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**CDC HEALTH ADVISORY**

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## **Hurricane Florence—Clinical Guidance for Carbon Monoxide (CO) Poisoning**

### **Summary**

The Centers for Disease Control and Prevention (CDC) is reminding clinicians seeing patients from the areas affected by Hurricane Florence to maintain a high index of suspicion for CO poisoning. Other people who may be exposed to the same CO source may need to be identified and assessed.

The signs and symptoms of CO exposure are variable and nonspecific. A tension-type headache is the most common symptom of mild CO poisoning. Other symptoms may include dizziness, flu-like symptoms (e.g., weakness, nausea, vomiting, fatigue) without a fever, drowsiness, chest pain, and altered mental status.

Clinical manifestations of severe CO poisoning include tachycardia, tachypnea, hypotension, metabolic acidosis, dysrhythmias, myocardial ischemia or infarction, noncardiogenic pulmonary edema, neurologic findings including irritability, impaired memory, cognitive and sensory disturbances, ataxia, altered or loss of consciousness, seizures, coma, and death, although any organ system might be involved.

Although CO poisoning can be fatal to anyone, children, pregnant women, the unborn, persons with sickle cell disease, older adults, and persons with chronic illness (e.g., heart or lung disease) are particularly vulnerable.

### **Background**

High winds and heavy rain from Hurricane Florence began affecting the southeastern U.S. around September 12, 2018. Impact on the southeast coast and inland led to thousands of people without power. Those without power may turn to alternate power sources such as gasoline generators and may use propane or charcoal grills for cooking. If used or placed improperly, these sources can lead to CO build up inside buildings, garages, or campers and poison the people and animals inside.

With a focused history of patient activities and health symptoms, exposure to a CO source may become apparent. Appropriate and prompt diagnostic testing and treatment are crucial to reduce morbidity and prevent mortality from CO poisoning. Identifying and mitigating the CO source is critical in preventing other poisoning cases.

### **Recommendations for Clinicians**

- 1) Consider CO poisoning in patients affected by Hurricane Florence, particularly those in areas currently without power. Assess symptoms and recent patient activities that point to likely CO exposure. Evaluation should also include examination for other conditions, including smoke inhalation, trauma, medical illness, or intoxication.
- 2) Administer 100% oxygen until the patient is symptom-free or until a diagnosis of CO poisoning has been ruled out.
- 3) Perform COHgb testing when CO poisoning is suspected. Venous or arterial blood may be used for testing. A fingertip pulse multiple wavelength spectrophotometer, or CO-oximeter, can be used to

measure heart rate, oxygen saturation, and COHgb levels in the field, but any suspicion of CO poisoning should be confirmed with a COHgb level by multiple wavelength spectrophotometer (CO-oximeter). A conventional two-wavelength pulse oximeter is not accurate when COHgb is present. For more information, see [https://www.cdc.gov/disasters/co\\_guidance.html](https://www.cdc.gov/disasters/co_guidance.html).

- 4) An elevated carboxyhemoglobin (COHgb) level of 2% or higher for non-smokers and 9% or higher COHgb level for smokers strongly supports a diagnosis of CO poisoning. The COHgb level must be interpreted in light of the patient's exposure history and length of time away from CO exposure, as levels gradually fall once the patient is removed from the exposure. In addition, carbon monoxide can be produced endogenously as a by-product of heme metabolism. Patients with sickle cell disease can have an elevated COHgb level as a result of hemolytic anemia or hemolysis. For additional information about interpretation of COHgb levels, visit [https://www.cdc.gov/disasters/co\\_guidance.html](https://www.cdc.gov/disasters/co_guidance.html) or call Poison Control at (800) 222-1222.
- 5) Hyperbaric oxygen therapy (HBO) should be considered in consultation with a toxicologist, hyperbaric oxygen facility, or Poison Control Center (800 222-1222). For additional management considerations, consult a toxicologist, Poison Control at (800) 222-1222, or a hyperbaric oxygen facility.
- 6) Be aware that CO exposure may be ongoing for others spending time in or near the same environment as the patient. These individuals should be evaluated and tested as described in this advisory.
- 7) Clinicians treating people for CO poisoning should notify emergency medical services (EMS), the fire department, or law enforcement to investigate and mitigate the source and advise people when it is safe to return.
- 8) Advise patients about safe practices related to generators, grills, camp stoves, or other gasoline, propane, natural gas, or charcoal-burning devices. Stress that that these devices should never be used inside an enclosed space, home, basement, garage, or camper — or even outside near an open window or window air conditioner. Please see <https://www.cdc.gov/co/pdfs/generators.pdf>.

## For More Information

Clinical Guidance for Carbon Monoxide (CO) Poisoning After a Disaster  
[https://www.cdc.gov/disasters/co\\_guidance.html](https://www.cdc.gov/disasters/co_guidance.html)

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