Ten Non-Chemical Lab Hazards and What They Do to You!

By Megan Cartwright - 11th August, 2014

Your lab is full of non-chemical hazards that can explode, stab, kill, and – as if that wasn’t enough – bite. Here’s a list of those hazards to remind you why Environmental Health & Safety exists!

1. Centrifuges

Centrifuges are dangerous, especially when not cared for! An unmaintained ultracentrifuge imploded in an American lab in 2000. Pieces of the centrifuge destroyed the room and ricocheted into an unfortunate scientist (who survived, fortunately). Another American lab was damaged when metal and rotor parts sprayed from an ultracentrifuge; it turned out that someone had loaded the wrong rotor.

Protect yourself (and your samples) with these guidelines on centrifuge safety from the University of Massachusetts.

2. Cryogenic liquids

These incredibly cold liquids can flash-freeze equipment and body tissue with direct contact. Even indirect contact can harm: a scientist suffered second-degree burns when she tried to shut off the flow valve on a liquid nitrogen dewar with her bare hand.

As if the cold wasn’t enough, cryogenic liquids expand quickly as they convert from liquid to gas. An unfortunate scientist re-learned this lesson when a rapidly pressurizing dewar shot its cap into his forehead (he survived).

Both of these scientists could have benefited from reading the University of Rochester’s advice for the safe handling of cryogenic liquids!

3. Compressed gases

Compressed gases are stored at pressures as high as 6000 psi – just compare that to a car tire inflated at 35 psi! If a gas cylinder’s valve breaks or shears off, the sudden pressure release can propel the cylinder through walls.

Gases are often hazardous in other ways, such as flammable hydrogen, oxidizing oxygen, or cryogenic helium. But even if the gas is inert like argon, it can still displace oxygen from a room and asphyxiate the unwary.

Keep yourself safe by reading these guidelines for compressed gases from Carnegie Mellon University (or this quick guide to safe gas handling from the University of Florida).

4. Glassware
Like many familiar, common hazards, it’s easy to forget how dangerous glassware can be. When broken, the sharp edges and hard-to-see slivers can cut like knives, as multiple scientists at Lawrence Berkeley National Laboratory learned. Glass shards are extra dangerous if they were in contact with a hazardous chemical. Furthermore, glassware can potentially burn you – a hot flask looks like a room-temperature flask!

Stay safe with these guidelines on preventing glassware cuts from the University of North Carolina.

5. **Needles and glass capillaries**

As if broken glassware wasn’t enough, researchers work with needles designed to stab! More than half a million needlesticks occur annually in the U.S. alone. But it’s not just researchers who are at risk: custodians may also get jabbed if researchers don’t dispose sharps properly. Getting jabbed is bad enough, but needles pose an extra hazard when loaded with blood, chemicals, and infectious agents!

Fortunately, Stony Brook University offers advice for handling sharps (as does the Centers for Disease Control with this short pamphlet on sharps safety).

6. **Mice**

They’re tiny, cute, and common, but mice pack sharp little teeth, allergens, and even zoonotic diseases like leptospirosis! Researchers can develop allergies to these furry animals’ hair, urine, and dander. Even worse, the longer you work with mice, the more likely you are to develop an allergy.

Fortunately, the U.S.’s Occupational Safety & Health Administration offers advice on safely working with small animals.

7. **Infection**

Leptospirosis from mice isn’t the only infection threatening researchers; many also work directly on infectious agents. By the late 1990’s, more than 5,000 lab staff in the U.S. alone had developed lab-associated infections from nasty species like *Mycobacterium tuberculosis* and *Cryptosporidium*, and viruses like hepatitis C.

Frighteningly, only a few infections were clearly linked to an incident (e.g., needlestick). Furthermore, almost 60% of cases involved research personnel, not clinical lab personnel!

The Centers for Disease Control, fortunately, provides guidelines on how to keep you safe from infection.

8. **Ultraviolet light**

That beautiful purple glow sterilizing your flow hood and lighting up your electrophoresis gels is dangerous!

Ultraviolet (UV) radiation can harm the eyes and skin, causing sunburns, cataracts, and even cancer. It’s easy to grab a face shield that doesn’t protect from UV if you’re not careful, as one sunburned Arizona
The UV lamps in flow hoods are dangerous, too, as one too-clever scientist discovered when they tried to use a hood’s UV instead of a transilluminator!

Fortunately, you can keep your skin and eyes healthy with these guidelines on protection against UV radiation from Tufts University.

9. Heavy objects

Researchers can hurt their backs lifting heavy objects like centrifuge rotors, animal feed bags, and gas cylinders. But these heavy objects can cause more than strains: one unfortunate grad student at Lawrence Berkeley National Laboratory suffered broken bones when a heavy gas cylinder rolled over their foot.

Protect your feet (and back) with these tips for safe lifting from Texas A&M University.

10. Autoclaves

Between their high pressure, boiling water, and scalding steam, autoclaves present quite a danger.

Researchers have been scalded from hot water and steam. But that pressure can be even more dangerous: an exploding autoclave actually shot its cover into a wall. Fortunately, nobody was in the room when the autoclave blew out racks of glass tubes and used needles waiting for sterilization!

Keep yourself safe – and your autoclave functioning – with these tips for autoclave maintenance and safety from Iowa State University.

Hopefully, this list has reminded you to be cautious around the lab! For more lab terrors, check out previous articles on dangerous lab chemicals and even more dangerous lab chemicals.

References