

Dry Surface Biofilms and Hospital Bedsheets

Understanding Risks and Infection Control

Bedsheets & Infection Control



Bedsheets: The First Line of Defense

- Hospital bedsheets act as the main barrier between patients and potentially contaminated mattresses.

Hidden Risks of Contaminated Bedding

- Contaminated sheets can facilitate the spread of **healthcare-associated infections (HAIs)**.
- Bacteria can persist on bedding even after standard cleaning procedures.

Understanding Bacterial Movement

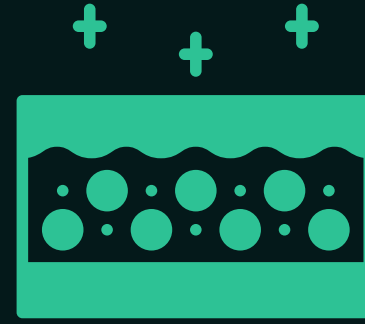
- Research shows bacteria can move **via and through** cotton sheets, especially when sheets are damp.
 - Knowing how bacteria transfer helps improve infection control strategies.
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Dry Surface Biofilms Explained



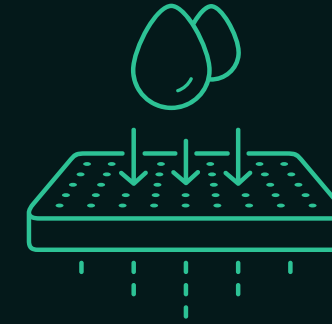
What Are Dry Surface Biofilms?

- Structured bacterial communities that form on dry surfaces in healthcare settings.



Resistant to Cleaning and Disinfectants

- DSBs show **extreme tolerance** to disinfectants and are difficult to remove, even with standard cleaning.



Persistent Contamination Risk

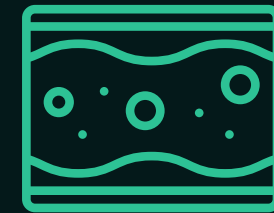
- Remain on hospital mattresses and pillows after cleaning, acting as reservoirs for pathogens.

How Bacteria Transfer Through Sheets



Bacteria Move Across and Through Sheets

- Pathogens can transfer both on the surface and by penetrating cotton bedsheets.



Thread Count Matters

- Lower thread count sheets (150 threads/in²) allow **more bacteria** to pass compared to higher thread count (250 threads/in²).



Wet Sheets Increase Risk

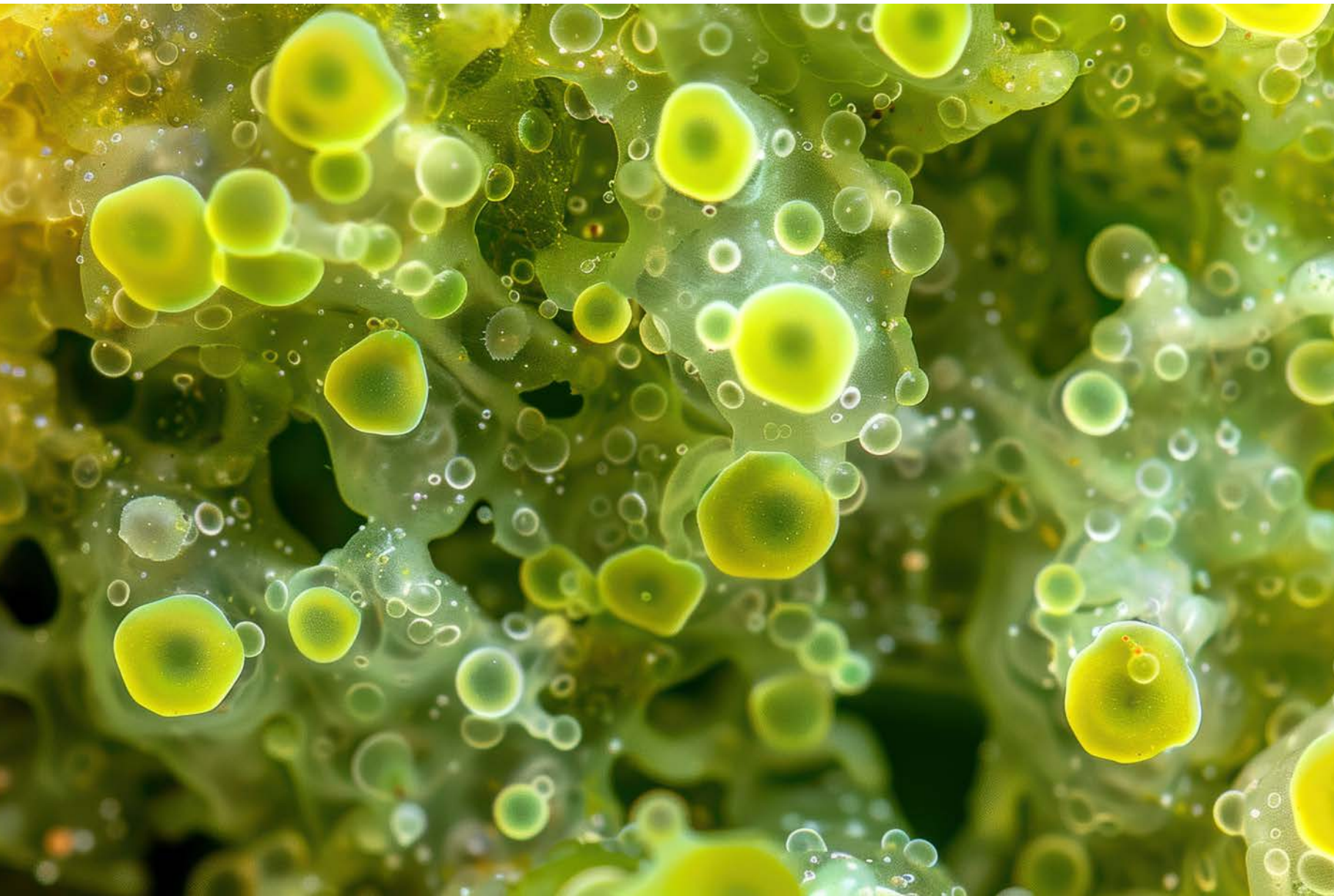
- When sheets are wet (from sweat or cleaning), **bacterial transmission rises significantly**.



Hands as Vectors

- Hands can pick up bacteria through sheets and transfer them to other surfaces, spreading contamination.

Bacterial Transfer: Key Insights



Thread Count Impacts Bacterial Transfer

- Sheets with **150 threads/in²** allowed significantly more bacteria to pass through than those with **250 threads/in²**.
- Higher thread count sheets reduced, but did not eliminate, bacterial transmission.

Moisture Increases Transmission Risk

- Wet sheets—simulating sweat or cleaning—led to a marked rise in bacteria transfer compared to dry sheets.

Hospital Bedding as a Contamination Source

- Clinical samples revealed **high bacterial loads** on real hospital mattresses and pillows, confirming persistent contamination.
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Key Infection Control Actions

Intervention	Rationale
Use sheets ≥250 threads/in ²	Reduces bacterial transmission compared to lower thread counts
Change sheets when damp	Wet sheets increase biofilm and pathogen transfer
Enhance mattress cleaning	Targets persistent biofilms in mattress surface pits

Future Innovations in Infection Control



Redesign Mattress Materials

- Adopt smooth, non-porous covers to block **biofilm reservoirs**

Innovate Hospital Linens

- Test water-repellent and **ultra-high-thread-count** sheets for enhanced protection

Enhance Cleaning Protocols

- Implement thermal drying after cleaning to disrupt **biofilm structure** and reduce pathogens
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Safer Hospital Bedding Practices



Cotton Sheets: A Hidden Risk

- Bacteria can pass **via and through** cotton bedsheets, especially when sheets are wet.
- Wet sheets dramatically increase the transfer of pathogens from mattresses to patients.

Thread Count Matters

- Higher-thread-count sheets (250 threads/in²) transmit **significantly fewer** bacteria than lower-thread-count sheets.
- Frequent sheet changes are crucial, especially if sheets become damp.

Innovative Prevention Strategies

- Redesign mattress and pillow covers to be smooth and non-porous, reducing biofilm reservoirs.
 - Develop water-repellent sheets and enhance cleaning protocols to target persistent biofilms.
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Remove Pathogens. Preserve Protection.

Switch to microbiome friendly cleaning for healthcare environments. Scientifically validated to prevent pathogen transfer and biofilm formation Safe for patients, staff, sensitive equipment and the environment.

Validated cleaning process removes greater than 99.9 % of bacteria. Safely replace disinfectant cleaning and remove accumulated soils in non critical wards and public spaces.

Studies confirm current health care disinfectant cleaning achieves 1.5 to 3 log pathogen reduction. Switch to targeted disinfectant application after Cogent One Health cleaning to achieve a combined six log pathogen reduction in critical areas of your facilities.



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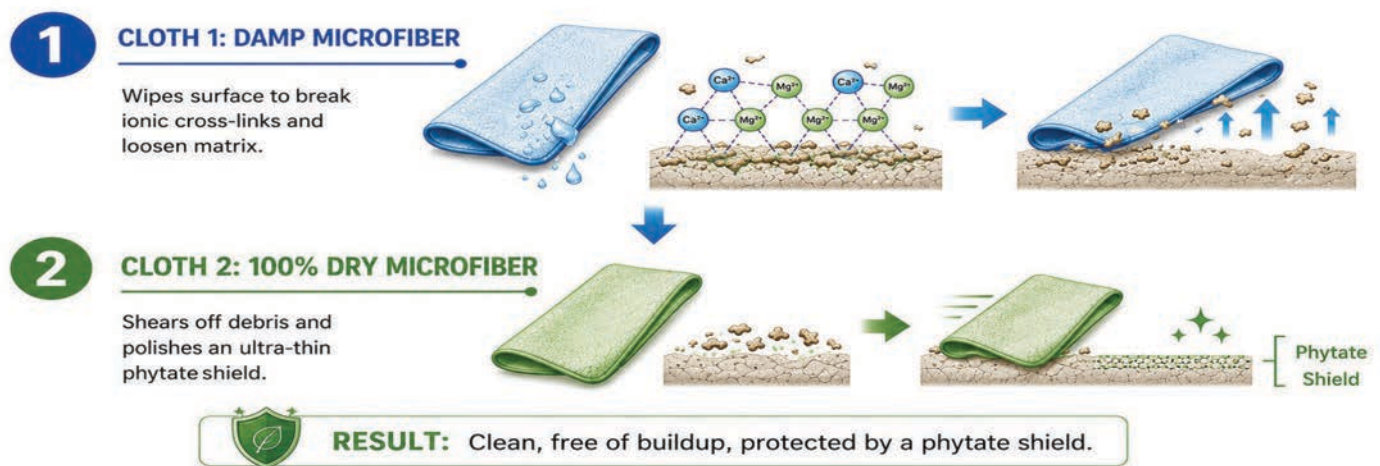
III. CLINICAL VALIDATION: THE CREMCO QCT3 BENCHMARKS

To verify this non-disinfectant strategy under realistic hospital conditions, the protocol was subjected to independent Cremco QCT3 (Quantitative Carrier Test Tier 3) testing—a high-friction, organic-soil standard. The results confirm clinical-grade extraction:

*99.9% Physical Bacterial Removal (3-Log Reduction): Confirms that de-solidifying the EPS cross-links allows a cloth to completely sweep away dense bacterial communities.

*97.8% Non-Enveloped Viral Removal: Proves the surfactant blend breaks the severe electrostatic forces pinning highly resilient viral capsids (e.g., Norovirus) to hospital substrates.

Near-Zero Cross-Contamination Transfer: The QCT3 transfer tier verified that the method prevents almost all transfer to adjacent surfaces during the wiping process, ensuring that pathogens are securely locked into the cleaning cloth“



*Step 1: Apply Cogent One Health RTU directly to Cloth 1 (Blue Microfiber) using a squirt-top bottle or extract a moistened wipe. Wipe all high-touch ward surfaces systematically from top to bottom.

*Step 2: Follow instantly behind with Cloth 2 (Green Microfiber), which must be kept completely dry. Buff the surface to a flawless, streak-free shine.

*Step 3 (The Conditioning Effect): Do not rinse. The dry cloth naturally shears away the loose biomass while spreading the remaining unevaporated solution into a self-limiting, sub-micron layer. As the moisture flashes off, the sodium phytate settles into a smooth, non-tacky protective shield. In critical care ,ICU , Isolation Discharge cleans when advised by Infection control apply disinfectant after cleaning.



V. WARD-LEVEL BENEFITS: SUBSTRATE SAFETY & MEDICAL ECOLOGY

Transitioning general hospital wards to this continuous surface conditioning loop yields major clinical and asset-protection advantages over traditional disinfectants:

***100% Asset Protection:** Standard oxidizers cause environmental stress cracking (ESC) on electronics, hospital mattress covers and micro-pitting on steel. This formulation is completely non-corrosive; it preserves expensive touchscreen monitors and plastic bedpanels and mattress covers, while acting as a natural rust-inhibiting conversion layer on stainless steel. ***Re-Establishing Beneficial Microbiomes:** Aggressive chemical disinfection wipes out harmless background bacteria, creating a dangerous biological vacuum that is quickly colonized by hyper-resistant superbugs. Dropping disinfectants outside of critical care zones (like the ICU) removes this selective evolutionary pressure. ***Competitive Exclusion:** The daily routine extracts dangerous, deep-seated pathogen biofilms while leaving a non-toxic surface energy. This allows a healthy, balanced, non-pathogenic environmental microbiome to re-establish on the ward, naturally crowding out invaders through resource competition.

[1]Antimicrobial activity and surface preconditioning study, Microbiology Spectrum:

<https://journals.asm.org/doi/abs/10.1128/spectrum.00267-23>

[2][Natural Anti-biofilm Agents: Strategies to Control Biofilm-Forming Pathogens

<https://pmc.ncbi.nlm.nih.gov/articles/PMC7658412/>

[3][Antimicrobial Activity of Phytic Acid: An Emerging Agent in Endodontics

<https://www.frontiersin.org/journals/cellular-and-infection-microbiology/articles/10.3389/fcimb.2021.753649/full>

[4] 5 Effective Methods to Remove Biofilm

<https://www.colgate.com/en-us/oral-health/plaque-and-tartar/biofilm-removal-three-effective-methods>



Contact & Ordering

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Visit site for detailed information and Safety Data Sheet



Product Formats

9506-4: 4 x 3.78L case

9506-6: 6 x 946ml case

9506-12: 12 x 70-count wipes per case