



## THE HIERARCHY AND LEVELS OF EVIDENCE

Evidence pyramids have been referred for a long time by researchers to appraise the quality of evidence of a research work. However, multiple evidence pyramids have been given in the past which often have conflicting contents. At the Department of Pediatrics & Preventive Dentistry at the College of Dental Sciences & Research Centre (Ahmedabad, India), we recommend that students and aspiring researchers follow the below two evidence pyramids (by SUNY Downstate Medical Center & Tufts University) for future reference.<sup>1 2</sup>

### How to cite this resource

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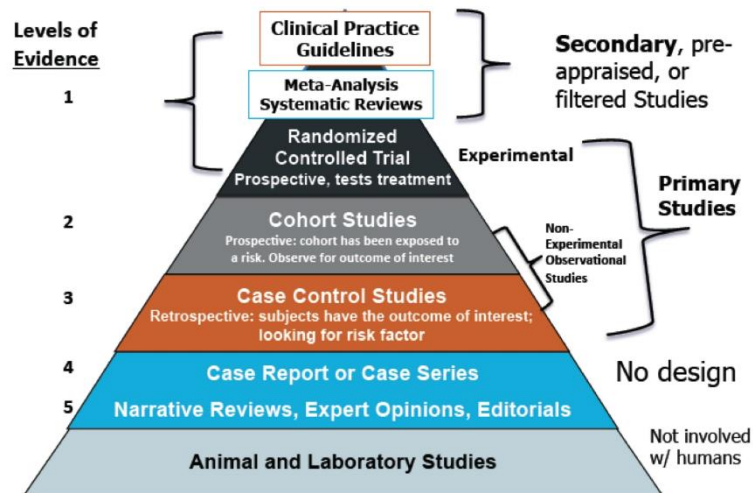


Figure 1 Modified Evidence Pyramid by SUNY Downstate Medical Center, Medical Research Library at Brooklyn

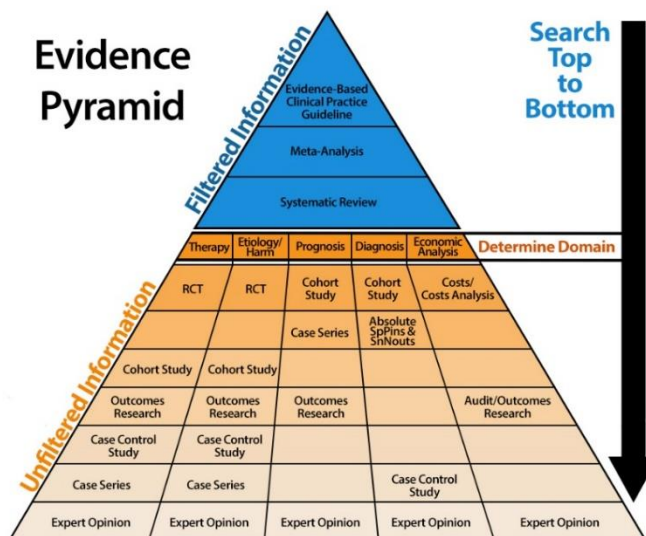


Figure 2 Evidence Pyramid by Tufts University

In order to grade the level of evidence, we recommend the use of Oxford Centre of Evidence Based Medicine's (OCEBM) 2011 evidence-based table.<sup>3</sup>

Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence					
Question	Step 1 (Level 1*)	Step 2 (Level 2*)	Step 3 (Level 3*)	Step 4 (Level 4*)	Step 5 (Level 5)
<b>How common is the problem?</b>	Local and current random sample surveys (or censuses)	Systematic review of surveys that allow matching to local circumstances**	Local non-random sample**	Case-series**	n/a
<b>Is this diagnostic or monitoring test accurate?</b> (Diagnosis)	Systematic review of cross sectional studies with consistently applied reference standard and blinding	Individual cross sectional studies with consistently applied reference standard and blinding	Non-consecutive studies, or studies without consistently applied reference standards**	Case-control studies, or "poor or non-independent reference standard**	Mechanism-based reasoning
<b>What will happen if we do not add a therapy?</b> (Prognosis)	Systematic review of inception cohort studies	Inception cohort studies	Cohort study or control arm of randomized trial*	Case-series or case-control studies, or poor quality prognostic cohort study**	n/a
<b>Does this intervention help?</b> (Treatment Benefits)	Systematic review of randomized trials or n-of-1 trials	Randomized trial or observational study with dramatic effect	Non-randomized controlled cohort/follow-up study**	Case-series, case-control studies, or historically controlled studies**	Mechanism-based reasoning
<b>What are the COMMON harms?</b> (Treatment Harms)	Systematic review of randomized trials, systematic review of nested case-control studies, n-of-1 trial with the patient you are raising the question about, or observational study with dramatic effect	Individual randomized trial or (exceptionally) observational study with dramatic effect	Non-randomized controlled cohort/follow-up study (post-marketing surveillance) provided there are sufficient numbers to rule out a common harm. (For long-term harms the duration of follow-up must be sufficient.)**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning
<b>What are the RARE harms?</b> (Treatment Harms)	Systematic review of randomized trials or n-of-1 trial	Randomized trial or (exceptionally) observational study with dramatic effect			
<b>Is this (early detection) test worthwhile?</b> (Screening)	Systematic review of randomized trials	Randomized trial	Non-randomized controlled cohort/follow-up study**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning

\* Level may be graded down on the basis of study quality, imprecision, indirectness (study PICO does not match questions PICO), because of inconsistency between studies, or because the absolute effect size is very small; Level may be graded up if there is a large or very large effect size.

\*\* As always, a systematic review is generally better than an individual study.

#### Levels of Evidence for Therapeutic Studies\*

Level	Type of evidence
1A	Systematic review (with homogeneity) of RCTs
1B	Individual RCT (with narrow confidence intervals)
1C	All or none study
2A	Systematic review (with homogeneity) of cohort studies
2B	Individual Cohort study (including low quality RCT, e.g. <80% follow-up)
2C	"Outcomes" research; Ecological studies
3A	Systematic review (with homogeneity) of case-control studies
3B	Individual Case-control study
4	Case series (and poor quality cohort and case-control study)
5	Expert opinion without explicit critical appraisal or based on physiology bench research or "first principles"

\*From the Centre for Evidence-Based Medicine, <http://www.cebm.net>.

## References

1. Levels of Evidence [Internet]. Evidence-based Decision Making: Introduction and Formulating Good Clinical Questions. Dental Care; [cited 2023Jan31]. Available from: <https://www.dentalcare.com/en-us/ce-courses/ce311/levels-of-evidence>
2. Evidence-based dentistry (EBD): Appraising the evidence [Internet]. Evidence-Based Dentistry (EBD). Tufts University; [cited 2023Jan31]. Available from: <https://researchguides.library.tufts.edu/c.php?g=249245&p=3701848>
3. OCEBM Levels of Evidence Working Group\*. "The Oxford Levels of Evidence 2". Oxford Centre for Evidence-Based Medicine. <https://www.cebm.ox.ac.uk/resources/levels-of-evidence/ocebm-levels-of-evidence>