



THE WAR ON SUPERBUGS

A NEW APPROACH FOR HAIS

By Barry Hunt



something as critical as hospital infections. It can help, though, to locate sinks and alcohol-based rub (ABR) stations in the most convenient locations possible. Studies show that second to monitoring, location makes the biggest difference in hand hygiene compliance.

Ironically, patient hand hygiene has largely been ignored even though it's often the route to infection inside patient rooms. The bed rails, nurse call buttons, and overbed tables that are in repeated contact with patients' hands are often significant reservoirs for today's superbugs, which include *C. difficile*, MRSA, and VRE.

While we were all taught as kids to wash our hands before dinner, this rarely happens in our hospitals. Patients confined to beds have limited access to wash facilities and ABRs are only just now beginning to be provided for patient use.

A NEW APPROACH

To make a real change, we need to take a new approach that extends far beyond hand hygiene. We need to take an engineered approach, and that's where you, the healthcare facility manager, comes in.

First, everyone needs to understand the issue of superbugs, the microbes that are resistant to most—or sometimes all—known antibiotics. We've created them; our hospitals have become incubators for superbugs. If someone gets an infection in a hospital, it is 70 times more likely to be a superbug than if they get an infection outside of a hospital.

It's not surprising when you think about it. Superbugs emerge in an evolutionary process when normal bacteria are challenged with antibiotics but not completely defeated. There may be a genetic mutation that allows a small population to survive and then propagate a new generation of strong progeny. A patient with MRSA or *C. difficile* may leave superbugs behind on surfaces in her room where they continue to grow to later be picked up and transferred weeks or even months after she is gone. In fact, studies show that there is a significantly greater risk of catching a superbug in a room that was previously occupied by an infected patient. The fact that up to 80 per cent of infections are transmitted by touch explains why outbreaks tend to cluster in areas in a hospital. The fifth floor may have a VRE outbreak while the seventh floor may have a *C. difficile* outbreak.

Despite everyone's best intentions, most surfaces in a patient room are not cleaned, or are not cleaned to a level sufficient enough to prevent infection, even during a "terminal clean" of an isolation room after a known infectious case. The typical range of surfaces cleaned is between 20 and 50 per cent. Housekeeping staff time pressures aside, even the surfaces that are cleaned can quickly become recontaminated if a few superbugs are left behind given the materials we are currently using.

UV disinfection of patient rooms can reduce bacteria counts by 99.9999 per cent. That's known as a 6-Log reduction by Infection Control Practitioners, and considered to be low enough to prevent infection and future recontamination. Using UV for sterilization is not new, but the concept of complete room sterilization is. Studies show that using UV room disinfection between patients can reduce

Healthcare Acquired Infections (HAIs) are the fourth leading cause of death in Canada, taking more lives than car accidents, breast cancer, and HIV combined. Canada has one of the highest incidences of HAIs in the world, where one in ten Canadians who spends a night in hospital catches an infection from that hospital, and one in 20 infected patients dies. That's 200,000 Canadians infected each year and 10,000 deaths; and the problem continues to get worse.

Something has to change and, believe it or not, it involves you, the healthcare facility manager. You manage the physical environment and often manage housekeeping as well; two keys to solving this problem.

It's believed that 80 per cent of HAIs are transmitted by touch. Until recently, the primary focus on treating this problem has been staff and visitor hand hygiene. Yet despite decades of hand hygiene education and promotion, the HAI statistics get worse every year.

What's more, the hand hygiene statistics are questionable at best. Studies show that staff wash their hands three times more often when they know they are being monitored. While Canadian hospitals continue to publicly self-report hand hygiene compliance rates of 90 per cent and above, the real numbers are often between 15 and 40 per cent.

Changing people's behaviour is hard and should not be relied upon as a primary means of defence, especially for

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hospital infection rates by 50 per cent. Kudos to Toronto East General, Winnipeg Health Sciences, and Vancouver General for being the first hospitals in Canada to implement UV room disinfection.

Stainless steel is most often specified for architectural interiors, including door hardware, corner guards, etc. It's durable, looks hospital clean, and is widely believed to help in infection control. However, stainless steel is just about the worst material choice to make. Its scratches harbour bacteria and it has zero antimicrobial properties. Studies show bacteria, including superbugs, thrive on stainless steel surfaces.

Instead of using stainless steel, consider using copper, or copper coatings, brass, and other copper alloys containing at least 60 per cent copper. Copper is the best biocidal metal available, meaning it actively and quickly kills bacteria, and destroys viruses. Studies show that replacing the high touch surfaces in patient rooms, particularly the ICU, can also reduce hospital infections by 50 per cent. Some copper products now being introduced to the hospital market for infection control will have a modest cost premium but many products, especially door hardware, were originally available in brass materials longer before the recent rise in popularity of stainless steel.

Every time a toilet flushes a microbe gets its wings, traveling for up to 90 minutes contaminating surfaces, people, and clothing. Toilets can become launchpads for disease, especially for *C. difficile* and VRE. Toilet aerosols were determined to be the primary means of transmission in several outbreak sites during the well documented SARS epidemic of 2003. Still, we continue to help mobilize toilet aerosols by installing updraft ceiling exhaust fans in patient washrooms when we should be exhausting washrooms low and behind the toilets. Washrooms are neutral in pressure relative to the patient room, which in turn is neutral to the corridor allowing the free flow of airborne particles. Ideally, all patient rooms should be treated as isolation rooms where the washrooms are negative in pressure to the patient room which in turn is negative to the corridor, with at least a closed door if not an anteroom. Now that CSA Z8000 requires single patient rooms, it's not much of a stretch to include glass doors, similar to a typical ICU.

A BIG PAYBACK

True, there is a cost to implementing UV, copper, and HVAC changes, but there is also a quick, substantial, and sustained payback. In addition to the \$2 billion spent annually on infection control practitioner salaries and hand hygiene stations, we spend 2 per cent of healthcare costs treating HAIs, adding another \$4 billion per year. Cutting the hospital infection rate by 50 per cent would free up \$2 billion per year that could be spent providing better healthcare services for Canadians. Better yet, cutting the infection rate by 80 per cent would save Canada \$3.2 billion dollars, 160,000 infections, and 8,000 deaths per year. That worthy goal is the mission of the recently formed non-profit Coalition for Healthcare Acquired Infection Reduction (CHAIR).

CHAIR is comprised primarily of Canadian volunteer doctors, researchers, infection control, and industry professionals who are committed to evaluating, advocating, educating, and supporting case studies, clinical trials, and standards to reduce HAIs in Canada. It's an exciting time, as companies are rapidly developing new products, hospitals are testing and implementing UV and copper solutions, and the CSA Steering Committee for Healthcare Standards has formed a task force on HAI reduction and may authorize development of a future CSA standard on hospital touch surfaces. There are exciting new developments in this field emerging almost weekly.

As for your hospital, there will be budgeting issues with implementing a solution. Infection control departments have budgets to monitor infections, but they don't have budgets to prevent infections through changes to the physical environment. In fact, many infection control practitioners are unaware of the significant role the physical environment plays in causing HAIs.

This dual problem of information and budget silos is common in healthcare but needs to be overcome to effect a solution. CHAIR is committed to helping Healthcare Facility Managers by educating and engaging both infection control practitioners and healthcare executives to break down both the knowledge and financial barriers to implementation. ■

Barry Hunt is chairman of the Coalition for Healthcare Acquired Infection Reduction. For more information, visit www.chaircanada.org.