AAOS
American Academy of Orthopaedic Surgeons

2017 Osteoarthritis: Function & Pain Assessment

Measure Methodology Report

Approved by:

The American Academy of Orthopaedic Surgeons Board of Directors, September 2017

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Disclosure Requirement

In accordance with AAOS policy, all individuals whose names appear as authors or contributors to Performance Measures filed a disclosure statement as part of the submission process. All work group members provided full disclosure of potential conflicts of interest prior to voting on the performance measure contained within this methodology report.

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How to Use This Report

This report describes updates that have been made to Measure #109 - Osteoarthritis: Function & Pain Assessment measure (henceforth referred to as the OAFP measure) during the measure reevaluation process. The report provides background information about the measure and its development, a description of the update, the impacts of the changes on the measure cohort and outcome, and overall measure results.

Executive Summary

This report presents the development, testing, and final specifications of a measure of function and pain assessment in patients diagnosed with osteoarthritis. The measure is designed to assess the quality of care provided by a physician. In 2014, the AAOS executed a measure transition agreement with the American Medical Association/Physician Consortium for Performance Improvement (AMA/PCPI) to assume the measure maintenance and stewardship responsibilities for the OAFP Measure. The AAOS Performance Measures Committee along with the Osteoarthritis: Function & Pain Assessment work group was charged with reviewing, updating and validating the OAFP Measure. The purpose of this effort was to provide a validated measure that could continue to be used to improve care for osteoarthritis patients. This provider-level measure will inform patient reported outcomes and help providers improve quality of care.

Rationale for Osteoarthritis: Function & Pain Assessment

Osteoarthritis (OA) is the most common joint pathology in the United States and remains the leading cause of disability among the elderly population.[1] OA is characterized by cell stress and extracellular matrix degradation of the movable joints.[2] The aging population and increasing prevalence of obesity is contributing to the witnessed rise in OA incidence.[3] According to the National Health Interview Survey (NHIS) [1] an estimated 52.5 million (22.7%) adults have been diagnosed with arthritis, of which 22.7 million (9.8%) have some degree of functional disability.[4, 5] As the prevalence and incidence of the disease continues to rise, the proper measurement of OA severity and its impact on health status becomes a crucial component in any orthopaedic practice. The symptomatic manifestations of OA as a combination of pain and stiffness contribute substantially to functional disability, lowering the patient's quality of life. Aligning with a patient-centered healthcare delivery model, the quality and success of interventions aiming to treat OA should be assessed based on outcomes deemed imperative by the patients. Hence, measurement instruments applied in the clinical setting should include patient reported outcome measures (PROMs) pertaining to pain and function.[6, 7]

Evidence Base

In order to develop an OA quality measure that satisfies quality reporting initiatives, a systematic review of the literature was undertaken to identify and evaluate measures of pain and function commonly used assess outcomes in patients with upper and lower extremity OA. **Methods**: English-language systematic reviews and meta-analyses evaluating validity of pain and function instruments in OA patients published between 1995 and 2014 were considered for inclusion in our study. The quality of all included studies was assessed using the Appraisal of Guidelines for Research and Evaluation II Instrument (AGREE II). **Results**: Greater than 90 pain and/or functional assessment tools were evaluated within the 16 systematic reviews included in this analysis. Out of the 16 systematic reviews, 6 articles had high quality study design and the remaining 10 reviews had moderate quality study designs. **Conclusion**: There currently exists no OA pain and functional assessment tool capable of meeting the stringent requirements established by newer quality reporting programs. The use of invalidated or unreliable PROMs may improperly estimate patient pain and functional status, which could affect treatment options, patient satisfaction, reimbursement, and/or quality of life.

Measure Development
AAOS developed the measure consistent with the National Quality Forum (NQF) and CMS's measure development guidance. AAOS' team assembled a team consisting of clinicians, health services researchers and statisticians. AAOS also convened through a public process, a national multidisciplinary Subject Matter Expert (SME) work group consisting of surgeons, clinicians, and methodologists. We also held a public comment period soliciting stakeholder input on the measure methodology.

Work Group Recommendations
The OAFP work group considered and discussed the existing OAFP measure. The key priority for measurement focus on type of function and pain assessment and frequency of function and pain assessment. The OAFP work group recognized a significant gap in the current measure related to the frequency of collecting function and pain assessment. As a result, the work group determined that the existing measure's requirement to collect function and pain assessment at every visit was too burdensome to both the patient and physician and does not add any value to patient care.

Revised Measure Specifications
In brief, the revised measure includes patients aged 21 years and older who have a diagnosis of osteoarthritis of the extremities. This measure is to be reported one time during the measurement period. This measure is a cross-cutting measure because it is broadly applicable across multiple clinical settings and providers within a variety of specialties. The measure outcome is the completion of a patient reported function and pain assessment.

The measure score is a ratio of the predicted to expected number of patients completing a function and pain assessment. The denominator is the number of patients with a diagnosis of OA of the extremities. The numerator is the number of patients with a diagnosis of OA that completed a function and pain assessment. A ratio of less than one indicates fewer OA patients completed a function and pain assessment than expected.

Measure Testing & Results
We tested the final measure specifications against the NQF's criteria for scientific soundness and importance, including evaluating the measure score variation. Using a 5% sample of Medicare data from 2011-2014, the national observed rate of OA function and pain assessment was low. However, when evaluating only the physicians who were aware and/or compliant with the measure it does demonstrate a good distribution of performance. The median ranges varied from one specialty to another and from year to year, and ranged from as low as .21 in the 25^{th} quartile and as high 1 in the 75^{th} quartile through all 4 years.

Summary

In summary, this report describes the final measure specification for an OA function and pain assessment measure at the provider-level. Stakeholder and expert input informed the measure development throughout the process. The measure is scientifically sound and reveals important variation across providers. The intent of this measure is to illuminate variation in quality of care across providers, inform patient-centered care and drive quality improvement.

Introduction

The increasing integration of health care delivery systems provides an opportunity to manage entire episodes of care in a patient-focused manner and to assess the impact of care on patient outcomes, including patient-reported outcomes (PROs). [8] Patient-reported outcome measures (PROMs) are measurement instruments that patients complete, typically pre- and post-intervention. PROMs provide insight on the effectiveness of care from patients' perspectives and complement existing clinical and administrative information to support the evaluation of health system performance.

Performance measurement has traditionally relied on routinely collected clinical information such as rates of hospital readmission, infections, procedural complications, survival, or laboratory values. But the ultimate impact on outcomes experienced by patients, such as symptoms, functional status, and health-related quality of life, have rarely been assessed. A *PRO* is defined as information about the status of a patient's health condition that comes directly from the patient, without interpretation of the patient's response by a clinician or anyone else. A P*atient-Reported Outcome Measure* (PROM) is a questionnaire used to elicit information directly from respondents. PRO measurement is already common in clinical trials and is of rising interest in comparative effectiveness research, routine clinical practice, and electronic medical record systems. Beyond patient-centeredness, there are additional rationales to include PROs in performance measurement. Recent data suggest that patients' self-reported symptoms and health status are associated with the use of medical services (e.g., emergency room visits and hospitalizations), costs, outpatient medication compliance, and survival.[9] The process of patient self- reporting itself can improve symptom management, quality of life, communication, and satisfaction with care. [10] Moreover, symptoms and functional status impairment are far more com- mon than serious complications of treatment, such as hospitalizations or death. [11]

In this report, we outline the final specifications for a quality measure of function and pain assessment in patients with OA of the extremities. This measure uses nationwide Medicare claims data form Medicare FFS patients aged 65 years and older. Providing performance rates to providers will make it visible to the provider's meaningful quality differences and incentivize improvement.

Methods

Measure Development Process
AAOS led the development of the measure. The AAOS team consisted of a multi-disciplinary team of clinicians, health services researchers, and statisticians. AAOS obtained input from three surgical consultants during the development. AAOS also convened, through a public process, a multi-disciplinary work group of subject matter experts including; clinicians, surgeons, methodologists, and researchers to provide input on the measure methodology. Additionally, AAOS held a public comment period soliciting stakeholder input on the measure methodology.

Data Sources
Consistent with scientific consensus standards for publicly reported measures we sought to define a clinically coherent group of patients for inclusion in the measure. Data sources must have the ability to link patient data across care settings to identify appropriate patients for inclusion. We therefore used claims/administrative data, as it supports the linkage and is available for all enrolled Medicare FFS patients.

To develop and test the patient-level model, AAOS used 2011-2013 claims data from the Medicare Carrier (Part B Physicians) Standard Analytical Files (SAF). We identified outpatient encounters using Medicare 5% FFS sample of beneficiaries' claims from the Carrier SAF. The data represented 5% of the of the United States Medicare/Medicaid population for each year and the number of patient visits ranged from 1 to 52 on an annual basis (Table 1.).

Table 1. Description of CMS Data Files

Year	CMS Carrier File	Size	CMS Denominator File
2011	5% Carrier File	N= 15,800,283	CMS Patient Demographics
2012	5% Carrier File	N= 91,216,321	CMS Patient Demographics
2013	5% Carrier File	N= 94,160,067	CMS Patient Demographics
2014	5% Carrier File	N= 95,476,402	CMS Patient Demographics

The measure cohort included all patients 21 years and older who received a diagnosis of OA of any extremity who received a pain and function assessment.

Study Cohort
The target population for this measure is patients aged 21 years and older with a diagnosis of OA of any extremity. We chose the Medicare FFS population because of the availability of a national dataset (Medicare claims) that could be used to develop, test, and publicly report the measure. We define the target population based on the following inclusion and exclusion criteria.

Inclusion Criteria
This measure is to be reported **one time** during the reporting period for patients with a diagnosis of OA seen during the 12 month reporting period. This measure may be reported by clinicians who perform the quality actions described in the measure based on the services provided and the measure-specific denominator coding.

Measure Reporting via Claims:
ICD-10-CM diagnosis codes, CPT codes, and patient demographics are used to identify patients who are included in the measure's denominator. CPT Category II codes are used to report the numerator of the measure.
When reporting the measure via claims, submit the listed ICD-10-CM diagnosis codes, CPT codes, and the appropriate CPT Category II code OR the CPT Category II code with the modifier. The reporting modifier allowed for this measure is: 8P- reason not otherwise specified. There are no allowable performance exclusions for this measure. All measure-specific coding should be reported on the claim(s) representing the eligible encounter.

Measure Reporting via Registry:
ICD-10-CM diagnosis codes, CPT codes, and patient demographics are used to identify patients who are included in the measure's denominator. The listed numerator options are used to report the numerator of the measure.

The quality-data codes listed do not need to be submitted for registry-based submissions; however, these codes may be submitted for those registries that utilize claims data. There are no allowable performance exclusions for this measure.

Numerator Statement: Patient visits with assessment for level of function and pain documented (includes the use of a standardized scale or the completion of an assessment questionnaire, such as VR12, AAOS Hip & Knee Questionnaire, PROMIS).

NUMERATOR NOTE: *For the purposes of this measure, the method for assessing function and pain is left up to the discretion of the individual clinician and based on the needs of the patient. The assessment may be done via a validated instrument that measures pain and various functional elements including a patient's ability to perform activities of daily living (ADLs).*

Acceptable assessments for ***Pain Assessment*** *include the following:*

- Visual Analog Scale (VAS)
- PROMIS
- Numeric Pain Rating System

Acceptable assessments for ***Functional Assessment*** *include the following:*

General Quality of Life

- Veterans RAND 12 (VR-12)
- PROMIS (PROMIS 10 or CAT)
- EuroQol-5D (EQ-5D)

Treatment Outcome

- Single Assessment Numeric Evaluation (SANE)

Foot and Ankle

- Foot and Ankle Ability Measure (FAAM)
- Foot and Ankle Disability Index (FADI)

Knee (Anterior Cruciate Ligament)

- International Knee Documentation Committee (IKDC) Subjective Knee Form (Pedi-IKDC)
- Marx Activity Rating Scale

Knee (Osteoarthritis)

- Knee Injury and Osteoarthritis Outcome Score (KOOS)
- Knee Injury and Osteoarthritis Outcome Score Jr. (KOOS Jr.)

Hip (Osteoarthritis)

- Hip Disability and Osteoarthritis Outcomes Survey (HOOS)
- Hip Disability and Osteoarthritis Outcomes Survey Jr. (HOOS Jr.)

Shoulder

- American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form (ASES)
- Oxford Shoulder Score (OSS)

Shoulder (Instability)

- American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form (ASES)
- Western Ontario Shoulder Instability Index (WOSI)

Elbow

- Disabilities of the Arm, Shoulder, and Hand Score (DASH)
- Quick-DASH

Wrist

- Disabilities of the Arm, Shoulder, and Hand Score (DASH)
- Quick-DASH

Hand

- Disabilities of the Arm, Shoulder, and Hand Score (DASH)
- Quick-DASH

Numerator Quality-Data Coding Options for Reporting Satisfactorily:
Osteoarthritis Symptoms and Functional Status Assessed
Performance Met: **CPT II 1006F**: Osteoarthritis symptoms and functional status assessed (may include the use of a standardized scale or the completion of an assessment questionnaire, such as the VR12, AAOS Hip & Knee Questionnaire, PROMIS)
OR
Osteoarthritis Symptoms and Functional Status not Assessed, Reason not Otherwise Specified
Append a reporting modifier (**8P**) to CPT Category II code **1006F** to report circumstances when the action described in the numerator is not performed and the reason is not otherwise specified.
Performance Not Met: **1006F *with* 8P:** Osteoarthritis symptoms and functional status not assessed, reason not otherwise specified.

Denominator Statement: All patient visits for patients aged 21 years and older with a diagnosis of Osteoarthritis.

Denominator Criteria (Eligible Cases):
Patients aged ≥ 21 years on date of encounter

AND
Diagnosis for osteoarthritis (OA) (ICD-9-CM) [for use 1/1/2015-9/30/2015]: 715.00, 715.04, 715.09, 715.10, 715.11, 715.12, 715.13, 715.14, 715.15, 715.16, 715.17, 715.18, 715.20, 715.21,715.22, 715.23, 715.24, 715.25, 715.26, 715.27, 715.28, 715.30, 715.31, 715.32, 715.33, 715.34,715.35, 715.36, 715.37, 715.38, 715.80, 715.89, 715.90, 715.91, 715.92, 715.93, 715.94, 715.95,715.96, 715.97, 715.98

And/or
Diagnosis for osteoarthritis (OA) (ICD-10-CM): M15.0, M15.1, M15.2, M15.3, M15.4, M15.8, M15.9, M16.0, M16.10, M16.11, M16.12, M16.2, M16.30, M16.31, M16.32, M16.4, M16.50, M16.51, M16.52, M16.6, M16.7, M16.9, M17.0, M17.10, M17.11, M17.12, M17.2, M17.30, M17.31, M17.32, M17.4, M17.5, M17.9, M18.0, M18.10, M18.11, M18.12, M18.2, M18.30, M18.31, M18.32, M18.4, M18.50, M18.51, M18.52, M18.9, M19.011, M19.012, M19.019, M19.021, M19.022, M19.029, M19.031, M19.032, M19.039, M19.041, M19.042, M19.049, M19.071, M19.072, M19.079, M19.111, M19.112, M19.119, M19.121, M19.122, M19.129, M19.131, M19.132, M19.139, M19.141, M19.142, M19.149, M19.171, M19.172, M19.179, M19.211, M19.212, M19.219, M19.221, M19.222, M19.229, M19.231, M19.232, M19.239, M19.241, M19.242, M19.249, M19.271, M19.272, M19.279, M19.90, M19.91, M19.92, M19.93

AND

Patient encounter during the reporting period (CPT): 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215

Exclusion Criteria
There are no exclusions for this measure.

Reliability and Validity

Reliability
Reliability was calculated according to the methods outlined in a technical report prepared by J.L. Adams titled "The Reliability of Provider Profiling: A Tutorial" (RAND Corporation, TR-653-NCQA, 2009). In this context, reliability represents the ability of a measure to confidently distinguish the performance of one physician from another. As discussed in the report: "Conceptually, it is the ratio of signal to noise. The signal in this case is the proportion of variability in measured performance that can be explained by real differences in performance. There are 3 main drivers of reliability; sample size, differences between physicians, and measurement error."

According to this approach, reliability is estimated with a beta-binomial model. The beta-binomial model is appropriate for measuring the reliability of pass/fail measures such as those proposed.

Validity
Empirical analysis of the CMS measure 109 that demonstrates that data are correct and/or conclusions about quality of care based on the computed measure score are correct. Validity testing focuses on systematic errors and bias. It involves testing agreement between the data elements obtained when implementing the measure as specified and data from another source of known accuracy. Validity of computed measure scores involves testing hypotheses of relationships between the computed measure scores as specified and other known measures of quality or conceptually related aspects of quality. A variety of approaches can provide some evidence for validity. The specific terms and definitions used for validity may vary by discipline, including face, content, construct, criterion, concurrent, predictive, convergent, or discriminant validity.

Statistical Software
All statistical analyses were performed using Statistical Analysis system (SAS) version 9.4 (SAS institute Inc., Cary NC).

Results

Patient/Provider Samples
When the inclusion criteria are applied to the 2011-2014 datasets the numbers of the diagnosed population can be found in Table 2.

Table 2. Descriptions of Included Populations

Year	Patient Sample Diagnosed	Patient Sample Assessed	Mean Age of Patients	# of Physicians Being Measured	# of Orthopedic Surgeons Being Measured	# of Non-Orthopedic Surgeons Being Measured
2011	613240	6700	74.2±10.8	9510	4100	5410
2012	331280	4748	71.55±12.4	7081	4112	2969
2013	330729	6295	71.4±12.31	10391	6417	3974
2014	330484	8835	71.4± 12.2	14542	8882	5660

Reliability

Physician specific reliability is around .7 for each year except for 2010, and thus can be considered to be good. Reliability scores vary from 0.0 to 1.0, with a score of zero indicating that all variation is attributable to measurement error (noise, or variation across patients within providers) whereas a reliability of 1.0 implies that all variation is caused by real difference in performance across accountable entities. There is not a clear cut-off for minimum reliability level. Values of 0.7, however, are considered sufficient to see differences between some physicians and the mean (see RAND tutorial, 2009). The Results of the Signal to Noise analysis can be found in Table 3.

Table 3. Reliability Statistics from the Signal to Noise Analysis

Year	# of Physicians	Reliability Statistic from signal-to-noise analysis (95% Cl)
2011	9510	.79 (.75,.83)
2012	7081	.7 (.68,.73)
2013	10391	.66 (.64,.68)
2014	14542	.67 (.65,.69)

Validity

Validity testing of the physician scores on the process measure of the assessment of osteoarthritis of the extremities was conducted by evaluating the differences between means of the measure construct. Testing the hypothesis evaluating the patients that were assessed by orthopedists compared to non-orthopedists using the orthopedists as the reference standard and the assumption that they perform more pain and function assessments than non-orthopedists (Table 4).

Table 4. Descriptions of Included populations

Year	Orthopedic Mean	Orthopedic Standard Deviation	Non-Orthopedic Mean	Non-Orthopedic Standard Deviation	Mean Difference	95%Cl
2011	0.00983	0.094	0.006554	0.078	0.00328	(0.0009257,0.0056263)
2012	0.012	0.10118	0.0053	0.06708	0.0067	(0.0050399,0.0083601)
2013	0.017	0.117	0.006656	0.075	0.01034	(0.0084354,0.0122526)
2014	0.023	0.135	0.012	0.1	0.011	(0.0087549,0.0132451)

Amongst the patients that were diagnosed with osteoarthritis and evaluated by both a non-orthopedist and an orthopedist the numbers were decisively low for those patients assessed for pain and function. We believe that the diagnosis of osteoarthritis should be accompanied by an assessment of pain and function so that quality improvement can be ascertained from subsequent assessments.

Performance Scores

Due to the low compliance rate of this measure it appears that evaluating every physician that diagnosed a case of osteoarthritis it does not demonstrate a good distribution of performance scores Table 5.1. However, when evaluating only the physicians who were aware and/or compliant with the measure it does demonstrate a good distribution of performance. The median ranges varied from one specialty to another and from year to year, and ranged from as low as .21 in the 25th quartile and as high 1 in the 75th quartile through all 4 years.

Table 5.1 Minimum to Maximum Ranges of Performances scores for All Physicians

Year		Mean	SD	Max	99%	95%	90%	75%Q3	50% Median	25% Q1	10%	5%	1%	Min
2011	Combined	0.0077	0.084	1	0	0	0	0	0	0	0	0	0	0
	Orthopaedists	0.0098	0.094	1	0.5	0	0	0	0	0	0	0	0	0
	Non-orthopaedists	0.0065	0.078	1	0	0	0	0	0	0	0	0	0	0
2012	Combined	0.007	0.077	1	0	0	0	0	0	0	0	0	0	0
	Orthopaedists	0.012	0.10118	1	0.76	0	0	0	0	0	0	0	0	0
	Non-orthopaedists	0.0067	0.067	1	0	0	0	0	0	0	0	0	0	0
2013	Combined	0.009	0.088	1	0.36	0	0	0	0	0	0	0	0	0
	Orthopaedists	0.017	0.117	1	0.89	0	0	0	0	0	0	0	0	0
	Non-orthopaedists	0.0066	0.075	1	0	0	0	0	0	0	0	0	0	0
2014	Combined	0.014	0.11	1	0.857	0	0	0	0	0	0	0	0	0
	Orthopaedists	0.023	0.135	1	0.96	0	0	0	0	0	0	0	0	0
	Non-orthopaedists	0.012	0.1	1	0.67	0	0	0	0	0	0	0	0	0

Table 5.2 Minimum to Maximum Ranges of Performances scores for Participating Physicians

Year		Mean	SD	Max	99%	95%	90%	75%Q3	50% Median	25% Q1	10%	5%	1%	Min
2011	Combined	0.7	0.34	1	1	1	1	1	0.89	0.43	0.14	0.1	0.07	0.07
	Orthopaedists	0.65	0.35	1	1	1	1	1	0.73	0.33	0.095	0.069	0.069	0.069
	Non-orthopaedists	0.75	0.32	1	1	1	1	1	0.96	0.5	0.2	0.13	0.125	0.125
2012	Combined	0.67	0.33	1	1	1	1	0.95	0.81	0.36	0.17	0.06	0.03	0.02
	Orthopaedists	0.69	0.33	1	1	1	1	0.96	0.86	0.42	0.13	0.049	0.015	0.015
	Non-orthopaedists	0.64	0.32	1	1	1	1	0.95	0.73	0.33	0.19	0.11	0.06	0.05
2013	Combined	0.61	0.36	1	1	1	1	0.94	0.75	0.23	0.09	0.04	0.02	0.01
	Orthopaedists	0.61	0.36	1	1	1	1	0.94	0.77	0.27	0.07	0.04	0.03	0.02
	Non-orthopaedists	0.6	0.36	1	1	1	1	0.95	0.71	0.21	0.098	0.059	0.013	0.013
2014	Combined	0.61	0.34	1	1	1	1	0.94	0.67	0.27	0.09	0.05	0.02	0.01
	Orthopaedists	0.6	0.34	1	1	1	1	0.94	0.69	0.27	0.1	0.04	0.02	0.02
	Non-orthopaedists	0.62	0.34	1	1	1	1	0.98	0.67	0.31	0.13	0.07	0.01	0.01

Summary

OA remains the most common cause of disability in adults in the United States.
By 2030, the number of adults affected with doctor-diagnosed arthritis is projected to reach 67 million, or 25% of the adult population. Corresponding arthritis-attributable activity limitation is projected to reach 25 million, meaning that 9.3 % of all adults will be affected. [12] Although data about patients' impressions of or experiences with care delivery (i.e. satisfaction) are routinely collected, reports about symptoms, functional status, or quality of life are not as confirmed the low compliance rate with this measure. More importantly, our analysis demonstrates this measure as specified has the potential to illuminate these quality differences, inform patient choice, and drive quality improvement with the ultimate goal of reducing unplanned hospital visits following outpatient surgery.

Summary of Non-Material Interest Disclosures

CONFLICT OF INTEREST
Prior to the development of this performance measures, performance measure development group members disclose conflicts of interest (COI). They disclose COIs in writing to the American Academy of Orthopaedic Surgeons via a private on-line reporting database and also verbally at the recommendation approval meeting. Disclosure Items: (n) = Respondent answered 'No' to all items indicating no conflicts. 1 = Royalties from a company or supplier; 2 = Speakers bureau/paid presentations for a company or supplier; 3A = Paid employee for a company or supplier; 3B = Paid consultant for a company or supplier; 3C = Unpaid consultant for a company or supplier; 4 = Stock or stock options in a company or supplier; 5 = Research support from a company or supplier as a PI; 6 = Other financial or material support from a company or supplier; 7 = Royalties, financial or material support from publishers; 8 = Medical/Orthopaedic publications editorial/governing board; 9 = Board member/committee appointments for a society

None of the members of the OAFP Work Group had any disqualifying material interests under the PCPI Conflict of Interest Policy. The following is a summary of non-disqualifying interests disclosed on Work Group Members' Material Interest Disclosure Statements (not including information concerning family member interests). Completed Material Interest Disclosure Statements are available upon request.

Enhanced Disclosure Information
for DISCLRSRCHWKGRP Customers

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  IMC/Health Access Services: Unpaid consultant
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  American Orthopaedic Association: Board or committee member; Board or committee member; Board or committe member; Board or committee ($0) Executive Committee(Self)
  American Orthopaedic Association Finance Committee: Board or committee member ($0)
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  Journal of Bone and Joint Surgery - American: Editorial or governing board ($0)
  Memorial Medical Center Co-Management Orthopaedic Board: Paid consultant ($0)
  NIH NIAMS (R0-1): Research support ($0)
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  OREF Clinical Research Awards Committee: Board or committee member ($0)
  Orthopaedic Research and Education Foundation Industry Relations Committee: Board or committee member ($0
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Appendix A

REVIEW OF DATA WITH LITERATURE APPRAISAL ON PAIN AND FUNCTION ASSESSMENTS FOR PATIENTS WITH OSTEOARTHRITIS

This rapid systematic review was completed to supplement the AAOS performance measure on the clinical use of pain and function assessments in patients with osteoarthritis.

Contents

Performance Measure Definition

The AAOS agreed to steward PQRS measure 109 on functional and pain assessments, as they relate to patients with osteoarthritis. The criteria defining the measure are listed below.

Denominator

- Patients age ≥ 21 on the date of the encounter and
- A diagnosis of Osteoarthritis of either the upper or lower extremities (hand, wrist, elbow, shoulder, foot, ankle, knee, hip)

Numerator

- Patient visits with **assessment for level of function and pain** documented
- Any type of assessment can be used; both validated instruments as well as assessment of functional elements such as Activities of Daily Living (ADLs).
    - Validated assessments include (this is not an exhaustive list):
        - DASH (Disabilities of the Arm, Shoulder and Hand
        - Hip and Knee Questionnaire
        - Lower Limb Questionnaire
        - Foot and Ankle Questionnaire

Exclude:

- Spine
- Pediatrics

Methodology for Establishing an Evidence Base for this Measure

The methodology used to construct the evidence-base for the original PQRS measure was unavailable to AAOS staff. A review of published systematic reviews addressing management of osteoarthritis (OA) was conducted to evaluate any evidence findings supporting the benefits of using pain and functional assessments for patients with osteoarthritis of any extremity (excluding spine and pediatric patients, per the measure criteria).

To identify possibly relevant systematic reviews, the AAOS medical librarian conducted an abstract search on 12/22/2014 for published systematic reviews that addressed any topics regarding OA of any extremity, except for spine and pediatric patients (see Appendix I for literature search report). The search returned 2,145 abstracts.

After the search results were returned, AAOS EBM analysts reviewed the abstracts and recalled the full text articles for any abstracts that contained any of the key terms listed in Appendix II in the article title or abstract. The articles not containing the key terms in the title or abstract were reviewed separately and their full text was recalled if deemed relevant. A total of 92 systematic reviews were recalled (view the study attrition chart in Appendix III). After the full text articles were recalled, the EBM analysts included 16 reviews which contained information regarding pain and functional assessments and appraised the design of these systematic reviews using the Appraisal of Guidelines for Research and Evaluation II Instrument (AGREE II). After quality evaluation, the EBM analysts extracted any findings reported by the systematic reviews that addressed the question of interest (i.e. assessment of pain or functional tests for OA patients). The findings were then collated into a final report for review by the clinician work group assigned to this performance measure.

Results of Quality Appraisal

The study design and methodology for all included systematic reviews were evaluated using the Appraisal of Guidelines for Research & Evaluation II Instrument (AGREE II). The AGREE II criteria evaluate the design of the literature reviews addressing on 23 methodological domains (see Table 3). Six out of the 16 literature reviews had high quality study design and the remaining 10 reviews had moderate quality study designs.

Table 1. Quality Visuals Key

	No Flaw in Domain	Half Flaw in Domain (unclear)	Full Flaw in Domain
Quality Visual	●	◑	○

Table 2a. Quality Scoring

High Quality Study	<3 Flaw
Moderate Quality Study	≥3 and <7 Flaws
Low Quality Study	≥7 and <11 Flaws
Very Low Quality Study	≥11 Flaws

Table 2b. AGREE II Instrument Domain Key

Question #	Domain	Question
Q1	Scope and Purpose	The overall objective(s) of the guideline is (are) specifically described.
Q2	Scope and Purpose	The health question(s) covered by the guideline is (are) specifically described.
Q3	Scope and Purpose	The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described.
Q4	Stakeholder Involvement	The guideline development group includes individuals from all relevant professional groups.
Q5	Stakeholder Involvement	The views and preferences of the target population (patients, public, etc.) have been sought.
Q6	Stakeholder Involvement	The target users of the guideline are clearly defined.
Q7	Rigour of Development	Systematic methods were used to search for evidence.
Q8	Rigour of Development	The criteria for selecting the evidence are clearly described.
Q9	Rigour of Development	The strengths and limitations of the body of evidence are clearly described.
Q10	Rigour of Development	The methods for formulating the recommendations are clearly described.
Q11	Rigour of Development	The health benefits, side effects, and risks have been considered in formulating the recommendations.
Q12	Rigour of Development	There is an explicit link between the recommendations and the supporting evidence.
Q13	Rigour of Development	The guideline has been externally reviewed by experts prior to its publication.
Q14	Rigour of Development	A procedure for updating the guideline is provided.
Q15	Clarity of Presentation	The recommendations are specific and unambiguous.
Q16	Clarity of Presentation	The different options for management of the condition or health issue are clearly presented.
Q17	Clarity of Presentation	Key recommendations are easily identifiable.
Q18	Applicability	The guideline describes facilitators and barriers to its application.
Q19	Applicability	The guideline provides advice and/or tools on how the recommendations can be put into practice.
Q20	Applicability	The potential resource implications of applying the recommendations have been considered
Q21	Applicability	The guideline presents monitoring and/or auditing criteria.
Q22	Editorial Independence	The views of the funding body have not influenced the content of the guideline.
Q23	Editorial Independence	Competing interests of guideline development group members have been recorded and addressed.

Table 3. Quality Evaluation Results

Study	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Overall Quality
Cibulka, M., 2009	●	●	●	●	●	●	●	●	◑	●	●	●	●	●	●	●	●	●	●	◑	●	◑	◑	High Quality
Busija,L., 2013	●	●	●	●	◑	●	●	●	●	●	●	●	●	●	●	●	●	◑	●	●	○	◑	◑	Moderate Quality
Dobson,F., 2012	●	●	●	●	◑	●	●	●	●	●	●	●	●	◑	●	●	●	●	●	●	◑	●	●	High Quality
Dziedzic,K.S., 2005	●	●	●	●	●	●	●	●	●	●	●	●	◑	◑	●	●	●	●	●	●	◑	●	◑	High Quality
Juhl,C., 2012	●	●	●	●	●	◑	●	●	●	◑	●	●	◑	●	●	●	●	●	●	●	●	●	●	High Quality
Lin,F.J., 2013	●	●	●	◑	◑	●	●	●	○	●	●	●	◑	○	◑	●	●	◑	●	●	○	◑	◑	Moderate Quality
Marks,M., 2013	●	●	●	◑	◑	●	●	●	●	●	●	●	◑	◑	●	●	●	●	●	●	○	●	◑	Moderate Quality
Naal,F.D., 2010	●	●	●	●	●	●	●	●	●	◑	●	●	◑	◑	●	◑	●	◑	●	●	◑	●	◑	Moderate Quality
Peer,M.A., 2013	●	●	●	◑	◑	●	●	●	●	●	●	●	◑	○	●	●	●	◑	●	●	○	●	●	Moderate Quality
Saha,S., 2014	●	●	●	◑	◑	●	●	●	●	●	●	●	●	●	●	◑	●	●	●	●	○	◑	◑	Moderate Quality
Sun,Y., 1997	●	●	●	◑	●	◑	●	◑	●	●	●	●	◑	●	●	●	●	●	●	●	●	◑	◑	Moderate Quality
Terwee,C.B., 2011	●	●	●	◑	◑	●	●	●	●	●	●	●	◑	○	●	◑	●	◑	●	●	○	●	◑	Moderate Quality
Thorborg,K., 2010	●	◑	●	◑	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	High Quality
Veenhof,C., 2006	●	●	●	●	●	◑	●	●	●	●	●	●	○	●	●	●	●	●	●	●	●	◑	◑	High Quality
Wang,D., 2010	●	●	●	◑	◑	●	●	●	○	●	●	●	◑	○	●	●	●	◑	●	●	○	●	●	Moderate Quality
Woolacott,N.F., 2012	●	●	●	◑	◑	●	●	●	●	●	●	●	◑	○	●	◑	●	◑	●	●	○	●	○	Moderate Quality

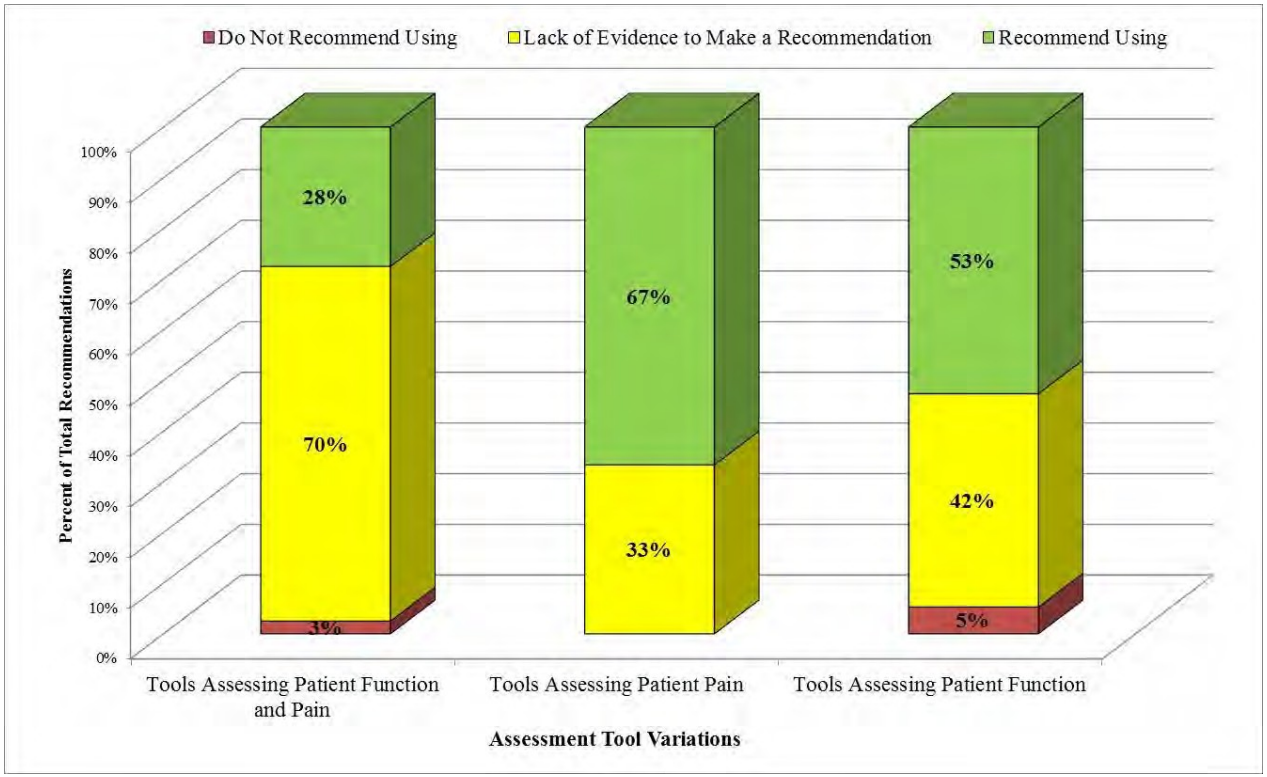
Results

Summary of Findings

The rapid systematic review returned 16 relevant published reviews/guidelines which contained recommendations on using assessment tools that measured pain, function, or both pain and function for adult patient populations with osteoarthritis. More than 90 various assessment tools were evaluated within the 16 reviews/guidelines included in this analysis. The summary of recommendations for using tools assessing pain, function, or both pain and function is listed in Table #4 and the detailed findings are listed in Tables 5-7.

Of the 40 various assessment tools reviewed in the included literature that assessed both patient function and pain, 28% of the reviews recommended their use, 70% of the reviews could not form a recommendation due to a lack of evidence, and 3% of the reviews did not recommend their use. Of the 30 various assessment tools reviewed that assessed patient pain, 67% of the reviews recommended using, 33% of the reviews could not form a recommendation due to a lack of evidence, and none of the reviews recommended against their use. And of the 38 various tools reviewed that assessed patient function, 53% of the reviews recommended their use, 42% could not form a recommendation due to a lack of evidence, and 5% of the reviews did not recommend theiruse.

Table 4. Percentage Breakdown of Evidence-Based Pain and/or Function Assessment Tool Recommendations



Detailed Report of Findings

Table 5. Findings Regarding Assessment Tools Measuring Both Pain and Functional Outcomes

First Author	Pain/Function Outcome Tool or Scale	Domain of Pain, Function, or Both	PRO Recommended YES/NO/LE (LE = Lacking Evidence)	Patient Population	Qualitative Conclusions	Statistical Conclusions
Cibulka, M	HHS	**Both**	**YES**	Hip	Validated functional outcome measure	
Cibulka, M	WOMAC	**Both**	**YES**	Hip	Validated functional outcome measure	Test/retest reliability (ICC) = 0.74-0.89. MCID range: 12-22%
Busija,L	Personal Burden of Osteoarthritis	**Both**	**LE**	All OA	Weak coverage of PBO domains by questionnaires. Preliminary evidence for relevance as all concepts present in other questionnaires; further studies needed to assess relevance and performance	
Dziedzic K	AIMS1/2	**Both**	**YES**	Hand OA	Positive outcome measures: internal consistency, reliability	GERI AIMS: independent living (mean = 1.37, SD = 2.09), homebound (mean =3.51, SD = 3.89) and institutionalised (mean = 2.13, SD = 2.70) Test/re-test reliability correlation in arthritis: mean= 0.87
Dziedzic K	AUSCAN	**Both**	**YES**	Hand OA	Positive outcome measures: construct validity, internal consistency	Test- retest (1 week) reliability high for AUSCAN and for sub-scales (ICC = 0.70 to 0.90); Inter-rater reliability at interval of 1 h, was high (ICC = 0.96); Cronbach's alpha: (0.90 to 0.98)
Fang-Ju, L; Longworth, L; Pickard, A	EQ-5D	**Both**	**LE**	General health-related QOL including all OA	Among the studies on OA that used DSPM, no DSPM dimensions were missing from EQ-5D	Among the studies on OA the used DSPM: goodness-of-fit for EQ-5D (adjusted R^2 = 0.313 - 0.449) and (RMSE = 0.095 - 0.21)
Marks,M	AUSCAN	**Both**	**LE**	Trapeziometacarpal OA	Positive outcome measures: construct validity. Doubtful interpretability	

First Author	Pain/Function Outcome Tool or Scale	Domain of Pain, Function, or Both	PRO Recommended YES/NO/LE (LE = Lacking Evidence)	Patient Population	Qualitative Conclusions	Statistical Conclusions
Marks,M	CMC Grind Test	**Both**	**LE**	Trapeziometacarpal OA		
Marks,M	OMERACT	**Both**	**LE**	Trapeziometacarpal OA	Positive outcome measures: internal consistency, construct validity, reproducibility. Negative outcome measures: responsiveness and floor or ceiling effect. Doubtful interpretability	
Marks,M	PRWE	**Both**	**LE**	Trapeziometacarpal OA	Positive outcome measures: internal consistency and criterion validity. Doubtful: construct validity	
Marks,M	quickDASH	**Both**	**LE**	Trapeziometacarpal OA	Positive outcome measure: internal consistency. Negative: floor or ceiling effect. Doubtful: construct validity	
Marks,M	SF-36	**Both**	**NO**	Trapeziometacarpal OA	Doubtful: criterion validity. Negative: reproducibility.	
Naal, F	AOFAS hindfoot score	**Both**	**LE**	Ankle OA	Positive outcome rating: floor and ceiling effects, responsiveness	Test-retest mean scores 45- 49 points. Construct validity correlations: Mod with FFI (r = -0.68), weak to mod with QUALY (r^2 = 0.22-0.47), weak with MFA domains (up to r = -0.32), weak to mod with SF-36 (up to r = 0.58). Responsiveness: 6m after TAA, ES=1.12-2.15), 24m after TAA, ES=2.39

First Author	Pain/Function Outcome Tool or Scale	Domain of Pain, Function, or Both	PRO Recommended YES/NO/LE (LE = Lacking Evidence)	Patient Population	Qualitative Conclusions	Statistical Conclusions
Naal, F	FFI	**Both**	**LE**	Ankle OA	Responsiveness: low to mod changes after 8 weeks in patients subjectively improved, unchanged, or deteriorated. Positive outcome rating: reliability, internal consistency, content validity, construct validity, pain subset of responsiveness. Negative outcome rating: criterion validity.	Test/retest reliability (ICC) = 0.7-0.99, alpha = (0.93-0.96). Internal consistency: Cronbach's alpha 0.73-0.96. Agreement (total): -0.2 +/- 2.1. No to mild floor effects, ceiling effects. Criterion validity: mod correlation with 50ft walking time (r = 0.31-0.48), painful foot joint count (r=0.53), low correlation with grip strength (r= -0.47). Construct validity: mod to high correlations with SF-36 (r = -0.51- -0.8), high correlation with VAS (up to r = 0.81); mod correlations with UCLA activity scale (up to r = -0.56). Responsiveness: 6m after surgery, ES (-0.55- -0.86), SRM (-0.39- -0.83)
Naal, F	Kofoed ankle score	**Both**	**LE**	Ankle OA	Literature provides no evidence of validity, reliability, responsiveness or interpretability of scores	
Sun, Y	Lequesne L-ISH	**Both**	**LE**	Hip/Knee OA	Acceptable outcome measures: inter-rater reliability.	Inter-rater reliability: gamma=1.0 for pain, 0.99-1.0 for function, 1.0 for clinical signs.
Sun, Y	Lequesne L-ISK	**Both**	**YES**	Hip OA	Acceptable outcome measures: inter-rater reliability, responsiveness, and content validity	Inter-rater reliability: no systematic difference between raters. Content and/or construct validity: significant for all but abduction and flexion
Sun, Y	Oberg	**Both**	**YES**	Knee OA	Acceptable outcome measures: inter-rater reliability, responsiveness, and content validity	Inter-rater reliability: no systematic difference between raters. Content and/or construct validity: significant for all but morning stiffness, limitation of flexion, and pain on flexion/extension

First Author	Pain/Function Outcome Tool or Scale	Domain of Pain, Function, or Both	PRO Recommended YES/NO/LE (LE = Lacking Evidence)	Patient Population	Qualitative Conclusions	Statistical Conclusions
Sun, Y	WOMAC	**Both**	**YES**	Hip/Knee OA	Acceptable outcome measures: test-retest reliability, responsiveness,	Test/retest reliability (ICC) = 0.68/0.64[3] for pain, 0.48/0.61[3] for stiffness, and 0.68/0.72[3] for function
Thorborg, T	AAOS-HS	**Both**	**LE**	Hip OA	Positive outcome measures: inter-tester reliability	
Thorborg, T	LISH	**Both**	**LE**	Hip OA		
Thorborg, T	WOMAC	**Both**	**YES**	Hip OA	Negative: ceiling effects	
Veenhof, C	A Patient-Based Measure	**Both**	**LE**	Knee OA	Doubtful responsiveness	Positively rated qualities (no.): 2
Veenhof, C	AIMS	**Both**	**LE**	All OA	Doubtful responsiveness	Positively rated qualities (no.): 2
Veenhof, C	AIMS2	**Both**	**LE**	All OA	Doubtful responsiveness	Positively rated qualities (no.): 2
Veenhof, C	AIMS2-SF	**Both**	**LE**	All OA	Doubtful responsiveness	Positively rated qualities (no.): 3
Veenhof, C	HOOS	**Both**	**LE**	Hip OA	Doubtful responsiveness	Positively rated qualities (no.): 5
Veenhof, C	KOOS	**Both**	**LE**	Knee OA	Limited data; doubtful responsiveness	Positively rated qualities (no.): 5
Veenhof, C	Lequesne Index - Hip	**Both**	**LE**	Hip OA	Doubtful responsiveness	Positively rated qualities (no.): 3
Veenhof, C	Lequesne Index - Hip: self-reported	**Both**	**LE**	Hip OA	Doubtful responsiveness	Positively rated qualities (no.): 2
Veenhof, C	Lequesne Index - Knee	**Both**	**LE**	Knee OA	Doubtful responsiveness	Positively rated qualities (no.): 3
Veenhof, C	Lequesne Index - Knee: self-reported	**Both**	**LE**	Knee OA	Doubtful responsiveness	Positively rated qualities (no.): 2
Veenhof, C	Lequesne modified	**Both**	**LE**	Both	Positive test-retest reliability, doubtful responsiveness	Positively rated qualities (no.): 5
Veenhof, C	SF-36	**Both**	**LE**	Hip/Knee OA	Doubtful responsiveness	Positively rated qualities (no.): 5

First Author	Pain/Function Outcome Tool or Scale	Domain of Pain, Function, or Both	PRO Recommended YES/NO/LE (LE = Lacking Evidence)	Patient Population	Qualitative Conclusions	Statistical Conclusions
Veenhof, C	WOMAC Likert	**Both**	**LE**	Hip/Knee OA	Doubtful responsiveness	Positively rated qualities (no.): 7
Veenhof, C	WOMAC numeric scale	**Both**	**LE**	Hip/Knee OA	Doubtful responsiveness	Positively rated qualities (no.): 0
Veenhof, C	WOMAC signal	**Both**	**LE**	Hip/Knee OA	Positive test-retest reliability, doubtful responsiveness	Positively rated qualities (no.): 5
Veenhof, C	WOMAC VA3.0	**Both**	**YES**	General Population	Highest ratings overall for both descriptive and psychometric qualities.	Positively rated qualities (no.): 6
Veenhof, C	WOMAC VA3.0 modified	**Both**	**YES**	Hip/Knee OA	Highest ratings overall for both descriptive and psychometric qualities.	Positively rated qualities (no.): 8
Wang D	Oxford Knee Score (OKS)	**Both**	**YES**	Knee OA	Positive Outcome Measure: internal reliability, validity	Item Total Correlation= 0.45–0.83 Cronbach's α= 0.87–0.93 Test/retest reliability (ICC) =0.92

Table 6. Findings Regarding Assessment Tools Measuring Pain Outcomes

First Author	Pain/Function Outcome Tool or Scale	Domain of Pain, Function, or Both	PRO Recommended YES/NO/LE (LE = Lacking Evidence)	Patient Population	Qualitative Conclusions	Statistical Conclusions
Juhl, C	AIMS (pain subscale)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #7	Mean rank of responsiveness (range) : 1.5 (1-2)
Juhl, C	ASES (pain subscale)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #7	Mean rank of responsiveness (range) : 2.0 (2)
Juhl, C	Global knee pain (VAS)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #4	Mean rank of responsiveness (range) : 1.7 (1-4)
Juhl, C	HAQ (pain subscale)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #7	Mean rank of responsiveness (range) : 1.5 (1-2)
Juhl, C	Knee-Specific Pain Scale (KSPS)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #7	Mean rank of responsiveness (range) : 2.5 (2-3)
Juhl, C	Lequesne algofunctional index (pain subscale)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #7	Mean rank of responsiveness (range) : 1.5 (1-2)
Juhl, C	McGill Pain Questionnaire (pain intensity)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #7	Mean rank of responsiveness (range) : 2.0 (2)
Juhl, C	Number of painful days (days)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #8	Mean rank of responsiveness (range) : 1.0 (1)
Juhl, C	Pain at night (VAS)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #8	Mean rank of responsiveness (range) : 3.0 (3)

First Author	Pain/Function Outcome Tool or Scale	Domain of Pain, Function, or Both	PRO Recommended YES/NO/LE (LE = Lacking Evidence)	Patient Population	Qualitative Conclusions	Statistical Conclusions
Juhl, C	Pain at rest (VAS)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #5	Mean rank of responsiveness (range) : 2.3 (1-4)
Juhl, C	Pain during activity (NRS)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #8	Mean rank of responsiveness (range) : 2.5 (1–4)
Juhl, C	Pain during Activity (VAS)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #2	Mean rank of responsiveness (range) : 1.4 (1-5)
Juhl, C	Pain during walking (NRS)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #8	Mean rank of responsiveness (range) : 2.5 (2-3)
Juhl, C	Pain during walking (VAS)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #3	Mean rank of responsiveness (range) : 1.5 (1-3)
Juhl, C	SES (Schmerzempfindungsskala)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #7	Mean rank of responsiveness (range) : 2.0 (2)
Juhl, C	SF-36 (bodily pain (BP) subscale)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #6	Mean rank of responsiveness (range) : 1.5 (1-3)
Juhl, C	Womac (100 mm scale)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #1	Mean rank of responsiveness (range) : 1.9 (1-4)
Juhl, C	WOMAC (Likert scale)	**Pain**	**YES**	**Knee OA**	(Rankings for suggested order of use) #1	Mean rank of responsiveness of responsiveness (range) : 1.8 (1-4)
Marks,M	PASS	**Pain**	**LE**	**Trapeziometacarpal OA**	Doubtful construct validity	
Marks,M	PCS	**Pain**	**LE**	**Trapeziometacarpal OA**	Doubtful construct validity	

First Author	Pain/Function Outcome Tool or Scale	Domain of Pain, Function, or Both	PRO Recommended YES/NO/LE (LE = Lacking Evidence)	Patient Population	Qualitative Conclusions	Statistical Conclusions
Saha,S	Patient Response Assessment Tool after Homeopathic Treatment (PRATHoT)	**Pain**	**LE**	**Knee OA**	Acceptable psychometric properties considered promising for future use. Higher PRATHoT scores correlated with higher pain VAS responses.	Regression analysis: B = 0.037-0.066, p <0.05 (significant correlation). Reliability: Cronbach's $\alpha > 0.7$; good consistency. Discriminant validity: F = 10.1, $p < 0.05$, acceptable. Concurrent validity: Pearson's r 0.388-0.441, $p < 0.05$; acceptable. Interrater Reliabillity: kappa > 0.61, substantial agreement or better.
Sun, Y	Jones score	**Pain**	**LE**	**Knee OA**	Validity not reported. Acceptable outcome measures: intra-rater reliability. Poor outcome measures: inter-rater reliability	Inter-rater reliability: kappa = 0.53-0.72 for pain, 0.46-0.62 for stiffness, and 0.09-0.35 for variety of symptoms. Intra-rater reliability: 0.76-0.86 for pain, 0.74-0.9 for stiffness, and 0.54-0.78 for variety of symptoms
Veenhof, C	ADL pain scale	**Pain**	**LE**	**All OA**	Doubtful responsiveness	Positively rated qualities (no.): 0
Veenhof, C	J-MAP	**Pain**	**LE**	**Patients with joint pain**	Doubtful responsiveness	Positively rated qualities (no.): 2
Veenhof, C	Knee Pain Scale	**Pain**	**LE**	**Knee OA**	Doubtful responsiveness	Positively rated qualities (no.): 2
Veenhof, C	Likert	**Pain**	**LE**	**General Population**	Doubtful responsiveness	Positively rated qualities (no.): 3
Veenhof, C	VAS	**Pain**	**LE**	**General Population**	Doubtful responsiveness	Positively rated qualities (no.): 2
Wang D	Knee Pain Scale	**Pain**	**LE**	**Knee OA**	Lack evidence for internal consistency	Test/retest reliability (ICC) > 0.84

First Author	Pain/Function Outcome Tool or Scale	Domain of Pain, Function, or Both	PRO Recommended YES/NO/LE (LE = Lacking Evidence)	Patient Population	Qualitative Conclusions	Statistical Conclusions
Wang D	KOOS	**Pain**	**YES**	**Knee OA**	Positive Outcome Measure: internal reliability Recommended for late OA questions in longitudinal studies	Test/retest reliability (ICC)= 0.85
Woolacott, N	WOMAC	**Pain**	**Yes**	**Knee OA**		

Table 7. Findings Regarding Assessment Tools Measuring Functional Outcomes

First Author	Pain/Function Outcome Tool or Scale	Domain of Pain, Function, or Both	PRO Recommended YES/NO/LE (LE = Lacking Evidence)	Patient Population	Qualitative Conclusions	Statistical Conclusions
Cibulka, M	LEFS	**Function**	**YES**	**Hip**	Positive reliability and validity in patients with lower extremity musculoskeletal problems	MDC and MCID both 9 scale points
Dobson, F	ALF	**Function**	**LE**	**Knee OA**	Positive outcome measures: reliability	Test/retest reliability (ICC) = 0.99 (0.98-0.99)
Dobson, F	FAS	**Function**	**YES**	**Hip/Knee OA**	Positive outcome measures: Inter-reliability, Structural validity, Criterion validity with good sensitivy and specificity	G = 0.99-1.0 (range of all tests); Sensitivity 0.70-0.89; Specificity 0.57-1.0
Dobson, F	Lin Battery Test	**Function**	**LE**	**Hip/Knee OA**	Doubtful internal inconsistency	a =0.84, Test/retest reliability (ICC) = 0.94-0.96 (0.75-0.99)
Dobson, F	PAR	**Function**	**YES**	**Knee**	Positive outome measures: internal consistency, reliability	a = 0.82; r =0.880-0.93 (range of all tests)
Dobson, F	Stratford Battery	**Function**	**YES**	**Hip/Knee**	Positive outcome measures: Criterion validity	N/A
Dziedzic K	FIHOA	**Function**	**YES**	**Hand OA**	LE on validity of the FIHOA No inter-interviewer reliability carried out due to small number of patients	Cronbach's alpha coefficient of 0.85 Kappas ranged between 0.68- 0.87; Test/retest reliability (ICC) = 0.954
Dziedzic K	HAQ	**Function**	**YES**	**Hand OA**	Positive outcome measures: contsruct validity, reliability	Test/re-test reliability correlations in arthritis range from 0.87 to 0.96 HAQ and AIMS correlated well with each other (0.91, P <0.01)

First Author	Pain/Function Outcome Tool or Scale	Domain of Pain, Function, or Both	PRO Recommended YES/NO/LE (LE = Lacking Evidence)	Patient Population	Qualitative Conclusions	Statistical Conclusions
Dziedzic K	Cochin	**Function (disability)**	**YES**	**Hand OA**	Positive outcome measures: internal validity, high inter-rater reliability	Inter-rater reliability high (ICC = 0.96) Mean difference in scores 0.2 (SD = 3.60) Cochin scale correlation with Dreiser's functional index and VAS for handicap (r = 0.67 to 0.87
Juhl, C	ASES (disability subscale)	**Function (disability)**	**YES**	**Knee OA**	(Rankings for suggested order of use) #4	Mean rank of responsiveness (range) : 2.0 (2)
Juhl, C	HAQ (disability subscale)	**Function (disability)**	**YES**	**Knee OA**	(Rankings for suggested order of use) #4	Mean rank of responsiveness (range) : 1.5 (1-2)
Juhl, C	PDI (pain disability index)	**Function (disability)**	**YES**	**Knee OA**	(Rankings for suggested order of use) #4	Mean rank of responsiveness (range) : 2.0 (2)
Juhl, C	Physical composite score (PFC) (based on SF-36, SF-12, or SF-8)	**Function (disability)**	**YES**	**Knee OA**	(Rankings for suggested order of use) #3	Mean rank of responsiveness (range) : 1.8 (1–3)
Juhl, C	SF-36 (physical function PF subscale)	**Function (disability)**	**YES**	**Knee OA**	(Rankings for suggested order of use) #2	Mean rank of responsiveness (range) : 1.8 (1-2)
Juhl, C	WOMAC function (100 mm scale)	**Function (disability)**	**YES**	**Knee OA**	(Rankings for suggested order of use) #1	Mean rank of responsiveness (range) : 1.5 (1-2)
Juhl, C	WOMAC function (Likert scale)	**Function (disability)**	**YES**	**Knee OA**	(Rankings for suggested order of use) #1	Mean rank of responsiveness (range) : 1.5 (1-2)
Marks,M	Eaton Classification	**Function**	**NO**	**Trapeziometacarpal OA**	Doubtful reproducibility	
Marks,M	Hand Functional Index of the Keitel Functional	**Function**	**NO**	**Trapeziometacarpal OA**	Negative outcome measures: construct validity and floor or ceiling effect.	

First Author	Pain/Function Outcome Tool or Scale	Domain of Pain, Function, or Both	PRO Recommended YES/NO/LE (LE = Lacking Evidence)	Patient Population	Qualitative Conclusions	Statistical Conclusions
	Test (HFI/KFT)					
Marks,M	Nelson Score	**Function**	**LE**	**Trapeziometacarpal OA**	Positive outcome measures: internal consistency and responsiveness. Doubtful: content validity, construct validity, and reproducibility	
Marks,M	DASH	**Function (disability)**	**LE**	**Trapeziometacarpal OA**	Positive outcome measures: internal consistency, criterion validity, construct validity, responsiveness, and floor or ceiling effect. Doubtful interpretability	
Naal, F	AOS	**Function**	**LE**	**Ankle OA**	Positive outcome measures: reliability and criterion validity.	Reliability: ICC (0.94-0.97). Criterion validity: mod to high correlations with single heel lifts (r = 0.63-0.9). Construct validity: mod to high correlations with WOMAC (r = 0.65-0.79) and SF-36 (up to r = -0.66)
Peer,M	KOOS	**Function**	**YES**	**Knee OA**	Strength: large effect sizes to measure outcome over time. Weakness: weak-to-mod realiability and weak construct validity in some subscales	Cronbach's $\alpha > 0.7$ in all subscales except other symptoms ($\alpha = 0.56$). ICC values > 0.7 in all subscales except sport and recreation (0.45-0.65). Standard error of measurement: 7.2-24.6. Construct validity: pain (r = 0.29 - 0.65), physical functioning (r = 0.48), sport and recreation (r = -0.01 - 0.47), QoL (r > 0.53). Responsiveness: SRM 0.81 - 1.99. Feasibility: 92% response after 6m and 86% after 12m.

First Author	Pain/Function Outcome Tool or Scale	Domain of Pain, Function, or Both	PRO Recommended YES/NO/LE (LE = Lacking Evidence)	Patient Population	Qualitative Conclusions	Statistical Conclusions
Peer,M	KOOS-PS	**Function**	**YES**	**Knee OA**	Strength: large effect sizes to measure outcome over time. Weakness: weak-to-mod realiability	Cronbach's α = 0.89 for overall score. Construct validity: compared to WOMAC for physical function (r = 0.85 - 0.9), for measure of fatigue (r = 0.33 - 0.66). Responsiveness: SRM 1.4- 1.7
Sun, Y	ILAS	**Function**	**YES**	**Hip/Knee OA**	Positive outcome measures: intra-rater reliability, concurrent validity, and responsiveness.	Inter-rater reliability: kappa =0.66 supine to sit, 0.53: sit to stand, 0.48: ambulation, 0.76: stair climbing, 0.78: ambulation velocity. Test/retest reliability (ICC) = 0.82. Intra-rater reliability: kappa = 0.79-0.9.
Terwee, C	Baecke Questionaire	**Function (Activity)**	**LE**	**Hip OA**	Positive outcome measures: reliability, questionable validity	Test/retest reliability (ICC) = 0.78-0.87
Terwee, C	HAP	**Function (Activity)**	**LE**	**Knee OA, no previous joint replacement**	Positive outcome measures: reliability, questionable validity	Test/retest reliability (ICC) = 0.95-0.96; Significant lower PA than controls in women (P < 0.001), not in men (P = 0.09); Correlations with other scales 0.19-0.63
Terwee, C	LEAS	**Function (Activity)**	**YES**	**Hip/Knee OA, preop**	Positive outcome measures: content validity, reliability, and construct validity	Test/retest reliability (ICC) = 0.91; Total r=0.49; WOMAC pain r =0.24-0.34; WOMAC stiffness r =0.05- 0.22; WOMAC function r =0.30-0.46; comorbidity r = 0.24- 0.22 (88% of hypotheses confirmed)
Thorborg, T	HOOS	**Function**	**YES**	**Hip OA**	HOOS reccomended for patients with hip OA undergoing non-surgical treatment and surgical	

First Author	Pain/Function Outcome Tool or Scale	Domain of Pain, Function, or Both	PRO Recommended YES/NO/LE (LE = Lacking Evidence)	Patient Population	Qualitative Conclusions	Statistical Conclusions
					interventions such as total hip replacement	
Veenhof, C	ADL difficulty scale	**Function**	**LE**	**All OA**	Doubtful responsiveness	Positively rated qualities (no.): 0
Veenhof, C	HAQ	**Function**	**LE**	**All OA**	Doubtful responsiveness	Positively rated qualities (no.): 4
Veenhof, C	IRGL	**Function**	**LE**	**RA**	Doubtful responsiveness	Positively rated qualities (no.): 1
Veenhof, C	NHP	**Function**	**LE**	**General Population**	Doubtful responsiveness	Positively rated qualities (no.): 2
Veenhof, C	Patient Global Assessment	**Function**	**YES**	**General Population**	Doubtful responsiveness	Positively rated qualities (no.): 3
Veenhof, C	QR&S	**Function**	**LE**	**General Population**	Doubtful responsiveness	Positively rated qualities (no.): 1
Veenhof, C	SIP	**Function**	**LE**	**General Population**	Doubtful responsiveness	Positively rated qualities (no.): 1
Veenhof, C	SMFA	**Function**	**LE**	**Musculoskeletal extremity disorders**	Doubtful responsiveness	Positively rated qualities (no.): 3
Wang D	Lower Extremity Activity Profile (LEAP)	**Function (disability)**	**LE**	**Knee OA**	No test/retest reliability information, no assessment for content/face validity	Item Total Correlation= 0.69–0.78; Cronbach's α=0.73

First Author	Pain/Function Outcome Tool or Scale	Domain of Pain, Function, or Both	PRO Recommended YES/NO/LE (LE = Lacking Evidence)	Patient Population	Qualitative Conclusions	Statistical Conclusions
Wang D	Walking Impairment Questionnaire (WIQ)	**Function (disability)**	**LE**	**Knee OA in overweight patients**	No assessment for content/face validity	Cronbach's α=0.97; Test/retest reliability (ICC)= 0.86–0.87.

Appendices

Appendix I - Literature Search Report

Literature Search Report December 2014
Performance Measure: OA Pain and Function Assessment
Total Results: 2,045 citations Ref IDs: 1-2081

Database: Cochrane Database of Systematic Reviews
Search interface: Wiley Online Library
Date searched: December 18, 2014

Search	Terms	Hits
#1	MeSH descriptor: [Osteoarthritis] this term only	1,571
#2	MeSH descriptor: [Osteoarthritis, Hip] explode all trees	596
#3	MeSH descriptor: [Osteoarthritis, Knee] explode all trees	1,656
#4	#1 or #2 or #3	3,581
#5	osteoarthrit*	6,564
#6	osteoarthro*	440
#7	#5 or #6	6,728
#8	#4 or #7 Publication Year from 1995 to 2014,	390

Limits: Publication year from 1995 to 2014, published in Cochrane Reviews

390 Search Results	Ref IDs
Cochrane Reviews: 299 results	1-299
Cochrane Protocol: 91 results	300-390

Database: PubMed
Search interface: http://www.ncbi.nlm.nih.gov/pubmed
Date searched: December 22, 2014

Search	Terms	Hits
#1	"Osteoarthritis"[Mesh:NoExp] OR "Osteoarthritis, Hip"[Mesh] OR"Osteoarthritis, Knee"[Mesh]	43,866
#2	(osteoarthrit*[tiab]) OR osteoarthro*[tiab]	44,742
#3	#1 OR #2	61,176
#4	MEDLINE[tiab] OR (systematic[tiab] AND review[tiab]) OR meta analysis[pt]	140,460
#5	(animal[mh] NOT human[mh]) OR cadaver[mh] OR cadaver*[ti] OR comment[pt] OR editorial[pt] OR letter[pt] OR "historical article"[pt] OR addresses[pt] OR news[pt] OR "newspaper article"[pt] OR "in vitro"[pt] OR "case report"[ti]	5,937,565
#6	((#3 AND #4) NOT #5) AND English[la] AND 1995:2014[dp]	1,197

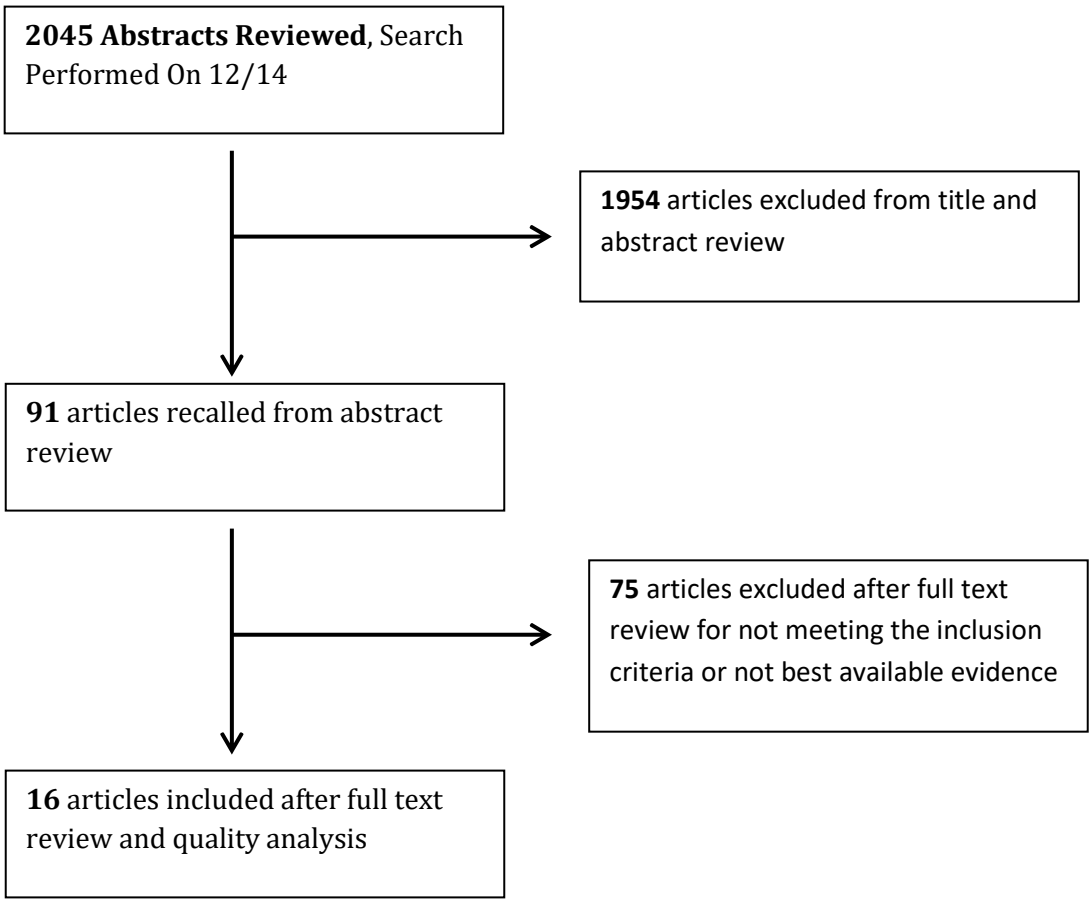
1,197 Search Results (1,192 de-duplicated)	Ref IDs
PubMed article type filter for SR: 1,069 (1,064)	391-1459
Remaining search results: 128 (128)	1460-1587

Database: Embase
Search interface: http://www.embase.com
Date Searched: December 22, 2014

Appendix II - Key Words Used to Identify Relevant Reviews During Abstract Search

ADLS
AFAS
AIMS
American Foot & Ankle
American Foot and Ankle
AOS
ASES
Back Pain Index
Cincinatti
Constant Shoulder
DASH
Disabilities of arm
Disabilities of the arm
Distress and Risk Assessment Method
DRAM
FIQ
Foot & Ankle Disability Index
Foot and Ankle Disability Index
function assessment
grade
Harris Hip
Hip disability and Osteoarthritis Outcome
HOOS
HOOS
Knee Injury & Osteoarthritis Outcome
Knee Injury and Osteoarthritis Outcome
Knee Society Score
KOOS
KSS
Likert
MAYO Elbow
MAYO Wrist
Michigan Hand
Oswestry
Oxford
pain assessment
patient oriented
patient reported
patient reported outcomes
PCS
pro
prom
promis
pros
questionnaire
rank
Rowe
scale
scheme
score
SF-36
Tegner
UCLA Shoulder
VAS
Vernon
Western Ontario
WOMAC
WOSI

Appendix III - Study Attrition Chart



Appendix IV - References for Included Articles

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Appendix B

Quality ID #109: Osteoarthritis (OA): Function and Pain Assessment – National Quality Strategy Domain: Person and Caregiver-Centered Experience and Outcomes

2018 OPTIONS FOR INDIVIDUAL MEASURES:
REGISTRY ONLY

MEASURE TYPE:
Process

DESCRIPTION:
Percentage of patient visits for patients aged 21 years and older with a diagnosis of osteoarthritis (OA)with assessment for function and pain

INSTRUCTIONS:
This measure is to be submitted one time during the performance period for patients with osteoarthritisseen during the performance period. The assessment can be completed either during a denominator eligible encounter or via electronic/mobile system. This measure may be submitted by eligible clinicians who perform the quality actions described in the measure based on the services provided and the measure-specific denominatorcoding.

Measure Submission:
The listed denominator criteria is used to identify the intended patient population. The numerator options included in this specification are used to submit the quality actions allowed by the measure. The quality-data codes listed do not need to be submitted for registry submissions; however, these codes may be submitted for those registries that utilize claims data.

DENOMINATOR:
All patient visits for patients aged 21 years and older with a diagnosis of OA

Denominator Criteria (Eligible Cases):
Patients aged ≥ 21 years on date of encounter
AND
Diagnosis for osteoarthritis (OA) (ICD-10-CM): M15.0, M15.1, M15.2, M15.3, M15.4, M15.8, M15.9, M16.0, M16.10, M16.11, M16.12, M16.2, M16.30, M16.31, M16.32, M16.4, M16.50, M16.51, M16.52, M16.6, M16.7, M16.9, M17.0, M17.10, M17.11, M17.12, M17.2, M17.30, M17.31, M17.32, M17.4, M17.5, M17.9, M18.0, M18.10, M18.11, M18.12, M18.2, M18.30, M18.31, M18.32, M18.4, M18.50,M18.51, M18.52, M18.9, M19.011, M19.012, M19.019, M19.021, M19.022, M19.029, M19.031, M19.032, M19.039, M19.041, M19.042, M19.049, M19.071, M19.072, M19.079, M19.111, M19.112, M19.119, M19.121, M19.122, M19.129, M19.131, M19.132, M19.139, M19.141, M19.142, M19.149, M19.171, M19.172, M19.179, M19.211, M19.212, M19.219, M19.221, M19.222, M19.229, M19.231, M19.232, M19.239, M19.241, M19.242, M19.249, M19.271, M19.272, M19.279, M19.90, M19.91, M19.92, M19.93
AND
Patient encounter during the performance period (CPT): 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215

NUMERATOR:
Patient visits with assessment for level of function and pain documented (may include the use of a standardized scale or the completion of an assessment questionnaire, such as an SF-36, AAOS Hip & Knee Questionnaire)

NUMERATOR NOTE: For the purposes of this measure, the method for assessing function and pain is left up to the discretion of the individual eligible clinician and based on the needs of the patient. The assessment may be done via a validated instrument (though one is not required) that measures pain and various functional elements including a patient's ability to perform activities of daily living (ADLs).

*Acceptable assessments for **Pain Assessment** include the following:*

- Visual Analog Scale (VAS)
- PROMIS
- Numeric Pain Rating System

*Acceptable assessments for **Functional Assessment** include the following:*

General Quality of Life

- Veterans RAND 12 (VR-12)
- PROMIS (PROMIS 10 or CAT)
- EuroQol-5D (EQ-5D)

Foot and Ankle

- Foot and Ankle Ability Measure (FAAM)
- Foot and Ankle Disability Index (FADI)

Knee (Anterior Cruciate Ligament)

- International Knee Documentation Committee (IKDC) Subjective Knee Form (Pedi-IKDC)
- Marx Activity Rating Scale

Knee (Osteoarthritis)

- Knee Injury and Osteoarthritis Outcome Score (KOOS)
- Knee Injury and Osteoarthritis Outcome Score Jr. (KOOS Jr.)

Hip (Osteoarthritis)

- Hip Disability and Osteoarthritis Outcomes Survey (HOOS)
- Hip Disability and Osteoarthritis Outcomes Survey Jr. (HOOS Jr.)

Shoulder

- American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form (ASES)
- Oxford Shoulder Score (OSS)
- Single Assessment Numeric Evaluation (SANE)

Shoulder (Instability)

- American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form (ASES)
- Western Ontario Shoulder Instability Index (WOSI)

Elbow

- Disabilities of the Arm, Shoulder, and Hand Score (DASH)
- Quick-DASH

Wrist

- Disabilities of the Arm, Shoulder, and Hand Score (DASH)
- Quick-DASH

Hand

- Disabilities of the Arm, Shoulder, and Hand Score (DASH)
- Quick-DASH

Numerator Options:

Performance Met: Osteoarthritis symptoms and functional status assessed (may include the use of a standardized scale or the completion of an assessment questionnaire, such as the SF-36, AAOS Hip & Knee Questionnaire) (1006F)

OR

Performance Not Met: Osteoarthritis symptoms and functional status not assessed, Reason not otherwise specified (1006F *with* 8P)

RATIONALE:

Osteoarthritis (OA) is the most common joint pathology in the United States and remains the leading cause of disability among the elderly population. The aging population and increasing prevalence of obesity is contributing to the witnessed rise in OA incidence. According to the National Health Interview Survey (NHIS) an estimated 52.5 million (22.7%) adults have been diagnosed with arthritis, of which 22.7 million (9.8%) have some degree of functional disability. As the prevalence and incidence of the disease continues to rise, the proper measurement of OA severity and its impact on health status becomes a crucial component in any orthopedic practice. The symptomatic manifestations of OA as a combination of pain and stiffness contribute substantially to functional disability, lowering the patient's quality of life. Aligning with a patient-centered healthcare delivery model, the quality and success of interventions aiming to treat OA should be assessed based on outcomes deemed imperative by the patients. Hence, measurement instruments applied in the clinical setting should include patient reported outcome measures (PROMs) pertaining to pain and function.

CLINICAL RECOMMENDATION STATEMENTS:

Performance measurement should assess both subjective and objective components of pain and physical function pertaining to each osteoarthritic joint. Overall, 100% of all high and moderate quality systematic reviews with sufficient evidence to make a recommendation supported the use of at least one PROM for pain, function, or the combination of the two. (AAOS Systematic Review on Measures for Pain and Function Assessments for Patients with Osteoarthritis 2015).

Any persistent pain that has an impact on physical function, psychosocial function, or other aspects of quality of life should be recognized as a significant problem. (AGS; IIA Recommendation)

THE MEASURES AND SPECIFICATIONS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANYKIND.

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2018 Registry Flow for Quality ID
#109: Osteoarthritis (OA): Function and Pain Assessment

Please refer to the specific section of the specification to identify the denominator and numerator information for use in submitting this Individual Specification. This flow is for registry data submission.

1. Start with Denominator
2. Check Patient Age:
    a. If the Age is greater than or equal to 21 years of age on Date of Service and equals No during the measurement period, do not include in Eligible Patient Population. Stop Processing.
    b. If the Age is greater than or equal to 21 years of age on Date of Service and equals Yes during the measurement period, proceed to check Patient Diagnosis.
3. Check Patient Diagnosis:
    a. If Diagnosis of Osteoarthritis as Listed in Denominator equals No, do not include in Eligible Patient Population. Stop Processing.
    b. If Diagnosis of Osteoarthritis as Listed in Denominator equals Yes, proceed to check Encounter Performed.
4. Check Encounter Performed:
    a. If Encounter as Listed in the Denominator equals No, do not include in Eligible Patient Population. Stop Processing.
    b. If Encounter as Listed in the Denominator equals Yes, include in the Eligible population.
5. Denominator Population:
    a. Denominator Population is all Eligible Patients in the Denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d equals 80 visits in the Sample Calculation.
6. Start Numerator
7. Check Osteoarthritis Symptoms and Functional Status Assessed:
    a. If Osteoarthritis Symptoms and Functional Status Assessed equals Yes, include in Data Completeness Met and Performance Met.
    b. Data Completeness Met and Performance Met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a equals 40 visits in Sample Calculation.
    c. If Osteoarthritis Symptoms and Functional Status Assessed equals No, proceed to Osteoarthritis Symptoms and Functional Status Not Assessed, Reason Not Specified.
8. Check Osteoarthritis Symptoms and Functional Status Not Assessed, Reason Not Specified:
    a. If Osteoarthritis Symptoms and Functional Status Not Assessed, Reason Not Otherwise Specified

equals Yes, include in Data Completeness Met and Performance Not Met.

b. Data Completeness Met and Performance Not Met letter is represented in the Data Completeness in the Sample Calculation listed at the end of this document. Letter c equals 30 visits in the Sample Calculation.

c. If Osteoarthritis Symptoms and Functional Status Not Assessed, Reason Not Specifiedequals No, proceed to Data Completeness Not Met

9. Check Data Completeness Not Met

a. If Data Completeness Not Met equals No, Quality Data Code or equivalent not submitted. 10 visits have been subtracted from the Data Completeness Numerator in the Sample Calculation.

Quality ID #109: Osteoarthritis (OA): Function and Pain Assessment – National Quality Strategy Domain: Person and Caregiver-Centered Experience and Outcomes

2018 OPTIONS FOR INDIVIDUAL MEASURES:
CLAIMS ONLY

MEASURE TYPE:
Process

DESCRIPTION:
Percentage of patient visits for patients aged 21 years and older with a diagnosis of osteoarthritis (OA)with assessment for function and pain

INSTRUCTIONS:
This measure is to be submitted one time during the performance period for patients with osteoarthritisseen during the performance period. The assessment can be completed either during a denominator eligible encounter or via electronic/mobile system. This measure may be submitted by eligible clinicians who perform the quality actions described in the measure based on the services provided and the measure-specific denominatorcoding.

Measure Submission:
The listed denominator criteria is used to identify the intended patient population. The numerator quality-data codes included in this specification are used to submit the quality actions allowed by the measure. Allmeasure-specific coding should be submitted on the claim(s) representing the eligible encounter.

DENOMINATOR:
All patient visits for patients aged 21 years and older with a diagnosis of OA

> Denominator Criteria (Eligible Cases):
> Patients aged ≥ 21 years on date of encounter
> AND
> Diagnosis for osteoarthritis (OA) (ICD-10-CM): M15.0, M15.1, M15.2, M15.3, M15.4, M15.8, M15.9, M16.0, M16.10, M16.11, M16.12, M16.2, M16.30, M16.31, M16.32, M16.4, M16.50, M16.51, M16.52, M16.6, M16.7, M16.9, M17.0, M17.10, M17.11, M17.12, M17.2, M17.30, M17.31, M17.32, M17.4, M17.5, M17.9, M18.0, M18.10, M18.11, M18.12, M18.2, M18.30, M18.31, M18.32, M18.4, M18.50, M18.51, M18.52, M18.9, M19.011, M19.012, M19.019, M19.021, M19.022, M19.029, M19.031, M19.032,M19.039, M19.041, M19.042, M19.049, M19.071, M19.072, M19.079, M19.111, M19.112, M19.119, M19.121, M19.122, M19.129, M19.131, M19.132, M19.139, M19.141, M19.142, M19.149, M19.171, M19.172, M19.179, M19.211, M19.212, M19.219, M19.221, M19.222, M19.229, M19.231, M19.232, M19.239, M19.241, M19.242, M19.249, M19.271, M19.272, M19.279, M19.90, M19.91, M19.92, M19.93
> AND
> Patient encounter during the performance period (CPT): 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215

NUMERATOR:
Patient visits with assessment for level of function and pain documented (may include the use of a standardized scale or the completion of an assessment questionnaire, such as an SF-36, AAOS Hip & Knee Questionnaire)

> *NUMERATOR NOTE: For the purposes of this measure, the method for assessing function and pain is left up to the discretion of the individual eligible clinician and based on the needs of the patient. The assessment may be done via a validated instrument (though one is not required) that measures pain and various functional elements including a patient's ability to perform activities of daily living (ADLs).*

*Acceptable assessments for **Pain Assessment** include the following:*

- Visual Analog Scale (VAS)
- PROMIS
- Numeric Pain Rating System

*Acceptable assessments for **Functional Assessment** include the following:*

General Quality of Life

- Veterans RAND 12 (VR-12)
- PROMIS (PROMIS 10 or CAT)
- EuroQol-5D (EQ-5D)

Foot and Ankle

- Foot and Ankle Ability Measure (FAAM)
- Foot and Ankle Disability Index (FADI)

Knee (Anterior Cruciate Ligament)

- International Knee Documentation Committee (IKDC) Subjective Knee Form (Pedi-IKDC)
- Marx Activity Rating Scale

Knee (Osteoarthritis)

- Knee Injury and Osteoarthritis Outcome Score (KOOS)
- Knee Injury and Osteoarthritis Outcome Score Jr. (KOOS Jr.)

Hip (Osteoarthritis)

- Hip Disability and Osteoarthritis Outcomes Survey (HOOS)
- Hip Disability and Osteoarthritis Outcomes Survey Jr. (HOOS Jr.)

Shoulder

- American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form (ASES)
- Oxford Shoulder Score (OSS)
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Shoulder (Instability)

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- Quick-DASH

Wrist

- Disabilities of the Arm, Shoulder, and Hand Score (DASH)
- Quick-DASH

Hand

- Disabilities of the Arm, Shoulder, and Hand Score (DASH)
- Quick-DASH

Numerator Quality-Data Coding Options:

Osteoarthritis Symptoms and Functional Status Assessed

Performance Met: CPT II 1006F: Osteoarthritis symptoms and functional status assessed (may include the use of a standardized scale or the completion of an assessment questionnaire, such as the SF-36, AAOS Hip & Knee Questionnaire)

OR

Osteoarthritis Symptoms and Functional Status not Assessed, Reason not Otherwise Specified

Append a submission modifier (8P) to CPT Category II code 1006F to submit circumstances when the action described in the numerator is not performed and the reason is not otherwise specified.

Performance Not Met: 1006F *with* 8P: Osteoarthritis symptoms and functional status not assessed, Reason not otherwise specified

RATIONALE:

Osteoarthritis (OA) is the most common joint pathology in the United States and remains the leading cause of disability among the elderly population. The aging population and increasing prevalence of obesity is contributing to the witnessed rise in OA incidence. According to the National Health Interview Survey (NHIS) an estimated 52.5 million (22.7%) adults have been diagnosed with arthritis, of which 22.7 million (9.8%) have some degree of functional disability. As the prevalence and incidence of the disease continues to rise, the proper measurement of OA severity and its impact on health status becomes a crucial component in any orthopedic practice. The symptomatic manifestations of OA as a combination of pain and stiffness contribute substantially to functional disability, lowering the patient's quality of life. Aligning with a patient-centered healthcare delivery model, the quality and success of interventions aiming to treat OA should be assessed based on outcomes deemed imperative by the patients. Hence, measurement instruments applied in the clinical setting should include patient reported outcome measures (PROMs) pertaining to pain and function. CLINICAL RECOMMENDATION STATEMENTS:Performance measurement should assess both subjective and objective components of pain and physical function pertaining to each osteoarthritic joint. Overall, 100% of all high and moderate quality systematic reviews with sufficient evidence to make a recommendation supported the use of at least one PROM for pain, function, or the combination of the two. (AAOS Systematic Review on Measures for Pain and Function Assessments for Patients with Osteoarthritis 2015).

Any persistent pain that has an impact on physical function, psychosocial function, or other aspects of quality of life should be recognized as a significant problem. (AGS; IIA Recommendation)

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2018 Claims Flow for Quality ID
#109: Osteoarthritis (OA): Function and Pain Assessment

Please refer to the specific section of the specification to identify the denominator and numerator information for use in submitting this Individual Specification. This flow is for claims data submission.

1. Start with Denominator
2. Check Patient Age:
    a. If the Age is greater than or equal to 21 years of age on Date of Service and equals No during the measurement period, do not include in Eligible Patient Population. Stop Processing.
    b. If the Age is greater than or equal to 21 years of age on Date of Service and equals Yes during the measurement period, proceed to check Patient Diagnosis.
3. Check Patient Diagnosis:
    a. If Diagnosis of Osteoarthritis as Listed in Denominator equals No, do not include in Eligible Patient Population. Stop Processing.
    b. If Diagnosis of Osteoarthritis as Listed in Denominator equals Yes, proceed to check Encounter Performed.
4. Check Encounter Performed:
    a. If Encounter as Listed in the Denominator equals No, do not include in Eligible Patient Population. Stop Processing.
    b. If Encounter as Listed in the Denominator equals Yes, include in the Eligible Population.
5. Denominator Population:
    a. Denominator Population is all Eligible Patients in the Denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d equals 80 visits in the Sample Calculation.
6. Start Numerator
7. Check Osteoarthritis Symptoms and Functional Status Assessed:
    a. If Osteoarthritis Symptoms and Functional Status Assessed equals Yes, include in Data Completeness Metand Performance Met.
    b. Data Completeness Met and Performance Met letter is represented in the Data Completeness and Performance Ratein the Sample Calculation listed at the end of this document. Letter a equals 40 visits in Sample Calculation.
    c. If Osteoarthritis Symptoms and Functional Status Assessed equals No, proceed to Osteoarthritis Symptoms and Functional Status Not Assessed, Reason Not Specified.
8. Check Osteoarthritis Symptoms and Functional Status Not Assessed, Reason Not Specified:
    a. If Osteoarthritis Symptoms and Functional Status Not Assessed, Reason Not Otherwise Specified

equals Yes, include in Data Completeness Met and Performance Not Met.

b. Data Completeness Met and Performance Not Met letter is represented in the Data Completeness in the Sample Calculation listed at the end of this document. Letter c equals 30 visits in the Sample Calculation.

c. If Osteoarthritis Symptoms and Functional Status Not Assessed, Reason Not Specifiedequals No, proceed to Data Completeness Not Met

9. Check Data Completeness Not Met

a. If Data Completeness Not Met equals No, Quality Data Code not submitted. 10 visits have been subtracted from the Data Completeness Numerator in the Sample Calculation.

References

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