



## Infection Control Best Practices for Laundry & Housekeeping Professionals

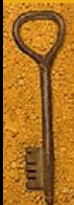
Nicole Kenny, B.Sc, Assoc Chem  
Director of Professional & Technical Services  
Virox Technology Inc  
nkenny@virox.com



## The Infection Control Team



- ◆ Controlling Infectious Disease is everybody's business
- ◆ Environmental Services department plays an important role in closing the gap in Infection Control
- ◆ Engage all personnel from every department



## Chicago Tribune (2000)

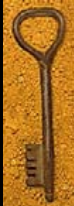
- ◆ 2000, 75% of an estimated 103 000 patient deaths linked to HAIs
- ◆ Due to unsanitary facilities, unwashed hands & dirty instruments
- ◆ Cleaning staff were inadequately trained & cleaning budgets had been steadily cut

Chicago Tribune



## The Reality

- ◆ Incidence of HAIs & pseudo-outbreaks can be minimized by:
  - Appropriate use of cleaners & disinfectants
  - Appropriate maintenance of medical equipment
  - Adherence to water quality standards
  - Adherence to ventilation standards (negative pressure)



## Handwashing

- ◆ Contaminated hands are probably the single most common vector for the spread of Infectious disease



Stay Healthy—Wash Your Hands



## Today's Focus

- ◆ Chemicals
- ◆ Methods & Procedures
  - Hand Hygiene
  - Cleaning & Disinfection
- ◆ Current Infection Control Guideline Recommendations
- ◆ Environmental Services Associations



## Best Practices

For Selecting Cleaners & Disinfectants



## Disinfectant? SO WHAT!



In simple terms...not unlike antibiotics, disinfectants are under fire for not being as effective as they used to be and new strains of organisms arrive regularly, new weapons must be deployed

“Resistant Germs...Emerging Strains...Toxicity of Legacy Chemistry for Users and the Planet”



## Effects of Germicides on Microorganisms

- ◆ HCWs take for granted the action of disinfectants without fully understanding mechanism of action
- ◆ Differences in the action of antimicrobial ingredients
- ◆ Differences depending on concentration of chemical used

Infection Control Today  
Cleaning & Disinfecting: The Effects of Germicides on Microorganisms  
Feb 2004



## Sanitation

- ◆ Criteria: reduction of surrogate bacterial strains by more than 5- $\log_{10}$  in the presence of 5% bovine serum
  - *Staphylococcus aureus*, *Pseudomonas aeruginosa* & *Salmonella choleraesuis* etc



## Disinfection Testing Requirements

Criteria for disinfection:

- ◆ Bactericidal: effective against Vegetative bacteria (*Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Salmonella choleraesuis*): > 6  $\log_{10}$  reduction in viable numbers.
- ◆ General Virucide: effective against the Sabin strain of Polio virus Type 1 (Hydrophilic virus), criterion is > 3  $\log_{10}$  reduction
- ◆ Virucidal: effective against targeted viruses (enveloped or non-enveloped), criterion is > 3  $\log_{10}$  reduction



## Disinfection Testing Requirements

Criteria for disinfection:

- ◆ Fungicidal: effective against Trichophyton mentagrophytes, criterion is  $> 5 \text{ Log}_{10}$
- ◆ Tuberculocidal: effective against Mycobacteria terrae
  - For Instruments the criterion is  $> 6 \text{ Log}_{10}$
  - For Surfaces the criterion is  $> 4 \text{ Log}_{10}$
- ◆ Sporicidal: effective against Bacillus subtilis & Clostridium sporogenes, criterion is  $> 6 \text{ Log}_{10}$



## Positive Changes

- ◆ “By eliminating the carcinogenic substances from the workplace, large steps will also be taken to reduce their release into the environmental and surrounding communities”

-Canadian Auto Worker's Prevent  
Cancer Campaign



## Positive Changes

- ◆ “It is cheaper & more effective to prevent environmental & health damage than to attempt to manage or cure it. Prevention requires examining the entire life cycle of products. It encourages the exploration of safer alternatives and the development of cleaner products, technologies & workplaces.”

- Preventing Occupational & Environmental Cancer  
- A strategy for Toronto



## How to Choose a Cleaner or Disinfectant

- ◆ Factors that influence the choice of disinfection procedure for Environmental Surfaces:
  - Nature of item to be disinfected
  - Number of organisms present
  - Innate resistance of organisms
  - Amount of organic soil present
  - Type & concentration of germicide used
  - Duration & temperature of germicide contact
  - Specific indications & directions for use



## Choosing a Disinfectant

- ◆ Understand the shelf-life
  - Bleach shelf life is 3-6 months once opened & daily once diluted
- ◆ Knowing the dilution requirements is very important
  - Chefs love to experiment when following recipes, but this is a recipe for DISASTER when it comes to infection control



## Acceptance

- ◆ Buy In (Acceptance) is VITAL!
- ◆ Acceptability by housekeepers can be the main criteria for selecting a disinfectant
  - Perception is everything, if the staff do not like the smell, think the product doesn't foam enough, foams too much etc it doesn't matter how great the product is
  - If the product is not used correctly (or at all) the Infection Control Program fails

## Disinfectant (Chemical) Selection

Consider:

- ◆ Efficacy
- ◆ Spectrum
- ◆ Versatility
- ◆ Ease of use
- ◆ Safety profile
- ◆ Cost



*What's in your bottle?*

## Desired Traits In A Disinfectant

- ◆ Government registered (DIN)
- ◆ Non-toxic to humans & animals
- ◆ Non-allergenic & non-sensitizing
- ◆ Non-hormone disrupting
- ◆ Environmentally sound
- ◆ Broad-spectrum germicidal activity

Courtesy of Dr. Syed Sattar

## Desired Traits In A Disinfectant

- ◆ Free from Volatile Organic Compounds
- ◆ Long Shelf Life
- ◆ Safe to transport & safe and easy to store
- ◆ No Active Residual Chemistry
- ◆ Not readily neutralized in organic or inorganic matter
- ◆ Non-corrosive & material compatible

Courtesy of Dr. Syed Sattar

## Desired Traits In A Disinfectant

- ◆ Fast-acting
- ◆ Non-staining & free of any pungent smell
- ◆ Cost Effective
- ◆ Easy to Use with clear label instructions

Courtesy of Dr. Syed Sattar

## Summary of Chemistries

Germicide Type	Germicide Type								
	Active Residuals	Volatile Organic Compounds	Toxic / Irritant	Substrate Impact	Pool Cleaning	Environmental Issues	Narrow Spectrum Germicide	Organic Neutralization	Restrictions In Use
Iodine									
Alcohols									
Phenolics									
Chlorine									
Quats									
AHP									

## Best Practices

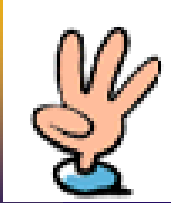


For Hand Hygiene



## FACTS

- ◆ Play a major role in the transmission of pathogenic microorganisms to susceptible hosts
- ◆ Hands acquire known or potential pathogens by contact with objects and animate and inanimate surfaces
- ◆ Strict adherence to HH is more likely to prevent the spread of infections than procedures exceeding routine cleaning of the environment



## Hand Hygiene

- ◆ Recognized as the best way of stopping the spread of organisms in this setting
- ◆ Soap and water
  - No indication for antimicrobial soap
  - 10-15 seconds of lathering
- ◆ Alcohol
  - more research into concentration required to kill all viruses



## Computer Keyboards May Harbor Harmful Bacteria

- ◆ Harmful bacteria can survive for prolonged periods on keyboards & keyboard covers (VRE & MRSA: 24 hrs, PSAE: 1hr)
- ◆ More contact with contaminated keyboard increase likelihood of transmitting bacteria to hands (MRSA: 42% - 92%, VRE: 22% to 50%, PSAE: 9% to 18%)
- ◆ Hand Hygiene important helps cut down on transmission
- ◆ Cleaning & Disinfection of keyboards & keyboard covers helps decrease contamination

Infection Control Today  
Computer Keyboards May Harbor Harmful Bacteria;  
Experts Advise to Use Disinfectant and Wash Your Hands  
April 2005



## Cleaning

Like brushing your teeth, its something that has to be done.



## Reasons for Cleaning



- ◆ Microbes hide inside the soil on surfaces
- ◆ Body fluids, waste, food and even hard water soils can offer a protective barrier for germs
- ◆ A disinfectant is effective only on the germs it can touch
- ◆ Heavier build ups may require a detergent cleaner with agitation by a mop or brush in order to get down to the pathogens



## Did you know?

- ◆ Cleaning reduces or eliminates the reservoirs of potential pathogenic organisms
- ◆ Proper cleaning methods & the mechanical action of cleaning alone will physically remove 99 to 99.9% of organisms on a surface
- ◆ Cleaning alone will make most surfaces safe for staff & patients



## Cleaning Strategy

- ◆ Minimize contamination of cleaning solutions & cleaning tools
- ◆ Bucket solutions become contaminated almost immediately (especially if double dipping)
- ◆ Cleaning solutions should be replaced frequently



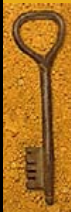
## Cleaning Strategy – Sources for Contamination

- ◆ Cloths & mop heads, especially if left soaking in dirty cleaning solutions can be a source of contamination
- ◆ Laundered cloths / mop heads must be allowed to dry before re-use to help minimize the degree of contamination
- ◆ Replace cloths/mop heads with clean items each time a bucket of detergent / disinfectant is emptied & replaced with fresh, clean solution
- ◆ Disposable cloths & mop heads are an alternative option



## Best Practices

Defining the Housekeeping Protocol



## Housekeeping

- ◆ Surfaces can be divided into 2 groups
  - Minimal hand contact (floors, walls etc)
  - Frequent hand contact (high touch surfaces)
- ◆ High touch surfaces must be cleaned &/or disinfected more frequently
- ◆ Work with ICPs to define the high touch surfaces then develop an appropriate protocol



## Housekeeping

- ◆ Horizontal surfaces with infrequent hand contact require cleaning on a regular basis, when soiling or spills occur or when patient has been discharged
- ◆ Cleaning of walls, blinds & window curtains is recommended when they are visibly soiled



## Housekeeping

- ◆ Detergents are adequate for most housekeeping
- ◆ Disinfectants are not usually needed in housekeeping activities (floors, walls, administrative areas etc) in health care settings, but are necessary in specified areas (surgical suites, ICUs, CCUs, transplant units)



## Housekeeping - Floors

- ◆ Extraordinary cleaning & decontamination of floors is unwarranted
- ◆ Disinfection of floors offers no advantage over regular detergent/water cleaning & has minimal or no impact on the occurrence of HAIs
- ◆ Newly cleaned floors become rapidly re-contaminated from airborne microorganisms & those transferred from shoes, equipment wheels & body substances



## Environmental Reservoirs

- ◆ Association between reservoirs and outbreaks
- ◆ Protocols should include careful cleaning of wet surfaces and equipment to prevent the build up of Biofilms
- ◆ Examples:
  - Faucet aerators, Shower Heads
  - Sinks, Drains
  - Flower Vase Water
  - Ice Machines
  - Hydrotherapy Baths



## Additional Reservoirs

- ◆ Dilute solutions of detergents or disinfectants can be a source of contamination
- ◆ Gr<sup>-</sup>ve bacilli (*Pseudomonas* & *Serratia*) have been detected in solutions of some disinfectants (phenols & Quats)
- ◆ Consider using containers that provide only enough product for the day, discard any remaining solution & drying out the container will help minimize degree of bacterial contamination



## Cleaning & Disinfectant Strategies

- ◆ Use a DIN registered product
- ◆ Use disinfectant in accordance with manufacturer's instructions
- ◆ Do not use alcohol to disinfect large environmental surfaces
- ◆ Keep housekeeping surfaces visibly clean on a regular basis & clean up spills promptly
  - Floors, walls, tabletops



## Cleaning & Disinfectant Strategies

- ◆ Detergent & water are adequate for cleaning surfaces in non-patient care areas
  - Administrative offices
- ◆ Clean & disinfect high-touch surfaces on a more frequent schedule than minimal-touch housekeeping surface
  - Doorknobs, bed rails, light switches, bathrooms
- ◆ Clean walls, blinds & window coverings in patient-care areas when they are visibly dusty or soiled



## Cleaning & Disinfectant Strategies

- ◆ Avoid large-surface cleaning methods that produce mists or aerosols, or disperse dust in patient-care areas
- ◆ Follow proper procedures for effective uses of mops, cloths & solutions
  - Prepare cleaning solutions daily or as needed
  - Replace with fresh solution frequently
  - Change mop head at beginning of each day, when soiled or after cleaning up large spills of blood or other body substances
  - Clean mops & cloths after use and allow to dry before reuse (or use single use / disposable cloths & mops)



## Cleaning & Disinfectant Strategies

- ◆ Use appropriate dusting methods for patient-care areas designated for immunocompromised patients
  - Wet-dust horizontal surfaces daily by moistening a cloth with an approved disinfectant
  - Avoid dusting methods that disperse dust (ie feather dusting)
- ◆ Keep vacuums in good repair & equip vacuums with HEPA filters for use areas with patients at risk
- ◆ Close doors of immunocompromised patients' rooms when vacuuming to minimize exposure to airborne dust



## Cleaning & Disinfectant Strategies

- ◆ Avoid unnecessary exposure of neonates to disinfectant residues when disinfecting environmental surfaces in nurseries or NICU & always follow manufacturers' instructions & safety advisories
  - Do not use phenolics or any other chemical germicide to disinfect bassinets or incubators
  - Rinse disinfectant-treated surfaces, especially those treated with phenolics
  - If using phenolics prepare solutions as per manufacturers' instructions



## Cleaning Spills: Blood / Body Fluids

- ◆ Promptly clean & decontaminate spills of blood or other potentially infectious materials
- ◆ Use protective gloves & other PPE appropriate for the task
- ◆ For large spills clean visible matter with disposable absorbent material & discard used cleaning materials in labeled containers
- ◆ After surface has been cleaned, swab area with a disinfectant and allow the surface to air dry



## Carpeting & Cloth Furnishings



- ◆ Vacuum carpeting in public areas & general patient care areas regularly
- ◆ Thorough deep cleaning of carpeting should be performed periodically using a method that minimizes the production of aerosols
- ◆ Avoid use of carpeting in high-traffic zones in patient-care areas or where spills are likely



## Carpeting & Cloth Furnishings

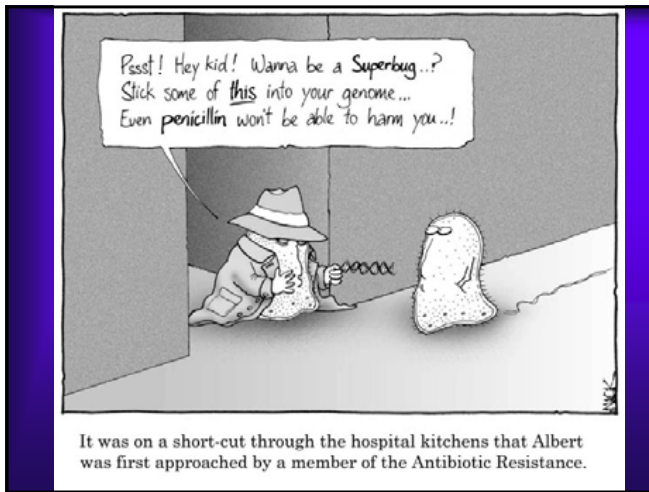
- ◆ Thoroughly dry wet carpeting to prevent the growth of fungi, replace carpeting that remains wet after 72hrs
- ◆ Do not use carpeting in hallways & patient rooms in areas housing immunosuppressed patients



## Special Pathogens


- ◆ Use appropriate HH, PPE & isolation precautions during cleaning & disinfecting procedures
- ◆ Use standard cleaning & disinfection protocols to control environmental contamination with AROs
  - Pay close attention to cleaning & disinfection of high-touch surfaces
  - Ensure compliance by HCWs with cleaning & disinfection protocols
  - Use DIN registered products appropriate for the task as per manufacturers' instructions







## Best Practices

For Laundry

## Laundry & Bedding

- ◆ Employers should consider laundering worker's uniforms
- ◆ Maintain receiving area for contaminated textiles in -ve pressure
- ◆ Ensure laundry areas have handwashing facilities & appropriate access to PPE
- ◆ Use & maintain equipment as per manufacturers' instructions




## Laundry & Bedding

- ◆ Do not leave damp textiles or fabrics in machines overnight
- ◆ Disinfection of washing & drying machines in residential care is not needed as long as gross soil is removed before washing
- ◆ Handle contaminated textiles & fabrics with minimum agitation to avoid contamination of air, surfaces & persons



## Laundry & Bedding

- ◆ Bag or contain contaminated textiles & fabrics at point of use
  - Do not sort or pre-rinse contaminated textiles or fabrics in patient-care areas
  - Use leak-resistant containment for textiles & fabrics contaminated with blood or body substances
  - Identify bags or containers for contaminated textiles with labels or colour coding



## Laundry & Bedding

- ◆ Do not conduct routine microbiological sampling of clean textiles
- ◆ Use microbiological sampling during outbreak investigations IF evidence indicates a role of transmission with textiles or clothing



## Associations or Society's

The World of  
Environmental Services



## Environmental Management Associations

- ◆ Canadian Association of Environmental Management
  - To improve management throughout the Environmental Service field in all work places. The objective is to promote professional growth & development of its members. The only thing that remains constant in our professional life is change & only with education does this allow us to meet the challenges of today

## Environmental Management Associations

- ◆ American Society for Healthcare Environmental Services (ASHES)
  - Setting the standards for environmental excellence. Leads, represents & serves our members by promoting excellence, best practices, innovation & leadership through advocacy, education & certification.

## Environmental Management Associations

- ◆ International Executive Housekeepers Association (IEHA)
  - A professional organization committed to a cleaner, safer, healthier environment. To provide a professional organization for Executive Housekeepers, Directors of Environmental Services, managers within the housekeeping & custodial activities and suppliers of custodial goods & services. Through the organization, individuals can attain education, share research, & achieve recognition for success while interacting with colleagues within the career environment.

## References

- ◆ Guidelines for Environmental Infection Control in Healthcare Facilities, CDC. MMWR June 2003, Vol 52, No RR-10
- ◆ Handwashing, Cleaning, Disinfection and Sterilization in Health Care, Health Canada, December 1998, Vol 24S8
- ◆ Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care, Health Canada, July 1999, Vol 25S4

## References

- ◆ Rutala, APIC Guideline for Selection and Use of Disinfectants (1990)
- ◆ Webber, P. Hospital & Housekeeping Infection Control, Sanitation Canada, March/April 2005, pg 30 – 36
- ◆ Fitzgerald, T.J., Pathogen Eradication from an Environmental Services Perspective, ICT, October 2005, Vol 9, No 10, pg 40



## References

- ◆ Dix, K & Schraag, J. Environmental Surface Cleaning First Defense Against Infection Agents, ICT, December 2005, Vol 9, No 12, pg 22 – 30
- ◆ Twoney, C. Hand Hygiene Best Practices for 2006, ICT, February 2006, Vol 10, No 2, pg 36 - 40