

Applying Study Results to Patient Care

Updated May 2025

Also see our [Glossary of Study Design and Statistical Terms](#).

Statistically Significant

- Results of a trial are **statistically significant** when p-values are less than a pre-specified number, usually 0.05.¹

p-value

- The probability that an outcome is due to chance.²
- A p-value less than 0.05 means there is less than a 5% chance that the result is due to chance.²

Clinically Significant

- Clinically significant** results are meaningful or important enough to change clinical practice.¹
- Number needed to treat (NNT) and number needed to harm (NNH) are simple calculations that estimate the importance of study results to patients.

Number Needed to Treat (NNT)

- Estimated** number of patients that would need to be treated to prevent one outcome compared to a control group, over a specified time period.³
- Rounded up to a whole number.³
- Only appropriate for statistically significant differences.³
- NNT = 1/ ARR expressed as a decimal

Number Needed to Harm (NNH)

- Estimated** number of patients treated with a specified therapy/intervention in order for one to have a bad outcome, over a specified time period.⁴
- Rounded down to a whole number.⁴
- Only appropriate for statistically significant differences.
- NNH = 1/ Absolute risk increase expressed as a decimal

Confidence Interval (CI)

- A range of values which likely contains the true value.
- With a 95% CI, we're 95% sure that the true value lies in the reported range.⁵ If the same population is sampled repeatedly, approximately 95% of the calculated confidence intervals will contain the true value.

Relative Risk (RR)

- The risk of an outcome in the treatment group divided by the risk of the outcome in the control group.⁴
- RR = 1**: no association between treatment and outcome.
- RR >1**: positive association between treatment and outcome (e.g., bleeding while taking an anticoagulant).
- RR <1**: negative association between treatment and outcome (e.g., **decreased** risk of thrombosis while taking an anticoagulant).

Relative Risk Reduction (RRR)

- The change in event rate between a treatment group and a control group.⁶
- $RRR = 1 - (\text{treatment rate}/\text{control rate})$.⁶
- Often misinterpreted as an overestimation of treatment effect.

Absolute Risk Reduction (ARR)

- The absolute change in event rates between two groups.⁶
- $ARR = \text{control rate} - \text{treatment rate}$
- Less commonly reported, and may need to be calculated to see true treatment effect.

Odds Ratio (OR)

- The odds of exposure in cases divided by the odds of exposure in controls.^{5,6}
- Analogous to relative risk; however, OR can be used in case-control studies.
- Can exaggerate risk when disease/outcome is common.^{5,6}

Composite Endpoints

- A combination of (similarly valued) endpoints that each have a low incidence but together may provide a single measure of effect.⁷

Non-inferiority Trial

- Designed to assess if the treatment being studied is not inferior to a control/currently used treatment.⁴
- Requires fewer patients compared to a superiority study.⁴

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References

1. Shreffler J, Huecker MR. Hypothesis testing, p values, confidence intervals, and significance. March 13, 2023. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-.
2. Tenny S, Abdelgawad I. Statistical Significance. November 23, 2023. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-.
3. Ranganathan P, Pramesh CS, Aggarwal R. Common pitfalls in statistical analysis: Absolute risk reduction, relative risk reduction, and number needed to treat. *Perspect Clin Res*. 2016 Jan-Mar;7(1):51-3.
4. Association of Health Care Journalists. Health journalism glossary. <https://healthjournalism.org/glossary/>. (Accessed March 20, 2025).
5. Nagendrababu V, Dilokthornsakul P, Jinatongthai P, et al. Glossary for systematic reviews and meta-analyses. *Int Endod J*. 2020 Feb;53(2):232-249.
6. Darzi AJ, Busse JW, Phillips M, et al. Interpreting results from randomized controlled trials: What measures to focus on in clinical practice. *Eye (Lond)*. 2023 Oct;37(15):3055-3058.
7. High-powered database. Quick review of biostatistics. <https://highpoweredmedicine.com/biostatsPage.html>. (Accessed March 20, 2025).

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