

Texas Department of State Health Services
Healthcare Safety Conference

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Cleaning and Disinfection: It's more than just spray and wipe!

CLEAN FREAK

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Today's Focus

- Identify the desired traits of disinfectants including the ability to identify the different active chemistries commonly used in EPA registered disinfectants
- Balancing the trade-offs to optimize disinfectant selection and implement an effective cleaning and disinfection program.
- Understand best practice principles for using disinfectants to minimize occupational health and safety concerns while ensuring infection prevention needs are met.

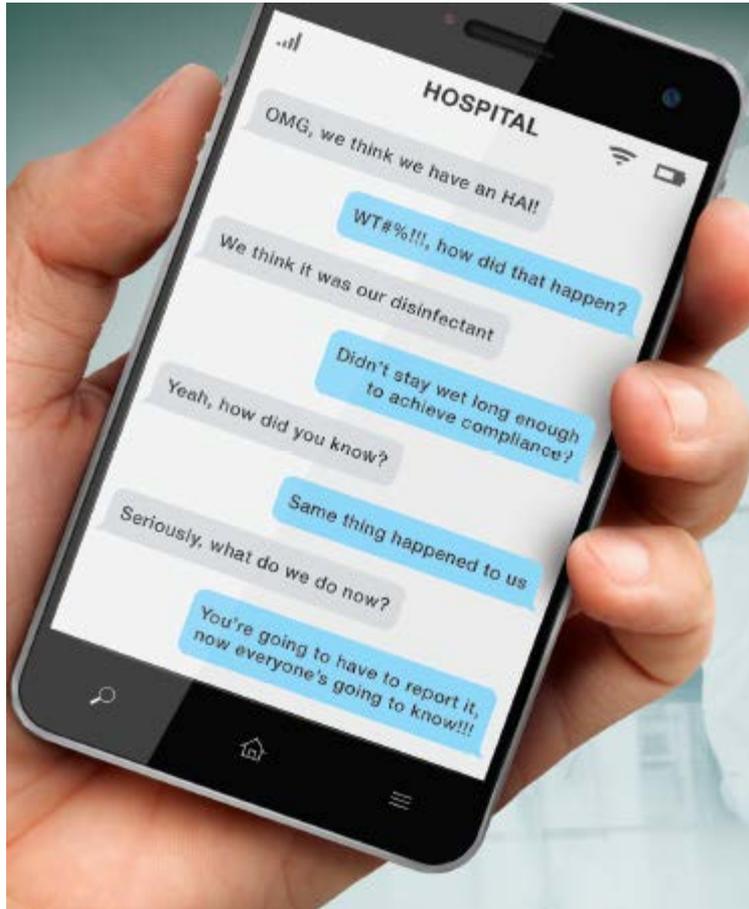


Why Should We Clean?

- Proven health benefits
 - Data supports the position that effective cleaning contributes to the economic bottom line
 - **Occupant wellness**: reduced absenteeism, increased productivity
 - **Patient/Resident/Client wellness**: reduced disease transmission
 - Asset preservation
 - Energy savings



Our First Line of Defence



- Disinfectants are the first line of **defence against pathogens** wanting to wage war on your healthcare facility.
- Is your disinfectant really providing the **protection** your infection prevention program needs?



It's more than the disinfectant you choose...



- **Survival of the Fittest**
 - “Bugs” (pathogenic or not) can **survive after inoculation** onto surfaces and fomites, can be cultured from in-use fomites and can proliferate on surfaces or fomites
- **I don't want your cooties!**
 - There is a direct means for bugs contaminating the environment to be **picked up or transferred** to our hands, patient's hands, visitor's hands, students hands etc.
- **You touch it, You get it!**
 - Exposure to contaminated surfaces or fomites in the environment is associated with **acquisition** (colonization) and/or infection
- **Just clean it!**
 - Decontamination of surfaces or fomites results in **eliminating transmission** of infection and can lower the rates of colonization or infection



How We Know Disinfection is Not Working

Study	Pathogen	Relative Risk of patient acquiring HAI based on prior room (+ve versus -ve room)
Martinez 2003	VRE	2.6
Huang 2006	VRE – prior room occupant	1.6
	MRSA – prior room occupant	1.3
Drees 2008	VRE – prior room occupant	2.2
	VRE – prior room occupant in previous two weeks	2.0
Shaughnessy 2008	C. difficile – prior room occupant	2.4
Nseir 2010	A. baumannii – prior room occupant	3.8
	P. aeruginosa – prior room occupant	2.1

1. Martinez *et al. Arch Intern Med* 2003; 163: 1905-12.
2. Huang *et al. Arch Intern Med* 2006; 166: 1945-51.
3. Drees *et al. Clin Infect Dis* 2008; 46: 678-85.
4. Shaughnessy. ICAAC/IDSA 2008. Abstract K-4194.
5. Nseir *et al. Clin Microbiol Infect* 2010 (in press).



What's in *your* bottle?

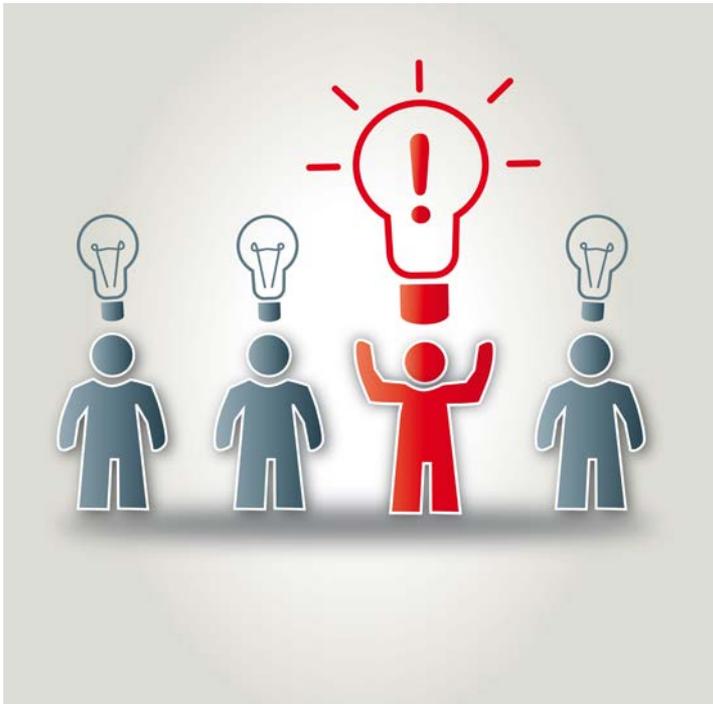


Disinfectant Desired Traits

Tips and Tricks to choosing
the ideal disinfectant



Today's Reality



- The very chemicals we have been using to fight microbes are causing environmental damage and threats to our health and safety
- Emerging pathogens are outpacing the efficacy capabilities of legacy disinfectants
- Resistance to legacy disinfectants is increasingly concerning
- Some active ingredients are on the verge of being banned



It starts with proper disinfection selection

- Selecting the right disinfectant requires consideration of many factors:
 - Product should have good cleaning properties and remain active in the presence of organic matter
 - Product should exhibit **GERMICIDAL EFFICACY** against a broad spectrum of microorganisms
 - Product should exhibit this efficacy in a rapid and realistic contact time
 - Product should be **NON-TOXIC** and have low irritancy and allergenic properties
 - Product should carry wide **MATERIAL COMPATIBILITY**. It should not cause the deterioration of metallic surfaces, rubber, plastics and other materials
 - Product should be **ENVIRONMENTALLY PREFERABLE** and should not damage the environment on disposal



Strength is **NOT** always found in numbers

- Do not get caught in the advertising hype that a product kills X bugs while the closest competition only kills Y

Bacteria

- Gr +ve
- Gr -ve
- AROs

Viruses

- Enveloped
- Non-Enveloped

Fungi

- Yeasts
- Molds

- Antibiotic resistance does not equate chemical resistance



What's in a HMIS Rating?

- Staff safety must be considered:
 - CDC Report highlighting 151 cases of Occupational Illness associated with Quats
 - CDC Study estimated number of injuries associated with use of disinfectants: 463 eye injuries, 271 neurologic injuries, 252 respiratory injuries

Active Ingredient	Health Hazard Rating*	Flammability Hazard Rating	Physical Hazard Rating	Recommended Personal Protective Equipment (PPE)*
Accelerated Hydrogen Peroxide (AHP)	0	0	0	None
Quat	2	0	0	None**
Quat / Alcohol	2	3	0	Gloves & Goggles
Quat / Alcohol	3	3	0	Wear gear as deemed necessary***
Sodium Hypochlorite (Bleach)	2	0	1	Gloves & Goggles
o-Phenylphenol & o-benzyl p-chlorophenol	1	0	0	Goggles

*HMIS and PPE requirements were based on available MSDS and Master EPA Labels as of October 15, 2013.

**Product causes moderate eye irritation. Contact with skin should be avoided.

***Product causes irreversible eye damage. Contact with skin should be avoided.



Disinfectants and Antibiotics Analogy

- We accept that antibiotics come with some unwanted side effects (drowsiness, nausea, increased heart rate, headaches etc.)
- This is also the case with disinfectants. Side effects can include skin, eye or respiratory irritation, environmental impacts or surface and equipment compatibility issues.
- Some antibiotic side effects can be prevented by following directions or minimized by following a specified procedures
- Similarly for disinfectants, we need to follow specified procedures to prevent or minimize potential side effects





The Chemistries

How to compare apples to
oranges



History of active ingredients in healthcare disinfectants

1930's

1940's

1950's

1970's

1990's

2000's

Chlorine
(+) broad efficacy
(-) unstable, poor cleaner

Iodine
(+) broad efficacy
(-) staining

Phenolics
(+) kills Tb
(-) health hazards

Quats
(+) broad efficacy, safe
(-) slow acting

Peracetic Acid
(+) fast acting
(-) health hazards
Silver
(+) fast acting, residual efficacy
(-) toxicity, environmental issues

Improved Hydrogen Peroxide
(+) fast acting, safety
(-) not widely accepted



Chemistry Report Card

	Broad Spectrum of Efficacy	Realistic Contact Times	Superior Cleaning Efficacy	Safer to Use	Environmental Profile
Improved H2O2	A to B	A to B	A	A to B	A to B
QUATs	C	C	B	B-	C+
QUAT/Alcohols	A to B	A to B	C	C to D	B to C
Alcohols	B to C	B to C	D	C	B to C
Phenolics	B to C	C	B	D	C
Chlorine	A to C	A to C	D	B to D	C



Stop the Disinfectant Abuse!

Tips on Ensuring we Marry
Products with Protocols



Are you insane?

- **insanity**, noun. [in-san-i-tee]
- **Definition:** doing the same thing over and over again and expecting different results.
- **Sentence:** “Our facility’s insanities center around using legacy disinfectants which don’t meet our infection prevention needs”



STOP of the Chemical Abuse!

- Eliminate the All For One Army
- Disband the Glug-Glug Gang & More is Better Bandits
- Sweep up the Shiny Surface Syndicate
- Retrain the Instruction Ignorers & Top-Off Artists
- Cancel the Custodial Chemist Classes
- Don't Allow the Sink or Swim Squad to Prosper!



Efficacy Comparisons

- All of the actives were tested for their efficacy against CA-MRSA, MRSA, VRE & MDR *Acinetobacter baumannii*
- In all tests, improved hydrogen peroxide proved to have a greater log-reduction of organisms to standard hydrogen peroxide and a greater or similar log-reduction to the QUAT tested at a one-minute contact time.
- The study found the improved hydrogen peroxide products were able to kill the pathogens tested in less than one minute, a contact time that is considerably less than the contact time of the QUAT product tested in this study

Infect Control Hosp Epidemiol 2012;33(11):1159-1161



Quat Binding – Impact on successful disinfection

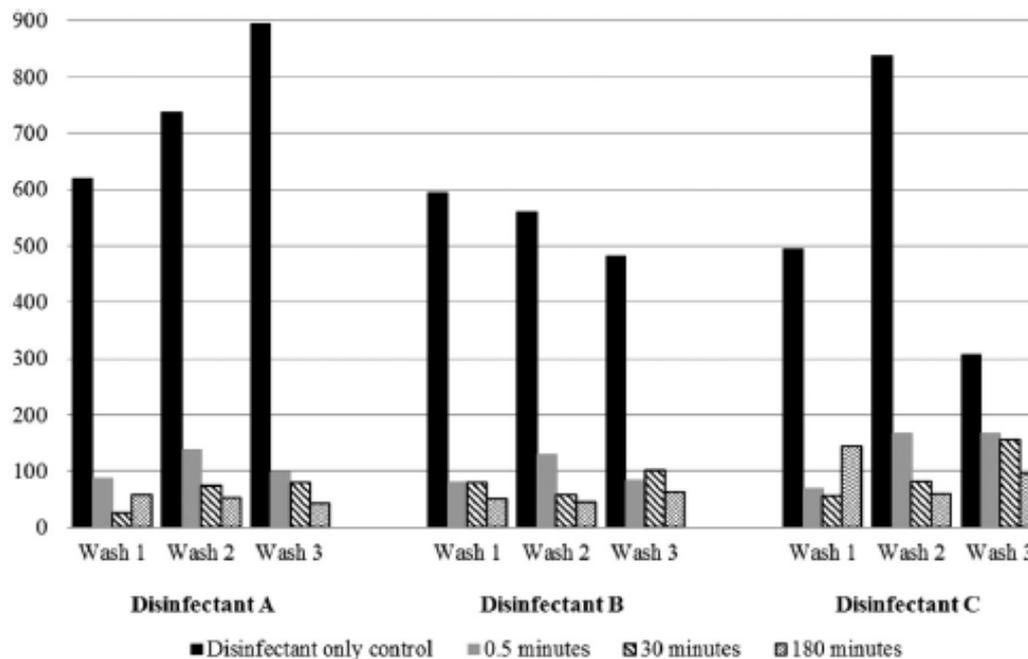


Fig 1. QAC concentrations in each of 3 commercially available substances before and after repeated exposure to cotton towels and laundering.

Gerba et al, Decreased activity of commercially available disinfectants containing quaternary ammonium compounds when exposed to cotton towels, AJIC 2013;41:908-11



Microbial Contamination of Cleaning Cloths

Am J Infect Control. 2013 Oct;41(10):912-5. doi: 10.1016/j.ajic.2013.01.015. Epub 2013 Mar 22.

Microbial contamination of hospital reusable cleaning towels.

Sifuentes LY¹, Gerba CP, Weart I, Engelbrecht K, Koenig DW.

⊕ Author information

Abstract

BACKGROUND: Hospital cleaning practices are critical to the prevention of nosocomial infection transmission. To this end, cloth towels soaked in disinfectants are commonly used to clean and disinfect hospital surfaces. Cloth cleaning towels have been linked to an outbreak of *Bacillus cereus* and have been shown to reduce the effectiveness of commonly used quaternary ammonium disinfectants. Thus, it is important to determine whether the reuse of cloth towels increases the risk of pathogen transmission in hospitals.

METHODS: The goal of this project was to determine the effects of laundry and cleaning practices commonly used in hospitals for washing, storage, and disinfection of cloth cleaning towels on their microbial loads.

RESULTS: Our results indicate that cloth towels used for cleaning hospital rooms contained high numbers of microbial contaminants.

CONCLUSIONS: In this case, hospital laundering practices appear insufficient to remove microbial contaminants and may even add contaminants to the towels. Furthermore, it has been previously reported that towels can interfere with the action of common hospital disinfectants. Either independently or in combination, these 2 factors may increase the risk for transmission of pathogens in hospitals. These observations indicate the need to critically reevaluate current hospital cleaning practices associated with reuse of cloth towels.





Disinfection Best Practices

Developing a Roadmap to
ensure disinfection
compliance



Importance of Cleaning & Disinfection

- **Just Because You are Using a Disinfectant, Does NOT Mean You are Disinfecting**
 - Right Time, Right Place
 - Method of Application
 - Contact Time
 - Protocol



A Successful & Compliant Disinfection Program



Disposables: Time and Money Savers!

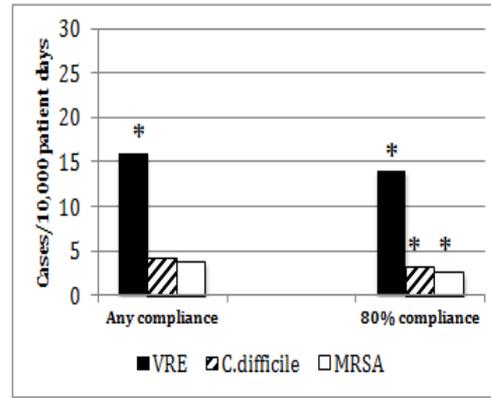
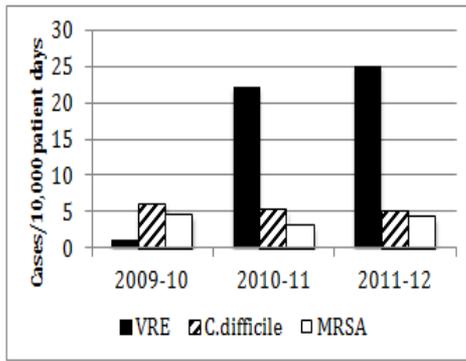
- Weimken et al (AJIC 2014) states "*a challenge of the cleaning and disinfection (CD) process is ensuring that the product is mixed and used properly and that the traditional bucket method has many opportunities for breakdowns in compliance.*"
- Compliance score was highest for the RTU wipes and the time to complete the CD requirements was significantly lower than that for the bucket method.
- The direct time-related cost savings for the RTU wipes was \$38.58 per employee per day
- Study concludes "*the use of RTU Wipes improves compliance in the CD process which may lead to a reduction in the environmental bioburden which can lead to a reduction in HAIs*"



Matching Product with Protocol Reduces HAIs

Use of daily disinfectant-cleaner instead of daily cleaner reduced hospital acquired infection rates

HAI Rates with Cleaner only → HAI Rates with Disinfectant-Cleaner in 2012-13



* Significant reduction in VRE rates (any cleaning compliance), and significant reduction of *C.difficile* and MRSA rates when a minimum of 80% cleaning compliance achieved.

There were 3 key components to ensure reduction of HAIs:

1. A clearly defined housekeeping protocol with education (including an assessment of the adequacy of housekeeper performance);
2. Routine housekeeping compliance monitoring with staff feedback and a minimum of 80% compliance;
3. The use of an effective disinfectant cleaner.

Alfa MJ, Lo E, Olson N, MacRae M, Buelow-Smith L. Use of a daily disinfectant cleaner instead of a daily cleaner reduced hospital-acquired infection rates. AJIC 2015;



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"This unexpectedly concludes tonight's program — the sponsor bailed out."

Conclusions

Have we learned to read (and interpret) the fine print?





Disinfectant Selection

Consider:

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



Gotta Stay Wet to Disinfect!

EFFICACY



SAFETY



The ideal wipe disinfectant should offer a balance between efficacy and safety — powerful against pathogens yet easy on users and the environment.



Sustained Wet Time

Does not evaporate before disinfection occurs.



One & Done

One Wipe, One-Step,
One Application.



PPE Free

Safe for users with the lowest HMIS rating possible.



Good for the Earth

Sustainable – minimal impact on the environment.



Stop the Insanity!

- It's time to **DO SOMETHING DIFFERENT** and implement effective infection control measures paired with an efficient disinfectant to **ENSURE THE SAFETY OF YOUR CLIENTS AND STAFF**



Questions?

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