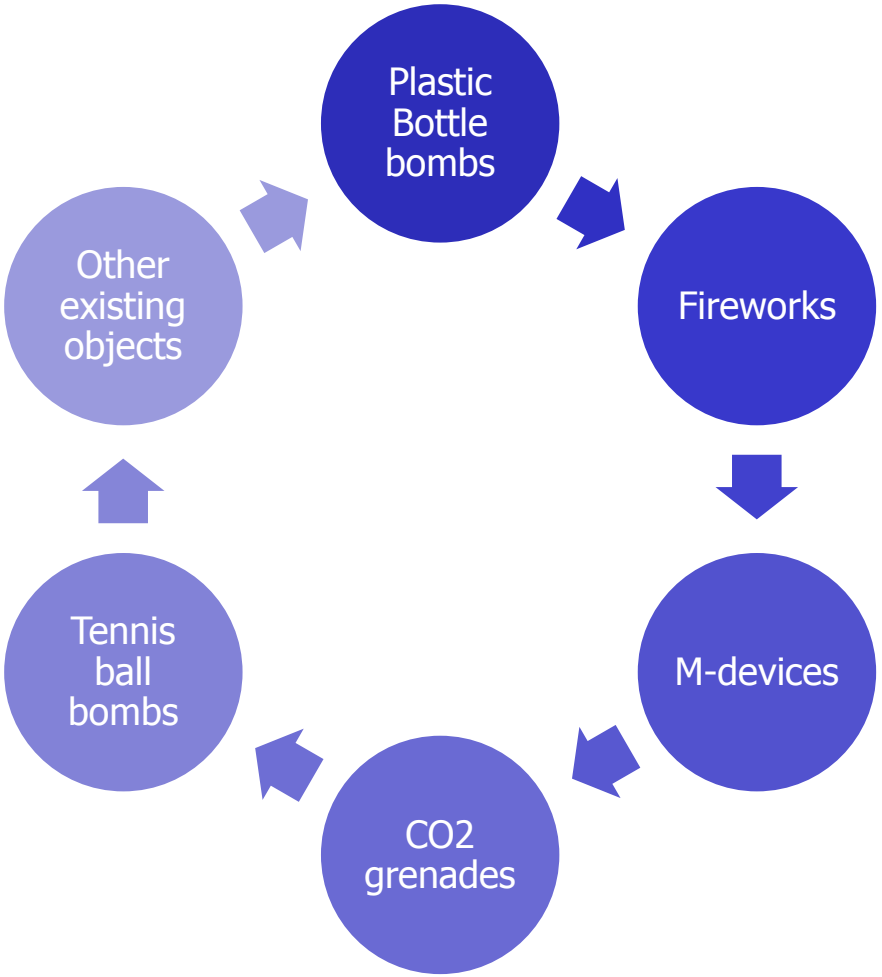




DISCUSSION QUESTION

What are some example of types of plastic bottle bombs?

Other types of IEDs take various unusual and typical forms.



DISCUSSION QUESTION

What other ordinary items may be substituted or used as a bomb container?

Identification of IEDs means that responders should be cautious of out-of-the-ordinary items.

Containers with unknown	Devices containing quantities of	Materials attached to or surrounding items such as	Ordinance such as
liquids	fuses, fireworks, match heads	nails, bolts, drill bits	blasting caps, detcord
materials	black powder, smokeless powder	marbles, etc.	military and commercial explosives, grenades, etc.
	incendiary or unusual materials		

REVIEW QUESTION

What are the different types of IEDs? Describe each briefly.

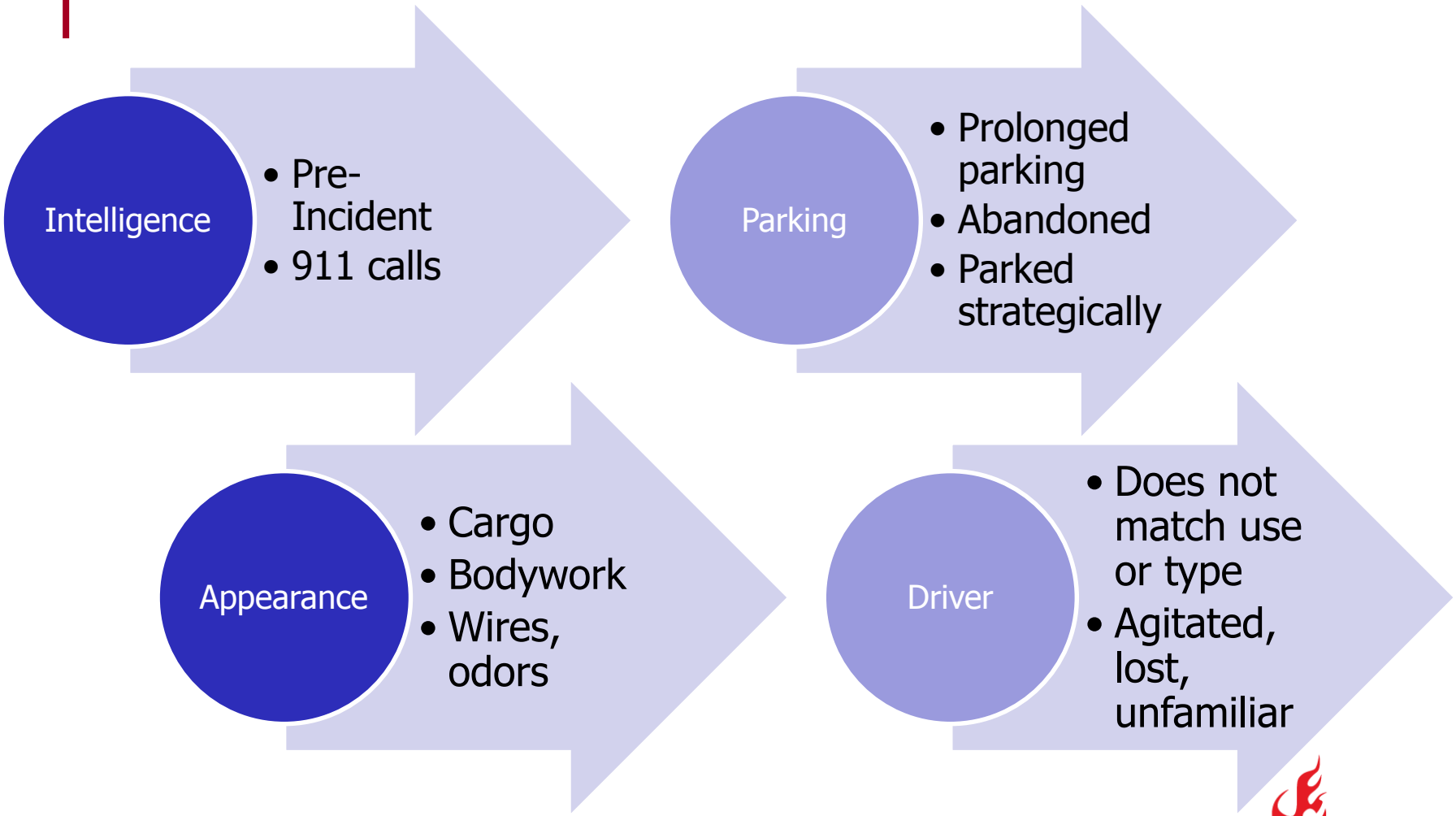
Person-borne devices can be identified by several indicators.

Courtesy of August Vernon

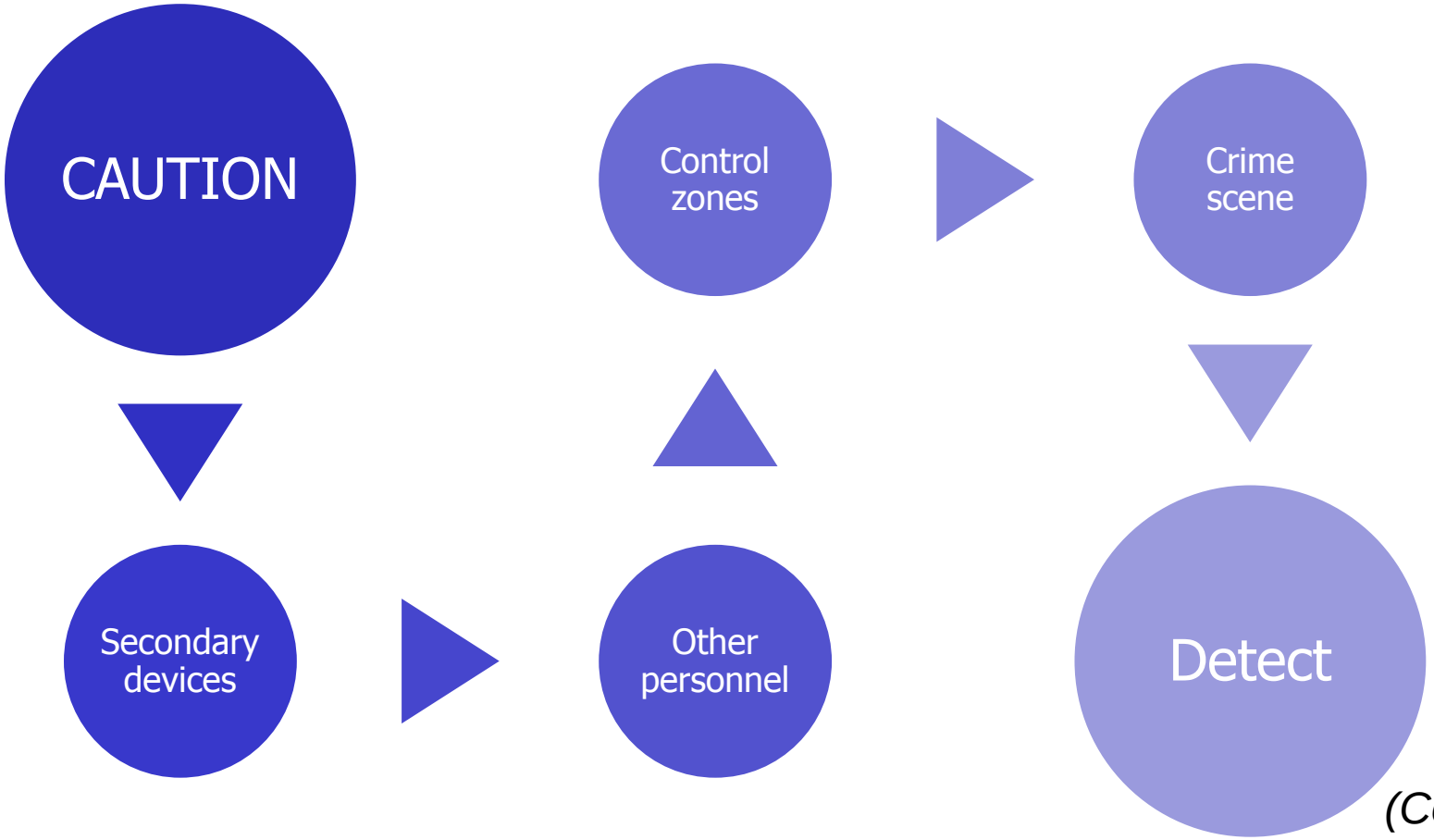
DISCUSSION QUESTION

What should be done with a suicide bomber who is injured or deceased?

Vehicle bombs (VBIEDs) can be identified by several indicators.



Response to explosive/IED events must be conducted within an ICS.



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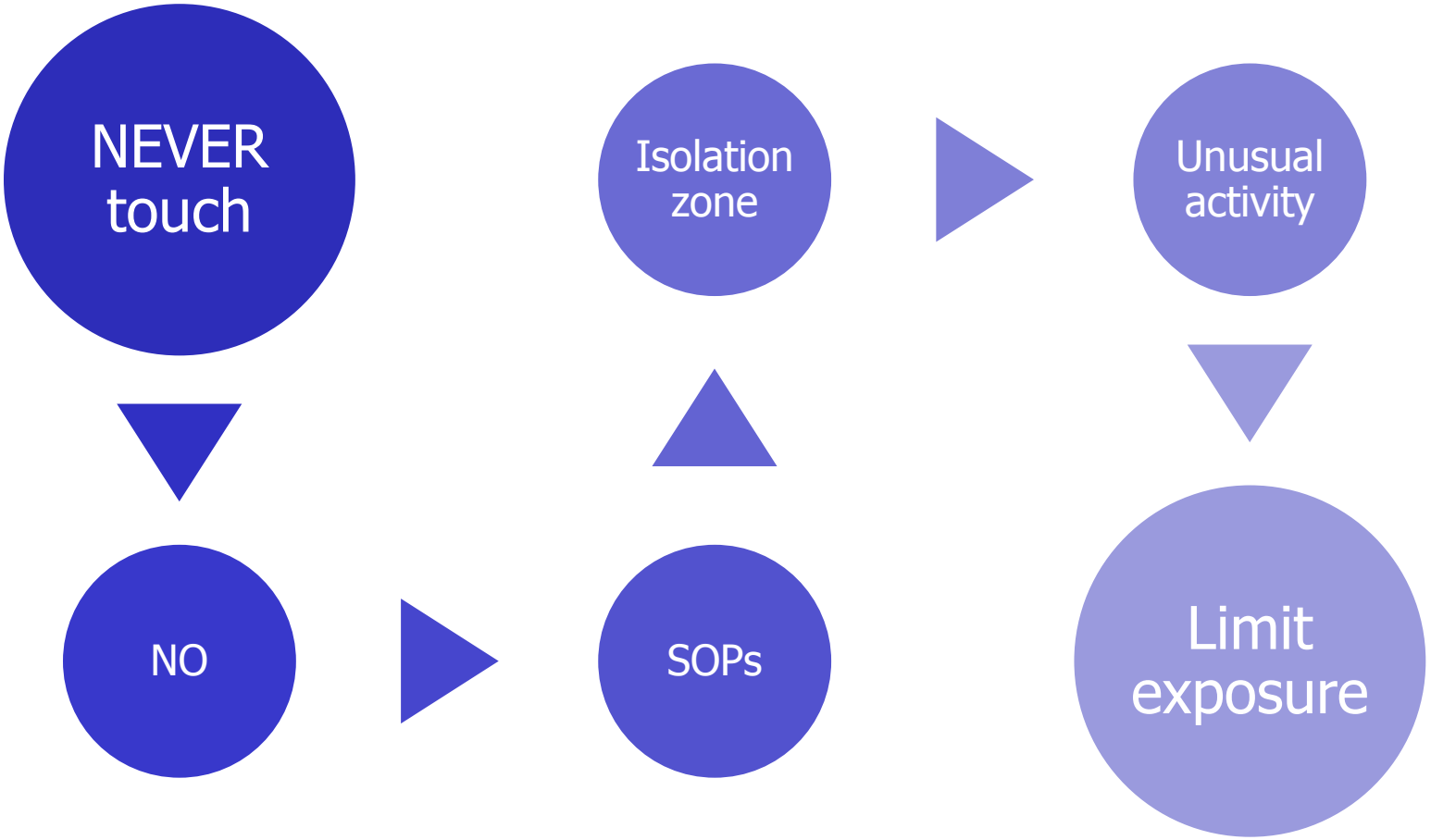
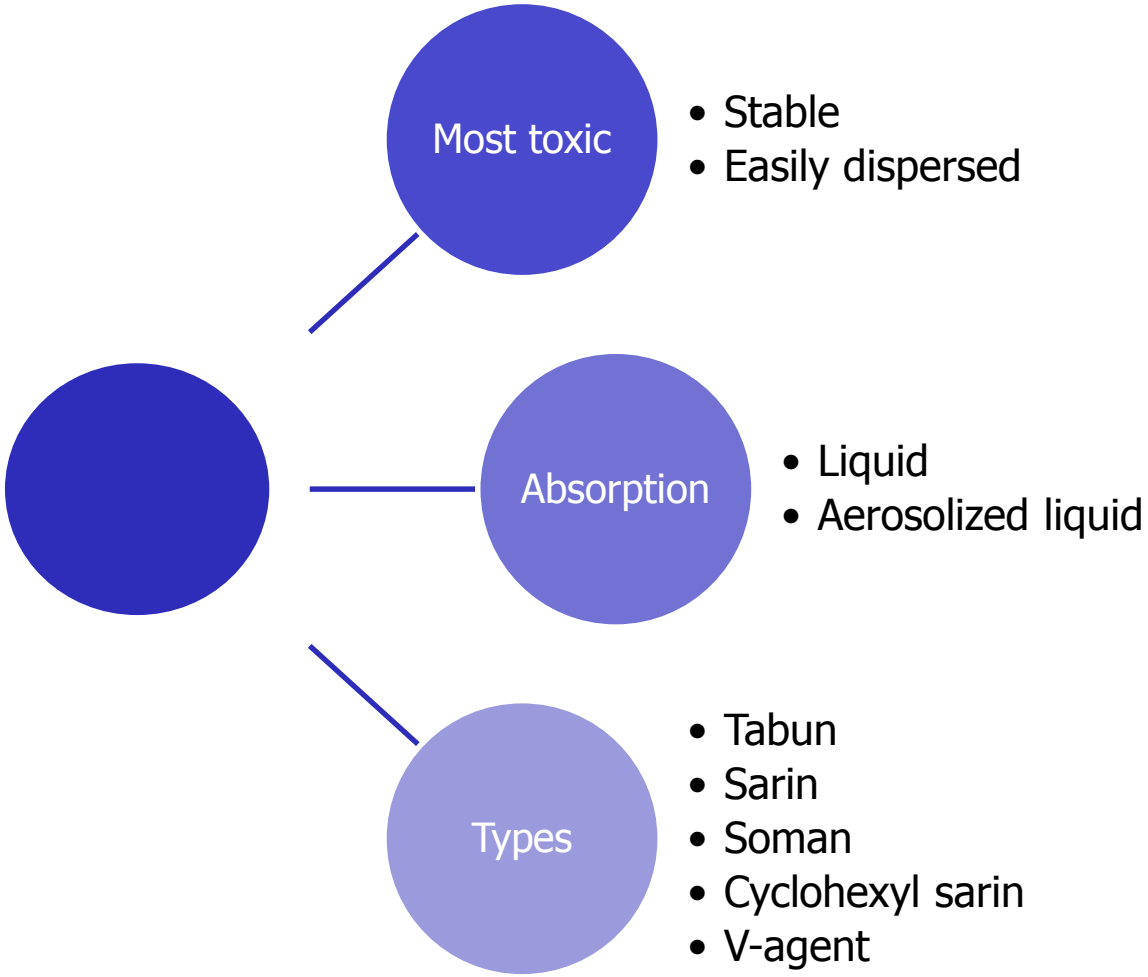


Learning Objective 5

Discuss chemical attacks.

Chemical attacks can involve two main types of agents that fall into six basic categories.

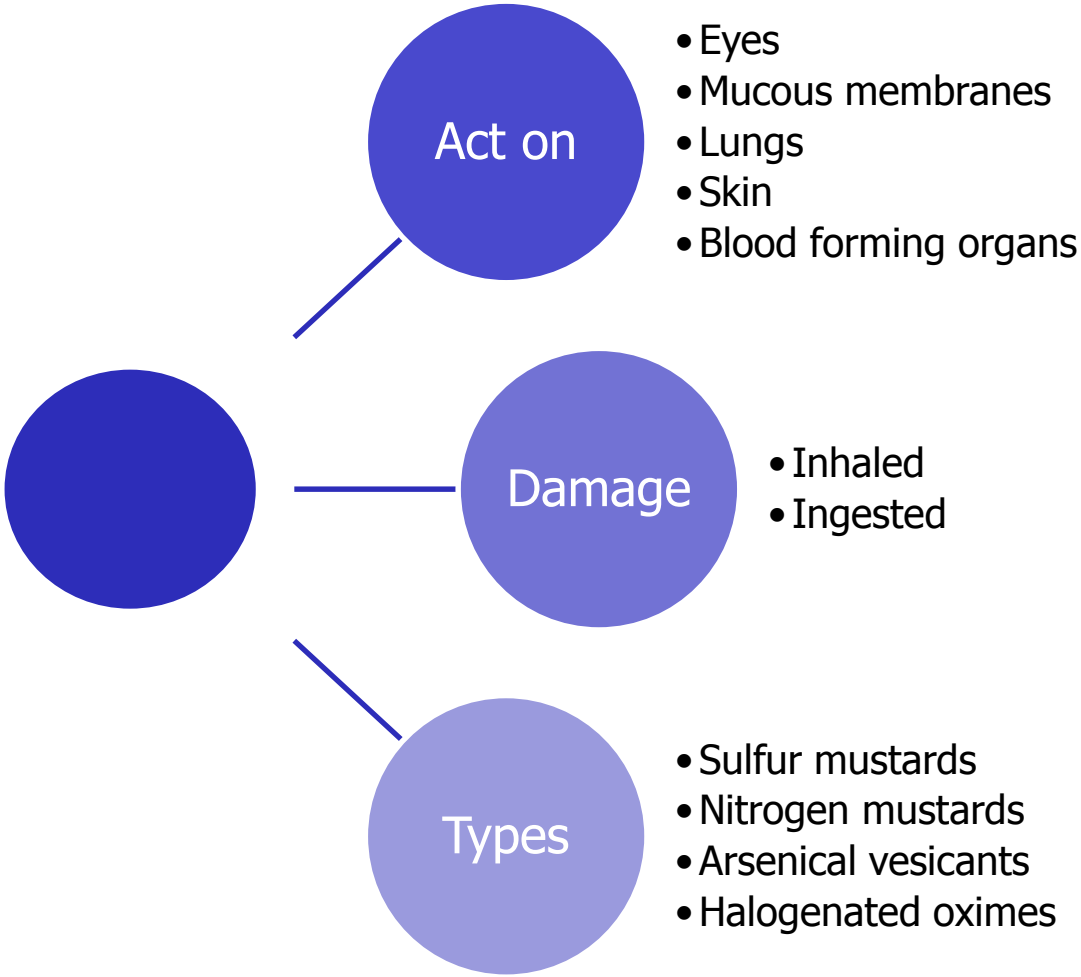
Nerve agents attack the nervous system by affecting the transmission of impulses.



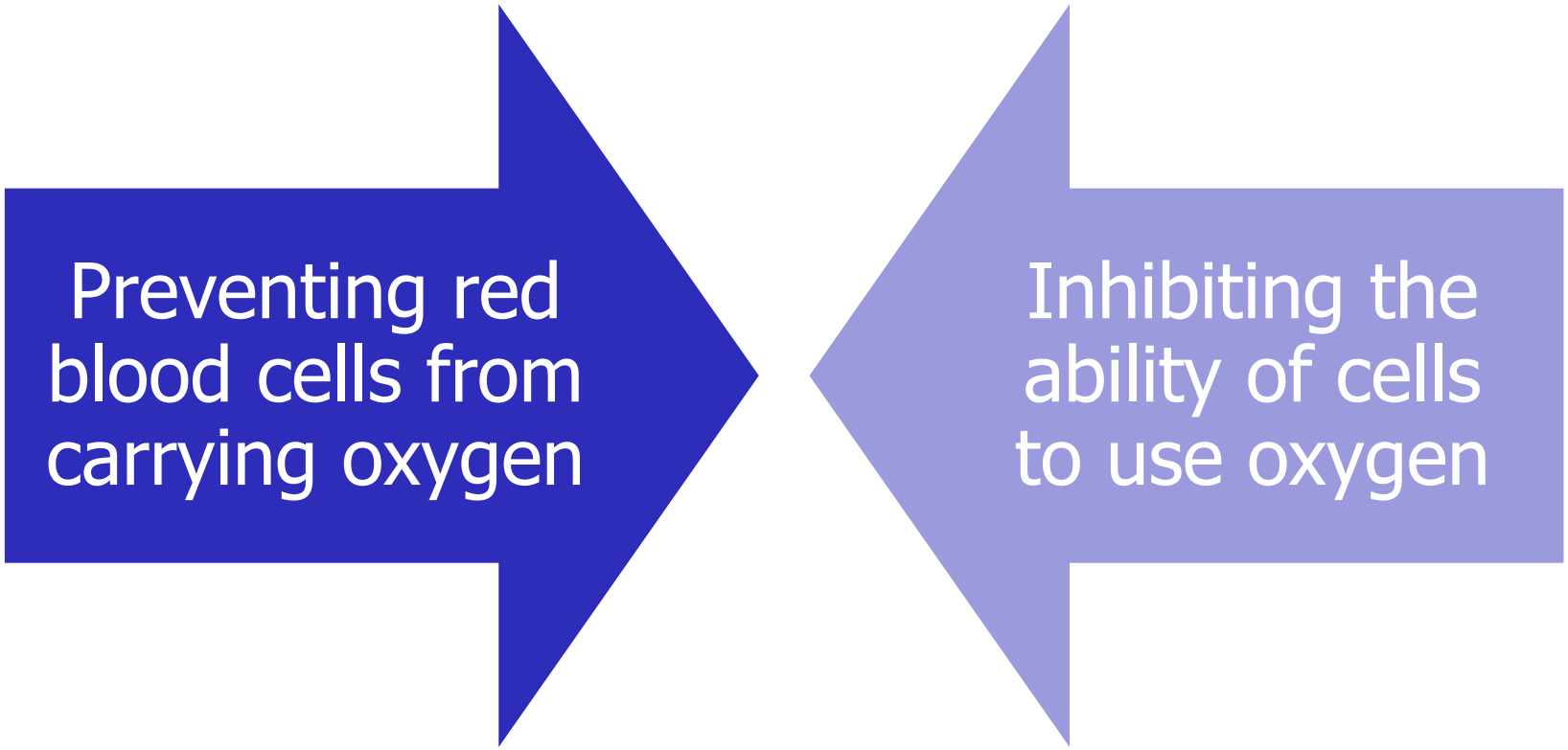
REVIEW QUESTION

With what types of nerve agents should first responders be familiar?

Blister agents burn and blister the skin or any other part of the body they contact.



Blood agents interfere with the body's ability to use oxygen in two main ways.



There are three main types of blood agents first responders should be familiar with.

Arsine

- Arsenic in contact with acid
- Gas
- Mild garlic odor
- Chronic health effects
- Nonpersistent

Hydrogen cyanide

- Colorless liquid
- Properties
- Faint odor like bitter almonds
- Nonpersistent

Cyanogen chloride

- Colorless liquid
- Dissolves
  - Organic solvents
  - Water
- Vapors
- Pungent, biting odor
- Normally nonpersistent

Choking agents attack the lungs and may be encountered during normal haz mat incidents.

Chlorine

- Gas
- Liquid
- Pungent, irritating odor
- Color
- Explosive or forms explosive compounds
- Not liquid for long

Phosgene

- Gas
- Odor of freshly cut hay
- Used in manufacture
- Stored as liquid
- Volatile and nonpersistent
- Vapor density
- Not liquid for long

DISCUSSION QUESTION

What does it mean that phosgene's odor threshold is well above its permissible exposure limit?

Riot control agents temporarily make people unable to function.

Irritation	Examples
Eyes, mouth, throat, lungs, and skin	Tear gas, mace, pepper spray
Solids, require dispersion	Incapacitants
Heavier than air	Vomiting agents

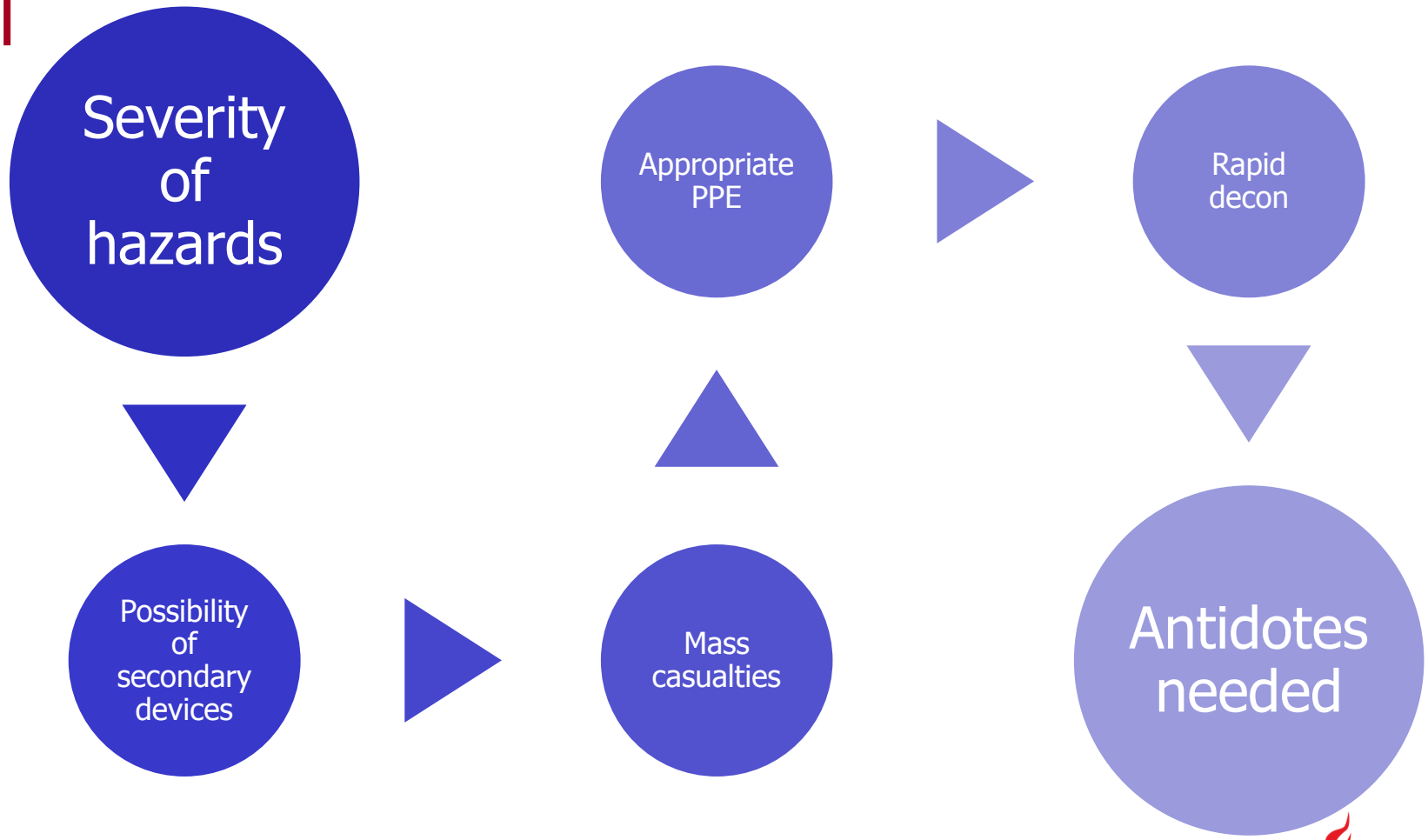
Toxic industrial materials are toxic in certain concentrations.

Not as lethal as nerve agents

Greater threat than chemical

Hazard categories

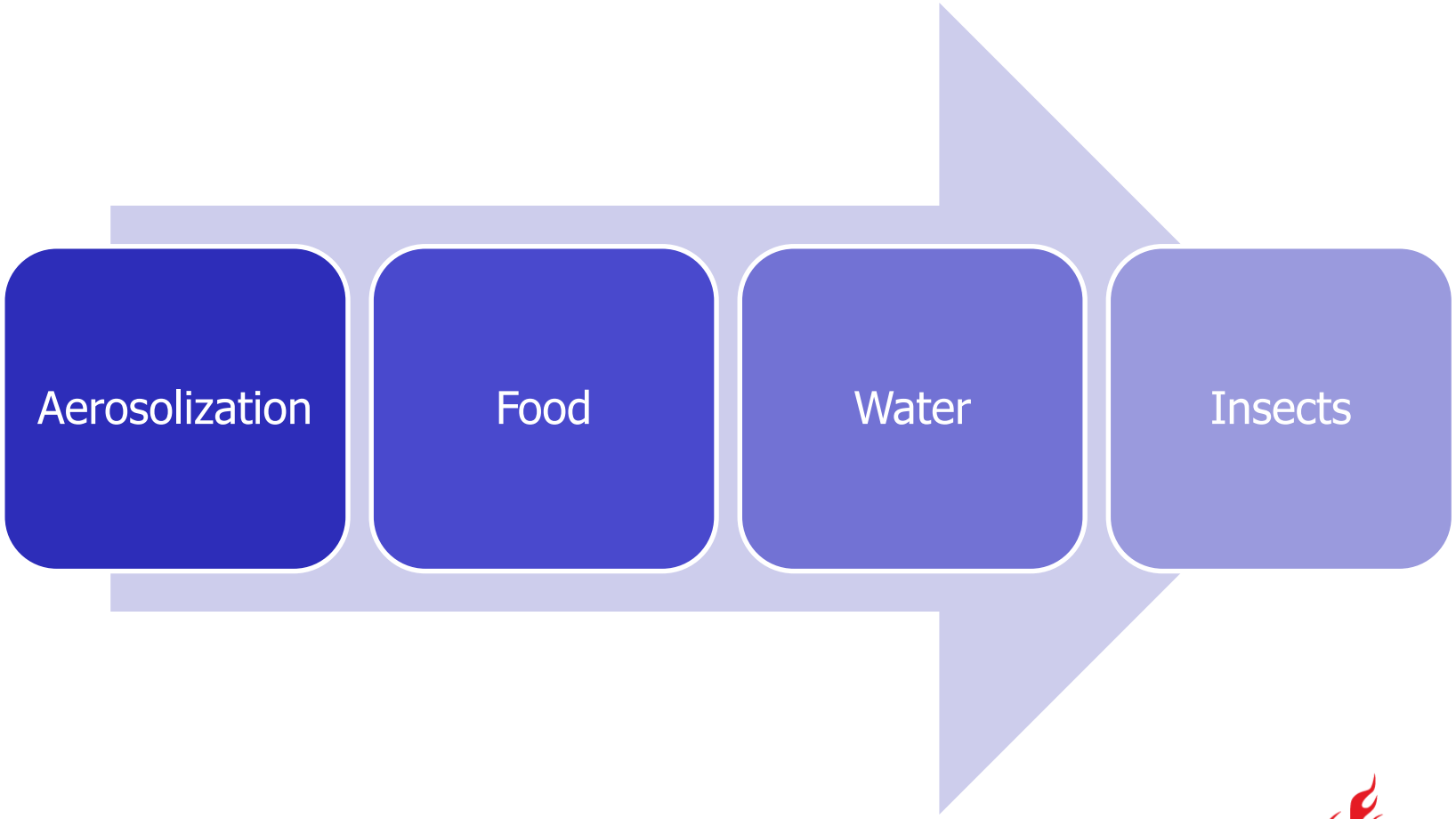
Chemical attack operations differ from other incidents in several ways.



Learning Objective 6

Discuss biological attacks.

Biological attacks are the intentional release of viruses, bacteria, or toxins by four main modes of transmission.



There are four main types of biological agents first responders should know.

Viruses	Simplest	Only replicate in hosts	Do not respond to antibiotics
Bacteria	Single-celled	Do not cause disease in most	Invades tissue or produces poison
Rickettsias	Specialized bacteria, single celled	Susceptible to broad-spectrum antibiotics	Only in living cells, not spread through human contact
Biological toxins	Poison produced by living organism	Some manufactured synthetically	Similar to chemical agents

DISCUSSION QUESTION

How quickly do biological agents cause health effects?

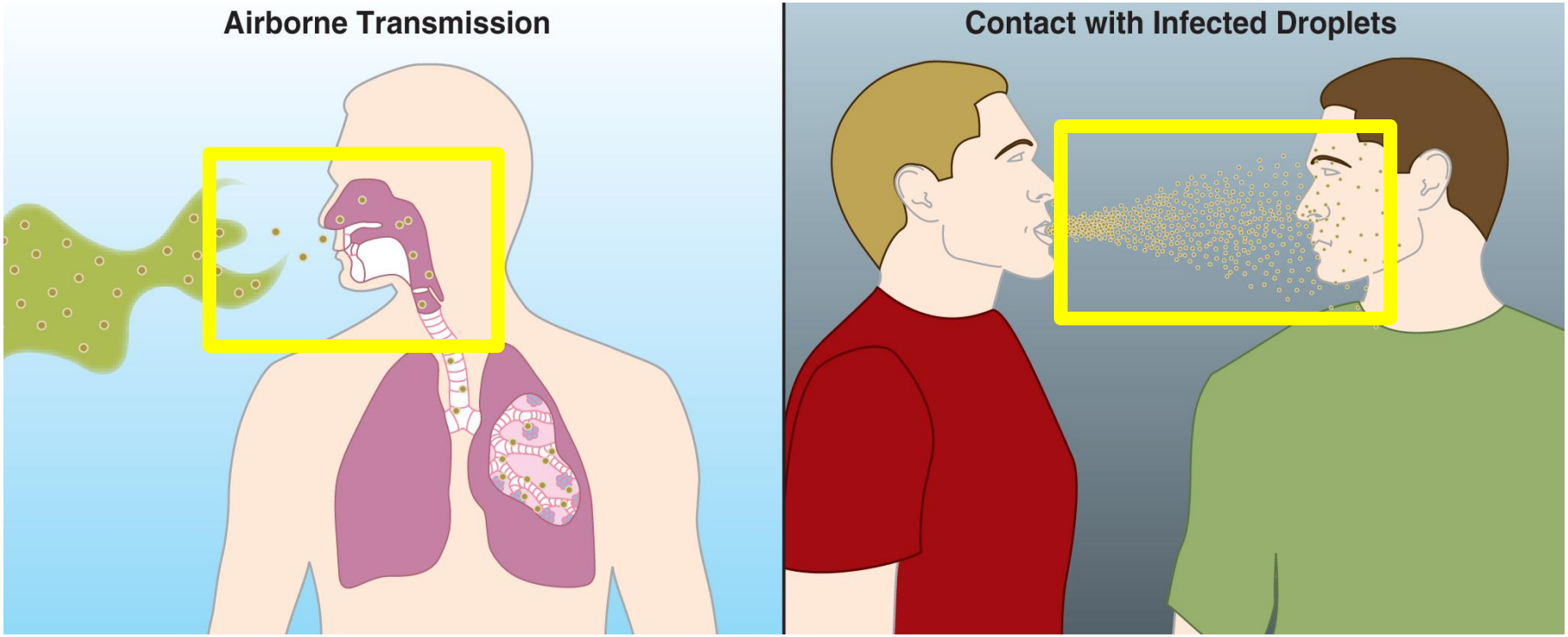
Biological agents typically fall into three categories.

Category A	Category B	Category C
Organisms	Pathogens	Emerging pathogens engineered for mass dissemination in the future
Easily disseminated or transmitted	Moderately easy to disseminate	Risks involve: availability, ease of production/dissemination
High mortality	Moderate morbidity and low mortality	Potential for high morbidity, mortality, and major health effects

REVIEW QUESTION

What are the categories of biological agents?

Disease transmission occurs in one of six ways.



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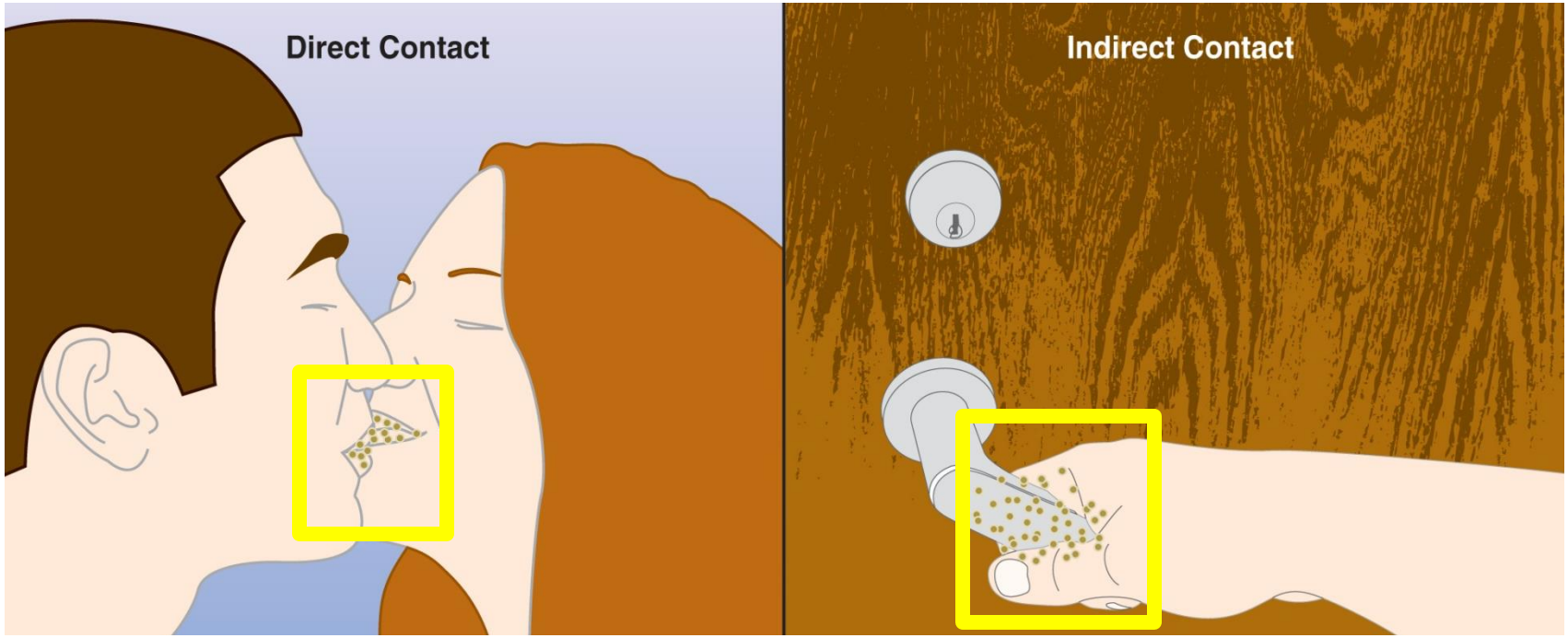

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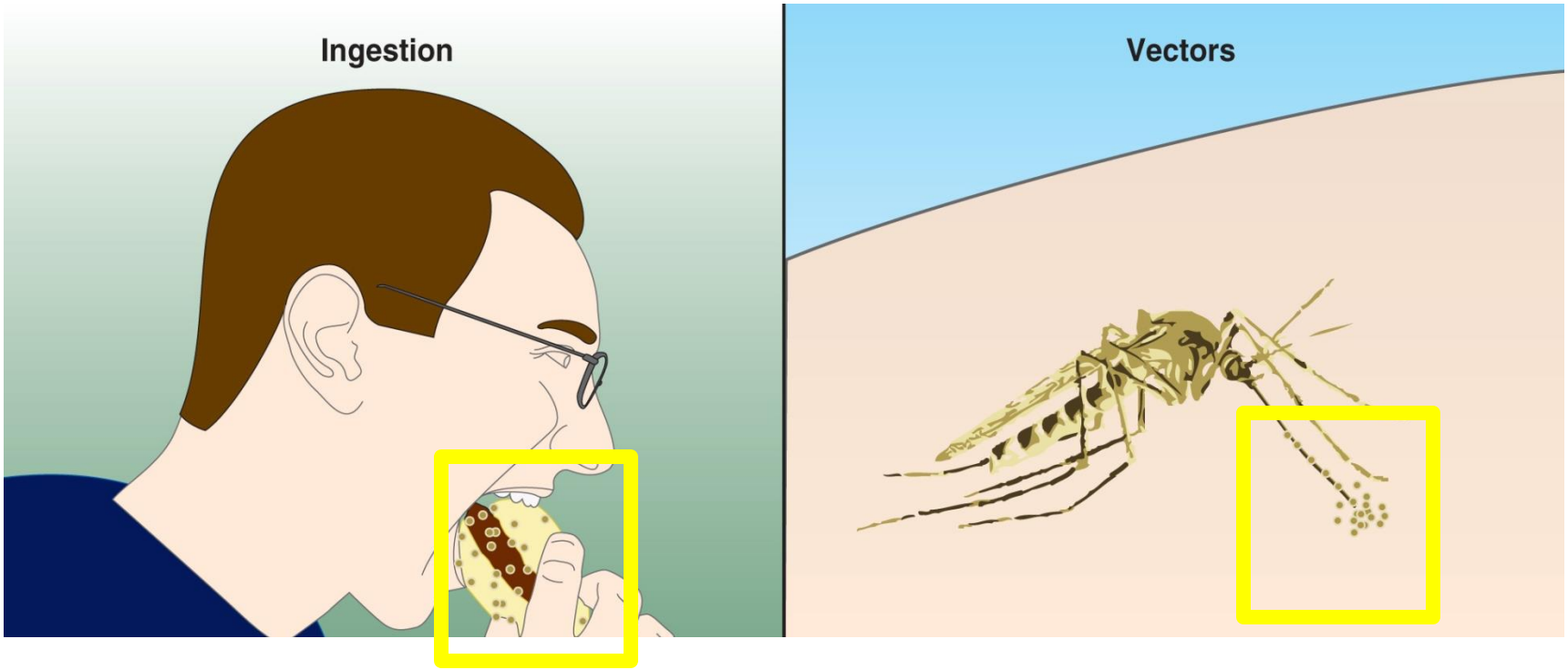
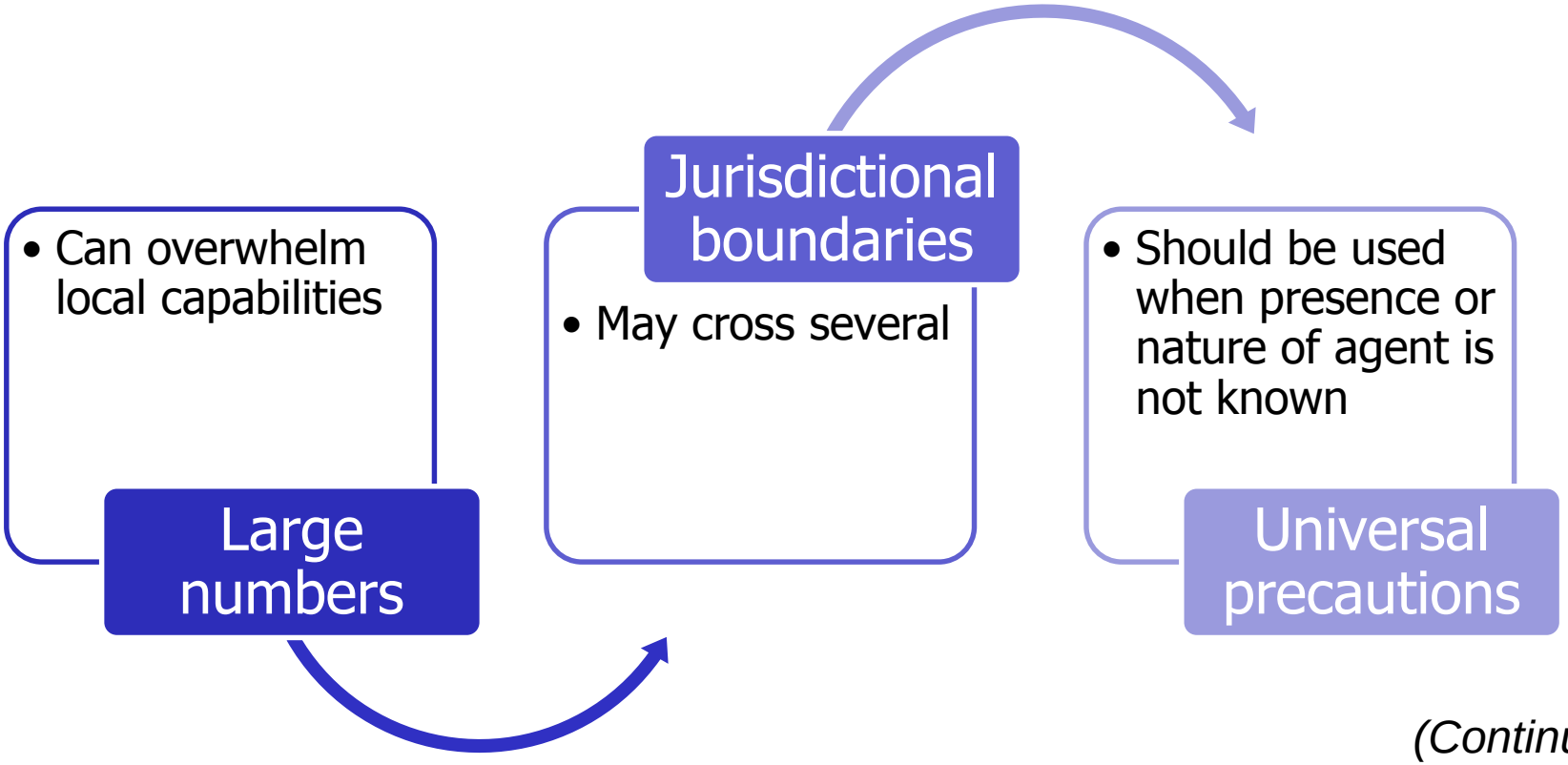


DISCUSSION QUESTION

What are vectors? What are some examples of vectors?

Biological attack incident operations require both training and equipment for safe response.



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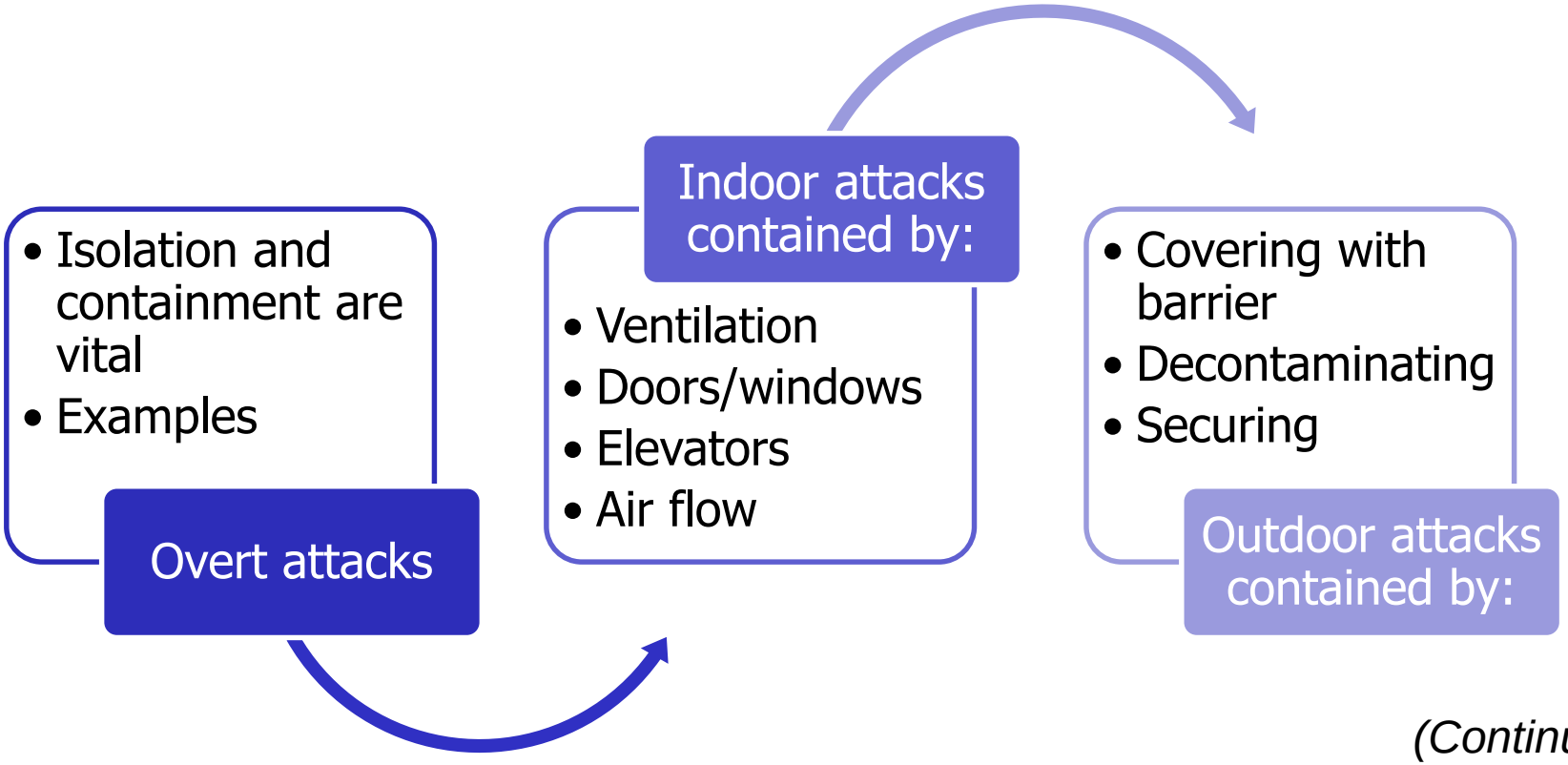
DISCUSSION QUESTION

What are universal precautions? What are some examples of universal precautions?

Additional precautions should be used once the agent is identified.



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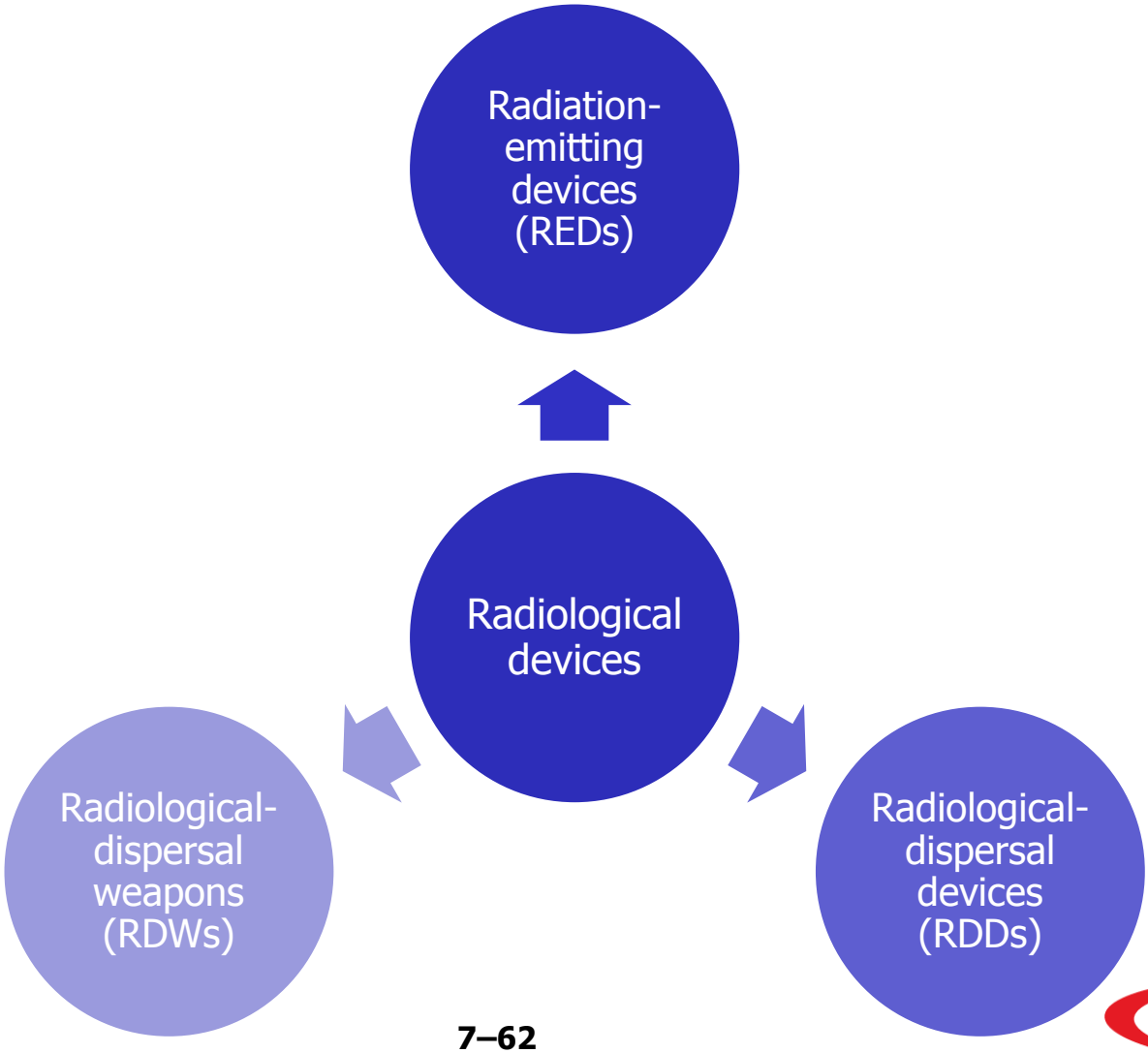
REVIEW QUESTION

How can indoor biological attacks be contained? Outdoor?

Learning Objective 7

Discuss radiological and nuclear attacks.

Radiological devices are commonly categorized in three ways.



REVIEW QUESTION

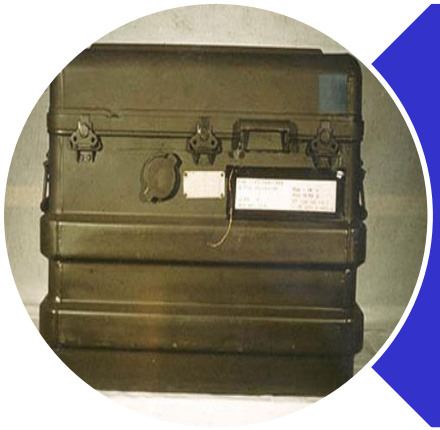
Describe the different types of radiological devices.

DISCUSSION QUESTION

What is the difference between a nuclear device and a nuclear weapon?

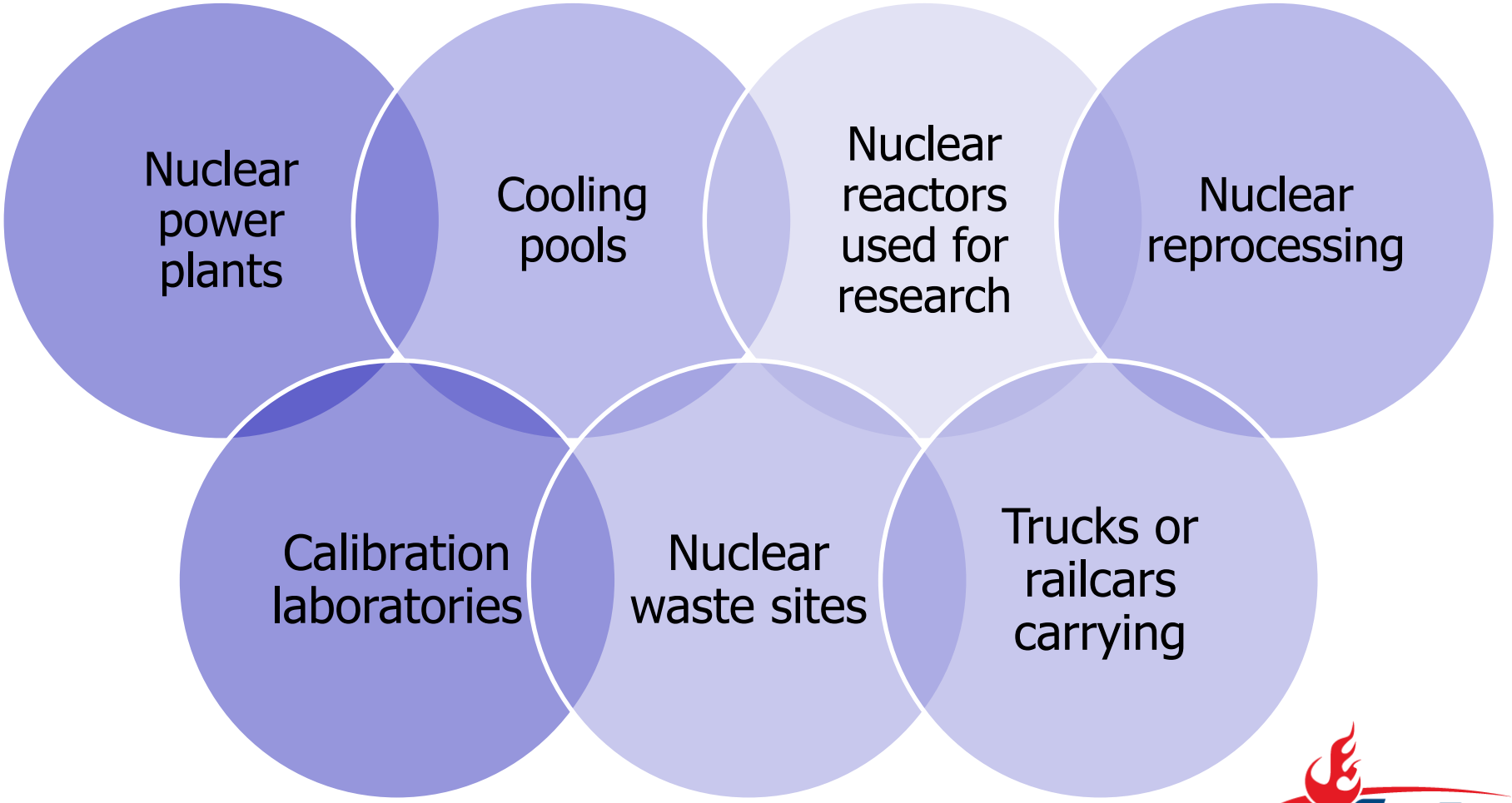
There are several factors that impede a nuclear attack, however there are exceptions.

Security → Difficulty → Transportation



Suitcase bombs

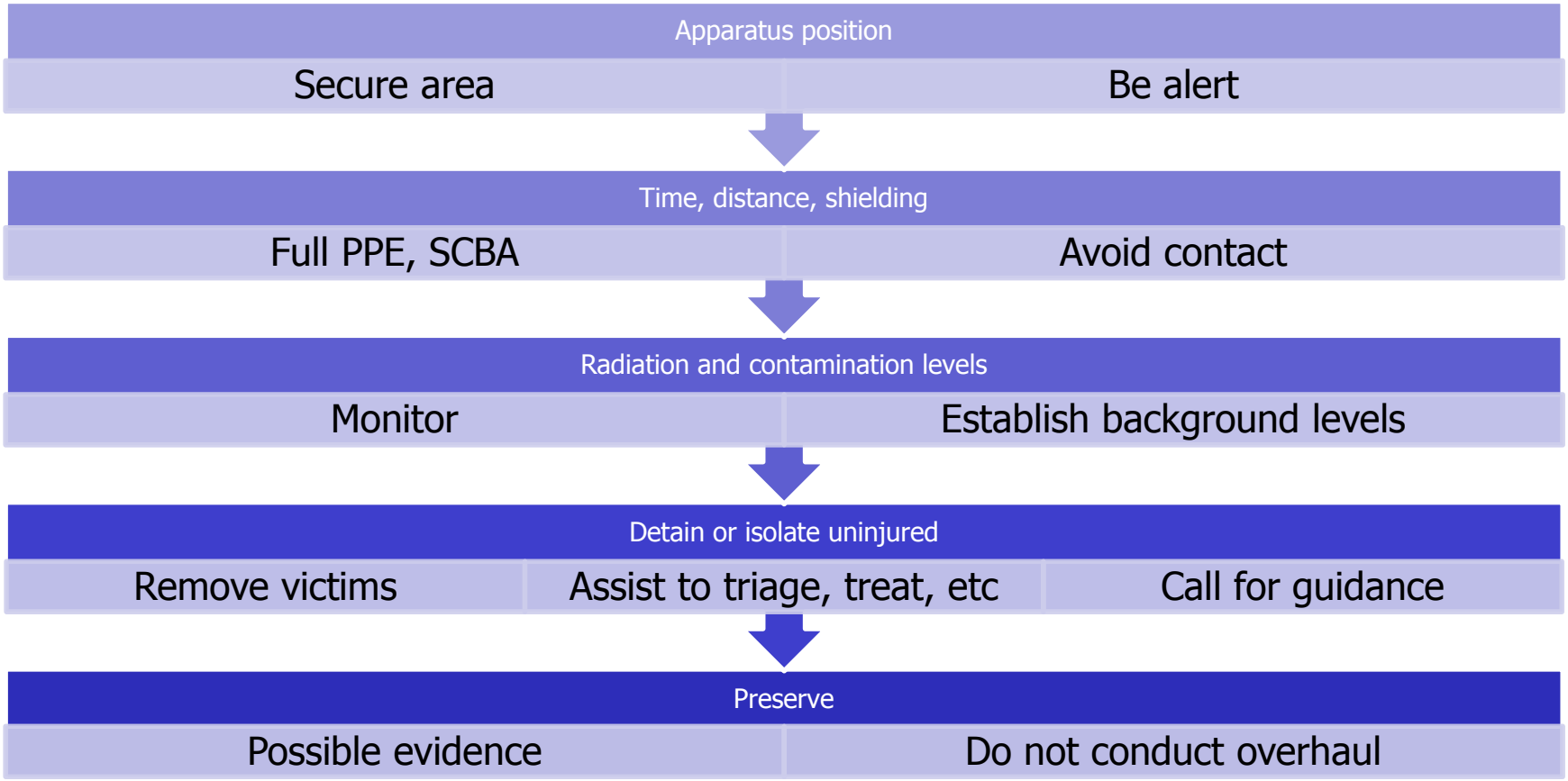
Sabotage of nuclear facilities can target any of the following.



DISCUSSION QUESTION

What is the likelihood of a successful attack on a nuclear installation or nuclear shipment? Why?

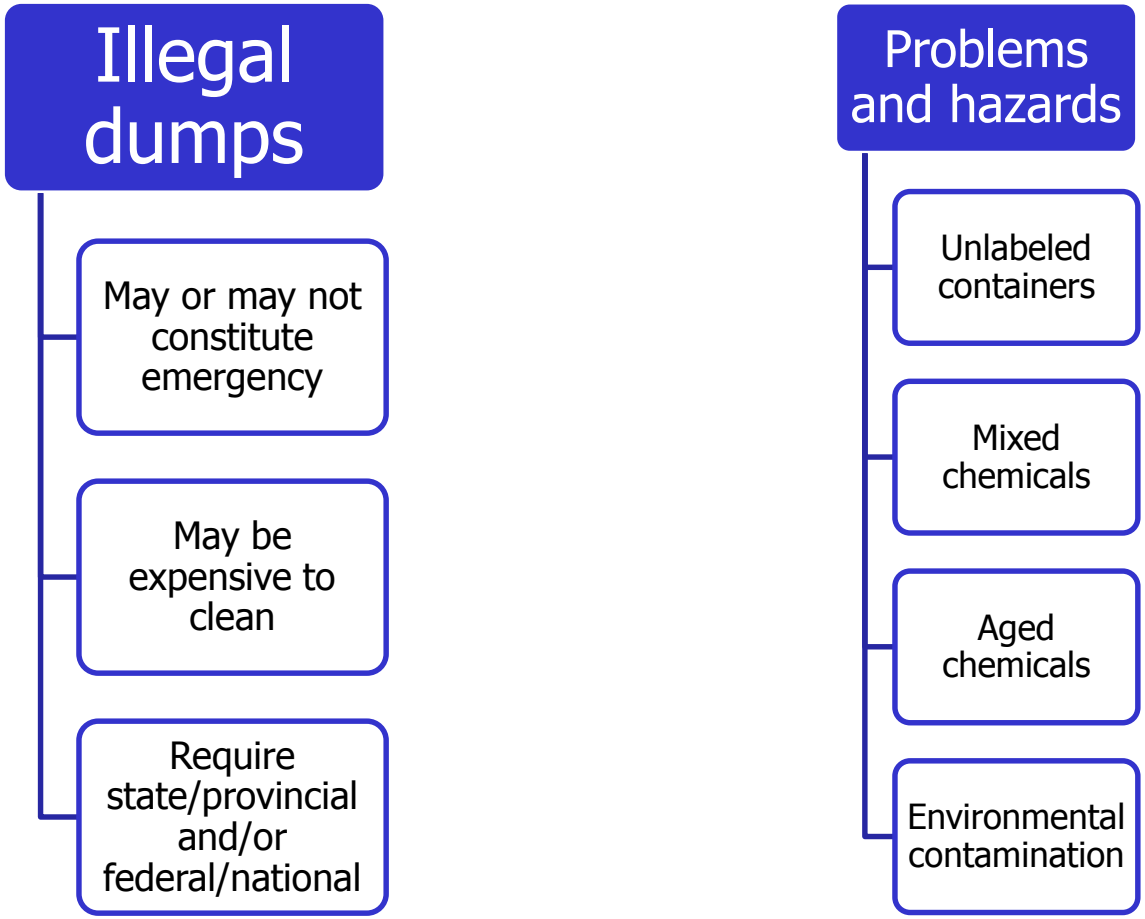
Operations during radiological and nuclear attacks are accomplished through ICS and use specific tactics.



Learning Objective 8

Identify hazards of illegal haz mat dumps.

Illegal haz mat dumps happen for a variety of reasons and present unique hazards and problems.



Learning Objective 9

Describe proper evidence preservation.

First responders should not collect evidence but can take steps to help preserve it for law enforcement.

DO NOT touch

- Anything that is not necessary
- Avoid disturbing areas

Remember

- Who
- What
- When
- Where
- Why

Document

- Take photos/videos
- When something is moved
- Minimize people in area

(Continued)

First responders should not collect evidence but can take steps to help preserve it for law enforcement.

Isolate

- Leave fatalities undisturbed
- Secure areas where evidence is found, report to law enforcement

Identify

- Witnesses
- Victims
- Evidence
- Preserve transient evidence

Evidence

- Collection points
- Isolate possible contaminated food
- Follow SOPs for crime scenes

REVIEW QUESTION

What steps should be taken to preserve evidence and assist law enforcement?

Learning Objective 10

Discuss hazardous materials during and after disasters.

Disasters can create haz mat incidents in a variety of ways.

Containers can wash away and/or release contents.

Courtesy of Rich Mahaney

Summary

- By using IMS, responders can focus on the problem-solving process.
- The IC must determine the strategic goals and tactical objectives that will begin to stabilize the incident and bring it to a successful conclusion with the least amount of harm and damage.