

Evidence Review



Topic: Appropriateness Criteria for THA or TKA

Background.

Total hip arthroplasty (THA) and total knee arthroplasty (TKA) are successful interventions that provide significant improvement in function, quality of life, patient satisfaction and pain relief. However, variability in rates of THA and TKA surgeries performed exists by country, region, ethnicity, and even among clinicians¹.

Explicit appropriateness criteria have been generated to reduce the variability in these rates by standardizing priority thresholds for THA and TKA^{2,3,4,5}. Formulation of these criteria is often based on consensus of expert panels who review extensive scientific evidence on the indications, effectiveness, efficiency, costs, risks and opinions associated with THA or TKA. Next, these panels are presented with a comprehensive list of mutually exclusive clinical scenarios (indications) in which THA or TKA might be performed, and then they are asked to rank, based on the review of evidence, the appropriateness level of each scenario for surgery. This method of developing appropriateness criteria for surgery was developed by RAND UCLA researchers in the 1980s, and has been used for hip replacements⁶ and spine surgeries^{7,8}. Appropriateness here is defined as a procedure where the expected benefits of arthroplasty exceed the expected negative consequences by an adequately large margin to make the procedure worth doing⁹. A spectrum of appropriateness indications can be developed from this process for all clinical scenarios for THA or TKA surgery that ranges from appropriate to inappropriate.

Review Design.

The aim of this review is to summarize, using evidence-based principles and techniques, the literature for criteria on the appropriateness of THA and TKA.

Search Strategy.

A search of the Cochrane Database of Systematic Reviews found no relevant reviews on this subject.

Search term used: (appropriate\$ or threshold\$).mp AND (criteria or standard\$ or guidelines).mp AND (arthroplasty or replacement).mp AND (hip or knee).mp. Limited to Systematic Reviews.

Search of EMBASE, MEDLINE and CINAHL were performed next.

Search term used: (appropriate or appropriateness or threshold or thresholds).mp AND (criteria or standard or standards or guidelines).mp AND (arthroplasty or replacement).mp AND (hip or knee).mp.

Articles selected:

- Quintana JM et al. (2006). Health-related quality of life and appropriateness of knee or hip joint replacement. *Arch Intern Med.* 166(2):220-6.
- Quintana JM et al. (2005). Appropriateness of total hip joint replacement. *Int J Qual Health Care.* 17(4):315-21.
- Escobar A et al. (2003). Development of explicit criteria for total knee replacement. *Int J Technol Assess Health Care.* 19 (1):57-70

Results.

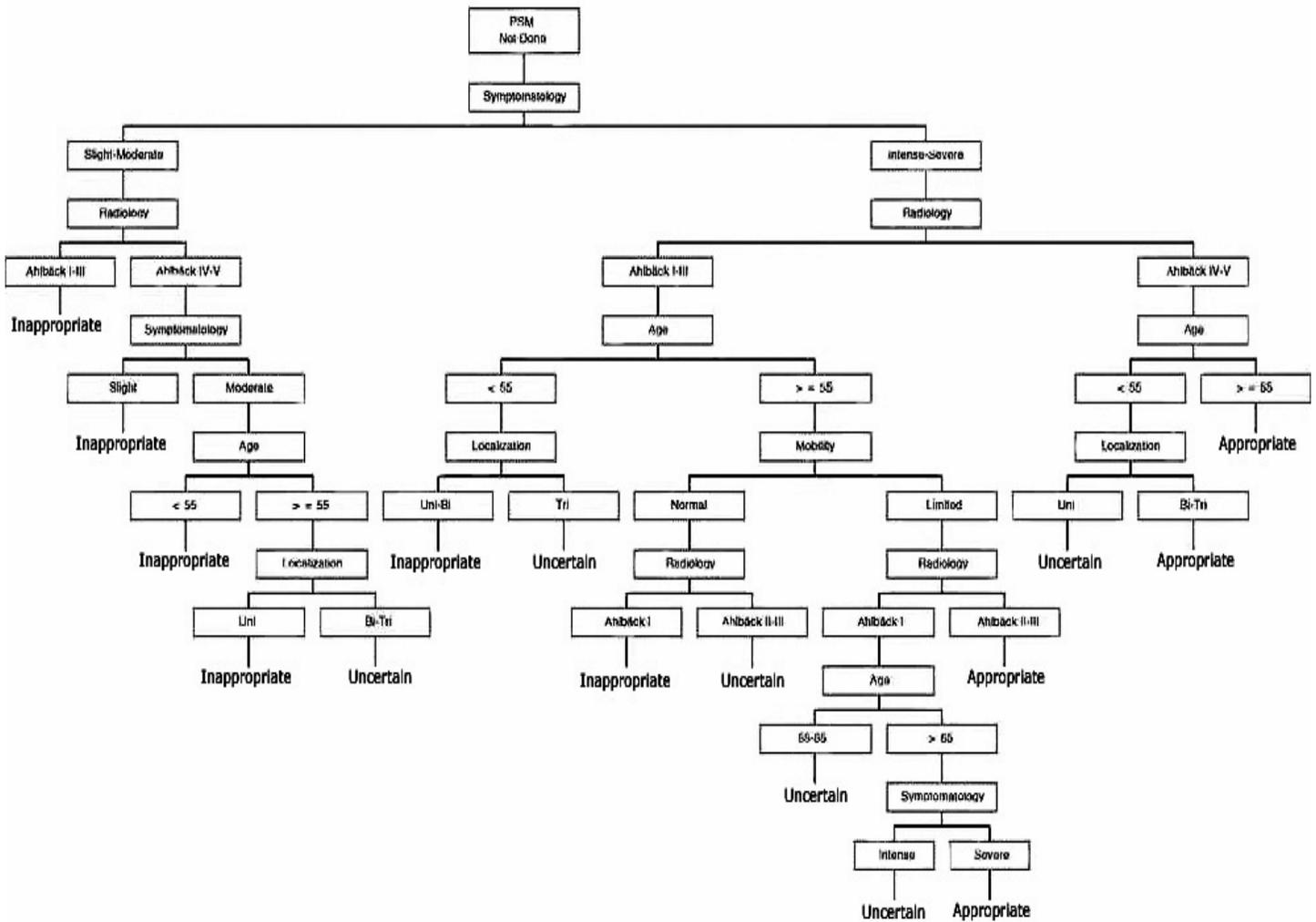
Although numerous guidelines have been developed for the diagnosis and treatment of severe OA with arthroplasty, few have examined the criteria threshold at which indications for such a surgery make it appropriate for the patient. Our literature search identified only a few studies that addressed the appropriateness for THA or TKA.

Escobar et al (2003) developed criteria for TKA based on the RAND UCLA method. In this study, a panel of 22 national experts of various disciplines voted on a comprehensive list of 624 scenarios that could require

TKA. This panel rated the appropriateness (defined above) for each scenario based on a 1 to 9 point scale (most inappropriate to most appropriate, respectively). The results were that 26.8% of scenarios were considered appropriate, 48.7% inappropriate and 24.5% uncertain. The ratings from another panel of experts on these scenarios correlated strongly with the first panel (kappa of 0.75). Moreover, there was no instance in which a scenario rated as appropriate by one panel shifted to inappropriate by another panel. The essential patient variables that were required to generate the full list of scenarios were age,

previous surgical management, localization, mobility and stability, symptomology, and radiology score (see Escobar et al for subclasses and definitions). Expressed as an algorithm, the authors generated a list of outcomes based on these variables which they proposed could be used in the development of clinical guidelines for TKA.

Quintana et al. (2005) also used the RAND appropriateness methodology to create an algorithm which considers several variables to determine which indications are



Classification tree for TKA patients. Figure from Escobar et al (2003).

appropriate for THA. A comprehensive list of 216 scenarios for the indication of THA was generated. These scenarios included the variables of age, diagnosis, ASA surgical risk, previous non-surgical procedures performed, pain, and functional limitations. The result of consensus panel voting was that 73.5% of scenarios were considered necessary or appropriate for THA, uncertain in 21.4%, and inappropriate in 5.1%. Next, the authors examined the patient records of 784 THA patients at 6 months after their surgery and determined that only 81 (37.5%) of scenarios occurred in practice. The most frequently encountered scenarios are provided in the table below.

Number	Scenario	Appropriateness evaluation	No. (%)
1	Patient 50–70 years of age, surgical risk low, pain severe, functional limitations moderate to severe, and adequate previous treatments	Appropriate	152 (19.4)
2	Patient 50–70 years of age, surgical risk low, pain severe, functional limitations moderate, and inadequate previous treatments	Appropriate	49 (6.3)
3	Patient >70 years of age, surgical risk low, pain severe, functional limitations moderate to severe and adequate previous treatments	Appropriate	114 (14.5)
4	Patient >70 years of age, surgical risk low, pain severe, functional limitations moderate, and inadequate previous treatments	Appropriate	51 (6.5)
5	Patient 50–70 years of age, surgical risk low, pain and functional limitations moderate	Uncertain	39 (5.0)
6	Patient >70 years of age, surgical risk low, pain and functional limitations moderate	Uncertain	36 (4.6)
7	Patient 50–70 years of age, surgical risk low, pain and functional limitations minor or moderate, and inadequate previous treatments	Inappropriate	20 (2.6)

In an effort to determine whether appropriateness for arthroplasty correlates with patient outcomes, Quintana et al. (2006)¹⁰ next examined the relationship between appropriateness criteria for THA and TKA, and the changes in health-related quality of life outcomes. The authors hypothesized that if appropriateness criteria offer good clinical guidance, then patients considered to be appropriate treatment patients should have higher improvements on the SF-36 and WOMAC following surgery. A total of 1,576 patients on waiting lists for surgery (784 THA, 792 TKA) participated in this observational study. Patients completed the questionnaires before and at 6 months after surgery. Hospital and clinic data were then analyzed at 6 months post-surgery to determine each patient’s ranking based on appropriateness criteria. This study found that patients considered appropriate candidates by the criteria had the greatest improvements on the SF-36 and WOMAC following THA and TKA than patients who were ranked inappropriate for the procedure. Quintana et al suggest that these results support the validity of explicit criterion since those deemed appropriate on these measures had greater benefit and similar low risks compared to the inappropriate group.

Summary.

- Appropriateness criteria have been established for THA and TKA
- There is evidence that appropriateness rankings correlate with patient health outcomes following surgery
- Research in this area is currently limited

Conflict of interest.

Non known.

Reference List

- 1 Birkmeyer, J.D. et al. (1998) Variation profiles of common surgical procedures. *Surgery* 124, 917-923
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- 3 Hadorn, D.C. and Holmes, A.C. (1997) The New Zealand priority criteria project. Part 1: Overview. *BMJ* 314, 131-134
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- 5 Quintana, J.M. et al. (2005) Appropriateness of total hip joint replacement. *Int. J. Qual. Health Care* 17, 315-321
- 6 Quintana, J.M. et al. (2000) Evaluation by explicit criteria of the use of total hip joint replacement. *Rheumatology. (Oxford)* 39, 1234-1241
- 7 Porchet, F. et al. (1999) The assessment of appropriate indications for laminectomy. *J. Bone Joint Surg. Br.* 81, 234-239
- 8 Larequi-Lauber, T. et al. (1997) Appropriateness of indications for surgery of lumbar disc hernia and spinal stenosis. *Spine* 22, 203-209
- 9 Brook, R.H. et al. (1986) A method for the detailed assessment of the appropriateness of medical technologies. *Int. J. Technol. Assess. Health Care* 2, 53-63
- 10 Quintana, J.M. et al. (2006) Health-related quality of life and appropriateness of knee or hip joint replacement. *Arch. Intern. Med.* 166, 220-226

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