

**Too Posh to Wash**  
**Martin Kiernan, Southport and Ormskirk NHS Trust**  
**Teleclass broadcast sponsored by GOJO**

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Martin Kiernan  
 Southport and Ormskirk NHS Trust

Teleclass Broadcast Sponsored by **GOJO**  
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**Too Posh to Wash**

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**Disclosures**

- Member of advisory boards for Pfizer and Vernacare and have presented at educational meetings that have been supported by Advanced Sterilisation Products and Johnson and Johnson
- The views presented before you are my own

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**Linking Cleanliness and Infection**

- Debate continues
  - But not as much as it used to..
  - Cleaning was not considered to be an evidence-based profession
- Dettenkofer (2004)
  - Systematic review found that the quality of the evidence was poor and that there was no convincing evidence that disinfection of surfaces reduces infection
- Donskey (2013) AJIC
  - High quality studies support environmental decontamination as a control strategy

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**Survival of Organisms**

- What we do know is that many pathogens survive very well in the environment

Organism	Survival Time
MRSA	Up to 300 days
TB	Two weeks
HIV	20 minutes
Hepatitis Viruses	6 hours
Clostridium difficile	Years
Neisseria gonorrhoeae	15 seconds

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**THE MOP OF DEATH**

**EXCLUSIVE**

By **GRAHAM JOHNSON**  
 Investigations Editor

**THIS is the hospital so dirty even the cleaners' mops are crawling with deadly bugs.**

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**Hospital bans flowers in wards**

Flowers have been banned from wards at St Richard's Hospital, as the battle against MRSA superbugs continues across the country. The policy is being introduced this month for 'tidiness, cleanliness and infection control reasons'.

Visits by children under 13 are also being restricted, as part of the action.

MRSA figures for St Richard's increased slightly, from 22 infections to 25, with an infection rate of 0.160 per 1,000 bed days for the period between April, 2004, and March, 2005.

Acting director of nursing Ruth Williams said critical care areas such as high dependency, intensive care and Boxgrove ward had not been allowed patients' flowers for some time.



No more ward flowers - St Richard's volunteer Rita Rose outside the hospital shop. 050173-1

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### Flowers

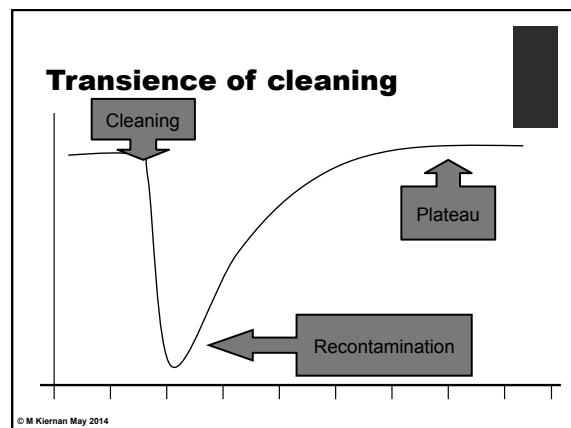
- Two papers
  - Contaminated flower vases
    - The Lancet, 1973;302:568-569. A. L. Rosenzweig
    - Flower vases in hospitals as reservoirs of pathogens
      - The Lancet 1973;302:1279-1281. D. Taplin, PM. Mertz
  - Protecting chrysanthemums from hospital infection
    - The Lancet 1974;303:267-268. W. Howard Hughes

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### Postulates

- Contamination of the environment by human pathogens can be shown to occur
- We can show that these microbes are able to persist in the environment
- A significant route to the patient can be demonstrated
- A useful level of decontamination of the environment can be achieved

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### 11 Patient Environment

- Door knobs, bed rails, curtains, instrument dials, computer keyboards likely to be contaminated by hands which onward transmit
  - MRSA on the door handles of 19% of rooms housing MRSA & 7% of door handles of non-MRSA rooms
    - Oie S, Hosokawa I, Kamiya A. J Hosp Infect. 2002;51(2):140-3.
  - 42% of nurses contaminated their gloves with MRSA while performing activities with no direct patient contact but involving touching objects in rooms of MRSA patients
    - Boyce JM, Potter-Bynoe G et al ICHE 1997;18(9):622-7.

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### Why is reducing contamination of the environment important?

- Contamination of the environment with *C. difficile* spores more common in symptomatic cases than asymptomatic carriers: 49% v 29%
  - But still significant in the asymptomatic group
    - Kim et al *J. Infect Dis* 1981
  - 8% of samples in rooms occupied by non-infected or colonised patients positive for *C. diff*
    - Riggs et al *Clin Infect Dis*. 2007

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#### Protect the patient from themselves

French, Otter et al, J. Hosp Infect, 2004

- Examined the extent of environmental contamination surrounding patients known to be MRSA-positive
  - 74% of sites positive
- Moment 2 of the 4/5 moments for hand hygiene
  - Dealing with an invasive device after touching the patient or their environment can increase risk

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#### Transmission MDR Organisms

Nseir S, Blazejewski C, Lubret F et al. Clinical Microbiology and Infection 17(2) pp1201-8 (2010)

- Prospective cohort study in ICU: successive occupiers of a room at risk from organisms from previous occupants
  - Pseudomonas aeruginosa (OR 2.3, p<0.02)
  - Acinetobacter baumannii (OR 4.2, p<0.001)
- 'Quality' audits showed that 56% of rooms were not cleaned correctly
  - Failure in room door knobs (45%), monitor screens (27%) and bedside tables (16%)

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#### Missing information

- What did the quality audits consist of?
  - Methodology, what was looked at, etc
- No attempt to look at the results of the cleaning audits to see if transmissions occurred when cleaning was poor
- No description of any divisions in cleaning duties
  - Cleanliness of clinical equipment not mentioned

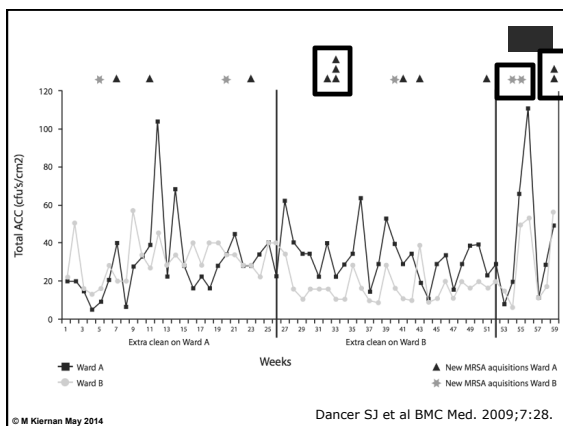
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#### Evidence for cleaning as a control mechanism for MRSA?

- One extra cleaner into two wards (Mon-Fri); each ward receiving extra detergent-based cleaning for six months in a prospective cross-over design
  - Ten hand-touch sites on both wards screened weekly
  - Patients monitored for MRSA infection
  - Patient and environmental MRSA isolates were characterized using DNA finger-printing

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Dancer SJ, White LF, et al BMC Med. 2009;7:28.



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#### What did they find?

- Extra cleaner responsible for
  - 33% reduction in colony counts on hand-touch sites
  - 27% reduction in new MRSA infections
    - despite busier wards and more MRSA patient-days
- They expected 13 infections during enhanced cleaning periods but 4 occurred
- Molecular studies demonstrated identical strains from hand-touch sites and patients
  - Some of which were months apart

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Dancer SJ et al BMC Med. 2009;7:28.

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## Was the extra cleaning cost effective?

- Costing exercise
  - Cleaner earned £12,320 a year and the consumables were £1,100
  - One MRSA surgical site infection estimated at £9,000
- Reduction by 5-9 cases
  - The hospital saved £45,000-£81,000 without the additional costs of cleaner/consumables
  - Annual nett saving for two wards was between £31,600 - £67,60

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Dancer SJ et al BMC Med. 2009;7:28.

## Who is really caring for your environment of care?

Dumigan DG, Boyce JM et al AJIC 38:387-92 (2010)

- Procedures for cleaning patient care environments, but often confusion about the division of labour when it comes to cleaning responsibilities
- Systems to monitor cleaning effectiveness are frequently suboptimal
  - Implemented ATP monitoring and reported improvement
  - looked at 'housekeeping' items only

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## ICP's view of cleaning services

Zoutman DE, et al Am J Infect Control. 2014;42(4):349-52

- 66% reported adequate training
- Excellent co-operation reported however
  - 26% rarely or sometimes consulted over surface finishes
  - 20% not always consulted over cleaning or disinfection products though most felt products were appropriate
  - 21% not always consulted over changes to cleaning or disinfection procedures
- Media headline
  - over a third did not think their hospital clean enough for IC purposes (21% rarely or never)

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## Are resources adequate?

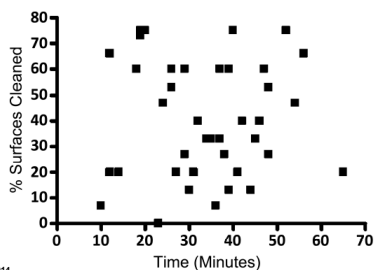
Zoutman DE et al Am J Infect Control. 2014;42(5):490-4

- Online survey of Environmental Services
  - Response rate >50%
- Supplies, equipment budgets thought adequate
  - 86% felt that training was adequate (66% ICPs did..)
  - Though 25% do not train to deal with spillage and 10% do not update on cleaning methods
- Cautions
  - 47% said they did not have enough staff
  - Auditing was variable (frequency and methodology)

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## Time spent cleaning does not indicate thoroughness

Rupp ME, Adler A et al, ICHE 34(1) 100-2 (2013)



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## Assessing cleanliness?

Luick BS, Thompson PA et al AJIC (2013)

- Compared ATP, UV and visual methods with micro cultures used as the 'Gold' standard
- Fluorescent marker and an adenosine triphosphate bioluminescence assay system demonstrated better than subjective visual inspection
- If visual checks are solely used, there is a greater chance that contaminated surfaces will be passes as 'clean'

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#### Audit of Equipment

Anderson RE, Young V et al, JHI 78(3) 2011

- Many items of *clinical* equipment in patient care do not receive appropriate cleaning attention
  - Average ATP score indicated that surfaces cleaned by professional cleaning staff were 64% lower than those by other staff (P=0.019)
- Nurses don't clean very well – of 27 items cleaned by clinical staff, 89% failed the benchmark

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#### UV-visible marker showing failure of terminal cleaning

Carling PC et al. ICHE 29:1-7 (2008)

- Ultraviolet marker was used to test whether items felt to be high touch in patient isolation rooms would be cleaned
  - Overall, 49% of objects/surfaces were not cleaned (range 35-81%)
  - Wide variation in cleaning particular items
- Poor were toilet handles, bedpan cleaners, light switches and door handles – under 30%

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**The Telegraph**

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#### Nurses 'cleaning wards at cash-strapped hospital'

Nurses at a cash-strapped hospital trust are being forced to clean their scrub wards to make up for a lack of funding for full-time cleaners, it has been claimed.

**#notnews**

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#### UV-visible marker demonstrates lack of compliance with cleaning

Alfa M, Duek C et al. BMC Infectious Diseases 8:64 (2008)

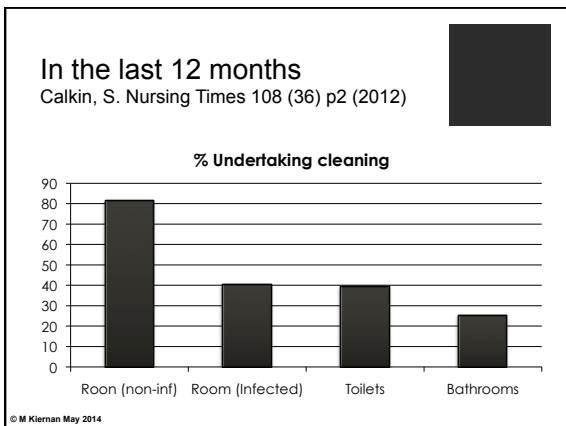
- Marker applied to toilets and commodes
  - Inspected daily and microbiologically sampled for *C. difficile*
- UVM marker found in half of toilet samples and 75% of commode samples
  - Commodes not cleaned at all on 72% of days sampled
- Toxigenic *C. difficile* recovered from 33.3% of toilet samples and 62.5% of commode samples

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#### Do Nurses Clean?

- Survey of >1000 Nurses and Healthcare assistants
  - Calkin, S. Nursing Times 108 (36) p2 (2012)
  - >50% felt that their organisation's cleaning services were 'inadequate'
  - 37% stated that a bed would not be closed if it had not been cleaned properly
  - 75% stated that they had not adequate training

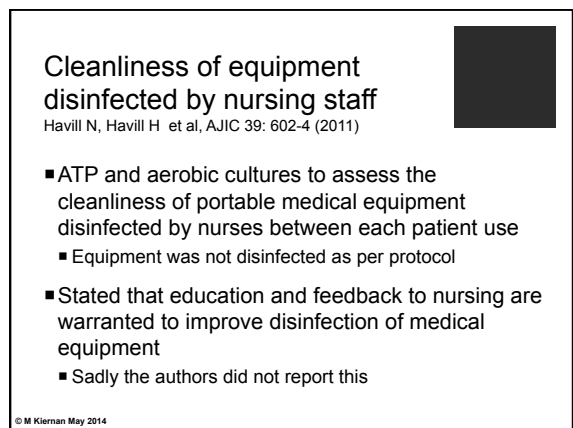
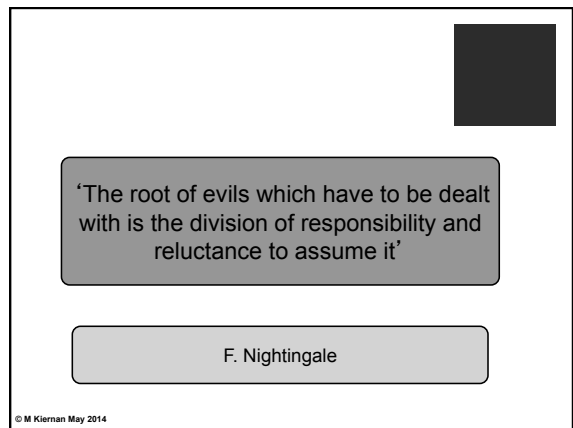
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# Too Push to Wash

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## Using wipes for cleaning

- Common use but label claims may be misleading
  - Mode of action, technique, absorption etc etc
  - No evidence for use against biofilms
    - Sattar SA, Maillard JY. AJIC 2013;41(5 Suppl):S97-104.
- Repeatedly using a wipe transfers organisms and C. difficile spores from contaminated to clean areas in significant numbers
  - Siani H, Cooper C et al. AJIC 2011;39(3):212-218
  - Cadnum J, Hurless K et al, ICHE 2013; 34(4) 441-2

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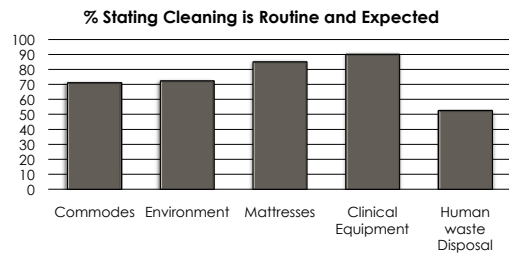
## Biofilms in the environment

- Viable MRSA grown from biofilm clinical surfaces from an ICU despite terminal cleaning
  - current cleaning practices may not be adequate to control biofilm development
  - The presence of organisms being protected within these biofilms may be the mechanism by which they persist within the hospital environment
    - Vickery K, Deva A et al J Hosp Infect. 2012;80(1):52-5.

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## Web-based Survey, 2012

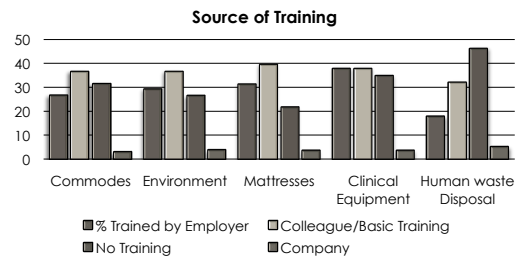
n=92



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## Web-based Survey, 2012

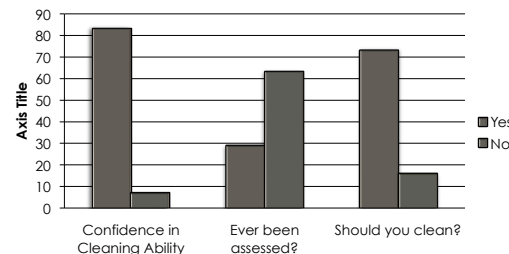
n=92



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## Web-based Survey, 2012

n=92



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## How to achieve learning

- Three methods
  - If you tell people they will forget
  - If you show them they may remember
  - If you involve them they will understand

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#### Who is responsible?

Ptak and Tostenson (2009) Outpatientsurgery.net

- When assigning cleaning duties to different staff members, avoided using general categories
  - Nurses in charge of "equipment" and housekeeping in charge of "furnishings" can cause confusion
- Created a simple pictorial cleaning manual
  - Each page displays photo of an item, who is responsible for cleaning, instructions on how to clean and frequency
- Staff involved in drafting and agreeing responsibilities

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#### Research is still needed....

- Does daily disinfection of high-touch surfaces and increased attention to portable equipment add significant benefit to terminal room cleaning?
- What is the optimal frequency of disinfection?
- Is it beneficial to include all rooms on high-risk wards or the whole facility in interventions?

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#### More disinfection questions

- Should interventions strive to "get to zero" positive cultures, or can we obtain similar results if contamination is reduced to an as-yet undetermined 'safe' level?
- Interesting that we seem to need evidence +++ when implementing 'technical' interventions, yet none when we change 'convenience' items such as wipes
  - Even though the total annual spend may be similar..

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#### Final Questions (honest)


- Should environmental disinfection be implemented with other strategies, like reducing environmental contamination at source?
  - Daily surface disinfection when combined with chlorhexidine bathing might be more effective than one or the other (like a bundle approach)
- Should we identify patients who shed pathogens into the environment? Might this have an impact by focusing cleaning efforts on the likely contaminated sites?

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#### Final Points

- Senior Nurses and Managers can resist training nurses to clean
  - Lack of acceptance that this is a regular occurrence however, bed pressures, spillage etc etc
- Time to accept the obvious
  - Nurses do have to clean
  - They don't do it well; this will increase risks to patients
- We must convince nursing colleagues that this is critical and train them to undertake this important task

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