STANDARD DEVIATIONS: Packing Parachutes Efficiently (PPE)

Click the image above to play this short introduction.

Greetings,

It took me about ten seconds watching this to start thinking about how I could use it as a cautionary tale. It's just a classic metaphor for how our attention to safety is

- Common sense
- Taken for granted
- Easily under-appreciated
- Sometimes overlooked
- And pretty important

Our profession has inherent risks that we must mitigate every time we step into the lab. These risks come in different shapes, sizes and colors. The ways we handle risk come in different flavors as well.

Chemicals pose threats. Sharps pose threats. Hot plates, -80 freezers, dry ice and autoclaves pose threats. Biologicals pose threats. How do we protect personnel from these posers??

The best way to deal with risk in the laboratory is to put a "CLOSED" sign on the door, leave the lab, take a vacation and forget about them. That's elimination.

The next best option is to change them into something less dangerous. That's substitution.

The last best option is to cover our bodies with PPE. Yep, that's the **LAST** best option.

Of course, the first two choices are rarely available to us. The nature of our work puts us into proximity with danger and we can't just walk away. And since we work with unknowns, we can't just test something we know is safe.

So we're kind of stuck with PPE. Used properly, PPE provides a barrier and protection from temperature threats, chemicals, sharps, aerosols, and exposure to pathogens. We use everything from head covers to booties to protect our bodies. But **PPE is only as safe as our usage makes it**; and misuse or improper application puts us directly in harms' way.

Elimination is a tool you might not realize we use. Most reagents are pre-made products that have taken dangerous chemicals out of our hands. Biosafety cabinets and fume hoods are helping to isolate us from pathogens and noxious chemicals.

We utilize substitution too. Plastics have replaced glass. Microbiology can use look-alike organisms that mimic pathogens but lack certain traits (like plasmids). That's how they set up controls for their media, MALDI-TOF, and other tools. Chemists use reagents that perform like hazardous material but are inert (think toxicology standards).

But PPE? That line of defense is simply a barrier between you and something out to get you. The danger hasn't gone anywhere; we just hope it can't get past whatever we're using to fend it off.

Lab safety requires that our PPE works, that we use it properly and that it is sufficient for the purpose.

We must pay attention to PPE. It's our last (and often only) line of defense in a hostile environment. Remember when your Mom made sure you were bundled up before sending you out into the snow? That won't happen in the laboratory; you're a big kid, now. But we can, and should, watch out for each other and speak up when we notice breaches in PPE usage.

So buckle up properly for the task at hand, and make sure you, your coworkers, and staff are safe!

Have a great week and, yes, be safe,

Bryan

p.s. A primary reference for safety guidance in the field is found in this text: **Biosafety in Microbiological and Biomedical Laboratories** (5th ed.), affectionately known as the BMBL. And here is the BSL-2 guidance for PPE:

C. Safety Equipment (Primary Barriers and Personal Protective Equipment)

1. Properly maintained BSCs, other appropriate personal protective equipment, or other physical containment devices must be used whenever:

a) *Procedures with a potential for creating infectious aerosols or splashes are conducted. These may include pipetting, centrifuging, grinding, blending, shaking, mixing, sonicating, opening containers of infectious materials, inoculating animals intranasally, and harvesting infected tissues from animals or eggs.*
b) *High concentrations or large volumes of infectious agents are used. Such materials may be centrifuged in the open laboratory using sealed rotor heads or centrifuge safety cups.*

2. Protective laboratory coats, gowns, smocks, or uniforms designated for laboratory use must be worn while working with hazardous materials. Remove protective clothing before leaving for non-laboratory areas, e.g., cafeteria, library, and administrative offices). Dispose of protective clothing appropriately, or deposit it for laundering by the institution. It is recommended that laboratory clothing not be taken home.

3. Eye and face protection (goggles, mask, face shield or other splatter guard) is used for anticipated splashes or sprays of infectious or other hazardous materials when the microorganisms must be handled outside the BSC or containment device. Eye and face protection must be disposed of with other contaminated laboratory waste or decontaminated before reuse. Persons who wear contact lenses in laboratories should also wear eye protection.

4. Gloves must be worn to protect hands from exposure to hazardous materials. Glove selection should be based on an appropriate risk assessment. Alternatives to latex gloves should be available. Gloves must not be worn outside the laboratory. In addition, BSL-2 laboratory workers should:

a) *Change gloves when contaminated, glove integrity is compromised, or when otherwise necessary.*
b) *Remove gloves and wash hands when work with hazardous materials has been completed and before leaving the laboratory.*
c) *Do not wash or reuse disposable gloves. Dispose of used gloves with other contaminated laboratory waste. Hand washing protocols must be rigorously followed.*

5. Eye, face and respiratory protection should be used in rooms containing infected animals as determined by the risk assessment.