

Understanding Medical Literature



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KEYWORDS

- Evidence-based medicine • Humans • Meta-analysis • Prospective studies
- Randomized controlled trials

HOSPITAL MEDICINE CLINICS CHECKLIST

1. The evidence pyramid shows the hierarchy of evidence by study type. Literature that is clinically relevant resides toward the top of the pyramid.
2. Levels of evidence are grading systems to assess the quality of evidence.
3. Clinicians should be familiar with commonly used statistics, including *P* value, power, confidence intervals, odds and hazard ratios, relative risk, number needed to treat or harm, sensitivity/specificity, positive and negative predictive values, and likelihood ratios.
4. There are 4 types of articles that are useful in clinical practice: therapy articles, diagnosis articles, harm/prognosis articles, and systematic reviews/meta-analyses.
5. Studies that are clinically relevant target patient-oriented outcomes, or outcomes that are important to patients such as morbidity, mortality, quality of life, and cost.
6. Performing an efficient evidence search starts with building an appropriate clinical question. The PICO (Patient-Intervention-Comparison-Outcome) format is often used for this.
7. Intention-to-treat analysis occurs when patients are analyzed in the group to which they were randomized. This validity criterion is important when assessing therapy articles.

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8. The number needed to treat is an important measure when evaluating the results of a therapy article. It represents the number of patients that need to be treated with an intervention to prevent 1 harmful effect.
9. When assessing the validity of an article on a diagnostic test, clinicians must consider whether the test was blindly compared with an independent gold standard.
10. Systematic reviews, in contrast with narrative reviews, answer a specific clinical question.
11. Meta-analyses use statistical techniques to combine evidence from difference studies to produce 1 summary result.

KEY PRINCIPLES

What is the Hierarchy of Evidence and how can clinicians use this in clinical practice?

The evidence pyramid represents the idea that the strength of a study can be surmised from the study design (Fig. 1).^{1,2} Note that the strength of evidence increases with position up the pyramid.

- Benefits:
 - Run efficient searches by limiting them to the highest-quality study designs.
- Limitations:
 - Applies primarily to studies that examine treatments/interventions.
 - If examining a harmful event (especially if rare), a randomized controlled trial (RCT) may not be practical or ethically feasible. In this case, observational studies (eg, cohort studies) may be more helpful.³
 - The scheme relies heavily on study type, not acknowledging that a well-designed cohort study may be stronger than a poorly run RCT. A variation of the hierarchy upgrades/downgrades studies based on their quality but decreases the hierarchy's simplicity.

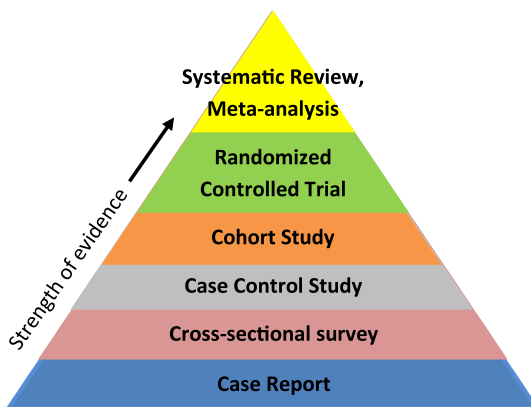


Fig. 1. Hierarchy of evidence. (From Dartmouth Biomedical Libraries, Dartmouth College and the Cushing/Whitney Medical Library, Yale School of Medicine. Available at: www.ebmpyramid.org. Accessed September 9, 2014.)

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