PREMIER®

A Retrospective Review

Cost Variance in 40-gram Dosages of Standard and Antibiotic-Infused Orthopedic Bone Cement

Polymethyl methacrylate (PMMA), more commonly identified as bone cement, is widely implanted in orthopedic total joint procedures. While hospitals, medical centers and ambulatory surgery centers often focus on the cost of the implants, it is our opinion that these facilities should also consider the cost of bone cement relative to the total implant cost for joint arthroplasty cases. This retrospective study reviewed the Premier Supply Analytics purchase order data for 948 unique facilities. This data was used to identify pricing variance between 40-gram standard and Gentamicin antibiotic infused orthopedic bone cement.

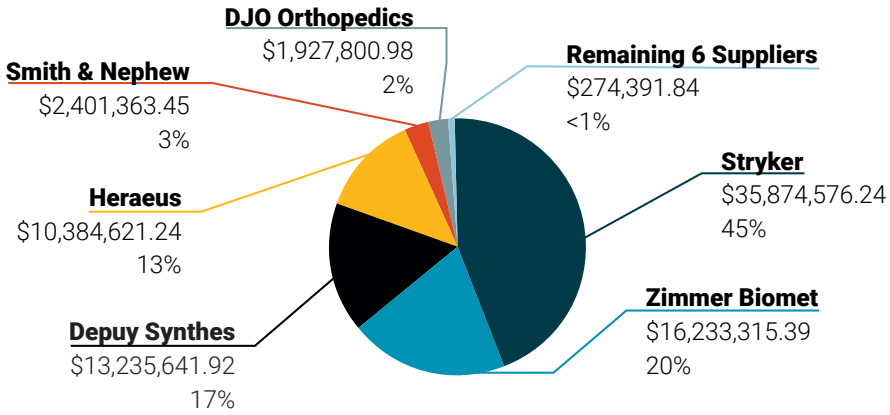
Methodology

This retrospective study utilized Premier Supply Analytics data from March 2019 through May 2020 (the "Data Set"). The Data Set identified 149 unique health systems and individual facilities with 948 total unique facilities. This retrospective review focused on 40-gram dosages of standard and gentamicin antibiotic infused orthopedic bone cement across 50,162 unique purchase orders. Purchase price and unit of measure were reviewed, and outliers identified were removed from the analysis.

Orthopedic Bone Cement Suppliers

A review of the 15-month dataset identified 12 suppliers selling both standard and antibiotic infused bone cement. The top six suppliers represent 99 percent of the total spend with 94.3 percent coming from the top four suppliers. The top four suppliers included Stryker, Zimmer Biomet, DePuy Synthes and Heraeus.

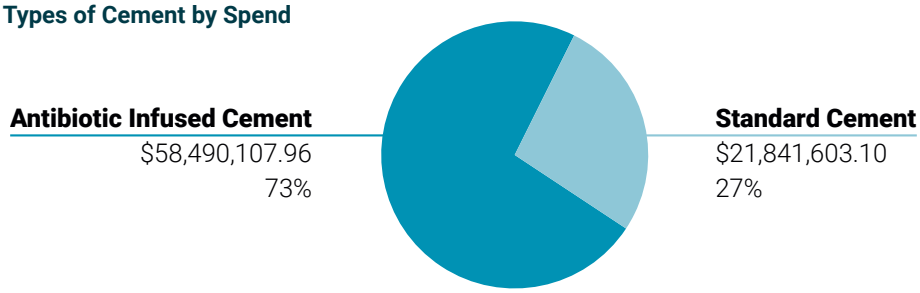
***Table 1.**
Orthopedic Bone Cement Suppliers



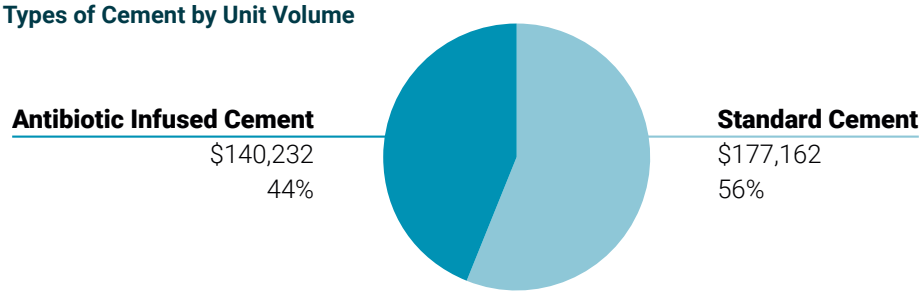
Types of Orthopedic Bone Cement

Orthopedic bone cement is sold in two different types, standard and antibiotic infused. Based on the Data Set, standard cement accounted for 27 percent of the orthopedic bone spend while antibiotic-infused orthopedic bone cement made up the remaining 73 percent of total spend. The largest driver for this variance was the higher cost associated with antibiotic-infused bone cement. Table 2 identifies antibiotic cement as 73 percent of the total spend, but Table 3 indicates that antibiotic-infused bone cement is only 44 percent of the total unit volume, thus highlighting the higher cost associated with antibiotic infused bone cement to hospitals, medical centers, and ambulatory surgery centers.

*** Table 2.**
Types of Cement by Spend



*** Table 3.**
Types of Cement by Unit Volume



Orthopedic Bone Cement Defined

40-gram Standard Bone Cement

A review of the Data Set has identified a large variance in price for 40-gram standard orthopedic bone cement. Pricing variance was influenced by bulk buying which lowered pricing considerably compared to single-unit or single-box purchases. The variance in pricing ranged from a minimum price of $38.00 to a maximum price of $197.00. The overall average price was calculated at $63.41 and the most common price paid was $60.00. Additionally, price points greater than the most common price paid of $60.00 accounted for 34 percent of the purchase volume.

* **Table 4.**
40-Gram Standard Orthopedic Bone Cement Pricing with Volumes

	Price Per Unit	Total Quantity	Percent Mix
Minimum Price	$38.00	763	0.43%
Average Price	$63.41	------	------
Maximum Price	$197.00	20	0.01%
Most Common Price			
$60.00	------	36,436	------
<$60.00	------	80,653	45.52%
>$60.00	------	60,073	33.91%
Total	------	177,162	100%

Antibiotic-infused Bone Cement

Gentamicin is a broad-spectrum antibiotic used by orthopedic surgeons to prevent or greatly reduce the chance of an infection after a joint replacement. Based on the Data Set, we found that the cost of antibiotic-infused bone cement is much higher compared to standard bone cement with an average price of $63.41. Gentamicin pricing ranged from a minimum price of $140.00 to a maximum price of $640.00. The overall average price was calculated at $220.47 and the most common price paid was $200.00. Additionally, purchases above the most common price paid of $200.00 accounted for 47 percent of the purchase volume.

* **Table 5.**
40-Gram Gentamicin Infused Orthopedic Bone Cement with Volumes

	Price Per Unit	Total Quantity	Percent Mix
Minimum Price	$140.00	1,170	0.92%
Average Price	$220.47	------	------
Maximum Price	$640.00	117	0.09%
Most Common Price			
$200.00	------	13,301	10.42%
<$200.00	------	54,007	42.31%
>$200.00	------	60,325	47.27%
Total	------	127,633	100.00%

Conclusion

Orthopedic bone cement is utilized to stabilize implants to bone in orthopedic total joint procedures. The largest utilization rate for orthopedic bone cement is in knee arthroplasty with a lower utilization rate in hip and shoulder arthroplasty. Hospitals, medical centers, and ambulatory surgery centers often scrutinize the cost of orthopedic total joint replacement implants, but should not overlook the value associated with lower-cost orthopedic bone cement to complete the procedure. Considering the large difference in cost between standard and Gentamicin infused orthopedic bone cement, it would be beneficial for healthcare organizations to understand the current facility price and the available benchmarking associated with orthopedic bone cement for their specific suppliers. Understanding market pricing can mitigate pricing variance and drive procedural savings for an organization. Using this information, healthcare organizations can provide credible pricing data to their orthopedic surgeons who may be unaware of the cost of their specific supplier's orthopedic bone cement. Open and credible discussion with surgeons regarding such data may drive fiscal savings opportunities while maintaining the same supplier mix within the organization and without impacting outcomes or surgeon choice. This can be achieved either through a standard reduction in price based on credible benchmarking or through a shift in utilization to a functionally equivalent product. Both options could provide fiscal savings opportunities for the organization while maintaining orthopedic bone cement choice for the orthopedic surgeons.

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* Source: Premier Supply Analytics March 2019-May 2020