

Custom-designed total knee arthroplasty is cost-effectiveness in comparison to a standard implant

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Abstract

Introduction

Total knee arthroplasty (TKA) remains one of the most effective and commonly performed procedures in the United States¹⁻². Although custom-designed implants offer theoretical advantages to patients with respect to improved alignment, kinematics, and implant fit, their value has been scrutinized given increased implant costs³⁻⁵. The aim of this study was to determine if the use of a custom-designed implant is cost-effective and beneficial in comparison to a traditional TKA as a measure of total direct cost, length of stay (LOS) and in-hospital opioid use.

Methods

A retrospective review was performed at a single institution between 2016 and 2019 using a financial database and electronic health record. Patient demographics, total direct costs, LOS and morphine equivalent dose (MED) opioid use were analyzed. Three groups were evaluated: a custom designed implant (Conformis®) versus a traditional implant (Zimmer Persona®) all performed by a single surgeon, and a control group performed by second surgeon (Stryker Triathlon®).

Results

Between February 2016 and December 2019, 244 Conformis, 298 Persona, and 580 Triathlon total knee arthroplasties were performed. The median age was 66 years old and median BMI 31 for all three groups. Mean LOS was 1.35 days for Conformis, 1.99 for Persona, and 1.83 for Triathlon patients. Total direct costs were \$9341 for Conformis, \$10,347 for Persona group, and \$10,604 for Triathlon. There was no apparent difference in MED opioid use amongst groups (99.5, 114, and 92 respectively).

Discussion

Although implant costs may be marginally higher for a custom-designed implant in comparison to a traditional implant, total direct costs for hospital admissions appear to be cost-effective. Variables such as operative time and LOS appear to favor a custom implant, which may help explain these findings. Health management teams should consider this data when negotiating implant contracts, particularly in the era of bundle-care reimbursement and value-based outcomes.

Significance

Custom designed implants have had an increased interest in recent years, although concerns regarding increased cost have remained a perceived limitation for many institutions. Although implant costs may in fact be higher, expedited surgical time and reduced length of stay in hospital may make utilization cost-effective.

References

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