

# Metallic irritants II



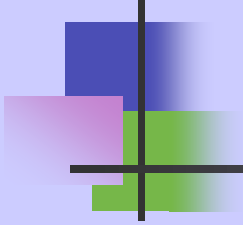
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Dr.Mallikarjun  
Professor & HOD

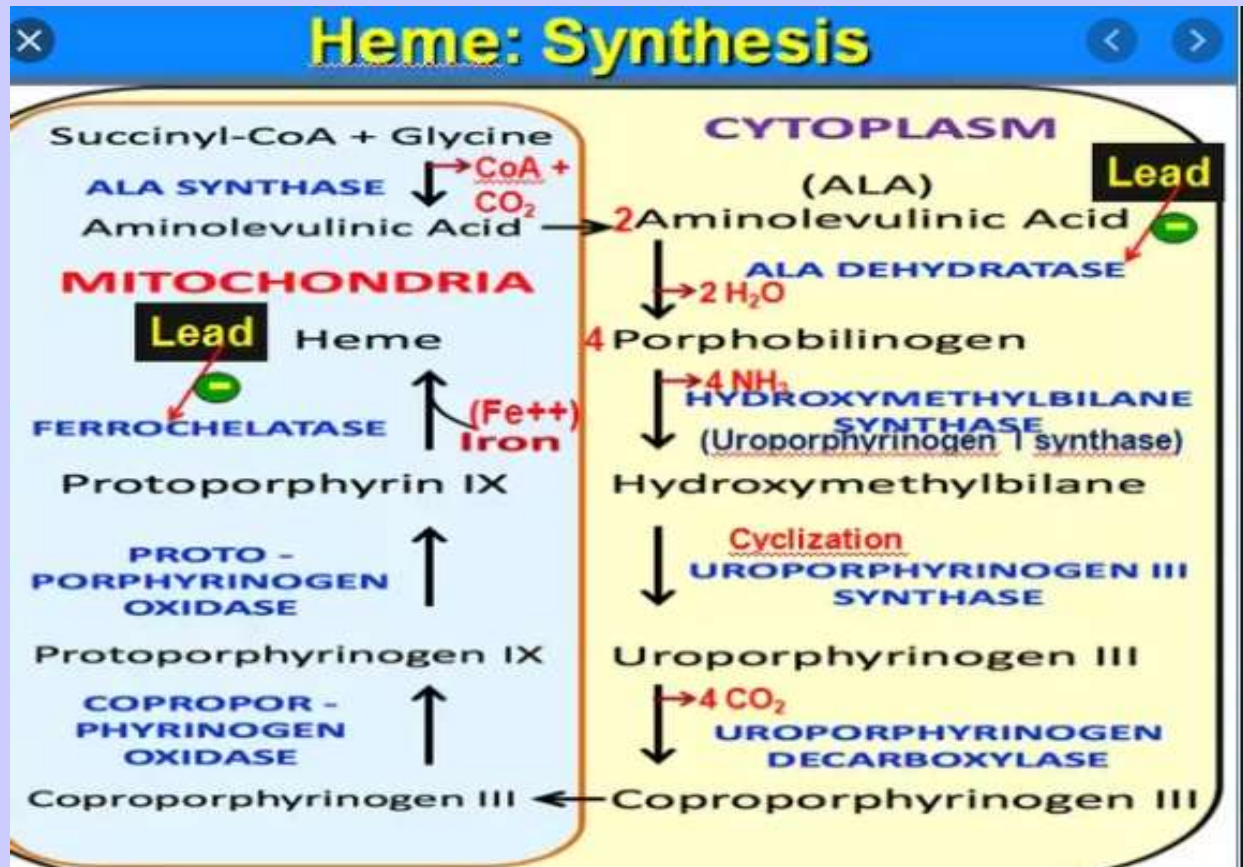


# Lead

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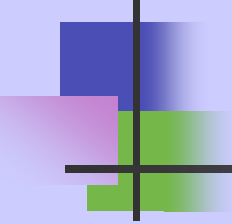
# MOA



# General Signs and Symptoms of Acute Lead Toxicity



- Metallic taste
- Dry throat
- Thirst
- Burning abdominal pain
- Nausea
- Vomiting
- sometimes diarrhoea
- Peripheral circulatory collapse
- Headache
- Insomnia
- Paraesthesia
- Depression
- Coma
- Cerebellar ataxia in children

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- Fatal dose- 10gm/70kg for most lead salts and 100mg/kg for tetraethyl lead.
  - Fatal period – usually within 2 to 3 days.



# Chronic poisoning

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## Causes

- Food & drinking water stored in lead cisterns
- Hair dyes & cosmetics containing lead
- Occupational exposure- common in painters, plumbers, printers



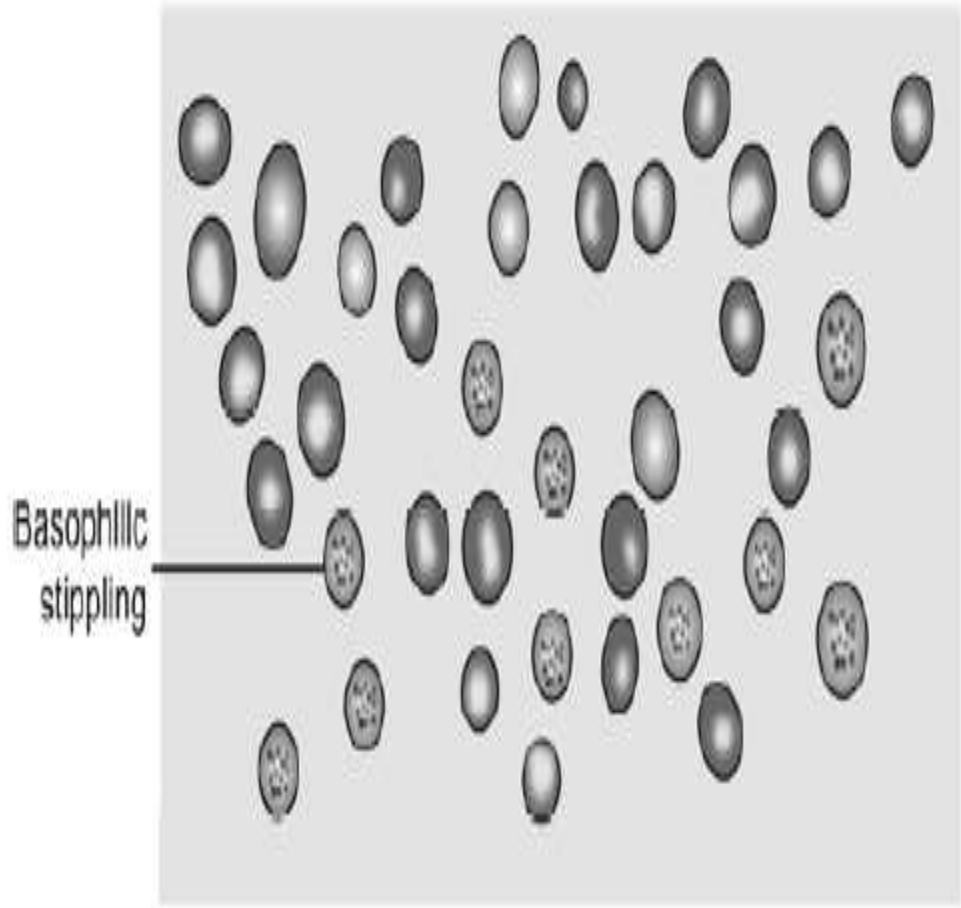
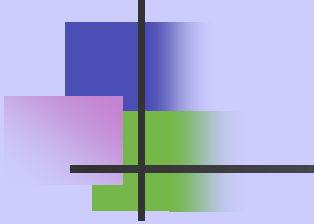
# chronic poisoning(plumbism)

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- **Facial pallor-**
- **Anaemia with punctate basophilia-**
- **Lead line or burtonian line-**
- **Colic & constipation-**





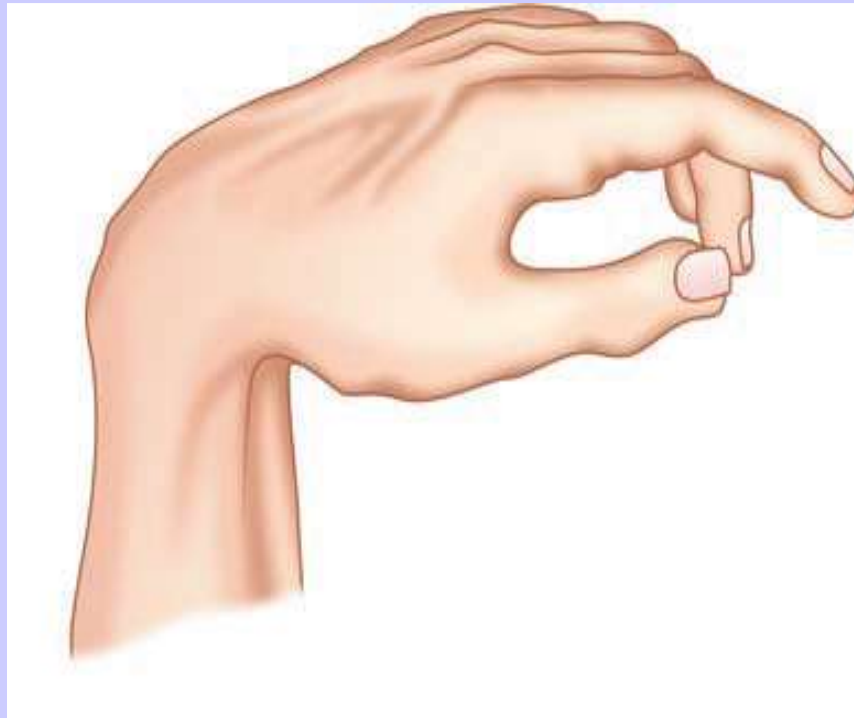
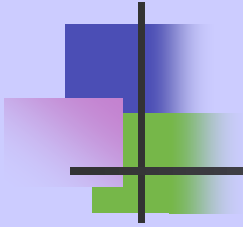




# chronic poisoning...

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- **Lead palsy-**
- **lead encephalopathy-**
- **Cardiorenal**
- **Reproductive**





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## Paediatric ABCD Drops For Me

- P- pallor facial
- A- anaemia, anorexia
- B- basophilic stippling, burtonian line
- C- constipation, colic
- D- drop foot/wrist
- F- foul breath
- M- metallic taste in mouth



# Diagnosis

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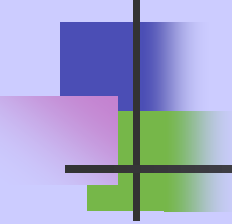
- Evaluation of clinical symptoms and signs
- CBC- anaemia & basophilic stippling
- Abdominal radiographs (for recent ingestion of lead-containing material)
- Whole blood lead level > 0.07 mg %
- X-ray fluorescence (XRF)- to assess body burden
- Urine lead level- above 150 mcg /litre
- Urine porphyrin level

# Treatment

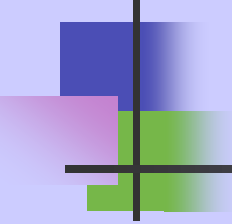
## **Severe acute poisoning with encephalopathy**

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- BAL 4 mg/kg
  - Cranial CT scan
- cerebral oedema:
- Diuretics
  - Glycerol
  - Corticosteroids

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- 
- KUB: to rule out lead chips in GI tract
  - For seizures: Treat seizures with intravenous diazepam
  - CaNa<sub>2</sub> EDTA 75 mg/kg/day IV infusion





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## **Severe acute poisoning without encephalopathy:**

- BAL 12 mg/kg/day
- EDTA 50 mg/kg/day

## **Moderate poisoning-**

- EDTA 50 mg/kg/day



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## **Mild poisoning**

- D-Penicillamine 30 mg/kg/day

## **Supportive measures**

- Thiamine 10 to 50 mg/kg
- IV calcium gluconate
- IV fluids

# Nutritional Supplementation



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- Iron supplementation
- Calcium supplementation – calcium rich foods
- Phosphorus supplementation
- Frequent food consumption- regular meals + snacks



# Autopsy Features

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- Pale skin, conjunctivae, and mucosa
- Burtonian line
- Emaciation



# MLI

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- Abortion
- Cattle poison
- Lead pellets



# Mercury

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# Mercury

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- Occurs in three forms (elemental, inorganic salts, and organic compounds)
- Contamination results from mining, smelting, and industrial discharges. Mercury in water can be converted by bacteria to organic mercury (more toxic) in fish.



# Uses

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- Can also be found in thermometers, dental amalgams, fluorescent light bulbs, disc batteries, electrical switches, folk remedies, chemistry sets and vaccines.



# Poisonous Mercury compound



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- Metallic mercury is not poisonous, if swallowed
- Poisonous compounds are-
  - Mercuric chloride
  - Mercuric oxide
  - Mercuric iodide
  - Mercuric cyanide
  - Mercurous chloride



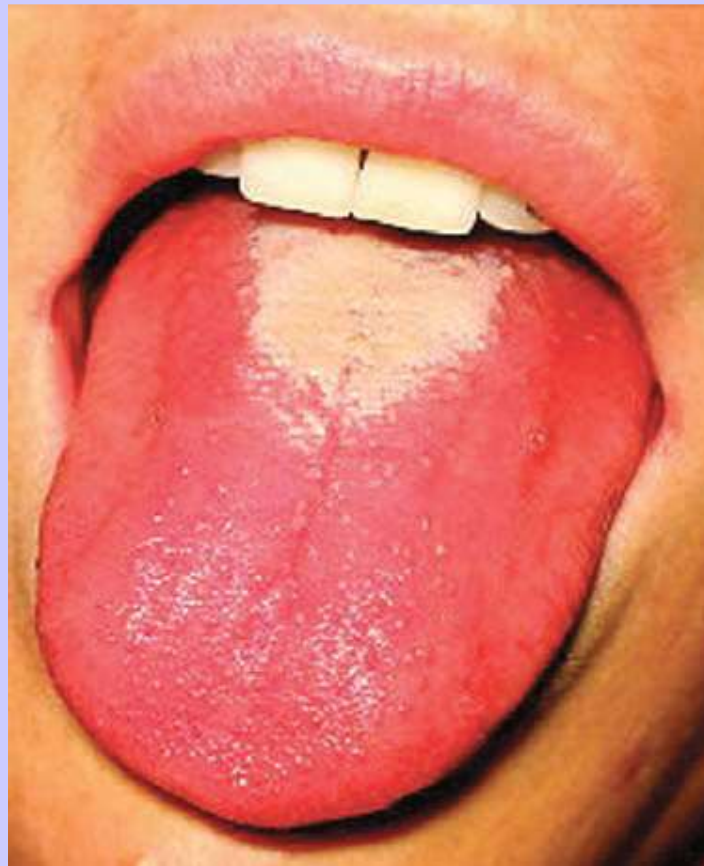
# Clinical Features

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Acute poisoning

## **Inhalation:**

- dyspnoea, cough, fever, headache,
- chills, GI disturbances, metallic taste, and blurring of vision.
- Stomatitis, swelling of the salivary glands and gingivitis
- Teeth may become loose due to gum inflammation.







# Ingestion

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- Abdominal pain, vomiting, diarrhoea, and shock.
- renal failure, pulmonary oedema, and coma

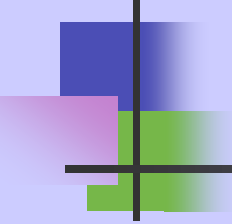


# Chronic poisoning

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## **Inhalation**

- **Danbury tremor**
- **Hatter's shakes**
- **Erethism**
- **Mercuria lentis**



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graph TD; A[Danbury tremor] --> B[Hatter's shake]; B --> C[Concussio mercurialis];
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Danbury tremor

Hatter's shake

Concussio mercurialis



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## **Ingestion**

- Colitis.
- Melanosis coli.
- Dementia.
- Tremor.
- Renal failure



# Acrodynia (Pink disease)



# Chronic Mercury poisoning

## contd..

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- **Minimata disease-** type of organic mercurial poisoning due to eating of fish poisoned by mercury.
- Toxicity occurs with long term exposure and effects the CNS.
  - Signs progress from paresthesias to ataxia, followed by generalized weakness, visual and hearing impairment, tremor and muscle spasticity, and then coma and death.

# with-fish-and-cane-minamata- japan

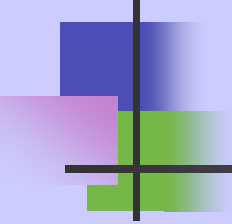




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## MEATS

- M- mecuria lentis, minmata disease
- E-Erethism
- A-acrodynia
- T-tremors
- S-salivation

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- **Fatal dose:** 1 to 2gm of mercuric chloride
  - **Fatal period:** three to five days



# Diagnosis

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- **Blood mercury level-** Normal level is less than 3 mcg/100 ml. Symptoms of toxicity may occur at blood mercury concentrations of 5 mcg/100 ml or greater.
- **Urine mercury level:** Normal level is less than 10 to 15 mcg/100 ml.



# Treatment

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## **Acute Poisoning**

Inhalation:

- Supportive measures.
- Chelation

Ingestion:

- Stomach wash
- Demulcents



# Chronic Poisoning

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## Chelation therapy—

- BAL- 100 mg by deep IM, every 4 hours for 48 hours, followed by 100 mg every 8 hours for 8 to 10 days. OR
- DMPS - 5 mg/kg IV, or 6 infusions of 250 mg/day, followed by 100 mg orally twice a day for 24 days.





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OR

- DMSA - 30 mg/kg/day orally for 5 days, followed by 20 mg/day for 14 days.

OR

- D-Penicillamine 250 mg qid, for adults, (20 mg/kg/day) for 5 to 10 days.



# Postmortem appearance

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- Mucosa of GI tract shows congestion and corrosion.
- Large intestine shows necrosis due to the re-excretion of mercury in the large bowel
- Acute tubular degeneration in the kidney
- Liver is congested and shows cloudy swelling



# MLI

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- Criminal abortion
- Dentistry