

# Selecting Your Studies (Screening)

After running your search through one or more databases, the next step is to screen through the results to decide which studies you want to include.

## Selecting Exclusion Criteria

Exclusion criteria should be determined before screening begins. Common exclusion reasons include the following:

- Publications prior to a specific date (for instance, January 1, 2000)
- Articles not written in English
- The wrong type of article (meta-analysis/systematic review, editorial, correspondence, letter to the editor, abstracts, protocol)
- The wrong type of study (in vitro and in vivo studies, retrospective study, cohort study, case series, case study)
- Too few patients (for example, fewer than 10).

Additional exclusion criteria often relate to [PICO](#). The study under consideration may involve the wrong population, interventions, comparators, and outcomes.

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## Screening Steps

\* Before going through each study, begin by removing any duplicates with the [Nested Knowledge software](#).

\* When reading the title and abstract to determine whether a study should be included, check each of the inclusion and exclusion criteria and the elements of PICO. If there are not enough details in the abstract, mark this study for full-text review. For studies that don't meet the inclusion criteria, mark them as excluded and note the reason they were excluded. Be sure to note any recurring exclusion reasons that were not determined beforehand.

\* After the initial round of screening is complete, go back through the remaining included studies and locate the full text for each. A great resource for finding full text is [Sci-Hub](#).

\* When looking through a PDF of a study, use "Ctrl F" to find specific words or phrases to quickly locate the elements of PICO to quickly find essential information. The remaining included studies will go on to have their data tagged and extracted for analysis.

See the visual here for an overview of where to find screening-related information in underlying studies:

# Reading Abstracts for Screening

## Start with the Title:

- Often structured roughly as:
- A [Study Type] of [Intervention] for [Disease State]
- Note: last sentence before Methods often states Purpose of study.

## Jump to Methods:

- Confirm Title information
- Check whether data are reused from a previous publication
- Check for abnormal patient selection or procedural methods that could bias outcomes

## Results (as needed):

- Confirm or add to Outcomes

The diagram illustrates the structure of a randomized trial abstract from the New England Journal of Medicine, with annotations for screening purposes. The abstract is titled "A Randomized Trial of Vertebroplasty for Osteoporotic Spinal Fractures". The annotations are as follows:

- Title:** Study Type, Intervention, Disease State. This annotation points to the title of the article.
- Methods:** Confirm ↑, Data reuse, Potential bias, Outcomes. This annotation points to the Methods section of the abstract.
- Results:** Outcomes. This annotation points to the Results section of the abstract.

The abstract itself is structured as follows:

**ORIGINAL ARTICLE**

**Title:** A Randomized Trial of Vertebroplasty for Osteoporotic Spinal Fractures

David F. Kallmes, M.D., Bryan A. Comstock, M.S., Patrick J. Heagerty, Ph.D., Judith A. Turner, Ph.D., David J. Wilson, F.R.C.R., Terry H. Diamond, F.R.A.C.P., Richard Edwards, F.R.C.R., Leigh A. Gray, M.S., Lydia Stout, B.S., Sara Owen, M.Sc., William Hollingsworth, Ph.D., Basavaraj Chdoke, M.D., Deborah J. Annesley-Williams, F.R.C.R., Stuart H. Ralston, F.R.C.P., and Jeffrey G. Jarvik, M.D., M.P.H.

**ABSTRACT**

**BACKGROUND:** Vertebroplasty is commonly used to treat painful, osteoporotic vertebral compression fractures.

**METHODS:** In this multicenter trial, we randomly assigned 131 patients who had one to three painful osteoporotic vertebral compression fractures to undergo either vertebroplasty or a simulated procedure without cement (control group). The primary outcomes were scores on the modified Roland-Morris Disability Questionnaire (RMDQ) (on a scale of 0 to 23, with higher scores indicating greater disability) and patients' ratings of average pain intensity during the preceding 24 hours at 1 month (on a scale of 0 to 10, with higher scores indicating more severe pain). Patients were allowed to crossover to the other study group after 1 month.

**RESULTS:** All patients underwent the assigned intervention (68 vertebroplasties and 63 simulated procedures). The baseline characteristics were similar in the two groups. At 1 month, there was no significant difference between the vertebroplasty group and the control group in either the RMDQ score (difference, 0.7; 95% confidence interval [CI], -1.3 to 2.8;  $P=0.49$ ) or the pain rating (difference, 0.7; 95% CI, -0.3 to 1.7;  $P=0.19$ ). Both groups had immediate improvement in disability and pain scores after the intervention. Although the two groups did not differ significantly on any secondary outcome measure at 1 month, there was a trend toward a higher rate of clinically meaningful improvement in pain (a 30% decrease from baseline) in the vertebroplasty group (64% vs. 48%,  $P=0.06$ ). At 3 months, there was a higher crossover rate in the control group than in the vertebroplasty group (51% vs. 13%,  $P<0.001$ ). There was one serious adverse event in each group.

**CONCLUSIONS:** Improvements in pain and pain-related disability associated with osteoporotic compression fractures in patients treated with vertebroplasty were similar to the improvements in a control group. (ClinicalTrials.gov number, NCT00068822.)

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## Should You Exclude Follow-up Studies?

It is generally better to include the primary study over follow-up (or post-hoc) studies. However, there are times when the follow-up study is more relevant than the primary study. As long as you are only collecting data on each patient once, the follow-up study should be included.

## Is Dual Screening Necessary?

Dual screening is a process where two reviewers independently screen the search results to make decisions about whether to include or exclude articles. Discrepancies are usually discussed before a final decision is made. Although dual screening may take more time, several studies have documented its advantage.<sup>1,2,3</sup>

One study showed that single-reviewer abstract screening missed 13% of relevant studies, while dual-reviewer screening missed only 3%.<sup>1</sup> Another analysis found a total reviewer error rate (false inclusion and false exclusion) of 10.76%.<sup>2</sup> The choice of whether to dual-screen or not should be discussed by the team.

[This article](#) provides some alternatives to dual screening.

## References

1. Gartlehner G, Affengruber L, Titscher V, Noel-Storr A, Dooley G, Ballarini N, König F. Single-

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2. Wang Z, Nayfeh T, Tetzlaff J, O'Brien P, Murad MH. Error rates of human reviewers during abstract screening in systematic reviews. *PLoS One*. 2020 Jan 14;15(1):e0227742. doi: 10.1371/journal.pone.0227742. PMID: 31935267; PMCID: PMC6959565.
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