Environmental Cleaning Audits

Dr. Michelle Alfa, Diagnostic Services of Manitoba

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Environmental Cleaning Audits:

Do they help reduce the spread of *C.difficile* and AROs in healthcare facilities?

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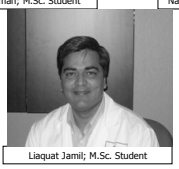

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Overview

- Role of environment in transmission of AROs in healthcare
- Environmental cleaning audits
  - Visible inspection
  - UV marker
  - ATP testing
  - Culture
- Audit feedback to staff
  - how to provide feedback
  - impact of feedback

Infection Transmission: Environmental role

"A culture report should not dictate the practice of Standard Precautions"
(Bartley et al 2008)

- AROs: VRE, MRSA, ESBLs, *C.difficile*, Acinetobacter spp.
- Improvements in cleaning; reduce all AROs

Healthcare Challenge: "Bum to Toilet Ratio"!!

- Shared toilets
  - Multiple patients in same room
  - Two rooms; one toilet
- Inadequate cleaning of one toilet facility may affect many patients!

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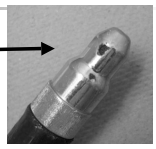
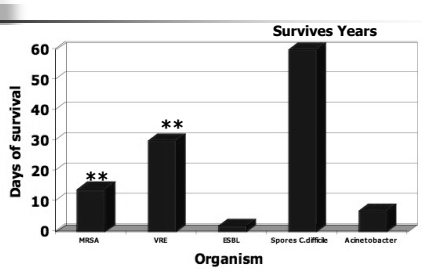
Is it Clean Enough???



Visual assessment: crude measure

NEED TO ENSURE SURFACES CLEANED EVEN IF THEY DON'T LOOK VISIBLY DIRTY: **YOU CAN'T SEE THE MICROBES**

Microbial survival on surfaces



****Prolonged survival when suspended in dust/organic debris of six months to a year has been reported (Dancer 2007, Hardy 2007, Howie 2009)**

Environmental detection: MRSA in Stool of patient with diarrhea

- Bedside rails: 100%
- Blood pressure cuff: 88%
- Television remote: 75%
- Bedside Table: 63%
- Toilets: 63%

"High-touch sites"

If MRSA (+) but not in stool;
~ 30% environmental contamination

Boyce J Hosp Infect 2007;65:50-54, Dancer Infection.thelancet 2007

Do caregivers acquire MRSA from environment?

42% of 12 nurses contaminated gloves with MRSA by touching objects in room of patients with MRSA in wound or urine

WITHOUT ANY PATIENT CONTACT!

Boyce J Environmental contamination makes an important contribution to hospital infection J Hosp Infect 2007;65:50-54.

Risk of Acquiring ARO from Environment?

- Increased risk of MRSA acquisition if room previously occupied by MRSA (+) patient (Huang et al 2006)

How to Eliminate Chain of Transmission?

ENSURE:

- Environmental cleaning/disinfection
- Hand hygiene

Sounds Easy!! Why isn't it working???

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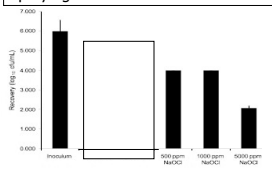
Hand-hygiene and Environmental Cleaning*

- Compliance with Hand-hygiene critical but hard to achieve
- Reducing environmental sources of MRSA, VRE and *C.difficile* does reduce healthcare associated infection* (and reduces colonization):
  ?how to tell level of cleaning compliance?

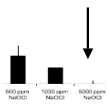
*** Boyce J Environmental contamination makes an important contribution to hospital infection J Hosp Infect 2007;65:50-54.**

Efficacy of Bleach in presence of organic material [killing of *C.difficile* spores]

Spray agent on surface and leave unwiped



Spray agent on surface and wipe



The Physical Action of Cleaning is critical NO MATTER WHAT AGENT is used for cleaning/disinfecting

Alfa et al BMC-Infectious Diseases submitted

Audit of Cleaning Compliance

UV Marker: [shows surface was wiped]
- Carling et al 2008: 49% of surfaces clean after "terminal cleaning"
- Alfa et al 2008: 20 – 50% of toilets clean after routine cleaning
- Carling 2008: 57.1% of ICU surfaces clean after patient discharge

ATP: [measure of organic & microbe level]
- Cooper: < 500 RLU /cm^2
- Griffith et al 2007: 0 – 14% of surfaces "clean" after routine cleaning

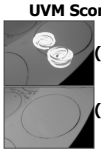
Viable count: [measure of microbe level]
- Dancer 2004: < 5 cfu/cm^2
- Griffith 2007: 50 – 90% of surfaces "clean" after routine cleaning

Visible Inspection: [does it look clean]

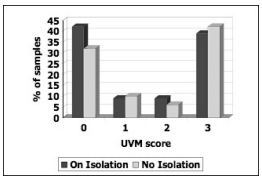
Environmental Cleaning:

- Visibly Clean: NOT ADEQUATE
- UV marker to audit cleaning

UVM Score:



UVM audit of toilets of patients with *C.difficile* infection on Isolation Precautions (twice daily cleaning)



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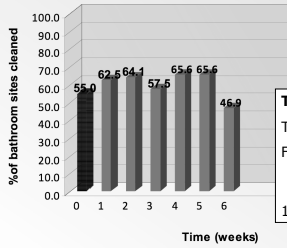
Alfa et al BMC-Infectious Diseases submitted

Isolation Precautions for CDAD:

- Enhanced frequency of cleaning rooms not achieved
- **Routine cleaning needs to be focus: risk highest prior to implementation of isolation precautions**
- Improve compliance of routine cleaning by UVM audit with feedback to staff
- Defined "cleaned" as score of 0,1, or 2: i.e. any indication of physical wiping

UV Marker Audit: patient bathrooms (not on isolation precautions)



Twelve patient rooms

Tested Mon – Fri

Four sites per bathroom
- toilet, sink, door knob, soap dispenser

192 sites tested per week

- Staff aware of study but do not get any feedback

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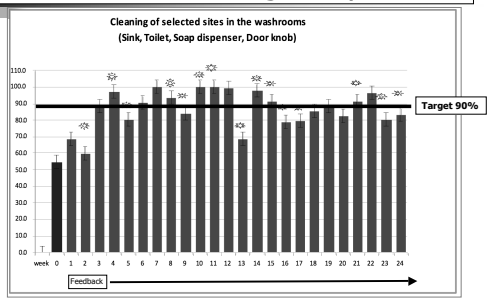
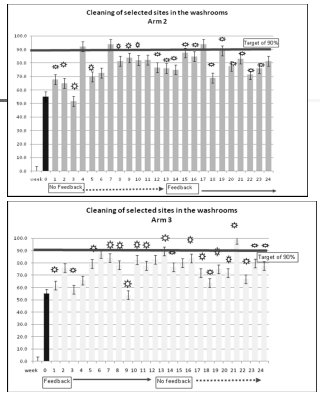
Discussion with cleaning staff

- What level of cleaning compliance did they think should be achieved?
  - initially they suggested 100%
  - settled on 90%

Impact of Feedback over 24 weeks on Cleaning compliance



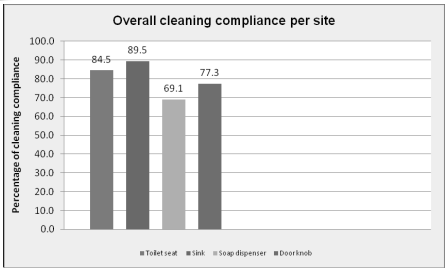


Impact of Casuals on Cleaning Compliance

* % casuals represents % of hours/wk worked staffed by casuals

	Wk 1-12	Wk 13-24
Arm 1	***[15.3% casuals]****	***[16.9% casuals]***
≥ 90% compliance	58.3%	33.3%
≥ 80% compliance	83.3%	75%
Arm 2	***[28.1% casuals]***	***[23.9% casuals]***
≥ 90% compliance	16.7%	16.7%
≥ 80% compliance	50.0%	41.7%
Arm 3	***[38.5% casuals]***	***[42% casuals]***
≥ 90% compliance	0%	0%
≥ 80% compliance	33.3%	25%

Cleaning by site



UVM Audit Summary:

Issues:

- Dedicated ward staff→ pulled for discharge cleaning
- Visibly clean → may be thought to not need cleaning
- Visitors in room disrupt ability to clean room
- Casual staff ? Adequacy of training?

Findings:

- Feedback did improve cleaning compliance
- Cleaning compliance → person specific
- Cleaning compliance → affected by % casual staffing

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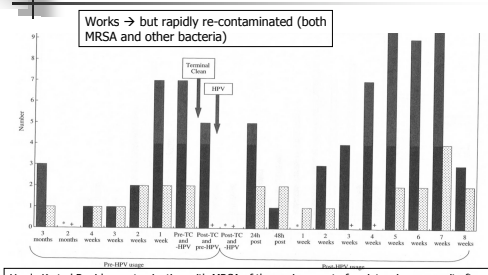
Room Fogging: VHP vapour

Works → but rapidly re-contaminated (both MRSA and other bacteria)



Hardy K et al Rapid recontamination with MRSA of the environment of an intensive care unit after decontamation with hydrogen peroxide vapour. J Hosp Infect 2007;66:360-368

Environmental cleaning:

- **Re-contamination from patient etc occurs rapidly; need ongoing & effective environmental cleaning process**
- Whatever product used → **AUDIT** to ensure cleaning is done properly
- Focus cleaning on "High-touch" areas for greatest impact in reducing spread of AROs

SUMMARY

- Visibly clean: INADEQUATE
- Cleaning UVM Audit tool helps ensure compliance with physical act of cleaning

Need to provide positive feedback and ensure Environmental Services are part of the Infection Control TEAM!!

"An ounce of prevention is worth a pound of cure" Especially in the Battle of the Bugs!!

Newest Aid for Healthcare??

Along with your hospital-issue gown you will get microfiber slippers!!

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