Infection Control and the Hygiene of Personal Mobility Equipment

A report by Pure Wheelchairs- August 2025

Executive Summary

Personal mobility equipment—including wheelchairs, shower chairs, standing frames, hospital beds, and walkers—is essential to patient and client care. Yet growing evidence shows these devices are also hidden vectors (both vehicles and transmitters) for infection.

Research demonstrates that pathogens, including multi-drug resistant organisms, can persist on mobility equipment surfaces within biofilms—protective microbial communities that survive routine cleaning and disinfection. In one multicentre study, 95% of sampled hospital items were still contaminated with biofilms after terminal cleaning. Even intensive wiping failed to remove them completely.

The mobile nature and shared use of some equipment amplifies the risk. Wheelchairs alone have been shown to make hundreds of trips across wards and clinics in just a few days, carrying Clostridioides difficile, MRSA, and other pathogens with them. Personal wheelchairs and equipment are moving between clinical settings, the community and homes, collecting and distributing pathogens as they go.

Contamination is not limited to mobility aids: bed rails are frequently and heavily contaminated, and surfaces that appear clean can be re-colonised within 24–48 hours. In wet environments, such as bathrooms, biofilms form readily on shower chairs and fittings, further compounding risk.

The consequences are significant. Healthcare-associated infections (HAIs) drive morbidity, mortality, and healthcare costs across hospitals, aged care, and disability services. Encouragingly, robust evidence shows that enhanced cleaning interventions work. The CLEEN trial in Australia demonstrated that structured cleaning programs—including staff education, dedicated cleaning hours, and auditing—reduced HAIs by ~35% and delivered substantial cost savings of over AUD 642,000 per 1,000 patients.

Key Implications

- Routine wiping is not enough: cleaning must be regular, thorough, and biofilm-aware.

- All parts of mobility equipment—including wheels, brakes, and hinges—must be included in cleaning protocols.

- Cleaning frequency should be risk-based, often requiring multiple cycles per day for high-use equipment.

- Facilities should adopt biofilm-targeted methods such as steam, sporicidal agents, or UV adjuncts.

- Structured, auditable cleaning programs are both clinically effective and cost-saving.

Conclusion

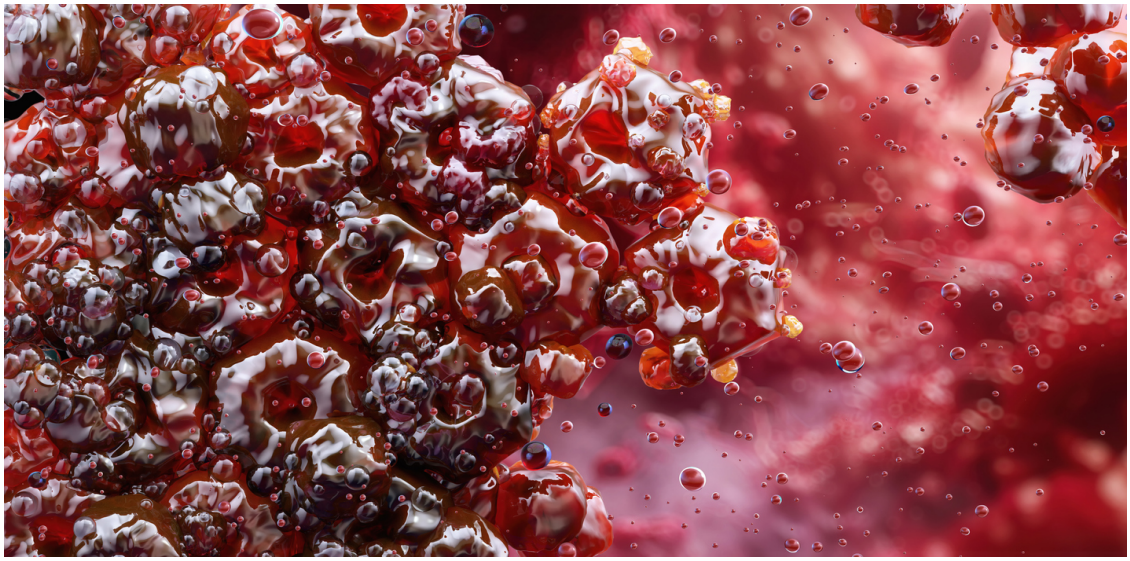
Mobility equipment must no longer be treated as “low-risk” in infection prevention and control. Recognising these devices as potential vectors, and investing in modern, evidence-based cleaning strategies, offers an opportunity to protect patients and clients, improve safety, reduce healthcare costs, and strengthen public trust in health and disability services.

Infection Control and the Hygiene of Personal Mobility Equipment

Introduction

Healthcare-associated infections (HAIs) remain a significant burden in acute and long-term care facilities. Mobility equipment such as wheelchairs, shower chairs, walkers, standing frames, commodes, and hospital beds are essential to daily care, but their frequent use and shared nature make them critical vectors for pathogen transmission. Evidence increasingly shows that conventional surface cleaning is insufficient, particularly where biofilms are concerned.

The following information summarises recent research findings on contamination, biofilm persistence, and the importance of deep cleaning strategies for mobility equipment.



Acinetobacter bacterium in biofilm, microscopic view stock photo- Getty Images Acinetobacter baumannii is commonly associated with infections of the blood, urinary tract, lungs and open wounds.

Biofilms and Resistance to Cleaning

Biofilms are structured microbial communities embedded in protective matrices. Unlike free-floating (“planktonic”) bacteria, biofilm-embedded microbes are significantly more resistant to disinfectants and can survive for extended periods on both wet and dry hospital surfaces.

- Biofilms have been documented to persist on dry surfaces in healthcare environments, with 95% of sampled hospital items still showing biofilm growth after terminal cleaning (Ledwoch et al., 2018).
- Even intensive wiping regimens fail to eliminate biofilms: a study showed that 50 wipes only reduced Staphylococcus aureus biofilms by 1.4 log10 (~96.7%), leaving viable bacteria behind (Ledwoch & Maillard, 2019).

- Biofilms act as reservoirs for multi-drug resistant organisms (MDROs), undermining routine cleaning and necessitating more advanced cleaning technologies (Maillard & Centeleghe, 2023).

Implication: Standard surface cleaning of mobility equipment may provide the appearance of hygiene but does not reliably remove biofilms or the pathogens embedded within them.

Mobility Equipment as Vectors of Transmission

Mobility equipment is particularly high-risk because of its constant movement between care areas and its direct, repeated contact with carers and users.

- Wheelchairs have been found contaminated with Clostridioides difficile spores and resistant organisms such as MRSA and Pseudomonas aeruginosa (Boyce et al., 2011).
- In one study, shared wheelchairs completed 851 trips across wards, radiology, and physiotherapy in just three days, amplifying opportunities for cross-contamination (Boyce et al., 2011).
- Wheels and tyres are under-recognised vectors. Research in long-term care demonstrated that MRSA on floors was carried into adjacent rooms by wheelchair wheels (Deshpande et al., 2017).

Implication: Infection control policies must treat wheelchairs, walkers, standing frames, and other mobile equipment as “high-mobility vectors” and enforce cleaning between every user, or at the end of each day for personal devices.

Photos of high-touch areas with visible build up, frequently found on wheelchairs- Pure Wheelchairs Left: armrest and wrist support. Right: joystick module of a powered wheelchair.

High-Touch Surfaces and Design Barriers

Like mobility devices, this research on hospital beds illustrates the risk of high-touch equipment:

- Bed rails are among the most frequently and heavily contaminated surfaces, yet their design often makes them difficult to clean effectively (Carling et al., 2008).
- Similar challenges exist with mobility equipment, which often contains hinges, padding, textured surfaces, and tight spaces that are frequently missed during routine wiping.

Implication: Infection control must go beyond “surface visible” cleaning to include design-aware cleaning protocols that account for hidden contamination points.

Left: A common armrest and seat cushion set up on a power wheelchair with advanced visible build-up in crevices, brackets, tight spaces and hard to reach areas.- Pure Wheelchairs. Right: bacterial and mould fungi colonies grown from hands surface stock photo- Getty Images

Speed of Recontamination

Even when cleaning is effective, recontamination is rapid:

- MRSA and MSSA levels on cleaned surfaces were found to rebound within 2–4 hours, with bacterial loads returning to baseline within 24–48 hours (Dancer, 2009).
- This suggests that once-a-day cleaning schedules are inadequate for equipment with frequent turnover, such as wheelchairs or shower chairs that are shared between users.
- It is interesting to note that this study didn’t specifically investigate the role of biofilms in the speed of recontamination. Other studies referenced here indicate that the speed of recontamination is likely reduced if the biofilm is disrupted and properly removed during cleaning.

Implication: Cleaning frequency should be risk-based, with mobility equipment requiring multiple disinfection cycles per day in high-use environments where there are multiple users.

The Impact of Enhanced Cleaning Programs

There is strong new evidence to demonstrate that enhanced cleaning interventions significantly improve outcomes:

- The CLEEN trial in Australia implemented a multimodal bundle (dedicated cleaning hours, education, auditing, feedback) and achieved a ~35% reduction in HAIs (Stewardson et al., 2024).
- An economic evaluation found the intervention was cost-saving, reducing both infection rates and healthcare costs, with an estimated saving of AUD 642,000 per 1,000 patients (Worth et al., 2025).

Implication: Investing in structured, auditable cleaning of shared mobility equipment is both clinically effective and financially sustainable.

Wet Environments and Bathroom Equipment

Mobility aids used in wet areas present additional risks:

- Hospital shower hoses and fittings were shown to harbor biofilms dominated by mycobacteria, resistant to common disinfectants (Whiley et al., 2017).
- Shower chairs and commodes in particular require deep cleaning, as splashing and moisture create conditions conducive to biofilm growth.

Implication: Bathroom-related equipment should be prioritised for biofilm-targeted cleaning methods such as steam disinfection or sporicidal agents.

Bathroom and shower mobility equipment showing visible build up of biofilms and mould in crevices, brackets and on flat surfaces.- Pure Wheelchairs

Conclusion

Mobility and shared equipment should not be viewed as “low-risk” in infection control. Evidence clearly shows that:

- Biofilms persist despite routine cleaning.
- Mobility devices spread pathogens across wards, facilities, community and home.
- High-touch surfaces recontaminate quickly.
- Enhanced cleaning programs, which include audits, education and improved cleaning protocols, cut HAIs and save money.

For effective infection prevention, healthcare and disability services must adopt cleaning protocols that are regular, deep, auditable, and biofilm-aware, ensuring that wheelchairs, shower chairs, walkers, standing frames, and hospital beds do not become hidden vectors for disease transmission. Organisations should be working to raise awareness among staff and clients, and providing the opportunity for education around the risks associated with poor mobility equipment hygiene and improved protocols for private homes, supported accommodation and clinical environments.

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