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Hospital Mattresses: A Hidden Danger to Patients

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- Practicing Emergency Physician for more than 40 years
- Active Researcher in infection prevention, emergency medicine and public health
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DISCLOSURE OF FINANCIAL RELATIONSHIPS

- I have the following relevant relationship(s) to disclose:
  - Trinity Guardion
    - Manufacturer of launderable bed barrier
  - Medical advisor

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Objectives

- At the end of the presentation, participants will be able to
  - Explain why cleaning the mattress is so important to preventing pressure injuries from getting infected.
  - Explain why modern mattresses require a multi-step process to be effectively cleaned and disinfected.
  - Explain how hospitals can overcome the challenges of cleaning modern mattresses that now have covers made of polyurethane, which is soft and porous.
  - Discuss how to identify and mitigate mattress damage in hospitals.
  - Describe best practices in mattress cleaning, disinfection, and maintenance.

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Introduction

- Hospital beds are high-tech reprocessable **Class II medical** devices.
- The surface of the mattress (cover) is manufactured using polyurethane-coated fabric to ensure moisture-vapor transmission, to prevent pressure ulcers.
- Due to multidrug-resistant organisms, healthcare organizations have used increasingly harsh chemicals to clean these mattresses. None of these chemicals are approved for use on polyurethane-coated fabric.

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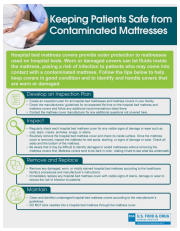
Hospital Beds are a Huge Safety Problem

- **FDA** has issued two safety advisories in the last 10 years about failed mattresses
  - Last one had over 700 reports of mattress failure
- **ECRI** called mattresses the top health technology hazards in 2019
- **AMA** passed a resolution highlighting the risk of infections from hospital mattresses in 2023



ECRI Institute

2019 Top 10 Health Technology Hazards

Executive Brief

A Report from Health Devices

AMA AMERICAN MEDICAL ASSOCIATION

Resolution 428 be adopted as amended.

RESOLVED, That our American Medical Association work with the accrediting bodies and interested stakeholders to make sure all possible appropriate care and maintenance measures be undertaken to mitigate infection related to hospital bed and mattress use (Directive to Take Action).

Your Reference Committee heard testimony in support of this resolution. It was noted that not all hospitals are following proper mattress care recommendations from manufacturers and regulatory agencies, which results in an increased spread of infections. Amendments were offered to encourage our AMA to collaborate with other health care organizations in addressing appropriate care and maintenance measures. Your Reference Committee agrees and recommends that Resolution 428 be adopted as amended.

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WHY?

- Mattresses are made differently today, to prevent pressure injuries
  - Now mattress covers are made of cloth covered with polyurethane and are only 1/40 of an inch thick
    - No longer made of vinyl
- Modern mattresses are a problem to clean
  - Mattresses are now soft porous surfaces to allow for moisture to wick away from patient
  - All of the cleaners being used to clean mattresses in the US are not approved for soft porous surfaces, they are only supposed to be used on hard non-porous surfaces
    - Mattress covers are being degraded by current on step processes

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Mattresses have changed

- 1970's Mattress Covers were Vinyl
  - Non-porous – Hard Surface Disinfectants Worked. Easier to clean
  - Expected fabric life 10+years
  - Concerns over excessive perspiration and skin irritation pressure injuries and skin breakdown led to Microclimate Mattresses
- Newer Microclimate mattresses with high moisture vapor transmission
  - Porous surface
  - Expected fabric life 1-2 years

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How are Mattresses and Beds Cleaned in your hospital?

- Survey
- Question
  - How are Mattresses and Beds Cleaned in your hospital?
- Answers
  - I don't know
  - One step process using a single cloth or wipe.
    - No rinsing
    - No separate steps for disinfection and cleaning
  - One step process using multiple cloths or wipes.
    - No rinsing
    - No separate steps for disinfection and cleaning
  - Multi-step process
    - Follow the Manufacturers Instruction For Use
      - 5-6 steps
      - Includes rinsing after cleaning and again after disinfection

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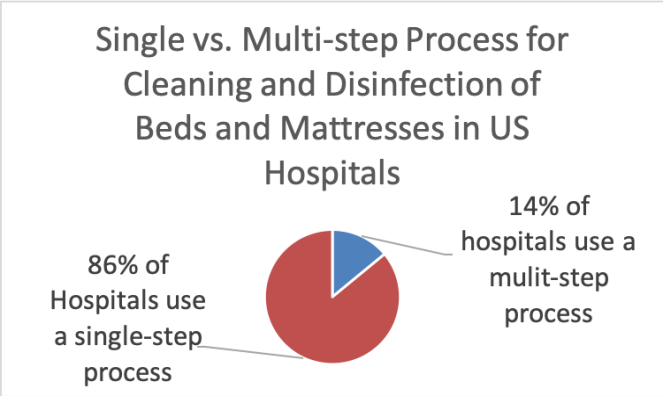
Previous Research on Cleaning



Based on a sample of at 2019 APIC conference.

Hooker, E. A. (2021). Disinfecting hospital beds and mattresses: A time for change. *AJIC*, *49*(10), 1341.

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One-step Process Does Not Work

- Hooker (2012) showed that 51/62 (83%) of terminally cleaned beds (cleaned with one-step process) were still contaminated with bacteria, including MDROs.
- Bacteria Isolated after Terminal Cleaning
  - *MRSA*- Methicillin Resistant *Staphylococcus aureus*
  - *VRE*- Vancomycin-resistant *Enterococcus*
  - *Acinetobacter lwoffii*
  - *Acinetobacter baumannii*
  - *Enterobacter cloacea*
  - *Pseudomonas fluorescens*
  - *Pseudomonas aeruginosa*
  - *Stenotrophomonas maltophilia*
  - *Streptococcus viridans*
  - *Klebsiella* pneumonia
  - *Rhizobium radiobacter*
  - *Proteus mirabilis*
  - *Bacillus* species
  - *Micrococcus* species
  - Coagulase negative *Staphylococci*

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One-step Process Does Not work

- Quaternary Ammonia Compounds
  - only get less than a log1 reduction (Hooker, 2013) and most surfaces still contaminated after cleaning (Manian, 2013; Sigler, 2013) =
- Hydrogen peroxide/peracetic acid
  - only gets a log2 to log3 reduction (Doan, 2012) and did not reduce C. diff infections (Alfa, 2015)
- Bleach
  - failed to reduce C. diff counts and did not reduce C. diff infections (Anderson, 2017)
- UV light
  - only reduced C. diff counts by only log1 or less (Anderson 2013 & 2017; Randive 2017) and failed to reduce C. diff infections (Anderson, 2017)

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Neonatal Isolettes

- Guzman-Cottrill (2025)
  - Review article from neonatologist
  - Mattresses are **not clean** after recommended disinfection procedures
- Butin (2019)
  - Cultured for Methicillin-resistant clone Staphylococcus capitis NRCS-A. Causes Sepsis in Neonates. 12/16 (75%) mattresses were contaminated before disinfection and 6/16 (37.5%) were still contaminated afterwards.
- Chavignon (2021)
  - Cultured 20 mattresses from neonatal incubators
  - 100% were contaminated before and after disinfection. Most common bacterium isolated were Coagulase-negative Staphylococci, Enterococcus, and Bacillus
  - Bacteria that were isolated from the incubator were linked to two episodes of sepsis in neonates and this extended their stays.

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UV Light after One-step Does Not Work

- Chin (2019)
  - UV light added to bleach did not work for terminal cleaning. Patients became infected with MDROs that remained after cleaning.
- Health Quality Ontario (2018)
  - Systematic review that showed evidence for value of UV light is extremely poor and that the costs are huge.
- Anderson (2017)
  - UV failed to decrease C. diff or MRSA infections
  - No bed manufacturer recommends use of UV light for disinfection.

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UV Light Actually Damages Fabric

- Hospital furniture is damaged by UV light. Most is made of the exact same material is the hospital mattress (fabric coated with polyurethane)
- UV light has a ”destructive effect” on these fabrics

New Information about Specifying and Cleaning Durable Coated Fabrics for Healthcare
American Academy of Healthcare Interior Designers (AAHID) Education
Session November 4, 2019

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Wipes actually spread contamination

- Nkemngong (2020)
  - Showed that as disinfectant wipes are used, they contaminate previously uncontaminated surfaces.
  - Wipes still had viable spore on them after use.

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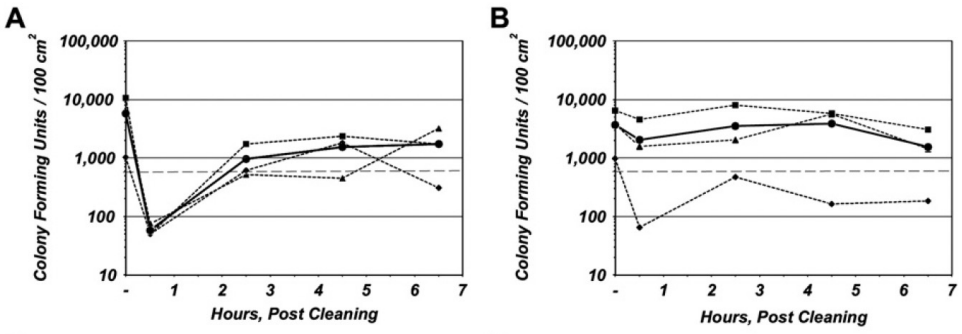
Bacterial Burden Rebounds Quickly After Cleaning

- Attaway (2012)
  - Used two types of quaternary ammonium (single wipe method)
    - Only get log 1 to log 2 reduction
  - Contamination quickly rebounded to almost precleaning levels within hours



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FDA changed reprocessing in 2015

- 2015 FDA changed from the requirements of medical device manufacturers from just having to show compatibility of the cleaning agents and disinfectants with the device to requiring them to show efficacy of the cleaning and disinfection process and compatibility, as well as requiring an expected use life.
  - "The instructions should recommend only cleaning agents or classes of agents (e.g., detergents such as quaternary ammonium compounds and enzymatic detergents) that were used during the cleaning validation studies, that have been demonstrated to be **compatible** with the device, and are **effective** in cleaning the device."
  - "The labeling should either 1) inform the user how many times the device can be reused, based on testing; or 2) provide the user with a mechanism or method to ascertain whether the device has exceeded its use life. "

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Mattress Reprocessing has Changed

- New MIFUs require a 5+ step process.
  - Preclean (remove visible soil)
  - Rinse
  - Clean (clean prior to using a disinfectant)
  - Rinse off cleaner
  - Disinfect (must be a distinct step, not part of cleaning)
  - Rinse
  - Inspect mattress for damage

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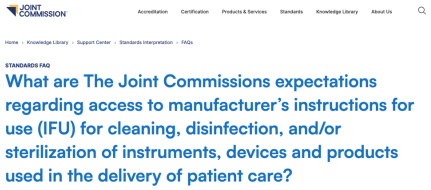
Joint Commission

- "It is important to understand that each patient care item has its own IFUs for cleaning and disinfection and the expectation is that the organization will follow those instructions. Failure to follow such instructions or misuse creates significant risk to safe, quality care."



https://www.jointcommission.org/standards/standard-faqs/office-based-surgery/infection-prevention-and-control-ic/000002250/?p=1

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APIC Survey on IFUs

- Tomlinson (2024)
  - 70% of IPs struggle with the IFUs
  - 42 % of IPs surveyed (n=1200) said that they had been cited for not following the IFUs. Most unable to get citation reversed.
  - Mattress often mentioned as the device

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Consequences of Not Following IFUs

- Mattress is not clean
  - Increased HAIs
  - Increased infected HAPIs
- Mattresses are damaged by leaving chemicals on surface
  - Increased mattress failure
- Can be cited by Joint Commission and some States

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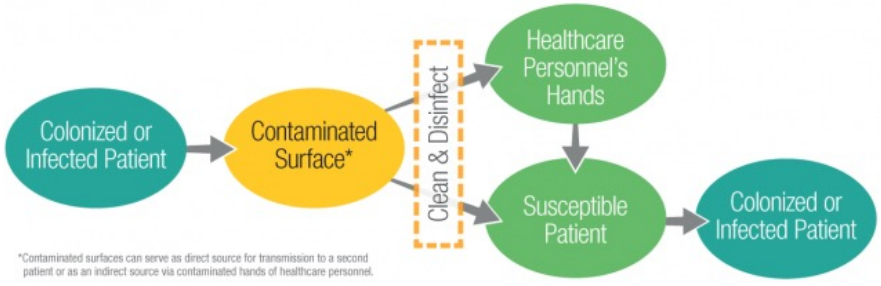
Hand Washing and Contaminated Surfaces



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Contaminated surfaces

- CDC (2003)
  - "The transferral of microorganisms from environmental surfaces to patients is largely via hand contact with the surface.[947, 948] Although hand hygiene is important to minimize the impact of this transfer, cleaning and disinfecting environmental surfaces as appropriate is fundamental in reducing their potential contribution to the incidence of healthcare-associated infections."

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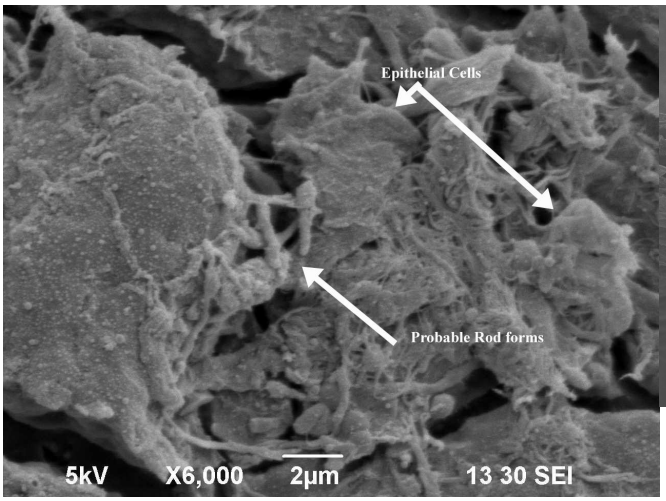
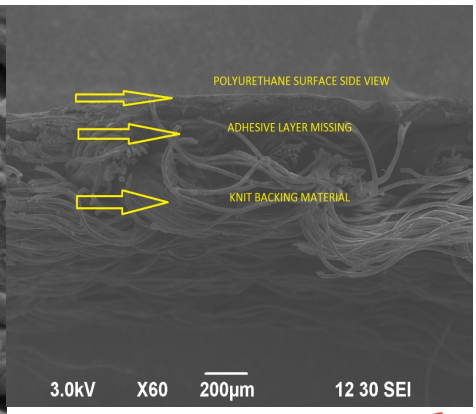
Damage Caused by One-step Process





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Have you had Mattresses Fail at Your Facility

- Survey
- Question:
  - Have you had mattresses fail at your facility?
- Answers:
  - We have had mattresses fail at our hospital
    - Fluids coming from mattress
  - I am unaware of mattress failure at out hospital.
  - Unsure

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Do You Routinely Inspect Your Mattresses for damage?

- Survey
- Question
  - Do you routinely inspect your mattresses for damage?
- Answers
  - We routinely inspect our mattresses after each patient as part of the cleaning process **using only external visual inspection**
  - We routinely inspect our mattresses after each patient as part of the cleaning process **by unzipping the mattress and examining inside**
  - We **do not** routinely inspect out mattresses for damage
  - Don't know

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Damaged and Failed Mattresses are Common

- Bradbury (2014) : 27% of hospital mattresses (n=656) had failed and had damage on interior.
- Yu (2016)
  - Crib Mattresses at Toronto Sick Kids. Random sample of mattresses. Painted with blue dye. 7 of 7 (100%) had failed and dye was on foam. 25% of foam cultures were positive for coliforms.
- Marks (2018) : 32% of hospital mattresses (n=2561) were damaged.
- Hooker (2021)
  - 72% of hospital mattresses (n=727) were damaged
  - 183 (25%) had failed
    - 8% were 1-2 years old; 21% were 2-3 years; 46% were 3-4 years old
  - 340 (47% of total beds) required a new cover
- Todd (2025)
  - 5121 beds in 85 Acute Care Facilities
  - 66% had damage; 3,023 (59%) had failed and needed replacement
  - 50% of all foam were compromised at 3.8 years.

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Types of Damage (Hooker, 2021)

- Holes in the mattress cover (n=428) (59%)
  - 26% visible to the naked eye
  - 74% only detected by shining a light through cover
- Stains on the exterior cover (n=173) (24%)
- Stains on the interior
  - top cover (n=215) (30%)
  - bottom cover (n=192) (26%)

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Bed Frame Rust

- Rust was identified on 175 beds (24%)
  - 65 had widespread rust (9%)
  - 110 had localized rust (15%)

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Delamination

- The chemicals cause the surface of the mattress cover to delaminate with layers separating.
- One major bed manufacturer has issued multiple recalls over the last few years for delamination.

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Infections Related to Failed Mattresses

- van der Mee-Marquet, N., et al. (2006). Multiresistant Enterobacter cloacae outbreak in an intensive care unit associated with therapeutic beds. Critical Care, 10(1), 405.
  - 15 colonized or infected
- Bousquet, A., et al. (2017). Outbreak of CTX-M-15–producing Enterobacter cloacae associated with therapeutic beds and syphons in an intensive care unit. American journal of infection control, 45(10), 1160-1164.
  - 4 deaths, 18 infected or colonized
- Cadot, L., et al. (2019). Extended spectrum beta-lactamase-producing Klebsiella pneumoniae outbreak reveals incubators as pathogen reservoir in neonatal care center. European journal of pediatrics, 178(4), 505-513.
  - 21 Neonates Infected. All mattresses were contaminated.

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Risk to future occupants

- Cohen (2018)
  - Association between healthcare-associated infection and exposure to hospital roommates and previous bed occupants with the same organism. infection control & hospital epidemiology, 39(5), 541-546.
  - 583% increase in infections if previous patient had the infection.
- Mitchell (2023)
  - Review article
  - 245% increase in infections if previous occupant had the infection.

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What do the Experts Say…

- National Pressure Injury Advisory Panel (NPIAP)
  - The Support Surface Standards Initiative (S3I) is a subcommittee of NPIAP
  - To maintain the support surface cover's performance and integrity, manufacturer instructions on the cleansing, disinfecting, and care of their product should take precedence over instructions from cleansing/disinfectant suppliers and/or other authorities (FDA, CDC, TJC, CMS).
    - To Cleanse
      - Blood and gross soiling must be physically removed using non-abrasive means
      - Wipe all exposed surfaces with pH neutral detergent
      - Rinse thoroughly with clean, warm water and a clean cloth
    - To Disinfect
      - Wipe all exposed surfaces with disinfectant and incubate for the recommended kill time
      - Then rinse thoroughly with clean warm water using a clean cloth or sponge and ensure it is dry before linens are added
    - Inspect the product for damage such as pinholes, tears, or cracks in the material and replace it if necessary.

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What do the Experts Say….

- German Society for Hospital Hygiene/DGKH
  - S2k Guideline: Hygienic requirements for patient beds, bed linen, bed accessories and personal protection when handling beds
  - Lots of recommendations
    - #11: After the patient has been discharged, if mattress encasings are used (the mattress cover that encases the foam), they should be disinfected….and checked for damage.

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What do the Experts Say….

- Healthcare Surfaces Institute
  - Prevention of HAIs depends on healthcare workers to properly clean and disinfect the hospital environment, comply with all infection prevention protocols, and keep equipment or surfaces in good working condition…..
    - Cleaning and disinfection with the recommended products, in the manner described by the manufacturer.
    - Ensuring proper equipment use and removal of visibly damaged equipment promptly.

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BOTTOM LINE

- There are a lot of damaged mattresses
  - If you don't inspect (open them up), you could give someone an infection and possibly kill them
- Damaged mattresses must be replaced immediately
  - The FDA, CDC, ECRI, and manufacturers recommend routine mattress inspection and replacement of mattresses with any visible signs of stains, wear, or damage.
- You must follow MIFUs to help prevent mattress damage

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What is inspection (According the FDA)

- Regularly check each hospital bed mattress cover for any visible signs of damage or wear such as cuts, tears, cracks, pinholes, snags, or stains.
- Check all sides of the mattress
- Open cover (most have a zipper)
- Look for staining or wet spots inside
- Immediately Replace (not repair) all damaged mattresses

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Patching

- DON"T
- Per CDC: "Patches for tears and holes in mattress covers do not provide an impermeable surface over the mattress. Mattress covers should be replaced when torn; the mattress should be replaced if it is visibly stained."
    - https://www.cdc.gov/infection-control/hcp/environmental-control/laundry-bedding.html

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Bacteria on Mattresses Linked to colonization

- Viana (2016)
  - analyzed all beds occupied by patients colonized or infected by resistant bacteria
  - Evaluated 51 mattresses.
    - A total of 26 had resistant bacteria on the surface
      - Acinetobacter baumannii
      - Klebsiella pneumoniae
      - Pseudomonas aeruginosa
  - Showed that it was the **phenotypically same** bacteria on the surface of the mattress that the patient was colonized or infected with.

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Bacteria on Mattresses linked to clinical infection

- Boulesna (2023)
  - Analyzed 80 environmental samples and 86 clinical samples over a 1-year period in an ICU.
  - A. baumannii was identified in 25 (31.25%) environmental (60% of them were from beds) and 30 (34.88%) clinical samples (73% were from surgical wound infections)
  - The clinical and environmental isolates were **phenotypically very similar** (similar resistance pattern to antibiotics, Carbapenemase and Metallo-β-Lactamase Isolates and Biofilm-forming Potential)

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Genetic Testing Proves Mattress as Source of Infections

- Qiannan (2026)
  - Used whole-genome sequencing (WGS) combined with epidemiological data to trace changes in the infection rate and transmission routes of carbapenem-resistant Acinetobacter baumannii (CRAb).
  - Linked Mattress to two patient's infections

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Mattress as source of Pressure Injury Infections

- Kunimitsu (2019, 2020, and 2021)
  - High bacterial count was significantly associated with wound inflammation and positive biofilm formation tended to be associated with wound inflammation
  - Used genetic testing to prove the same bacteria were in the pressure injury and on the bed.

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Infected Pressure Injuries Kill

- Sepsis Episodes Caused by Pressure Injuries in Critical Illness: A Retrospective Observational Cohort Study
  - 272 patients in the adult ICU with PIs.
    - 91 patients with sepsis.
    - PI was identified as the site of infection in 36 of the 272 patients (13.2%)
    - Very High Mortality in the Sepsis from PI group
    - Bacteria Isolated from Pressure Injuries and blood cultures
      - Klebsiella pneumoniae
      - Acinetobacter baumanni
      - Pseudomonas aeruginosa

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Why is Mattress Problem Not Resolved?

- Four silos exist in most hospitals
  - WOC nurses
    - Want the bed to have microclimate cover with moisture vapor transmission (MVT). Don't want infected PIs, but these new covers are difficult to clean and are easily damaged.
  - Infection Prevention Specialist
    - Want to control infections and are therefore using harsh chemicals, not realizing the damage to the cover that these chemicals cause. Not following MIFU. This increases infections
  - Facilities Department
    - Responsible for monitoring for damage and replacing beds and mattresses that have failed. However, many do not realize that these covers last 1-2 years and are often wearing out much sooner. American Hospital Association says a mattress last 5 years. Results in damaged and failed mattresses being used. Increased infections.
  - Operations
    - wants beds turned quickly to get ready for the next patient because there are so many holds. However, this causes beds to not be cleaned and causes infections. This slows bed turnover and cost the hospital money.
      - Shepard (2020) showed that preventing HAIs is profitable because shorter length of stay.

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What should a WOC nurse do now?

- Get the four groups responsible for maintenance and cleaning of beds and mattresses together.
- Ask bed manufacturer for their updated MIFUs (post 2015). If it is not multistep, they are not giving you the correct ones or they have failed to be compliant.
- Look at your processes and make sure you are following these MIFUs
- Ensure that age of products are being tracked.
- Ensure that the mattresses are being inspected (preferably by clinical professional staff, not EVS).
- Ensure mattress covers are being replaced when product reaches its end of life (usually 1-2 years).

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REFERENCES & RESOURCES

- Blodgett, Elleen, Sonia Garcia, Bethany McDade, Angela Oltean, Kamel Rahmani, and Nancy Wong. 2022. “Making Our Bed: WOC Nurse-Led Initiative to Replace Aging Hospital Beds to Decrease Pressure Injuries.” https://www.wocn.org/podcasts/making-our-bed-woc-nurse-led-initiative-to-replace-aging-hospital-beds-to-decrease-pressure-injuries/.
- Butin, M., Dumont, Y., Monteix, A., Raphard, A., Roques, C., Martins Simoes, P., ... & Laurent, F. (2019). Sources and reservoirs of Staphylococcus capitis NRCS-A inside a NICU. Antimicrobial Resistance & Infection Control, 8(1), 157.
- Chavignon, M., Reboux, M., Tasse, J., Tristan, A., Claris, O., Laurent, F., & Butin, M. (2021). Persistent microbial contamination of incubators despite disinfection. Pediatric research, 90(6), 1215-1220.

48

REFERENCES & RESOURCES

- Cohen, B., Liu, J., Cohen, A. R., & Larson, E. (2018). Association Between Healthcare-Associated Infection and Exposure to Hospital Roommates and Previous Bed Occupants with the Same Organism. *Infection Control & Hospital Epidemiology*, *39*(5), 541-546.
- Dolati, Mehran, Abdolreza Javadi, Shohre Zare Kariz, and Bahareh Ghobadi Saki. "Phenotypic and molecular identification of bacteria involved in decubitus ulcers." *Journal of Medical Bacteriology* 6, no. 1-2 (2017): 45-55.
- Etland, C., RN, L. L., Darrel Hicks, B. A., Master, R. E. H., CHESP, G. S., Harris, J., & Turner, E. (2022). Healthcare surfaces and transmission of pathogens: A consensus statement. *Canadian Journal of Infection Control*, *37*(3), 135-140.

49

REFERENCES & RESOURCES

- Guh, A., Korhonen, L. C., Winston, L. G., Martin, B., Johnston, H., Brousseau, G., ... & McDonald, C. (2020). How Much Does Prior Hospitalization Contribute to Readmission with Community-onset Clostridioides difficile Infection?. In Open Forum Infectious Diseases (Vol. 7, No. Supplement_1, pp. S434-S435). US: Oxford University Press.
- Guzman-Cottrill, J. A., & Bryant, K. A. (2025). Keeping your neonatal intensive care unit clean: the hospital environment as a potential source of health care-associated infections. Clinics in Perinatology, 52(1), 1-14.
- Hooker, E. A. (2023). Hospital mattress failures—A hidden patient danger. Infection Control & Hospital Epidemiology, 44(3), 501-503.

50

REFERENCES & RESOURCES

- Hooker, E. A., Mallow, P. J., McKinney, C., Gnoni, M. L., & Gonzales, F. F. (2019). Use of a Launderable Bed Barrier and Antibiotic Stewardship to Decrease Hospital Onset Clostridioides difficile Infections in an Acute Care Hospital: A Retrospective Pre-Post Case Study. Journal of Health Economics and Outcomes Research, 6(3), 196.
- Kramer, A., Seifert, J., Gruber, B., Abele-Horn, M., Arvand, M., Blacky, A., ... & Sunderdiek, U. (2025). S2k Guideline: Hygienic requirements for patient beds, bed linen, bed accessories and personal protection when handling beds. GMS Hygiene and Infection Control, 20, Doc20.
- Küçükdemirci Kaya, P. I. N. A. R., Kaya, A., Girgin, N., Kahveci, F., Akalın, E. M. İ. N., & Işçimen, R. E. M. Z. İ. (2023). Sepsis episodes caused by pressure injuries in critical illness: a retrospective observational cohort study. Wound Management and Prevention, 69(4).

51

REFERENCES & RESOURCES

- Kunimitsu, M., Nakagami, G., Kitamura, A., Minematsu, T., Mugita, Y., Ogai, K., ... & Sanada, H. (2021). Dissemination of microbiota between wounds and the beds of patients with pressure injuries: a cross-sectional study. Wound Practice & Research: Journal of the Australian Wound Management Association, 29(2), 70-76.
- Kunimitsu, M., Nakagami, G., Kitamura, A., Minematsu, T., Koudounas, S., Ogai, K., ... & Sanada, H. (2020). Temporal changes in the diversity and composition of the bed microbiota of patients with pressure ulcers. Journal of Japanese Society of Wound, Ostomy and Continence Management, 24(4), 366-378.
- Mitchell, B. G., McDonagh, J., Dancer, S. J., Ford, S., Sim, J., Khadar, B. T. S. A., ... & Kiernan, M. (2023). Risk of organism acquisition from prior room occupants: an updated systematic review. *Infection, Disease & Health*, *28*(4), 290-297.

52

REFERENCES & RESOURCES

- Nkemngong, C. A., Chaggar, G. K., Li, X., Teska, P. J., & Oliver, H. F. (2020). Disinfectant wipes transfer Clostridioides difficile spores from contaminated surfaces to uncontaminated surfaces during the disinfection process. Antimicrobial Resistance & Infection Control, 9(1), 1-9.
- Sehulster, L., Chinn, R. Y., Arduino, M. J., Carpenter, J., Donlan, R., Ashford, D., ... & Cleveland, J. (2003). Guidelines for environmental infection control in health-care facilities. *Morbidity and mortality weekly report recommendations and reports RR*, *52*(10).
- Shepard, J., Frederick, J., Wong, F., Madison, S., Tompkins, L., & Hadhazy, E. (2020). Could the prevention of health care–associated infections increase hospital cost? The financial impact of health care–associated infections from a hospital management perspective. American Journal of Infection Control, 48(3), 255-260.

53

REFERENCES & RESOURCES

- Sood, G., Truelove, S., Dougherty, G., Landrum, B. M., Qasba, S., Patel, M., ... & Galai, N. (2022). Clostridioides difficile infection (CDI) in a previous room occupant predicts CDI in subsequent room occupants across different hospital settings. American journal of infection control, 50(12), 1352-1354.
- Support Surface Standards Initiative (S3I) - National Pressure Injury Advisory Panel. (2025). Best Practices for Cleansing, Disinfecting, and Care of Polyurethane Support Surface Covers. https://npiap.com/page/S3I
- Thurman, K., Todd, J., & Ambrose-Jones, S. (2025). The Impact of Cleaning and Disinfecting on Full-Body Support Surfaces. Advances in Skin & Wound Care, 38(2), 67-70.

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REFERENCES & RESOURCES

- Todd, J., Manista, G., Nicholson, L., Ikpeze, T., Black, J., & Koshy, T. (2025). Assessment of Support Surface Integrity in the Acute Health Care Setting. Journal of Wound Ostomy & Continence Nursing, 52(3), 181-189.
- Tomlinson, L., Hailpern, N., Alexander, M., Townsend, S., Zabriskie, K., & Luper, L. (2025). *Modernizing medical device instructions for Use (IFUs): infection preventionists speak up for patient safety. Association for Professionals in Infection Control and Epidemiology. May 2024*. Available at: https://apic.org/wp-content/uploads/2024/05/APIC_Modernizing-Medical-Device-IFUs_5_16_24.pdf Accessed April 2, 2026.

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REFERENCES & RESOURCES

- U. S. Food and Drug Administration (FDA) (2015) Reprocessing Medical Devices in Health Care Settings: Validation Methods and Labeling Guidance for Industry and Food and Drug Administration Staff, March 17 2015. Retrieved from (2 April 2026): https://www.fda.gov/media/80265/download
- Walkowiak, Nicole. 2023. “Wound Ostomy Care Nurses Advocate for New Mattresses.” Rush University. https://www.rush.edu/rush-university-medical-center-nursing-annual-report-fy-2023/transformational-leadership/wound.
- Witt, L. S., Howard-Anderson, J., Prakash-Asrani, R., Overton, E., & Jacob, J. T. (2024) The role of the hospital bed in hospital-onset Clostridioides difficile: A retrospective study with mediation analysis. Infection Control & Hospital Epidemiology, 1-5.

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