

# Hospital Waste and Cost Prevention Potential of Reprocessing Medical Devices

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## Objectives

- Surgery and related postoperative care are resource-intensive, generating large amounts of healthcare waste within a hospital.
- Single-use medical devices can exacerbate this problem.
- Long-term change in practice within the hospital is often only feasible if it can help with cost containment.
- We assessed the waste and cost prevention potential of switching from a single-use to a reprocessed intermittent pneumatic compression (IPC) sleeve from the US hospital's perspective.

## Methods

- Focusing on Cardinal Health's Kendall SCD™ Express Sleeves (Figure 1), we compared a hospital's waste generation and disposal costs when using the single-use (9529) versus the reprocessed (9529R) sleeve, which can be reprocessed up to 4 times.



Figure 1 Kendall SCD™ Express Sleeve: OEM & Reprocessed Packaging with Reprocessed Sleeve.

- The analysis included packaging waste of the IPC devices and pre-components as well as material waste, losses, and reject within the primary production and the reprocessing in the year 2021 (Figure 2).

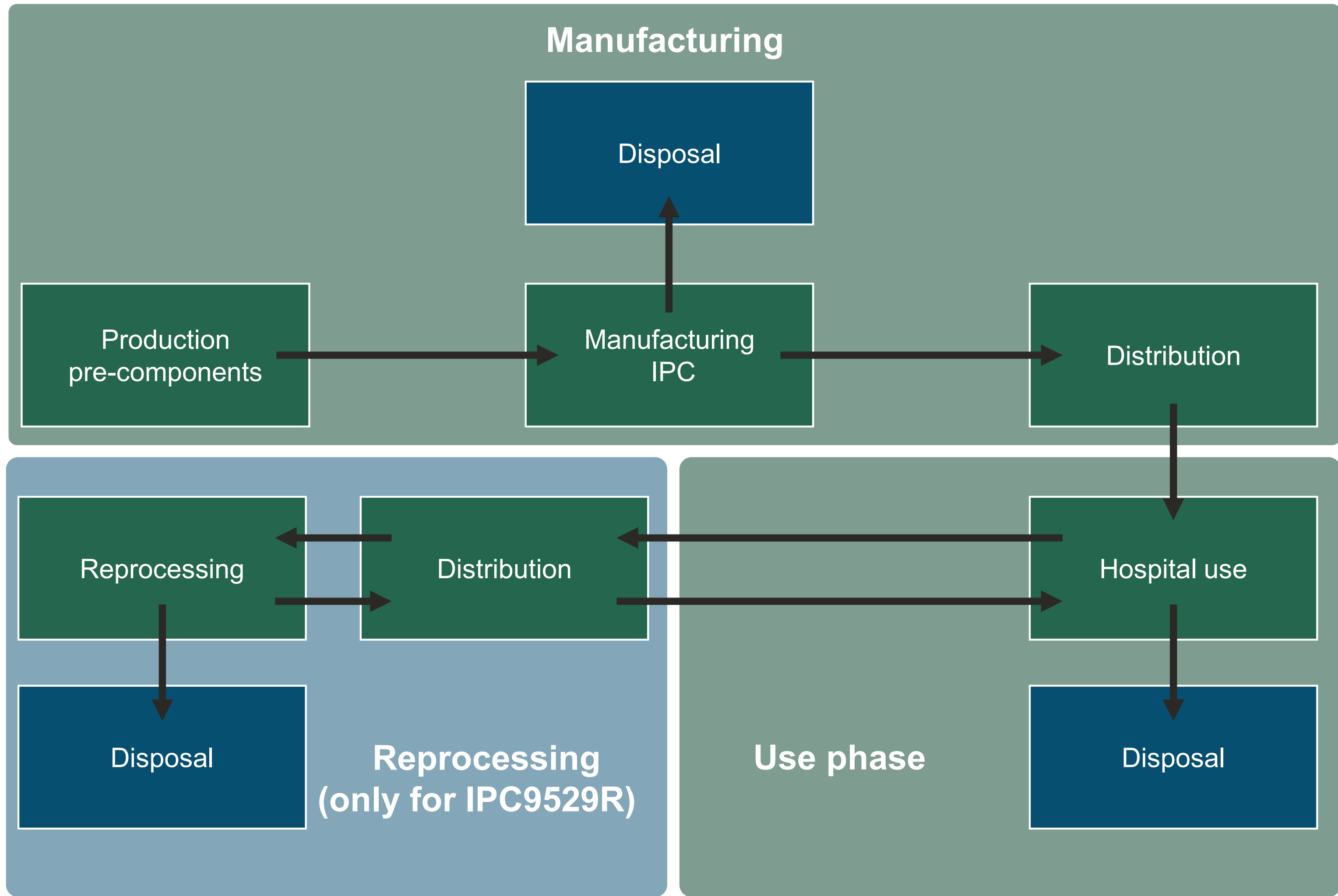


Figure 2 Phases of manufacturing, use, and reprocessing of the single-use (9529) versus the reprocessing (9529R) sleeve including required disposal.

- Waste generated during the production of the pre-components was not considered, as these are not costs or resource use associated with the hospital payer.
- Waste was measured in US tons.
- Waste disposal costs from the hospital perspective were taken from published literature and are presented in 2021 USD (Table 1&2).<sup>1,2,3</sup>

Table 1 Costs of non-hazardous waste.

Reference	Original cost year	Cost per ton in USD
Babu et al. 2019	2017	\$7,843.53
Kagoma et al. 2012	2010	\$181.35
Riedel 2011	2008	\$94.25
Riedel 2011	2008	\$110.90
		Median: \$146.13

Table 2 Costs of hazardous waste.

Reference	Original cost year	Cost per ton in USD
Babu et al. 2019	2017	\$61,018.14
Kagoma et al. 2012	2010	\$1,251.06
		Median: \$3,1134.60

- Results are presented for 100 patients treated, assuming that 90% of waste is standard, non-hazardous hospital waste and the remaining 10% is contaminated, hazardous waste (contaminated products are not reprocessed for neither 9529 nor 9529R).
- Sensitivity analyses were run using the upper land lower cost estimates for waste disposal.

## Results

- Reprocessing saves 27.7 lbs (30%) of total waste compared to single-use.
- Of this, 4.6 lbs of waste were reduced in manufacturing or during reprocessing (non-hospital) and 23.1 lbs of hospital waste were prevented (Figure 3).

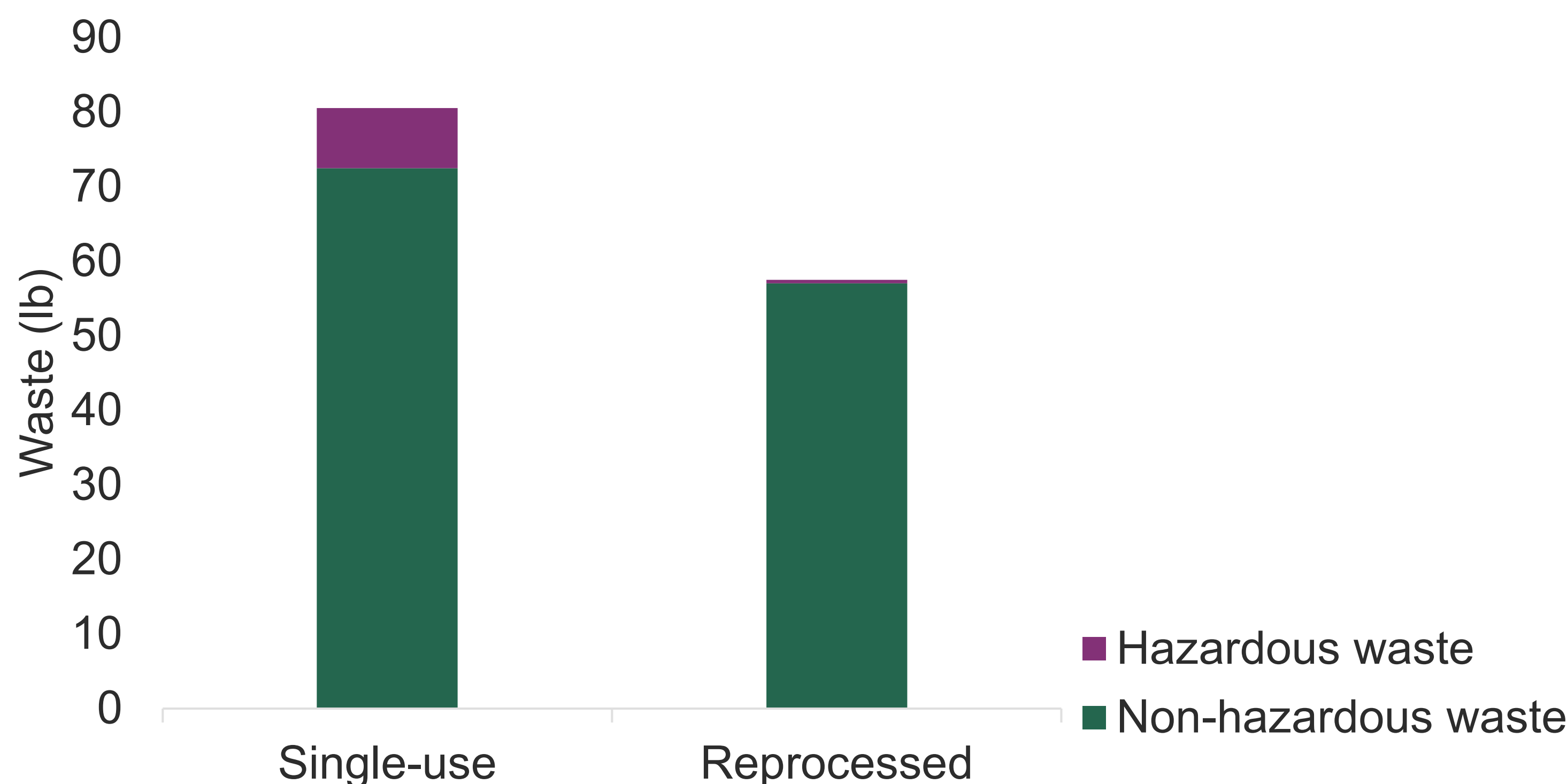


Figure 3 Waste accumulated for the treatment of 100 patients.

## Disclosure

MM is employee and associate of pulswerk GmbH; SL is CEO of Ecofides GmbH; FP, US, JH are employees and RS is the owner of Coreva Scientific GmbH & Co KG, all of whom received consultancy fees for this research. The research was funded by Cardinal Health. CARDINAL HEALTH and KENDALL SCD are trademarks of Cardinal Health and may be registered in the US and/or in other countries. Patent cardinalhealth.com/patents

## CONCLUSION

- Reprocessing IPC sleeves has clear waste prevention and cost savings potential for hospitals.
- The environmental impact of reduced waste is also an important factor to consider in the conservation of finite natural resources.

- Three studies were identified reporting on hospital waste disposal costs in the US (Table 1&2).<sup>1,2,3</sup>
  - Non-hazardous waste: \$146.13 (range \$94.25; \$7,843.53)
  - Hazardous waste: \$31,134.60 (range \$1,251.06; \$61,018.14)
- Hospital costs for waste disposal were \$130.69 for single-use and \$11.49 for reprocessed, a \$119.20 (91%) saving (Figure 4).
- The lower and higher savings estimate were \$5.47 and \$292.07 respectively.

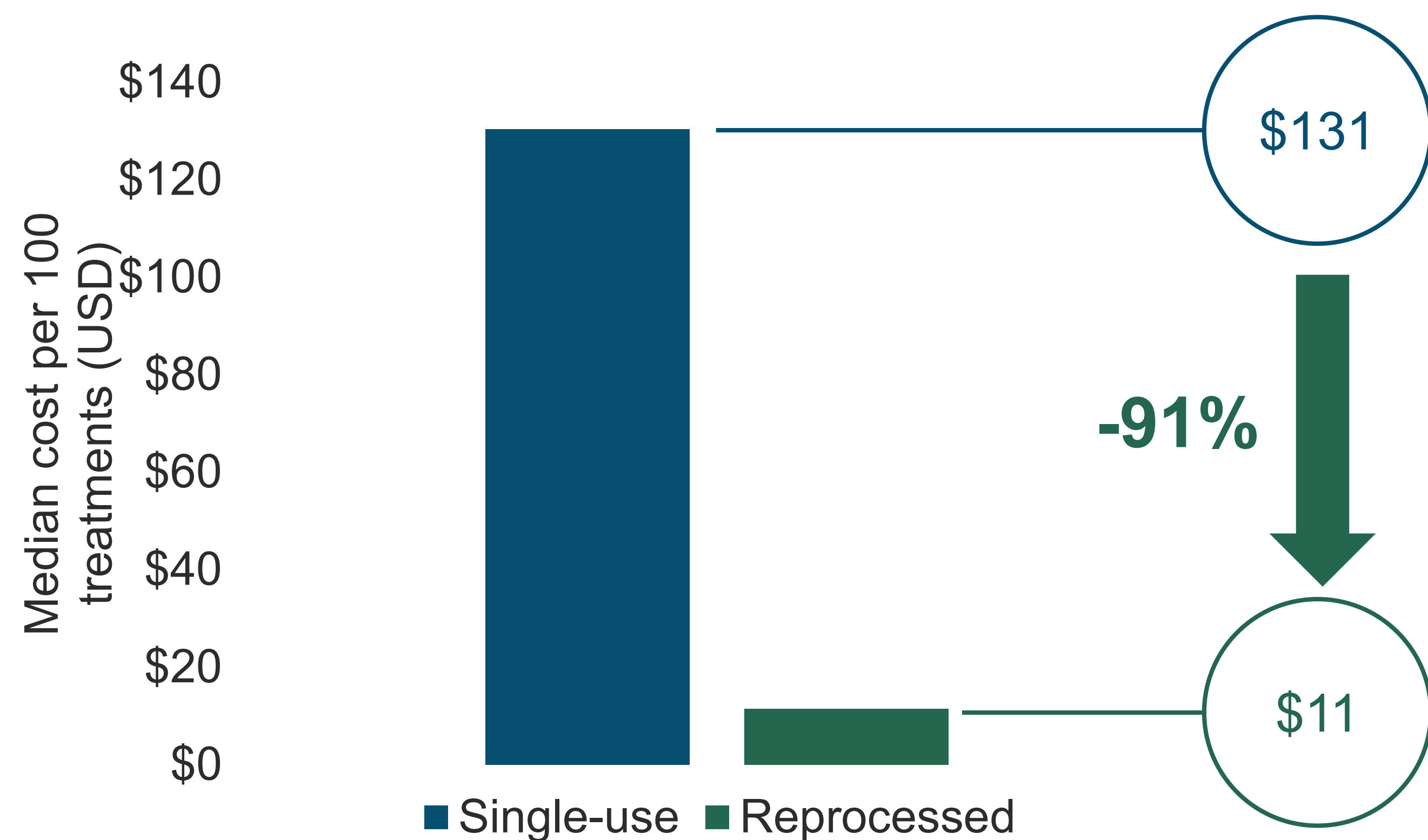


Figure 4 Reduction of waste disposal costs based on the implementation of a single-use and reprocessed sleeve of IPC.

## References

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2. Kagoma YK, et al. (2012) People, planet and profits: the case for greening operating rooms. In: Canadian Medical Association Journal 184 (17), S. 1905-1911.
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