

## Arsenic or compounds thereof

### Definition of causal agent

Arsenic is a silver-grey element that exists in four different oxidation (valence) states. It occurs most commonly in the atmosphere as vapour and particulates in the As(III) – ‘arsenite’ - or As(V) – ‘arsenate’ - states.

The main inorganic compounds of concern include: arsenic trioxide  $As_2O_3$ , copper arsenite  $Cu(AsO_2)_2$ , sodium arsenite  $NaAsO_2$ , lead arsenate  $Pb_3(AsO_4)_2$  and arsenic pentoxide  $As_2O_5$ .

### *Main occupational uses and sources of exposure:*

Manufacture and use of some pesticides such as in cotton or tobacco farming and processing, manufacture and use of wood containing preservatives, non-ferrous (Cu, Zn, Pb) smelting, coal burning, microelectronics, optical industry, glassmaking and tanning. Most industrial exposure is respiratory or dermal but oral exposures are probably also important. The use of arsenic in many compounds is now banned or restricted in most countries.

### Toxic effects

#### 1. Local effects

- At high concentrations inorganic arsenic compounds are irritant to the skin, eyes and mucous membranes.
- Repeated high nasal exposures may lead to septal ulceration or perforation.

#### *Exposure Criteria:*

*minimum intensity of exposure:* 0.1 mg/m<sup>3</sup>

*minimum duration of exposure:* immediate

*maximum latent period:* a few minutes for acute irritant effects  
6 months for septal perforation

#### 2. Systemic effects

##### □ skin

- palmar and plantar hyperkeratosis
- hyperpigmentation, depigmentation
- arsenical warts

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**☐ nervous system**

- sensorimotor polyneuropathy (with decrease in peripheral nerve conduction velocity)
- encephalopathy (following very high acute exposures)

**☐ peripheral circulation**

- vasospasticity and Raynaud's syndrome

***Exposure Criteria:***

For neurological, peripheral circulation and non-malignant skin effects:

*minimum intensity of exposure:* 0.05 mg/m<sup>3</sup>

*minimum duration of exposure:* 6 months

*maximum latent period:* 1 year

**☐ malignancy**

- lung cancer

***Exposure Criteria***

*minimum intensity & duration of exposure:* 250 µg/m<sup>3</sup>.years

*maximum latent period:* not appropriate

*induction period:* 15 years

- skin cancer

*minimum duration of exposure:* 1 year

*induction period:* 5 years