

Sustainable shift in surgical practice: embracing reusable gowns

In the face of increasing environmental concerns and the shift towards sustainability, the health sector stands at a critical juncture. Reusable sterile surgical gowns present a compelling opportunity for hospitals to introduce an evidence-based, sustainable practice to the operating theatre. The move away from reusable sterile surgical gowns has been widespread, and driven by concerns around infection prevention, cost and convenience. To dispel myths around the safety and efficacy of reusable surgical sterile gowns the Royal Australasian College of Surgeons (RACS) led the development of a position statement in collaboration with the Australasian College of Infection Prevention and Control (ACIPC) and the Australian College of Perioperative Nurses (ACORN).¹ This position statement outlines the evidence supporting reusable sterile gowns as equally effective at preventing surgical site infections as disposable gowns; the standards that any reusable sterile gown supplier is required to meet; the clear environmental advantages of reusable gowns; and the evidence demonstrating staff preference for reusable gowns. The position statement has now been endorsed by 12 colleges and societies as well as Doctors for the Environment Australia.

Reusable gowns are as safe and efficacious as their disposable counterparts

A WHO² meta-analysis of four studies showed no statistically significant difference between single-use and reusable surgical gowns when measuring surgical site infections (SSIs) or SSI-attributed mortality in any of the studies. Additionally, McQuerry *et al.*³ found that reusable gowns provided 'greater water resistance, strength, and piling resistance' than their disposable counterparts. Industrial laundering (IL) was found to have no significant effect on the safety parameters of the reusable gowns studied, with the gowns continuing to meet American Society for Testing and Materials performance requirements across their lifespan (75 IL cycles).³ Evidently, reusable gowns have been shown to perform as well if not greater than single-use gowns.

Hospitals should continue to monitor rates of SSI when implementing reusable gowns. This works to both consolidate existing research, thereby encouraging adoption by more hospitals, as well as detect any potential discrepancies (e.g., conflicting data, quality control issues, improper washing by staff, etc.). Furthermore, hospitals should continue to monitor the integrity and function of reusable gowns after subsequent washing cycles due to the potential for bacterial penetration.⁴ This would involve monitoring

systems; standardized washing procedures; and accurate logging of gown performance. This should be performed in conjunction with the supplier of the reusable gowns.

Reusable gowns must comply with standards

Reusable gowns require Therapeutic Goods Administration approval and must adhere to the relevant sections of the Australian Standard AS3789 for textiles used in healthcare facilities and institutions. These specifications include the need for a water-repellent barrier to provide defence against biohazardous material exposure (AS 3789 Part 2: Theatre linen and pre-packs)⁵ and minimum performance metrics for water and vapour permeability (AS 3789 Part 8: Recyclable barrier fabrics).⁵ This is in addition to complying with ACORN standards which are further explored in the full position statement.

Reusable gowns are significantly better for the environment

Vozzola *et al.*⁶ found that, when compared to disposable gowns, reusable gowns lowered energy use by 28%; decreased greenhouse gas emissions by 30%; cut water use by 41%; and reduced solid waste generation by 93%. A follow-up study in 2020 by Vozzola *et al.* found a further reduction in these parameters of 64%, 66%, 83%, and 84%, respectively.⁷ In general, the significant environmental benefit of reusable surgical gowns has been extensively studied and is no longer in question.^{8–10}

Staff prefer reusable gowns

Van Nieuwenhuizen *et al.*¹¹ found that 79% of operating theatre staff scored reusable gowns higher on six out of seven criteria including comfort; ventilation and temperature regulation; fit and length; functionality; and barrier function. Moreover, 59% of staff rated reusable gowns high in terms of ease of use.¹¹ Those who rated disposable gowns easier to use cited that they were not yet 'habituated with the use of the reusable gown'.¹¹

A study by Yap *et al.*¹² found that hesitancy to adopt reusable gowns among perioperative staff was primarily due to a lack of education regarding the environmental impact and safety profile when compared to disposable gowns. It then follows that hospitals should introduce reusable gowns in a way that ensures staff become



Figure 1. A list of organizations that have endorsed the current RACS/ACIP/ACORN joint position statement on the adoption of reusable sterile surgical gowns over their disposable counterparts. This list is current as of 9 July 2024.

habituated to their use and are simultaneously educated about the evidence supporting their implementation.

The adoption of reusable gowns has received wide support

The widespread support for the use of reusable sterile surgical gowns (Fig. 1) over disposable gowns underscores the evidence discussed thus far. Ongoing research continues to highlight the safety, efficacy, and sustainability of reusable gowns. The joint position statement advocates for a shift towards sustainable practices in healthcare delivery, reflecting a commitment to both patient care and environmental stewardship.

Surgeons should advocate for the implementation of reusable gowns at their hospital

When compared with disposable gowns, reusable gowns have been proven to be safe, effective, better for the environment, and preferred by operating theatre staff. As such, it is pertinent that all surgeons advocate for their hospitals to make the transition to reusable gowns. This is while ensuring compliance with Australian Standards, continuous monitoring of safety, and staff education.

While preliminary studies have shown long-term cost savings with reusable gowns,^{13,14} this can vary depending on individual hospital circumstances. Contractual issues including existing agreements, vendor relationships, and regulatory environments may act as a major hurdle for reusable gown adoption (e.g., renegotiating existing contracts, evaluating new vendors, additional documentation and inspections, etc.).

Conclusion

Embracing reusable surgical gowns offers a promising pathway towards sustainability in healthcare. However, this transition requires a systematic approach to ensure the highest quality surgical outcomes are maintained. It is also equally as essential that surgeons, and by extension perioperative staff, continue to research and advocate for the shift to a more sustainable operating environment.

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Author contributions


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