AAOS Clinical Performance Measures Methodology Document

2017 AAOS Performance Measures Committee

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Introduction

Two reports from the Institute of Medicine, *To Err is Human: Building a Safer Health System* (1) and *Crossing the Quality Chasm: A New Health System for the 21st Century* (2) highlight a need for systematic change within the United States’ healthcare environment. According to these reports, quality problems plaguing healthcare stem from “the growing complexity of science and technology, the increase in chronic conditions, a poorly organized delivery system, and constraints on exploiting the revolution in information technology.” (3) Since the release of these reports, there has been increased focus on utilizing scientific evidence to inform healthcare decisions. There has also been increased focus from payers and regulatory agencies to quantify the quality of care rendered to patients. One way to do this is through clinical performance measures. At a high level, clinical performance measures are indicators of the quality of care rendered by clinicians. The National Quality Forum (NQF) describes performance measures as a way to calculate whether and how often a healthcare system does what it should. Measures are based on scientific evidence about processes, outcomes, perceptions, or systems that relate to high quality care. (4)

Over the last couple years, the American Academy of Orthopaedic Surgeons (AAOS) has undertaken developing clinical performance measures for musculoskeletal conditions, for use in public and private pay-for-reporting and pay-for-performance quality programs. For example, part of the Centers for Medicare & Medicaid Services’ (CMS) Quality Payment Program (QPP) includes providers’ reporting on an array of clinical performance measures for their Medicare patients. The following serves as a methodology document for how the American Academy of Orthopaedic Surgeons (AAOS) develops clinical performance measures. The intended audience is physicians participating in or looking to participate in the performance measures development process. For example, the AAOS Performance Measures Committee (PMC), Measure Development Work Group Leaders, and Measure Development Work Group Members. This document will be a public facing document available on the www.aaos.org website.

Goals for Measure Development

The AAOS believes that the primary purpose of quality measurement is to identify opportunities to improve patient care and outcomes. Guiding principles for measure development include to:

- Ensure measures are scientifically valid and based on the best evidence available.
- Develop measures for topics of high impact and importance for orthopaedic patients, and that will have substantial impact, whether defined by prevalence, severity, and/or functional status.
- Develop measures that address a performance gap where there is known variation in clinical actions or the outcomes of interest.
- Develop well-defined measure specifications that incorporate broad stakeholder input.
- Develop measures that are feasible; for example, the collection of data to support the measures will not cause undue burden on clinicians, patients, or families.
- Implement the final measure set into CMS value-based payment programs, such as the QPP.

Measure Development Lifecycle

AAOS performance measures are developed using a rigorous, standardized process, commensurate with the NQF and CMS standards. At the AAOS, measures are developed by physician-led work groups with the assistance of staff within the Performance Measures Unit of the Department of Research, Quality and Scientific Affairs (RQSA) department.

Figure 1 illustrates the five phases in the AAOS measure development lifecycle, from the time of initial measure development through implementation and maintenance. Although the lifecycle shows each phase as a discrete activity, the measure lifecycle is dynamic. Some phases may overlap or take place concurrently. Measure development work groups, which include a multitude of stakeholders, focus on phases 1–3. As the measure steward, AAOS staff is responsible for phases 4–5.
Role of the Performance Measures Committee

The AAOS Performance Measures Committee was established in 2014. The PMC is involved in all key activities related to the development, testing, dissemination, and implementation of orthopaedic performance measures. The Committee is composed of 10 orthopaedic surgeons and oversees the measure development work groups, which include multiple stakeholders related to the measure set topic. Members of the PMC serve as work group Oversight Chairs and act as a liaison to the PMC to provide regular updates on the progress of their respective work group. The PMC reports to the Council on Research and Quality (CoRQ), which reports to the Academy Board of Directors (BOD).

Quality Measurement Overview

Anatomy of a Measure

At its basic level, a performance measure is a ratio. The denominator includes the eligible population and the numerator includes the unit of measurement. The type of measure determines how the numerator is written. As an example:

Exclusions and exceptions can be tricky because the measure developer needs to find a balance between including relevant patients and not overexcluding patients. The numerator is a subset of the denominator and contains the specific area of interest to be evaluated. After the numerator, denominator, exclusions, and exceptions are outlined the measurement period, the care setting and data sources can be considered.
Measure Types

There are several types of performance measures. Table 1 outlines the different types of measures, their definitions, and measure examples.

Table 1

<table>
<thead>
<tr>
<th>Type of Measure</th>
<th>Definition</th>
<th>Example</th>
</tr>
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<tbody>
<tr>
<td>Structural</td>
<td>Assess healthcare infrastructure; i.e. the characteristics of a care setting, including facilities, personnel, and/or policy.</td>
<td>The percentage of physicians in a practice who have systems to track and follow patients with a high number of falls.</td>
</tr>
<tr>
<td>Process</td>
<td>Assess steps that should be followed to provide good care, i.e. if the services rendered to patients are consistent with routine clinical care.</td>
<td>The percentage of women age 50–85 years who have sustained a fracture and who either underwent a bone mineral density test or received a prescription for a drug to treat osteoporosis.</td>
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<tr>
<td>Intermediate Outcome</td>
<td>Assess the change in a person’s physiologic state that leads to a longer term health outcome.</td>
<td>A reduction in the number of patient falls is an intermediate outcome that leads to a reduction in the risk for hip and knee fractures.</td>
</tr>
<tr>
<td>Outcome</td>
<td>Assess patients’ health as a result of the care received.</td>
<td>The percentage of surgical site infections occurring within 30 days after the surgical procedure. (5) There is a strong movement from CMS and private payers toward developing outcome measures because process measures on their own do not directly improve care.</td>
</tr>
<tr>
<td>Patient-Reported Outcome Performance Measures</td>
<td>Assess patients’ perspectives on their care, including their assessment of any resulting change in their health.</td>
<td>Percentage of patients with &gt;20 points in difference in pre- and postoperative Hip Disability and Osteoarthritis Outcome Score (HOOS)</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Composite</td>
<td>Combines the results of two or more component performance measures, each of which individually reflects quality of care, into a single quality measure with a single score, to provide a more comprehensive picture of quality care. Composite measures can simplify and summarize a large number of measures or indicators into a more succinct piece of information.</td>
<td>Measuring in-hospital mortality indicators for select orthopaedic conditions. (6)</td>
</tr>
</tbody>
</table>

**Outcome Measurement**

There has been an emphasis from CMS and private payers towards developing outcome measures because process measures alone do not directly improve or measure patient care. Outcomes measurement is not new in healthcare but to date has been utilized primarily in research and local performance improvement projects. Outcomes can be the result of ancillary tests, physician reported, or patient reported. This last category offers the most comprehensive assessment of healthcare delivery effects to the patient and his/her goals for care.

The NQF draws a distinction between patient-reported outcomes (PRO), the concept; patient-reported outcome measure (PROM), a measurement tool; and patient-reported outcome performance measure (PRO-PM), a performance measure based on aggregated PROM data. Each measure is accompanied by different levels of specificity. 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 the clinician or anyone else. A PROM is a questionnaire or tool used to obtain information directly from patients. For example, the Single Assessment Numeric Evaluation (SANE) tool. A PRO-PM goes a step further by looking at calculated rates from the measurement instrument (PROM) within a patient population and compares that against a predetermined benchmark.
Measure Development Process

The measure development process takes about 18–24 months to complete, with seven phases (see Figure 4). The remainder of this paper delves into each phase in more detail.
**Topic Nomination and Selection**

The first step is an ongoing “call for measure topics” that is widely announced and publicized through multiple publications including the AAOS website. Topic suggestions for measure development can occur internally within the AAOS membership and/or externally. Measure topics refers to the clinical area or condition; for example, knee impairments. On an annual basis, the PMC prioritizes and selects topics, with the goal of initiating one to two new measure development topics per year. For each topic under consideration, the AAOS completes an environmental scan among stakeholders to determine the amount of concurrent research efforts and performance measures development taking place, to ensure the AAOS is not duplicating efforts. The environmental scan also helps determine gaps in measurement and identifies opportunities to harmonize with existing and related measures.

**Work Group Solicitation**

**Purpose:** After a topic has been chosen and a project timeline has been established, the measure development work group must be convened. The purpose of the work group is to guide and direct the process of transforming a measure topic to a measure concept, and then measure specifications that can be implemented.

**Structure:** The PMC looks to convene a multidisciplinary panel of experts in the selected topic area, for the measure development work group. Work group members are selected based on their expertise, experience, diversity of perspective, and training. Relevant medical specialty groups are considered. Applications are open to all AAOS members, and nominations are accepted from specialty societies in which the PMC has deemed their participation imperative to the work group. Work group members include clinicians, patients and caregivers, quality improvement experts, methodologists, and...
statisticians. To date, work groups consist of approximately 12–18 members, including the PMC Oversight Chair and Work Group Chair. The specific roles and responsibilities of each can be found in Appendix A. Note that an AAOS staff member serves as the lead methodologist / project manager for each work group.

**Conflict of Interest:** The AAOS is committed to producing independent and critical quality measures. As such, the AAOS conflict of interest (COI) policy is strictly enforced and all work group applicants must complete an enhanced disclosure as part of the application process. The PMC Chair and Oversight Chair appoint the Work Group Chair. The Oversight Chair and Work Group Chair must not have any relevant conflicts of interest. Both review all member applications for any relevant potential conflicts of interest. There is also an important role for a Consultant in the measure development process. A Consultant is an individual who has unique knowledge about the measure development topic, but who has a relevant financial or nonfinancial COI. The addition of a Consultant to assist the Work Group is determined by the PMC Chair and Oversight Chair. A Consultant contributes to discussions but is not a voting member of the Work Group. Once Work Group membership is finalized, members must complete an attestation form at the first in-person meeting.

**Measure Conceptualization**

Whereas a measure topic includes the clinical area or condition, the measure concept includes both the clinical area/condition and the aspect of care to be measured. For example, implementing a multimodal approach for pain management in total knee arthroplasty. Measure conceptualization begins with reviewing the relevant evidence, such as the strong and moderate-strength recommendations from AAOS clinical practice guidelines (CPGs). Next, the work group prioritizes measure concepts based on related and competing measures, measure feasibility, impact on improving patient care and importance, usability, and potential to remove unwanted variability from existing provider care processes. A useful tool to utilize during this phase is the NQF criteria matrix. The criteria matrix helps developers evaluate and prioritize measure concepts. See Appendix B for an example. If there are related or competing measures, work groups may want to harmonize measures, or identify whether existing measures can be adopted to fit the desired purpose of a new measure.

During measure conceptualization, the work group considers:

- What important processes or outcomes need to be improved?
• Do the processes relate to improved outcomes? Can the outcomes be influenced?
• Can the processes or outcomes be measured?
• What will the measures be used for?

Measure Specification

Measure specifications include precise detail and algorithms informed by clinical and technical knowledge. The work group members develop draft specifications. There are seven key components within a measure specification, depending on the nature of the measure. For example:

1. **Measure Title**: Includes the measure focus and target population.

2. **Measure Description**: A brief narrative that describes the intent of the measure and its impact on patient care.

3. **Numerator**: Specifies clinical action needed to meet the measure.

4. **Denominator**: Specifies the target population and time period. The definition should include inclusion criteria, such as the diagnosis, diagnostic subgroup, and acuity of diagnosis, age ranges, and other positive selection factors.

5. **Exclusions**: Factors supported by clinical evidence that removes a patient from inclusion in the measure population. For example, if the denominator indicates the measure is for all patients aged 65 or older, a patient who is 50 years old is excluded.

6. **Exceptions**: Conditions that remove the patient, procedure or unit of measurement from the denominator only if the numerator criteria are not met. For each measure, there must be a clear rationale to permit an exception.

7. **Data Sources**: Details the data source to be utilized for measure implementation. For example, medical records, data registry, Qualified Clinical Data Registry, and Electronic Health Records (EHR).

Additional components include:

• Care setting; for example, outpatient or inpatient hospital.
• Measure type; for example, outcome, process, structural, or patient experience.
- Supporting guidelines and references, which provide the supporting evidence verbatim. Measure importance includes a brief statement of the relationship to the desired outcome (for process measures) and opportunities for improvement.

- Measure Harmonization. A work group may recommend the creation of a measure that may be similar to an existing measure. The measure specifications will address steps taken to harmonize the AAOS measure with existing measures, as well as the rationale for developing a separate measure. When possible, the AAOS will partner with measure developers to include musculoskeletal conditions in existing and endorsed measures, as appropriate.

- Code sets; for example, related codes for specification.

- Risk Adjustment. This outlines the need and method for adjusting for external factors which may unfairly influence the measure. This applies primarily to outcome measures.

**Measure Testing**

Once measure specifications are complete, the measure needs to be tested. The purpose of testing is to understand if the measure works the way it was intended, and ensure that the measure is valid, reliable, and feasible. *Validity testing* ensures that the performance measure assesses the components it is intending to measure, and is consistent with the evidence. *Reliability testing* refers to the repeatability or precision of measurement. *Feasibility testing* is qualitative and involves an assessment of the availability of the data required for the measures, and the ease and cost of obtaining that data. Note that looking at feasibility of the measure set should occur during each step of the measure development process. Examples of sources with which to test data include claims data, survey data, EHR data, and registries. If the work group has no revisions or significant updates as a result of measure testing, the measure set will be released for public comment.
Public Comment Period

Public comment to the measurement set ensures transparency and equal input from all affected stakeholders. When a measure is released for public comment, the goal is to obtain feedback on both the technical aspects of the measure as well as the clinical and operational implications of using the measure. The measure set is posted to the AAOS website for a minimum of 30 days. The public has the opportunity to review measures and provide comments and suggest changes. Measure developers and project managers should plan accordingly to incorporate the time needed to solicit and receive public comment, including time needed to go back and make revisions to the measurement set.

At the AAOS, the call for public comment on performance measures is included in a variety of notification outlets, including the AAOS website, AAOS publications, and sending notices to internal and external stakeholders. Requests for public comment are sent to the AAOS BOD, CoRQ, the Board of Specialty Societies, the Board of Councilors, orthopaedic specialty societies, relevant medical societies, patient advocacy organizations, and health insurers. All comments are submitted to AAOS staff electronically. See Appendix D for a sample feedback request form.

After the public comment period, AAOS staff prepares a report summarizing all feedback received, including verbatim comments. The PMC and work group review each comment and considers measure revisions to improve clarity. All public comments receive a written response. Comments and responses are included in the final measurement set report.

Note that the federal rulemaking process also includes a public comment period, which is distinct from the AAOS public comment period. If an AAOS-stewardied performance measure is used in a federal quality reporting program, CMS would receive feedback on that measure as well. During measure use, public comments received as part of the federal rulemaking process should be considered as part of ongoing surveillance. These comments should also be formally considered when the measure is re-evaluated. (7)
Approval

If no major revisions to the measure are needed based on public comment, the measurement set goes through the process of approval. Once the measures are approved by the measure development work group, they are submitted to the PMC for approval, the CoRQ for approval, and finally the BOD for approval. After Board approval, the AAOS will seek out NQF endorsement. If substantial revisions to the measure set are needed based on this approval process, the process of developing measures based on evidence review begins again, followed by peer review, testing, soliciting public comment, and approval.

Dissemination

The work group leadership will be asked to draft a summary that will highlight the final measure set and rationale, as well as how providers can capture and report data for the measure. The summary will be submitted for publication in AAOS Now and will link to the full measurement set. Following publication of the summary, AAOS staff will coordinate dissemination activities including a public notification of the release of the measures via the AAOS website, social media, and other educational programs.

The primary purpose of measure development is to provide orthopaedic surgeons with tested, approved, and endorsed measures for research, outcomes documentation, and value-based payment models. Implementation from the measure developer perspective means getting the measures used in federal and private payer value-based payment models, including pay-for-reporting and pay-for-performance quality programs. CMS identifies and selects measures it is considering for use in its quality programs; when considering a measure for a topic already measured in a different program, CMS prefers to use the same measure or a harmonized measure. (8) To ensure the utility of their measure, measure developers must provide strong evidence to CMS that the measure adds value to quality reporting programs. (9) After the measures are implemented, the AAOS will monitor the performance of the measures, respond to ongoing feedback, and continuously scan the environment for similar measures.
Performance measures must be continually evaluated, as new evidence changes best practices for clinical care, new data sources become available, and/or unforeseen side effects of the measures are discovered. Sometimes the creation of a measure leads to the realization that information is not being collected or is not being collected in the best way. The AAOS will continue to maintain and modify physician level performance measures to ensure that they are consistent with the latest scientific advances. Check the AAOS website for information about physician level performance measures as well as information about the CMS QPP as physician-level performance measures continue to evolve.
References


(3) Ibid.


(6) Ibid.


(8) Ibid.

(9) Ibid.
APPENDIX A

Measure Development Work Group Composition

**CO-CHAIRS**
- Appointed by PMC and Oversight Chair
- Organizes, Guides & Facilitates
- Develops Goals, Mission & Objectives
- Serves as Spokesperson
- Resource to Staff and Work Group Members

**OVERSIGHT CHAIR**
- Member of the PMC – Nonvoting Member of Work Group
- Acts as “Governing Body”
- Organizes & Guides
- Liaison between PMC & Work Group
- Develops Goals, Mission & Objectives
- Ensures Measure Development is Rigorous & Well Defined

**WORK GROUP MEMBERS**
- Appointed by Leadership
- Voting Member
- Identify measure concepts that are appropriate for development
- Review existing information to related effort
- Aid by identifying additional analysis
- Participate fully and consistently
- Develop & Review measures specifics & NQF submissions forms

APPENDIX B

Sample Criteria Matrix

<table>
<thead>
<tr>
<th>Harmonization</th>
<th>Importance</th>
<th>Feasibility</th>
<th>Usability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Existing Measure</strong></td>
<td><strong>Evidence</strong></td>
<td><strong>Priority (Impact)</strong></td>
<td><strong>Performance Gap</strong></td>
</tr>
<tr>
<td>Is there an existing performance measure on this concept? If a measure currently exists, will a newly developed measure have a meaningful impact on clinical decision-making/clinical outcomes and/or reduce practice variation, and/or be of significant benefit to AAOS members?</td>
<td>Is there an existing evidence-based CPG or AUC on this topic? And/or are there sufficient research findings available upon which to base a clinical performance measure?</td>
<td>Is the topic area a national health goal/priority or high impact area of healthcare (e.g., large number of patients impacted, leading cause of morbidity and mortality, high cost, or high burden of illness)?</td>
<td>Are there substantial variations in the diagnosis and/or treatment of the health problem?</td>
</tr>
<tr>
<td>Is there an existing evidence-based CPG or AUC on this topic? And/or are there sufficient research findings available upon which to base a clinical performance measure?</td>
<td>Is the topic area a national health goal/priority or high impact area of healthcare (e.g., large number of patients impacted, leading cause of morbidity and mortality, high cost, or high burden of illness)?</td>
<td>Are there substantial variations in the diagnosis and/or treatment of the health problem?</td>
<td>Are there data sources for implementation? If yes, what are they?</td>
</tr>
</tbody>
</table>

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APPENDIX C

Sample Measure Specification Worksheet


**2017 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 reported at each denominator eligible visit occurring during the reporting period for patients with osteoarthritis seen during the reporting period. This measure may be reported by eligible clinicians who perform the quality actions described in the measure based on the services provided and the measure-specific denominator coding.

**Measure Reporting:**
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. All measure-specific coding should be reported 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**

**AND**
Patient encounter during the reporting 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 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).
Appendix D

Detailed Measure Development Process

Measure Development

- Prioritize Topics & Assemble Measure Work Group
- Review Evidence; Develop Measure Concepts
- Draft Measure Specifications
- Committee Feedback

Measure Testing

- Field Testing
- Committee Feedback
- Public Comment
- AAOS Approval Process

Measure Finalization

- Prepare Submission Documents
- Defend Measure during Review Process
- Dissemination & Implementation
- Measure Maintenance