
Quality measures in osteoarthritis

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ABSTRACT

Published guidelines emphasize a multidisciplinary approach to management of patients with osteoarthritis (OA), yet studies have demonstrated substantial variation in the treatment approach of both primary care physicians and rheumatologists. During the past decade, quality indicators have been developed by several groups in order to provide a minimally acceptable standard of care. This article summarizes the results of a qualitative systematic review of the English-language literature on quality indicators for osteoarthritis and highlights relevant indicators published by the Arthritis Foundation and American College of Rheumatology.

Introduction

Osteoarthritis (OA) is the most common form of arthritis, and the pain associated with OA is a major cause of activity limitation, functional disability and reduced health-related quality of life (1, 2). In addition, OA is the cause of the majority of total hip replacements and more than 90 percent of total knee replacements performed in the United States (3). Recommendations for the medical management of hip and knee OA were published by the American College of Rheumatology (ACR) in 1995 and updated in 2000 (4-6). These recommendations address both non-pharmacologic and pharmacologic modalities, as well as surgical interventions. Consensus recommendations for both elective total hip and total knee replacement have been developed by National Institutes of Health consensus panels in 1994 and 2003, respectively (7, 8). In addition, recommendations for the management of hip and knee OA have been developed by the European League of Associations of Rheumatology (EULAR) (9, 10).

Recently, the OsteoArthritis Research Society International (OARSI) completed a critical appraisal of 23 sets of published guidelines identified from

a systematic review (11). Of 51 treatment modalities noted in one or more of these guidelines, 20 were recommended in all and an additional 12 were recommended in more than three-quarters of the guidelines. These 32 different modalities covered the spectrum from non-pharmacologic and pharmacologic treatments to surgical interventions. OARSI has also developed recommendations for the treatment of hip and knee OA; these have not been published as of the writing of this article in July 2007 (Nuki G: Personal communication).

Surveys of practicing rheumatologists and primary care physicians conducted more than 10 years ago indicated substantial variation in the management of patients with lower limb OA (12, 13). As part of the recent trend to improve the quality of care delivered to patients with chronic diseases, one goal being to reduce unexplained variation in practice patterns, quality indicators have been developed to assess the process of health care delivered to patients with OA. Such quality indicators represent a minimally acceptable standard of care and are largely consistent with published recommendations for diagnosis and management.

A literature search was performed using PubMed with the search terms 'osteoarthritis' and 'quality indicators' to identify relevant publications. This article briefly reviews the published quality indicators for OA.

Assessing Care of Vulnerable Elders (ACOVE) quality indicators

The project "Assessing Care of Vulnerable Elders" (ACOVE) has addressed quality indicators for OA (14). A structured literature review was performed, and proposed quality indicators were developed and reviewed by an external expert panel of reviewers. A total of 11 indicators were accepted (Table I). These focused on the assessment of pain and function, the exclusion of su-

Conflict of interest: Dr. Hochberg is a consultant to Bayer Health Care, Merck & Co. Inc., and Novartis Pharma AG.

Table I. ACOVE quality indicators for osteoarthritis (ref. 14).

1. If a vulnerable elder is diagnosed with symptomatic OA, then his or her functional status and the degree of pain should be assessed annually because this information is necessary to direct therapeutic decisions.
2. If a vulnerable elder has mono-articular joint pain associated with redness, warmth, or swelling and the patient also has an oral temperature greater than 38.0°C and does not have a previously established diagnosis of pseudogout or gout, then a diagnostic aspiration of the painfully swollen red joint should be performed that day because this sign-symptom complex is common in joint infection, and requires treatment that is different than that for OA.
3. If an ambulatory vulnerable elder is newly diagnosed with OA of the knee, has no contraindication to exercise, and is physically and mentally able to exercise, then a directed or supervised strengthening or aerobic exercise program should be prescribed within 3 months of the diagnosis because such programs improve functional status and reduce pain.
4. If an ambulatory vulnerable elder has had a diagnosis of symptomatic OA of the knee for longer than 12 months, has no contraindication to exercise, and is physically and mentally able to exercise, then there should be evidence that a directed or supervised strengthening or aerobic exercise program was prescribed at least once since the time of diagnosis, because such programs improve functional status and reduce pain.
5. If an ambulatory vulnerable elder is diagnosed with symptomatic OA, then education regarding the natural history, treatment, and self-management of the disease should be offered at least once within 6 months of diagnosis because such education produces improvements in physical functioning and pain.
6. If an ambulatory vulnerable elder has had a diagnosis of symptomatic OA for 12 months or longer, then there should be evidence that the patient was offered education regarding the natural history, treatment, and self-management of the disease at least once since the time of diagnosis because such education produces improvements in physical functioning and pain.
7. If oral pharmacologic therapy is initiated to treat OA in a vulnerable elder, then acetaminophen should be the first drug used unless there is a documented contraindication to use, because this agent is as effective in treating OA as other oral agents and it is less toxic.
8. If oral pharmacologic therapy for OA in a vulnerable elder is changed from acetaminophen to a different oral agent, then there should be evidence that the patient has had a trial of maximum-dose acetaminophen (suitable for age and co-morbid conditions), because acetaminophen in adequate doses is as effective in treating OA as other oral agents, and it is less toxic.
9. If a patient is treated with a COX non-selective non-steroidal anti-inflammatory drug (NSAID), then there should be evidence that the patient was advised of the risk for gastrointestinal bleeding associated with these drugs, because this risk is substantial.
10. If a vulnerable elder is older than 75 years of age, is being treated with warfarin, or has a history of peptic ulcer disease or gastrointestinal bleeding and is being treated with a COX non-selective NSAID, then he or she should be offered concomitant treatment with either misoprostol or a proton-pump inhibitor (PPI), because this will substantially reduce the risk of NSAID-induced gastrointestinal bleeding.
11. If a vulnerable elder with severe symptomatic OA of the knee or hip has failed to respond to non-pharmacologic and pharmacologic therapy and has no contraindication to surgery, then he or she should be referred to an orthopaedic surgeon to be evaluated for total joint replacement within 6 months unless a contraindication to surgery is documented, because hip and knee replacements markedly improve function and quality of life by reducing pain and/or improving range of motion.

perimposed joint infection in patients with an acute synovitis, the prescription of non-pharmacologic modalities and acetaminophen for patient man-

agement, and referral to orthopaedic surgeons. The project was supported by a contract from Pfizer Inc. to the RAND Corporation.

Ganz and colleagues reported the results of an ancillary study of a sample of community-dwelling elders aged 75 years and above who were enrolled

Table II. Arthritis Foundation quality indicators for OA (ref. 17).

1. If a patient is begun on a drug treatment for "joint pain," "arthritis" or "arthralgia," then evidence that the affected joint was examined should be documented.
2. If a patient is diagnosed with symptomatic OA of the knee or hip, then his or her pain should be assessed annually and when new to a practice.
3. If a patient is diagnosed with symptomatic OA of the knee or hip, then his or her functional status should be assessed annually and when new to a practice.
4. If a patient has had a diagnosis of symptomatic OA of the knee or hip for > 3 months, then education about the natural history, treatment, and self-management of OA should have been given or recommended at least once.
5. If an ambulatory patient has had a diagnosis of symptomatic OA of the knee or hip for > 3 months, has no contraindication to exercise, and is physically and mentally able to exercise, then a directed or supervised muscle strengthening or aerobic exercise program should have been prescribed at least once and reviewed at least once per year.
6. If an individual is overweight (as defined by body mass index of > 27 kg/m²), then he or she should be advised at least annually to lose weight.
7. If a patient has symptomatic OA of the knee or hip and is overweight (as defined by a body mass index of > 27 kg/m²), then he or she should be advised at least annually to lose weight, and the benefit of weight loss on the symptoms of OA should be explained to the patient.
8. If a patient has symptomatic OA of the knee or hip and has been overweight (as defined by body mass index of > 27 kg/m²) for 3 years, then he or she should receive referral to a weight loss program.
9. If a patient has had symptomatic OA of the knee or hip and reports difficulty walking to accomplish activities of daily living for more than 3 months, then his or her walking ability should be assessed for the need to use ambulatory assistive devices.
10. If a patient has a diagnosis of OA and reports difficulties with non-ambulatory activities of daily living, then his or her functional ability with problem tasks should be assessed for the need to use non-ambulatory assistive devices to aid with problem tasks.
11. If a non-narcotic pharmacologic therapy is initiated to treat OA pain of mild or moderate severity, then acetaminophen should be the first drug used unless there is a documented contraindication to use.
12. If oral pharmacologic therapy for OA is changed from acetaminophen to a different oral agent, then there should be evidence that the patient has undergone a trial of maximum dose acetaminophen (suitable for age/co-morbidities).
13. If a patient with severe symptomatic OA of the knee or hip has failed to respond to non-pharmacologic and pharmacologic therapy, then he or she should be offered referral to an orthopaedic surgeon.
14. If a patient has hip or knee OA and worsening complaints accompanied by a progressive decrease in activities and no previous radiograph during the preceding 3 months, then a knee and hip radiograph should be performed within 3 months.

Table III. Arthritis Foundation quality indicators for analgesic use (ref. 18).

1. If a patient is prescribed an NSAID (non-selective or selective), then he or she should be advised of the associated gastrointestinal bleeding risks and renal risks, and the gastrointestinal risks should be documented.
2. If a patient is prescribed low-dose (≤ 325 mg/day) aspirin, then he or she should be advised of the associated gastrointestinal bleeding risks.
3. If a patient is prescribed acetaminophen and has risk factors for liver disease, or if the patient is treated with high-dose (≥ 4 gm/day) acetaminophen, then he or she should be advised of the associated risk of liver toxicity.
4. If a patient is treated with a non-selective NSAID and has risk factors for gastrointestinal bleeding, then he or she should be treated concomitantly with either misoprostol or a proton pump inhibitor (PPI).
5. If a patient is treated with a COX-2-selective NSAID, takes low-dose aspirin daily, and has risk factors for gastrointestinal bleeding, then he or she should be treated concomitantly with either misoprostol or a PPI.
6. If a patient is treated with low-dose aspirin daily and has two or more risk factors for gastrointestinal bleeding, then he or she should be treated concomitantly with either misoprostol or a PPI.
7. If a patient who is not being treated with low-dose aspirin has risk factors for gastrointestinal bleeding and is prescribed an NSAID, then he or she should receive either a non-selective NSAID plus a gastroprotective agent (PPI or misoprostol) or a COX-selective NSAID.
8. If a patient who is taking coumadin is prescribed an NSAID, then the NSAID should be either COX-2-selective or a non-acetylated salicylate.
9. If a patient is treated with daily NSAIDs (selective or non-selective) and has risk factors for gastrointestinal bleeding, then a CBC should be performed at baseline and during the first year after initiating therapy.
10. If a patient is treated with daily NSAIDs (selective or non-selective) and has risk factors for developing renal insufficiency, then a serum creatinine should be assessed at baseline and at least once in the first year following the initiation of therapy.

in the Assessing Care of Vulnerable Elders (ACOVE-2) intervention study and who reported a physician- or nurse-diagnosis of OA (15). For this study, Ganz *et al.* adopted a version of the original ACOVE indicator set for OA that had been modified by a committee of geriatricians based on new medical literature and tailored for use in outpatients aged 75 and above (see Appendix in 15). The final ACOVE-2 set used in the study included eight indicators. Data were collected for 339 patients with a mean age of 81 years; more than half reported back or knee pain while fewer than half reported hip pain. The median quality of care score was 50%, with median treatment and medication safety subscale scores of 67% and 50%, respectively. This indicates that half or more of the quality indicators relevant for each patient were satisfied. The lowest pass rate was for the indicator of offering concomitant therapy with either misoprostol or a proton-pump inhibitor to a vulnerable elder with OA who is being treated with a non-selective non-steroidal anti-inflammatory drug (NSAID).

In only 60% of the cases was there evidence that the functional status of the patient and the degree of pain were measured on an annual basis. The authors concluded that the quality of care for community-dwelling vulnerable elders with OA was suboptimal, with lower pass rates for indicators reflecting medication safety.

Arthritis Foundation quality indicators

The Arthritis Foundation (AF) Quality Indicator Project was developed to establish a set of measures that could be used to assess the quality of care for patients with OA, as well as rheumatoid arthritis (16). A 3-step process was drawn up to develop the quality indicators: 1) a comprehensive literature search that identified 86 relevant publications and indicator sets; 2) the selection of processes of care for consideration; and 3) the definition of each proposed quality indicator and its expected impact on outcomes. A multi-disciplinary expert panel discussed and rated the validity of the proposed measures using a modification of the RAND/UCLA Appropri-

ateness Method. This project was supported by a contract from the Arthritis Foundation to the RAND Corporation. Of importance for the health care practitioner who manages patients with OA is the AF Quality Indicator Set for OA (Table II) and the set for analgesics (Table III) (17, 18)

The AF Quality Indicator Set for OA includes 14 indicators that cover the areas of physical examination, assessment of pain and function, non-pharmacologic modalities (including patient education, exercise, weight loss, and the use of assistive devices), the use of acetaminophen, surgical evaluation, and the role of radiographs (17). The AF Quality Indicator Set for Analgesics includes eight indicators covering the topics of informing patients about risks, gastrointestinal prophylaxis, the selection of an NSAID, and monitoring for toxicity (18). Neither of these sets of quality indicators addressed the use of intra-articular therapy, the appropriate use and risks of opioid analgesics, or the recognized cardiovascular risks of both non-selective and COX-2 selective NSAIDs.

Table IV. American College of Rheumatology's starter set of measures for quality in the care for rheumatic and musculoskeletal diseases: Drug safety (www.rheumatology.org/practice/qmc/quality.asp).

1. If a patient is newly prescribed NSAIDs (selective or non-selective), then a discussion with the patient about the risks of the chosen therapy should be documented.
2. If a patient is treated with (i) a non-selective NSAID or (ii) a COX-2 selective NSAID plus aspirin, and has risk factors for upper gastrointestinal bleeding, then the patient should be treated concomitantly with either misoprostol or a proton pump inhibitor unless he or she refuses.
3. If a patient is treated with daily NSAIDs (selective or non-selective) and has risk factors for gastrointestinal bleeding, then a hemoglobin count or hematocrit should be performed at baseline and during the first year after initiating therapy.
4. If a patient is treated with daily NSAIDs (selective or non-selective) and has risk factors for developing renal insufficiency, then serum creatinine should be assessed at baseline, within the first 3 months, and then at least annually thereafter.

Table V. American Medical Association physician performance measures for osteoarthritis, with the measure description listed as a sub-bullet (www.ama-assn.org/ama/pub/category/15651.html).

1. Assessment for the use of anti-inflammatory or analgesic over-the-counter medications
 - Percentage of patient visits for OA patients > 21 years of age with assessment for use of anti-inflammatory or analgesic OTC medications
2. Gastrointestinal prophylaxis
 - Percentage of patient visits for OA patients > 21 years of age during which GI prophylaxis was considered
3. Symptom and functional assessment
 - Percentage of patient visits for OA patients > 21 years of age with assessment for function and pain
4. Non-steroidal anti-inflammatory (NSAID) risk assessment
 - Percentage of OA patients > 21 years of age on prescribed or OTC NSAIDs who were assessed for GI/renal risk factors
5. Physical examination of the involved joint
 - Percentage of OA patients > 21 years of age for whom a physical examination of the involved joint was performed during the initial visit
6. Anti-inflammatory/analgesic therapy
 - Percentage of patient visits for OA patients > 21 years of age during which an anti-inflammatory agent or analgesic was considered
7. Therapeutic exercise for the involved joint
 - Percentage of patient visits for patients > 21 years of age with OA of the hip or knee during which therapeutic exercise for the hip or knee (therapeutic exercise instructed or physical therapy prescribed) was considered

American College of Rheumatology measures for quality of care

The American College of Rheumatology (ACR) has developed a starter set of quality performance indicators that cover the areas of rheumatoid arthritis (3 indicators), osteoporosis (3 indicators), gout (4 indicators) and drug safety (6 indicators); there are no indicators specifically listed for OA (accessed at www.rheumatology.org/practice/qmc/quality.asp on June 12, 2007) (see Anderson, in this volume). Nearly all the indicators in the ACR starter set were modified from other well-developed sets of quality indicators (*vide supra*). In the author's opinion, four of the six indicators for drug safety are relevant to the management of OA patients who are taking NSAIDs; they are similar to the indicators developed by the Arthritis Foundation and are listed in Table IV. It is surprising that, while the ACR has published recommendations for the management of both hip and knee OA and updated these recommendations on its website to reflect recent data on the cardiovascular risks of NSAIDs (accessed at "www.rheumatology.org/publications/guidelines/oa-mgmt/oa-mgmt.asp?aud=mem" on June 12, 2007), it has not promulgated quality indicators for OA.

American Medical Association Consortium

The American Medical Association (AMA) Physician Consortium for Per-

formance Improvement has developed a set of Physician Performance Measures and related data specifications that are intended to assist physicians in enhancing the quality of care. The measures are not meant to establish a standard of care and have not been fully tested or evaluated. The AMA Consortium's measures for OA are listed in Table V (accessed at www.ama-assn.org/ama/pub/category/15651.html on June 12, 2007). Each measure has a description, a definition of the numerator and denominator, and linkage to the Center for Medicare Studies Demonstration Projects. They are not designed to assist the practitioner in the management of the individual patient, but rather to assess the overall quality of the practice for a group of patients.

Conclusion

Osteoarthritis is associated with important morbidity and imposes a large economic burden on the US economy. While guidelines for the evaluation and management of patients with OA have been published, it is unclear whether they have had any impact on the patterns of care delivered to patients with this disease. In an attempt to improve the delivery of health care to patients with OA, quality indicators consistent with recommendations for management have been developed to direct the practitioner and, potentially, to evaluate the care delivered to patients with OA. Hopefully, adherence by the prac-

titioner to these indicators will improve the quality of life for patients with OA, not only by reducing the pain and functional impairment associated with OA, but also by reducing the occurrence of adverse events from treatments for OA and their associated morbidity and mortality.

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