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Research based evidence concludes that computer keyboards and other input devices spread infections in healthcare settings, schools and in communal environments.

According to The Centers for Disease Control and Prevention, Healthcare Associated 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 research abstracts below strongly support that computer keyboards and other input devices are a source of bacteria and cross-contamination that can lead to HAIs. Therefore, solutions which provide for the disinfection of these devices should be put into place. The SteriHood and SteriBox products provide the most effective, convenient, and low cost solution to reduce the risk of infections and cross-contamination from these multi user devices.

University of North Carolina 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)

- 25% of hospital keyboards harbor the Super Bug- MRSA.

University of Arizona Research Study (Keyboards in Educational Settings) Microbiology Professor / leading expert on infectious disease, Dr. Charles Gerba conducted a study that found computer keyboards harbor up to 400 times more microbial bacteria than the average toilet seats and our among the dirtiest items in an office.

Other research data from this study concluded the following:

- In schools, the most germ-laden places are desktops; computer keyboards, mice, and touchpads; pencil sharpeners, water fountains and restrooms.
- Of the professions studied, school teachers had the most germs in their offices by 20 times.
- More germs were found in daycare centers than anywhere else

American Society for Microbiology Research Study (Keyboards in Hospital Settings) Discovered that MRSA can survive on computer keyboards for up to 6 weeks. For the study, two strains of MRSA were inoculated in triplicate onto coupons made of bed linen, keyboard covers and acrylic fingernails. At selected times over 8 weeks, the coupons were sub cultured and surviving bacteria were counted. MRSA survivors remained at detectable levels for 6 weeks on computer keyboard covers.

Association for Professionals in Infection Control – APIC (Guide to Preventing C. Diff Infections) The guide’s prevention strategies include “cleaning and disinfection of computers, including keyboards” and goes on to say “check the computer manufacturer’s recommendations for acceptable products. Exposure to an environment or patient with CDI can create a challenge especially when there is a highly virulent strain. The use of some of the bleach-containing disinfectants may not be possible due to potential damage.”

American Journal of Infection Control - AJIC Report (Keyboards in Hospital Settings) Recommendations for cleaning and disinfection: Computer equipment used in patient care within a multihospital system. Ensure that working with computer equipment is included in policies/procedures for hand hygiene. Specifically, when working with keyboards or mice in high-risk areas disinfect and glove hands.

Northwestern Memorial Research Study (Keyboards in Hospital Settings) Samples obtained from the keyboards and keyboard covers revealed growth of MRSA and VRE at 24hrs. 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.

Tripler Army Medical Center Research Study (Keyboards in Hospital Settings) Cultured 10 computer keyboards in the intensive-care unit eight times over two months. About 25 percent of the samples harbored the bacteria hospital officials fear most – multidrug-resistant staphylococcus aureus.

District of Columbia Department of Health - DCDOH Report (Keyboards in School Settings) The DCDOH investigation of a Norovirus outbreak in an Elementary School reported that non-cleaned computer equipment (keyboards and mice) and person-to-person contact resulted in illness. Laboratory results from a computer mouse and keyboard in first-grade classroom tested positive for norovirus subtype GII.

Stanford University Research Study (Cell Phones/Touch Screens) A cell phone is covered with 18 times more bacteria than a toilet handle. Stanford doctoral student Tim Julian warns, “If you put virus on a surface, like an iPhone, about 30 percent of it will get on your fingertips, and a fair amount of it may go from your fingers to your eyes, mouth or nose, the most likely routes of infection.”

University of Arizona Research Study (TV Remotes in Hospital Settings) Microbiology Professor / leading expert on infectious disease, Dr. Charles ranks the TV remote control as the highest carrier of bacteria in a patient's hospital room compared to the toilet bowl handle, bathroom door and call buttons, among others. Even more disturbing is the detection of Methicillin-Resistant Staphylococcus Aureus (MRSA) on the remote control. As an antibiotic-resistant bacteria, a leading cause of infection and death in hospitals.

University of Houston Research Study (TV Remote in Hotel Rooms) University of Houston, along with researchers from Purdue University and the University of South Carolina sampled a variety of surfaces from hotel rooms in Texas, Indiana and South Carolina found high levels of aerobic bacteria and coliform (fecal) bacterial contamination on TV remotes. Tests showed bacteria levels between 2 and 10 times higher than levels permissible in hospitals.

