Primary Total Hip Replacement Versus Hip Resurfacing
Hospital Considerations


Abstract
Multiple factors regarding surgical procedures and patient selection affect hospital staffing needs as well as hospital revenues. In order to better understand the potential impact on hospitals that hip arthroplasty device selection (standard total hip arthroplasty vs. resurfacing) creates, a review of all primary hip arthroplasties performed at one institution was designed to identify factors that impacted hospital staffing needs and revenue generation. All primary hip arthroplasties undertaken over three fiscal years (2008 to 2010) were reviewed, utilizing only hospital business office data and medical records data that had been previously extracted prior for billing purposes. Analysis confirmed differing demographics for two hip arthroplasty populations, with the resurfacing patients (compared to the conventional total hip arthroplasty population) consisting of younger patients (mean age, 50 vs. 61 years), who were more often male (75% vs. 45%), were more likely to have osteoarthritis as their primary diagnosis (83 vs. 67%) and were more often covered by managed care or commercial insurance (83 vs. 34%). They also had shorter hospital stays (mean length of stay, 2.3 vs. 4.1 days) and consequently provided a more favorable financial revenue stream to the hospital on a per patient basis. Several trends appeared during the study periods. There was a steady increase in all procedures in all groups except for the resurfacings, which decreased 26% in males and 53% in females between 2009 and 2010. Differences were observed in the demographics of patients presenting for resurfacing, compared to those presenting for conventional total hip arthroplasty. In addition to the revenue stream considerations, institutions undertaking a resurfacing program must commit the resources and planning in order to rehabilitate these patients more expeditiously than is usually required with conventional hip arthroplasty patients.

competition in the market between vendors. Furthermore, we employ computer navigation on all resurfacings, as we have found doing so allows us to be more precise for the sizing of implants and positioning. This adds an extra $840 supply cost per case, compared to conventional total hip arthroplasties. These extra-added costs result from computer depreciation and use fees, computer personnel costs, and disposable supply costs (reflective spheres, pins, etc.).

The investigators performed a financial and demographic analysis of the institution’s resurfacing program, contrasting that to the conventional primary total hip arthroplasty experience, to better determine the financial impact and advantages-disadvantages to the institution’s overall joint arthroplasty program, based on device selection. The current review was designed to identify factors that impacted hospital staffing needs and revenue generation.

Materials and Methods

Demographic and financial analyses were performed on all primary conventional total hip and surface arthroplasties undertaken during the three fiscal years 2008, 2009, and 2010 (defined as July 1 to June 30 of the named year), with historical data from 2007 utilized when appropriate. The data utilized was the hospital’s business office and medical records data as extracted for billing purposes. There was no medical chart review performed exclusively for the purposes of this analysis.

Results

During the study period, a total of 260 resurfacings (25% female) and 728 conventional total hip arthroplasties (55% female) were performed. The number of resurfacings peaked in fiscal year 2009 (n = 107), whereas the number of conventional total hip arthroplasties peaked in 2010 (n = 278). The age distribution differed as expected, with the age of no resurfacing patient greater than or equal to 70 years (mean age, 50 years), whereas 32% of the total hip arthroplasty population was greater than or equal to 70 years (mean age, 61 years). Between fiscal years 2008, 2009, and 2010, there was a steady increase in procedures, except for resurfacings, which between 2009 and 2010, decreased 26% in males and 53% in females, presumably reflecting trends in patient selection. The mean length of stay was 2.3 days for resurfacings and 4.1 days for conventional total hip arthroplasties.

Table 1 Mean Length of Stay in Days*

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Conventional Replacement</th>
<th>Resurfacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>3.5</td>
<td>—</td>
</tr>
<tr>
<td>2006</td>
<td>3.7</td>
<td>—</td>
</tr>
<tr>
<td>2007</td>
<td>4.4</td>
<td>2.1</td>
</tr>
<tr>
<td>2008</td>
<td>4.8</td>
<td>2.4</td>
</tr>
<tr>
<td>2009</td>
<td>4.1</td>
<td>2.2</td>
</tr>
<tr>
<td>2010</td>
<td>3.6</td>
<td>2.1</td>
</tr>
</tbody>
</table>

*The table shows each fiscal year’s mean length of stay for conventional total hip arthroplasty and resurfacing patients.

There was a steady increase in the percent of patients with osteoarthritis in both resurfacings (69% in 2008 to 94% in 2010) and conventional total hip arthroplasties (61% in 2008 to 70% in 2010). Overall, 83% of resurfacing patients had osteoarthritis, compared to 67% of the conventional total hip arthroplasty patients.

Over this 3-year time-period, there was a progressive increase in the percent of managed care-commercial insurers in both resurfacings (78 to 86%) and conventional total hip arthroplasties (28 to 40%), with a concomitant decrease in Medicaid in both resurfacings (5% to 2%) and conventional (9% to 4%). Overall, during the 3-year period, managed care-commercial insurance was the insurer type covering 83% of resurfacing patients, compared to only 34% of conventional total hip arthroplasty patients. Within resurfacing patients, the diagnosis of osteoarthritis was associated with a more favorable payor mix (88% managed care-commercial insurance and 1% uninsured) than the diagnosis of osteonecrosis (56% managed care-commercial insurance and 15% uninsured). From a revenue standpoint, a greater adjusted contribution to margin was achieved with resurfacings, compared to conventional total hip arthroplasties, with Workers Compensation, managed care-commercial insurance, and Medicare as the primary payors in which the hospital could achieve a positive contribution to margin, excluding indirect costs. Workers Compensation and managed care-commercial insurance were the best payors from a revenue standpoint. In our last year, Medicare was the largest payor for total hip
arthroplasties (50%), whereas managed care-commercial insurance was the largest payor for resurfacings (86%).

Discussion
Multiple factors affect patient length of stay. Patient selection (by both the patients themselves as well as by the physicians) has led to a trend for the healthiest and most active patients being selected for resurfacings. Analysis of Table 1 reveals that when resurfacing technology was introduced in fiscal year 2007, the mean length of stay increased for conventional total hip arthroplasties at our institution, whereas the mean length of stay for the resurfacing patients has remained markedly below that of conventional patients. These typically more active, vigorous, healthier, and younger patients are rehabilitated much more quickly and therefore are ready for hospital discharge much earlier than the average conventional total hip arthroplasty patient. Figures 1 and 2 illustrate the other demographic effect: older patients require more hospital stay time to prepare for hospital discharge. This effect is most notable in the conventional population above the age of 69 years, wherein, all mean lengths of stay are greater than 5 days. There were no resurfacing patients in this over-69 age group.

Contractual details can affect the managed care revenue greatly. For instance, one private insurer has a “short-stay trim,” whereby the payments to the hospital for patients approved for a longer hospital stay (for example, payment for a patient pre-certified for a 3-day stay for a resurfacing would be trimmed if the patient’s actual length of stay was 1 or 2 days, averaging a 36.5% payment trim in some cases for patients discharged in 2 or fewer days. The shorter the stay, the larger the payment trim. Another insurer’s contract specified a lower reimbursement for procedures classified as outpatient, a fact that became relevant in the cases of several hospital patients who were able to be discharged on their first postoperative day. Their hospital stays, which had initially been classified as inpatient, were retrospectively reclassified as outpatient at the request of the insurance carrier. Such factors affect net hospital revenue.

The establishment of a resurfacing program can provide tremendous financial advantage to the host institution, attracting patients who tend to offer a more favorable payor mix to that facility. Many of these patients, who often travel large distances, would otherwise not seek care at our facility. However, the initiation of a resurfacing program can tax the institution in its attempts to accommodate these younger patients, with the concomitant increase in demands for faster rehabilitation, early recovery, and shorter stays. Unless the contractual payor relationships are negotiated appropriately, the reallocation of precious resources to facilitate the early discharge goals may impact the institution negatively in the short run from a revenue standpoint. Overall, however, with its better payor mix, an institution is likely to benefit financially from the establishment and maintenance of a strong resurfacing program to complement an overall joint replacement program.

Disclosure Statement
William G. Ward, M.D., was previously a consultant to Smith & Nephew and to Wright Medical Technology. Riyaz Jinnah, M.D., is a consultant to Wright Medical Technology. The other authors have no financial or proprietary interest in the subject matter or materials discussed, including, but not limited to, employment, consultancies, stock ownership, honoraria, and paid expert testimony.