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"The secret of success is constancy of purpose"

Benjamin Disraeli

Clinging to the edge of life, a young wife and mother of three fights to survive life-threatening injuries sustained as a result of a 'hit and run' road traffic accident. Intensive Care Unit staff support her through one crisis after another and finally stabilise her condition. The relief of family and staff is palpable as during the next four days she slowly improves.

And then – a fever develops. As her condition rapidly worsens, a catheter-related bloodstream infection is suspected (and later confirmed) and aggressive antimicrobial treatment initiated. But it's too late, the treatment is ineffective, everything is moving too fast and suddenly she's gone.

Although initial surveillance cultures were all negative for resistant organisms, cultures taken when the fever developed come back positive for both methicillin-resistant *Staphylococcus aureus* and glycopeptide-resistant enterococci. After all that work, all that progress so painfully won, the promise of recovery and life... what happened here? Everyone was confident that she had an excellent chance of recovery – she was young and strong and was being cared for by specialist practitioners.

Recent audits of hand hygiene practices in the ICU were disappointing – some staff members were not decontaminating their hands each and every time they should have. There were many reasons for this – intense workloads, continuing high bed occupancy, staff fatigue, shortage of staff, etc.

The reality of this death was almost certainly that someone who provided care for her infected her, and it was probably preventable. So, no rationalising, no excuses, no apologies – sorry doesn't do it. The rate of preventable healthcare-associated infections (HCAI) is unacceptable and it must be reduced – however and whatever it takes.

The Infection Control Nurses Association (UK) has been proclaiming for decades that each per-

son working in healthcare, whether it be in a clinical or nonclinical role, is responsible for taking active measures to minimise the risk of HCAI to patients – it's everybody's business and it's a 24 hours, 7 days a week job. The individual responsibility for protecting patients from infection isn't new – it's always been at the core of healthcare practice. The founders of the professions of medicine and nursing stressed the essential need for patient safety. The dictum *Primum non nocere* (First, do no harm), originated from the writings of Hippocrates, the father of medicine, where he said: "As to diseases, make a habit of two things – to help, or at least to do no harm" (*Of the Epidemics*, 400 BC). This was further elaborated by Florence Nightingale who wrote that "It may seem a strange principle to enunciate as the very first requirement in a hospital, that it should do the sick no harm" (*Notes on Nursing*, 1859).



The public could be forgiven for thinking that not harming patients is axiomatically embedded in the day-to-day practice of everyone who works in hospitals and in primary and community care settings. We know how to protect patients from the risk of HCAI and this knowledge is based on good quality evidence. It seems so simple: effective hand hygiene practice, active HCAI surveillance with meaningful feedback, the safe use of medical devices, good standards of targeted disinfection and environmental hygiene, and consistently adhering to the infection prevention and control recommendations in national and local guidelines. If colleagues do just this, HCAI rates will plummet – end of story, right? But it's not – it's more complex than this and we often don't really comprehend the organisational and individual behaviours associated with failing to effectively use these evidence-based measures to protect patients from HCAI.

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A Discussion of Measurement

Nicole Kenny, Virox Technologies

We all make the assumption that it is important to clean/decontaminate environmental surfaces in healthcare facilities to reduce transmission of infectious disease. The key, however, is effectively measuring the cleaning methods that we use and tracking progress to determine if the desired results are being achieved. Measurement is critically important in all critically important things, particularly anything resembling an objective or policy. I have listed below some of the most popular measurement tests for environmental surface cleaning/decontamination and will discuss how each stack up against "Nicole's 4 R's of Measurement Success".

"Nicole's 4 R's of Measurement Success" - successful measurement tools should be (1) rapid, (2) reliable, (3) relevant and (4) repeatable. "Rapid" depends on what we are wanting to measure, but in this case the test should reap results within minutes or hours, not days. "Reliable" indicates that the test the results would stand up to scientific scrutiny and consistent from test to test while "Relevant" would ensure that the test can replicate the real world application. Lastly, as a "Repeatable" test it should be simple enough (and inexpensive enough) that it can be undertaken frequently. It was a recent Webber Training teleclass, "*C. difficile*, Environmental Survival" with Dr. Michelle Alfa, that got me thinking about this again. And then, during a re-read of an article in the American Journal of Infection Control (Environmental surface cleanliness and the potential for contamination during handwashing, AJIC, April, 2003) I really started to wonder about the efficacy of our means of cleanliness measurement for environmental surfaces.

Here's what we have.

The Look/Feel/Smell method: Vastly most common. Entirely subjective. Completely unreliable.

The UV Marker method: Dr. Michelle Alfa showed this method during her teleclass. Apply small patches of a water-soluble substance to a surface.

Table 1. Overall results for adenosine triphosphate assays, aerobic colony counts, and staphylococcal counts for pediatric and surgical wards

	Faucet handles		Soap dispenser		Paper-towel dispenser	
	Pediatric	Surgical	Pediatric	Surgical	Pediatric	Surgical
Overall ATP results						
Mean ATP	7767	5459	2383	2932	2410	1293
No., % above benchmark clean values	112/120 93%	113/120 84%	90/96 94%	79/84 94%	90/114 79%	77/84 92%
Overall ACC results						
Range, % of results > 20 cfu/cm ²	<0.2->40 4%	<0.2->40 3%	<0.2->20 1%	<0.2->20 2%	<0.2->20 1%	<0.2->10 0%
No., % above benchmark clean values	48/120 40%	51/120 43%	21/98 21%	19/84 23%	21/114 18%	17/84 20%
Overall staphylococcal counts						
Range, % of results > 20 cfu/cm ²	<0.2->20 1%	<0.2->40 3%	<0.2->20 1%	<0.2->10 0%	<0.2->20 1%	<0.2->10 0%
No., % above benchmark clean values	39/120 33%	38/120 32%	16/96 17%	13/84 15%	21/114 18%	16/84 19%

ACC, Aerobic colony counts; ATP, adenosine triphosphate.

The substance, such as a UV marker or GloGerm® cream, is visible only under UV light. After the surface has been cleaned a UV light is employed to view the results. This test is interesting in that it reveals immediate results, is visually dramatic, and does not require the tester to assign a baseline measurement. Unfortunately the evaluation of the results is somewhat subjective and the test does not lend itself to reliable consistency.

Adenosine Triphosphate Assays: ATP test provides a measure of organic debris, skin or other cells and microorganisms, thus indicating the level of organic residue remaining on a surface. These are commercially available test kits that give a measure of cleanliness in relative light units (RLU). The higher the relative light units the more ATP and in turn, the greater the organic matter present on the surface. This is a useful test in that it is relatively rapid (allow an hour or so), the results are hyper-accurate, and the test measures more than just microbial decontamination. As a perfectly clean surface is not possible, some work is required in advance to set an acceptable baseline measurement. In the AJIC article that I mentioned, results of the authors' testing revealed that post-cleaning surface soiling was 79-94% above baseline indicating either very poor cleaning, or an inappropriate baseline determination (see table). Also, as this is a commercial test, it comes at a cost.

Aerobic Colony Counts: An aerobic colony count provides a general measure of the bacterial load. This is sometimes referred to as a Staphylococcal Colony Count test. These tests will indicate the

number of Staphylococci, a common skin inhabitant, and other aerobic organisms present on the surface. This test method can be accomplished in any hospital or public laboratory using a simple Rodac plates, and is thus rapid and repeatable. The results can be considered fairly reliable, depending on the sensitivity of the lab equipment, the skill of the technician, and the consistency of the samples. For some surfaces, particularly chronically damp ones, an Anaerobic Colony Count might also be prudent. For this test to be useful, it would be necessary to set a baseline contamination level. It must also be considered that aerobic and anaerobic organisms contained in a biofilm will not be readable in this test. A manager of an overly taxed laboratory will undoubtedly object to the processing of endless environmental samples, thus requiring the employ of an outside lab, or more likely abandonment altogether. This would be particularly true during a time of outbreak, when the lab would be busier than normal, and yet when the taking of environmental samples would be even more urgent to support epidemiological control data.

The use of hygiene surface monitoring to evaluate routine hospital cleaning and to establish cleanliness standards has been shown to be both cost-effective and instructive as it provides real-time information on surface contamination, especially in relation to the cost of cleaning. Measurement through testing would be another tool to help reduce hazards in critical care environments. We must first determine what we will measure, then how we will measure, and then most importantly how all of this measurement data will influence actions to improve our situation.



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Virox Update

10-Minute High Level Disinfectant DIN Received!

We are very excited to announce that after several years of research & development we have received the DIN number for a new 10 Minute High Level Disinfectant. Please come by our booth at CHICA to pick up information on the new product.

20-Minute Chemosterilant to be approved shortly!

We expect to have our DIN registration for a new 20-minute Sporicidal Chemosterilant in late March. This new product will be launched under the name Accel CS 20 and will be the perfect product for facilities that require a cold soak chemosterilant for reprocessing critical stainless steel instruments such as foot care instruments. To find out more about the product please contact Virox at 1-800-387-7578.

C. diff Technical Bulletin

A new Technical Bulletin all about Clostridium difficile will soon be available. This document will provide a wealth of facts about the organism. It will answer many of the commonly asked questions about environmental survival of C. difficile and hints on how to prevent environmental spread. It will discuss how to decontaminate surfaces that have been contaminated with the organism and will provide comparisons between AHP and bleach. To get a copy of our monthly Technical Bulletins, subscribe to our mailing list or contact our office.

2006 Virox Speakers Series

Virox is pleased to announce that the FREE Speakers Series will continue in 2006. If there are particular topics of interest or people you are interested in hearing speak, please contact Nicole Kenny at 1-800-387-7578 x118 or by email at nkenny@virox.com.

Website Update: www.virox.com

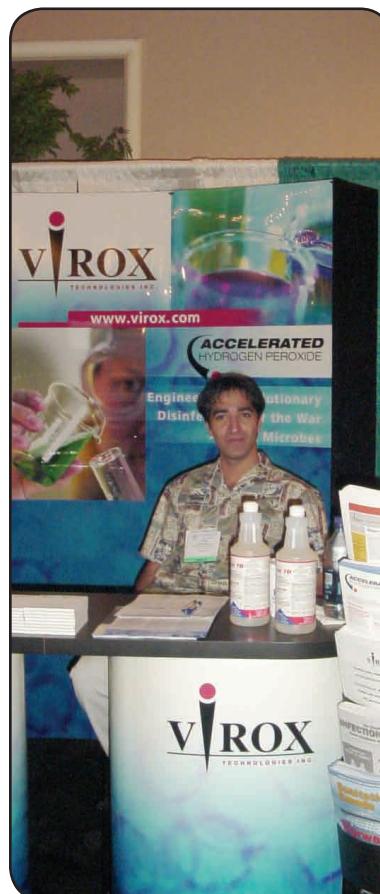
MEMBER SECTION LAUNCHED! Do you want to be sure you get all the updates on Virox? Interested in being included on all of the invitations to all Virox's FREE education seminars?

Log on to www.virox.com and click the Member's Sign-Up icon to enrol!

Virox prides itself on being a resource tool to the infection control community so please check out our website frequently as new links will be posted regularly.

Research Poster Presented at the 2005 PacifiChem Conference

Navid Omidbakhsh, Director of Research & Development at Virox travelled to Hawaii in December for the 2005 PacifiChem conference. This congress is an international gathering of chemists with a focus on research results in chemical sciences. Navid's poster was titled "A high-level disinfectant based on accelerated hydrogen peroxide: evaluation of microbial activity, human and environmental safety and materials compatibility".



Conference & Education Winter/Spring Schedule

Virox will be participating in the following functions:

March 13th – 16th – Seatrade Cruise Shipping Convention in Miami Beach Florida

March 18th – 21st – The Society for Healthcare Epidemiology of America (SHEA) in Chicago

April 30th – May 1st – Esthetique Spa International in Toronto

April 10 & 11 – Allied Beauty Association in Toronto

April 6th – 8th – Ontario Dental Association (ODA) in Toronto

April 9th – 11th – Ontario Long Term Care Association Conference (OLTCA) in Toronto

April 26th – 27th – Canadian Sanitation Supply Association (CSSA) in Toronto

May 6th – 10th – CHICA Annual Conference in London

May 10th – 11th – BC CIPHI Annual Conference in Kamloops

May 24th – 26th – AICI Annual Conference in Quebec City

Virox is very excited about participating in so many conferences & education days. We wish the best to all of the various organizers and would like to thank them for their dedication and effort in organizing these very important educational opportunities. We look forward to attending and talking to all of the participants.

Every great and commanding moment in the annals of the world is due to the triumph of enthusiasm. Nothing great was ever achieved without it.

- Ralph Waldo Emerson

Cleaning *C diff*—Whose Job Is It Anyway?

Excerpts from a teleclass lecture by
Dr. Michelle Alfa, Winnipeg, Manitoba

Toilets and commodes are probably the most heavily soiled and contaminated surfaces in the room of a patient infected with *Clostridium difficile*. And there is potential for a disastrous outbreak if the proper cleaning isn't happening. Although it sounds like a rhetorical question – whose job is it? - what you think is happening, may not actually be happening.

The toilets in most healthcare facilities are the responsibility of the housekeeping staff to clean. In my own facility the protocol is that the toilets are cleaned once a day on the wards and throughout the hospital. If the patient is diagnosed with *Clostridium difficile* Associated Diarrhea (CDAD), that is bumped up to twice daily cleaning of their bathroom area, morning and afternoon. Our infection control protocol recognizes that the toilets need to be kept as clean as possible to reduce the risk for transmission.

To test the bathroom cleaning compliance of housekeeping staff in the rooms of CDAD patients we use a water-soluble UV marker to "inoculate" various surfaces of the toilet seat. The marks show up as fluorescent whirls under UV light, but are invisible under normal light. The fresh marks are considered 100% fluorescence, and even a simple wipe with a damp cloth can remove 50% of the mark. We allowed the housekeepers to clean the toilets as they normally would, unaware of the mark, and then viewed and evaluated the

residual fluorescence. We discovered that the cleaning efficacy of toilets in CDAD isolation rooms averaged 56.5%, whereas a regular non-isolation room averaged 72.9%. Rather than increased cleaning and decontamination, toilets in isolation rooms were cleaned less carefully. We can only speculate that the cleaners wanted to get in and out of the isolation room quickly and thereby rushed the decontamination procedure.

Commodes are notorious for moving between rooms. Of course it is important that once a patient is diagnosed with CDAD, if they need a commode, it is dedicated to their room and not shared between patients in multiple rooms. If the commode is handy to the patient, who will have frequent and sudden bouts of diarrhea, there won't be a temptation for a worker to rush into another room for a commode. The question again is: who is designated as responsible for cleaning the commodes? It was a surprise to us to find out that everybody thought everybody else was doing it, and in the end, nobody was doing it because it had not been designated as a responsibility.

If no-one is designated to clean the commodes, they may not be cleaned at all, or they may be cleaned very sporadically. You may think that in your policy you have toilet cleaning once or twice a day as a routine, but the commodes are one of those little cracks in the sidewalk. If nobody is actually aware that they are responsible for it, the cleaning of commodes will get lost in the busyness of modern healthcare.



Webber Training Teleclass Schedule

www.webbertraining.com

February

- 2 – Minimizing the Impact of Water-Borne Bacteria in Hemodialysis
Dr. Richard Ward, University of Louisville
- 9 – Environmental Surfaces and the Transmission of Viral Respiratory Diseases
Lynn Sehulster, Centers for Disease Control
- 14 – Sanitation & Hygiene in Food Processing
Dr. Keith Warriner, University of Guelph
- 23 – The Building as a Source and Vector of Problematic Microorganisms
Dr. Curt White

March

- 2 – Voices of CHICA
CHICA Board of Directors & Guests
- 9 – Pandemic Influenza
Stephano Lazzari, World Health Organization
- 21 – Leadership in a Healthcare Environment
Barry Dore, Leadership Consultant
- 30 – Critical Design for Acute Care
Karen Iverson, University Health Network, Toronto

April

- 13 – Vaccination and Immunization
Dr. Ian Gemmill, Medical Officer of Health, Kingston, Ontario
- 20 – Secrets from the CBIC Test Committee
CBIC Board Members
- 27 – Evaluation and Comparison of Quality Management Systems
Tammy-Sue Lundstrom, Wayne State University, Detroit

May

- 4 – Infection Control in the Dialysis Clinic
Dr. Charmaine Lok, University of Toronto
- 16 – Product Evaluation and Selection
Robert Garcia, Brookdale University Medical Center, New York
- 18 – Antibiotic Prescribing Practices – All Things in Moderation
Dr. Dick Zoutman, Queen's University
- 25 – Infection Control on Cruise Ships
Dr. Robert Wheeler, Voyager Medical Seminars

Hot Tub Lung

A persistent cough, chronic weariness, and lack of muscle strength might be diagnosed as many things. However, if the patient pays regular visits to a hot tub at home or at a fitness club, or if they work around hot tubs (long term care facility, rehab clinic), the problem might very well be what researchers are calling "Hot Tub Lung". At the American Thoracic Society meeting in 2005, Dr. Viktor Hanak of the renown Mayo Clinic issued a warning to people who regularly use or are exposed to hot tubs, "drain the tub and never go in it again".

Hot Tub Lung is caused by the respiration of *Mycobacterium avium*, a common microbe of the soil and water. Many physicians who find the bacterium in a sample will dismiss it as an environmental contaminant. The bacteria can trigger an allergic reaction in the lungs, particularly in elderly or people with compromised immune systems, that mimics several lung diseases. It is often misdiagnosed as asthma, bronchitis or sarcoidosis. In one Mayo Clinic study of 21 confirmed cases of Hot Tub Lung, all had been previously misdiagnosed as having another respiratory disease, and all were regular hot tub users.

Continuing to use or work around a hot tub could be a downward spiral to possible incapacitation. People feel poorly, and try to make themselves feel better by staying longer in the hot tub. Then they feel worse.

According to the Mayo Clinic study, the *M. avium* microbe can be found in the water used to fill the tub, or on the bodies that enter the tub without first showering. However, if the tub is maintained and disinfected correctly, preferably with an oxidizing agent, and if the water is sanitized according to manufacturer's directions, the organism will be killed. Proper disinfection of the pump, water lines and jets cannot be overemphasized. In the future, researchers predict, there will be many hot tub-sized gardens on people's patios and back decks ... perhaps the best defense against Hot Tub Lung.





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First Do No Harm

Continued from page 1

We need to develop a better understanding of the factors that influence some healthcare organisations to successfully and effectively translate evolving best evidence for efficacy into local clinical practice. We also need to know how those factors operate or don't operate in organisations that lack success in consistently using evidence to continuously improve the quality of their infection prevention and control practices and service. We need to learn the characteristics of 'winning' and 'failing' healthcare organisations so that we can adapt and support those positive characteristics and organisational traits throughout the Service that will result in more healthcare organisations becoming 'infection aware,' i.e., enthusiastically and consistently using best evidence to prevent healthcare-associated infections and enhancing patient safety.

Time is moving on and we've long past that previous point where we tolerated a situation where our patients developed a preventable infection as a result of our care (or lack of). We understand the evidence that underpins effective measures to prevent HCAI; we just don't fully understand the complex dynamics of why this is not universally incorporated into clinical practice. It's time we did and removed patients from harm's way.

Free "Enhanced Recording" on CD

Clostridium difficile - Environmental Survival

On December 17, 2006, Virox Technologies was honored to sponsor a Webber Training teleclass, "Clostridium difficile - Environmental Survival" with Dr. Michelle Alfa. During this teleclass Dr. Alfa spoke of the characteristics of *C. difficile* and its proclivity to form a durable spore to protect itself. She addressed infection control issues related to hospital transmission, and revealed the evidence of what is known regarding environmental survival of the organism. Dr. Alfa also spoke on the interventions that have been tried in the past, what worked, and what sorts of things we need to be considering to reduce the impact of *Clostridium difficile* environmental contamination.

The Webber Training group recorded this teleclass and assembled it into an "Enhanced Recording" on CD. This was an outstanding lecture and we have a number of copies of this CD. If you would like a free CD of the recording for your organization we will be glad to send one to you. Request your copy by e-mail, nkenny@virox.com, and in your e-mail please give us some feedback on the Virox Solutions newsletter – what you like best, what you would like to see more of, etc.

You can see a selection of Enhanced Recordings of Webber Training teleclasses in the Catalogue section of the Webber Training web site.



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