



Management of drug poisoning

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Objectives

- Definition of poison
- Common drugs causing poisoning
- Evaluation of drug poisoning
- Symptoms and signs of drug poisoning
- Common toxidromes
- Investigations and management of drug poisoning
- Drug antidotes

What is a poison?

- A substance which can cause illness or death of a living organism when introduced or absorbed.

- **Legal definition:**

- Any product or substance that can harm someone if it is used in the wrong way, by the wrong person, or in the wrong amount.

- **FAD definition of drug:**

- Any substance (other than food) intended to affect the structure or any function of the body.

Common drug poisoning

- **1- Narcotics:**
- **Fentanyl:** synthetic opioid: 19,413 deaths in 2016
- **Propofol**
- **2- Analgesics: Prescription pain relievers:** 19,354 deaths in 2016
(**paracetamol: Acetaminophen**)
- 3- Heroin
- 4- Cocaine
- 5- Methamphetamine
- 6- Benzodiazepines: sedative-hypnotics
- 7- Antidepressants

Evaluation Of A Case Of Drug Poisoning

- 1- Motive: accidental, suicidal, homicidal
- 2- Co-morbidity: Associated diseases:
Hypertension, Diabetes, Hyperlipidemia, Coronary insufficiency, Peptic ulcer
- 3- Drug: Type, Time, Preparation, Dosage
- 4- Co-ingestion: concurrent ingestion of **other drugs, food or substances**
- 5- Symptoms and signs

Symptoms and signs

- 1- Hyperventilation:

- Amphetamine
- Anticholinergics
- Cocaine

- 2- Hypoventilation:

- Sedative-hypnotics:
propofol
- Opioids
- Ethanol

Symptoms and signs

- **Hypothermia (< 35 C o)**

- Ethanol
- Sedatives-hypnotics:
barbiturates
- Opioids

- **Hyperthermia (> 37C o)**

- Cocaine
- Amphetamines
- Anticholinergics
- Neuroleptics

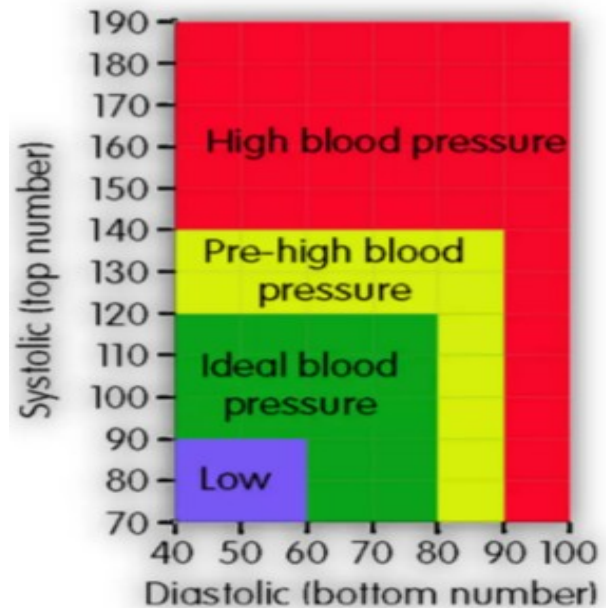
Symptoms and signs

- **Hypotension**

- Antihypertensive drugs
- Diuretics
- Barbiturates

- **Hypertension**

- Cocaine
- Anticholinergics



Symptoms and signs

- Bradycardia

- Opioids
- Digoxin

- Tachycardia

- Cocaine
- TCA: tricyclic antidepressants

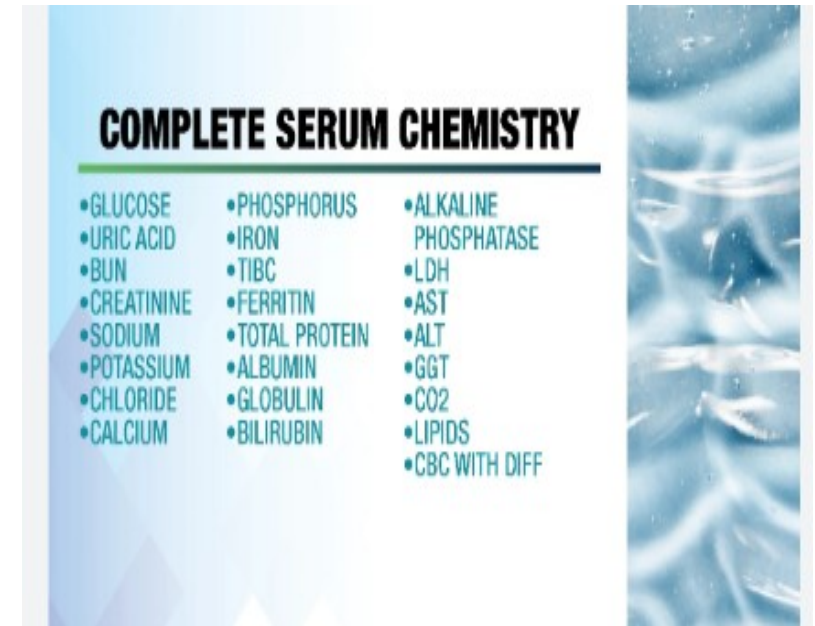
Normal: 60–100 bpm
Bradycardia: <60 bpm
Tachycardia : >100 bpm

Toxidromes

- Pattern of signs or symptoms that suggests a specific class of poisoning
- **Opioids:** triad of respiratory depression, pinpoint pupils, Coma
 - bradycardia, hypotension, hypothermia
- **needle tracks**
- **Anticholinergics:** TCA, antihistamines, antipsychotics
- Hot as a hare, Red as a beet, Dry as a bone, Blind as a bat, Mad as a hatter
- **Cholinergic:**
 - Insecticides: organophosphates, nerve gas, physostigmine:
 - Salivation, Lacrimation, Urination, Defecation, Gastric cramping, Emesis
 - Drowning in secretions, profuse sweating
 - Seizures, coma
 - Muscle fasciculations
 - Miotic pupils

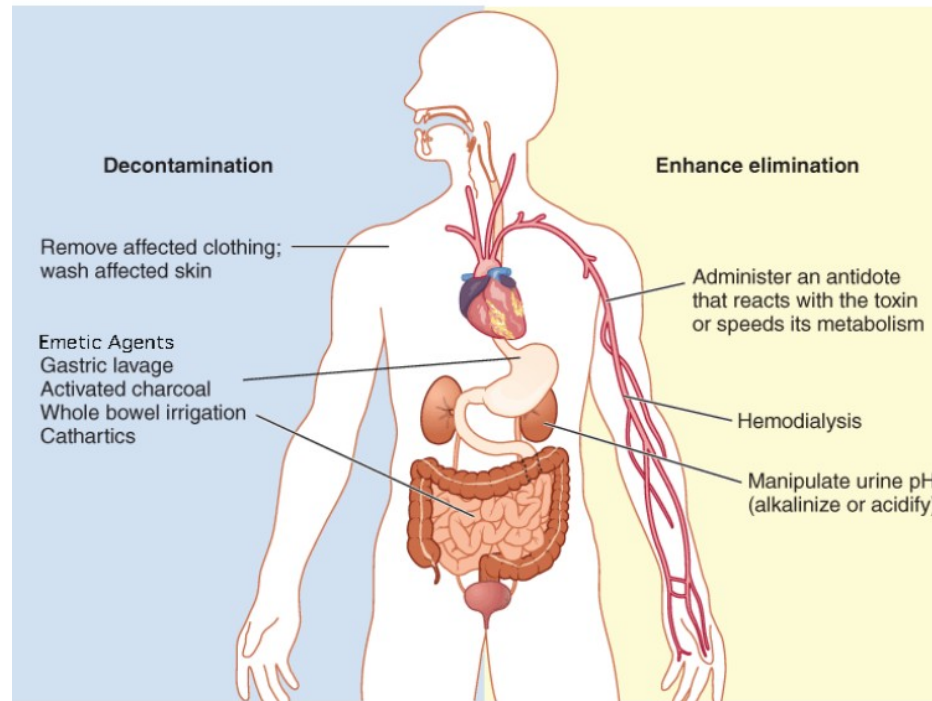
Investigations

- 1- Blood glucose level
- 2- SpO2
- 3- Serum chemistry
- 4- Blood levels of drugs and toxins:
 - prescription medicines, non-prescription medicines (such as **aspirin**), natural health products, alcohol, and illegal drugs: cocaine and heroin
- 5- ECG



Management (treat the patient NOT the poison)

- ABC (Airways: remove foreign bodies, breathing and circulation)
- Decontamination (remove from place, wash skin, clothes, GIT)
- Enhance elimination
- Antidote

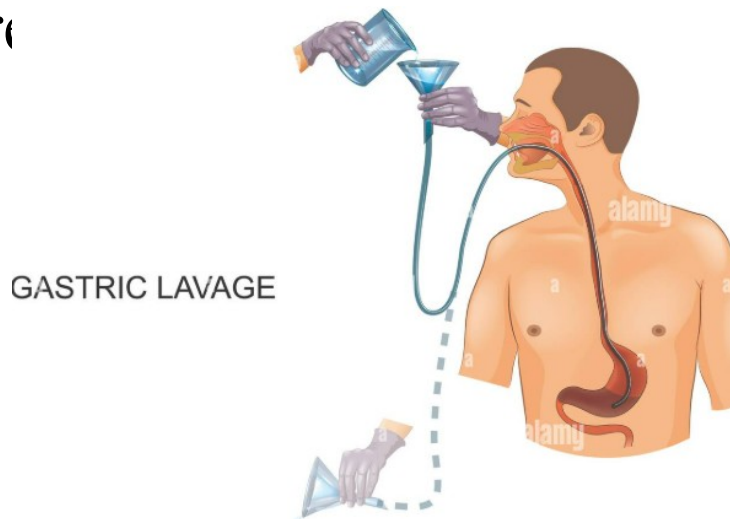


Initial resuscitation & stabilization:

- First priorities are ABC's
- I/V access – I/V fluids
- Endo tracheal intubation - to prevent aspiration
 - ❖ Unconscious patients
 - ❖ Respiratory depression/ failure
- Convulsions- give anticonvulsants

GIT decontamination

- **Emesis**: rarely used now due to dangerous risk
- **Indications:**
 - 1- Acute ingestion of toxic substance (less than 1 h)
 - 2- Long transport time to medical care



- **Methods of Emesis**

- 1- Oro-gastric lavage
- 2- Activated charcoal
- 3- Whole bowel irrigation

- **1- Oro-gastric lavage:**

- **Contraindications:**

- Caustic or corrosive ingestion
- Large foreign bodies
- Unprotected airways
- Suspected upper gastrointestinal injury

2- Activated charcoal

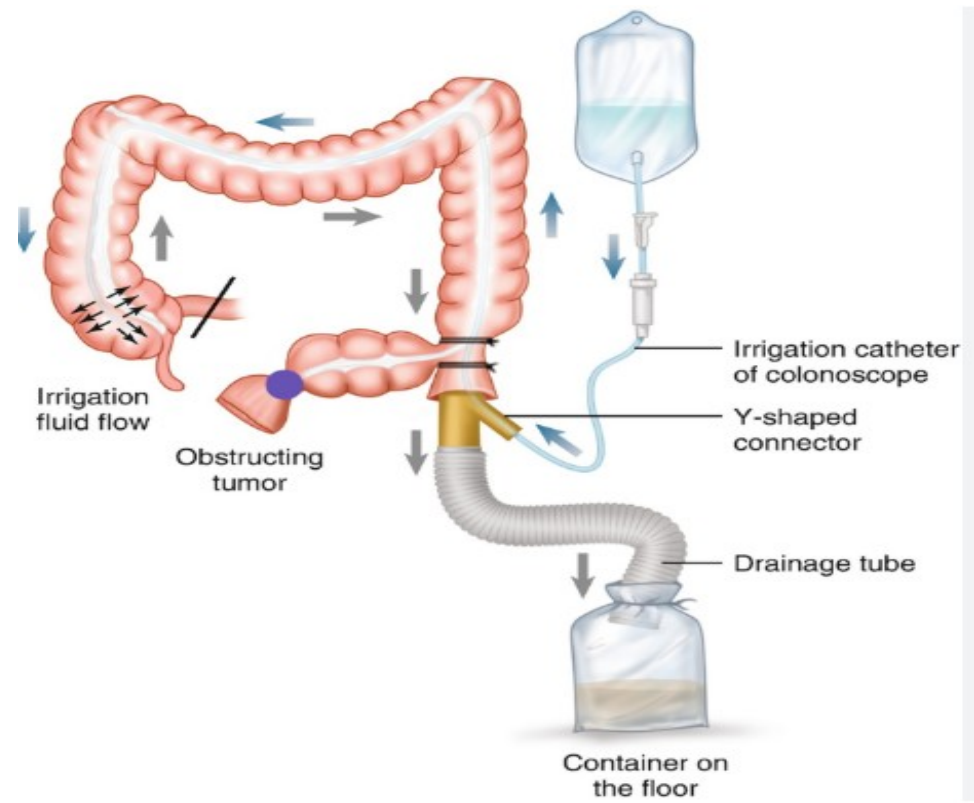
- **Advantages:**
- Large surface area
- High binding capacity
- Interruption of enterohepatic circulation
- **Dose:** single dose: 1 gm/Kg
- **Multiple doses:** 0.5 gm/ Kg
- Oral or by nasogastric tube
- **Indications:** aspirin, digoxin, theophylline, amitriptyline
- **Acts by adsorption:** preventing poison absorption
- **Contraindications:** ileus, GIT perforation, unprotected airways

One gram of activated carbon has the surface area (>400 m²) of approximately two tennis courts (260 m²) !



Whole bowel irrigation

- **Mechanical flushing of the ingested drug before absorption**
- **By iso-osmolar solution of polyethylene glycol**
- **Rate**: 1-2 liters/ hour
- **Duration**: 4-6 hours till rectal contents are clear
- **Route**: oral or rectal
- **Indications**:
 - 1- Poorly absorbed drugs: iron, zinc, lead
 - 2- Sustained release and enteric coated preparations
 - 3- Rising drug levels in blood despite using activated charcoal and orogastric lavage
- **Contraindications**: same as activated charcoal



Enhancing drug elimination

- **1- Changing pH of urine:**
- **Acidification** in **basic** drug poisoning by **ascorbic acid**: amphetamine, opioids
- **Alkalization** in **acidic** drugs by **sodium bicarbonate**: aspirin, barbiturates
- **2- Saline diuresis**
- **3- Hemodialysis:**
- **Drug:** Small, water soluble, poorly protein bound drugs, with small volumes of distribution, that are usually eliminated by the kidney
- **Patient:** renal failure, metabolic acidosis or electrolyte disturbances, or pulmonary edema

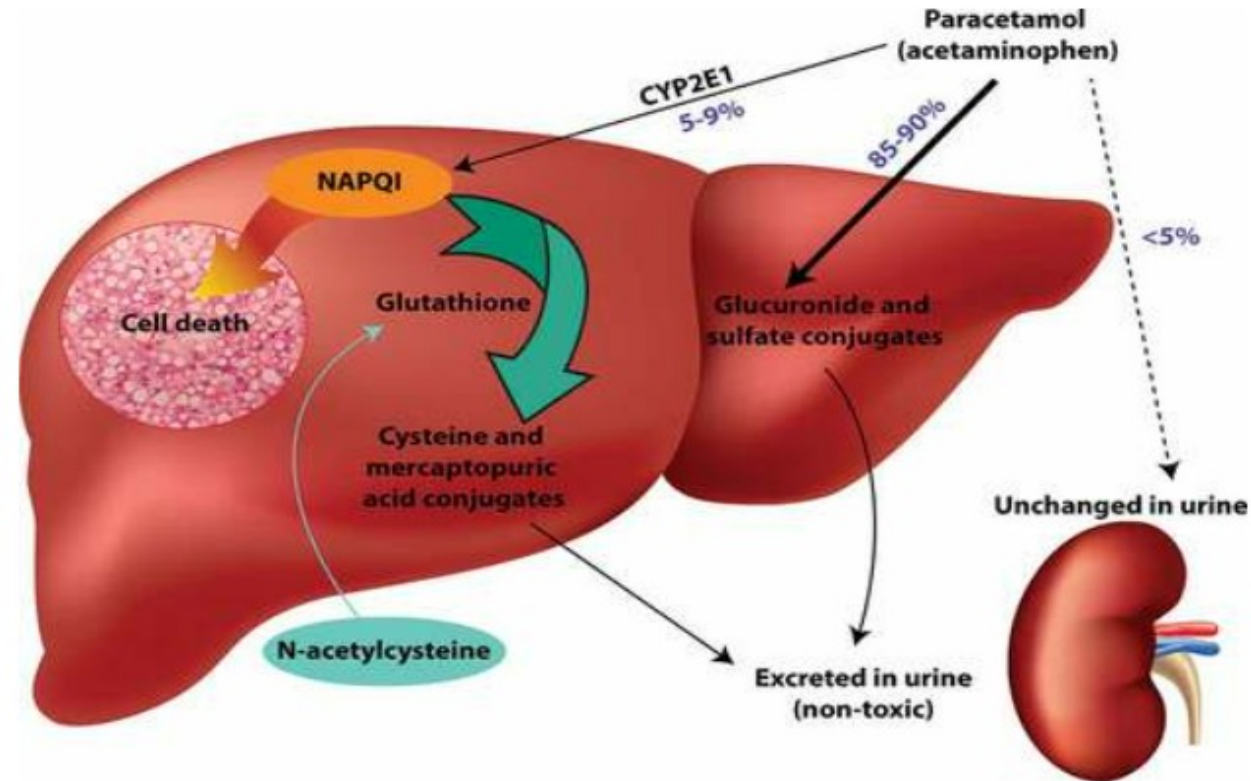
Antidote

- **Agents that abolish the effect of a poison or toxin.**
- **Mechanism of action :**
 - 1- Preventing the absorption of the toxin
 - 2- Binding and neutralizing the poison
 - 3- Antagonizing its effect
 - 4- Blocking of conversion of the toxin to more toxic metabolites.

Most common drug antidotes

- **Acetylcysteine** for acetaminophen: 3
- prevent or lessen liver damage caused by an overdose of acetaminophen
- **Activated charcoal** for most poisons (universal antidote): 1
- **Atropine** for organophosphates: 3
- **Digoxin immune fab** for digoxin toxicity: 2
- **Dimercaprol** for arsenic, gold, or inorganic mercury poisoning: 2
- **Flumazenil** for benzodiazepine overdose: 3
- **Naloxone** for opioid overdose: 3
- **Pralidoxime** for poisoning by anti-cholinesterase nerve agents:
reactivation of peripheral cholinesterase enzyme

Acetaminophen poisoning

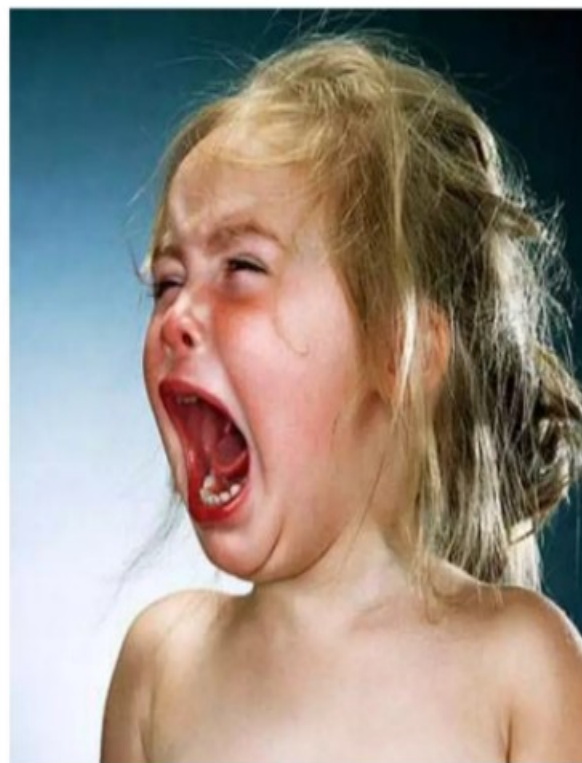


Case

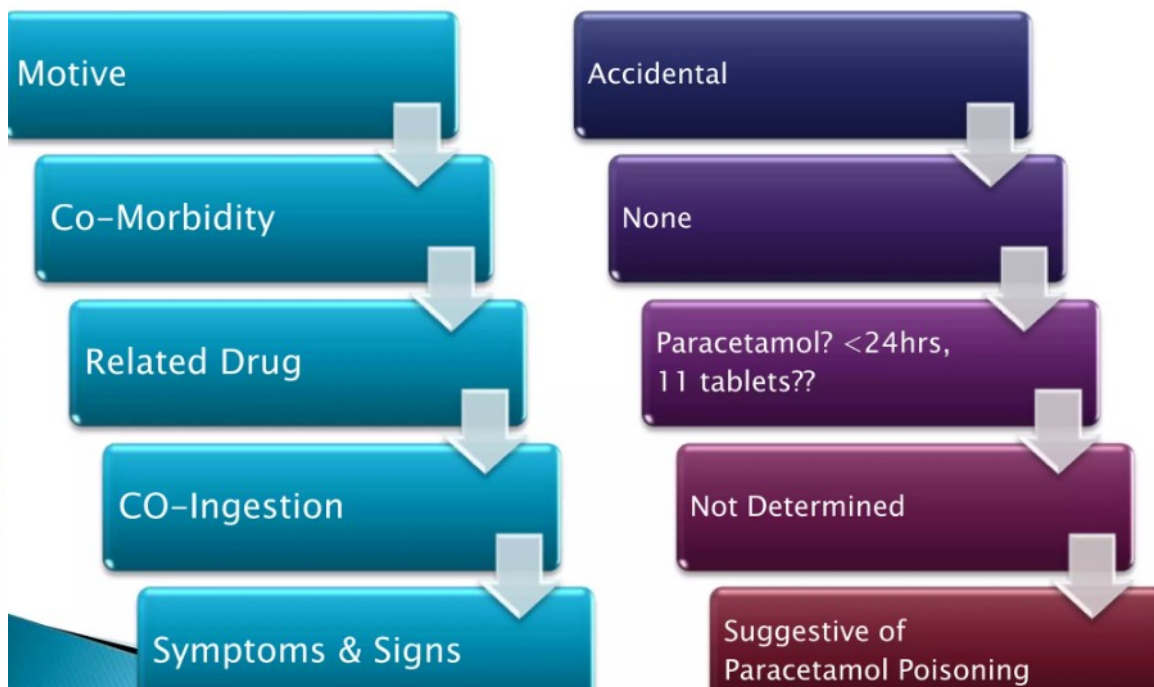
Child aged about 4 years

Nausea & Vomiting
Abdominal Pain

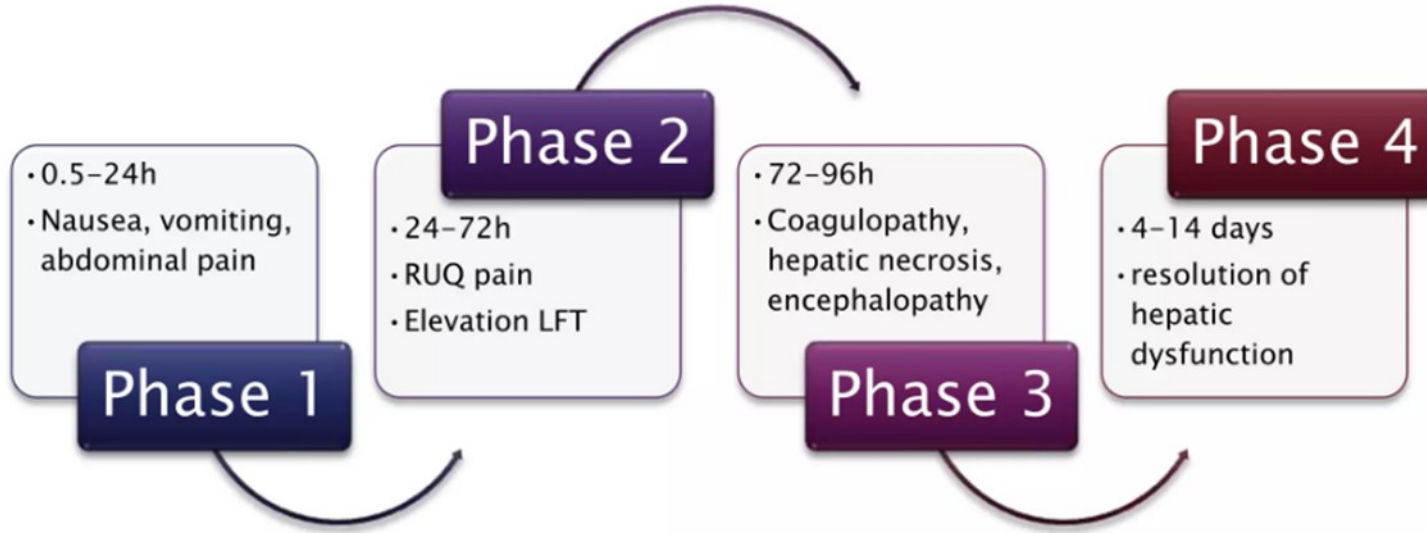
History of ingestion of
unknown white tablets



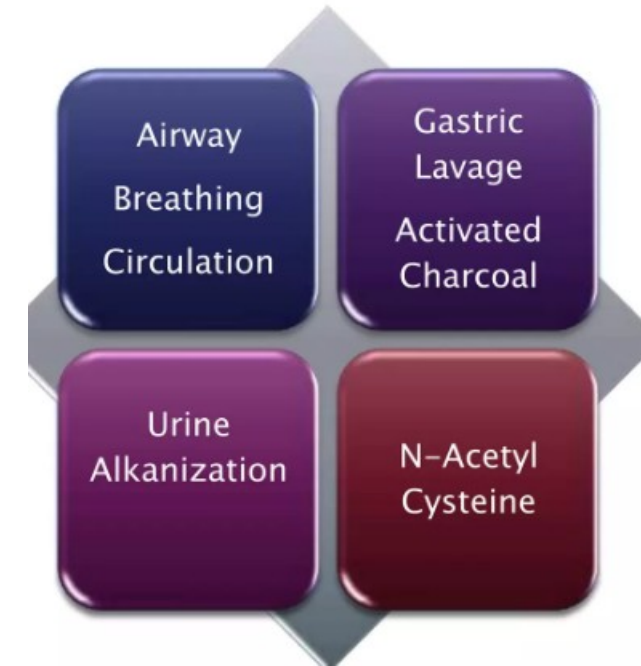
Evaluation



Paracetamol Overdose



Management



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Thank you 