

October 25, 2024

Roofing Project at Elkins Middle School Prompts Precautionary Measures Following Odor and Student Symptoms

On October 24, 2024, Elkins Middle School (EMS) experienced a temporary disruption due to a strong odor from adhesive glue associated with an ongoing roofing replacement project. Around 11:00 a.m., the smell affected several classrooms, and by 11:30 a.m., some classes had relocated to other parts of the building as a precautionary measure. The administration quickly began investigating the odor, which was later believed to have been caused by an open bucket of non-toxic adhesive glue. The adhesive was later tested by poison control, who determined that it was not a cause of the elevated carbon monoxide levels.

The school nurse assessed students who reported not feeling well during the incident while the school staff made efforts to ventilate the affected areas. At approximately 3:00 p.m., the hospital contacted the Elkins Fire Department and called the school after local hospital staff reported two students exhibiting signs of elevated carbon monoxide (CO) levels. The fire department, along with the local gas company, inspected the building and found that carbon monoxide levels were within normal safety ranges established by recognized safety organizations:

National Institute for Occupational Safety and Health (NIOSH): 35 parts per million (ppm) averaged over 8 hours

Occupational Safety and Health Administration (OSHA): 50 ppm averaged over 8 hours

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) and World Health Organization (WHO): 9 ppm averaged over 8 hours.

All readings at the school remained below the ASHRAE/WHO standards throughout the inspection.

As additional students began seeking medical evaluation at local emergency rooms, school officials convened with emergency management personnel, hospital staff, and the fire department for a review. A second inspection was conducted at 6:00 p.m., confirming that no elevated CO levels were detected in the building. However, out of caution, Randolph County Schools decided to close the school on Friday, October 25, to allow for further investigation as more students continued to report symptoms.

On the morning of October 25, the Fire Marshal, an HVAC specialist from the West Virginia Department of Education, the Elkins Fire Department, and school officials thoroughly inspected the facility. A kitchen appliance was found to be operating outside of standard safety protocols; however, it was contained within the kitchen's venting system. The unit was promptly taken offline for repair, and no elevated carbon monoxide levels were detected within the kitchen area or in the remainder of the school.

Randolph County Schools has installed additional carbon monoxide detectors throughout Elkins Middle School to further enhance safety measures. These detectors will supplement the existing detection system by providing more comprehensive coverage of the school's facilities as students return to class on Monday, October 28, 2024.

Understanding Carbon Monoxide and Health Impacts

Carbon monoxide (CO) is a tasteless, odorless, nonirritating, and colorless gas that poses health risks at elevated levels. The primary source of CO is the combustion of fuels, and environmental exposure can occur in various settings:

Traveling in motor vehicles can result in CO exposure levels ranging from 9-25 ppm, occasionally reaching up to 35 ppm.

Urban locations with heavy traffic can produce CO levels up to 50 ppm.

Domestic activities, such as cooking and heating with gas, kerosene, coal, or wood, can elevate CO levels up to 30 ppm.

Exposure may also occur through environmental tobacco smoke or in fires.

Naturally, the human body produces small amounts of CO during normal metabolism, leading to background levels of carboxyhemoglobin (COHb) in the blood at around 0.5-0.8%. However, smokers can have significantly higher COHb levels, typically in the range of 3-8%, due to the additional exposure from smoking.

Guidelines for Children's Exposure to CO

Carboxyhemoglobin (COHb) levels in the blood are used to gauge CO exposure severity:

- 0-2% COHb: Normal range for non-smokers not exposed to elevated CO.
- 2-10% COHb: Mild symptoms, such as headache, dizziness, or fatigue, may occur.
- 10-20% COHb: More significant symptoms, including visual disturbances, weakness, and impaired coordination, may arise.
- 20-40% COHb: Risk of serious symptoms, including confusion, chest pain, shortness of breath, or loss of consciousness.
- Above 40% COHb: Life-threatening, with a risk of coma, seizures, and potentially fatal outcomes if untreated.¹

Randolph County Schools is dedicated to the safety and well-being of all students and staff. The district will continue to closely monitor the situation and implement any additional measures needed to ensure a safe and healthy learning environment. We encourage anyone experiencing symptoms to seek medical attention promptly.

For more information, please contact Randolph County Schools at 304-636-9150.

¹ See "Goldfrank's Toxicologic Emergencies," 11th ed., and "Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose," 4th ed., for detailed discussions on CO exposure. Additional information on symptoms and treatment recommendations can be found in the American College of Emergency Physicians (ACEP) guidelines and resources provided by the Centers for Disease Control and Prevention (CDC). For studies on CO exposure and management, see "Annals of Emergency Medicine" and "Journal of Toxicology" articles discussing COHb levels and associated clinical presentations.