



# THE EDITOR'S DESK

## Science and Clinical Potpourri for Your Life and Your Practice

### How We Dress in the OR: Does It Lead to a Decrease in Surgical Site Infections (SSI)?

*J Am Coll Surg.* 2018;226:804-813.



Likely in the institution(s) where you work, policies exist regarding dress codes. Some are more stringent than others, but primarily directed at operating room attire. The variability from one institution to another has created as much confusion as rational, evidence-based applications, so a recent study compared outcomes in two institutions where formal policy changes were implemented that were intended to decrease SSI.

Using data from the National Surgical Quality Improvement Program, a database created by the American College of Surgeons, researchers did a before (9 months) and after outcome analysis to see if rigid dress code interventions had an effect. The findings to policymakers who are looking for a magic bullet were disappointing, as no effect was observed.

The genesis of SSI infections is complex, multifactorial in nature, and research reveals that anesthesia providers play an important role as vectors, due to our workplace behaviors. That said, it is unlikely that any singular invention, such as implementation of stringent dress

attire in the surgical environment, will have a broad impact. The worth of any implemented policy should be held to its effect on relevant outcomes, but also not be prematurely underestimated due to the possibility of it having an interactive effect on other interventions.

### A Vaccine for Lyme Disease?

*Vaccine*, Nov. 2015.



The French pharmaceutical company, Valneva, has completed a human trial of a vaccine for Lyme disease. Early reports suggest the vaccine may be >90% effective and may soon be available in the United States pending some additional work.

Ticks carry a wide range of pathogens, including viruses, bacteria, and protozoa. One particularly problematic disease which ticks can carry, is Lyme disease, a concern well appreciated to those who spend time in the outdoors. Lyme disease is one of the most common and widespread vector-borne illnesses in the Northern Hemisphere. After a tick bite, it typically manifests as an expanding area of redness on the skin, though about one in four people don't get a rash at all. Untreated or misdiagnosed, the disease can cause a variety of pathophysiological processes that in some cases can be catastrophically debilitating. The symptoms may abate, and even when the disease is diagnosed and (apparently) properly treated, in some cases they can resurface even months later.

The vaccine for Lyme disease works by stimulating the immune system to produce antibodies that attack the bacteria hiding inside the

insect. This prevents the organism from entering the human blood.

Valneva announced that the vaccine may become available for adults or children as young as 2 years. Following an initial dose, a booster dose is administered 13 months later, to enhance its effectiveness.

Valneva's effort has been costly to date, apparently in the range of \$350 million for research and development. These costs also include innovations that can help the company manufacture the vaccine at a reasonable cost. The vaccine candidate, VLA15, is currently the only active vaccine program in clinical development against Lyme disease. The program is being granted fast track designation by the US Food and Drug Administration (FDA).

Time will tell whether this is the real deal. Readers may recall that in 1998, the FDA approved LYMERix, a recombinant Lyme vaccine which was found to be effecting in nearly 80% of vaccine recipients. However, within 3 years of vaccine release, the manufacturer withdrew its product from the market due to fears of vaccine side-effects, and declining sales.

### Viruses Outnumber Bacteria in Human Microbiome?

*PLOS Biology.* Aug. 19, 2016.



We've heard a lot about our microbiome, in the context of the large number of bacteria (perhaps nearly 40 trillion) that inhabit us. Despite that number, which is rather difficult to get one's head around, it is actually viruses that are the most prolific based on new estimates by scientists

who study this sort of thing.

The more recent estimates place the number of viruses that constitute our microbiome somewhere in the vicinity of 380 trillion. This is not to imply that these are all dangerous types, rather these are in part, bacteriophages—the viruses that you likely learned about in your fundamental science courses that attach themselves and infect bacteria that they come into contact with. Collectively the viruses that inhabit us are referred to as our microbiome.

Until fairly recently not much attention was directed at these highly abundant constituents of our microbiome. Insight into their action, purpose, and consequence is only recently been given the attention that it should, with only their most basic features now coming to light.

Bacteriophages kill bacteria, in a most diabolical type of physiological craftiness, the “phages” (as they are generally referred to), take over the bacteria and cause the bacteria to make more phages rather than making more bacteria. When they have had their way with it, they burst out of the bacterium, destroying it. Phages exist not only in our body but on our skin awaiting the opportunity to encounter vulnerable bacteria, a kind of stalking-like behavior.

What actually is happening is that the phage enters the bacterium, inserts its own genetic material into the host, and this actually takes over the bacteria, causing the bacterium to literally become a factory to produce more of the very virus that has infected it.

Viruses have been found everywhere in the body. And these viruses like to “infect” others, so the very viruses that inhabit you, are likely now inhabiting those who you are physically close to, and vice versa.

We now realize that overuse of antibiotics can harm our “helpful” bacteria, sometimes with significantly adverse consequences. Killing off our

healthy bacterial can allow harmful bacterial to gain a foothold. It is clear that our bacterial microbiome plays a role in keeping us healthy.

How this all plays out with our virome, since they are essentially bacterial killers, determining what their role is in keeping us healthy seems a most worthy pursuit, and is the subject of ongoing research. One such avenue that is being pursued is using phages to treat antibiotic-resistant bacteria, interventions that are now termed “phage therapy.”

A lot here remains to be deciphered. So, stay tuned as our “virome” becomes better clarified.

### **Beware: The Lawnmower Is Not Without Its (Your) Risk!**

*Publ Health Rep.* Aug. 1, 2018.



Over the years 2006-2013 some 52,000 people were injured in lawn mowing incidents with over 12,000 losing a body part. Most of the damage involved hands and feet, and far too often involved children under the age of four who were more likely than older people to injure their feet and to require amputation.

Based on a careful study of existing data, they suggested the injuries occurred when a child approached a family member who was mowing the lawn or when they fell off the lap of a person driving a riding mower.

Adults do not appear to be fully cognizant of the risks involved, and in some cases, children who are permitted by their adult family members to use the equipment, may try to clear debris from a running mower despite the loud noise and whirring blades.

Researchers at Johns Hopkins are actively working with engineers to attempt to mitigate the risk by developing new types of equipment with barriers to keep humans from hurting themselves. While they attempt to make the equipment “smart enough” so that no one gets hurt, it seems that some solid edu-

cation about the risks for those who may be unwary seems like a logical intervention, as well.

### **Global Warming: Worse Than We Thought**

United Nations Report: October 2018.



No matter what your political views are, sobering reading was recently released by the United Nations Scientific Panel on Climate Change that describes a far more dire picture of the consequences of climate change than previously thought and urges that avoiding the damage requires transforming the world economy at a speed and scale that has not been seen previously.

The actual report was prepared by the Intergovernmental Panel on Climate Change, a group of scientists convened by the United Nations to guide world leaders, and describes a world of famine, wildfires, and loss of coral reefs worldwide, occurring as soon as 2040.

The report notes that should greenhouse gas emissions continue to rise at their current rate, the atmosphere will warm up by as much as 2.7° F (1.5° Celsius) above preindustrial levels by 2040. While the increase may not seem like much to the casual reader, the computer models suggest that coastlines will be completely flooded and areas of drought and poverty will be intensified greatly!

Previous work had focused on estimating the damage if average temperatures were to rise by a larger number, 3.6° F (2° Celsius), because that was the threshold scientists previously considered for the most severe effects of climate change.

It is a certainty that no matter what is contributing to the warming trend, and what politics such discussions stir up, life on earth will change dramatically if the heat continues to be turned up.