
Information and recommendations for patients

- Patients whose clothing or skin is contaminated with nitrogen dioxide can cause secondary contamination of rescue and medical personnel by direct contact or through its vapor.
 - Nitrogen dioxide and its vapor are rapidly corrosive when they come in contact with tissues such as the eyes, skin, and upper respiratory tract causing irritation, burns, coughing, chest pain and dyspnea. Swelling of the throat and accumulation of fluid in the lungs (shortness of breath, cyanosis, expectoration, cough) may occur.
 - Ingestion of nitrogen dioxide can cause severe corrosive injury to the lips, mouth, throat, esophagus, and stomach.
 - There is no antidote to be administered to counteract the effects of nitrogen dioxide. Treatment consists of supportive measures.
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Substance information

Nitrogen dioxide (NO₂), CAS 10102-44-0

Synonyms: dinitrogen tetroxide, nitrogen peroxide, and NTO.

Nitrogen dioxide is a colorless to yellow liquid at room temperature. Above 21°C (70°F) it is a gas. The concentrated gas has a dark violet to black color; when rarefied it becomes reddish-brown to yellow. Nitrogen dioxide has an irritating sharp odor at concentrations of 1-5 ppm. Upon contact with water it forms nitric acid. Nitrogen dioxide itself is nonflammable, but it can increase the flammability or cause the spontaneous combustion of other materials.

Nitrogen dioxide is formed naturally when fossil fuels like coal, oil or gas are burned and when stored grain ferments in storage silos. It is also part of airborne smog. Nitrogen dioxide is released in the reaction between nitric acid and any organic material. It is also formed whenever nitric acid acts upon metals, as in bright dipping, pickling, and etching.

What immediate health effects can result from exposure to nitrogen dioxide?

Exposure to small amounts of vapor usually causes eye, nose, and throat irritation with tearing of the eyes, sore throat and coughing. Extended exposure can cause severe breathing difficulty, which may lead to chemical pneumonia and death. Deep burns of the skin and mucous membranes may be caused by contact with liquid nitrogen dioxide; sometimes yellowing of the skin results. Severe eye burns with clouding of the surface, perforation of the globe, and ensuing blindness may occur from exposure to nitrogen dioxide.

Are any future health effects likely to occur?

A single small exposure from which a person recovers quickly is not likely to cause delayed or long-term effects. Some people who have had serious inhalation exposures have developed permanent breathing difficulty and tended to develop lung infections easily.

Follow-up instructions

Keep this page and take it with you to your next appointment. Follow only the instructions checked below.

- () Call your doctor or the Emergency Department if you develop any unusual signs or symptoms within the next 24 hours, especially:
 - coughing or wheezing
 - difficulty breathing or shortness of breath
 - increased pain or a discharge from exposed skin or eyes
 - chest pain or tightness
- () No follow-up appointment is necessary unless you develop any of the symptoms listed above.
- () Call for an appointment with Dr. _____ in the practice of _____
When you call for your appointment, please say that you were treated in the Emergency Department at _____ Hospital by _____
and were advised to be seen again in _____ days.
- () Return to the Emergency Department/ _____ Clinic on _____
(date) at _____ am/pm for a follow-up examination.
- () Do not perform vigorous physical activities for 1 to 2 days.
- () You may resume everyday activities including driving and operating machinery.
- () Do not return to work for _____ days.
- () You may return to work on a limited basis. See instructions below.
- () Avoid exposure to cigarette smoke for 72 hours; smoke may worsen the condition of your lungs.
- () Avoid drinking alcoholic beverages; alcohol may worsen your clinical conditions.
- () Avoid taking the following medications: _____

- () You may continue taking the following medication(s) that your doctor(s) prescribed for you: _____

- () Other instructions: _____

Signature of patient _____ Date _____
Signature of physician _____ Date _____

References

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