Fig. E-1
Mean Oxman and Guyatt score of the meta-analyses according to publication date. The
maximum attainable Oxman and Guyatt score is 7.
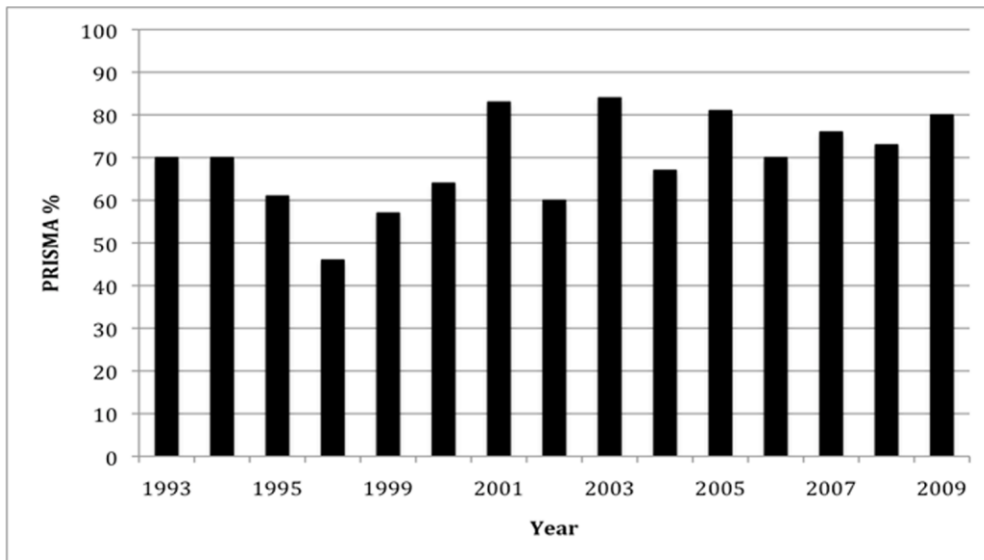

Fig. E-2
Mean percentage of PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-
Analyses) items present in the meta-analyses according to publication date.

TABLE E-1 Journals in Which the Included Meta-Analyses Were Published

Journal Name	No. of Studies	%
The Journal of Bone and Joint Surgery (American Volume)	14	18
The Journal of Arthroplasty	12	16
Clinical Orthopaedics and Related Research	5	6
Cochrane Review	5	6
Acta Orthopaedica	4	5
Archives of Internal Medicine	4	5
The Journal of Bone and Joint Surgery (British Volume)	3	4
JAMA: the Journal of the American Medical Association	2	3
International Orthopaedics	2	3
Annals of Internal Medicine	2	3
Archives of Orthopaedic and Trauma Surgery	2	3
Cancer Epidemiology, Biomarkers & Prevention	1	1
Spine	1	1
BMJ	1	1
BMC Medicine	1	1
The Journal of Rheumatology	1	1
British Journal of Anaesthesia	1	1
The Lancet	1	1
European Journal of Nuclear Medicine and Molecular Imaging	1	1

The Knee	1	1
The American Journal of Surgery	1	1
Journal of Surgical Research	1	1
The Journal of Foot and Ankle Surgery	1	1
The British Journal of Surgery	1	1
Anesthesia & Analgesia	1	1
Radiology	1	1
International Journal of Radiation Oncology Biology Physics	1	1
Journal of Clinical Anesthesia	1	1
European Journal of Radiology	1	1
Journal of Shoulder and Elbow Surgery	1	1
Updates in Blood Conservation and Transfusion Alternatives: Journal of the Australasian Association for Blood Conservation	1	1
Thrombosis Research	1	1
Anaesthesia and Intensive Care	1	1

TABLE E-2 Meta-Analyses According to Subject Area

Subject Area	No. of Studies	%	Primary Study Design*	% of Studies That Were Randomized Controlled Trials
Pharmacology	20	26	15 randomized, 3 mixed, 2 quasi-randomized	75
Thromboprophylaxis	13			
Blood Conservation	4			
Antibiotics	2			
Bisphosphonate	1			
Total hip arthroplasty	16	21	7 randomized, 4 mixed, 2 observational, 3 quasi-randomized	44
Total knee arthroplasty	14	18	7 randomized, 2 mixed, 5 quasi-randomized	50
Functional outcome	7	9	3 mixed, 4 observational	0
Anesthesia	5	6	3 randomized, 2 quasi-randomized	60
Radiology	5	6	3 mixed, 2 observational	0
Total hip arthroplasty and total knee arthroplasty	2	3	1 randomized, 1 observational	50
Total shoulder arthroplasty	2	3	1 randomized, 1 mixed	50
Total ankle arthroplasty	2	3	2 mixed	0
Rehabilitation/physiotherapy	2	3	1 randomized, 1 mixed	50
Metacarpophalangeal joint arthroplasty	1	1	1 observational	0
Education	1	1	1 randomized	100

*Mixed = mixture of randomized and observational.

TABLE E-3 Oxman and Guyatt Scores of the Meta-Analyses According to Study Quality

Question	Mean Score (Stand. Dev.)	Mean % of Maximum Possible Score	% of Studies That Met Criteria (N = 77)	% of Studies with Major or Extensive Flaws That Met Criteria (N = 38)	% of Studies with Minor or Minimal Flaws That Met Criteria (N = 39)	P Value
Search methods reported?	1.75 (0.46)	87	77	74	79	0.721
Comprehensive search?	1.96 (0.25)	98	97	95	100	0.212
Inclusion criteria reported?	1.97 (0.16)	99	97	95	100	0.212
Selection bias avoided?	1.46 (0.55)	73	49	46	53	0.599
Validity assessment criteria reported?	1.17 (0.95)	59	54	18	92	<0.01
Validity assessment appropriate?	1.51 (0.50)	76	51	18	84	<0.01
Methods to combine findings reported?	1.92 (0.35)	96	95	90	100	0.020
Findings combined appropriately?	1.97 (0.16)	99	97	95	100	0.212
Conclusions supported by analysis?	1.99 (0.11)	99	99	97	100	0.728

TABLE E-4 PRISMA Checklist Items Present in the Meta-Analyses According to Study Quality*

Question	Mean Score (Stand. Dev.)	% of Studies That Met Criteria (N = 77)	% of High-Quality Studies That Met Criteria (N = 38)	% of Poor-Quality Studies That Met Criteria (N = 39)	P Value
Adequate title?	0.91 (0.29)	92	100	83	0.000
Structured abstract?	1.00 (0)	100	100	100	—
Rational introduction?	0.99 (0.11)	99	100	98	0.336
Objective introduction using PICOS format?	1.00 (0)	100	100	100	—
Does protocol exist, and if so is registration number provided?	0.13 (0.34)	13	23	7	0.043
Eligibility criteria exist?	1.00 (0)	100	100	100	—
All information sources described?	0.96 (0.19)	96	100	93	0.036
Detailed search strategy present?	0.77 (0.19)	77	82	71	0.238
Description of process of study selection?	0.73 (0.45)	73	91	62	0.000
Data collection process described?	0.78 (0.42)	78	100	57	0.000
Definition of all data variables and any assumptions?	0.95 (0.22)	95	100	90	0.011
Description of how assessment of risk of bias in individual studies made?	0.65 (0.48)	65	100	43	0.000
Principal study measures (risk ratio, difference of means, etc.) stated?	0.97 (0.16)	97	100	98	0.336
Description of method of synthesis of results?	0.96 (0.19)	96	100	93	0.036
Risk of bias affecting cumulative evidence specified?	0.26 (0.44)	26	73	5	0.000
Description of additional analyses done?	0.52 (0.50)	52	100	21	0.000
Description of study selection?	0.92 (0.27)	92	95	88	0.161
Characteristics extracted from each study specified?	0.73 (0.45)	73	86	59	0.002
Description of risk of bias within studies?	0.47 (0.50)	47	77	24	0.000
Description of results of	0.74 (0.44)	74	100	52	0.000

individual studies?					
Description of synthesis of results?	1.00 (0)	100	100	100	—
Description of assessment of risk of bias across studies?	0.23 (0.42)	23	73	2	0.000
Description of results of any additional analyses done?	0.49 (0.50)	49	95	21	0.000
Evidence summarized?	1.00 (0)	100	100	100	—
Limitations discussed?	0.92 (0.27)	92	100	88	0.004
General interpretation provided?	0.92 (0.27)	92	100	88	0.004
Description of any funding?	0.56 (0.50)	56	68	48	0.069
Flow chart present?	0.23 (0.43)	23	41	9	0.001

*PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses. High-quality studies were those with an Oxman and Guyatt score of ≥5, and poor-quality studies were those with a score <5.

Appendix 1. Oxman and Guyatt Score[8,10,11]

Index of Scientific Quality for Research Overviews

    1. Were the search methods used to find evidence (original research) on the primary question or questions stated?
    No   Partially   Yes

    2. Was the search for evidence reasonably comprehensive?
    No   Can't tell   Yes

    3. Were the criteria used for deciding which studies to include in the overview reported?
    No   Partially   Yes

    4. Was bias in the selection of studies avoided?
    No   Can't tell   Yes

    5. Were the criteria used for assessing the validity of the included studies reported?
    No   Partially   Yes

    6. Was the validity of all of the studies referred to in the text assessed with use of appropriate criteria (either in selecting the studies for inclusion or in analyzing the studies that were cited)?
    No   Can't tell   Yes

    7. Were the methods used to combine the findings of the relevant studies (to reach a conclusion) reported?
    No   Partially   Yes

    8. Were the findings of the relevant studies combined appropriately relative to the primary question that the overview addresses?
    No   Can't tell   Yes

    9. Were the conclusions made by the author or authors supported by the data and/or analysis reported in the overview?
    No   Partially   Yes

    10. How would you rate the scientific quality of this overview?
    1-Extensive Flaws
    2
    3-Major Flaws

4
5-Minor Flaws
6
7-Minimal Flaws

Instructions for Scoring the Index

The purpose of this index is to evaluate the scientific quality (that is, adherence to scientific principles) of research overviews (review articles) published in the medical literature. It is not intended to measure literary quality, importance, relevance, originality, or other attributes of overviews.

The index is designed to assess overviews of primary (original) research on pragmatic questions regarding causation, diagnosis, prognosis, therapy, or prevention. A research overview is a survey of research. The same principles that apply to epidemiological surveys apply to overviews: a question must be clearly specified, a target population must be identified and assessed, appropriate information must be obtained from that population in an unbiased fashion, and conclusions must be derived, sometimes with the help of a formal statistical analysis, as is done in meta-analysis. The fundamental difference between overviews and epidemiological surveys is the unit of analysis, not the scientific issues that the questions in this index address.

Since most published overviews do not include a methods section, it is difficult to answer some of the questions in the index. The answers should be based, as much as possible, on information provided in the overview. If the methods that were used are reported incompletely relative to a specific item, score that item as "partially." Similarly, if no information is provided regarding the methods used relative to a particular question, score it as "can't tell," unless there is information

in the overview to suggest whether or not a criterion was met.

For question 8, if no attempt was made to combine the findings and no statement is made regarding the inappropriateness of combining the findings, check "no." If a summary estimate is given anywhere in the abstract, the discussion, or the summary section of the paper and the method used to derive the estimate is not reported, mark "no," even if there is a statement regarding the limitations of combining the findings of the studies reviewed. If in doubt, mark "can't tell."

For an overview to receive a "yes" on question 9, data (not just citations) must be reported that support the main conclusions regarding the primary question or questions that the overview addresses.

The score for question 10, the overall scientific quality, should be based on the answers to the first nine questions. If the "can't tell" option is used one or more times on the preceding questions, a review is likely to have minor flaws at best, and it is difficult to rule out major flaws (that is, a score of 4 points or less). If the "no" option is used in question 3, 4, 6, or 8, the review is likely to have major flaws (that is, a score of 4 points or less, depending on the number and degree of flaws).