

# The three basic questions about hierarchies of evidence—with answers

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In evidence-based medicine (EBM) textbooks, one is recommended to evaluate the available evidence for or against a given treatment (against some disease or syndrome) using a so-called *hierarchy of evidence*; i.e., a list of investigative strategies (study types)<sup>1</sup> ordered with regard to epistemic value. A number of hierarchies of evidence, many of them quite similar but not identical, have been promoted by EBM supporters. There are three basic questions to be asked about these hierarchies:

- (1) What is the correct interpretation of hierarchies of evidence?
- (2) Can we establish a definitive hierarchy of evidence (ordering of investigative strategies) for use in treatment efficiency research?
- (3) To what extent, and why, would hierarchies of evidence in medicine at all be useful (valuable)?

All three questions have been discussed in the literature, but for at least (2) and (3), there is still no consensus. I will give answers to all three questions.

As for (1), I argue—in agreement with several other commentators—that a lexicographic interpretation is untenable. This is so since the ranges of the evidential strengths for different study types may partly overlap. What remains is then an interpretation according to which one study type can be better than another in a *ceteris paribus* sense. I argue that the *ceteris paribus* condition is very rarely satisfied, and I discuss the consequences.

As for (2): Under the interpretation established under (1), the ordering of certain items typically included in hierarchies of evidence can be established, under specified conditions. For other items typically included, however, it is very difficult to devise a single correct ordering. This is due to the complexity of evidential evaluations in general, and

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<sup>1</sup>Most items in such hierarchies are study types or aggregations of such types, e.g., “randomised controlled trial” or “systematic review of case–control studies”. Some items, however, may perhaps not qualify as “studies”, e.g., “mechanistic reasoning”—hence the more inclusive term “investigative strategies”.

also more specifically to the varying evidential strength of certain investigative strategies such as mechanistic reasoning.

As for (3), it is suggestive that there seems to be no other discipline or context in which aggregation of evidence from different sources is regularly performed using hierarchies of evidence. Instead, one is supposed to take *all* available evidence into account. I argue that the aggregation of evidence within medical treatment research is not different from the aggregation of evidence in other fields in any *principled* way that could justify the use of hierarchies of evidence. Therefore, their use could only be defended with some argument from *practical usefulness*. I identify two such arguments, both of which are tentatively accepted: (a) Strong beliefs are being attached to health issues. The mass media give constant attention to health topics. Erroneous theories and worthless methods are ubiquitous (“alternative medicine”). Powerful drug companies want certain results. A hierarchy of evidence could help remind all parties that in spite of the prestige and the strong opinions, there is a standardised way of considering evidence from different studies (though with important reservations and limitations). (b) In any field where evidence is to be aggregated from studies with very different methodologies, a hierarchy of evidence can be used as a *heuristic device*, e.g. for providing guidance for a rough sorting of studies with regard to evidential strength. This is consistent with—indeed, implied by—the answer to question (1).

Summary answers:

- (1) *Ceteris paribus*, an item higher up in the hierarchy is more valuable than an item further down.
- (2) No definitive ordering can be established for all (or most) of the items.
- (3) Hierarchies of evidence are useful (valuable) as heuristic tools for rough evaluations and as epistemic reminders.

The overall result is a very cautious defense of hierarchies of evidence in EBM.