
# HAZWOPER TRAINING
# FOR THE PROFESSIONAL

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# What is toxicology?

- *The study of the negative effects of chemicals on living things*
- *A chemical is considered toxic depending on*
  - *How much of it is necessary to cause harm*
  - *How easily it can enter the body*

# Routes of exposure

- *In order for a chemical to cause injury, it must enter the body*
  - *Inhalation*
  - *Ingestion*
  - *Absorption through the skin*
  - *Injection*

# Chemicals in the body

- *Distribution - spread throughout the body*
- *Metabolism - broken into smaller chemical compounds*
- *Storage - kept in the body for a long time*
- *Excretion - passed out through urine, feces, exhaled air, or sweat*

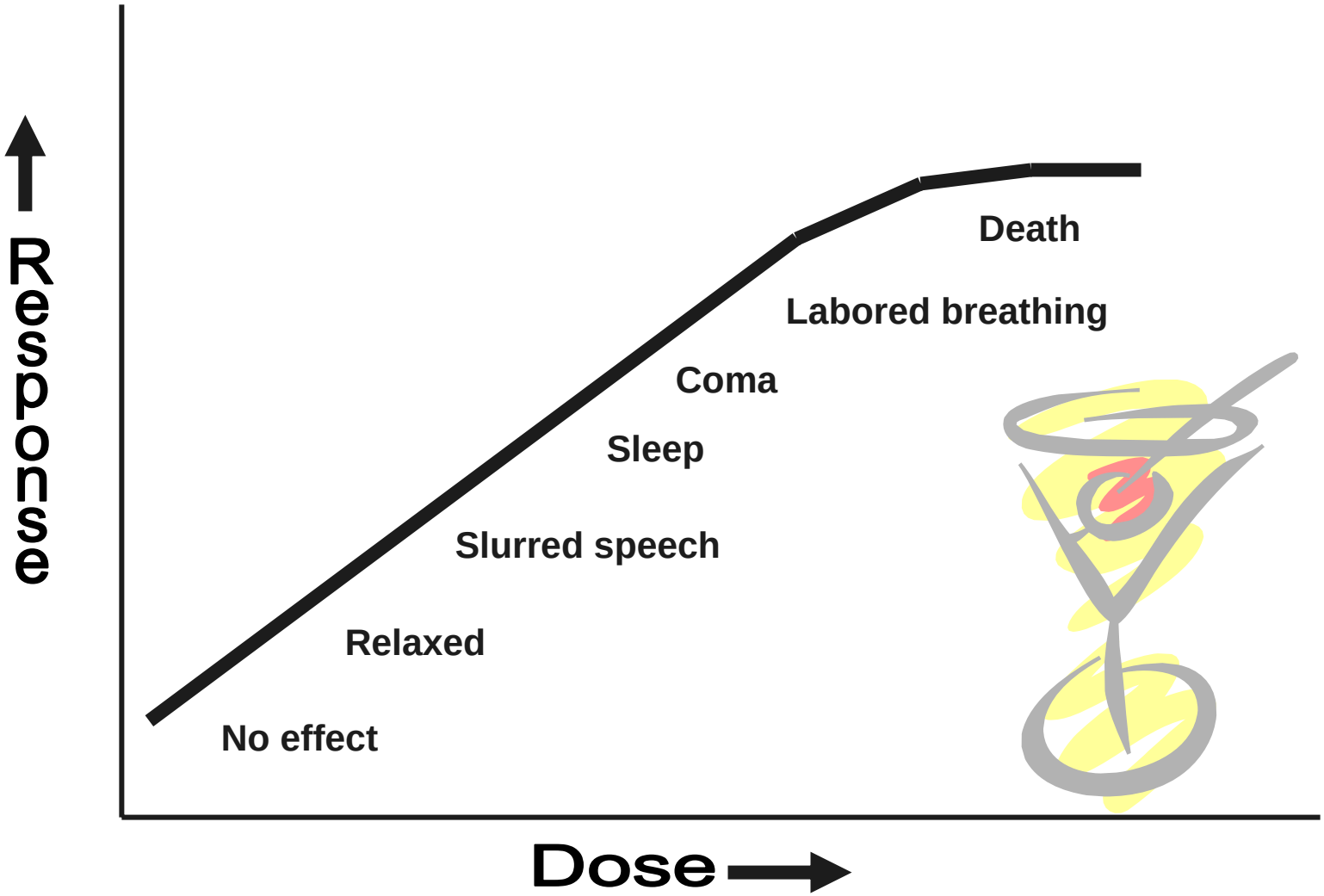
# Toxic effects

- *Toxic chemicals disrupt the normal functions of the body. Effects can be*
  - *Local - at the site of exposure*
  - *Systemic - affecting the entire body*
    - *target organs - organs or systems where symptoms of exposure appear*

# Dose and response

- *The reaction is dependent on the amount of the chemical received, but…*
  - *Some doses are so small they produce no response*
  - *Once the maximum reaction has occurred, increasing the dose doesn't change the reaction*

# Dose-response curve - alcohol



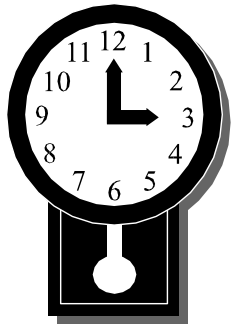
# Acute and chronic exposures

- *Acute - sudden, brief*
  - *A bee sting*

- *Chronic - repeated small doses over time*
  - *Smoking cigarettes for years*

# Acute and chronic effects

- *Acute - lasting hours*
- *Chronic - lasting a long time - possibly years*



# LD50 and LC50

- *These terms derive from laboratory tests on animals*
  - *LD50 is the dose which when swallowed, injected, or applied directly, kills half the test subjects*
  - *LC50 is the concentration of a chemical in a test atmosphere that kills half the test subjects within one hour when inhaled*

# Exposure Limits

- PEL - permissible exposure limit - airborne concentration enforced by OSHA
- STEL - short-term exposure limit -15 minutes four times a day, with l hour free of exposure between each 15 minute exposure
- IDLH - immediately dangerous to life and health - maximum airborne concentration which would not interfere with ability to escape

# Good work practices

- *Read the MSDSs*
- *Use PPE when required*
- *Practice good hygiene*
  - *Don't eat, drink, smoke, or apply cosmetics around hazardous chemicals*
  - *Wash your hands*
  - *If showering and changing clothes after your shift is recommended, do so*

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