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




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## Relevant Financial Disclosures

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

All of the relevant financial relationships listed have been mitigated.



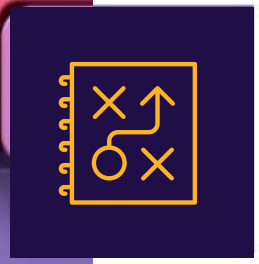
# Learning Objectives



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.



Explain 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



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.
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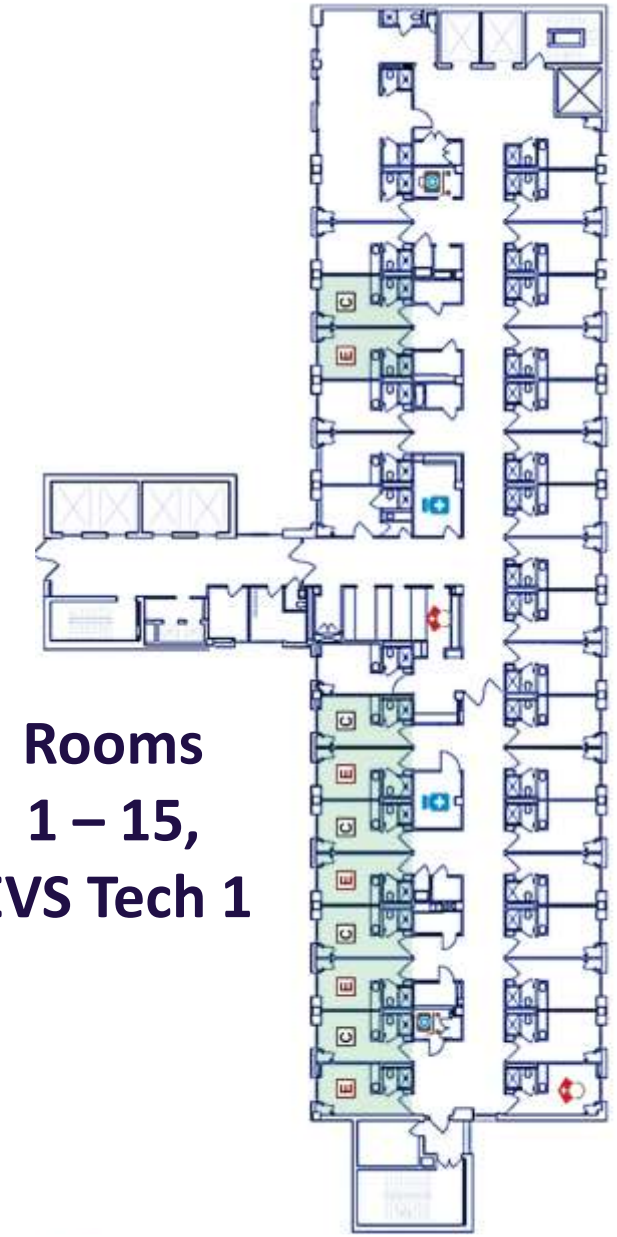


# On average, how long does it take for EVS to perform daily occupied patient room cleaning?

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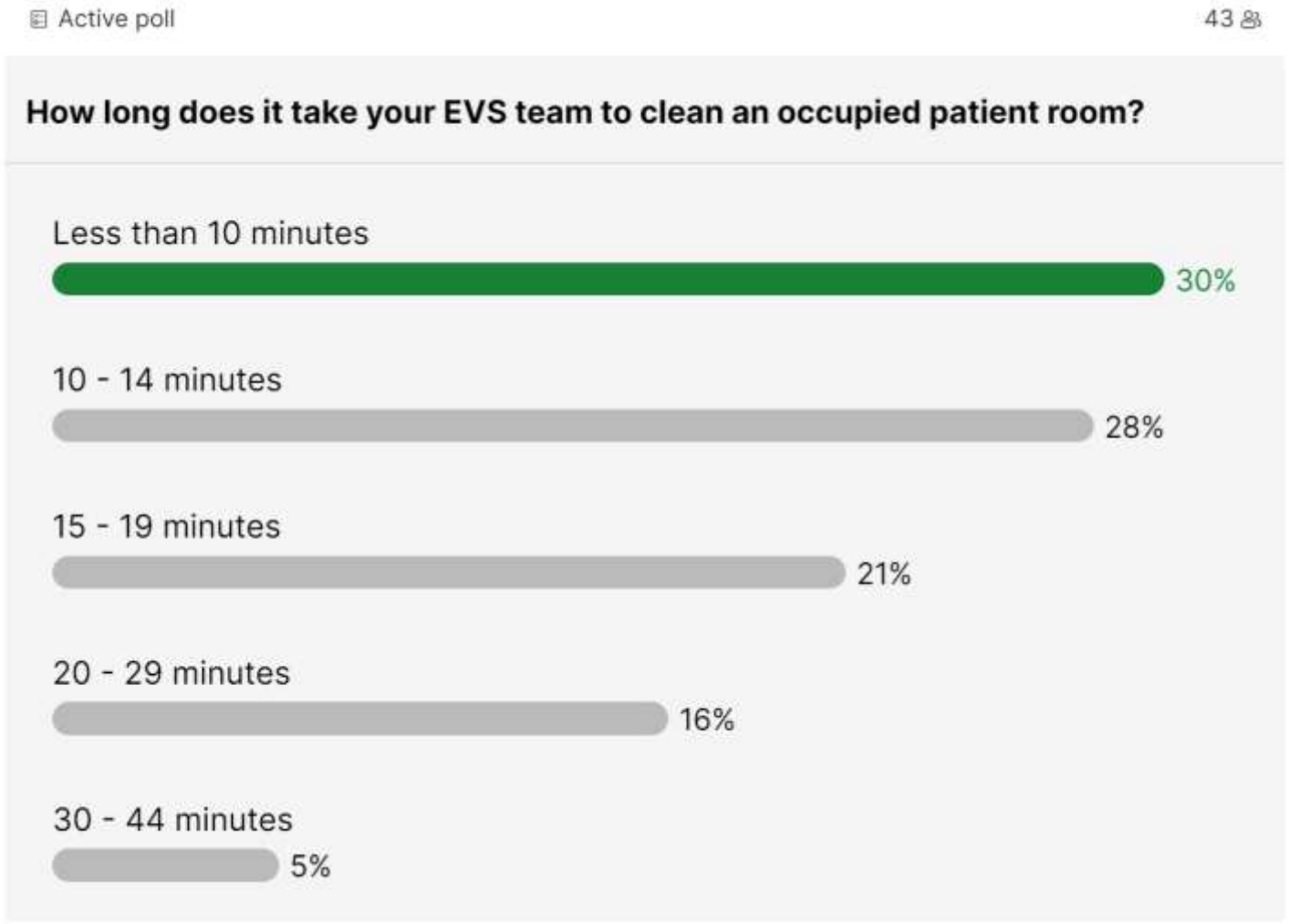
- Unpublished 2019 AHE Annual Trends Data Report revealed that almost 80% of membership reported daily room cleaning taking **10 to 19 minutes**.
- EVS leaders' expectations of each tech's expected workload varied per facility (*common schematic shown at right*):
  - 15 dailies, 2 to 4 discharges
  -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



**Rooms 16 – 30, EVS Tech 2**

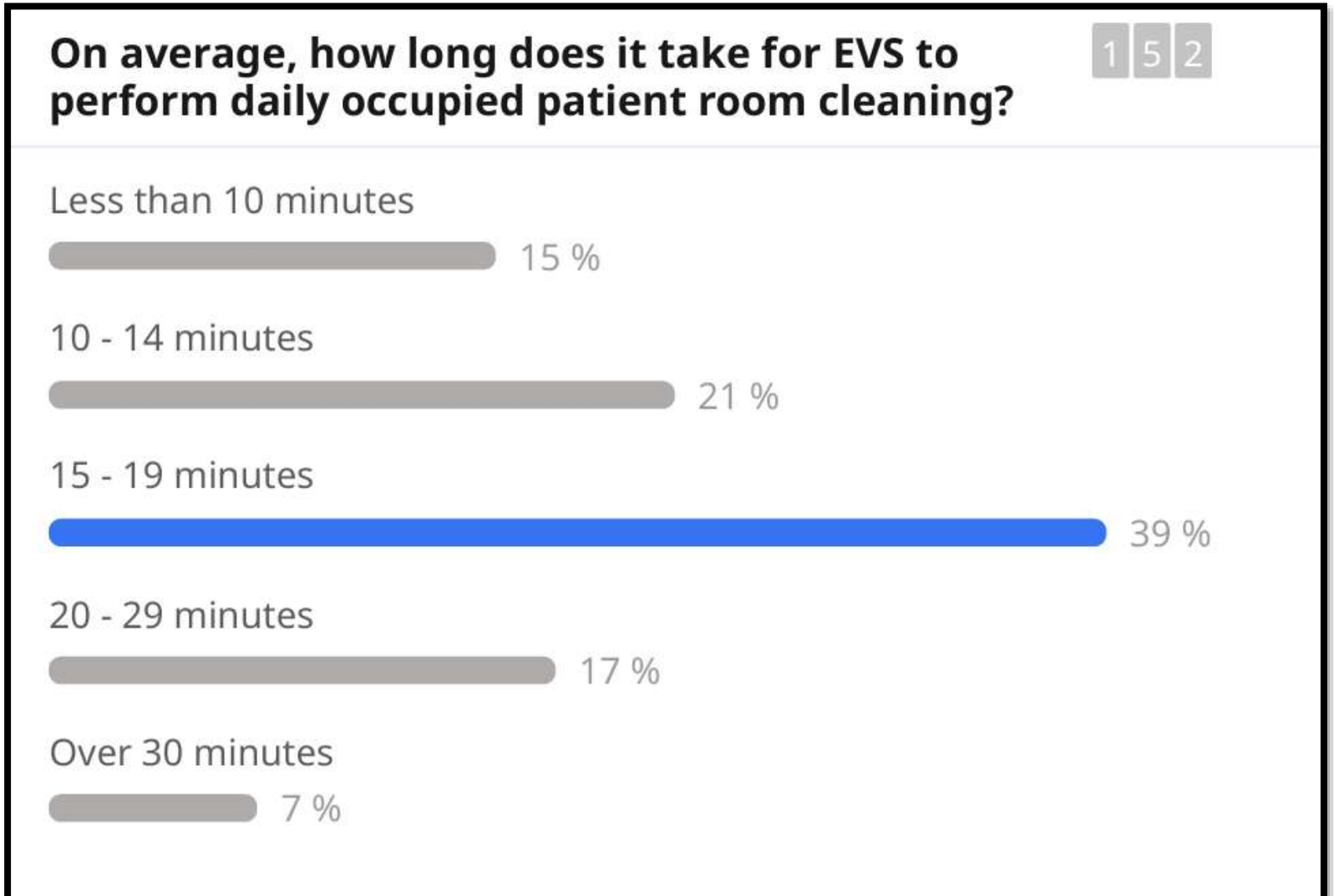
**Rooms 1 – 15, EVS Tech 1**

# Results from 2024 AHE Exchange Sunrise Session




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# 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?

- 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.



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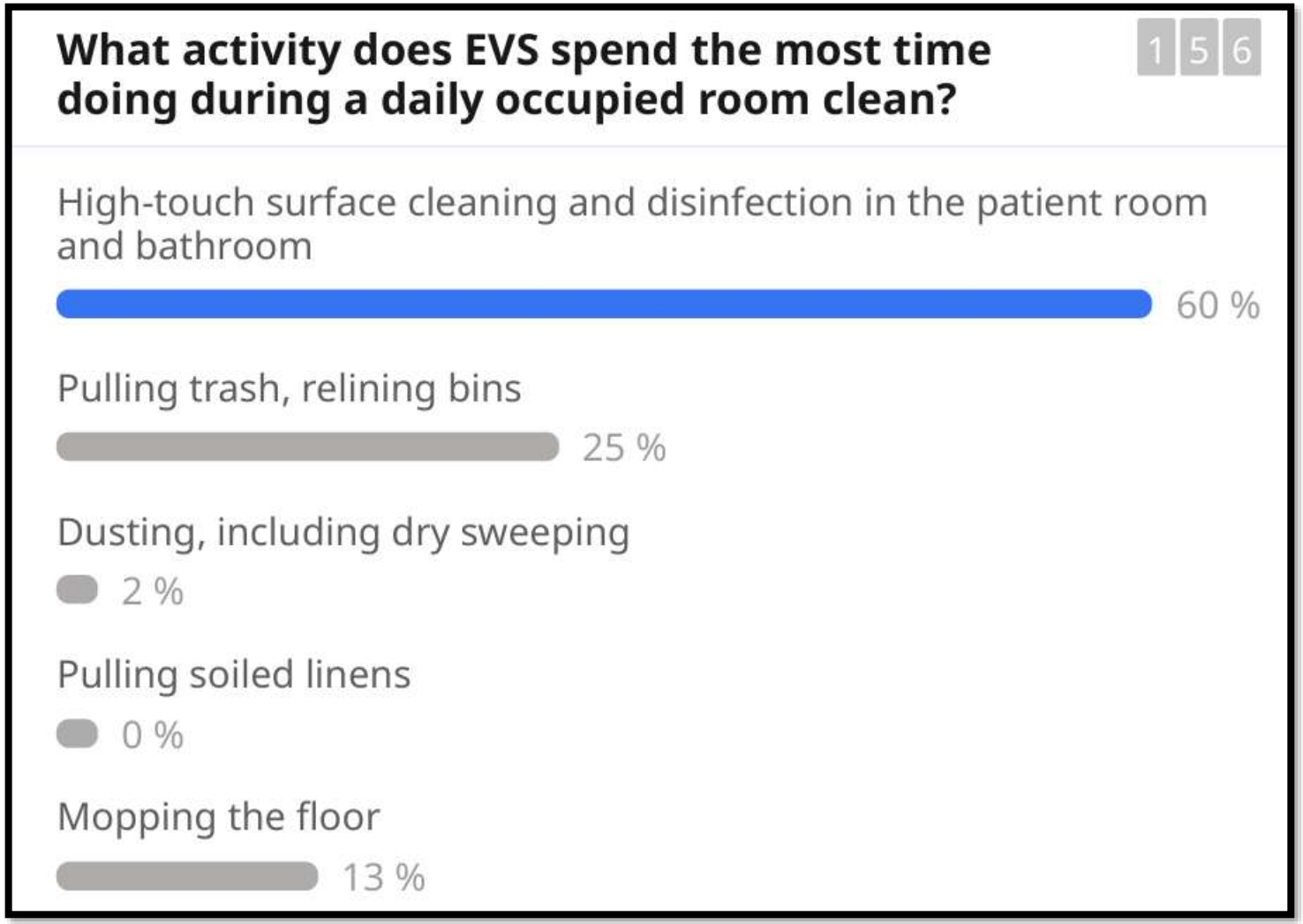


# What activity does EVS spend the most time doing during a daily occupied room clean?

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# Results from 2025 APIC National Conference



# Results from 2024 AHE Exchange Sunrise Session

**What activity does EVS spend the most time doing during an occupied room clean?**

Mopping the floor — 87%

Pulling trash, relining bins — 13%

Pulling soiled linens — 0%

Dusting, including dry sweeping — 0%

High-touch surface cleaning and disinfection in the room & bathroom — 0%



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# How Are the 9 Minutes Being Spent?





**Room & Bathroom Mopping**

**Room & Bathroom Disinfection**

**Other activities (trash, linen*, refilling consumables)**







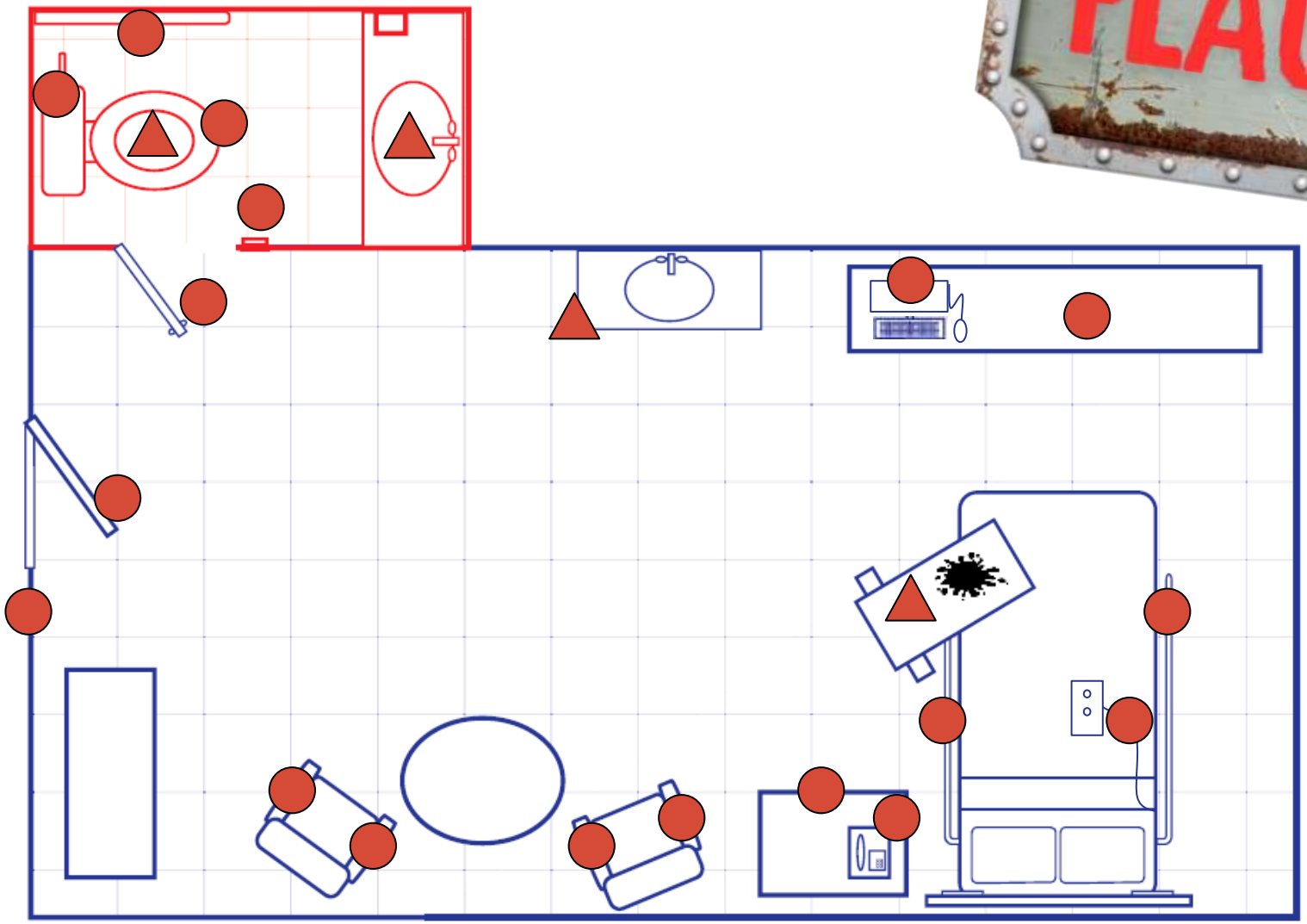



*Soiled linen removal was typically a clinical task but did occur during some daily turnovers.

# Is 3 Minutes Enough?



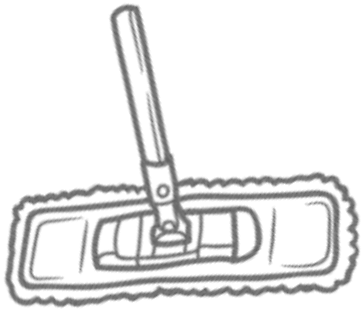


## HIGH-TOUCH SURFACES COMMONLY MISSED, BUT FLOORS NEARLY ALWAYS MOPPED

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

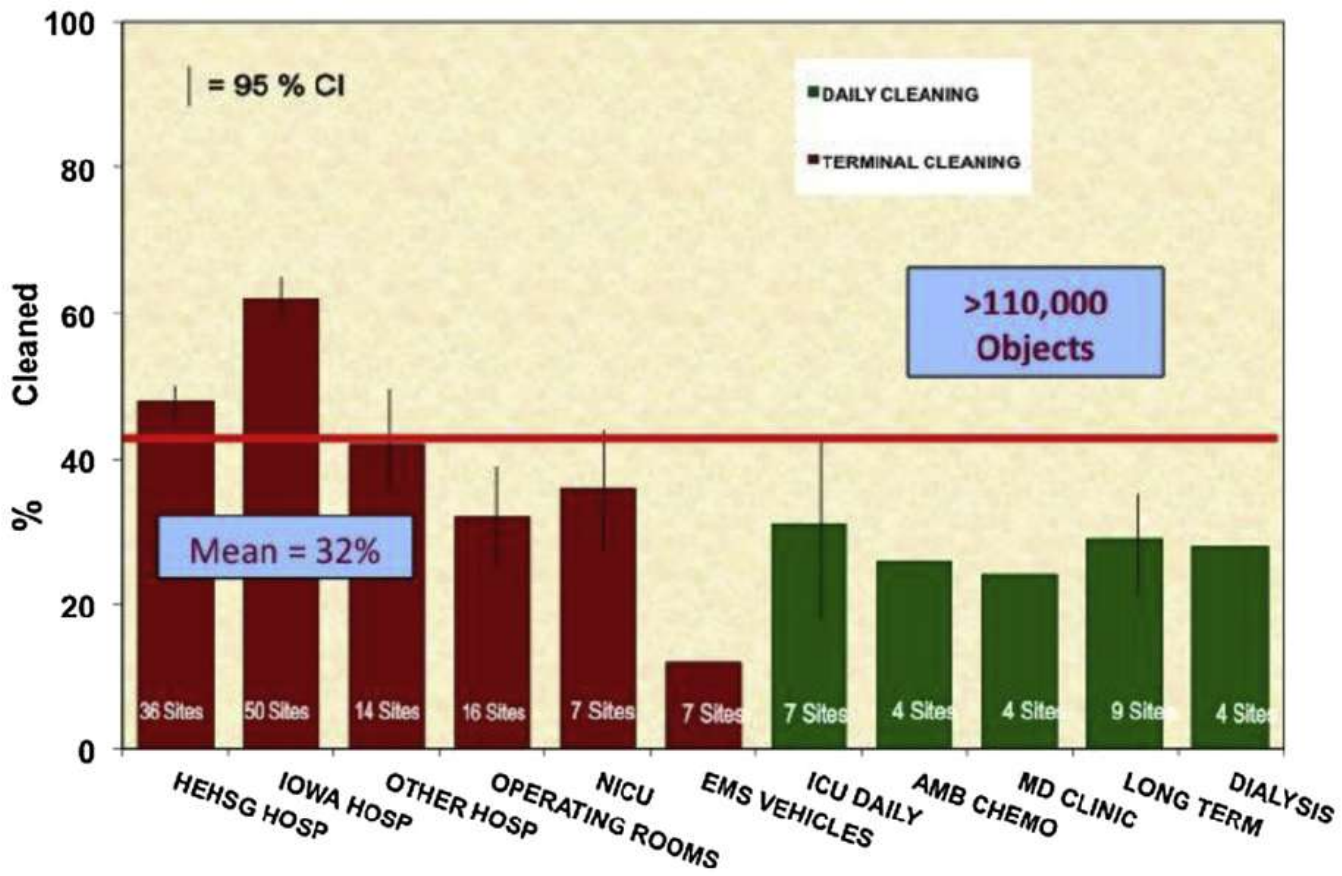



**Fig 2.** Thoroughness of environmental cleaning in multiple health care settings.

- 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.

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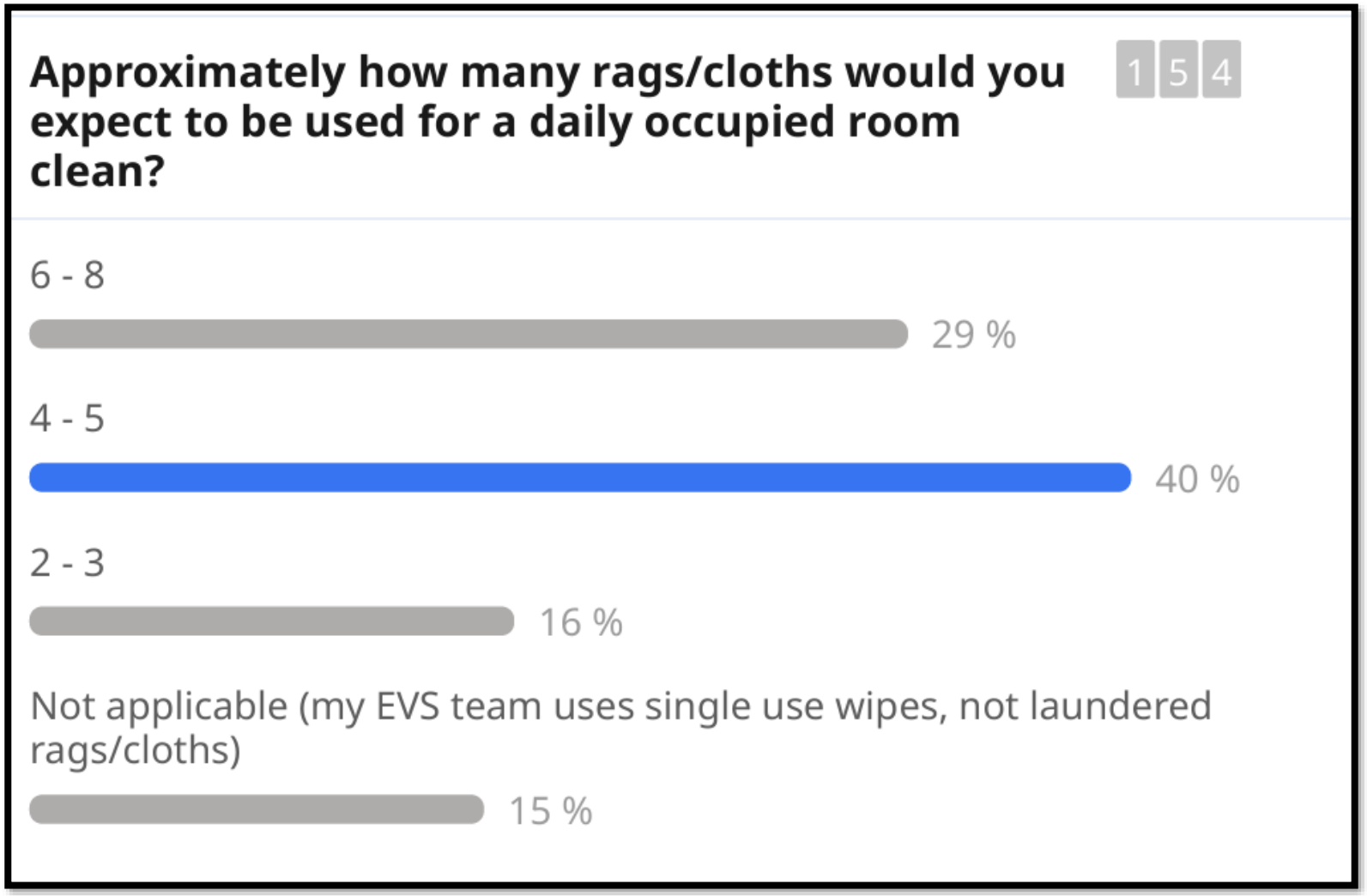


**Approximately how many rags/cloths would you expect to be used for a daily occupied room clean?**

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**Likely reflected bias of learning cleaning compliance results**

**What our facilities predicted would be used**



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# 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 | |
|---|---|---|---|---|
| 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% |

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




VS.






*Sattar & Maillard 2013*

# WHY DOES CLOTH/WIPE COUNT MATTER?

- 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*

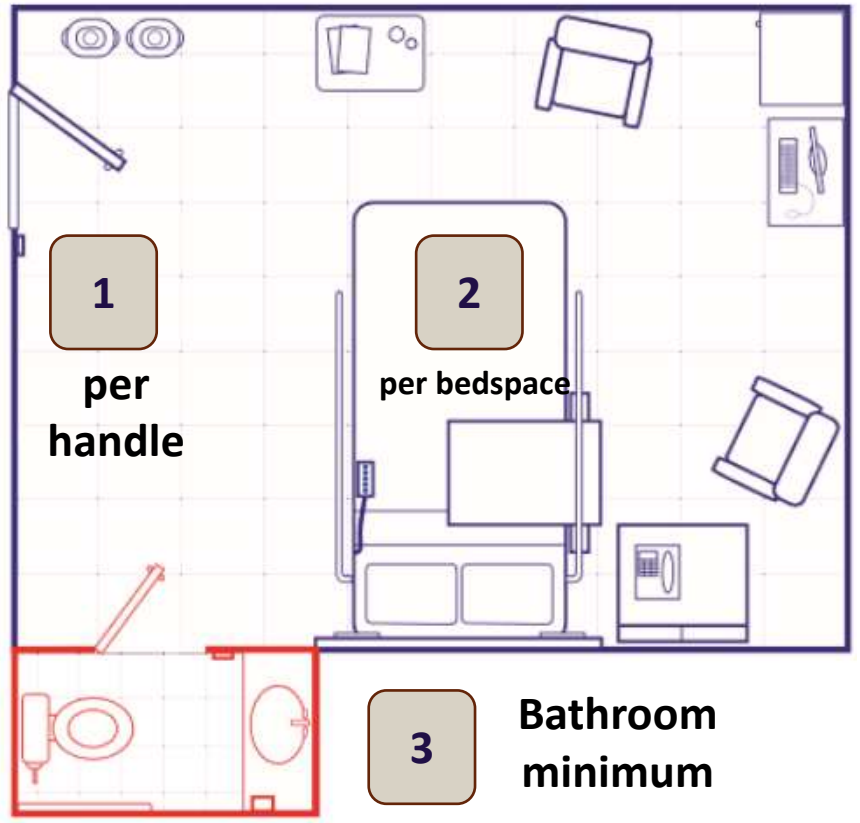
- Most studies use fluorescent marking or ATP to validate cleaning, but we only identified one that reported cloth count.
- Mckinley's results were very similar to ours.
- All facilities used relaundered microfiber cloths & quat disinfectant.
- The authors did not comment on the fact that nearly **40% 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?

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.



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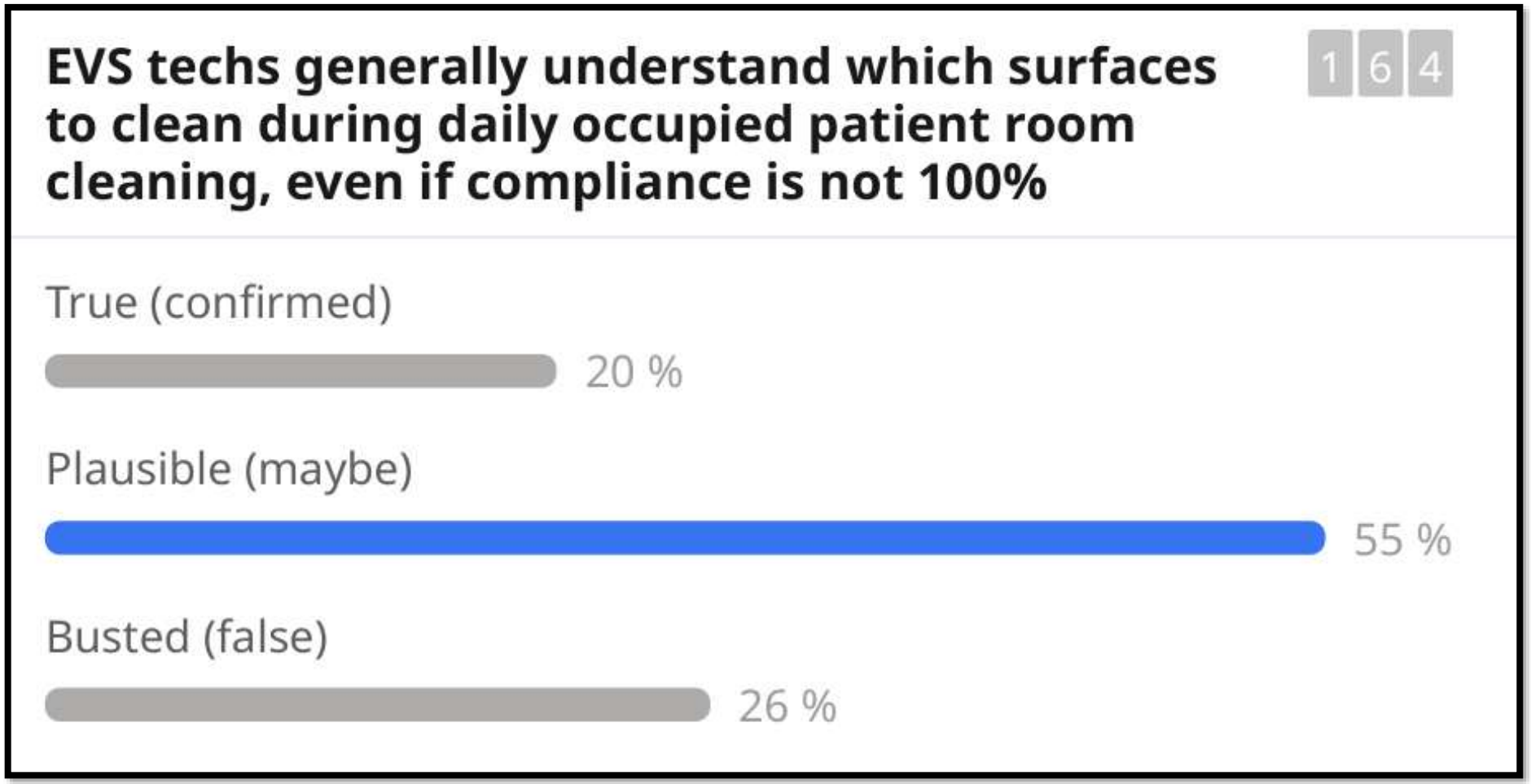


**EVS techs generally understand which surfaces to clean during daily occupied patient room cleaning, even if compliance is not 100%**

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# DAILY OCCUPIED ROOM CLEANING EXPECTATIONS

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




| | r | Tech |
|---|---|---|
| | ✚ | ✚ |
| | ✚ | ✚ |
| | ✚ | ✚ |
| 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 | ✖ | ✖ |
| hair | ✖ | ✖ |
| mp & pole | ✖ | ✖ |
| ommode | ✖ | ✖ |
| Barcode scanner* | ✖ | ✖ |
| Thermometer* | ✖ | ✖ |



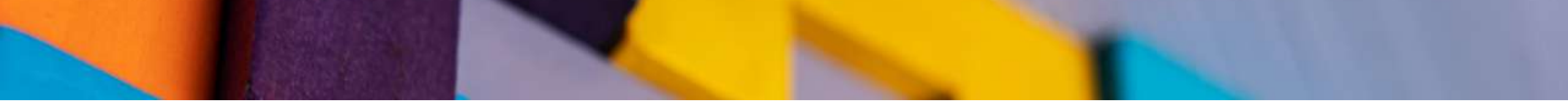

*Not currently on CDC list.
Site surveys analyzed individually.
Results reflect 4 completed surveys.

# 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

- **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**
  - Dripping wet rags near the patient?
  - *"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.*

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

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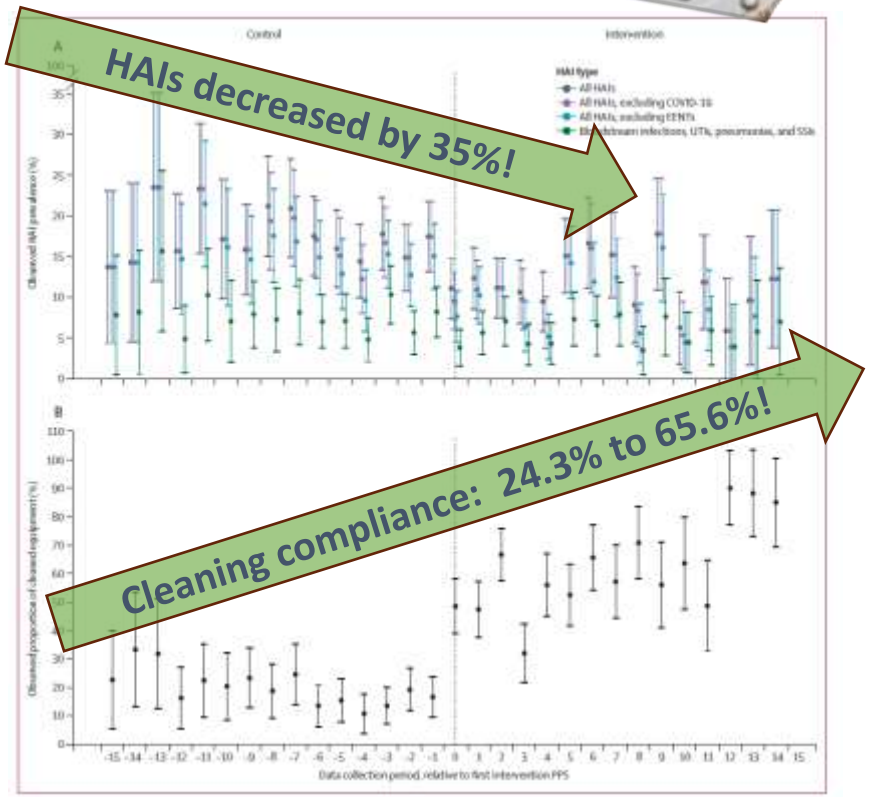
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# Dedicating Resources to Disinfect Portable Shared E

## *CLEEN Study from Australia*

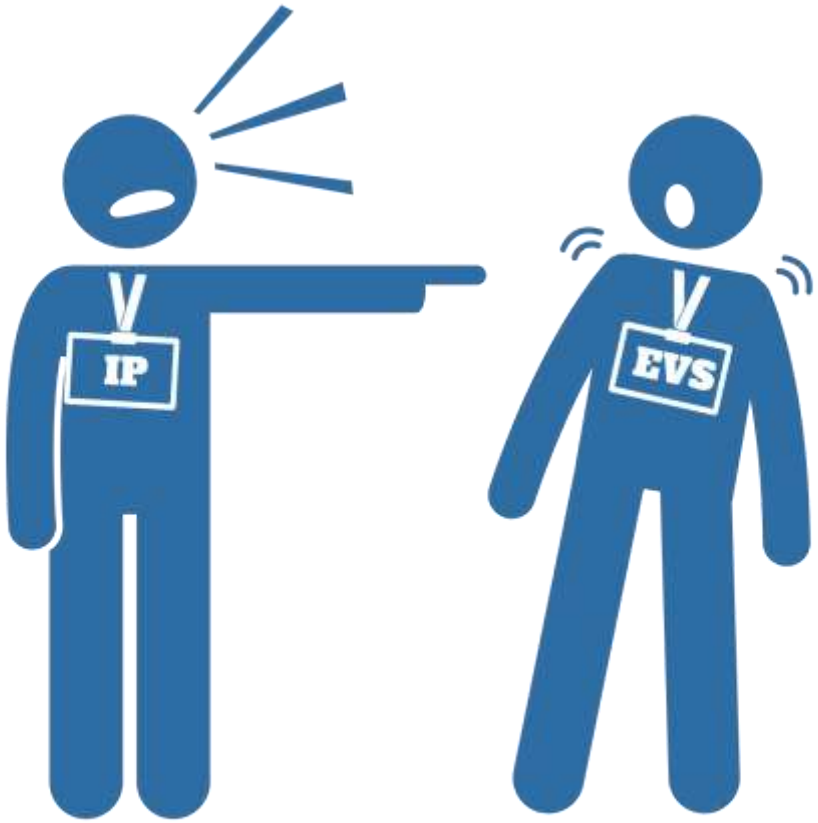



- **The majority of published EH literature, *including ours*, focuses on EVS-cleaned equipment & surfaces—not portable medical equipment that is shared from patient to patient, multiple times per day.**
- **A recent study showed the importance of routine disinfection of portable medical equipment.**
  - 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!



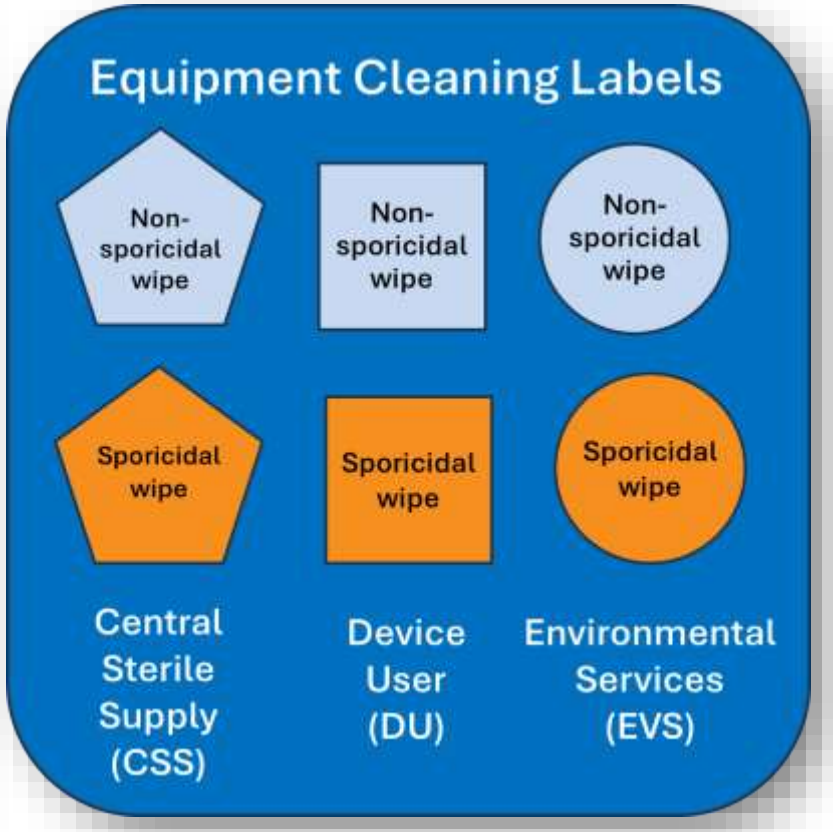

- EVS is often implicated in outbreaks/clusters of environmentally significant pathogens (e.g., *C. difficile*, *Candida auris*, *Acinetobacter baumannii*, etc.)
  - BUT portable medical equipment also plays a significant role in pathogen transmission and is rarely EVS's responsibility (Kanamori et al,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

# 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

# Newly published roles & responsibilities article!



PRACTICE FORUM · Articles in Press, February 04, 2026

## Wiping Out Confusion: A Toolkit to Define Roles and Improve Cleanliness in Complex Patient Care Spaces

Sara Townsend, MS HQS, CIC [a] · Tina Cermignano, BS OLEAD, T-CHEST, CMIP [b] · Paula Karley, BSN, RN [b] · Nicole Seon, BS [c] · Susan E. Coffin, MD, MPH [d]

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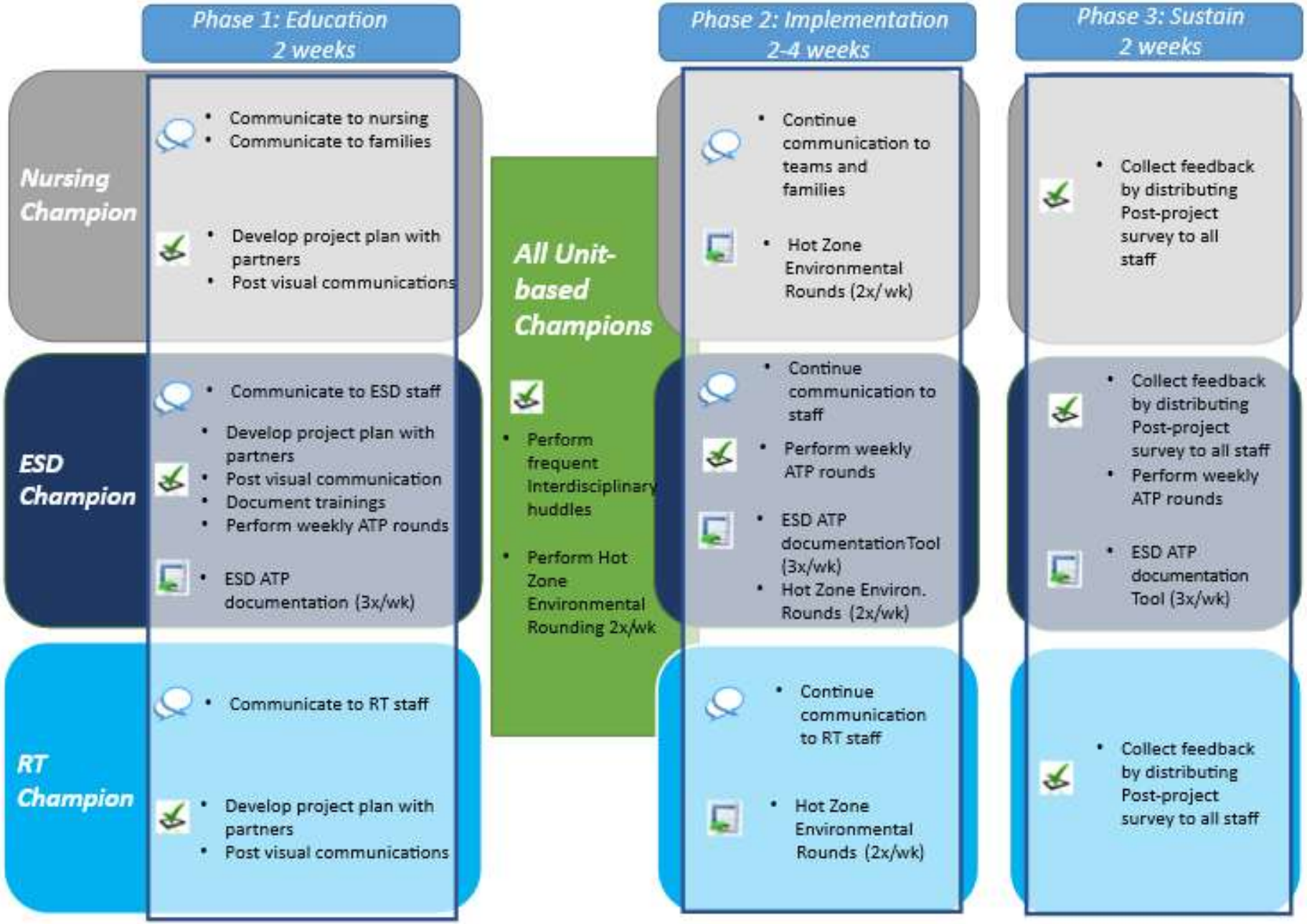
Show Outline

### Highlights

- Role clarity supports maintenance of a clean and safe patient care environment.
- Multidisciplinary partnerships promote improved patient room cleanliness.
- A cleaning toolkit can guide improvement in a complex patient care environment.

HOT OFF THE PRESS!

# Hot Zone Unit Based Project Plan




Townsend et al, 2026

# Define Roles and Responsibilities



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?

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





# 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.

# THANK YOU FOR COMING TODAY!

# QUESTIONS?

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