
Information and recommendations for first responders

- Before approaching the patient, the first responder must make sure that he does not risk exposing himself to cholinesterase-inhibiting chemicals.
 - Patients whose vomits, skin or clothing is contaminated with cholinesterase-inhibiting chemical may secondarily contaminate rescue and medical personnel.
 - Severe cholinesterase-inhibiting chemical poisoning may lead to death within minutes. Given reason to believe that cholinesterase-inhibiting chemical is present, there are many symptoms and signs with a large range of severity such as vomiting, diarrhea, excessive secretions, sweating, shortness of breath, tremor, weakness, headache, confusion, or coma to suggest the diagnosis.
 - If the patient has symptoms suggestive of cholinesterase-inhibiting chemical poisoning, secure the airway and administer 100% oxygen. Obtain the appropriate antidote, atropine, and prepare it for use.
-

1. Substance information

Cholinesterase-inhibiting chemicals, such as terbufos (COUNTER), phorate (THIMET), dimethoate (CYGON), temephos (ABATE), carbaryl. Synonyms: Anti-cholinesterase pesticides; **organophosphate** and N-methyl carbamate insecticides.

These chemicals are the most widely used insecticides available today. All apparently share a common mechanism of cholinesterase inhibition and can cause similar acute symptoms. However, there is a wide range of potency among these agents and there may be some differences in toxicity and management. Thus, identification of the specific agent or of the general class of agent is quite important.

2. Routes of exposure

Inhalation

Cholinesterase-inhibiting chemicals are efficiently absorbed via the lung.

Skin/eye contact

Cholinesterase-inhibiting chemicals are absorbed through skin or mucous membranes.

Ingestion

Cholinesterase-inhibiting chemicals are absorbed from the gastrointestinal tract.

3. Acute health effects

Onset of symptoms may occur in minutes or be delayed up to 12 hours. While low-level exposures may cause biochemical effects without producing symptoms, mild poisoning typically results in a normal level of consciousness and a small increase in secretions such as saliva, tears, nasal discharge, and phlegm. Classic first-onset symptoms can be remembered by the acronym "SLUDGE": salivation, lacrimation, urination, diarrhea, gastrointestinal distress, and emesis. Some other presenting symptoms include nausea, sweating, and a tight chest. Pupillary constriction is a characteristic sign, but its absence does not exclude the diagnosis, and enlargement may be seen early on. Severe poisoning includes an altered state of consciousness, heavy secretions and sweating, abnormal pupillary size, weakness and muscle twitching, chest pain, and shortness of breath. Life-threatening poisoning includes coma, seizures, massive secretions, cyanosis, pulmonary edema, and respiratory failure. Death can result if treatment is not begun rapidly.

4. Actions

Rescuer self-protection

If the zone that has to be entered by the rescuer is suspected of containing cholinesterase-inhibiting chemical, the person should avoid direct contact with contaminated clothing, skin and vomitus of victims as well as surfaces that may be contaminated themselves. Wear neoprene or nitrile gloves/rubber boots and chemical-protective clothing. Vinyl or leather gloves provide no protection.

Respiratory protection is necessary for emergency responders as toxic effects can occur after inhalation of the cholinesterase-inhibiting chemical. Depending on the extent of the contamination, level B protection (i.e., supplied air respirator or self-contained) should be considered. Patients whose skin or clothing is contaminated with materials containing cholinesterase-inhibiting chemical may secondarily contaminate rescue and medical personnel by direct contact. Note: inside surfaces of gloves, boots, and headgear can become contaminated. Equipment can become contaminated.

Patient recovery

Patients should be removed from the contaminated zone immediately. Patients who are unable to walk may be removed on backboards or stretchers; if these are not available, carefully remove/transport patients with appropriate action to a safe zone, taking into account your self-protection

Immediate priorities must follow the "A, B, C's" of resuscitation:

- A) Airway** (make sure the airway is not blocked by the tongue or by a foreign body)
- B) Breathing** (check to see if the patient is breathing, provide ventilation with use of appropriate barrier devices, e.g. with a pocket face mask, if breathing is absent)
- C) Circulation** (start CPR in any unresponsive person with absent or abnormal breathing)

Initial Treatment

Speed is critical. For symptomatic patients, secure an airway and provide 100% oxygen. Prepare the specific antidote, atropine, if within professional scope of practice. Tissue oxygenation should be improved as much as possible before administering atropine, so as to minimize the risk of arrhythmia. Treatment should be given simultaneously with decontamination procedures in severe cases.

In case of ingestion **do not induce emesis.**

Decontamination

All patients with suspected exposure to material containing cholinesterase-inhibiting chemical require decontamination. Patients who are able and cooperative may assist with their own decontamination. **Rapidly remove and double-bag (in plastic bags) contaminated clothing while flushing exposed skin and hair with water for 2-3 minutes.** Gently wash skin and hair with soap or mild dishwashing liquid and water.

Contaminated clothing is to be laundered separately before reusing. Contaminated leather such as shoes, belts, or wallets should be discarded.

Irrigate exposed or irritated eyes with plain water or saline for 5 minutes. Continue eye irrigation during other basic care or transport. Remove contact lenses if present and easily removable without additional trauma to the eye. Protect eyes during flushing of skin and hair.

Further actions

Each possibly exposed person should seek immediate medical advice and treatment. In case of emesis, save a sample of vomitus for laboratory analysis adhering to the techniques required for accuracy.

In this document BASF has made a diligent effort to ensure the accuracy and currency of the information presented but makes no claim that the document comprehensively addresses all possible situations related to this topic. This document is intended as an additional resource for first responders in assessing the condition and managing the treatment of patients exposed to cholinesterase-inhibiting chemicals. It is not, however, a substitute for the judgement of a first responder and must be interpreted in the light of specific information regarding the patient available to such a first responder and in conjunction with other sources of authority.

BASF SE
Corporate Health Management
Carl-Bosch-Straße 38
67056 Ludwigshafen
Germany

BASF Corporation
Medical Department
100 Campus Drive, M/S F 221
Florham Park, NJ 07932
USA