Spinal Fusions in Pennsylvania

2014 Data

Pennsylvania Health Care Cost Containment Council

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About the Report

Spinal Fusions in Pennsylvania

This report on spinal fusion procedures presents hospital-specific results for the 21,393 adult patients who underwent this procedure in a Pennsylvania hospital in 2014. Produced by the Pennsylvania Health Care Cost Containment Council (PHC4), the report includes

- Hospital-specific, risk-adjusted outcome measures: in-hospital complication, readmission for a complication, and any unplanned readmission.
- Average charges and average Medicare payments for hospitals.
- Surgeon volume.
- County-level utilization rates.
- Key findings, including regional and statewide trends.

Taken together, this information can be helpful to patients, families, and purchasers in making more informed health care decisions and can serve as an aid to providers in highlighting additional opportunities for quality improvement and cost containment.

About PHC4

Created by the PA General Assembly in 1986, PHC4 is an independent state agency charged with collecting, analyzing, and reporting information that can be used to improve the quality and restrain the cost of health care in the state. Today, PHC4 is a recognized national leader in public health care reporting. More than 840,000 public reports on patient treatment results are downloaded from the PHC4 website each year, and nearly 100 organizations and individuals annually utilize PHC4's special requests process to access and use data. PHC4 is governed by a 25-member board of directors, representing business, labor, consumers, health care providers, insurers, and state government.

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About spinal fusion

Back and neck pain are two of the most common reasons patients seek medical care and are leading causes of lost work and difficulty managing the daily activities of life. About 80% of people will experience back pain at least once during their lifetime.[1] In a single year, nearly 66 million adults reported low back pain and 33 million reported neck pain.[2] The causes of back and neck pain are often muscle strain, osteoarthritis, or degenerative disc disease, which can lead to herniated discs, sciatica (a compressed nerve that causes pain down the leg), and spinal stenosis (a narrowing of the spinal canal). Trauma, tumors, and in a small percentage of cases, congenital spinal deformities might also be the source of pain.

In the large majority of cases, people recover from back and neck pain over a period of several weeks or months without surgery. Usually, the treatment begins with physical therapy, massage therapy, or anti-inflammatory medication. Surgical options exist for those who fail to gain relief from other treatments, and in recent years there has been a trend toward increased use of spinal operations, especially spinal fusion surgeries.

An aging population with increased quality of life expectations, along with advances in technology leading to new diagnostic techniques and devices used to stabilize vertebrae (bones of the spine), have led to a rapid increase in the number of fusions performed in the United States. During the 1990's spinal fusions tripled[3] and increased again by more than two-fold over the last decade.[2]

Spinal Fusion

A spinal fusion is the joining of two or more vertebrae (bones of the spine) to relieve pain by limiting movement in the diseased part of the spine. Metal screws, rods, and plates may be used to fixate (stabilize) the spine while allowing time for the bone grafts inserted during surgery to heal, resulting in a fusion of the vertebrae. The bone grafts can be made of synthetic material (ceramic or bone-forming proteins) or from actual bone taken from the patient or a donor.

Additional Resources

American Academy of Orthopedic Surgeons: www.orthoinfo.org

National Institute of Arthritis and Musculoskeletal and Skin Diseases: www.niams.nih.gov

[1] Borenstein D. Back Pain. American College of Rheumatology. Available at http://www.rheumatology.org. Reviewed May 2015. Accessed May 6, 2016.
[2] United States Bone and Joint Initiative: The Burden of Musculoskeletal Diseases in the United States, Third Edition, 2014. Rosemont, IL. Available at http://www.boneandjointburden.org. Accessed on Apr 27, 2016.
[3] Deyo RA, Mirza SK. Trends and variations in the use of spine surgery. *Clin Orthop Relat Res*. 2006; 443:139-46.

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The goal of spinal fusion surgery is to decrease the pain associated with movement of the vertebrae within the diseased segment of the spine by fusing the vertebrae together. Fusion eliminates movement and prevents stretching of the nerves and surrounding ligaments and muscles. Spinal fusion is typically followed by several days in the hospital. During the recovery period, which may take several months, the spine must be kept in alignment. Patients are shown how to move properly, reposition, sit, stand, and walk. Light activity, like walking, is usually recommended immediately after surgery followed by a gradual increase in activity.

In this report

- This report includes hospital-specific outcomes and surgeon-specific volume for spinal fusion procedures, as defined by ICD-9-CM (International Classification of Diseases, Ninth Revision, Clinical Modification) codes (81.00-81.08 spinal fusion). The total number of cases includes elective and non-elective procedures. Hospital-specific outcomes are reported for spinal fusion procedures that are likely to be considered elective. Technical Notes relevant to this report provide additional detail. They are posted to PHC4's website at **www.phc4.org**.

- This report covers adult (18 years and older) inpatient hospital discharges for spinal fusion, regardless of payer, during calendar year 2014.

- The 111 Pennsylvania general acute care hospitals and 332 surgeons that performed spinal fusion procedures during calendar year 2014 are included.

- The hospital names have been shortened in many cases for formatting purposes. Hospital names may be different today than during the time period covered in the report due to mergers and name changes.

Also on PHC4's Website for Spinal Fusions

Statewide Statistics and Key Findings	**County-Level Rates**
Hospital Results	**Technical Notes**
Medicare Payment	**Hospital and Surgeon Comments**
Surgeon Volume	**Downloadable Data**

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About the data

The hospital inpatient discharge data used in this analysis was submitted to PHC4 by the general acute care hospitals in Pennsylvania that performed spinal fusion procedures in 2014. As part of PHC4's standard validation processes, hospitals were given an opportunity to verify and correct the discharge data. Hospitals were also given an opportunity to confirm the operating physician volume and Medicare payment data. The ultimate responsibility for data accuracy and completeness lies with each individual hospital. PHC4 wishes to acknowledge and thank the Pennsylvania hospitals that participated in the data submission and verification processes used for this report.

Medicare fee-for-service payment data was obtained from the Centers for Medicare and Medicaid Services. The Medicaid payment data (fee-for-service and managed care) was provided by the Pennsylvania Department of Human Services. The most recent Medicare and Medicaid payment data available to PHC4 for use in this report was for 2013. Medicaid data is reported at the statewide level only.

Accounting for high-risk patients

Some patients who undergo spinal fusion have more complex conditions than others—conditions that may be associated with the need for the procedure and/or other chronic diseases such as arthritis, asthma, and coronary artery disease. Included in the data PHC4 receives from Pennsylvania hospitals is information indicating, in simple terms, "how sick the patient was" on admission to the hospital—information that is used to account for high-risk patients. Even though two patients may be admitted to the hospital with the same illness, there may be differences in the seriousness of their conditions. In order to report fair comparisons among hospitals, PHC4 uses a complex mathematical formula to risk adjust the complication and readmission measures included in this report, meaning that hospitals receive "extra credit" for treating patients who are more seriously ill or at a greater risk than others. Risk adjusting the data is important because sicker patients may be more likely to develop complications or be readmitted.

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PHC4 uses results from laboratory blood tests, patient characteristics such as age and gender, and billing codes that describe the patient's medical conditions such as the presence of arthritis, coronary artery disease, etc., to calculate risk for the patients in this report. A comprehensive description of the risk-adjustment techniques used for this report can be found in the Technical Notes on PHC4's website at **www.phc4.org**.

What is measured in this report and why is it important?

PHC4's mission is to provide the public with information that will help to improve the quality of health care services while also providing opportunities to restrain costs. The measurement of quality in health care is not an exact science. As such, there may be a number of ways to define quality. Measures for this report were chosen because they are important components in examining quality of care and resource use for patients undergoing spinal fusion procedures.

- ***Total Number of Cases (reported for hospitals and surgeons).*** This is the number of spinal fusion procedures (both elective and non-elective procedures) performed by the hospitals and surgeons included in this report. This information provides an idea of the experience each facility or surgeon has in performing these procedures. Studies have suggested that, in at least some areas, the volume of cases treated by a hospital or physician can be a factor in the success of the treatment. The number of cases represents separate hospital admissions, not individual patients. A patient admitted several times for spinal fusion would be included each time in the number of cases. Not included in this measure are procedures performed on patients younger than 18 years old, those performed in children's hospitals, veterans' hospitals, or those performed in other states by surgeons who also practice outside Pennsylvania.

The following measures are reported for hospitals. While the total number of cases includes all spinal fusion procedures for adult patients (elective and non-elective procedures), these measures only include patients whose procedures were likely to be considered elective. That is, more clinically complex cases were excluded. Additional exclusions specific to these measures are outlined in the Technical Notes on PHC4's website at **www.phc4.org.**

- ***In-Hospital Complication (risk adjusted).*** This measure is reported as a statistical rating that represents the number of patients who developed a surgical complication during the hospital stay in which the spinal fusion was performed. For this report, an in-hospital complication was counted if the patient died or developed one of the following conditions during the hospital stay: mechanical complication of device, implant, or graft; infection of

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device, implant, or graft; surgical site bleeding; or wound complication. To determine the risk-adjusted rating for in-hospital complications, PHC4 compares the number of patients one could reasonably expect to develop a complication, after accounting for patient risk, with the actual number of complications. Ratings were reported for hospitals with five or more spinal fusion cases. (See "Understanding the Symbols" box.)

- ***Readmission for a Complication (risk adjusted).*** This measure is reported as a statistical rating that represents the number of patients who were readmitted to a Pennsylvania general acute care hospital within 30 days or 90 days (depending on the complication) of being discharged from the hospital where the spinal fusion was performed *and* where the principal reason for the readmission was one of the following surgical complications: mechanical complication of device, implant, or graft; infection of device, implant, or graft; surgical site bleeding; or wound complication. To determine the risk-adjusted rating for this measure, PHC4 compares the number of patients one could reasonably expect to be readmitted for a complication, after accounting for patient risk, with the actual number of such readmissions. Ratings were reported for hospitals with five or more spinal fusion cases. (See "Understanding the Symbols" box.)

- ***Any Unplanned Readmission (risk adjusted).*** This measure is reported as a statistical rating that represents the number of patients who were readmitted to a Pennsylvania general acute care hospital within 30 days of being discharged from the hospital where the spinal fusion was performed. This measure includes a broader array of readmissions than the "readmission for a complication" measure previously discussed. However, readmissions captured in this measure were counted only if they were considered "unplanned"; that is, the patient was readmitted for a

Understanding the Symbols

The symbols displayed in this report represent a comparison of a hospital's actual complication or readmission rate to what is expected after accounting for patient risk.

- ○ **Hospital's rate was significantly lower than expected.** Fewer patients developed a complication or were readmitted than could be attributed to patient risk and random variation.
- ⦿ **Hospital's rate was not significantly different than expected.** The number of patients who developed a complication or were readmitted was within the range anticipated based on patient risk and random variation.
- ● **Hospital's rate was significantly higher than expected.** More patients developed a complication or were readmitted than could be attributed to patient risk and random variation.

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reason that was not defined as planned using an algorithm developed by the Centers for Medicare and Medicaid Services.[4] To determine the risk-adjusted rating for this measure, PHC4 compares the number of patients one could reasonably expect to have an unplanned readmission, after accounting for patient risk, with the actual number of such readmissions. Ratings were reported for hospitals with five or more spinal fusion cases. (See "Understanding the Symbols" box.)

Readmission is an outcome influenced by the quality of inpatient and outpatient care, including coordination of care, discharge planning, and medication reconciliation. Identifying readmissions provides information that can inform quality improvement efforts that have the potential to improve patient experience and lower health care costs. While some re-hospitalizations can be expected, high quality care may lessen the need for subsequent, unplanned hospitalizations.

- ***Average Hospital Charge (case-mix adjusted).*** The amount a hospital bills for a patient's care is known as the charge. The charge includes the facility fee but does not include professional fees (e.g., physician fees) or other additional post-discharge costs such as rehabilitation treatment, long-term care, and/or home health care. In almost all cases, hospitals do not receive full charges from private insurance carriers or government payers. Hospitals typically receive actual payments that are considerably less than the listed charge. Hospital charges often vary by individual hospital and by regions of the state. The average charge included in this report was adjusted for the mix of cases specific to each hospital and reflects the entire length of stay. Additional exclusions specific to this measure are outlined in the Technical Notes on PHC4's website at **www.phc4.org**. The average charge is reported for each hospital with 11 or more cases.

- ***Average Medicare Fee-for-Service Payment.*** This section of the report displays the average amount a hospital is paid for a Medicare patient in the fee-for-service system (Pennsylvania residents), along with the number of cases included in the average payment and average hospital charge (trimmed and case-mix adjusted) for these cases. Payments from Medicare Advantage plans (e.g., Medicare HMOs) are not included. The average Medicare payment was trimmed for outliers as appropriate and calculated using the dollar amount the Centers for Medicare and Medicaid Services provided for the Medicare Part A hospital insurance

[4] Centers for Medicare and Medicaid Services. "2014 Procedure Specific Readmission Measures Updates and Specifications Report: Elective Primary Total Hip Arthroplasty (THA) and/or Total Knee Arthroplasty (TKA) – Version 3.0." March 2014. Available at http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/Measure-Methodology.html.

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fund payment. Patient liabilities (e.g., coinsurance and deductible dollar amounts) were not included. The average payment was calculated by summing the Medicare payment amounts for the cases and dividing the sum by the number of cases. Hospitals were given an opportunity to verify the average Medicare payments reported for their facilities prior to the public release of the information. The most recent Medicare payment data available to PHC4 was for calendar year 2013.

Medicare payments are based on formulas that take into account regional variation in the cost of delivering care, the increased costs from teaching doctors still in training, higher costs for hospitals that service large numbers of low-income patients, and for costs of new technologies. Medicare payments are based on the entire hospital stay, as are the average hospital charges for the Medicare fee-for-service patients. The average Medicare payment and average hospital charge for these cases are reported for each hospital with 11 or more cases.

Uses of this report

This report can be used as a tool to examine hospital performance. It is not intended to be a sole source of information for making health care decisions, nor should it be used to generalize about the overall quality of care provided by a hospital. Readers of this report should use it in discussions with their physicians who can answer specific questions and concerns about their care.

- ***Patients/Consumers*** can use this report as an aid in making decisions about where to seek treatment. This report should be used in conjunction with a physician or other health care provider when making health care decisions.
- ***Group Benefits Purchasers/Insurers*** can use this report as part of a process in determining where employees, subscribers, members, or participants should go for their health care.
- ***Health Care Providers*** can use this report as an aid in identifying opportunities for quality improvement and cost containment.
- ***Policymakers/Public Officials*** can use this report to enhance their understanding of health care issues, to ask provocative questions, to raise public awareness of important issues, and to help constituents identify health care options.
- ***Everyone*** can use this information to raise important questions about why differences exist in the quality and efficiency of care.