

Metallic irritants I



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Professor & HOD

ARSENIC



- Inorganic arsenic is more toxic than organic, and trivalent arsenic is more toxic than pentavalent or zerovalent arsenic

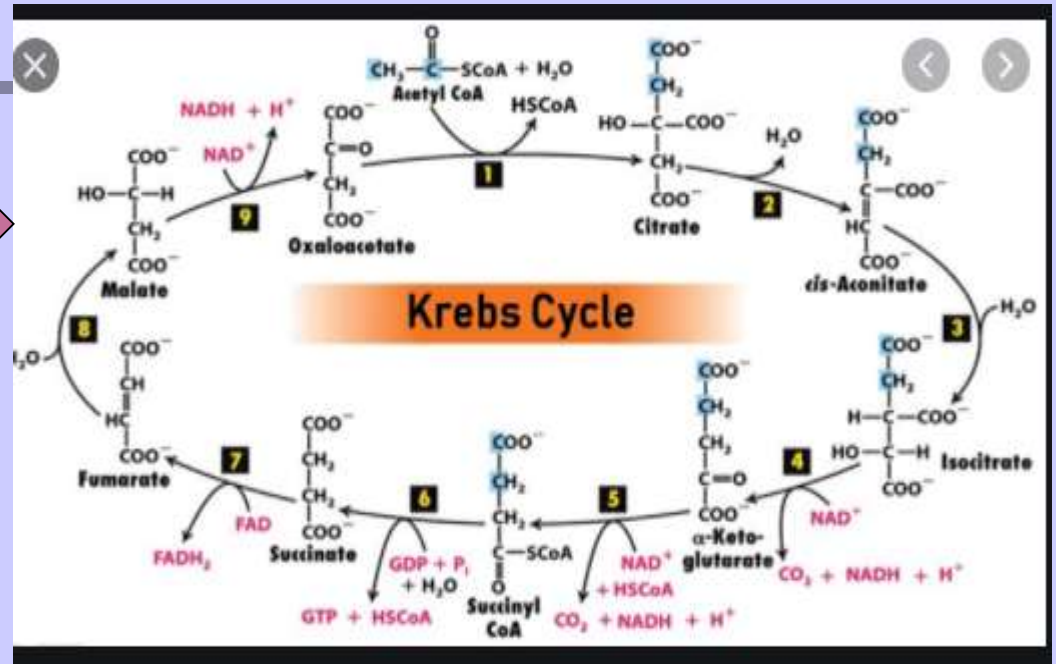
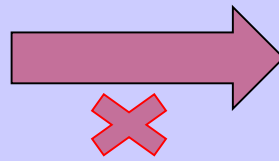


Uses

- In alloys
- Lead plating, soldering
- Manufacture of glass, insecticide, rodenticide
- Pottery
- Colouring agent for toys, wall paper

MOA

Arsenic





Poisonous compound

- **Arsenic trioxide**
- **Copper arsenite**
- **Copper acetoarsenite**
- Arsenic acid
- Arsenic sulphide
- Arsenic trichloride
- Arsine gas





Manifestations of acute arsenic poisoning



Gastrointestinal

Ocular

Pulmonary

Liver

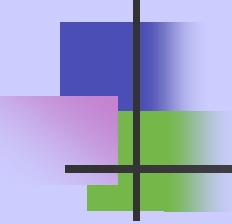
Kidneys

Neurological

Cardiac

Difference between arsenic poisoning and cholera

Feature	Arsenic poisoning	cholera
Pain in throat		
Purging		
Vomited matter		
Stools		
Tenesmus		
Voice		
Conjunctivae		
Analysis of excreta		

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- **Fatal dose:** arsenic trioxide 200-300mg.
 - **Fatal period : 1-2days**



Chronic poisoning

- GIT Symptoms:
- Skin symptom: Mee's line
- Haematological-
- Neurological-





Hyperkeratosis of soles



Palmer Keratosis



Mee's line





Ocular-

Airways-

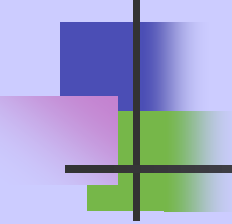
Kidney-

Cardiac-



Diagnosis

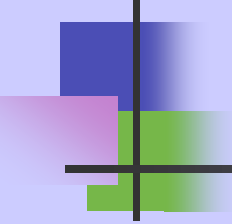
- x-ray of abdomen
- ^ in serum arsenic level (70mcg/lt)
- Urinary arsenic level (exceed 100 mcg) should be measured in 24 hours.
- Arsenic - hairs and nail for a long time.

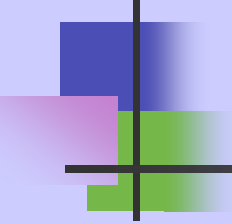
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- Monitor CBC, serum electrolytes, urinalysis, liver and renal function tests.
 - ECG
 - chest radiograph



Management

- **Gastric lavage** - freshly precipitated hydrated ferric oxide (convert to ferric arsenate, harmless salt).
- **Dimercaprol** is the chelating agent of choice and is administered intramuscularly

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- BAL at a dose of 3 to 5 mg/kg intramuscularly every 4 hours until the urinary arsenic excretion dips below 50 mcg/24 hours.
 - Usual duration of therapy is 7 to 10 days.

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- Penicillamine- orally at a dose of 100 mg/kg/day, 6th hourly for 5 days.
 - Whole bowel irrigation with polyethylene glycol
 - Haemodialysis or exchange transfusion.



Postmortem appearance

- **Externally-**
- **Internally-** red velvet stomach



ARSeNiC

- A- Aldrich Mees lines
- R- Raindrop pigmentation, Rash, Red velvety stomach mucosa
- S- Sub endocardial haemorrhages
- N- Neuropathy peripheral
- C- Cholera like



MLI

- Homicidal
- Suicidal
- Accidental
- Cattle posion



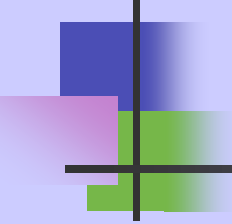
Lead



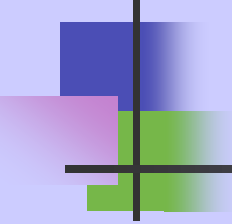
Poisonous lead compound

- Lead carbonate
- Lead chromate
- Lead acetate
- Lead monoxide
- Lead sulphide
- Lead tetraoxide
- Tetraethyl lead

Pharmacokinetics and Pharmacodynamics



- Distributed extensively throughout tissues: bone, teeth, liver, lung, kidney, brain, and spleen
- Body lead storage: bones- can constitute a source of remobilization and continued toxicity after the exposure has ceased

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- Lead crosses the BBB and concentrates in the gray matter
 - Lead crosses the placenta
 - Excretion:
 - Kidneys. The excretion increases with increasing body stores (30 μ g-200 μ g/day)
 - Feces