STANDARD DEVIATIONS: Handing it Over, and Over, and Over

Greetings,

Just like flu season, I'm back, and still talking about **Preparedness Month**! Last week I pushed the influenza vaccine as the Engineering Control we reach for first in preparation for influenza. I promised more and here it is. Today's missive is all about that little chore we handle several times each shift, hand hygiene.

Thousands of bacteria, and over a hundred species, reside on a person's hand at any given time.

It's hard to think of a safety practice we use more than keeping our mitts meticulously clean. Just look at how much of your work day is spent over the sink, scrubbing.

Healthcare acquired infections (HAI) are a growing concern, and hands are the most common source of pathogen propagation. We know, from surveillance, that up on your floors, people are moving bugs around from patient to patient. Everything from *Candida auris* to Rotavirus and all the other resistance-evolving organisms you're finding in the lab are being moved by someone's touch. Transmission of influenza virus is another major threat.

Let's face facts, it all flows downhill and ends up in the lab; and that just adds more risk to our work.

We know that clean hands make for healthier labs. We also know that what we handle gets all over those hands (well, hopefully gloves).

Soooooo. Are you good at washing your hands?

Sorry, it's a trick question. Because, of course you are (!); and yet….maybe not.

Dozens of studies point to problems and controversy:

- We don't wash very well (fingertips, thumbs and cuticles especially)
- We don't wash long enough
- We don't use soap (especially in the restroom!)
- We don't kill germs (antibacterial vs alcohols vs soaps)
- We get lazy and sloppy with our glove use
- Using hand sanitizer alone may be causing HAI

I am not going to tell you how to wash your hands (am including a link, though). I do want to discuss some basics.

Should I pick soap or an alcohol based hand rub (ABHR)?

Both! One is not a replacement for the other. They are to be used in conjunction with one another.

Alcohol based hand rubs are great engineering controls, **mostly**. These products are not very good against spores or inactivating certain kinds of germs, like *Cryptosporidium*, norovirus, and *C. difficile*. As long as the concentration of EtOH is at least 60%, these are pretty effective. But they have limitations, and influenza A is a big one. We see poor efficacy in situations where wet mucous surrounds the virus-laden droplet. Wet mucus has a protective effect and acts as a hydrogel protecting the virus from ethanol. Handwashing with soap and water is recommended in such circumstances.

How hot should the water be?

A lot of looking has gone into this. The temperature of the water does not appear to affect microbe removal; however, warmer water may cause more skin irritation and is more environmentally costly.

Does laboratory soap need to be "antimicrobial"?

Here's the CDC's take "…studies have shown that there is no added health benefit for consumers (this does not include professionals in the healthcare setting) using soaps containing antibacterial ingredients compared with using plain soap. As a result, FDA issued a final rule in September 2016 that 19 ingredients in common "antibacterial" soaps, including triclosan, were no more effective than non-antibacterial soap and water and thus these products are no longer able to be marketed to the general public. This rule does not affect hand sanitizers, wipes, or antibacterial products used in healthcare settings."

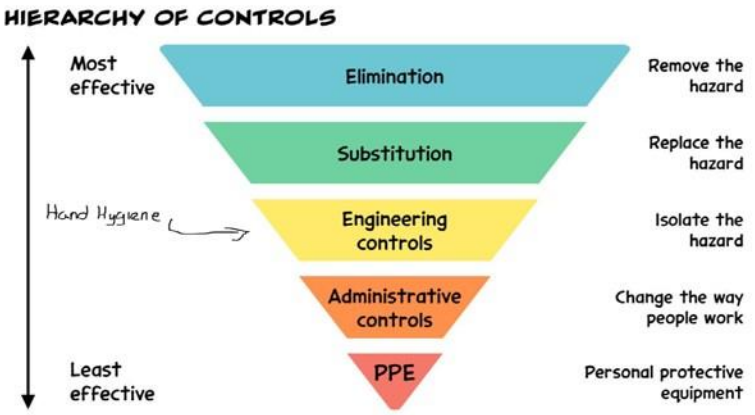
In the lab antimicrobial soaps are the right way to go. Outside the lab these products are not more beneficial than ordinary soaps and may contribute to resistance.

Interestingly, a recent publication by ASM notes that handwashing with just water is effective against influenza A. This is the Dilution Solution, but more effective than AHBR rubs.

What's the take-home message, Bryan?

Being prepared for the influenza season means practicing good hand hygiene. Contact infection is an important infection route because sputum acts like a biofilm to protect respiratory virus from our cleansers. Alcohol based hand rubs alone are not the right way to protect yourself. Good handwashing with soap and water and ABHRs is a vital defense against influenza A and pathogenic organisms in the lab.

What follows is the (yawn) Biosafety message. Again, I'm going to try and keep it short and sweet.



As healthcare professionals, we have an intimate relationship with these control measures; I don't need to beat an achy, coughing, feverish horse to death. Hand hygiene is an Engineering Control essential to mitigating risk from pathogenic organisms. But describing and thinking about these tools is another form of preparedness, an Administrative Control.

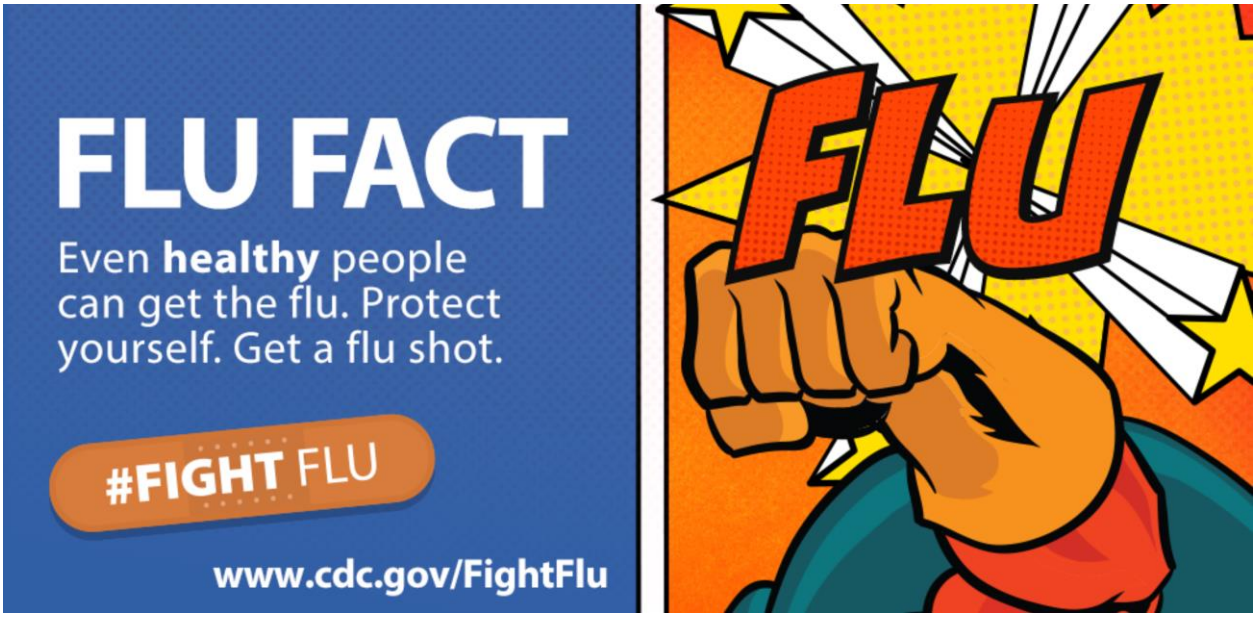
Healthcare worker infections are my concern. Studying biofilm effects and the lessons learned from outbreaks of Marburg, Lassa, MERS, SARS, Ebola, and , yes, influenza teach us that hands are vulnerable in our laboratory work environment. Handwashing is a weak link in the chain of infection control.

Infection control is everyone's concern. Hand hygiene plays a significant role in transmission and warrants our recognition.

Have a great week and be safe,

Bryan

p.s. A few of the Utah labs we visit have taken my Glo-Germ challenge, illuminating (that's a Glo-Germ pun) the difficulties and need for diligence in hand-washing technique. You can be next! And, here's that link for handwashing guidance: https://www.cdc.gov/handwashing/showme-the-science-handwashing.html



Vaccines and hands; we're two for three now! Stay tuned.