

Comparative Cost Analysis of Single-use Sterile versus Reprocessed Distal Radius Volar Plate Sets

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Introduction

- Distal radius fracture incidence and treatment through open reduction internal fixation (ORIF) are rising
- The rise in treatment has led to ORIF cost concerns in the current climate of medical cost containment
- In an effort to reduce sterilization and processing costs and implant stocking needs, medical device manufacturers are introducing sterile packed kits with one-time use instruments and individually packed sterile implants.
- The purpose of this study is to evaluate and compare the costs of the single use kit (SK) against a conventional reprocessed surgical sets (RS) for volar plating of distal radius fractures (DRF).

Materials and Methods

- A four-year retrospective review of financial and surgical records conducted at three outpatient surgical centers
- Implant costs for a single company's RS included calculating the list price of the most frequently used implants from an average weighted discount price negotiated between the company and surgical centers and the average sterilization and processing costs for a distal radius set from surgical center management reports
- RS instrumentation cost was estimated by straight-line depreciation from the original purchase price.
- SK cost were obtained for the same set by the same company.
- Incidence of surgical delays related to implants or instrumentation was estimated by an anonymous electronic survey of 23 hand surgeons
- Cost of operating room delays per minute was obtained from surgical center management reports.
- Sensitivity analysis on the frequency of OR delays was also performed to assess a range of overall costs.

Results

- Based on estimated implanted-related OR delay of 1 out of 100 cases, OR delay costs were found to average \$11 per case.
- For RS, average per case cost of instruments, implants, and sterilization were found to be \$47, \$2881, and \$39, respectively resulting in a total RS cost of \$2,978 per case (Table 3)
- The total cost of the SK was \$1,666, which was inclusive of all instruments and implants (Table 3)
- On average, the SK was \$1,312 less costly per case (Table 3)

Table 1: Estimated Sterilization Cost of Reprocessed Kits

Item	Estimated cost per tray
Steam indicators	\$0.09 x 3 = \$0.27
Tray wrap	\$1.99
Washer Cycle	\$3.29
Sterilizer Cycle	\$4.51
Labor	[\$25/hr x (139 min / 60 min/hr)]/2 = \$28.96
Total	\$39.02 / tray

Table 2: Estimated Time for Sterilization of Reprocessed Kit

Sterilization Process	Time
Soaking	20 minutes
Washer	40 minutes
Sterilizer	54 minutes
Biologic Test	25 minutes
Total	139 minutes

Table 3: Costs per Case for Reprocessed Sets and Sterile Kits

	Cost per case
Reprocessed Set Cost Components	
Cost of Instruments (depreciation)	\$47.54 (1.6%)
Cost of Implants	\$2881.52 (96.7%)
Sterilization	\$39.02 (1.3%)
Operating Room Delay Cost	\$11.49 (0.4%)
Total Cost of Reprocessed Set	\$2979.57
Total Cost of Sterile Kit	\$1,666.50
Total Cost Difference (RS - SK)	\$1313.07

Conclusion

- RS was found to cost \$1,312 more per case than the SK in an ambulatory surgical setting (\$2,978 vs \$1,666 per case)
- Pricing for the RS and SK, however, is highly variable from center to center based on negotiated and contractual pricing.
- This study highlights that SK could be both a more cost effective and convenient implant strategy for DRFs.