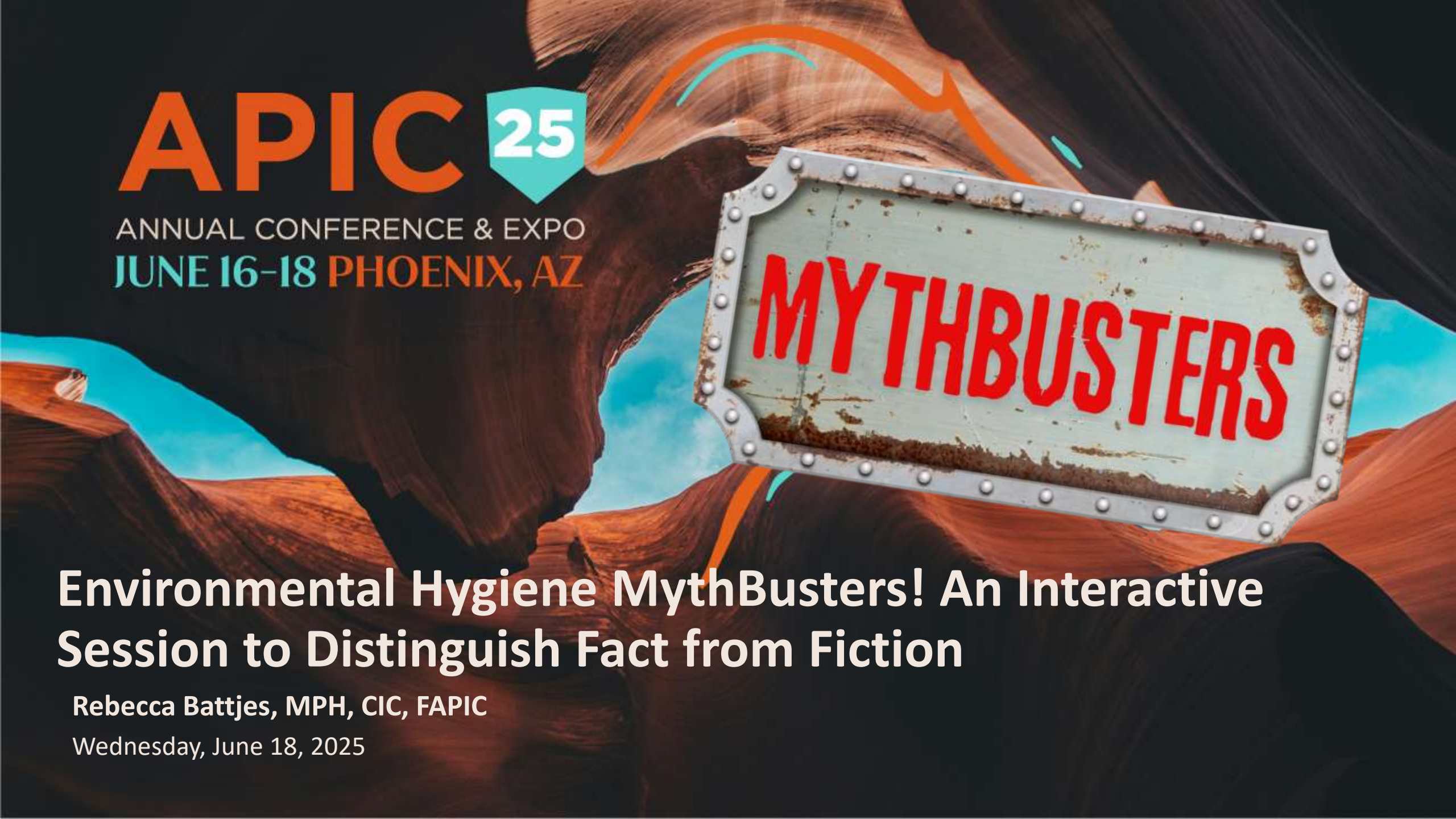

Environmental Hygiene MythBusters! An Interactive Session to Distinguish Fact from Fiction

Rebecca Battjes, MPH, CIC, FAPIC

Wednesday, June 18, 2025

Disclosure

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Relevant Financial Disclosures

Rebecca Battjes, MPH, CIC, FAPIC is an employee of Diversey—A Solenis Company.

All of the relevant financial relationships listed have been mitigated.

Learning Objectives

- Summarize key successes and challenges identified during hundreds of recent daily and discharge room direct cleaning observations in patient care areas.
- Describe the evolution of peer-reviewed literature related to occupied patient room and discharge cleaning compliance.
- Understand how different cleaning activities are performed during patient area cleaning, the impact on high-touch surfaces disinfection, cross contamination and pathogen transmission risk.

In-progress study overview

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Shadow hundreds of Environmental Services (EVS) daily & discharge patient room cleans across a diverse mix of wards in hospitals across several US regions.

Perform direct practice observations of high-touch surface (HTS) cleaning & disinfection activities (despite Hawthorne effect risk).

Measure & analyze the time to perform various cleaning & disinfection tasks during daily occupied & discharge patient room cleaning.

Identify product & application opportunities in real world settings.

Additional Study Details

- EVS-driven, site-specific quality improvement projects coordinated by primary disinfectant manufacturing partner
  - Preexisting EVS supply chain relationships (i.e., current product users)
- 3 large academic acute care tertiary hospitals
  - All >500 beds
  - Joint Commission accredited
  - All part of larger health systems
- Research team attempted to connect with facility IP teams in all hospitals, but only 1 of 3 collaborated directly
- As study is in-progress, statistical analysis has not yet been calculated

Ground Rules

- “Myths” = general assumptions IPs, professional organizations, researchers and other may have about environmental cleaning & disinfection (aka “environmental hygiene”)
- Like Adam Savage & Jamie Hyneman on *Mythbusters*, we’ll bust myths into one of three verdicts:
  - **Busted** = the assumption is false
  - **Plausible** = the assumption is likely, but not consistently supported by the available scientific evidence
  - **Confirmed** = the assumption is supported by our study observations and other peer-reviewed evidence

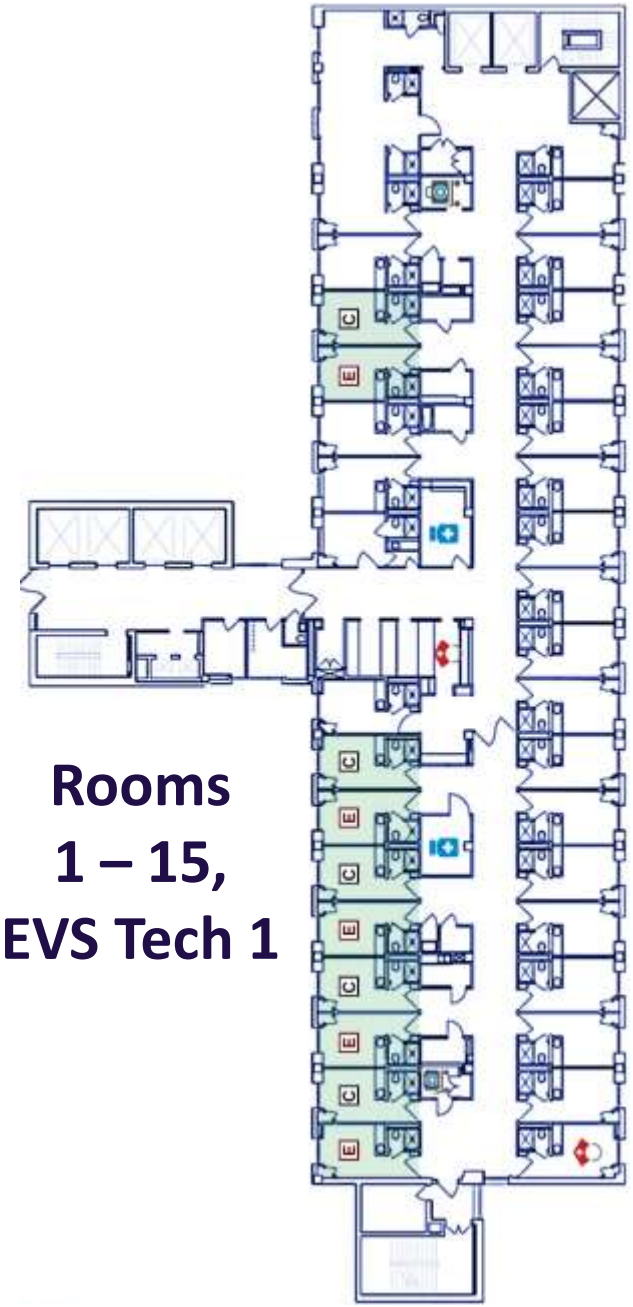
https://www.usatoday.com/story/life/entertainthis/2015/10/21/8-important-things-mythbusters-taught-us-our-favorite-shows-films/74340678/

TIME

Get your smartphones ready!

- Scan the QR code.
- Click the link.
- Answers are anonymous.
- Select your answer.
- You will not need to rescan QR codes if browser is kept open.

- Unpublished 2019 AHE Annual Trends Data Report revealed that almost 80% of membership reported daily room cleaning taking **10 to 19 minutes**.
- EVS leaders' expectations of each tech's expected workload varied per facility (*common schematic shown at right*):
  - 15 dailies, 2 to 4 discharges
  - 22 dailies, up 2 discharges
  - 13 dailies, up to 2 discharges



OUR AVERAGE OBSERVED OCCUPIED DAILY ROOM CLEAN TURNOVER TIME WAS 9 MINUTES

- **Turnover time = the minute the EVS tech began any cleaning activity until the minute they stopped, including hand hygiene/PPE doffing**
- **638** daily room turnovers observed
- Notably, square footage was not calculated per room
- Different rooms may have different types of equipment & surfaces (NICU versus stepdown)
- Includes mostly single occupancy room turnovers (91.5%)
- **All facilities were using a 10-minute quaternary ammonium compound disinfectant at baseline.**

How does this compare to the current literature?

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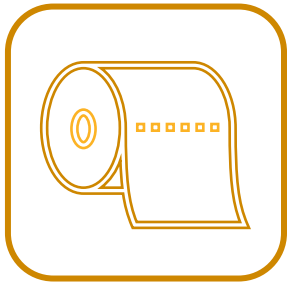
- Notably, most published studies do not study daily room cleaning, only terminal (Carling et al, 2013)
  - Cleaning compliance is commonly tracked, but time to complete cleaning is not.
- McKinley et al (2023) reported approximately 9 ½ minutes for acute care daily cleaning (n = 35).
- How 9-minutes were spent varied greatly from tech to tech, facility to facility.

How Are the 9 Minutes Being Spent?



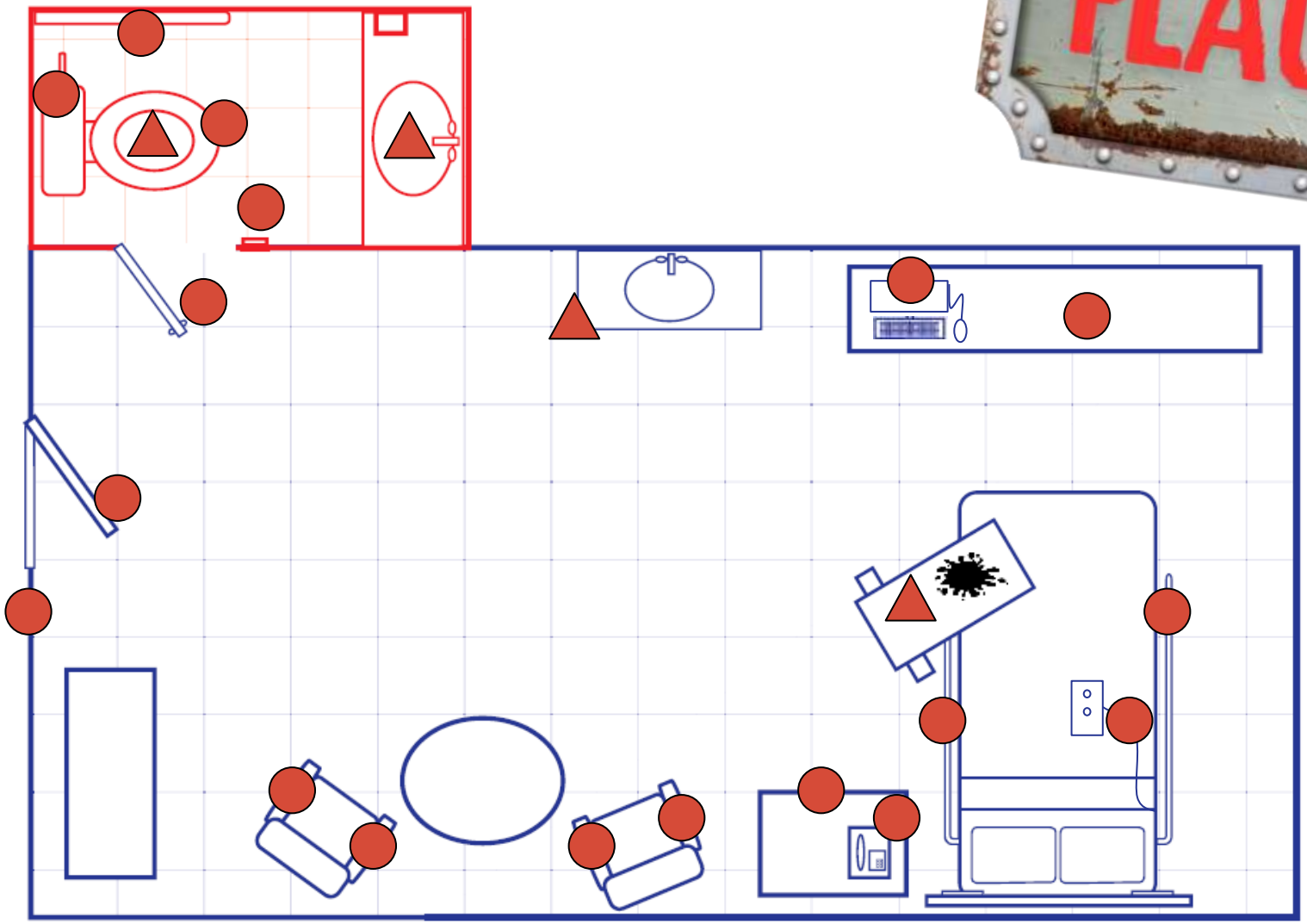
Room & Bathroom Mopping

Room & Bathroom Disinfection

Other activities (trash, linen*, refilling consumables)

*Soiled linen removal was typically a clinical task but did occur during some daily turnovers.

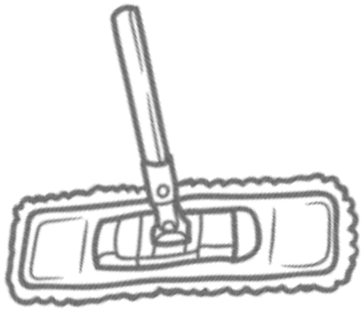
Is 3 Minutes Enough?



HIGH-TOUCH SURFACES COMMONLY MISSED, BUT FLOORS NEARLY ALWAYS MOPPED

Floor mopping of daily occupied rooms was much more consistent than HTS disinfection.

McKinley et al (2023) also reported 90% compliance with floor cleaning, compared to 70% acute care HTS compliance.



ARE FLOORS HIGHEST RISK FOR HAI TRANSMISSION?

Clean floors are an essential part of HCAHPS scores, but their role in transmitting infections is not fully understood.

If HAIs are an issue, consider striking a better balance between cleaning floors, disinfecting high-touch surfaces AND disinfecting shared portable medical equipment where risk has been more clearly established.

CLEANING COMPLIANCE & PROCESS

MORE TIME ≠ DAILY CLEANING COMPLIANCE GOALS

Study Site	Number Rooms Observed	Average Time to Complete Daily Occupied Turnover	Daily High-Touch Surface Cleaning Compliance*
Site X	369	7:19	41.2%
Site Y	169	8:39	38.1%
Site Z	100	15:42	48.5%
Total	638	8:59	NC**

*Defined as wiping the surface with disinfectant cloth or wipe.

**Not yet calculated, given variance in cleaning protocols

HISTORICAL DATA ON CLEANING COMPLIANCE

P. Carling / American Journal of Infection Control 41 (2013) S20-S25

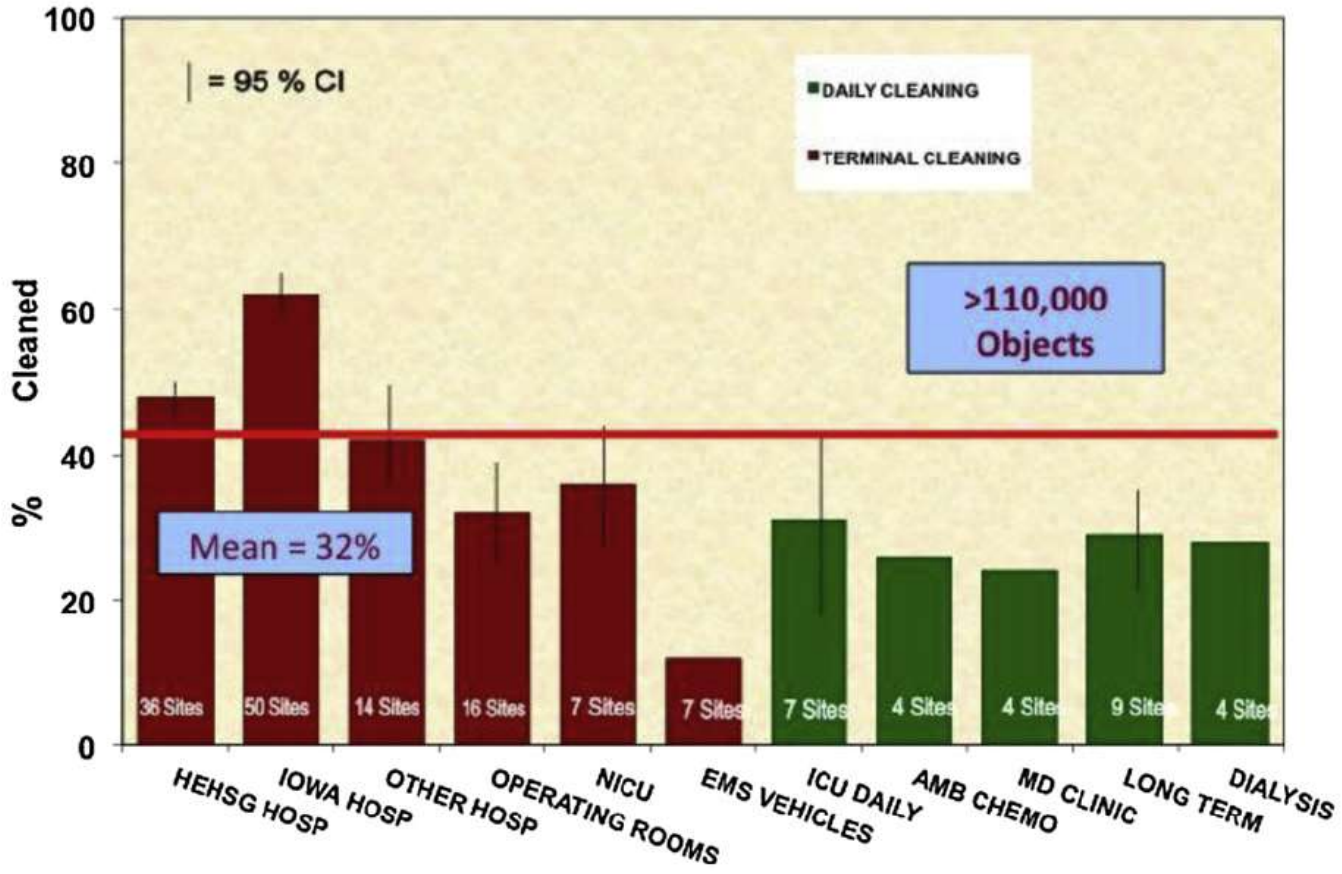


Fig 2. Thoroughness of environmental cleaning in multiple health care settings.

- Good news: we've improved!
- Carling's review (2013) reported average daily cleaning compliance at approximately 32% or lower, but most included sites were ambulatory/outpatient.
- Hospital cleaning focus was primarily on terminal cleaning, which had better compliance than daily.

HOW MANY CLOTHS/WIPES TO CLEAN & DISINFECT EACH PATIENT AREA & BATHROOM

Substrate & Disinfectant	# of Observed Room Cleans	Disinfectant Contact Time	Average # Used per Occupied Room Clean	% of Rooms (patient room & bathroom) Cleaned with Only One Cloth or Wipe
Relaundered Microfiber + Dilutable Disinfectant	170	3 to 10 minutes	1.5 cloths	48%
Single Use Dry Wipe + Dilutable Disinfectant	212	3 to 10 minutes	2.28 wipes	16%
Prewetted Single Use Ready-to-Use Wipe	215	1 minute	2.89 wipes	18%

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Using single use wipes reduced the odds of only using one wipe for both the bathroom & patient room.

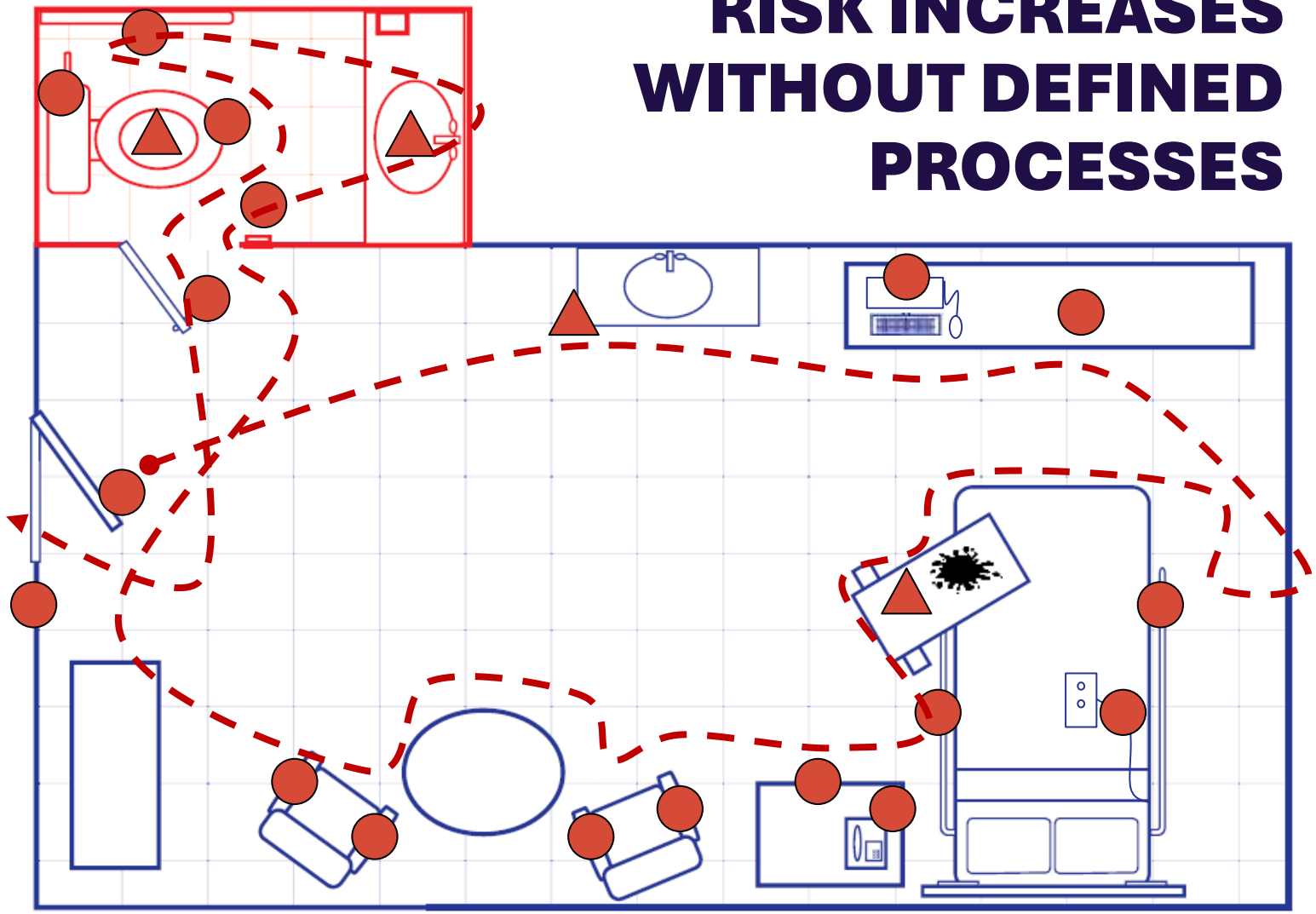
vs.

WHY DOES CLOTH/WIPE COUNT MATTER?

Sattar & Maillard 2013

- Using only one cloth may unintentionally transfer pathogens from one surface to another, especially if it is visibly soiled (Sattar & Maillard 2013).
- Many other factors can impact outcomes of mechanical wiping.
- Disinfectant contact time may not be fully reached if one cloths/wipes are used on all patient room surfaces.

RISK INCREASES WITHOUT DEFINED PROCESSES



CHANGE CLOTH/WIPE HIGH-TOUCH SURFACES

- We frequently observed EVS cleaning in/around the patient room sink, then moving to the overbed table & patient zone without changing cloths.
- Fortunately, we never saw a bathroom cloth/rag used in the patient room.
- In our study thus far, we have not observed any double dipping!

ADDITIONAL STUDIES ON CLOTH COUNTS?

Number of cleaning cloths used	% of rooms (total rooms observed)
>3	16% (n =10)
2 - 3	40% (n = 25)
0 - 1	39% (n = 24)

McKinley et al 2023

- Most studies use fluorescent marking or ATP to validate cleaning, but we only identified one that reported cloth count.
- Mckinley's results were very similar to ours.
- All facilities used relaundered microfiber cloths & quat disinfectant.
- The authors did not comment on the fact that nearly **40% of their rooms** were only cleaned with **one or zero cloths!**
- **Remember, they reported a 69% overall cleaning compliance rate . . .**
  - **But were they truly removing pathogens or simply moving them around?**

Optimal Cloth/Wipe Usage?

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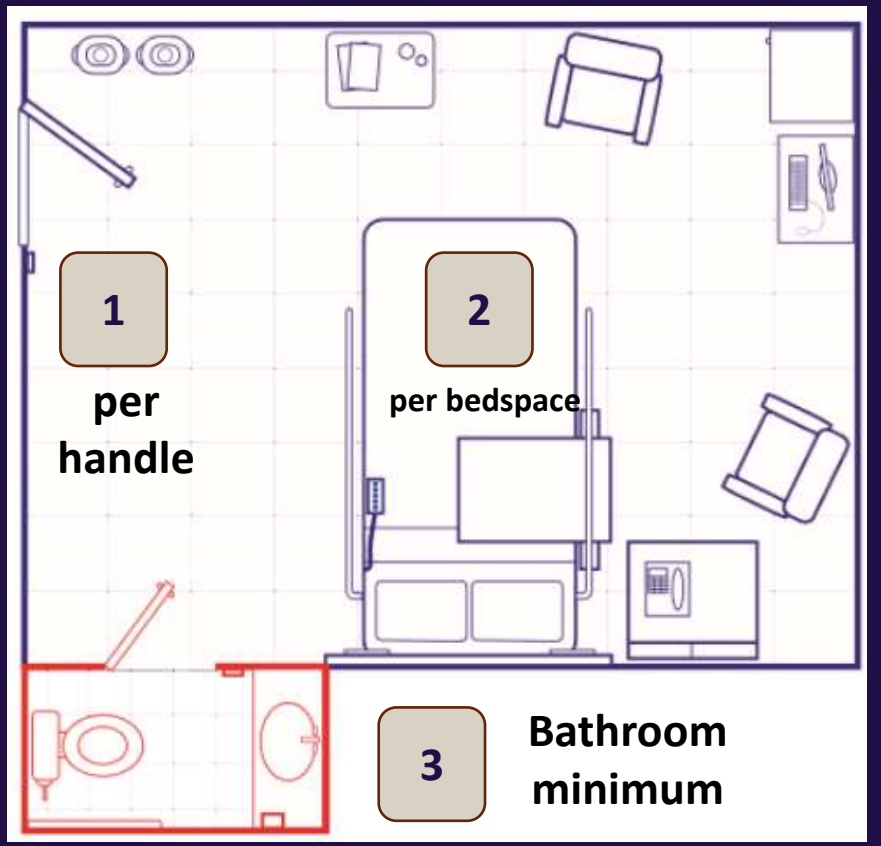
Determining the optimal number of cloths or wipes per patient room can be challenging, as rooms vary greatly from facility to facility, and even from unit to unit!

The level of contamination, size, amount of equipment/surfaces & availability of surfaces can impact the cloth/wipe need.



Suggested number of cloths/wipes per Dr M. Alfa (2015)

DAILY OCCUPIED ROOM CLEANING EXPECTATIONS

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Everyone plays a role in cleaning & disinfection! We know you cannot clean & disinfect everything, every day. We'd like to know which surfaces you believe you are expected to clean during a **daily room clean**. Please place an "x" next to the surfaces you believe you are expected to clean for **daily patient room cleans**. We know not all boxes will be marked.

Door knobs		Overbed tray table		Chair(s)		Toilet handrails	
Light switches		Call button		IV pump		Bathroom sink/faucet handles	
Sink/faucet handles		Remote control		IV pole		Toilet seat	
In-room computer		Telephone		Cabinets		Toilet bowl	
Bed rails		Barcode scanner		Commode		Toilet flush handle	
Bed rail controls		Bedside table		Thermometer		Toilet bedpan cleaner	
List any other surfaces not listed above:							

Expectations surveys were given to both frontline techs & leaders.

EVS EXPECTATIONS SURVEY RESULTS

	[illegible] r	Tech
[illegible]	[illegible]	✚
[illegible]	[illegible]	✚
[illegible]	✚	✚
Sink/faucet	✚	✚
Toilet flush handle	✚	✚
Toilet handrails	✚	✚
Bathroom sink/faucet	✚	✚
Overbed table	✚	✚
Door knobs	✚	✚
Light switches	✚	✚

	Leader	Tech
Telephone	✚	✖
Bedside table	✚	✖
Cabinets*	✚	✖

	Leader	Tech
Computer	✖	✖
Bed rails	✖	✖
Bed controls	✖	✖
Call button	✖	✖
air	✖	✖
mp & pole	✖	✖
ommode	✖	✖
Barcode scanner*	✖	✖
Thermometer*	✖	✖

IP: WHO DISINFECTS WHAT EVS DOESN'T?

You can do the same survey at your facility! So easy!

*Not currently on CDC list.
Site surveys analyzed individually.
Results reflect 4 completed surveys.

Variability in Occupied Daily Room Cleaning

- **First & foremost, understand that environmental services work is physically demanding and exhausting.**
- **Expectations were unclear.**
- **We learned that the EVS tech's room-specific risk assessment ≠ risk of potential pathogen transmission**
  - We observed skipping daily cleaning & disinfection due to *potential* discharge or discharge/terminal clean performed recently
  - "Double cleaning" (daily + discharge in same day) a room was a negative key performance indicator in some facilities.

Artwork by Aya Brown via https://www.artnews.com/art-in-america/features/aya-brown-essential-workers-1234596688/

DISCHARGE CLEANING = EXCELLENT!

Study Site	Number Observed	Average Time to Complete Discharge Clean	Discharge High-Touch Surface Cleaning Compliance*
Site X	46	40:43	90%
Site Y	34	45:00	87%
Site Z	11	47:22	92.1%
Total	*91*	*43:07*	*NC***

*Defined as wiping the surface with disinfectant cloth or wipe.
**Not yet calculated, given variance in cleaning protocols

COMPLIANCE KEY TAKEAWAYS

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- **Most EVS techs agreed that almost everything in the room was their responsibility during a terminal clean**
  - Clearer expectations, higher compliance?
- **Cleaning & disinfection is much more challenging when a patient is present**
  - *"Now the daily [cleaning], sometimes you can do that and sometimes you can't because some patients don't want you in there [their room]."* (McKinley et al 2023)
  - Clutter & personal belongings impede thorough cleaning

Overbed tables are commonly covered with personal belongings, meds, and food.

Cleaning and disinfection of portable shared medical equipment is just as important as cleaning and disinfection of patient room high-touch surfaces.

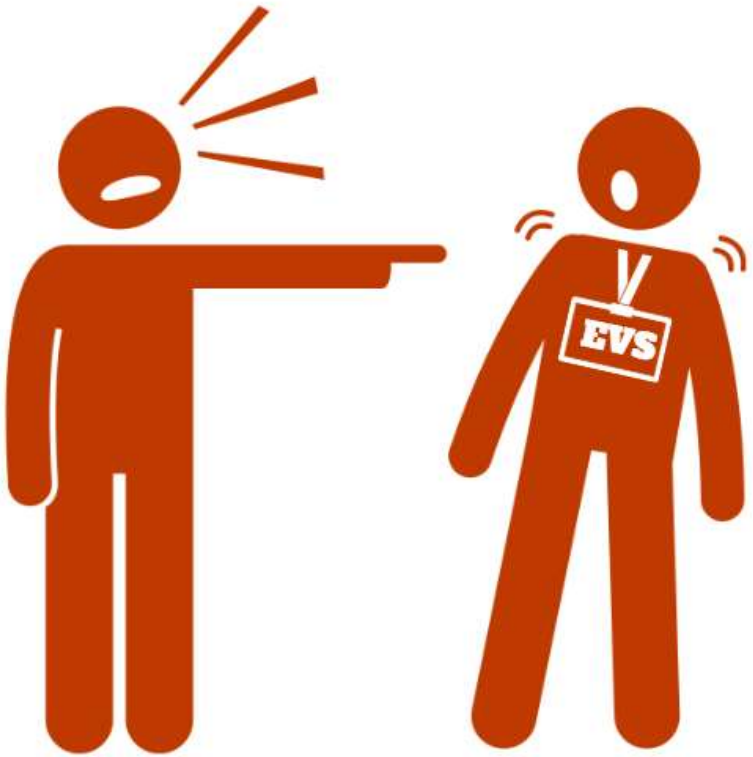
Dedicating Resources to Disinfect Portable Shared [illegible] HAIs

CLEEN Study from Australia

- **The majority of published EH literature, *including ours*, focuses on EVS-cleaned equipment & surfaces—not portable medical equipment that is shared from patient to patient, multiple times per day.**
- **A recent study showed the importance of routine disinfection of portable medical equipment.**
  - Dedicated one employee for 3 hours a day per ward/unit solely to cleaning and disinfection of shared portable medical equipment
- **As cleaning compliance for portable medical equipment went up, composite HAI rates went down.**

Browne et al, 2024

Environmental Hygiene Is a Shared Responsibility!



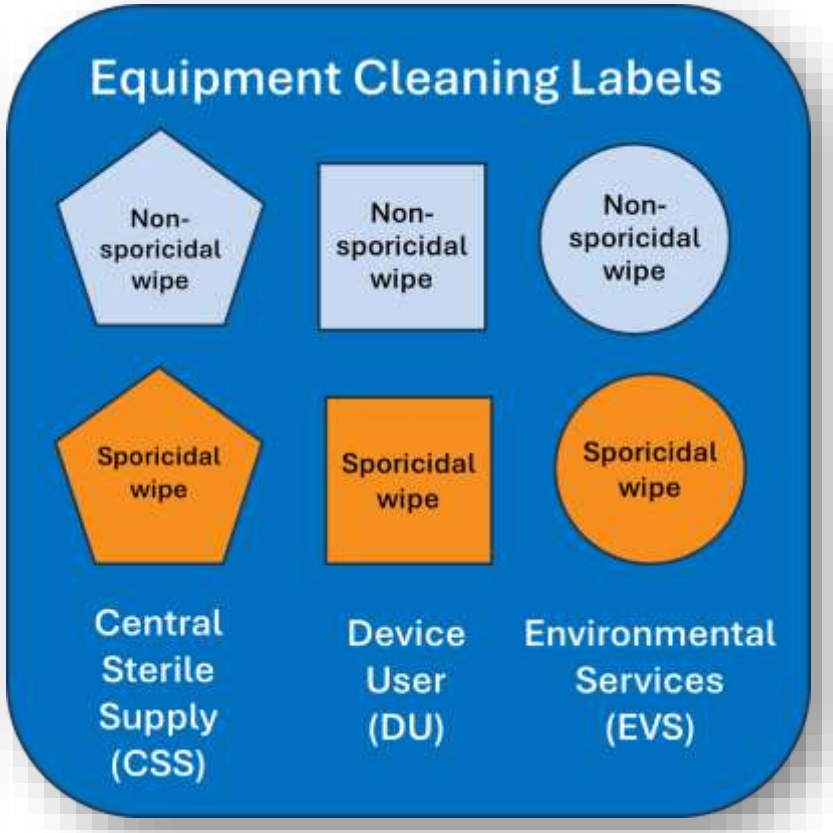
- EVS is often implicated in outbreaks/clusters of environmentally significant pathogens (e.g., *C. difficile*, *Candida auris*, *Acinetobacter baumannii*, etc.)
  - BUT portable medical equipment also plays a significant role in pathogen transmission and is rarely EVS's responsibility (Kanamori et al, 2017; Jones et al, 2023; Browne et al, 2024; Havill et al, 2011)

APIC 2022 NONCRITICAL DISINFECTION PRESENTATION

#APIC2022

Selected Equipment for Labeling

Equipment or Item	Group Responsible	Manufacturer Recommended
IV pump	CSS	Bleach
SCD Pump	EVS	Bleach
Vital Sign Machines	User	Bleach
Wall Mounted Vital Sign Machines	EVS	Bleach
EKG Machine	User	Bleach
PCA	CSS	Bleach
Feeding Pump	EVS	Bleach
Defibrillator on Code Cart	CSS	Quaternary Ammonium
Wall Mounted Patient Monitor/Leads/Pulse Ox/Cuff	EVS	Quaternary Ammonium
Bladder Scanner	User	Quaternary Ammonium
Telemetry Pack	User	Quaternary Ammonium



Dabkowski M. 2022

Define Roles and Responsibilities

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Direct practice observations can help identify process gaps and orphan equipment & surfaces, despite risk of Hawthorne effect

Based on observations and validation, specify which surfaces are most critical during daily cleaning & among clinical staff.

Convene a multidisciplinary team to determine who is responsible for cleaning and disinfecting what.

Ensure SOPs are available across the institution.

How & where are P&P accessed? Intranet, mobile app? Equipment labels?

Closing Thoughts

As IPs, we spend a lot of time & energy on **disinfectant products**. Are we focused as much on **disinfectant processes**?

While most research examines terminal cleaning, a reasonable (if not greater) level of **transmission risk** occurs during **daily patient care and via shared portable medical equipment**.

Mindset shift? Optimally effective tools and creative staffing approaches may be needed to address age-old environmental cleaning and disinfection challenges.

Special thanks to all the EVS technicians who partnered with us—giving us a unique glimpse into their often-overlooked realities.

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THANK YOU FOR COMING TODAY!

QUESTIONS?

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