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Converting health care and institutions to evidence based cleaning practices.

The environment in health care settings has been a contributor to the spread of pathogens and therefore indirectly to the acquisition of hospital acquired infections. Hospitals have in the past been encouraged to use a one step cleaner disinfectant process in order to reduce the spread of pathogens

However, cleaning and disinfecting are two distinct processes, and new research supports an approach that separates cleaning and disinfecting.

Separating Cleaning and Disinfecting

For a long time many people thought that it was simply easier and more convenient to clean with a disinfectant cleaner, since it involved a single-step process.

There are a number of reasons why we have to rethink these old views:

- Cleaning is not a one step process.

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Cleaning with a disinfectant and not precisely following the manufacturer's instruction for its use can create problems. For example, it is hard to determine during normal cleaning whether the disinfectant has been left wet on the surface long enough for the surface to be considered disinfected. Typically some surfaces will dry before the full dwell time recommended by the manufacturer. It is also difficult to determine whether the level of soil on a surface is within the range that the disinfectant can handle.

There are a number of reasons why we have to rethink these old views:

Some disinfectants are absorbed by cleaning cloths, making the disinfectants unavailable for application to the surface.(2)

There are a number of reasons why we have to rethink these old views:

Some pathogens like *C.difficile* and *Noro* virus are not completely removed from the environment when surfaces are cleaned with disinfectant cleaners.(3)

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Many surface disinfectants contain quaternary ammonium compounds (QUATs), phenolics, hydrogen peroxide or sodium hypochlorite, which can cause skin and respiratory irritation. Disinfectants are one of the leading allergens affecting health care providers.(4) Female cleaning staff have the highest risk of having children with birth defects.(5)

There are a number of reasons why we have to rethink these old views:

The European Commission's Scientific Committee on Emerging and Newly Identified Health Risks posed and answered the following questions on the antibiotic resistance effects of biocides:

“1.a Does current scientific evidence indicate that the use of certain active substances in biocidal products in various settings as mentioned above can contribute to the occurrence of antibiotic resistant bacteria, both in humans and in the environment?”

“Yes, current scientific evidence (including bacteriological, biochemical and genetic data) does indicate that the use or misuse of certain active substances in biocidal products in various settings may contribute to the increased occurrence of antibiotic resistant bacteria, both in humans and in the environment.

“2.c If yes, which types of areas of application create the highest risks for increasing antibiotic resistance?”

Any application that encompasses the widespread regular use of biocides at sub-lethal concentrations maintains a continuous selective pressure and thus increases the risk of selecting resistant bacteria. This may occur in a number of uses including hospitals, food production and cosmetics manufacturing etc.” (7)

There are a number of reasons why we have to rethink these old views:

Gilbert & McBain (2003) stated that “in any environment there is likely to be a continuum of biocide concentration ranging from treatment concentration to nil”. This, in effect, presents subinhibitory concentrations in the environment to which step-wise decreases in susceptibility may occur. (8)

There are a number of reasons why we have to rethink these old views:

It has never been actually proven that cleaning with a disinfectant cleaner prevents infection better than cleaning with regular detergent. Today there are methods that can be used to instantly validate cleaning scientifically. These are able to show that we can make surfaces safe to use and handle without cleaning with disinfectant cleaners.(9) (10) (11)

There are a number of reasons why we have to rethink these old views:

Cleaning with detergents has demonstrated the ability to lower MRSA from health care environment without the use of disinfectants.(12)

Understanding Cleaning

The process of cleaning is the removal or transfer of surface contamination from environmental surfaces to cleaning cloths. A common misconception is that the cleaning chemical used provides the cleaning. Cleaning chemicals only provide a portion of the cleaning process; removal is accomplished with the cleaning cloth and the procedures used.

Understanding Cleaning

The selection of cleaning cloths, the procedures used and the laundering/decontaminating of the cleaning cloths likely impact the outcome far more than the selection of any specific cleaner or disinfectant. (20)

Understanding Cleaning

Cleaning of environmental surfaces in health care settings involves wiping over surfaces using friction to transfer soils from surface to cleaning cloth. There is usually no dwell time allowed to suspend soils and no rinsing step to remove suspended soils.

Understanding Cleaning

The repeated use of cleaning and disinfecting products without a rinsing step allows for the accumulation of synthetic organic detergent surfactant and disinfectant surfactant residues on surfaces which the following bacteria have demonstrated the ability to acclimatize, adapt to and consume as a reproductive energy source
Pseudomonas aeruginosa, *Escherichia coli*,
Enterococcus majodoratus, *Klebsiella liquefasciens*,
Enterobacter liquefasciens, *Klebsiella aerogenes*,
Enterobacter agglomerans, *Staphylococcus albus*,
Proteus sp., *Klebsiella oxytoca* and *Brevibacterium* sp.,(22)

Understanding Cleaning

Until now, the most common component of cleaning compounds has been surfactants. Surfactants work on the liquid surface interface by lowering surface tension, therefore allowing soils to release from surfaces to be cleaned. They also reduce friction between cleaning solution and cleaning cloth and the surface to be cleaned. This process of emulsifying or suspending soils by lowering surface tension takes time.

Understanding Cleaning

Converting cleaning formulations to buffered organic acids without surfactants has the following benefits.

Lactic acid and other organic acids are natural antimicrobial agents that discourage the growth of many pathogens and encourage the growth of many beneficial microorganisms. Lactic acid is commonly added to many food products as a preservative and to animal feed to improve growth of pigs and chickens and prevent infections. It is expected the addition of lactic acid will replace the addition of antibiotics in animal feed without the environmental problem of misuse of antibiotics.(23)

Its all about the process.

Effective cleaning is the removal of inorganic and organic soils from environmental surfaces, to very low levels. Cleaning procedures need to consistently remove soil and minimize the risk of spreading contamination from one surface to another. (21)

Its all about the process.







Moisten your cleaning cloths **"C"** with MicroClean



Take a Cleaning **"C"** cloth and fold it into 4

Begin by wiping the surface in one direction, then wipe in the



Using a dry cloth **"D"**, dry the surface



ATP MONITORING SYSTEM

Its all about the process.

Laundering / Decontaminating Cleaning Cloths

The effective removal of accumulated soils from cleaning cloths is a critical component to any successful cleaning process. Therefore laundering processes need to be reviewed and any required process changes implemented, before a successful cleaning program can be implemented.

Evidence based cleaning is all about the process.

Clean with safer cleaning products

Use a validated cleaning process.

Restrict the application of disinfectants to pre-cleaned surfaces, and only where they are required.

Evidence based cleaning is all about the process.

Evidence based cleaning provides cleaner surfaces than current hospital cleaning with disinfectant cleaners.

Safe and can used on any surface not damaged by water.

Easily trained and accepted by all staff.

Resolving the cleaning question. Evidence based cleaning practices for outbreak prevention and management.

Evidence based cleaning is all about the process.

Utilizing ATP monitoring is an excellent method of identifying areas where staff require improvement, items not being cleaned grey areas and preventing the spread of contamination from cleaning.

Faced with the real possibility that our ability to treat infections with antibiotics is ending.

Converting to evidence based cleaning may become our primary method of preventing infections.

Targeted use of disinfectants .

Application of disinfectants on targeted surfaces after evidence based cleaning practices provides all the insurance needed.

Restricted use of disinfectants allows for the selection of a single disinfectant recommended for the removal of all pathogens.

Targeted use of disinfectants .

Hypochlorites are recommended for use to remove *C. difficile* from health care environments by:

May 2010 *C. difficile* update Society for Healthcare Epidemiology of America (SHEA) and the Infectious Diseases Society of America (IDSA).(13)

June 2009 Revised Health Care Cleaning Manual NHS National Health Care System Britain.(14)

December 2009 Ontario Best Practices for Environmental Cleaning and Prevention of Infections.(4)

All recommendations are for a minimum of 1000 ppm .

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