

# How to Select a Wipe

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**REFLECTIONS ON INFECTION PREVENTION AND CONTROL**

*Our reflections on IPC based on clinical microbiology, epidemiology, science & literature, and the practical issues that we run into day to day*

# Disclaimer

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- I am Clinical Director of GAMA Healthcare with responsibility for clinical research and education
  - This presentation will contain no product information nor will products be identified

# Choosing a wipe

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- A wipe is a wipe is a wipe
  - Thank you for listening

# Key Points

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- Wipes are not the perfect solution to environmental decontamination and are not the best option for 'routine' cleaning
  - However many items need cleaning regularly or between patient contacts and not always by staff that are professionally trained to clean
- So they do fit into an IPC programme
  - Convenient
  - Fast
  - Available
  - Consistent

# Factors to consider

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## IPC

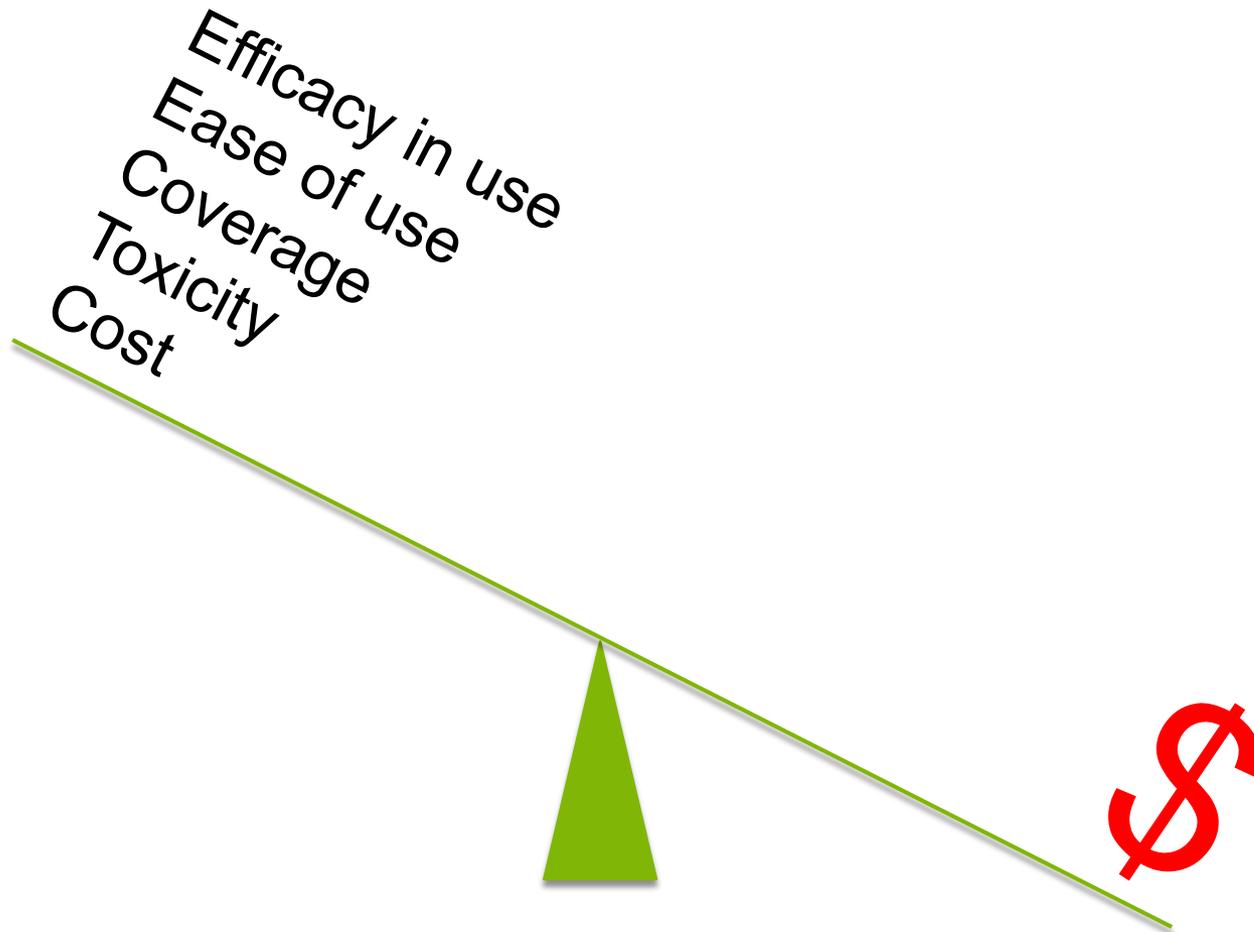
- Efficacy against target pathogen(s)
- Finance
- Flexibility
- Ease of use
- Coverage
- Toxicity

## Procurement



# Balance must be achieved

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# Wipes have one or two functions

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- Cleaning: Physical removal of microbial contamination
  - Dependent on contamination level (blood, faeces, vomit etc.), how it was applied (e.g. thin or thick smear), how long it was left to dry and how difficult the surface is to clean (textured vs. rough vs. smooth)
- Disinfection
  - How long before the disinfectant evaporates; how much is it inactivated by the organic matter in which the microbes are deposited; whether the microbe tested is innately susceptible to the disinfectant

# Disinfectant tests

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- There are European Standard (“EN”) and other (e.g. TGA, ASTM, OECD ..... ) tests for disinfectants
  - A disinfectant test is a single, repeatable, highly controlled situation – real life is not
- “Phase 1” tests (e.g. EN 1040) are essentially screening tests to allow disinfectants to proceed to further, more targeted testing
  - Quantitative suspension test for the evaluation of basic bactericidal activity
  - They should not be seen as validation for any particular application

# Disinfection tests: applied

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- “Phase 2, step 1” tests (e.g. EN 13727) are suspension tests simulating specific use situations (none of which are wipes)
  - Quantitative suspension test for the evaluation of bactericidal activity of chemical disinfectants for instruments used in medicine
  - Suspension tests allow greater access to the target than would normally be the case with wipes

# Disinfection tests: applied to surfaces

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- “Phase 2, step 2” tests (e.g. EN 14561) are surface tests – more accurately simulate the situation in which wipes are used
  - Quantitative carrier test for evaluation of bactericidal activity for instruments used in medicine
  - All of these tests can be done either in “clean” or “dirty” conditions
    - “Clean” is easier to pass
    - “Dirty” is more difficult but may simulate use conditions such as commodes better

# What about the wipe itself?

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- Various physical variables do make a difference to wipe properties and selection
  - Wet strength
  - Absorbency
  - Grammage
  - Size
  
- But price usually rules

# Nonwoven wipes

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- Advantages
  - May be saturated with an active ingredient
  - Delivers optimal concentration to the surface that it is used on
    - As long as contact times are achieved
  - Stabilised, so can be used for extended periods
  - Closed, single use system minimises risk of contamination
  - Flexible placement

# Factors influencing moisture retention

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- Disinfectant Absorbency and Release
  - How the disinfectant is absorbed by the wipe and then released onto the surface is a function of both wipe material and disinfectant formulation
    - fibre used will either enhance or hinder disinfectant absorption rate, as will the amount and type of surfactant used in the formulation
    - These properties play a key role in the wettability, compliance and cost of the product

# The Adsorption Issue

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## □ Problem

- “Tests carried out by the manufacturer on these wipes showed an interaction between the active disinfectant and the wipe material resulting in inadequate disinfection properties. This interaction is attributed to the adsorption of active ingredients in the disinfecting solution onto the tissue fibres of the wipe”
  - Cationics bind to cellulose-derived fibre
- Solution: Test fluid that is squeezed from a wipe, not the fluid that will be added to the wipe

### Medical Device Alert

#### Action

Ref: MDA/2009/025 Issued: 08 April 2009 at 14:00

#### Device

Mikrozid<sup>®</sup> sensitive wipes (alcohol free surface disinfection wipes for medical devices) manufactured by Schulke & Mayr.



MHRA

# Substrate affects wipe action

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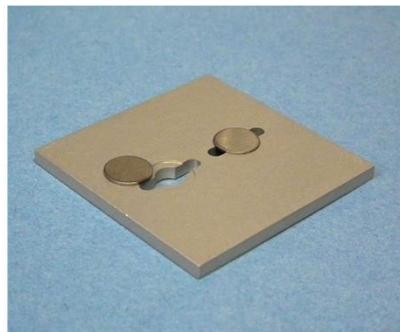
- Polypropylene does not absorb, so very good for delivering the disinfectant ensuring that contact times are achieved
- More absorbent fibres like viscose will pick up more effectively but there is a potential that not enough ingredient will be applied to the surface
- Mixed fibre helps achieve the best balance

# 3-Step Wipe Test

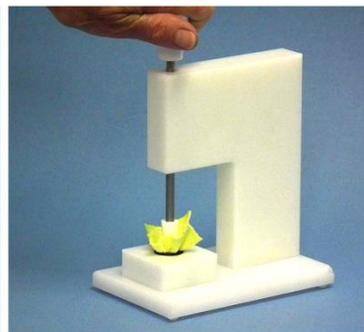
New ASTM Intl. Standard (E2967-15) (04-15)

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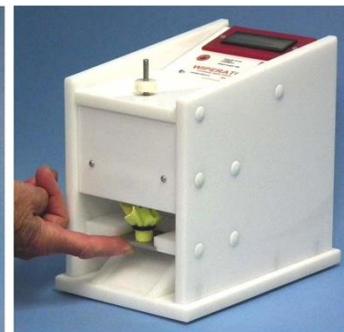
Purpose	Stage
Remove bioburden from a surface	<b>Stage 1 – bacterial removal</b> How good are the wipes in removing microbial contaminants? (not killing effect)
Prevent transfer of bioburden from the wipe to other surfaces	<b>Stage 2 – bacterial transfer “adpression tests”</b> Can the wipes transfer survivors to other surfaces (i.e. cross-contaminate)?
Where antimicrobial is present – kill the microbial bioburden	<b>Stage 3 – Antimicrobial activity</b> Can the wipes kill the bacteria they remove?



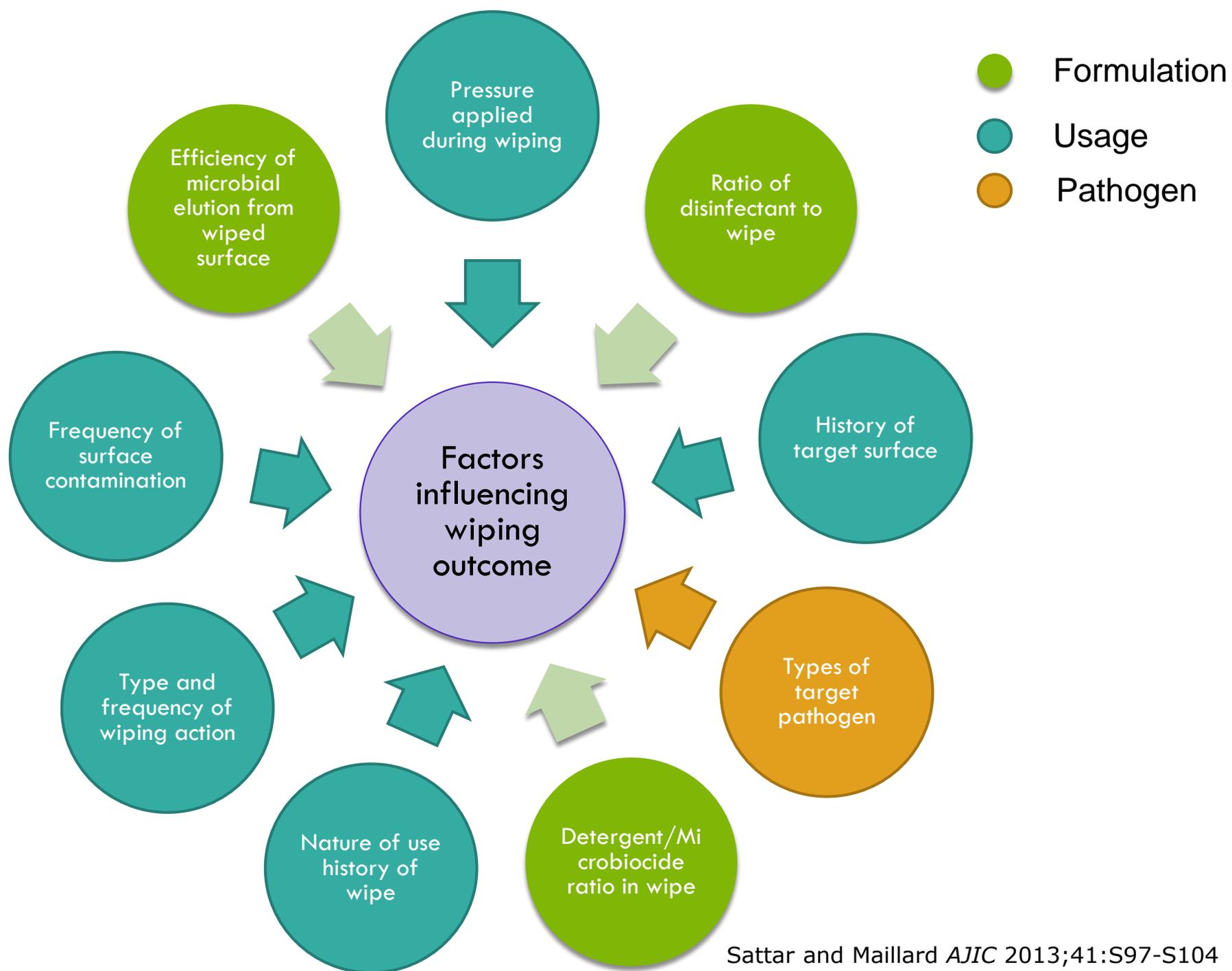
Sample Carrier with two 10-mm dia stainless steel disks



Loading a wipe onto a Boss using the Wipe Loader



The Wiperator wipes sample disks with an orbital motion



# Observation of wipes in use

Williams et al. J Hosp Infect 2007

<b>Surface initially wiped</b>	<b>Time applied (seconds)</b>	<b>Number of consecutive surfaces wiped (other surfaces)</b>
Bed Rail	4	5: (bedside table, monitor X2, monitor stand)
Steel Trolley	6	2: (both shelves on the trolley wiped)
Monitor	4	5: (monitors, two keypads, monitor stand)
Bed rail	7	4: (table, monitor, keypad)
Bedside table	10	4: (folder, two bed rails)

# Hospital Hygiene in the News

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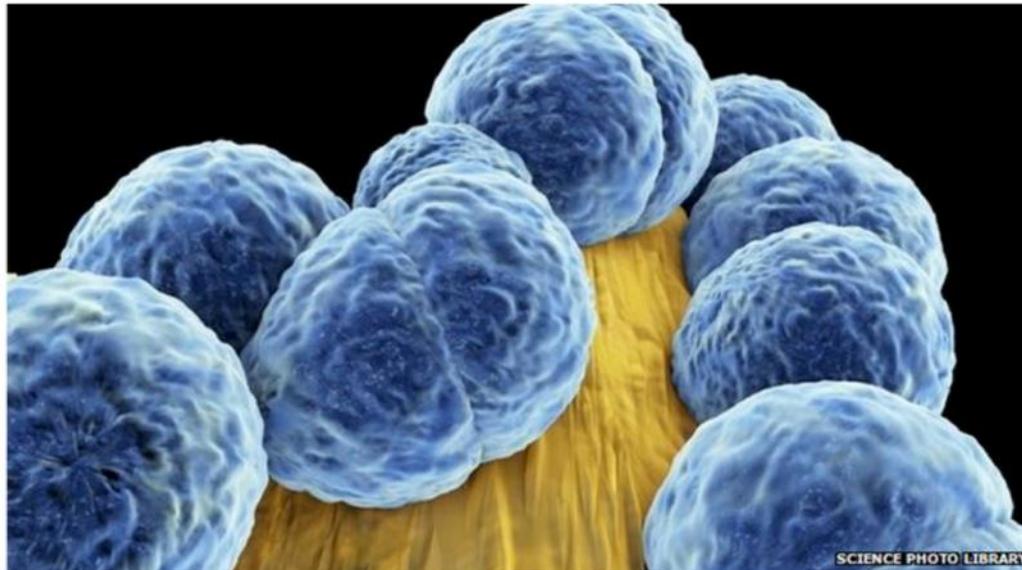
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## Superbugs 'spread by hospital wet wipes'

8 June 2015 | Wales



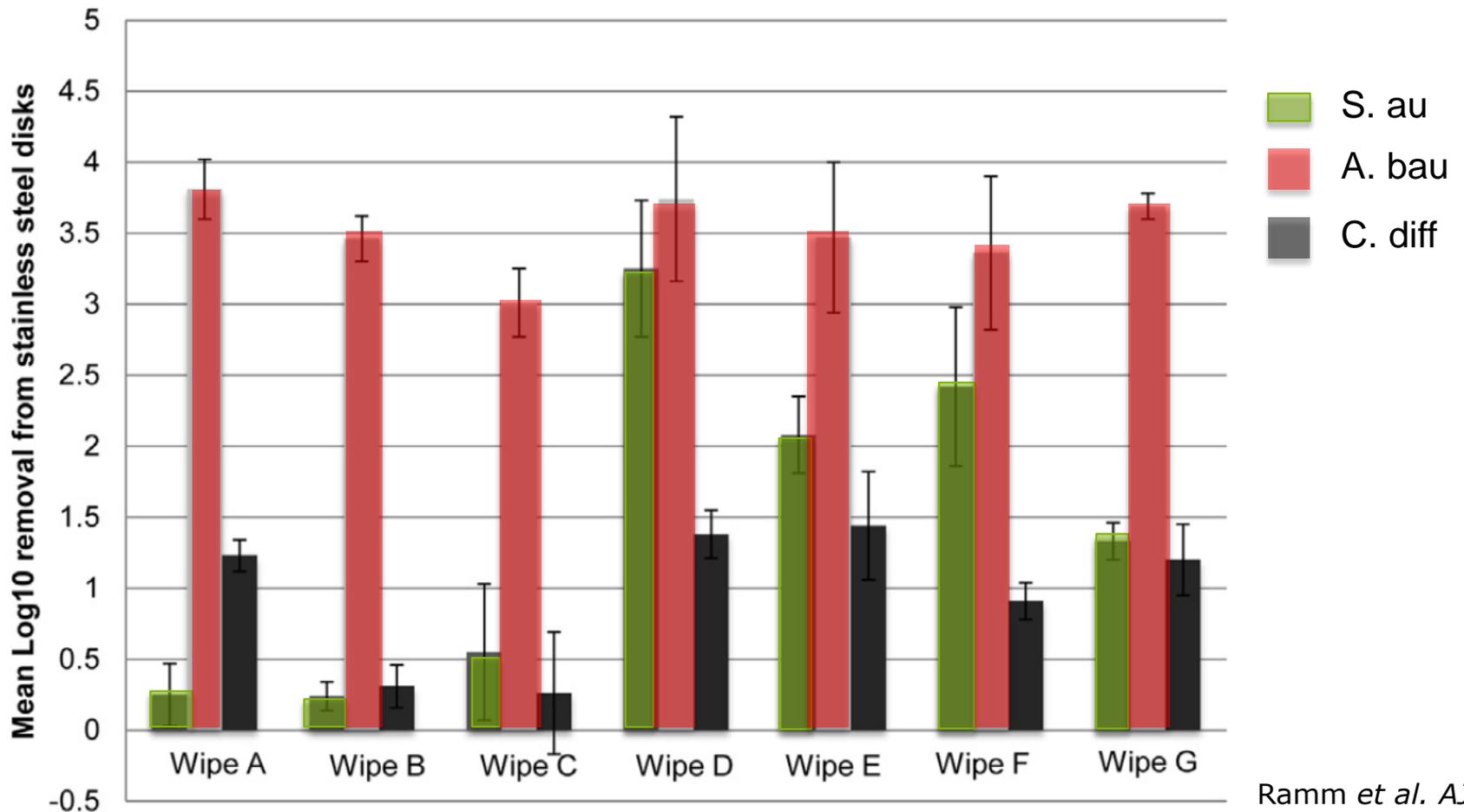
MRSA bacteria can cause skin, blood, lung and heart infections

# A wipe is a wipe is a wipe

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- Study comparing seven detergent wipes composed of nonionic surfactants, preservatives, and perfume
  - Ramm et al, (2015) AJIC 43(7)
- Significant differences in performance
  - Transfer and removal
  - Performance of wipes may be influenced by
    - type of nonwoven
    - quality of the raw materials and nonwoven
    - liquid to wipe ratio
    - product packaging

# Detergent wipe efficacy



Ramm et al. AJIC;  
43(7), 724-728

# Transfer from Detergent Wipes

Wipes	Spores on wipess* (CFU)	Transfer first surface % microbe/spore transfer	Transfer second surface	Transfer third surface	Total transferred (%)
<i>S aureus</i>					
A	66,890	66.43	82.28	64.74	213.45
B	3,633,282	11.01	9.75	13.14	33.90
C	5,078,282	8.58	66.05	44.83	119.46
D	4,941,786	0.04	0.03	0.04	0.11
E	14,537,759	0.43	0.39	0.37	1.20
F	13,388,894	0.09	0.07	0.21	0.37
G	16,705,056	0.00	0.00	0.00	0.00
<i>A baumannii</i>					
A	13,388,894	0.02	0.01	0.01	0.04
B	1,505,426	0.02	0.01	0.02	0.05
C	3,442,779	8.00	0.03	0.02	8.05
D	1,505,426	0.01	0.01	0.01	0.03
E	507,976	0.03	0.02	0.03	0.08
F	507,804	0.02	0.02	0.02	0.06
G	777,048	0.00	0.00	0.00	0.00
<i>C difficile</i>					
A	92,684	2.88	13.10	11.68	27.66
B	24,111	2.89	7.18	2.69	12.76
C	29,907	114.95	71.78	36.52	223.25
D	25,275	8.16	20.88	1.76	30.80
E	5,928	5.34	3.09	2.53	10.96
F	5,360	16.61	20.42	31.10	68.13
G	9,070	5.33	6.43	1.29	13.05

# C. diff transfer from 'sporicidal' wipes

Efficacy testing against C. difficile NCTC12727

Wipes	Bacterial Removal (log <sub>10</sub> cfu/disk ± SD) 500 g surface pressure	Bacterial transfer following 10 s wiping time at 500 g surface pressure
Negative control	1.13 (± 0.36)	5 consecutive transfers. TNTC
NaOCl soaked wipe	2.02 (± 0.21)	5 consecutive transfers. TNTC
WIPE A	4.09 (± 0.79)	No spore transferred
WIPE B	0.22 (± 0.07)	5 consecutive transfers. From 0 to TNTC
WIPE C	1.30 (± 0.33)	5 consecutive transfers. From 0 to TNTC
WIPE D	0.57 (± 0.07)	5 consecutive transfers. From 1 to TNTC
WIPE E	+0.08 (± 0.08)	5 consecutive transfers. TNTC
WIPE F	1.14 (± 0.65)	5 consecutive transfers. From 83 to TNTC
WIPE G	0.67 (± 0.11)	5 consecutive transfers of ≤43 bacteria
WIPE H	0.88 (± 0.13)	5 consecutive transfers. From 2 to TNTC
WIPE J	0.84 (± 0.66)	5 consecutive transfers. From 40 to TNTC

# Choice of Disinfectant Product

- In the healthcare setting a number of disinfectants are available either as single substance products or in combinations
  - Choice will depend on intended use
  - Manufacturers instructions need to be followed to ensure correct application
  - Incorrect selection and/or use can lead to transference of microorganisms to clean surfaces or persistence from use of suboptimal concentrations of biocide

# Check the true cost

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	Product 1	Product 2
Cost/wipe	£0.05	£0.04
Surface area covered by 1 wipe (sq. ft)	11.5	6.5
No of wipes to disinfect a bed	8	14
Total cost (Consumables only)	£0.40	£0.56

# Conclusion

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- All wipes could be better
  - Better wipe materials would mean more effective removal of micro-organisms
    - However no procurement manager would pay for them
    - We need some cost-effectiveness studies
- Ask about testing, contact time, wipe materials, coverage and not just A\$
  - A wipe is not a wipe is not a wipe