WAC 296-848-60010 Health information about inorganic arsenic. (1) You must make this section readily available to employees as required in Training, WAC 296-848-30005.

(2) You must provide this section to the licensed health care professional (LHCP) as required in Step 4 of the medical evaluation process found in Medical evaluations, WAC 296-848-30030.

Table 5
General Health Information About Inorganic Arsenic

What is inorganic arsenic?
In this chapter, "inorganic arsenic" means: – The element arsenic; – Arsenic-containing compounds that don't contain the element carbon; – Copper aceto-arsenite. Arsine is a gaseous inorganic arsenic compound not addressed by requirements in this chapter. It's addressed in a separate chapter, Respiratory hazards, chapter 296-841 WAC.
How does inorganic arsenic get into my body?
Inorganic arsenic enters your body when you: – Breath in **(inhale)** airborne particles such as dusts, fume, sprays, or other aerosols that contain inorganic arsenic. You will also inhale inorganic arsenic particles when you smoke tobacco products that have become contaminated from contact with inorganic arsenic at work. Some compounds, including arsenic trichloride, can be inhaled as a vapor; – Swallow **(ingest)** food, drink, cosmetics such as lip balm, sweat and other substances that become contaminated from contact with inorganic arsenic at work. Inorganic arsenic particles brought home on your clothes, shoes, or body can be inhaled or ingested by household members. Some inorganic arsenic compounds enter your body when **eye or skin contact** occurs. Arsenic trichloride is one example of a compound that is readily **absorbed** through the eyes and skin.
What happens after inorganic arsenic enters my body?
Once inorganic arsenic enters your body, some of it is changed into a less harmful organic form by the liver. Both the organic and inorganic forms leave your body in urine. Most of the arsenic will be gone within several days, although some will remain in your body for several months and even longer.
Why is medical monitoring necessary?
Although exposure to inorganic arsenic is associated with various health effects, the most serious health effects are **lung and skin cancer.** The medical monitoring requirements in this chapter are established to minimize your risk for these diseases. To learn more about the medical monitoring process, see Medical evaluation, WAC 296-848-30030.

What health effects and symptoms are linked with exposure to inorganic arsenic?

Exposure to inorganic arsenic is associated with various health effects ranging from **temporary local** effects such as skin irritation to **lasting systematic** effects due to gradual (chronic) or sudden (acute) poisoning. Such effects should not occur if the requirements in this chapter are followed.

Skin Health Effects:

Arsenic trioxide, arsenic trichloride, and other trivalent compounds can cause **skin irritation** from direct contact.

- The following moist mucous membranes are most sensitive to irritation:
  - Eye and inner eyelid (conjunctiva);
  - Linings inside the nose, mouth, and respiratory system.
- Other sites most vulnerable irritation also include:
  - Eyelids;
  - Angles (the space between 2 planes) of the ears, nose, and mouth;
  - Moist and macerated (softened by moisture) areas of skin;
  - Wrists;
  - Genitalia, if personal hygiene is poor.

Inorganic arsenic is also capable of causing keratoses **(small corns or warts),** especially on palms and soles.

Trivalent arsenic compounds are **corrosive** to skin:

- Brief contact won't cause irritation, but prolonged contact causes localized engorgement (hyperemia) which later forms vesicular (blister-like) or pustular (pimple-like) eruptions.
- Exposure can create perforations (holes) in the nasal septum (the tissue dividing the nasal cavity in half).

Arsenic trioxide and arsenic pentoxide exposure have been linked to **skin sensitization** (acquired sensitivity or allergy) **and contact dermatitis** (inflammation due to allergic or irritant reaction).

Acute Poisoning Effects:

Acute poisoning is usually linked to ingestion, not inhalation, of inorganic arsenic. Cases of acute poisoning **rarely** occur in occupational settings and inhalation-related cases are exceedingly rare.

When acute poisoning is due to **ingestion,** the following gastrointestinal symptoms develop within 1/2 to 4 hours:

- Tightening (constriction) of the throat followed by difficulty or inability to swallow (dysphagia), pain in the region above the belly button (epigastric pain), vomiting, and watery diarrhea. Blood may appear in vomit and stools;
- Shock may develop due to severe fluid loss when the amount of inorganic arsenic swallowed is sufficiently high. Death can occur in 24 hours.

When acute poisoning is due to inhalation:

- The following symptoms develop first:
  - Cough;
  - Chest pain;

- Shortness of breath (dyspnea);
- Giddiness;
- Headache;
- Extreme general weakness.

– Gastrointestinal symptoms will follow.

Chronic Poisoning Effects:

Cases of chronic poisoning caused by **ingestion** are also rare. Symptoms are:

– Weight loss;
– Nausea and diarrhea alternating with constipation;
– Skin pigmentation and eruptions;
– Hair loss;
– Numbness in hands and feet, "pins and needles" sensation, muscle weakness, and other symptoms resulting from peripheral neuritis;
– Horizontal white lines (striations) on fingernails and toenails.

Inhalation of inorganic arsenic is the most common cause of chronic poisoning in occupational settings. Symptoms associated with this condition are divided into 3 phases.

– 1st phase, earliest symptoms:
  - Weakness;
  - Loss of appetite;
  - Some nausea;
  - Occasional vomiting;
  - Sense of heaviness in the stomach;
  - Some diarrhea.
– 2nd phase symptoms:
  - Inflammation of the eyes and inner eyelid (conjunctivitis);
  - Inflammation, accompanied by an abundant discharge from mucous membranes (a catarrhal state) of the nose, larynx, and respiratory passage;
  - Symptoms associated with the common cold (Coryza), hoarseness, and mild tracheobronchitis may occur;
  - Skin lesions are common (eczematoid and allergic in type). Perforations (holes) in the nasal septum (the tissue dividing the nasal cavity in half) are the most typical lesions of the upper respiratory tract.
– 3rd phase symptoms (related to peripheral neuritis):
  - Numbness in hands and feet, "pins and needles" sensation, muscle weakness.
  - In severe cases, motor paralyses occur: Initially affecting the toe extensors and the peronei (outer portion of the lower leg).
  - "Wrist drop" or "foot drop" (resulting from paralysis of flexor muscles of feet and hands) **only occurs in the most severe cases.**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. WSR 18-22-116, § 296-848-60010, filed 11/6/18, effective

12/7/18; WSR 07-03-153, § 296-848-60010, filed 1/23/07, effective 6/1/07.]