Assessing the Utilization of Total Ankle Replacement in the US

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Disclosure

• No relevant financial disclosures
Introduction

• Increased utilization of TAR for addressing end-stage ankle arthritis

• 1000% increase over past 20 yrs in Medicare beneficiaries

• Reasons:
  • Patient benefits
  • Design improvements
  • Surgeon facility with technique
  • Expansion of indications
Introduction

• Greater number of health systems performing TAR
• Implant costs and potential for complications can increase financial burden through additional hospitalizations/surgeries
• Serve as potential deterrent for surgeons and health systems desiring to perform them
Introduction

• Little attention has been devoted to evaluating the impact of the increase in TAR at the individual hospital level with respect to volume and profitability.

• It is the purpose of this investigation to evaluate the variation in the utilization of total ankle arthroplasty, reimbursement rates and overall cost across health systems.
Data and Methods

• Data Sources
  • Medicare Inpatient Limited Data Sets (2011, 2012) (Medicare FFS)
  • Nationwide Inpatient Sample (NIS) (2011) (for all discharges)

• Methods
  • Multivariate regression modeling to assess the effects of hospital characteristics on likelihood of performing TAR and number of TARs
Outcomes and Other Key Variables

• Primary Outcome Variables
  • Likelihood of hospital performing TAR
  • # TARs performed conditional on having performed at least one per year

• Key Variables of Interest
  • Hospital overall margin = (Total Pay - Total Cost)/Total Pay
  • TAR Margin = (Total TAR Pay – Total TAR Cost)/ Total TAR Pay
  • Orthopaedic specialty hospital indicator (orthopaedic cases >=50% of all Medicare cases/year)
  • Hospital characteristics: teaching status, size, urban/rural status
Results

- 3528 Inpatient admissions related to TAR (0.01% of all admissions)
- Average length of stay 2.4 days, total cost $19,057
- Majority between ages of 45-64
- Medicare & Private Insurance
- Approximately 11% of hospitals performed ≥ 1 TAR on a Medicare FFS beneficiary
- Teaching hospitals performed the majority of TAR cases (58%) *
- Other characteristics associated with performing a TAR*, include: Size, Non-profit status, Orthopaedic Specialty Hospital

*Based on Medicare FFS data
Results

• Average prosthesis cost $13034 in Medicare FFS accounting for approx. 70% of total cost
• Approximately 1/3 of institutions were profitable
• Profitable hospitals performing TAR had lower total Medicare costs and higher Medicare payments
  • Difference of approx. $11,000 from TAR surgeries between profitable and nonprofitable hospitals
  • Due to relative difference in prosthetic costs among institutions
• No difference in length of stay or number of TAR cases
Costs and Payments Associated with TAR for Hospitals that are Profitable and Nonprofitable Based on TAR Cases

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th></th>
<th>2012</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Profitable Hospitals (n=122)</td>
<td>Nonprofitable Hospitals (n=233)</td>
<td>Profitable Hospitals (n=101)</td>
<td>Nonprofitable Hospitals (n=285)</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Median</td>
<td>Mean</td>
<td>Median</td>
</tr>
<tr>
<td>Total Cost</td>
<td>$14,425</td>
<td>$13,271</td>
<td>$19,884</td>
<td>$18,936</td>
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<tr>
<td>Cost per Day</td>
<td>$4,950</td>
<td>$4,669</td>
<td>$6,314</td>
<td>$5,653</td>
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<tr>
<td>Length of Stay</td>
<td>3.2</td>
<td>3.0</td>
<td>3.4</td>
<td>3.0</td>
</tr>
<tr>
<td>Cost of Prosthesis</td>
<td>$10,627</td>
<td>$10,103</td>
<td>$13,197</td>
<td>$12,642</td>
</tr>
<tr>
<td>Payment</td>
<td>$19,631</td>
<td>$16,356</td>
<td>$13,640</td>
<td>$12,876</td>
</tr>
<tr>
<td>Profit</td>
<td>$5,206</td>
<td>$3,003</td>
<td>$(6,244)</td>
<td>$(5,207)</td>
</tr>
<tr>
<td>Number of Cases</td>
<td>3.3</td>
<td>2.0</td>
<td>3.2</td>
<td>2.0</td>
</tr>
</tbody>
</table>
Regression Results

• Major teaching hospitals 45% more likely to perform TAR
• Large & urban hospitals 2x likely to perform TAR relative to small, rural
• Orthopaedic specialty hospitals 4x more likely to perform TAR
  • Greater the number of orthopaedic cases performed, greater likelihood of performing TAR
• Hospital overall margin had no effect on the likelihood of performing a TAR or on the number of TARs performed
• Margin on TAR cases had a small but positive effect on the number of TAR cases performed (if performing at least 1 TAR)
Conclusion

• Financial burden associated with performing TAR

• Many health systems unable to demonstrate profitability despite increased utilization

• Profitable hospitals: lower costs/day, prosthesis costs and higher payments

• Is it better to be done at profitable centers?