

Study types guide

Types of single studies

Different types of single studies may be best used to answer different questions, and may provide different Levels of Evidence. Each study type has strengths and weaknesses that may affect the validity of the results.

- [Randomised controlled clinical trials](#)
- [Prospective blind comparison to a gold standard](#)
- [Cohort studies](#)
- [Case Control Studies](#)
- [Case Series and Case Reports](#)

Analysis, reviews and guidelines

In the literature you will also find studies that combine and appraise collections of studies on a particular topic or question in different ways:

- [Meta-analysis](#)
- [Systematic reviews](#)
- [Clinical practice guideline](#)

Randomized controlled clinical trials

These are carefully planned prospective projects that study the effect of a therapy on real patients. They include methodologies that reduce the potential for bias (randomisation and blinding) and allow for comparison between intervention groups and control groups (no intervention).

Prospective, blind comparison to a gold standard

These are studies that show the efficacy of a diagnostic test. In these studies, all patients with varying degrees of an illness, or clinical suspicion of an illness, and who are eligible for an investigation or clinical test, are administered both investigations or tests – the test under investigation and the ‘gold standard’ test. The ‘gold standard’ test is investigation or clinical test that has, until now, been shown to be most sensitive/specific for the condition. The investigators reading or interpreting the test results are blinded to the results of the alternative test. Results are usually expressed in terms of ‘sensitivity’ and ‘specificity’, positive and negative predictive value.

Cohort studies

These studies take a large population and follow patients who have a specific condition or receive a particular treatment over time and compare them with another group that has not been affected by the condition or treatment being studied. Cohort studies are observational and not as reliable as randomised controlled studies, since the two groups may differ in ways than the variable considered in the study.

Case Control Studies

These are studies in which patients who already have a specific condition are compared with people who don't. They often rely on medical records and patient recall for data collection. These types of studies are

often less reliable than randomised controlled trials and cohort studies because showing a statistical relationship does not mean that one factor caused the other.

Case Series and Case Reports

Consist of collections of reports on the treatment of individual patients or reports on the treatment of individual patients or a report on a single patient. Because they are reports of cases and use no control groups with which to compare outcomes, they have no statistical validity and are subject to many biases.

Meta-analysis

A meta-analysis will thoroughly examine a number of valid studies on a topic and combine the results using accepted statistical methodology as if they were from one large study. Some clinicians put Meta-analysis at the top of the pyramid because part of the methodology should include critical appraisal of the selected RCTs for analysis, and discussion of the likelihood of bias in those studies.

Systematic reviews

These usually focus on a clinical topic and answer a specific question. An extensive literature search is conducted to identify all studies with sound methodology. The studies are reviewed, assessed for validity, and the results summarised according to the predetermined criteria of the review question. A systematic review may or may not include a meta-analysis as a statistical synthesis of the study results. This is usually displayed as a Forest plot.

Clinical practice guideline

Whilst not a 'study type' as such, these documents may attempt to systematically answer a number of questions related to an illness. Many clinical practice guidelines are developed by independent bodies or regulatory organisations. A well-researched clinical practice guideline should use rigorous methodology to ask clinical questions, and systematically review and critically appraise the evidence. A recommendation or guideline should be made and the strength of that recommendation should be given.