

# Chemical Emergency Medical Guideline

Information and recommendations for first responders and patients

## Sulfur dioxide

CAS No.: 7446-09-5

GHS symbols:



**GHS05**  
Corrosive



**GHS06**  
Acute toxicity

**Signal word: Danger**

**Hazard statements:**

- H314 Causes severe skin burns and serious eye damage.  
H331 Toxic if inhaled.

### Overview

- Before the first aider approaches a patient, they must ensure that there is no danger to themselves from sulfur dioxide.
- There is no danger from contact with patients who have only been exposed to sulfur dioxide gas. However, a patient who is wet with liquid sulfur dioxide (boiling point  $-10^{\circ}\text{C}$ ) or whose clothing is wet with it may endanger other people through direct contact or through sulfur dioxide gas escaping.
- Sulfur dioxide has a strong corrosive effect on moist skin, the eyes and the upper respiratory tract, causing eye irritation, coughing, chest pain and breathing difficulties. Laryngeal spasms and signs of fluid accumulation in the lungs (shortness of breath, blue-red discoloration of the skin, lips and mucous membranes, sputum, coughing) may occur.
- There is no known specific antidote. Treatment depends on the extent of exposure and the symptoms.

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## 1. Information about the substance

Sulfur dioxide (SO<sub>2</sub>), CAS 7446-09-5

Synonyms: sulfurous acid anhydride

At room temperature, sulfur dioxide is a colorless, non-flammable gas with a sharp, pungent, sulfurous odor. Under pressure or at temperatures below -10°C, it is a clear liquid. Sulfur dioxide is water-soluble and forms sulfurous acid (H<sub>2</sub>SO<sub>3</sub>). Sulfur dioxide is used in metalworking, in the manufacture of chemicals, in wood processing and paper production, in the extraction of lubricants, as a preservative, disinfectant, reducing agent, antioxidant in magnesium extraction, bleaching agent, fungicide, insecticide and as a preservative and additive in foodstuffs.

## 2. Exposition

### 2.1. Inhalation

Inhalation is the main route of exposure to sulfur dioxide. The smell of sulfur dioxide has a clear warning effect. However, chronic exposure to low concentrations can lead to a dulling of the sense of smell and a reduction in irritation. Asthmatics may also react to concentrations below the odor threshold. As sulfur dioxide is heavier than air, there is a risk of suffocation in poorly ventilated, low-lying or enclosed spaces.

### 2.2. Skin/eye contact

Exposure of wet or damp skin or eyes to liquid sulfur dioxide or gas causes severe chemical burns with ulceration and scabbing.

### 2.3. Ingestion

Ingestion of sulfur dioxide is unlikely as it is a gas at room temperature.

## 3. Acute health effects

Sulfur dioxide gas causes irritation of the eyes and upper respiratory tract (throat irritation, coughing) and asthmatic symptoms. At high concentrations, it can quickly lead to breathing difficulties with chest pain, shortness of breath, laryngeal spasms and fluid accumulation in the lungs. The symptoms may increase over time. In the event of massive exposure, respiratory and cardiovascular failure is possible.

If the skin is wet or damp, contact with gaseous sulfur dioxide can cause skin irritation or redness. Contact with pressurized liquid sulfur dioxide may result in frostbite.

Low gas concentrations can cause eye irritation with burning, redness, tearing and eyelid closure. Contact with higher concentrations or liquid sulfur dioxide can cause clouding of the eye surface and subsequent permanent eye damage.

A single, short-term exposure to low concentrations of sulfur dioxide gas, from which the affected person recovers quickly, does not normally cause delayed or lasting damage to health. After inhaling relevant amounts of sulfur dioxide, permanent respiratory disorders and increased susceptibility to lung infections have been reported.

## 4. Measures

### 4.1. Self-protection of first responders

If there is a suspicion that the area the helper must enter contains sulfur dioxide, a self-contained breathing apparatus and a chemical protection suit must be worn. Contaminated equipment should not be used.

There is no danger from contact with patients who have only been exposed to sulfur dioxide gas. Patients who are wet with liquid sulfur dioxide or whose clothing is wet with liquid sulfur dioxide may endanger other people through direct contact or through sulfur dioxide gas emissions.

#### 4.2. Rescue

Patients should be removed from the danger zone immediately. If they are unable to walk unaided, they should be removed from the danger zone quickly using appropriate means, taking care to protect themselves. The "A, B, C procedure" has absolute priority in this case.

- A) Clear the airways** (check for blockages caused by the tongue or foreign objects)
- B) Ventilation** (check the patient's breathing, if necessary, begin ventilation with adequate self-protection, e.g. breathing mask)
- C) Circulation** (begin resuscitation for any person who does not respond to verbal commands and is not breathing normally)

#### 4.3. Cleaning

Patients who have only been exposed to gaseous sulfur dioxide and show no signs of skin or eye irritation do not require any special cleaning measures, unlike all others.

If possible, patients should assist in their own decontamination. If liquid sulfur dioxide has been exposed and clothing is contaminated, it must be removed and securely wrapped.

Rinse affected skin and hair with water for at least 15 minutes. Protect eyes while rinsing. Continue other important first aid measures during this time.

If the eyes have been exposed to sulfur dioxide or if there is eye irritation, rinse with water or neutral saline solution for 15 minutes. Remove any contact lenses, if possible, without causing additional danger to the eye. Continue other important first aid measures during this time.

#### 4.4. Further measures

Anyone who may have been exposed to sulfur dioxide should seek medical attention immediately.

#### 4.5. Instructions for further rules of conduct

Consult your family doctor or the emergency department of the nearest hospital if any abnormalities or symptoms occur within the next 24 hours, in particular:

- Coughing, wheezing or whistling breath
- Difficulty breathing or shortness of breath
- Increased pain or abnormalities in the affected skin areas or eyes
- Pain or tightness in the chest

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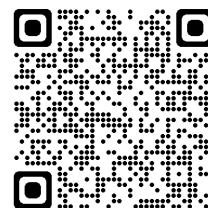
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