A Message from the Chairman, Herbert Schwartz, MD

The compelling need for a good definition of health care value highlights a fundamental challenge. We have not yet developed scientifically sound or accepted approaches to defining or measuring either patient-centered outcomes of care, or the costs of producing those outcomes. The scientific hurdles to defining patient-centered outcomes are numerous. Outcomes can be subtle and multidimensional, involving not only physiological and functional results, but also patients’ perceptions and valuations of their care and health status. The ability of health care organizations to measure costs is primitive at best and doesn’t meet the standards used in many other advanced industries. Equally challenging is the lack of data systems to support outcome measurement.

The Vanderbilt Department of Orthopaedics (VDO) presents this compilation of Value, Quality and Safety as testimony to our mission, accomplishments and culture. The Divisions within VDO have proudly displayed some examples of the programs conducted in 2013 which document our commitment to value in health care. Value can be defined as: Quality Patient Outcomes, Safety and Satisfaction divided by Cost, Waste Reduction and Operational Redesign. We strive to deliver the very best care for our patients, as per our credo of putting the patient first, by performing evidence based medicine whenever appropriate and setting examples of that behavior for our residents, alumni and colleagues.

At Vanderbilt, the promise of discovery is our passion. Teamwork within VDO is fundamental and each team member is critical in facilitating a constantly evolving and improved product. We emphasize patient’s rights and the sanctity and privacy of the patient – doctor relationship. We use our data management systems to support our discovery of best practices and apply them to the individual based upon their needs. Our team tries to focus on optimal access and care-delivery while minimizing the distractions of poor metric proxies of performance. We must be mindful in our changing healthcare environment that we maintain our focus on delivering the care to our patients that they need.

Please enjoy reviewing our march toward delivering value based health care.

Best Wishes in the New Year,

Herbert S. Schwartz MD
Professor and Chairman
Vanderbilt Department of Orthopaedics
MCE South Tower, Suite 4200
Nashville, TN 37232-8774
Phone: 615.322-0543, Fax: 615.875-1079
herbert.s.schwartz@vanderbilt.edu
Outcomes Reported by Our Patients

Lumbar Surgery
- Back Pain
- Leg Pain
- Back-Related Disability
- General Health State
- Quality of Life

Cervical Surgery
- Neck Pain
- Arm Pain
- Neck-Related Disability
- General Health State
- Quality of Life

Return to Work – Lumbar Surgery
- Lumbar Non-Fusion: 97% returned to work
- Lumbar Fusion: 94% returned to work

Return to Work – Cervical Surgery
- 98% returned to work

Patient Satisfaction with Care
- Satisfaction with Surgeon: 97%
- Satisfaction with Nursing Staff: 98%

At least 94% of patients returned to work after lumbar and cervical spine surgery within three months.
Primary total knee replacement remains the most common procedure performed by the Joint Replacement Center, while primary hip replacement volume continues to grow. Our center has remained a strong referral center for revision hip and knee replacements, as well as infected joint replacements.

Infection and complication rates after total joint replacements continue to remain below national standards, as compared to other large, tertiary centers (de-identified) as seen in the data obtained from University HealthSystem Consortium (UHC).
The average patient-controlled analgesia (pain medication usage) among patients participating in the Accelerated Recovery Program (ARP) was nearly half that of the group not participating in ARP.

The average number of oral pain tablets (taken as needed for pain) per visit using a random sample of 30 patients. The total overall average of tablets taken per visit for all of the ARP patients was 7 per patient.
Surgical site infection rates for patients receiving spinal fusions continues to decrease. In Quarter 3 of 2011 there were 7 surgical site infections for every 100 procedures completed. That number has been reduced to 0 surgical site infections for every 100 procedures completed in Quarter 3 of 2013.
The length of stay for patients undergoing a spinal fusion has been reduced from 6.8 days prior to the postoperative pathway modifications to 4.3 days. This is 1.61 days below the national average of 5.91 (as indicated by black bar on table above).

**Benefits of a shorter length of stay:**
* Patients are able to recover quicker and return to school/activities sooner
* Families face less of a socioeconomic burden (lower cost, less time off of work)
* Hospitals have increased open beds, available staff for new patients, and reduced costs.
Outcomes of Hook of the Hamate Fracture Excision in High Level Athletes

Demographics

Outcomes

Patient Satisfaction

Satisfaction was based on a score of 1 (not satisfied) to 10 (very satisfied).

Pain Scores

Pain was based on a scale of 0 (no pain) to 10 (worst possible pain).

Return to Sport

All patients successfully returned to full participation in their sport an average of 6 weeks after surgery. Performance in the patient’s respective sport was measured on a scale of 1 (worst possible performance) to 10 (best possible performance). A patient’s functional outcome was measured using the DASH (Disabilities of the Arm, Shoulder, and Hand) questionnaire and DASH Sports module which uses a scale of 1 (no difficulty doing specific function) and 5 (unable to do specific function).

Performance Scores

Postoperative DASH Scores
Surgical-Site Infections and Resected Soft Tissue Sarcomas

81% of patients (n=91) who underwent preoperative radiation prior to the operative procedure to resect their soft tissue sarcoma did not suffer any wound complications. In addition, 88% of the patients did not have a local recurrence.

Management of Obese Patients with Extremity Soft Tissue Sarcomas

The Vanderbilt Sarcoma Service is able to achieve the same overall survival, local recurrence rates, and wound healing in obese (Body Mass Index > 30) and non-obese (BMI < 30) patients in contrast to other orthopaedic and general surgery literature.
Quality Projects on Incomplete Excisions of Soft Tissue Sarcomas

**Patient Distance**

<table>
<thead>
<tr>
<th>Miles (Median)</th>
<th>Primary Excision (n=253)</th>
<th>Reexcision (n=147)</th>
</tr>
</thead>
<tbody>
<tr>
<td>114</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Insurance Status**

<table>
<thead>
<tr>
<th>% of Patients</th>
<th>Primary Excision (n=253)</th>
<th>Reexcision (n=147)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60.0%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**INSURANCE AND DISTANCE ANALYSIS:** Insurance status and patient distance from the treatment center were not significantly different between patients who underwent primary excision and reexcision of a soft tissue sarcoma. However, large and deep tumors and certain histology types predicted appropriate referrals.

**COST ANALYSIS:** The average professional charge was $9694 for a primary excision and $12896 for a reexcision. After adjusting for variables such as: tumor size, grade, and site, patients undergoing reexcision saw an increase of $3,699 in professional charges more than those with a primary excision.

Proposed Flowchart for Avoiding Unplanned Resections of Wrist Sarcomas

Flowchart of purposed algorithm of diagnostic steps (diamonds) and treatment recommendations (rectangles) for patients presenting with dorsal wrist mass. This algorithm was created to help surgeons avoid treating malignant tumors thought to be dorsal ganglion cysts.
Relationship of Hyperglycemia and Surgical-Site Infection (SSI) Rates

Review of 790 Non-Diabetic Orthopaedic Trauma Patients Requiring Surgery

Of the 790 patients, 294 had more than one glucose value of ≥ 200mg. This factor was associated with thirty-day SSIs, with 4.4% of the 294 patients with that indication of hyperglycemia having a surgical-site infection versus 1.6% of the 496 patients without more than one glucose value of ≥ 200mg. Hyperglycemia was an independent risk factor for thirty-day SSIs in orthopaedic trauma patients without a history of diabetes. We now closely monitor and control glucose levels perioperatively.

Stress-Induced Hyperglycemia as a Risk Factor for Surgical-Site Infection (SSI) Rates

Review of 187 Non-Diabetic Orthopaedic Trauma Patients Admitted to the Intensive Care Unit (ICU)

Stress-induced hyperglycemia demonstrated a significant independent association with surgical-site infections in a non-diabetic orthopaedic trauma patients who were admitted to the ICU. In addition, patients with an SSI received a greater amount of blood transfusions. We also closely monitor and control glucose values in severely injured patients.
Health Literacy in Orthopaedic Trauma Patients

Implementation of Program to Improve Patient’s Understanding of Injuries

Patient Assessment
1. What bone did you break?
2. How was the bone fixed?
3. How much weight can you put on your extremity?
4. How long until your bone is healed?
5. Are you supposed to be on medicine for blood clots?

Provided MD Information to Patient
- Hometown
- Residency Program
- Fellowship Program
- Medical Interests
- Professional Memberships
- Name

Overall Patient Performance on Comprehension Questions

Patient Satisfaction

All patients receive plain language information on their injury, surgery and follow-up.
Over half (56%) of the sampled worker’s compensation population (n=50) were restricted to light duty for less than 30 days. 84% of the patients were restricted to light duty for 60 days or less. The average number of days a worker’s compensation patient was restricted to light duty ranged from 19 days for patients with foot and ankle injuries to 50 days for patients suffering from hand injuries.

51% of 29 worker’s compensation patients sampled were able to return to work following treatment. Over 67% of lumbar spine injury patients and 100% of amputation patients were able to return to work.
Value–Based Treatment of Atraumatic Rotator Cuff Tears

MOON (Multicenter Orthopaedics Outcomes Network) Physical Therapy Program for Atraumatic Rotator Cuff Tears

Physical Therapy (6 weeks)
- Daily Range of Motion Exercises
- Daily Flexibility Exercises
- Strengthening Exercises (3x/week)
- Heat/Cold Therapy
- Home Therapy Program

Further Treatment Determined
- Patient “cured” - No further treatment
- Patient “improved” - Physical therapy for 6 more weeks
- Patient “no better” - Could elect to have surgery

Outcomes

Patient-completed Survey Scores

Range of Motion Measurements

Nonoperative treatment using the MOON physical therapy program was found to be effective for treating atraumatic rotator cuff tears in approximately 75% of the 452 patients that were followed for 2 years. Patient-reported outcomes improved significantly at 6 and 12 weeks. If patients did fail the therapy program it was usually within the first three months.

87% Cost Savings

(Between patients undergoing surgery for rotator cuff tear and patients treated successfully using MOON physical therapy program)

Realized Cost Savings = $11 Million/per year