

## Candidate Performance Measure Profile

**Measure Set:** Advanced Certification for Total Hip & Total Knee Replacement (THKR)

**Measure ID#:** THKR-01

**Performance Measure Name:** Prophylactic Antibiotic Started Within One Hour of Incision

**Description:** Surgical patients with prophylactic antibiotics started within one hour prior to surgical incision. Patients who receive vancomycin for prophylactic antibiotics should have the vancomycin started within two hours prior to surgical incision due to the longer infusion time required for this antibiotic.

**Setting:** Inpatient, Hospital Outpatient Departments, Ambulatory Surgery Centers

**Rationale:** A goal of prophylaxis with antibiotics is to establish bactericidal tissue and serum levels at the time of skin incision. Studies performed in the 1960's and 1970's demonstrated that a common reason for failure of prophylaxis was delay of antibiotic administration until after the operation. In a study of 2,847 surgery patients at LDS Hospital in Salt Lake City, it was found that the lowest incidence of post-operative infection was associated with antibiotic administration during the one hour prior to surgery. The risk of infection increased progressively with greater time intervals between administration and skin incision. This relationship was observed whether antibiotics preceded or followed skin incision (Classen 1993).

**Type of Measure:** Process

**Improvement Noted As:** An increase in the rate.

**Numerator Statement:** Patients undergoing total hip or total knee replacement who had the prophylactic antibiotic started within one hour of incision (two hours if receiving vancomycin).

**Included Populations:** As above

**Excluded Populations:** None

**Denominator Statement:** Patients undergoing a total hip or total knee replacement.

**Included Populations:** Patients with an ICD-10-PCS Principal Procedure Code as defined in Appendix A, Table 1 (Total Hip Replacement) or Table 2 (Total Knee Replacement).

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### Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients enrolled in clinical trials
- Patients whose ICD-10 principal procedure occurred prior to the date of admission
- Patients with physician/advanced practice nurse/physician assistant (physician/APN/PA) documented infection prior to surgical procedure of interest
- Patients with an ICD-10-CM Principal Diagnosis suggestive of preoperative infectious diseases (as defined in Appendix A, Table 3 for ICD-10-CM codes)
- Patients who had other procedures requiring general or neuraxial anesthesia that occurred within 3 days prior to or after the procedure of interest (during separate surgical episodes) during this hospital stay

**Risk Adjustment:** No

**Data Reported As:** Proportion for hip replacements, proportion for knee replacements and aggregated proportion for hip & knee replacements.

### Selected References:

- American College of Obstetricians and Gynecologists (ACOG) Committee on Practice Bulletins ACOG Practice Bulletin No 104 Antibiotic prophylaxis for gynecologic procedures. *Obstet Gynecol* May 2009; 113(5) : 1180-1189.
- Bernard HR, Cole WR. The prophylaxis of surgical infections: the effect of prophylactic antimicrobial drugs on the incidence of infection following potentially contaminated operations. *Surgery*. 1964;56:151-157.
- Bratzler DW, Houck PM, for the Surgical Infection Prevention Guidelines Writers Group. Antimicrobial prophylaxis for surgery: An advisory statement from the National Surgical Infection Prevention Project. *CID*. 2004;38(15 June):1706-1715.
- Finkelstein R, Reinhertz G, Embom A. Surveillance of the use of antibiotic prophylaxis in surgery. *Isr J Med Sci*. 1996;32:1093-1097.
- Gorecki P, Schein M, Rucinski JC, et al. Antibiotic administration in patients undergoing common surgical procedures in a community teaching hospital: the chaos continues. *World J Surg*. 1999;23:429-432.
- Larsen RA, Evans RS, Burke JP, et al. Improved perioperative antibiotic use and reduced surgical wound infections through use of computer decision analysis. *Infect Control Hosp Epidemiol*. 1989;10:316-320.
- Mangram AJ, Horan TC, Pearson ML, et al. Guidelines for prevention of surgical site infection, 1999. *Infect Control Hosp Epidemiol*. 1999;20:247-280.
- Matuschka PR, Cheadle WG, Burke JD, et al. A new standard of care: administration of preoperative antibiotics in the operating room. *Am Surg*. 1997;63:500-503.

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- Polk HC, Lopez-Mayor JF. Postoperative wound infection: a prospective study of determinant factors and prevention. *Surgery*. 1969;66:97-103.
- Silver A, Eichorn A, Kral J, et al. Timeliness and use of antibiotic prophylaxis in selected inpatient surgical procedures. *Am J Surg*. 1996;171:548-552.
- Stone HH, Hooper CA, Kolb LD, et al. Antibiotic prophylaxis in gastric, biliary, and colonic surgery. *Ann Surg*. 1976;184:443-452.

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## Candidate Performance Measure Profile

**Measure Set:** Advanced Certification for Total Hip & Total Knee Replacement (THKR)

**Measure ID#:** THKR-02

**Performance Measure Name:** Prophylactic Antibiotic Completely Infused Prior to Inflation of Proximal Tourniquet (Knee Replacements Only)

**Description:** Patients undergoing total knee replacement who had the prophylactic antibiotic completely infused prior to inflation of proximal tourniquet.

**Setting:** Inpatient, Hospital Outpatient Departments, Ambulatory Surgery Centers

**Rationale:** The prevention of infection is paramount when replacing a joint. Often the antibiotic is not administered until just before the surgery begins. With the use of a tourniquet, all blood flow to the leg ceases, thereby stopping the flow of antibiotic to the places it is needed most, the site of the incision and the implant. As a result infection continues to be a common complication of conventional joint replacement surgery.<sup>1</sup> This measure evaluates that the prophylactic antibiotic is completely infused prior to the inflation of the tourniquet. Antibiotic prophylaxis was evaluated by SooHoo et al. They evaluated the timing, the discontinuation, the appropriateness of the antibiotic and the proximal tourniquet inflation after infusion. Adherence to this indicator ranged from 24 to 27 percent.<sup>2</sup>

**Type of Measure:** Process

**Improvement Noted As:** An increase in the rate.

**Numerator Statement:** Patients undergoing total knee replacement who had the prophylactic antibiotic completely infused prior to inflation of the proximal tourniquet.

**Included Populations:** As above

**Excluded Populations:** None

**Denominator Statement:** Patients undergoing a total knee replacement.

**Included Populations:** Patients with an ICD-10-PCS Principal Procedure Code as defined in Appendix A, Table 2 (Total Knee Replacement).

**Excluded Populations:**

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients enrolled in clinical trials

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- Patients whose ICD-10 principal procedure occurred prior to the date of admission
- Documentation of medical reason for not completely infusing the prophylactic antibiotic prior to the inflation of the proximal tourniquet
- Tourniquet was not used
- Patients with physician/advanced practice nurse/physician assistant (physician/APN/PA) documented infection prior to surgical procedure of interest
- Patients with an ICD-10-CM Principal Diagnosis suggestive of preoperative infectious diseases (as defined in Appendix A, Table 3 for ICD-10-CM codes)
- Patients who had other procedures requiring general or neuraxial anesthesia that occurred within 3 days prior to or after the procedure of interest (during separate surgical episodes) during this hospital stay

**Risk Adjustment:** No

**Data Reported As:** Proportion for knee replacements

### Selected References:

- <sup>1</sup>Understanding Conventional Hip & Knee Replacement, The Joint Replacement Center of Boston, <http://www.thejointreplacementcenterofboston.com/understanding-conventional-hip-and-knee-replacement> - accessed website 10/1/2015.
- <sup>2</sup>SooHoo N, Tang E, Krenek L, et al. Variations in the quality of care delivered to patients undergoing total knee replacement at 3 affiliated hospitals. *Orthopedics* 34(5): 356, 2011.
- Soohoo NF, Lieberman JR, et al. Development of Quality of Care Indicators for Patients Undergoing THR/TKR. *BMJ Qual Saf* 2011;20:153-157.
- American Association of Hip and Knee Surgeons, Total Knee Replacement Performance Measurement Set, January 2013.
- Bratzler DW, Houck PM. Antimicrobial prophylaxis for surgery: an advisory statement from the National Surgical Infection Prevention Project. *Am J Surg* 189:395-404, 2005.
- AQI QCDR Measure Specification, Year 2015, Anesthesia Quality Institute. Updated 4/27/15.

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**Measure Set:** Advanced Certification for Total Hip & Total Knee Replacement (THKR)

**Measure ID#:** THKR-03

**Performance Measure Name:** Regional Anesthesia

**Description:** Patients undergoing a total hip or total knee replacement with regional anesthesia.

**Setting:** Inpatient, Hospital Outpatient Departments, Ambulatory Surgery Centers

**Rationale:** Regional anesthesia (peripheral nerve blocks, spinal/epidural anesthesia and periarticular local anesthetic injections) provide better pain control and lead to faster rehabilitation and fewer complications than general anesthesia. The utilization of regional anesthesia for primary joint arthroplasty is associated with improved perioperative outcomes. Research shows that patients who received regional anesthesia had statistically significant decreases in 30-day mortality, length of hospital stay and in-hospital complications.<sup>1</sup> Additional studies show decrease in DVT/PE, operating room time and need for blood transfusions.<sup>2-3</sup> Compared with general anesthesia alone, regional anesthesia reduced postoperative pain, morphine consumption, and opioid-related adverse effects. Length of stay may be reduced and rehabilitation facilitated for patients undergoing regional anesthesia and analgesia for total knee arthroplasty.<sup>4-5</sup>

Anesthetic practice for joint replacements has been evolving towards wider use of regional anesthesia. According to the National Surgical Quality Improvement Project database, from 2005-2011, 52% and 60% of knee and hip replacements respectively were performed under general anesthesia.

Some surgeons avoid using regional anesthesia due to concerns that regional anesthesia may cause motor weakness, making patients more likely to fall when they are walking in the first days after joint replacement surgery. Research has shown that use of regional anesthesia had lower adjusted odds of inpatient falls compared with adjusted odds of inpatient falls with the use of general anesthesia alone. The type of anesthesia may represent a modifiable risk factor and the use of regional over general anesthesia may be considered in the context of a fall-prevention program.<sup>6</sup>

**Type of Measure:** Process

**Improvement Noted As:** An increase in the rate.

**Numerator Statement:** Patients undergoing a total hip or total knee replacement with regional anesthesia performed

**Included Populations:** Patients receiving any of the following during the

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operative episode:

- Peripheral nerve block, single dose
- Peripheral nerve block, continuous infusion
- Epidural anesthesia
- Spinal anesthesia
- Periarticular local anesthetic infiltrations/injection

**Excluded Populations:** None.

**Denominator Statement:** Patients undergoing a total hip or total knee replacement.

**Included Populations:** Patients with an ICD-10-PCS Principal Procedure Code as defined in Appendix A, Table 1 (Total Hip Replacement) or Table 2 (Total Knee Replacement).

**Excluded Populations:**

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients enrolled in clinical trials
- Documentation of patient preference of anesthesia other than regional
- Documented contraindication by physician/APN/ PA to regional anesthesia (i.e., anticoagulated patients, coagulopathies, neurologic condition, previous spinal fusion)

**Risk Adjustment:** No

**Data Reported As:** Proportion for hip replacements, proportion for knee replacements and aggregated proportion for hip & knee replacements.

**Selected References:**

- <sup>1</sup>Memtsoudis SG, Xuming S.; Ya-Lin Chiu, et al. Perioperative Comparative Effectiveness of Anesthetic Technique in Orthopedic Patients, *Anesthesiology* 05 2013, Vol.118, 1046-1058.
- <sup>2</sup>Mauermann WJ, Shilling AM, Zuo Z. A comparison of neuraxial block versus general anesthesia for elective total hip replacement: a metaanalysis. *Anesth. Analg.* 2006; **103**: 1018–25.
- <sup>3</sup>Hu S, Zhang Z-Y, Hua Y-Q, Li J, Cai Z-D. A comparison of regional and general anaesthesia for total replacement of the hip or knee: a metaanalysis. *J. Bone Joint Surg. Br.* 2009; 91: 935–42.
- <sup>4</sup>Macfarlane AJ, Prasad GA, Chan VW, Brull R. Does regional anaesthesia improve outcome after total hip arthroplasty? A systematic review. *Br. J. Anaesth.* 2009; 103: 335–45.

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- <sup>5</sup>Macfarlane AJ, Prasad GA, Chan VW, Brull R. Does regional anesthesia improve outcome after total knee arthroplasty? *Clin. Orthop. Relat. Res.* 2009; 467: 2379–402.
- <sup>6</sup>Stavros G. Memtsoudis, Thomas Danninger, Rehana Rasul, Jashvant Poeran, Philipp Gerner, Ottokar Stundner, Edward R. Mariano, Madhu Mazumdar. Inpatient Falls after Total Knee Arthroplasty. *Anesthesiology*, 2014; 120 (3): 551-563
- Nielsen PT, Jørgensen LN, Albrecht-Beste E, Leffers A, Rasmussen LS. Lower thrombosis risk with epidural blockade in knee arthroplasty. *Acta Orthopaedica Scandinavica*, 1990,61:1, 29-31
- Mitchell D, Friedman, RJ, Baker DJ, Cooke JE, Darcy, MD, Miller MC. Prevention of thromboembolic disease following total knee arthroplasty: Epidural versus general anesthesia. *Clinical Orthopaedics & Related Research*, August 1991; 269:109-112.
- Jorgensen LN, Rasmussen LS, Nielsen PT, Leffers A, Albrecht-Beste E. Antithrombotic efficacy of continuous extradural analgesia after knee replacement. *Br J Anaesth.* 1991/1; 1: 8-12
- Soohoo NF, Lieberman JR, et al. Development of Quality of Care Indicators for Patients Undergoing THR/TKR. *BMJ Qual Saf* 2011;20:153-157
- Premier-IHI *Integrated Care Pathway for Total Joint Arthroplasty* (April 2013)
- Chan, M.H., Chen, W.H., Tung, Y.W., Liu, K., Tan, P.H., Chia, Y.Y. Single-injection femoral nerve block lacks preemptive effect on postoperative pain and morphine consumption in total knee arthroplasty. *Acta Anaesthesiol. Taiwan* 2012/6; 2: 54-58
- Williams-Russo P, Sharrock NE, Haas SB, et al. Randomized Trial of Epidural Versus General Anesthesia: Outcomes After Primary Total Knee Replacement. *Clinical Orthopaedics & Related Research.* 331:199-208, October, 1996.
- National Surgical Quality Improvement Project database
- FORCE-Total Joint Registry database
- Surgical Management of Osteoarthritis of the Knee Evidence-Based Clinical Practice Guideline. Adopted by the American Academy of Orthopaedic Surgeons Board of Directors, 12/4/2015.



## Candidate Performance Measure Profile

**Measure Set:** Advanced Certification for Total Hip & Total Knee Replacement (THKR)

**Measure ID#:** THKR-04

**Performance Measure Name:** Postoperative Mobilization on Day of Surgery

**Description:** Patients undergoing total hip or total knee replacement who mobilized the day of surgery.

**Setting:** Inpatient, Hospital Outpatient Departments, Ambulatory Surgery Centers

**Rationale:** Early mobilization as close to the time of surgery as possible, can reduce the risk of complications associated with bed rest such as deep vein thrombosis, pulmonary embolism, atelectasis, pneumonia and urinary retention. Additionally, early mobilization results in a decreased length of stay, lowering the patient's risk for hospital acquired infections and other complications. Early mobilization leads to improvement in outcomes (range of motion, gait, balance, muscle strength and pain) without an increase in adverse events.<sup>1</sup> Studies demonstrating positive results showed that rapid mobilization can be achieved as early as in the recovery room.<sup>2</sup>

**Type of Measure:** Process

**Improvement Noted As:** An increase in the rate.

**Numerator Statement:** Patients undergoing total hip or total knee replacement who mobilized the day of surgery.

**Included Populations:**

Postoperative mobilization with nursing, physical therapy or other health care provider on the day of surgery includes any of the following activities (with assistive devices and/or physical assist as needed/appropriate for safety):

- Transfer from bed to chair
- Sit out of bed
- Sit to stand
- Stand
- Walk

**Excluded Populations:** None

**Denominator Statement:** Patients undergoing a total hip or total knee replacement.

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**Included Populations:** Patients with an ICD-10-PCS Principal Procedure Code as defined in Appendix A, Table 1 (Total Hip Replacement) or Table 2 (Total Knee Replacement).

**Excluded Populations:**

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patient enrolled in clinical trials
- Postoperative patients who are admitted to ICU the day of surgery
- Documented contraindication by physician/APN/ PA for not mobilizing on day of surgery.
- Patients with an ICD-10-CM Principal or Secondary diagnosis of hip fracture as defined in Appendix A, Table 4 (Hip fracture diagnosis)

**Risk Adjustment:** No

**Data Reported As:** Proportion for hip replacements, proportion for knee replacements and aggregated proportion for hip & knee replacements.

**Selected References:**

- <sup>1</sup>Guerra ML, Singh PJ, Taylor NF. Early mobilization of patients who have had a hip or knee joint replacement reduces length of stay in hospital: A systematic review. *Clin Rehabil.* 2014 Dec 1.
- <sup>2</sup>Tayrose G, Newman D, Slover J, Jaffe F, Hunter T, Bosco J. Rapid Mobilization Decreases Length of Stay in Joint Replacement Patients. *Bulletin of the Hospital for Joint Diseases* 2013;71(3):222-6.
- AAOS Guidelines on Preventing Venous Thromboembolic Disease in Patients Undergoing Elective Hip and Knee Arthroplasty”, AAOS.
- Premier-IHI *Integrated Care Pathway for Total Joint Arthroplasty* (April 2013)
- Soohoo NF, Lieberman JR, et al. Development of Quality of Care Indicators for Patients Undergoing THR/TKR. *BMJ Qual Saf* 2011;20:153-157
- Larsen K, Sorensen, O, Hansen T, Thomsen P, Soballe K. Accelerated perioperative care and rehabilitation intervention for hip and knee replacement is effective: A randomized clinical trial involving 87 patients with 3 months of followup. *Acta Orthopaedica* 79:2, 149-159.
- den Hertog A, Gliesche K, Timm J, Mühlbauer B, Zebrowski. Pathway-controlled fast-track rehabilitation after total knee arthroplasty: a randomized prospective clinical study evaluating the recovery pattern, drug consumption, and length of stay. *Arch Orthop Trauma Surg.* 2012 Aug; 132(8):1153-63.
- Smith TO, McCabe C, Lister *Set al* Rehabilitation implications during the development of the Norwich Enhanced Recovery Programme (NERP) for patients following total knee and total hip arthroplasty. *Orthop Traumatol Surg Res* 2012; 98: 499–505.

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- Raut S, Mertes SC, Muniz-Terrera G, Khanduja V. Factors associated with prolonged length of stay following a total knee replacement in patients aged over 75. *Int Orthop* 2012; 36: 1,601–1,608.
- Raphael M, Jaeger M, van Vlymen J. Easily adoptable total joint arthroplasty program allows discharge home in two days. *Can J Anaesth* 2011; 58: 902–910
- Pua YH, Ong PH. Association of early ambulation with length of stay and costs in total knee arthroplasty: retrospective cohort study. *Am J Phys Med Rehabil* 2014; 93:962-970.
- Chen AF, Stewart MK, Heyl AE, Klatt BA. Effect of Immediate Postoperative Physical Therapy on Length of Stay for Total Joint Arthroplasty Patients. *The Journal of Arthroplasty* 2012;Vol.27 No. 6
- Wellman SS, Murphy AC, Gulczynski D, Murphy SB. Implementation of an accelerated mobilization protocol following primary total hip arthroplasty: impact on length of stay and disposition. *Current Reviews in Musculoskeletal Medicine* Volume 4(3); 2011 Sep
- Renkawitz T, Rieder T, Handel M. Comparison of two accelerated clinical pathways – after total knee replacement how fast can we really go? *Clinical Rehabilitation* 2010; 24:230-239
- Labraca,NS, Castro-Sanchez,AM, Mataran-Penarrocha,G, Arroyo-Morales,M, Sanchez-Joya,M, Moreno-Lorenzo C. Benefits of starting rehabilitation within 24 hours of primary total knee arthroplasty: randomized clinical trial. *Clin Rehabil.* 2011/25(6):557-566
- Surgical Management of Osteoarthritis of the Knee Evidence-Based Clinical Practice Guideline. Adopted by the American Academy of Orthopaedic Surgeons Board of Directors, 12/4/2015.

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**Measure Set:** Advanced Certification for Total Hip & Total Knee Replacement (THKR)

**Measure ID#:** THKR-05

**Performance Measure Name:** Discharged to Home

**Description:** Patients whose preoperative goal (as documented in the medical record) was to be discharged to home and who were discharged to home following total hip or total knee replacement.

**Setting:** Inpatient, Hospital Outpatient Departments, Ambulatory Surgery Centers

**Rationale:** Home-based rehabilitation is increasingly utilized to reduce health-care costs; however, with a shorter hospital stay, the possibility arises for an increase in adverse clinical outcomes. Research has shown that despite concerns about early hospital discharge, there is no difference in pain, functional outcomes, or patient satisfaction between groups that received home-based rehabilitation versus inpatient rehabilitation. Home-based rehabilitation protocol following elective primary total hip or knee replacement is the more cost-effective strategy.<sup>1-2</sup>

According to 2012 Medicare claims data, 49% of patients undergoing hip and knee replacements were discharged to an inpatient rehabilitation facility (IRF) or skilled nursing facility (SNF) for rehabilitation. Therefore, only 51% of patients were discharged to home.

**Type of Measure:** Process

**Improvement Noted As:** An increase in the rate.

**Numerator Statement:** Patients whose preoperative goal (as stated in the medical record) was to be discharged to home and who were discharged to home following total hip or total knee replacement.

**Included Populations:** As above.

**Excluded Populations:** None

**Denominator Statement:** Patients undergoing a total hip or total knee replacement whose preoperative goal) is to be discharged to home

**Included Populations:** Patients with an ICD-10-PCS Principal Procedure Code as defined in Appendix A, Table 1 (Total Hip Replacement) or Table 2 (Total Knee Replacement).

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### Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients enrolled in clinical trials
- Patients undergoing bilateral total knee or total hip replacements
- Patients whose preoperative goal is to be discharged to a destination other than home

### Risk Adjustment: No

**Data Reported As:** Proportion for hip replacements, proportion for knee replacements and aggregated proportion for hip & knee replacements.

### Selected References:

- <sup>1</sup>Mahomed NN, Davis AM, Hawker G, Badley E, Davey JR, Syed KA. et al. Inpatient compared with home-based rehabilitation following primary unilateral total hip or knee replacement: a randomized controlled trial. *J Bone Joint Surg Am.* 2008;90(8):1673–1680.
- <sup>2</sup>Padgett DE, et al. Study: Patients Who Go Home After Knee Replacement Do As Well as Those Discharged to Rehab Facility. Presented at: American Academy of Orthopaedic Surgeons Annual Meeting; March 24-28, 2015; Las Vegas.
- Inpatient Rehabilitation Facility Services: Assessing payment adequacy and updating payments - Report to the Congress: Medicare Payment Policy March 2014
- Mallinson TR, Bateman J, Tseng HY, Manheim L, et al. A Comparison of Discharge Functional Status After Rehabilitation in Skilled Nursing, Home Health, and Medical Rehabilitation Settings for Patients After Lower-Extremity Joint Replacement Surgery. *Arch Phys Med Rehabil* Vol 92, May 2011.

## Candidate Performance Measure Profile

**Measure Set:** Advanced Certification for Total Hip & Total Knee Replacement (THKR)

**Measure ID#:** THKR-06

**Performance Measure Name:** Preoperative Functional/Health Status Assessment as Reported by Patient

**Description:** Percentage of patients who completed a validated pre-operative functional/health status assessment tool 90 days prior to surgery. Examples of validated tools include VR-12, PROMIS Global-10, HOOS/KOOS, HOOS JR/KOOS JR.

**Setting:** Inpatient, Hospital Outpatient Departments, Ambulatory Surgery Centers

**Rationale:** Good orthopedic care requires a knowledge of the patient's history of musculoskeletal pain and associated limitations in daily function. Standardized measures of patient-reported outcomes (PROs) can provide this information. Integrating PROs into routine orthopedic patient visits can provide key information to monitor changes in symptom severity over time, support shared clinical care decisions, and assess treatment effectiveness.<sup>1</sup>

The American Academy of Orthopedic Surgeons and American Association of Hip and Knee Surgeons are very supportive of the Centers for Medicare and Medicaid Services' effort to develop patient-reported functional status outcome measures for total hip and knee arthroplasty. When fully specified and risk-adjusted, these measures will be useful in assessing quality and value of care and will permit performance measurement progression beyond process measures, which are often poorly correlated with outcomes that matter to patients and clinicians.<sup>2-3</sup>

The VR-12 is a generic patient reported outcome (PRO) measure used to measure health related quality of life. This tool, which measures physical function and health status, is widely used and well validated in the total hip and total knee population. Additionally, the Patient Reported Outcomes Measurement Information System (PROMIS) Global-10 instrument, funded by the National Institutes of Health, is increasingly used in the United States. PROMIS instruments use modern measurement theory to assess patient-reported health status for physical, mental, and social well-being to reliably and validly measure patient-reported outcomes (PROs) for clinical research and practice. PROMIS instruments measure concepts such as pain, fatigue, physical function, depression, anxiety and social function.

Hip disability and Osteoarthritis Outcome Score (HOOS) and Knee injury and Osteoarthritis Outcome Score (KOOS) are well validated and widely used instruments for measuring joint-specific pain and physical function before and after joint replacement. While the full HOOS and KOOS surveys are lengthy, the orthopedic

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community prefers an abbreviated survey that captures a subset of items referred to as HOOS JR/KOOS JR.

**Type of Measure:** Process

**Improvement Noted As:** An increase in the rate.

**Numerator Statement:** Patients who completed a validated pre-operative functional/health status assessment tool 90 days prior to surgery. Examples of validated tools include:

- VR-12
- PROMIS Global-10
- HOOS/HOOS JR (hip patients only)
- KOOS/KOOS JR (knee patients only)

**Included Populations:** As above

**Excluded Populations:** None

**Denominator Statement:** Patients undergoing elective total hip or total knee replacement.

**Included Populations:** Patients with an ICD-10-PCS Principal Procedure Code as defined in Appendix A, Table 1 (Total Hip Replacement) or Table 2 (Total Knee Replacement).

**Excluded Populations:**

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients enrolled in clinical trials
- Patients with an ICD-10-CM Principal or Secondary diagnosis of hip fracture as defined in Appendix A, Table 4 (Hip fracture diagnosis)

**Risk Adjustment:** No

**Data Reported As:** Proportion for hip replacements, proportion for knee replacements and aggregated proportion for hip & knee replacements

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### Selected References:

- <sup>1</sup>Ayers DC, Zheng H, Franklin PD. Integrating Patient-reported Outcomes Into Orthopaedic Clinical Practice: Proof of Concept From FORCE-TJR. *Clinical Orthopaedics and Related Research*. 2013;471(11):3419-3425. doi:10.1007/s11999-013-3143-z.
- <sup>2</sup> AAOS letter to Andy Slavitt, Acting Administrator/CMS dated April 3, 2015. Re.: Response during public comment on “Proposed Electronic Clinical Quality Measures for Functional Status Assessment and Improvement for Patients who received a Total Hip Replacement and Functional Status Assessment and Improvement for Patients who received a Total Knee Replacement.”
- <sup>3</sup> AAHKS letter to Andy Slavitt, Acting Administrator/CMS dated March 30, 2015. Re.: Response during public comment on “Proposed Electronic Clinical Quality Measures for Functional Status Assessment and Improvement for Patients who received a Total Hip Replacement and Functional Status Assessment and Improvement for Patients who received a Total Knee Replacement.”
- AAHKS sponsored Patient Reported Outcomes Summit for Total Joint Arthroplasty Report. August 31, 2015.
- FORCE-TJR letter to CMS dated September 3, 2015. Response during public comment on CMS-5516-Proposal for Comprehensive Care for Joint Replacement Payment Model for Acute Care Hospitals Furnishing Lower Extremity Joint Replacement Services.
- AAHKS, AAOS, AJRR letter to Andy Slavitt, Acting Administrator/CMS dated September 8, 2015. Response during public comment on CMS-5516-Proposal for Comprehensive Care for Joint Replacement Payment Model for Acute Care Hospitals Furnishing Lower Extremity Joint Replacement Services.
- AAHKS letter to Andy Slavitt, Acting Administrator/CMS dated September 8, 2015. Response during public comment on CMS-5516-Proposal for Comprehensive Care for Joint Replacement Payment Model for Acute Care Hospitals Furnishing Lower Extremity Joint Replacement Services.