

Ebola And Hospital Acquired Infections

By [Guest Post](#) on November 6, 2015 5:34 am in [Science](#)

Ebola And Hospital Acquired Infections by Art Keller

A year ago, American complacency about the terrifying outbreak of West Africa Ebola remaining limited to West Africa was shattered when the first US case was diagnosed in late September 2014, to be followed shortly thereafter by the spread of Ebola to the nurses caring for the [first US patient](#).

The story of that spread highlights one of the biggest dangers to American public [health](#) and the so-far wildly inadequate response to it. The US remains woefully underprepared to handle not only truly terrifying pathogens like Ebola, but also the more ordinary, yet by body count, far more lethal pathogens that infest health care facilities across the US and kill tens of thousands patients every year.

If Mr. Clean were not just a logo on a Proctor and Gamble bottle, but an actual deity of hygiene, his earthly avatar would be Kevin Wang. While Wang hasn't the logo's muscles or trademarked bald pate, his Anaheim-based company [Disaster Clean Up](#) has more than 25 years practice developing tools and techniques to eradicate some of the most toxic sludge on the planet, from heaps of dead bodies, to radiological contamination, to massive oil spills, to chemical and biological warfare agents.

Shortly after the US index patient was diagnosed on 30 Sept 2014, Wang predicted to me that US caregivers of the Ebola patient would almost certainly contract it, because they simply weren't trained or equipped to handle it. Several days later, his prediction proved prophetic after two Texas health care workers who treated the now-deceased Ebola patient Thomas Eric Duncan were diagnosed with Ebola.

When telling me why he thought that was going to happen, Wang explained his prediction was based on evaluation and testing he had conducted in US hospitals months before Ebola arrived in the US.

One of many problem areas Wang identified was that hospital staff just didn't know how to get into and out of personal protective equipment (usually abbreviated PPE), and also lacked transition areas connecting isolation areas to common areas. With no transition area in which to decontaminate, staff were coming directly out of "hot" isolation suites and walking straight into common areas, spreading contamination along the way.

Wang also obtained smoking-gun evidence of grossly inadequate sanitizing procedures, by testing hospital surfaces for the presence of energy enzyme ATP, Adenosine Triphosphate.

(Note: The test does not distinguish between living or dead bacterial loading, but even dead bacteria are a bad sign on a surface that is supposedly sterile, because a surface with high levels of ATP loading mean any pathogens that come in contact with it are landing on a rich, fertile food source, spurring rapid growth).

Wang's measured ATP levels by swabbing surfaces with a phosphorescing reagent sensitive to the presence of ATP, hitting it with a light and measuring the amount of light reflected; the more "relative light units" (RLU) measured, the more ATP present, indicating higher bacteria loading.

With that test, a "clean" surface would have ATP RLU levels from 0-10, a surface with 11-20 RLUs of ATP posed a moderate hazard, and one with 21-30 units was regarded as failing in terms of effective sterilization.

"I tested one infectious disease isolation unit in a hospital in Orange County which had just been signed off as sanitized. I swabbed the patient's food tray, got a [reading](#) of 770, and thought 'the next patient is going to eat off that, a food tray with a 770 RLU count has to be full of the previous patient's 'goo and bugs!'"

I asked the hospital staff what condition the previous patient in the isolation suite had; they told me he died of a virulent form of Hepatitis C.

You have to be very sick to be admitted to an isolation room in the first place; whatever put him there in the first place, I was afraid the next patient in that room would pick up Hep C, too."

Wang's concerns expressed to me over a year ago have since been substantiated by statements on the website of the US Centers for Disease Control (CDC). According to the CDC's post-game analysis on Ebola care in the US, "Two nurses caring for the patient were infected, most likely as the result of underprepared processes, lack of training, and suboptimal use of PPE."

Since the outbreaks last year, CDC teams visited 81 hospitals and certified 55 as prepared to handle Ebola. As there are more than 5,600 hospitals in the US, that amounts to less than one percent. The CDC has issued updated Ebola guidance for the other 99%, but whether they are paying attention is anybody's guess.

Of course, Ebola made headlines last year because it kills fast and gruesomely...a hemorrhagic fever so perfectly fits the cynical but dead-accurate characterization of what drives news coverage: "If it bleeds, it leads."

The true significance of US nurses contracting Ebola is not the relatively minor chance that US citizens will contract that particular disease, but what the spread of dangerous but eminently containable Ebola says about US health care facilities' preparedness to deal with the now-chillingly-routine spread of pathogens that aren't headline news makers, but are quiet killers racking up body counts far higher than Ebola.

The number of Hospital Acquired Infections (HAIs) is exploding in the US, with millions infected, and at least 100,000 Americans dying from them a year. Most alarming is the growth of antibiotic resistant infections acquired during US hospital stays. These pernicious trends are skyrocketing at a rate that neither US hospitals, nor the CDC, are willing to admit.

Looking at statistics for just one type of antibiotic-resistant bug makes plain that shocking truth. In 1993, there were 2000 US cases of methicillin-resistant Staphylococcus aureus (MRSA). According to study published in the American Journal of Infection control, by June, 2007, 2.4 percent of all patients had MRSA infections, which equates to roughly 880,000 cases a year, or a *4,400% increase from 1993. And MRSA infections account for less than 10% of all HAIs according to a recent study by Emory University.*

The non-profit [Committee to Reduce Infection Deaths](#) (RID) now openly scoffs at how vastly the CDC underreports HAIs. RID also posts data from [studies](#) proving the actual number of annual hospital infections is several times the 1.7 million annual hospital infections the CDC claims.

After finishing his round of tests at the Orange County hospital with the scarily contaminated food tray, Wang met with the hospital administrators.

"I recommended they stop using janitors, who often just smear dirt and contaminants around by ineffectual mopping and 'spray and wipe' decontamination that just doesn't work. I told them to hire cleaning technicians, people with at least a year of college-level biology and a rigorous training course, at least several weeks in length, on how disease spreads and how to actually clean things... not just give the appearance of cleaning them."

The administrator allegedly told Wang his suggestions to hire trained cleaning technicians and pay them \$5/hour more than janitors would add \$100,000 to the hospital's budget.

"I asked the administrator, 'How many wrongful death suits is the hospital currently facing?'"

"11," he told me."

"So for the cost of settling one of those lawsuits, you could have a much cleaner hospital, fewer infections, not to mention reducing future lawsuits."

The hospital didn't hire the cleaning techs.

Nor did they follow any other suggested measures like installation of HEPA filters and sterilizing lights in air ducts, use of more effective cleaning equipment, or adopting techniques to limit the spread of pathogens like use of positive-pressure personal protective equipment (PPE) by staff in contact with the most infectious patients.

Wang's company still [offers](#) comprehensive evaluations to any health care facility interested in fighting HAIs, but given institutional reluctance to implement new training or hire more qualified cleaning techs, he also moved to build a new tool to fight them.

He is currently beta testing a new sterilization device that combines ultra-high intensity UV C lights with a high output ozone generator. High intensity UV C light can rupture the cell walls of viruses and bacteria, and high doses of ozone can disassemble pathogens to the molecular level, while permeating areas UV C can't reach. Combining the two should theoretically be a powerful one-two punch in the fight against the HAIs rampant in US hospitals.

Even if Wang's high hopes for his sterilizer prove justified, he admits it is no silver bullet. The vast inertia maintaining substandard cleaning and sterilization techniques, major contributing factors to the spread of HAIs, is just too great for any one new invention to fix, without also addressing other major gaps in training, procedures, and equipment.

Whether the CDC is asleep at the switch, has too many other crucial issues on its plate, or is just understandably overwhelmed at the magnitude hospital acquired infections in the US is difficult to judge; the CDC's press office did not respond to multiple requests for comment on this article.

It may well be that the explosive growth of HAIs in US hospitals will continue until the costs of the legal liability incurred by failing to address HAIs finally exceeds the cost savings to hospitals of minimizing or ignoring the issue.

In the meantime, [readers](#) who rightly conclude that if they or Proctor ones enter a hospital they now have an alarmingly high chance of acquiring an infection can at least [follow the steps](#) prescribed by Reduce Infection Deaths for how to protect themselves against the epidemic of hospital acquired infections in US hospitals.

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