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Comparative Cost-effectiveness Analysis of Coflex Interlaminar Stabilization versus Posterolateral Fusion for Lumbar Stenosis and Low-grade Spondylolisthesis

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Introduction: While lumbar spinal fusion remains the standard of care surgical treatment for recalcitrant spinal stenosis with back pain and spondylolisthesis, the potential for perioperative morbidity, adjacent segment degeneration, and increased costs have led to the investigation into less-invasive, and perhaps less costly, alternative treatments. Two-year interim analysis results from the IDE trial comparing coflex® interlaminar stabilization with posterolateral spinal fusion (PLF) for stenosis with spondylolisthesis have demonstrated clinical equivalence or superiority with coflex®, and have shown clear superiority with respect to perioperative outcomes including shorter hospital length of stay, less blood loss, and shorter surgical times (data reported separately), resulting in significantly decreased healthcare resource utilization. Consequently, we hypothesize that the actual costs associated with coflex® interlaminar stabilization are favorable compared with PLF.

Methods: Actual cost of care data was available for 3 of the 20 sites that participated in the randomized, prospective, IDE trial comparing coflex® with PLF for stenosis and spondylolisthesis. For each study enrollee, the costs-per-case data were calculated, which included OR costs, recovery room costs, and non-recurring costs such as implant costs, supplies, drugs, and durable medical equipment. Although the data was captured for surgeries performed between 2006 and 2010, conversions were made to 2011 US dollars in order to create a common, relative cost value. Since the coflex® device is not commercially available, the following implant assumptions were made for the current analysis:

- 1) coflex® device cost range: \$4-8000/device;
- 2) PLF implant costs range: \$7-11000 for 1-level, and \$10-14,000 for 2-level.

Results: Actual cost data was available for 62 patients. **Table 1** depicts the baseline demographics, perioperative data, and costs. The average blood loss, hospital stay, and OR time were substantially lower with coflex®. Using the national average for cost-per-minute of \$30/minute for OR time and \$10/minute for recovery time in the inpatient setting, as well as other cost-per-minute values provided by facility administrators, a 1-level coflex® procedure saved on average \$8,776 peri-operatively, compared with 1-level PLF. Similarly, a 2-level coflex® procedure saved \$4,702 compared with 2-level PLF. Most savings were in implant costs (in 1-level procedures), drugs/supply, and OR costs. For this cohort of 62 patients, %ODI improvement was similar among the 4 cohorts at 2 years: 1-level coflex® (59.5%), 1-level fusion (38.0%), 2-level coflex® (63.3%), 2-level fusion (64.1%).

Measure	1-level coflex® (n=28)	1-level PLF (n=8)	2-level coflex® (n=19)	2-level PLF (n=5)
Mean Age (y)	59 years old	56 years old	58 years old	66 years old
Gender (% male)	41.4% male	12.5% male	75% male	60% male
Gender (% female)	58.6% female	87.5% female	25% female	40% female
Average Blood Loss	67.4 mL	225 mL	78.8 mL	900 mL
Average Op Time	113 mins	162 mins	111 mins	232 mins
Average Recovery Time	162 mins	186 mins	208 mins	330 mins
Average Length of Stay	0.79 days	2.75 days	1.2 days	4.6 days
Non-Recurring Expenses				
Intra-Operative	\$3,368	\$6,134	\$4,723	\$7,975
Post-Operative	\$2,611	\$2,896	\$3,147	\$3,296
Recurring Expenses				
Avg Implant Costs (Accepted Ranges)	\$4,000 - \$8,000	\$7,000 - \$11,000	\$8,000 - \$16,000	\$10,000 - \$14,000
Drug / Supply	\$749	\$3,474	\$796	\$2,097
RANGE OF	\$10,728 - \$14,728	\$19,504 - \$23,504	\$16,666 - \$24,666	\$23,368 - \$27,368
TOTAL COSTS				

[Table 1. Patient Demographics, Perioperative Outco]

Discussion: While prior data has shown clinical equivalence or superiority with coflex® when compared with PLF at 2 years, the current study is the first to quantify the actual cost savings associated with coflex® interlaminar stabilization. On average, 1-level coflex® procedures saved \$8,776 per case, while 2-level coflex® procedures saved on average \$4,702 compared with fusion, while producing similar or improved clinical outcomes at 2 years. Our data suggest the potential for substantial cost-savings, without compromising clinical outcomes, with coflex® interlaminar stabilization compared with fusion in the treatment of spinal stenosis and spondylolisthesis.