GENERAL APPROACH TO A POISONED VICTIM AND ANTIDOTE:

Diagnosis of poisoning may be difficult. The victim may be unconscious to self-poisoning. Therefore, a suspicious mind is required. When acute poisoning is suspected, the clinician needs to ask a number of questions in order to establish a diagnosis:

1- (**History of present illness**). **In the case of an unconscious (comatose) victim**: the circumstances in which the victim was found and whether any tablet, bottles or other containers **(scene residues)** were present can be important. **If the victim is awake**, he or she should be questioned about the presence of poisons in the home or workplace. The victim's past medical history (including drugs).

2- Physical examination of the victim may indicate

- The poison or class of poison involved.
- The clinical features associated with some common poisons may be specific. For example**, the combination of pin-point pupils, hyper salivation, incontinence and respiratory depression suggests poisoning with a cholinesterase inhibitor such as an organophosphorus pesticide**. However, the value of this approach is limited. Moreover, many drugs have similar effects on the body, while some clinical features may be the result of secondary effects such as anoxia. Thus**, if a victim is admitted with depressed respiration and pin-point pupils, this strongly suggests poisoning with an opioid**.
- Diagnoses other than poisoning must also be considered. For example**, coma can be caused by a cerebrovascular accident.**

3- General laboratory tests :

a-

- Hematological

 Biochemical

b) Toxicological studies

c) Electrocardiogram

d) X-ray findings

. to resuscitation of the poisoned patient:

A- Maintain open **air way**s.

B- breathing**:** adequate ventilation &oxygenation, provide tracheal intubation if required.

C- Circulatory support: If comatose, administer glucose, fluid &oxygen

- For seizures, administer anticonvulsants .

D- Antidotal therapy –

E. **Principles of toxin eliminations** (**decontamination**)

- If the poison **has been inhaled**, the victim should first be removed from the contaminated environment.

- If **skin contamination** has occurred, contaminated cloths should be removed and the skin washed with an appropriate **fluid,** usually water.

- In adult victims, gastric aspiration and lavage (**stomach washout)** are often performed, if the poison has been ingested, to minimize the risk of continued absorption.

- Similarly, in children **emesis** can be induced by the oral administration of syrup of ipecacuanha (ipecac).

- The absorption of any residue remaining after gastric lavage can be minimized by leaving a high dose of **activated charcoal** . However, repeated oral administration **of activated charcoal** appears to be effective in enhancing

elimination of certain poisons (**digitalis, salicylate, thiophylin),** but poorly in **alcohol, pesticide and metals iron.**

F- Antidotes :

Antidotes are agents with a specific action against the activity or effects of a poison. Antidote are generally **administered** after exposure to a toxicant and often in response to clinical toxicosis. Some antidote may be toxic **if used excessively or for too long during therapy** - Adverse effects of antidote may be more likely if administered in the absence of the toxicant; thus, correct diagnosis is important prior to the use of antidotes.

- Antidotes may be ineffective or inadequate **if general decontamination of the animal is not carried out first.**

Mechanism of action of antidote :

A)- chemical antidotes : specifically interact with or neutralize the toxicant . Relatively few antidotes act in this manner.

1-**Comlex formation** : antidote can complex with (bind to) the toxicant , making it unavailable to cross cell membranes or to interact with receptors. The complex must be both inactive and stable until excreted.

a-dimercaprol and dimercaptosuccinic acid (**DMSA)** are sulf hydryl compounds that bind metals as arsenic , lead and cadmium making them unavailable to susceptible receptors.

b-Edetate and D-pencillamine act by **chelation of the metal lead ,copper forming a more water-soluble complex** that is readily excreted in the urine.

C-antivenins against **snake venoms** and antibodies against digitoxin are immunologically generated agents that bind specifically to the venom or toxin.

2-Metabolic conversion. Some antidotes enhance metabolic conversion (i.e.detoxification of the toxicant to a less toxic product).

a-**Nitrite** interacts with hemoglobin and cyanide to form cyanmethemoglobin which is less toxic than cyanide and interferes with cyanide access to the cytochrome oxidase system.

b-**thiosulfate** provides sulfur ,, which interacts with cyanide to form thiocyanate.

B)- **pharmacologic antidotes** :

1-**prevention of toxic metabolite formation**. : these antidotes prevent biotransformation to a more toxic metabolite from the original toxicant as ethanol and 4-methylpyrazole (4-MP) which compete with alcohol dehydrogenase to prevent formation of toxic acidic intermediates from ethylene glycol .

2-**enhancement of toxicant excretion** . these antidotes facilitate more rapid or complete excretion of the toxicant. As molybdenum and sulfate which form a water soluble complex with copper that is readily excreted in urine.

3-**competition for receptor sites.** As naloxone blocks the action of opioids by competing for the same opioids receptor sites.

4-**restoration of normal function** : Acetylcysteine supplies precursors amino acids for glutathione , which serves as a biologic antioxidant against acetaminophen toxicosis.

Some antidotes &protective agents used to treat acute poisoning:

ANTIDOTE	*drugs*
Acetylcysteine	Paracetamol
Atropine	Organophosphate
Ethanol	methanol
protamine	heparin
Physiostigmine	Atropine
Naloxone	Opioids
Pyridoxine	Isoniazid