

Chemical Incidents in Schools: Are You Prepared for ‘Unplanned Experiments’?

- It was first period on a Friday morning when a student intentionally tossed a jar containing hydrochloric acid and other chemicals onto the entry way floor of the science classroom. Irritating acid vapors were released into the school and officials ordered the evacuation of over 100 students and staff.
- One Wednesday morning, a high school science teacher found his students playing with drops of quicksilver (mercury metal) which had come from a cracked lab barometer. The teacher notified the school nurse; the science lab and the adjacent classroom were promptly evacuated for about an hour.
- At 8:30 a.m. on a Thursday morning, a school maintenance employee poured liquid chemicals into the school swimming pool and failed to turn on the circulation pumps to mix the chemicals. Chlorine gas was released into the pool facility, injuring five people and causing the pool to be closed for the rest of the day.
- One Thursday morning in an elementary school, a heated water pipe for the air conditioning and heating system suddenly burst, and 1,600 gallons of an ethylene glycol-based fluid soaked into the carpet of several classrooms and half of a hallway. The children and staff were evacuated to another part of the school for two days. Access to the impacted area was restricted to reduce further exposures.

Unexpected chemical releases, whether in schools or elsewhere, rarely occur on a convenient day or time. From 1993 through 2004, the Texas Department of State Health Services, Texas Hazardous Substances Emergency Events Surveillance System (Texas HSEES) has documented thousands of hazardous chemical incidents that have affected the environments in and around industries, offices, roadways, homes, and schools. The consequences for these releases in schools can be great and may carry over to the home environment). Twenty-two documented school events, seven of which included mercury, have resulted in: 1) twenty-seven people (15 children and 12 adults) being injured; 2) more than 1,785 school occupants being evacuated; and 3) more than 137 hours of lost class time. Additional monetary costs and time lost in careful cleanup of these unexpected chemical events cannot be properly accounted as these types of incidents in schools are probably under-reported. This may be due, in part, to the small quantities of chemicals involved (for example the small amount of mercury in a thermometer).

The highlighted examples illustrate common factors that are often the underlying causes of chemical incidents and injuries in schools: improper chemical storage, unsafe handling practices, not following proper procedures, and equipment failure (i.e., broken containers, hoses, or pipes. The following strategies

and prevention practices may be considered and adopted by school administrators, safety specialists, and nurses to control many preventable chemical events.

Prepare Ahead to Prevent Chemical Incidents and Exposures

Identify where chemical health and safety incidents might occur on your school's campus:

store rooms	custodial closets	science and art classrooms
nurses' offices	kitchens	lawn care and maintenance buildings
motor pools (bus barns)	swimming pools	vocational and agricultural shops

Develop and Follow good chemical safety precautions like:

-Appropriate health and safety training and work practices for staff and students who use chemicals

Examples of preventive measures:

- Store hazardous chemicals securely, in well-ventilated and lit areas, and in tightly closed, properly labeled containers
- Avoid the combination of incompatible chemicals
- Avoid the use of flammable chemicals near open ignition sources
- Perform periodic maintenance checks on vessels and equipment that contain hazardous chemicals

-Campus-specific contingency plans and emergency procedures for staff and students, in the case of chemical events

Examples of preventive procedures:

- Practice evacuation and "shelter-in-place" drills with faculty and students
- Compile a chemical event notebook that might contain emergency checklists and phone contacts; chemical inventories; and material safety data sheets (MSDS)

-Policies and practices for chemical use and control on school grounds

Examples of preventive practices:

- Ensure that proper timing and ventilation practices are considered when chemicals like pesticides, paints, and floor strippers are applied
- Identify and properly dispose of waste or derelict chemicals that have been in storage for an unknown period of time
- Enforce policies on improper possession or use of chemicals when observed on school grounds; common items may include liquid mercury, pepper spray, or cans of spray paint
- Substitute equipment that does not use mercury when replacement purchases are made, like thermometers, blood pressure cuffs, or electrical equipment

For more information regarding Texas HSEES contact the DSHS Environmental and Injury Epidemiology and Toxicology Branch at 512-458-7269 or <http://www.dshs.state.tx.us/epitox/hsees.shtm>. For additional information and resource materials check the Environmental Protection Agency (EPA) Indoor Air Quality resources such as the EPA's Tools for Schools Kit website at <http://www.epa.gov/iaq/schools/tools4s2.html>.