Bugs on the Wheel go Round and Round

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Disclosures

- Nothing to disclose

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Objective

- To use a simple laboratory-based method to evaluate the bacterial contamination on a high-touch surface of paper towel dispensers used for hand washing in patient-care areas of an acute care hospital

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Background

- Drying hands after Hand Hygiene (HH)
- "Hands-free" drying towel dispensers
  - If towel becomes stuck, user needs to turn the wheel
- Is the wheel clean?
- Are my hands still clean after touching the wheel? Should I perform HH again?

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Research Questions

1. Does the manual spin wheel located on the side of Hands-Free Towel Dispensers harbour microorganisms?
2. Do the present cleaning practices adequately reduce the microorganism burden?

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Hypothesis

- We predicted there will be a high microorganism count on the manual spin wheel located on the side of Hands-Free Towel Dispenser despite the cleaning practices in place.

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Methodology

- **Setting:** Two acute care sites
  - Site 1: large tertiary acute care hospital
  - Site 2: community acute care hospital
- **Participants**: Hands-Free Towel Dispensers
- **Inclusion Criteria**: Clinical units including nursing stations, hallways, medication rooms, staff bathrooms, and/or HH sinks used by HCPs
- **Exclusion Criteria**: Units on alert or outbreak

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Specimen Collection

- Specimens collected from surface of manual wheel with sterile, pre-moistened swabs and labelled with code
- Surface swabbed included side-facing surface and crevasse that surrounds the rotating part (surface area ~15 cm^2)
- Three specimens were collected from each dispenser wheel:
  1. Before cleaning (0900 hrs)
  2. 30 – 60 minutes after cleaning (0930-1000 hrs)
  3. 4 – 6 hours after cleaning (1500 hrs)

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Specimen Processing

- Specimens inoculated onto Columbia Agar with 5% sheep blood agar plates (BAP) within 72 hours of collection
- Incubated at 35°C O_2 atmosphere
- Photographed at 48 and 72 hours after incubation
- Colony-Forming Units were counted from the photograph by single reviewer (BM)
- No further identification was performed on colonies

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Results

- **Site 1:** Total of 30 samples from 10 dispensers were collected on July 29, 2021 (initial proof-of-concept study)
- **Site 2:** Total of 88 samples from 30 dispensers were collected on April 4, 2022
  - Excluded 1 dispenser which only had Pre-cleaning specimen collected
  - Remaining 87 samples included in analysis

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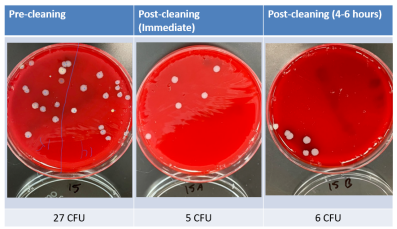
Results



Photos were taken by smart phone and then colonies were counted from enlarged image on tablet

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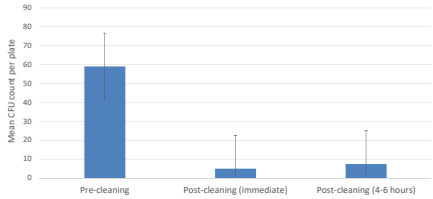
Results

Figure 1: Bacterial growth, mean CFU at 72 hours



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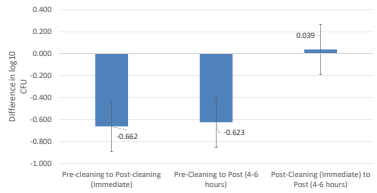
Results

Figure 2: Change in bacterial colony growth



Limitations

- Small sample size
- Limited analysis
  - Only colony counts, no colony identification

Future Directions

- Larger study is recommended
- Identify bacterial colonies, particularly if evidence of nosocomial transmission (e.g. MRSA, CPO)
- Validate methodology against other standardized EVS audit tools (e.g. UV marker, ATP)

Summary

- "Wheel" on hands-free paper-towel dispenser is a potential site for bacterial growth and transmission
- Cleaning of the "wheel" decreases the amount of bacterial burden; this effect persists at least 6 hours

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Reference

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