

# MY 5 'BEST' PAPERS

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# NEAR MISSES

- Wiencek, M. (2019). "Beyond the Naked Eye: Biofilms and Microbial Diversity in Re-laundered Mops and Towels Used in Healthcare Facilities." American Journal of Infection Control **47**(6).
- Strassle, P. D. et al (2019). "Incidence and risk factors of non-device-associated pneumonia in an acute-care hospital." Infect Control Hosp Epidemiol: 1-7.
- Smismans, A. et al (2019). "New environmental reservoir of CPE in hospitals." The Lancet Infectious Diseases **19**(6): 580-581.
- Persson, M. (2019). "Airborne contamination and surgical site infection: Could a thirty-year-old idea help solve the problem?" Med Hypotheses **132**: 109351
- Rojas, F. et al (2019). "Complementary work in the hospital: How infection preventionists perceive opportunities for cooperation with higher status physicians." Journal of Professions and Organization **6**(2): 196-212.

# CDI DETECTION BY DOGS

- High sensitivity, specificity and inter-rater reliability between two dog teams
- certified annually for both odour recognition and search capability by an independent validator in the field of canine scent detection
- Environmental reservoirs in this case
  - Charles, M. K., Y. Wang, T. Zurberg, J. Kinna and E. Bryce (2019). "Detecting *Clostridioides (Clostridium) difficile* using canine teams: What does the nose know?" Infection Prevention in Practice 1(1).



WHICH EXPLAINS THIS..



# RELATIVE COSTS

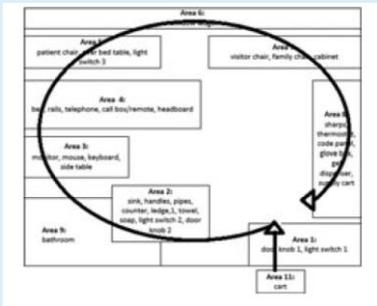
- Cost of capital and consumables
  - MALDI-TOF etc \$\$\$\$\$\$
- Canine (Purebred Springer Spaniels)
  - Pedigree chum
  - Small black plastic bags for residue



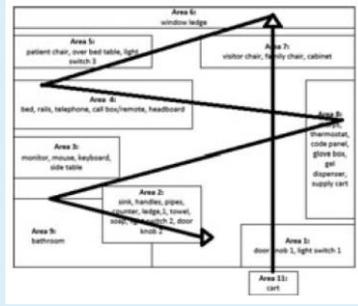
# IDENTIFYING WORK FACTORS THAT INFLUENCE CLEANING

- Observational study to assess cleaner performance during daily patient room cleaning
  - Median time to clean a room was 14 minutes; Median % of surfaces cleaned 69%
- High-touch surfaces frequently missed during daily cleaning
  - bedrails, telephone, patient and visitor chairs, and cabinet
- Work system factors that could influence cleaning performance included
  - type of unit
  - presence of patient and family members in the room
  - cleaning patterns and orders of cleaners
  - interruptions while cleaning (56% of observations)
    - Xie A, C Rock, et al. 2018. 'Improving Daily Patient Room Cleaning: An Observational Study Using a Human Factors and Systems Engineering Approach', *IIE Transactions on Occupational Ergonomics and Human Factors*, 6: 178-91

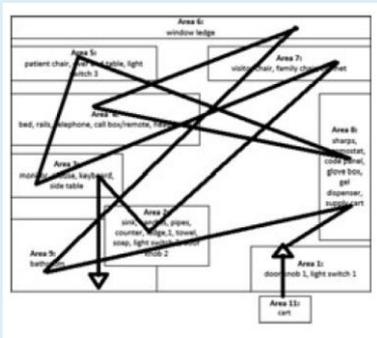
# SPOT THE SYSTEM



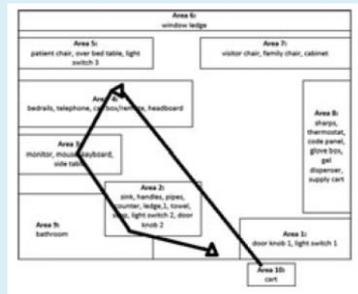
**Clockwise or anticlockwise**  
**31%**



**Horizontal or Vertical**  
**42%**



**Random**  
**17%**



**Local**  
**10%**

Bathrooms: 12 (14%) cleaned first, 10 (11%) in the middle, and 64 (72%) last in the order

# INDIVIDUAL STAFF ARE INCONSISTENT

EVC associate	Number of rooms cleaned	Main room cleaning patterns <sup>a</sup>				Bathroom cleaning orders				Not cleaned, n (%)
		C/CC, n (%)	H/V, n (%)	Random, n (%)	Local, n (%)	First, n (%)	Middle, n (%)	Last, n (%)		
1	9	3 (33)	2 (22)	1 (12)	3 (33)	0 (0)	3 (33)	6 (67)	0 (0)	
2	8	7 (88)	0 (0)	0 (0)	1 (12)	0 (0)	0 (0)	8 (100)	0 (0)	
3	8	5 (63)	2 (25)	1 (12)	0 (0)	7 (88)	0 (0)	1 (12)	0 (0)	
4	10	1 (10)	5 (50)	4 (40)	0 (0)	0 (0)	0 (0)	10 (100)	0 (0)	
5	11	1 (9)	8 (73)	2 (18)	0 (0)	0 (0)	0 (0)	9 (82)	2 (18)	
6	13	2 (15)	7 (54)	4 (31)	0 (0)	4 (31)	4 (31)	5 (38)	0 (0)	
7	10	4 (40)	3 (30)	0 (0)	3 (30)	0 (0)	2 (20)	8 (80)	0 (0)	
8	5	0 (0)	5 (100)	0 (0)	0 (0)	0 (0)	0 (0)	5 (100)	0 (0)	
9	5	2 (40)	1 (20)	2 (40)	0 (0)	0 (0)	1 (20)	4 (80)	0 (0)	
10	10	3 (30)	4 (40)	1 (10)	2 (20)	1 (10)	0 (0)	8 (80)	1 (10)	
Total	89	28 (31)	37 (42)	15 (17)	9 (10)	12 (13)	10 (11)	64 (72)	3 (4)	

<sup>a</sup>C/CC: clockwise or counter-clockwise; H/V: horizontal or vertical.

# VARIATIONS IN PRACTICES

- When disinfectant wipes were used, some returned to the cart every time they needed a new disinfectant wipe, while others kept a few wipes in hand and used one at a time
- When microfibre cloths were used, some EVC associates folded the microfibre cloths to increase the number of sides for use and reduced the number of times they returned to the cart to recharge the cloths
  - Others simply used the microfibre cloths without folding

# ED PHYSICIANS ARE TOUGH

<b>PPE for MRSA isolation precautions</b>	<b>Inpatient only (n = 176) % agree</b>	<b>ED only (n = 54) % agree</b>
Support wearing in MRSA patient rooms	76.1	66.7
Feel safer wearing	66.5	40.7
Feel patients are safer when I wear	75.0	57.4
Likely to get MRSA on me if I do not wear	60.8	50.0
Not wearing once can result in transfer to another patient	77.3	70.4
Wearing makes patient care more difficult	41.5	64.8
Facility provides information on how to use when approaching room	92.6	85.2
Facility provides information about requirements	92.6	87.0
Takes too much time to put on	35.2	64.8
Convenient to put on and take off	38.6	16.7

Krein, S. L., et al (2019). "Comparing inpatient versus emergency department clinician perceptions of personal protective equipment for different isolation precautions." American Journal of Infection Control. In Press

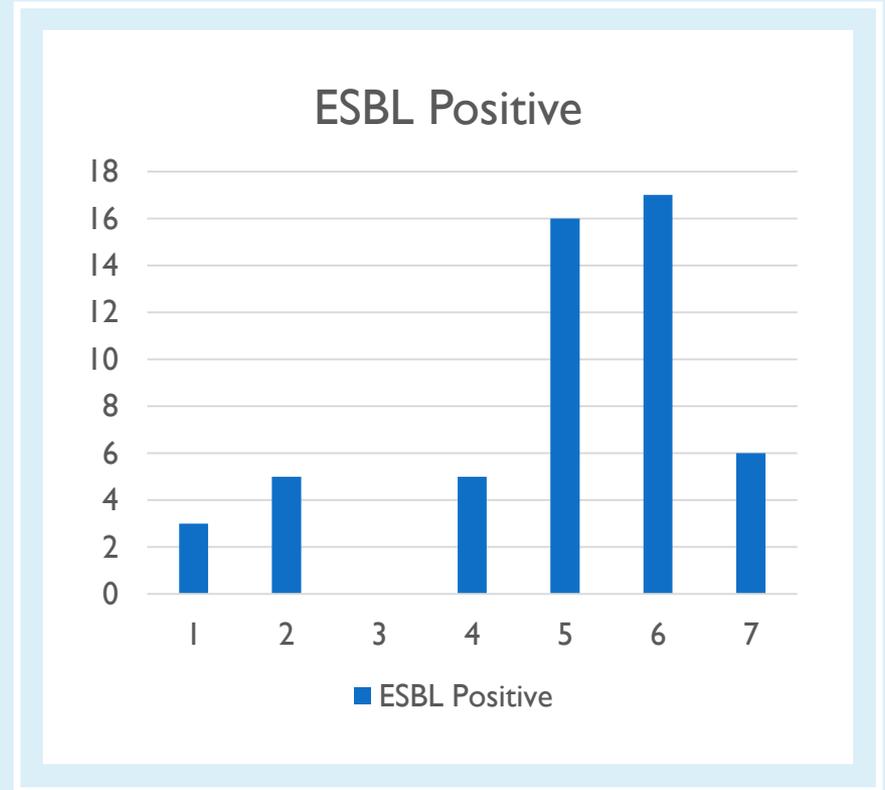
# PPE FOR CDI AND TB



- Still not convenient to put on and take off
- More people thought they were likely to get TB or C. difficile on them than MRSA
  - >85% of them feel safer wearing PPE – (<65% for MRSA)
- Nearly 80% of ED and 86% of inpatient physicians thought that a failure to wear PPE once could result in transfer of TB to another patient

## SO WHAT ABOUT TRANSMISSION TO STAFF

- Study on medical students in the Lebanon
  - Previous hospital admission/colonisation with MDRO excluded (33% of faculty)
  - Annual screening for MRSA and MDR Gram-negatives during the 7-year course
  - Years 5 and 6 are clinical
    - Saliba, G. et al (2019). "Single-institution experience of medical students' bacterial colonization during training." *Am J Infect Control* **47**(3): 268-270.



# TRANSMISSION TO MEDICAL STUDENTS

- Students who had completed at least 2 high-risk clinical rotations were more prone to ESBL (OR, 2.56; 95% CI, 1.18-5.56; P = .017)
- Intensive care unit training (OR, 2.50, 95% CI, 1.10-5.67, P = .028) and gynaecology (OR, 2.19, 95% CI, 1.04-4.60, P = .039) identified as risk factors
- Multivariate analysis identified the medical year as the sole factor contributing to the extended spectrum beta-lactamase producing Enterobacteriaceae colonization (OR = 2.33 [1.14-4.77], P = 0.021)
- Saliba, G., N. El Kary, Z. Bakouny, L. Dagher, M. Mallah Hamdan and W. Abdallah (2019). "Single-institution experience of medical students' bacterial colonization during training." *Am J Infect Control* 47(3): 268-270.

# TRANSMISSION TO STAFF

- 6.2% contaminated hands with *E. coli*
  - 100% concordant with patient isolates
- 7.4% contaminated hands with *Klebsiella*
  - 55% concordant
- 87% of patients had been bathed in CHG
- Most contaminations occurred when wearing gloves
  - 8% contaminated their hands on removal
    - Takoi, H. et al (2019). "Acinetobacter baumannii can be transferred from contaminated nitrile examination gloves to polypropylene plastic surfaces." *Am J Infect Control* **47**(10): 1171-1175.

The screenshot displays the journal's header with the CMI logo, the text 'CLINICAL MICROBIOLOGY AND INFECTION', the ESCMID logo, and the text 'OFFICIAL PUBLICATION OF EUROPEAN SOCIETY OF CLINICAL MICROBIOLOGY AND INFECTIOUS DISEASES'. Below the header is a navigation bar with 'Articles & Issues', 'Collections', 'For Authors', and 'Journal Info'. A search bar contains 'All Content' and 'Search' buttons. The main content area shows 'Articles in Press' with navigation links for 'Previous Article' and 'Next Article'. The article title is 'Contamination of healthcare workers' hands with *E. coli* and *Klebsiella* species after routine patient care: a prospective observational study'. The authors listed are Mireia Puig-Asensio, MD PhD, Daniel J. Diekema, MD MS, Linda Boyken, BA, Gosia S. Clore, MPH, Jorge L. Salinas, MD, and Eli N. Perencevich, MD, MS. There is a PlumX Metrics icon and a DOI link: <https://doi.org/10.1016/j.cmi.2019.11.005>. An 'Article Info' link is also present.

# SINGLE ACTIVITIES LEADING TO TRANSMISSION

Endotracheal tube/tracheostomy care	50	(1/2)
Giving medications via nasogastric/gastrostomy tubes	100	(3/3)
Toilet assistance	18.2	(2/11)
Cleaning mouth/suctioning secretions	25.0	(1/4)
Wound dressing	50.0	(1/2)
Hygiene/bed bathing	11.5	(3/26)
Assistance in transfers	4.7	(1/22)
Reposition on bed	13.3	(2/15)
Giving intravenous medications	5.3	(2/38)
Vital signs	3.6	(1/28)

# RISK ADJUSTED FOR TIME SPENT IN THE ROOM

Type of care	Contamination rates (%) <sup>a</sup>	Care given with other type of care (%)	Adjusted OR (95%CI) <sup>b</sup>	p-value
Endotracheal tube/tracheostomy care	38.5 (5/13)	84.6 (11/13)	5.66 (1.58–20.25)	0.008
Giving medications via nasogastric/gastrostomy tubes	33.3 (3/9)	66.7 (6/9)	5.08 (1.20–21.46)	0.027
Toilet assistance	31.6 (6/19)	42.1 (8/19)	6.80 (2.35–19.66)	<0.001
Cleaning mouth/suctioning secretions	28.6 (6/21)	81.0 (17/21)	3.75 (1.22–11.47)	0.020
Wound dressing	25.0 (2/8)	75.0 (6/8)	3.37 (0.63–18.18)	0.157
Hygiene/bed-bathing <sup>c</sup>	20.0 (9/45)	42.2 (19/45)	3.24 (1.35–7.73)	0.008
Assistance in transfers	16.7 (7/42)	47.6 (20/42)	2.76 (1.09–6.97)	0.032
Reposition on bed	16.2 (6/37)	59.5 (22/37)	1.69 (0.62–4.62)	0.307
Giving intravenous medications	10.3 (10/97)	60.8 (59/97)	1.17 (0.54–2.52)	0.691
Vital signs	7.6 (6/79)	64.6 (51/79)	0.96 (0.39–2.36)	0.923
Physical exam	7.1 (7/99)	62.6 (62/99)	0.77 (0.33–1.80)	0.545

# STAFF GROUPS AND ENVIRONMENT

<b>Type of HCW</b>				
Respiratory therapist	26.7	(4/15)	3.01 (0.86–11.0)	0.084
Occupational/physical therapist	13.6	(3/22)	1.57 (0.41–5.91)	0.509
Nurse	8.3	(32/385)	1.05 (0.45–2.42)	0.914
Physician/nurse practitioner	4.6	(1/22)	0.51 (0.07–3.92)	0.519
Patient care technician	-	(0/14)	-	-
Other <sup>c</sup>	-	(0/8)	-	-

<b>Environmental contact</b>				
Lift	50.0	(1/2)	8.46 (0.51–139.62)	0.136
Ventilator	28.6	(2/7)	3.24 (0.58–18.0)	0.179
Vital sign monitor	23.3	(10/43)	3.37 (1.40–8.10)	0.007
Sink/Faucet	14.8	(4/27)	1.87 (0.61–5.78)	0.277
Supply cart	13.6	(6/44)	1.36 (0.49–3.61)	0.568
Bed rail	12.4	(23/185)	1.83 (0.91–3.68)	0.090

# WHAT DO PATIENTS THINK ABOUT DEVICES?

- Indwelling devices are frequently used, but what about the recipient?
  - open-ended question about other comments (initial interview) or problems (follow-up interview) associated with the device then descriptive analysis of these comments, classifying them as positive, negative, or neutral
    - Trautner, B.W., S. Saint, K. E. Fowler, J. Van, T. Rosen, J. Colozzi, V. Chopra, E. Lescinskas and S. L. Krein (2019). "What do patients say about their experience with urinary catheters and peripherally inserted central catheters?" Am J Infect Control **47**(9): 1130-1134.
- Positive comments from 6% of urinary catheter and 10% of PICC patients
- Negative comments from 87% of catheterised and 81% of PICC

# POSITIVES

- Catheter related to convenience
  - Because of urgency at night, he wishes it was still in. He is having to wake up all night, stand up, and use the urinal. With the catheter, he would be able to sleep
  - It was a relief to have the catheter right after the surgery so he didn't have to worry about having to use the bathroom or a urinal
  - I used to wear a diaper and change it 5 times a day. The catheter is nice to have
- PICC related to not having repeated venepuncture

# NEGATIVES - CATHETER

- Pain, irritation, discomfort and UTI (“I recognise the smell”)
  - “Hose had a few cracks in it, so it would leak everywhere”
  - One patient went to great lengths to ensure that his catheter would drain, “The patient hangs upside down to move the catheter so that it will drain. He hangs for a few seconds, and when he turns upright, it drains properly”
  - Wishes he never had the thing in the first place and wishes to never have one again. Would like to know why a catheter was ordered for him since he had no problem urinating in the first place
  - “When the nurse placed the second catheter, he did not use gloves. I have a urinary tract infection, and other problems with the catheter”

# NEGATIVES - PICC

- Often related to practice
  - Staff competence and the need for repeated venepuncture
    - Improper technique on placement
    - Lack of training in removal (Doctors, home care nurses and ED staff)
  - Allergic reactions to the dressing (plus other dressing issues)
- Activities of daily living
  - Bathing; Impairs use of arm
- Do we consider these (and do we mention these aspects – informed consent?)

# AS USUAL

- The more I learn, the less I know