



## Reduce infection contamination with Antimicrobial keyboards and mice



**According to The Centers for Disease Control and Prevention, Hospital-acquired infections (HAIs) are a leading cause of death in the U.S. healthcare arena, with an overall estimated annual incidence of 1.7 million cases and 100,000 deaths.**

HAIs in U.S. hospitals generate an estimated \$28.4 billion to \$45 billion in excess healthcare costs annually. Furthermore, the Centers for Medicare and Medicaid Services will no longer provide reimbursement over and

above the typical Inpatient Prospective Payment System rate for care required to battle HAIs.

The fact of the matter is hospitals are mandated to clean up their act and get HAIs under control, especially now that Medicare and other insurers are not reimbursing hospitals for treating HAIs. Some hospitals have successfully lowered their HAI rate by taking measures to clean their facilities thoroughly and regularly. Part of that cleaning process includes disinfecting common-touch surfaces such as keyboards and mice.

And now that requirement is reaching beyond the hospital. Last year the CDC traced a viral outbreak in the

Washington, DC, school district directly to a computer keyboard. Schools across the nation are facing issues with students being infected with this Super Bug, and many of those students are dying as a result of that infection. The cost to clean up AFTER THE FACT is enormous and not typically included in the school budget. How much less expensive it is to make a small purchase now that can easily help eliminate one source of cross-contamination.

### **Hospital Acquired Infections Hurt Hospital Profitability**

Hospital infections affect two million Americans every year, costing 100,000 lives and adding \$30.5 billion to the nation's healthcare tab," said Betsy McCaughey, Ph.D., founder and chairman of the Committee to Reduce Infection Deaths (RID).

Where do those numbers come from? The Centers for Disease Control (CDC) indicate that approximately 2,000,000 cases of hospital acquired infections (HAIs) occur each year. Each HAI adds approximately \$15,000 to the cost of treating the patient, over and above the costs associated with treating the problem that brought them to the hospital in the first place. Simple math makes that a \$30 billion problem. Research shows that eliminating infections can result in a 20-to-1 payback for the hospital within the first year alone, with no or minimal capital outlay. "Good infection control can make the difference between profitability and loss for an individual hospital," McCaughey said. Hospitals in Virginia, Pennsylvania and Iowa realized significant reductions in infection rates through simple

screening programs and rigorous enforcement of staff and equipment hygiene procedures.

### What is on those keyboards?

That was the question asked in a recent study conducted in the Cleveland VA Medical Center.

In 2002, the Cleveland VA Medical Center experienced a large outbreak of the epidemic strain of *C. difficile*. After steps to isolate and disinfect the rooms more effectively and to retrain housekeeping to improve their disinfecting methods, the Center found that while the CDI infection rate was reduced, it was not reduced to the baseline levels seen before the outbreak. As a result, the Center hypothesized that there might be hidden reservoirs of the bacteria on surfaces outside of the CDI isolation rooms that could contribute to transmission. Environmental surfaces were tested in nursing stations, physician work areas and on portable equipment.

### Here is what they found:

- 73% of isolates tested had ribotype patterns detected in stool samples from CDI patients
- 50% of these were epidemic, binary toxin-positive strains
- 67% of the isoates from the ward environment were epidemic strains
- 26% of desktop computers were contaminated with toxin-producing *C. difficile*

### Spraying is Not Enough

"Most EPA-registered disinfectants suggest a 10-minute dwell time. Otherwise, the disinfectant may not be as effective. One concern about current disinfecting practices is the use of spray bottles to disperse the chemical to the contaminated surface. Spraying a surface followed by a quick wipe with a paper towel is not sufficient to reduce bioload. Only germs that come in direct contact with disinfectant will be killed, which typically takes four applications of spray on a surface to properly kill microorganisms."

So says Dannette Young Heath, CEH, NREMT-B, director of medical treatment facilities at Aztec Facility Management, Houston. She goes on to say, "The Centers for Disease Control and Prevention (CDC) estimate that in the United States, as many as one in 10 patients, or 2 million patients a year, acquire a nosocomial infection; of those patients, about 90,000 die as a result of the infection. One third of nosocomial infections are considered preventable, and can be directly related to the standard of practice in infection control cleaning techniques.

With well-defined cleaning protocols and a good in-service training program, reduction of microorganisms will promote a healthy environment for patients, visitors, cleaning staff and healthcare workers."

### Wash the Keyboard and Mouse to Completely Disinfect

Well-defined cleaning protocols include regularly washing surfaces we touch often, and that includes keyboards and mice. Wash my keyboard? Wash my mouse? Can I do that? Not with most keyboards and mice. Even the so-called spill proof keyboards can take only a limited amount of moisture before they just stop working.



### Spill-Proof is not Waterproof

Only Seal Shield™ keyboards and mice with Silver Seal™ protection meet the tough IP68 submersibility standards. These keyboards and mice use the exclusive Seal Shield waterproofing technology (Patent Pending) that make the the only fully submersible and dishwasher safe products on the market. These keyboards can even be washed in a diluted bleach solution to disinfect the board thoroughly. Seal Shield keyboards and mice are Silver Seal protected. They contain an antimicrobial, fungistatic agent which protects the product and keeps it cleaner, greener and fresher by inhibiting the growth of microbial bacteria, mold, mildew and fungi on the product's surface.

# WASHABLE KEYBOARDS HELP HOSPITAL FIGHT ACINETOBACTER INFECTIONS

By Karin Lillis

One bacterial outbreak is one too many, says Marie Ayers, RN, CIC, interim director of infection prevention and control at UF Health Shands Hospital.

The facility — a level 1 trauma center, tertiary care and teaching hospital in Gainesville, Fla. — had an outbreak of Acinetobacter on its burn unit. Ayers quickly looked to the keyboards, and found that equipment carried most of the bioburden — swabs obtained from keyboards on the unit revealed unacceptable levels of Acinetobacter. Ayers and her colleagues quickly looked to Seal Shield for answers.

The Jacksonville, Fla.-based company makes submersible and waterproof keyboards and other computer equipment that can withstand high-powered disinfectants hospitals use to keep equipment and surfaces bacteria- and virus-free. Seal Shield also offers Silver Seal Antimicrobial Protection for many of its products.

“Outbreaks of Acinetobacter infections typically occur in intensive care units and healthcare settings housing very ill patients. Acinetobacter infections rarely occur outside of healthcare settings,” the Centers for Disease Control and Prevention notes. Especially at risk are acutely or chronically ill patients who are on a ventilator, patients hospitalized for long periods of time and those with open wounds, the CDC says. Urinary catheters can also increase a patient’s risk of contracting an Acinetobacter infection. The bacteria spreads from person-to-person contact, the CDC says, or when someone touches a contaminated surface.

“We ended up rebuilding the unit and cleaning up. We started to look at features that we could bring to the unit that would help us prevent the spread of infections. Keyboards are a horrible source of pathogens,” Ayers says. She and her colleagues had seen Seal Shield’s submersible keyboard at a recent APIC conference.

“The Seal Shield guys actually had a keyboard in an aquarium, and told us to fish it out and use it. I pulled out a mouse from

the bottom of the tank and used it. That sold me right there,” Ayers says.

“Our nurses were so devastated by the outbreak and so interested in what they could do to stop the spread of bacteria and viruses,” Ayers says. “We let our nurses pick the keyboard we would use on the unit. We actually took a whole box up to them and told them to test them all out.”

Ultimately the hospital provided Seal Shield keyboards throughout its entire burn unit. The nurses, Ayers says, selected a white keyboard so it was “easier to see dust, dirt and debris.”

The infection prevention staff then taught nurses on the burn unit the right way to clean the keyboards.

“We don’t really submerge the keyboards as much as we spray them down between every patient,” she says, unless the keyboard is visibly contaminated with bodily fluid or tissue.

The nurses picked the keyboard and Ayers and her staff have not heard any complaints. The keyboards, she says, are working well. Nurses are responsible for spraying down the keyboards a few times a day and at the end of every patient transfer.

UF staff use Sani-Cloth wipes “in all different shapes and sizes,” Ayers says — including bleach, quaternary with alcohol and quaternary products. “In the case of a patient with C. diff, we always use bleach — and we can actually submerge the keyboards in a 10:1 bleach/water solution.”

The hospital also trained its environmental services staff to properly clean the keyboards. “The biggest thing we did, too, is adding housekeeping to assist us in cleaning surfaces that previously they couldn’t touch — like keyboards. They can absolutely spray it down and clean it. We encourage them to do so,” Ayers says.

She adds that keyboards like Seal Shield’s should be “the future and the standard for everyone in healthcare. Proactively switching to a product that we can use and clean makes sense. If we clean everything and encourage cleaning high-touch areas, why not start with the keyboard?”

*Karin Lillis is a freelance healthcare journalist.*

Research that substantiates keyboard contamination includes:

- ◆ University of North Carolina (Chapel Hill) Research Study (Keyboards in Hospital Settings) The study, published in Infection Control and Hospital Epidemiology, comes from William Rutala, PhD, MPH, and colleagues at the University of North Carolina (UNC) at Chapel Hill. Researchers took samples from 25 computer keyboards at various locations inside UNC Hospitals and tested the samples for bacterial contamination. They found that each keyboard was contaminated with at least two types of bacteria. In particular, every keyboard tested positive for coagulase-negative staphylococci or CoNS, which is a major cause of bloodstream infections in hospitalized patients. In addition, 13 other types of bacteria were found, with the most common, after CoNS, being diphtheroids (found on 20 computers, or 80 percent), Micrococcus species (72 percent) and Bacillus species (64 percent). Data suggest that microbial contamination of keyboards is prevalent and that keyboards may be successfully decontaminated with disinfectants. Keyboards should be disinfected daily or when visibly soiled or if they become contaminated with blood.

- ◆ Northwestern Memorial Hospital (Chicago) Research Study (Keyboards in Hospital Settings) Samples obtained from the keyboards and keyboard covers revealed growth of MRSA and VRE at 24 hours. Transmission studies revealed that increased contact with the inoculated keyboards (from 1 to 5 touches) increased recovery of bacteria on hands. The transmissibility rate from keyboard covers was not appreciably different. VRE and MRSA are capable of prolonged survival on both computer keyboards and keyboard covers. After any contact with computer keyboards, both gloved and ungloved hands frequently become contaminated. Researchers found that a good way to prevent the transmission of this type of infection is for healthcare workers to wash their hands and to have computer keyboards disinfected on a regular basis.

# Conjunctivitis (Pink Eye) Outbreak Traced Back to School's Public Keyboards

*Geisel School of Medicine at Dartmouth College*

*Pete Fletcher, IT Director*

In June 2008, I was hired as a User Support Consultant at Dartmouth College. In the fall, my responsibilities expanded and part of my new role was to look after the 300+ public machines around the campus. This included looking after both the software and hardware of these machines.

I decided that I would talk to students and staff who use the public machines and get their feedback on them. Some of the feedback I received was the following:

- People tended not to use the public machines near restrooms. This was because they thought not everyone was washing their hands when using the restrooms, and then would use the keyboards upon exiting.
- The machines nearest dining areas were often broken because people would spill drinks or drop food on them.
- Students also mentioned that they were put off using these keyboards because of how dirty they were.

Taking this information, I decided to clean and disinfect the keyboards with disinfecting wipes, Lysol, Fantastic and other common place cleaners. I replaced the keyboards that were too damaged. I also hired a student who would walk around each week and clean the keyboards.

I found at the end of the fall term of 2008 I needed to replace more keyboards because of spilled drinks (soda's being the worst because of the sugar content, it stuck all the keys together). I also discovered quite a number of students (estimated around 200-300) had contracted a Pink Eye. Among other ways the infection was spreading were public keyboards. We found that people were rubbing their eyes and then using the keyboards. This enabled the Pink Eye to spread.

We again replaced keyboards and began to disinfect machines. I found that the cost of replacing and cleaning keyboards was rising at an alarming rate. I needed to find a better solution.

In January 2009, I was in a staff meeting and a colleague had just returned from CES. He was talking about a company that had been there called "Seal Shield". He said that they had Antimicrobial and dishwasher safe keyboards. Immediately, he had my attention.

I contacted Seal Shield and decided to purchase four "Silver Shield" keyboards as a trial. As soon as they arrived, I put them in a high traffic area near a dining location. As luck would have it, within two days a student had dropped a large soda over the keyboard. We ran the keyboard through the dishwasher and it came out looking like new (fully working too). On this basis alone, I ordered another twenty keyboards straight away.

With the new Seal Shield keyboards in hand, I began to replace the keyboards on the public machines. The result was the Pink Eye infection outbreak stopped almost instantly. I then ordered more keyboards to replace ALL the keyboards on the public machines.

From the time we installed Seal Shield keyboards, the number of replacement keyboards are almost zero. There have been no reported cases of Pink Eye. Because the keyboards are run through a dishwasher at the end of each term, students and staff are much happier at the clean look. I also explained to the students that the keyboards on the public machines are Antimicrobial. They are amazed by this and are happier to be using them.

**For more information  
contact Corrine Ormsby**

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