

#822: The environmental impact of reusable and single-use catheters for intermittent catheterisation: a life cycle analysis

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Background and aims

Reusable intermittent catheters have been shown to be safe¹, cost-effective² and acceptable³ to people who wish to use them. Their comparative environmental impact, however, was unknown.

This study determined the environmental impact of:

- Reusable-only and mixed reusable/single-use catheterisation compared with single-use only.
- Different single-use catheter designs.

Study design and methods

- Cradle-to-grave life-cycle analysis to ISO 14040:2006 and ISO 14044:2006.
- Seventeen impact categories assessed; this poster focuses on climate change.
- Four single-use designs: hard case, integrated bag, hydrophilic with sachet and hydrophilic without sachet.
- Impacts modelled over 28 days at four catheterisations per day.

Catheter-use scenarios modelled over 28 days

Reusable only

4 reusable catheterisations/day

Mixed use

2.8 reusable + 1.2 single-use/day

Single-use only

4 single-use catheterisations/day

Results: relative climate-change impact

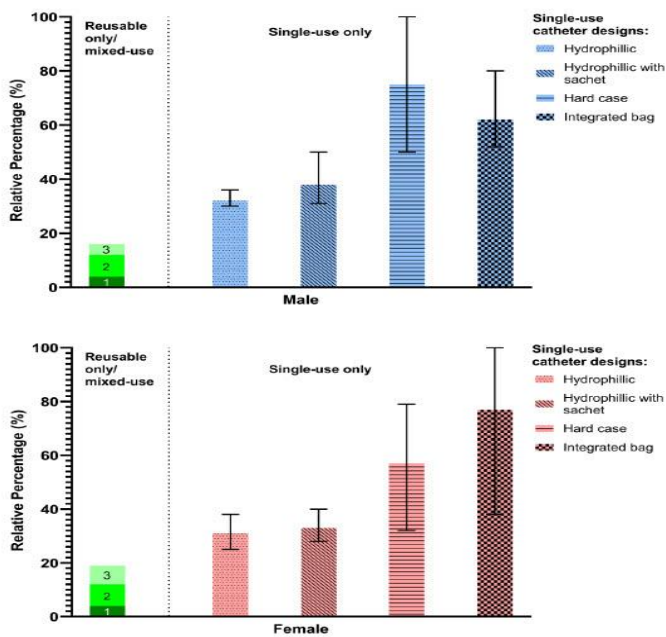


Figure 1: A comparison of climate change related impact between reusable catheters and reusable plus single-use catheters (mixed-use) and different designs of single-use catheters

- Reusable only/mixed-use** The bar represents the impact measure of:
- 4 catheterisations with a reusable catheter and none with a single-use catheter.
 - 2.8 catheterisations with a reusable catheter and 1.2 with a single-use catheter (based on average hydrophilic-coated with or without a sachet)
 - 2.8 catheterisations with a reusable catheter and 1.2 with a single-use catheter (based on average hydrophilic-coated with or without a sachet, catheters with a hard case, catheters with an integrated bag)
- Single-use only**
- Solid bars represent the impact measure of the middle of the three catheter variants analysed.
 - Lines represent the range of the 3 catheter variants from the most impactful (highest point) to the least impactful (lowest point).

Figure 1. Climate-change-related impact of reusable, mixed-use and single-use catheter strategies. Relative percentages are shown separately for male and female catheter products.

Key findings

- 1 Lower impact**
Using a reusable catheter for all catheterisations, or as part of mixed use, had less climate-change impact than single-use only.
- 2 Consistent pattern**
The finding applied to male and female catheters and across all single-use designs.
- 3 Design matters**
Hydrophilic designs had similar impacts and low within-category variation.
- 4 Heavier products**
Hard-case and integrated-bag designs generally had higher impacts, with substantial variation.
- 5 Main driver**
Product weight, including packaging, was the principal determinant of climate-change impact.

Interpretation and conclusion

Environmental impact can be substantially reduced by using a reusable catheter for all catheterisations or as part of mixed use.

- Among single-use devices, hydrophilic catheters with or without a water sachet typically had a lower climate-change footprint than products with a hard case or integrated bag.
- Reducing catheter and packaging materials, choosing lighter designs, or replacing disposable cases and bags with reusable components could further reduce impact.

Key message: Design lighter. Reuse more.

1. Fader M et al. Mixed (reusable/single-use) catheter management versus single-use catheter management for intermittent catheter users (MultiCath): A non-inferiority randomised controlled trial. Int J Nurs Stud. 2026 Aug;180:105536. 2. McCloskey S et al.,. An economic evaluation of the MultiCath randomised controlled trial, comparing combined use of reusable and single-use intermittent catheters to single-use catheters only. Cost Eff Resour Alloc. 2026 May 9;24(1):65. 3. Clancy B et al. Reusable Intermittent Catheters are Acceptable but Product Innovation is Needed: An Interview Study of Catheter Users' Experiences. J Wound Ostomy Continence Nurs. 2025 Jan-Feb 01;52(1):59-65