

Infection Control: its time has come

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For many years, Infection Control (IC) Professionals have been teaching and preaching hand washing and the use of barriers to prevent the spread of infectious diseases in hospitals. Many health care workers (HCW) view IC as the “hospital police” and groan, wondering “What have we done wrong this time?” when they show up on the ward. It’s time for HCW to rethink their cavalier attitude towards Infection Control.

Perception - No Threat

We have been living in an era where infectious diseases are seen as benign, preventable and treatable. HIV, which two decades ago had health care workers in a panic and for which universal precautions were invented, is no longer seen as the same threat. For the most part, HCW don’t come to work fearing exposure to life threatening infectious diseases. And only with reluctance do they incorporate IC into their daily practice as evidenced by the research showing that there is inadequate hand washing by HCW. The use of barriers or isolation precautions is often seen as an inconvenience.

Recent events have changed all that. Newly emerging diseases, such as SARS, have demonstrated that a nonchalant attitude towards infectious diseases can have deadly consequences; inadequate hand washing can spread disease to patients, colleagues and family members; the inappropriate use of barriers can lead to illness and death; coming to work sick can expose others to disease.

Personal Protective Equipment

When a patient is placed on infection control precautions, a sign is placed on the door to their rooms describing what type of barriers should be used. If the sign says, “Wear a mask”, HCW will typically use whatever mask is available.

Many are unaware of the difference in the level of protection provided by a procedural mask, a surgical mask or an N95 respirator. Gloves are often left on for extended periods of time while gowns are used to keep warm on night shift or to cover OR greens to go for a meal. Wearing full isolation gear, including a gown, gloves, hair cover, N95 respirator and eye protection, for any extended period of time is hot, uncomfortable and difficult to work in. As well, the more complicated the donning and doffing procedures for this equipment become, the more likely HCW are going to make mistakes and end up contaminating themselves with the infectious agent from which they are trying to be protected.

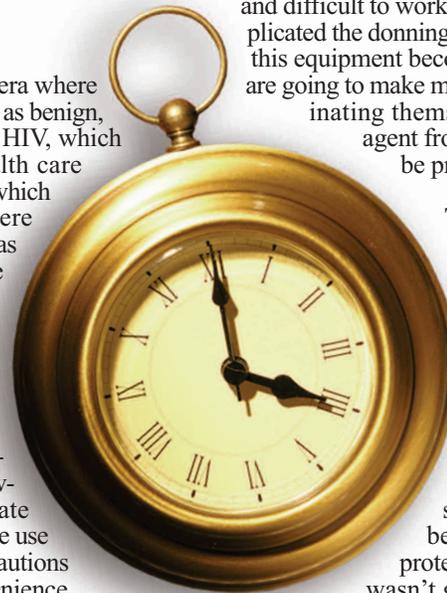
The SARS Effect

A common theme during the SARS outbreak was that the recommended precautions for personal protective equipment weren’t good enough. Even though health care workers were following the recommended practices they were still getting sick. The solution seemed to be adding another layer of protection. If one pair of gloves wasn’t good enough, wear two. If one gown wasn’t good enough, wear two.

If the N95 mask you’re wearing isn’t providing adequate protection move to an N100. The failure of recommended precautions to protect health care workers may have had little to do with the failure of the equipment and more to do with the lack of understanding on how to use it.

The Education Factor

Infection Control Professionals spend a lot of time educating staff on what precautions are necessary to protect themselves and their patients and when and how to wash their hands, but very little education is given on how to use the equipment. One had only to watch some news reports



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“The secret of success is constancy of purpose”

Benjamin Disraeli

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Action and Resistance:

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The modes of action of, and mechanisms of microbial (especially bacterial) resistance to, antibiotics have been studied extensively for over half a century. By contrast, comparatively few investigators have, until recently, been involved in understanding the reasons for the actions of, and tolerance or resistance to, biocides (antiseptics, disinfectants, preservatives).

This implies that the topic has not attracted research. On the contrary, there were several significant early findings, reviewed by Hugo (1957) that demonstrated that biocides did not act solely as 'general protoplasmic poisons' but that, especially at low concentrations, they produced quite subtle changes in bacterial and other types of microbial cells. The scientific literature contains a surprising, if rather scattered, number of publications (Russell 2002a). More recently, attention has focused on resistance and tolerance of bacteria to biocides, although this is by no means an entirely new phenomenon (Heinzel 1988; Russell 2002b), and whether biocide usage is associated with antibiotic resistance (McDonnell & Russell 1999; Gilbert *et al.* 2003).

It is legitimate to pose the question: why is it necessary to understand the underlying mechanisms of action of, and possible reduced susceptibility to, biocidal agents? There are several reasons: Academic interest – an enquiring mind would undoubtedly wish to know how biocides work and how organisms react. Different micro-organisms may show similar or different responses to a biocide and the underlying reasons may be linked to different structural, chemical and/or physiological differences in the cells (Russell 2003); Physiological and genetic responses, such as the activation of latent genes and programmed cell death, are two areas in which increasing information is being obtained; Insusceptibility mechanisms, in partic-

ular, the role of efflux pumps (Levy 2002; Poole 2002); The recalcitrance of biofilm, as opposed to planktonic cells (Donlan & Costerton 2002); Enhancement of activity Maillard & Russell 2001) by means of permeabilizers, efflux inhibitors, biocide combinations or improved biocide delivery to the microbial cell; Development of new biocidal agents, an aspect that has, to date, proved to be disappointing; Clinical, industrial and environmental relevance, i.e. correct usage, with due adherence to the many factors (concentration, pH, temperature, interfering materials, etc.) that might modify activity.

We now have an improved understanding of the action mechanisms of a range of biocidal agents, especially against non-sporulating bacteria (other than mycobacteria). These include aldehydes (glutaraldehyde, *ortho*-phthalaldehyde), biguanides (chlorhexidine, polymeric), chlorine-releasing agents (hypochlorites, chlorine dioxide), iodine and iodophors, isothiazolones, metals (mercury, silver), quaternary ammonium compounds (benzalkonium chloride, cetylpyridinium chloride), organic acids (benzoic, sorbic) and esters (parabens), peroxygens (hydrogen peroxide and the new peroxide-based formulations, peracetic acid), phenols and cresols, and phenylethers (triclosan). Information about action mechanisms on other types of micro-organisms (mycobacteria, bacterial spores, yeasts, moulds, protozoa, algae) or entities (viruses, bacteriophages, prions) is often disappointing.

Further research in many of these areas would be instructive and exciting.

For a list of scientific references for the Action and Resistance article please contact
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Now anyone can attend!



Virox Technologies Inc., Johnson Diversey, The Butchers Company, SciCan, Deb Canada and Webber Training are committed to furthering educational opportunities for the Infection Control Professional (ICP) in Canada. The Community and Hospital Infection Control Association - Canada (CHICA-Canada) National Education Conference is an excellent opportunity to bring ICPs together in a forum of learning.

The Virox Patron Member Scholarship Program is intended to provide financial assistance to eligible ICPs to attend the annual National Conference of CHICA-Canada.

Up to \$2000.00 is available for each successful recipient for the reimbursement of eligible costs related to participation at the CHICA-Canada National Conference.

Applications are due January 9, 2004

Registration form can be downloaded at

<http://www.viroxtech.com/pdf/application.pdf>



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What's new at Virox?



We're Moving!

As a result of continued acceptance and stunningly broad support of the Virox Accelerated Hydrogen Peroxide products we have outgrown our existing manufacturing facilities. We will be moving into a brand new 22,000 sq. ft. building at the Winston Business Park (Hwy 403 & Dundas area in Oakville). The new building is slated for completion this December. Updates on our progress, and final completion dates for the move can be found on our website (www.viroxtech.com).

Tuberculocidal Claim Received!

We are excited to announce the development of a new Disinfectant Surface Cleaner with a 5 minute Tuberculocidal Claim - part of the Accel family of products. This new Tuberculocidal Claim also applies to SciCan Optim 33 TB Disinfectant Surface Cleaners for use in the dental industry. Accel TB is designed for use in higher risk medical environments where the requirement for broad-spectrum germicidal performance in short contact times is required. The product is in a Ready-To-Use formula (no dilution required) and will be packaged in 500mL and 1L bottles, and in a disposable Wipes format. Accel TB and Optim 33 TB are proven effective as intermediate level disinfectants for non-critical medical devices and environmental surfaces.

Biofilm Study

Dr. Howard Ceri from MBEC Biofilms Technologies Ltd., at the University of Calgary, completed a detailed study on the effects of AHP against biofilms. The study concluded that AHP is a very effective biocide against the biofilms tested. This is extremely exciting as

biofilms in the Dental & Hydrotherapy markets have become a primary concern. A complete copy of the report can be viewed on the Virox website.

CHICA-Canada Education Sponsor

The Virox team believes that knowledge is the key to infection prevention. With our commitment to continued education and providing educational opportunities for the Infection Control Professionals in Canada Virox has agreed to become a Gold Sponsor of CHICA-Canada's Basic Infection Control Training web-based course. The CHICA Board perceives an urgent need for additional education opportunities for ICPs, and is proactively seeking other contributions to help fund the design of a distance education program for new infection control professionals.

Website Update

We are pleased to announce that the Protocol and Compatibility sections of the website are now fully functional. The Protocol section contains over 20 procedures for the use of AHP in Healthcare, Medical, Dental, and Health & Beauty industries. The Compatibility section contains results of compatibility studies with Accelerated Hydrogen Peroxide conducted either externally by manufacturers of instruments/devices or internally in the Virox laboratory. Whenever possible we work directly with manufacturers of instruments & devices by providing AHP directly to them for compatibility testing. We are also pleased to work with end-users by accepting instruments / devices and conducting compatibility studies in house. There is information that will be important to you on the web site - have a look.

www.viroxtech.com

Conference & Education

Fall Schedule

Virox will be participating in the following functions:

September 11 & 12:

NAPIC Conference: Developing Partnerships: A Team Approach to Infection Prevention in Edmonton

September 15 & 16:

CSAO Conference: Visions of Excellence in Toronto

September 18 & 19:

SASKPIC Conference: Battling the Bugs

Sept. 29 to Oct. 1:

Ontario Branch of CIPHI Conference: Emerging Concepts and Controversies in Public Health in Waterloo

October 3:

York Region Health Services Education Day: Little Bugs, Big Bites! In Newmarket

October 22:

CKICC Education Day: Balancing the Circle of Health in Chatham

October 29 & 30:

EOPIC Conference: The Intention is Prevention, in Kingston

November 10 to 12:

IFIC Conference: Fourth Congress of the International Federation of Infection Control, Malta

November 18 & 19:

CSSA: Can Clean in Toronto

December 1 & 2:

CHCA Conference: From Policy to Practice....The Home Care Challenge in Toronto

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.

Disinfectant Label Claims Unreliable Without Good Test Methods

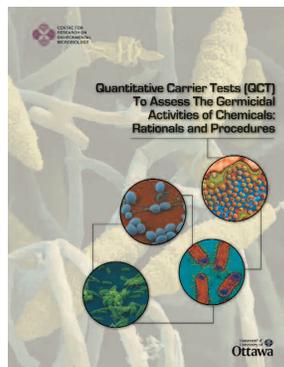
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Label claims of disinfectant activity of registered products are often based on test methods with flaws serious enough to compromise the quality of such claims. This issue was highlighted in 1990 in a report from the U.S. General Accounting Office and soon after the U.S. Environmental Protection Agency (EPA) initiated efforts to improve the test methods. Around the same time, the first national standard on disinfectant testing published by the Canadian General Standards Board incorporated improved versions of protocols based on the information available at the time. Since then, and as a result of funding support from the EPA, much has been done to design and evaluate disinfectant test methods which are simpler, fully quantitative and more reflective of the conditions a product may encounter in the field. The Centre for Research on Environmental Microbiology (CREM) has been particularly active in this endeavor and the quantitative carrier tests (QCT) it has developed are now standards of ASTM International, a highly respected standards-setting organization.

CREM's work, which started in early 1992, was initially aimed at developing a replacement for AOAC International's test for sporicidal activity. Soon after, the mandate was expanded to include other classes of microorganisms. The specific intent was to overcome the recognized flaws in other commonly used methods by a rational and quantitative approach so that a single test design could be applied to all major classes of pathogens. This unified approach to microbicide testing makes even more sense in the current economic realities

and moves toward regional and global trade initiatives are considered. For example, the Organization for Economic Co-operation and Development (OECD) has recently initiated efforts to harmonize disinfectant test methodology and registration requirements in its 30 member countries. AOAC International, a standards-setting organization whose disinfectant test methods have been in use for several decades now, set up a Task Force last year to review and revise its test protocols. CREM is actively involved in the work of this Task Force.



CREM's methods are based on a tiered approach. The first tier, termed QCT-1, is designed to assess the potency of a given microbicide under relatively ideal conditions. The second tier (QCT-2) is more stringent. Both QCT-1 and QCT-2 can be used to determine the activity of microbicides against a variety of microorganisms, including vegetative bacteria, spores, mycobacteria and fungi. QCT-2 is also suitable to work with viruses.

The use of improved test methods will add to the level of confidence a user can place in the label claims of microbicides used in infection control. Such methods should also encourage the development of better and safer formulations by creating a level playing field for manufacturers.

A newly issued CD and 90-page manual describing these methods in detail can soon be ordered on-line at: www.webbertraining.com/product.htm. Further information about the manual can be obtained by contacting: QCTmanual@webbertraining.com

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about the highly affected hospitals during the SARS crisis to see health care workers wearing protective garb inappropriately. One person had cut a hole in his mask so he could smoke through it!

Infection Control's time has come. It's time for health care workers to take infectious diseases seriously. It's time for Infection Control Professionals to explore ways to address the fear, confusion, attitudes and lack of education that contribute to poor infection control practices.

-Not everything that counts can be counted. Not everything that can be counted counts.

Einstein

In upcoming Virox Newsletters

- Lethal Effects of Heat on Bacterial Physiology
- Health Canada's Infection Control Guidelines
- Preventable Nosocomial Infections Cost Billions
- CHICA 2004 - Calgary
- Infection Control in the UK

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