

EBM 32 years later: Achieved goals and unresolved issues

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Conflicts

- Co-Chair GRADE working group
- CSO MAGIC Evidence Ecosystem Foundation
- UpToDate consultant

Plan for talk

- Achieved goals
 - Fundamental Guide to Clinical Practice
 - GRADE and systematic reviews, guidelines
- Achieved goals/Unresolved Issues
 - Hierarchy - ? Has it penetrated
 - COVID – ? Can it continue?
 - Electronic layered format, SOFs - ? Dissemination
- Unresolved issues
 - Can we educate optimally and successfully
 - Can we get right balance rigor and simplicity

Evidence-Based Medicine

An internist sees a 70-year-old man whose main problem is fatigue. The initial investigation reveals a hemoglobin of 90 g/L. The internist suspects iron deficiency anemia. How might she proceed?

The way of the past

When faced with this situation during her training just a few years earlier, the internist was told by the attending physician that one ordered serum ferritin and transferrin saturation and proceeded according to the results. She now follows this path. If both results come back below the laboratory's

normal range, she will order a serum iron deficiency index. If both results are above the laboratory's cut-off for an alternative diagnosis, she will proceed according to the clinical impression. If the results are interpreted, or

if the internist is unsure of herself whether the diagnosis is correct, she is considering ordering a computerized literature search to link by computer to the literature. She computerized literature indexing for "iron deficiency anemia" and "specificity," and reviews the titles, abstracts, and references relevant (1).

She faxes the citation to the library at the local hospital and picks up the article when she does rounds the next morning. She reviews the paper and finds that it meets criteria she has previously learned about validating a diagnostic test (2) and that the results are applicable to patients like hers.

The study shows that she should order a serum ferritin level, but not transferrin saturation, which is less powerful and adds no useful information. She also finds that her laboratory's normal range for the test is misleading. The internist estimates the pretest likelihood of iron deficiency and orders the test. When the result is available, she uses data from the article to determine the sensitivity and specificity associated with the serum ferritin value obtained, calculates the post-test probability of iron deficiency, and then decides on further management.

Discussion

The way of the future described above depicts an important advance in the inclusion of new evidence into clinical practice. Clinicians were formerly taught to look to authority (whether a textbook, an expert lecturer, or a local senior physician) to resolve issues of patient management. Evidence-based medicine uses additional strategies, including quickly tracking down publications of studies that are directly relevant to the clinical problem, critically appraising these studies, and applying the results of the best studies to the clinical problem at hand. It may also involve applying the scientific method in determining the opti-

mal management of the individual patient (3).

For the clinician, evidence-based medicine requires skills of literature retrieval, critical appraisal, and information synthesis.* It also requires judgment of the applicability of evidence to the patient at hand and systematic approaches to make decisions when direct evidence is not available. The primary purpose of *ACP Journal Club* is to help make evidence-based medicine more feasible for internists by extracting new, sound clinical evidence from the morass of the biomedical literature so that practitioners can get at it.

Gordon H. Guyatt, MD, MSc

References

1. Guyatt GH, Patterson C, Ali M, et al. Diagnosis of iron-deficiency anemia in the elderly. *Am J Med.* 1990;88:205-9.
2. Sackett DL, Haynes RB, Guyatt GH, Tugwell P. *Clinical Epidemiology, a Basic Science for Clinical Medicine, 2nd ed.* Boston: Little, Brown and Company. [In press for 1991].
3. Guyatt GH, Keller JL, Jaeschke R, et al. The n-of-1 randomized controlled trial: clinical usefulness. Our three-year experience. *Ann Intern Med.* 1990;112:293-9.

*Interested in acquiring or enhancing these skills? Attend the ACP Annual Meeting, 11-13 April 1991, for workshops on Searching the Literature on MEDLINE and Using the Clinical Literature to Solve Clinical Problems - *The Editor*



Evidence-Based Medicine

A New Approach to Teaching the Practice of Medicine

Evidence-Based Medicine Working Group JAMA, November 4, 1992—Vol 268, No. 17

EBM represents a new paradigm for medical practice

Less emphasis intuition, clinical experience, pathophysiologic rationale

Instead evidence from clinical research

Users' Guides to the Medical Literature

I. How to Get Started JAMA, November 3, 1993—Vol 270, No. 17

Andrew D. Oxman, MD, MSc; David L. Sackett, MD, MSc; Gordon H. Guyatt, MD, MSc;
for the Evidence-Based Medicine Working Group

25 part series in JAMA to 2000

Core principle

Health Science Education/Practice

- Wide acceptance of basic principles
 - Hierarchy of evidence, systematic reviews, V and P (SDM)
- Every undergraduate medical/health program
 - Curricula based on Users' Guides
- 2007 BMJ EBM one of top 10 advance since 1840

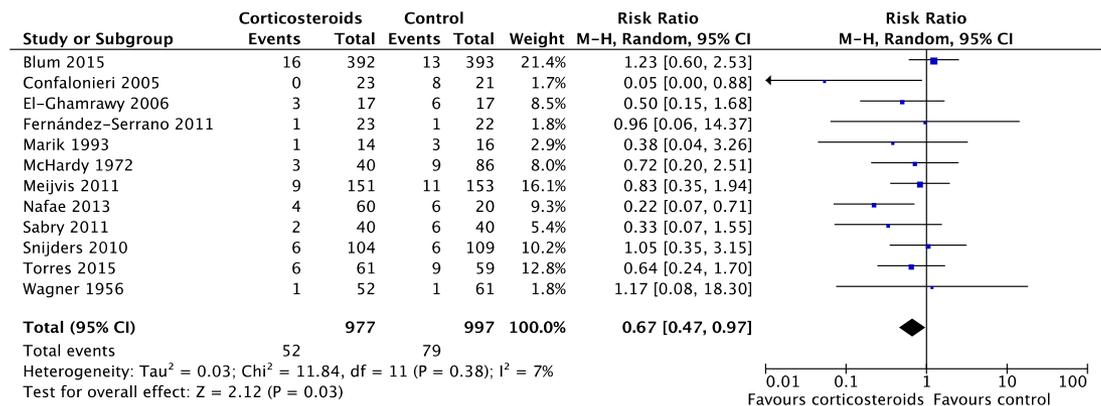
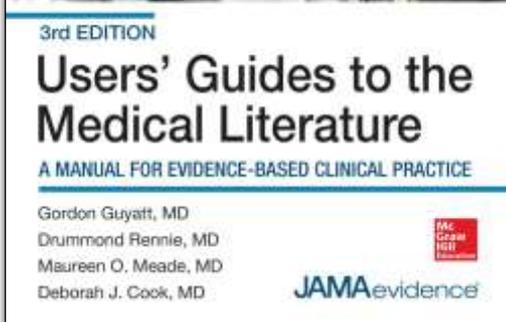


Figure 1: Effect of steroids on mortality in community acquired pneumonia

Grading quality of evidence and strength of recommendations

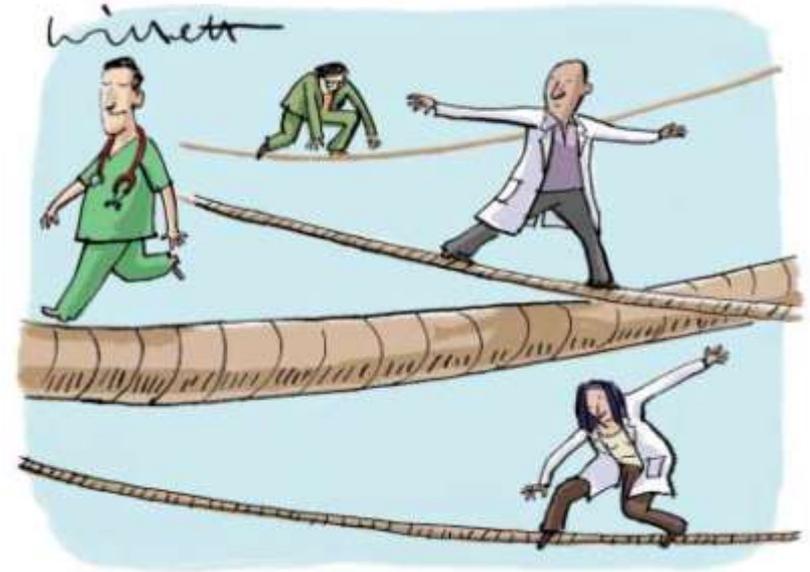
GRADE Working Group

Clinical guidelines are only as good as the evidence and judgments they are based on. The GRADE approach aims to make it easier for users to assess the judgments behind recommendations

BMJ VOLUME 328 19 JUNE 2004 bmj.com

Summary

Users of clinical practice guidelines and other recommendations need to know how much confidence they can place in the recommendations. Systematic and explicit methods of making judgments can reduce errors and improve communication. We have developed a system for grading the quality of evidence and the strength of recommendations that can be applied across a wide range of interventions and contexts. In this article we present a summary of our approach from the perspective of a guideline user. Judgments about the strength of a recommendation require consideration of the balance between benefits and harms, the quality of the evidence, translation of the evidence into specific circumstances, and the certainty of the baseline risk. It is also important to consider costs (resource utilisation) before



6 part series BMJ 2008

40 part series JCE

>110 organizations have adopted **GRADE**

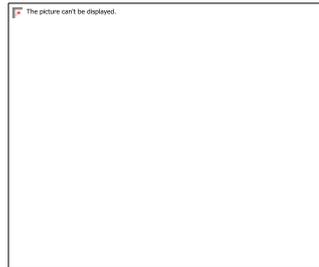


Certainty assessment criteria

Study Design	Confidence in estimates	Lower if	Higher if
Randomized trials	High	Risk of bias -1 Serious -2 Very serious	Large Effect + 1 Large + 1 Very large
	Moderate	Inconsistency -1 Serious -2 Very serious	Dose response +1 Evidence of a gradient
Observational studies	Low	Indirectness -1 Serious -2 Very serious	All plausible confounding +1 Would reduce a demonstrated effect or
	Very Low	Imprecision -1 Serious -2 Very serious Publication bias -1 Likely -2 Very likely	+1 would suggest a spurious effect when results show no effect

Strength of Recommendation

- Strong recommendation
 - Benefits clearly outweigh risks/hassle/cost
 - Risk/hassle/cost clearly outweighs benefit



- Rating down
 - Close balance evidence and harms/burdens
 - Low certainty of evidence
 - Uncertainty, variability values and preference
 - Issues with feasibility, acceptability, equity

Strong vs weak (conditional)

- Variability in patient preference
 - Strong, almost all same choice (> 90%)
 - Weak, choice varies appreciably
- Interaction with patient
 - Strong, just inform patient
 - Weak, ensure choice reflects values
- Use of decision aid
 - Strong, don't bother; weak, use the aid

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**Systematic Review /
Meta-analysis**

RCT

Prospective

Observational Studies

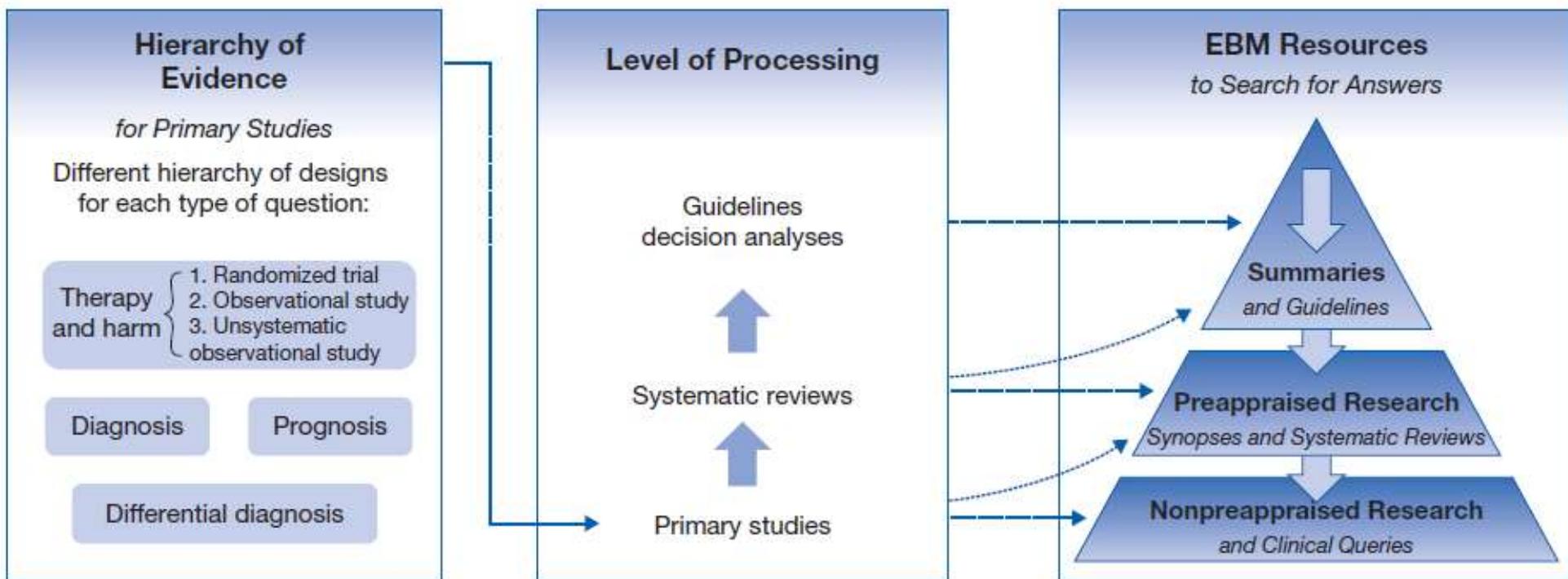
Retrospective

Case-Control

Case Series

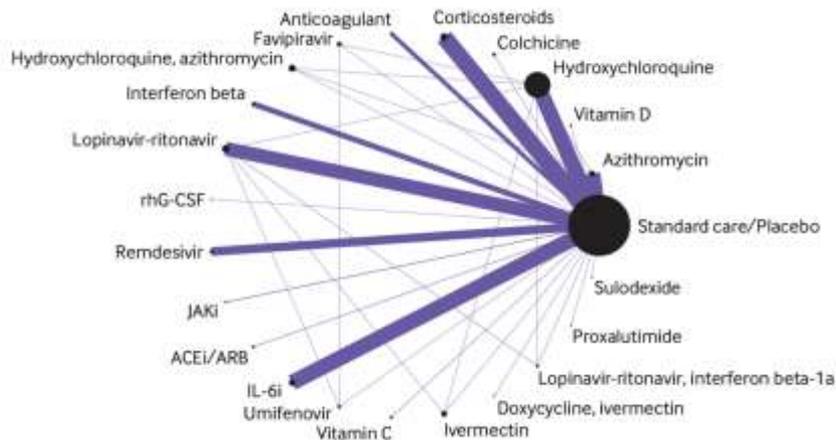
Nonsystematic Clinical Experience

From Evidence to Evidence-Based Resources



EBM and COVID-19

- Rapid conduct of platform clinical trials
- Vaccines, 3 drugs for non-severe, 4 for severe

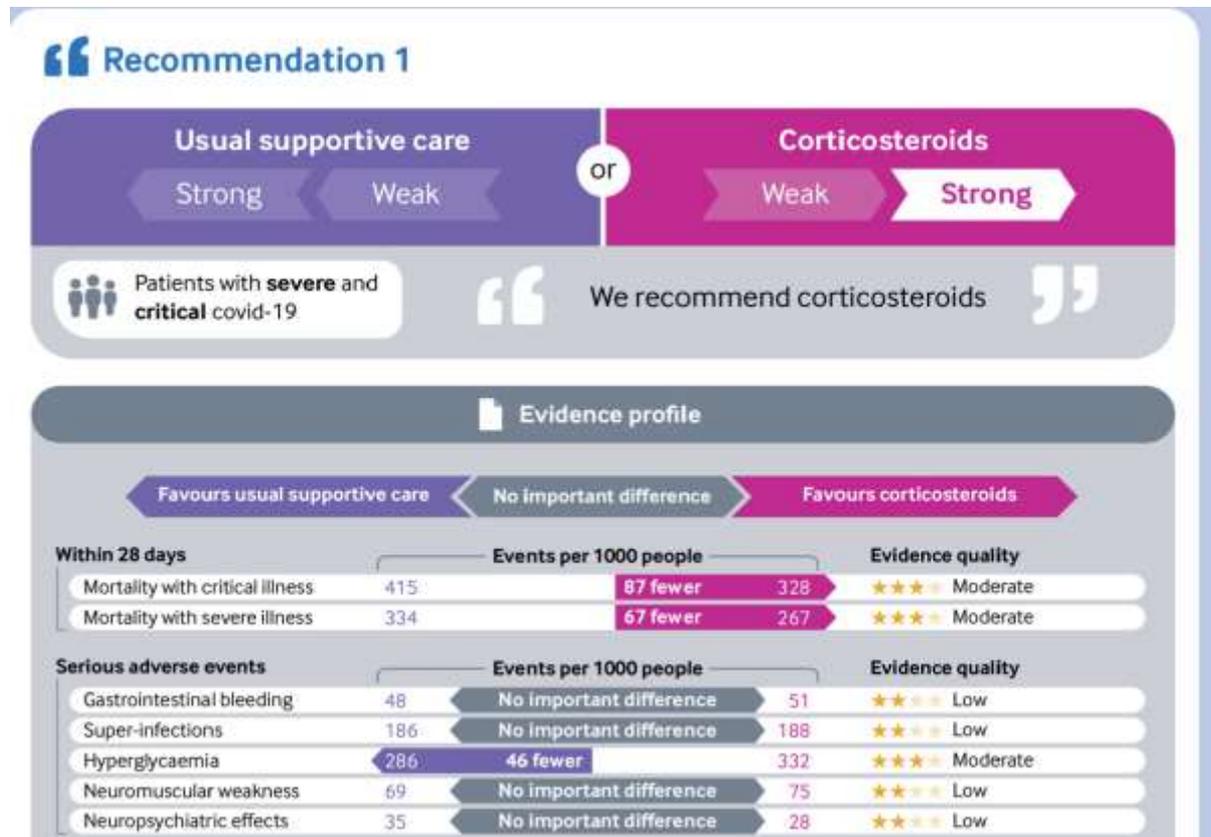


- Rapid production of trustworthy guidelines

RAPID RECOMMENDATIONS

A living WHO guideline on drugs for covid-19

the **bmj** | *BMJ* 2020;370:m3379 | doi: 10.1136/bmj.m3379



<https://www.who.int/publications/i/item/WHO-2019-nCoV-therapeutics-2021.1>

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Practitioners of evidence based care

Not all clinicians need to appraise evidence from scratch but all need some skills

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10.1136/bmjebm-2020-111542

EBM learning



OPEN ACCESS

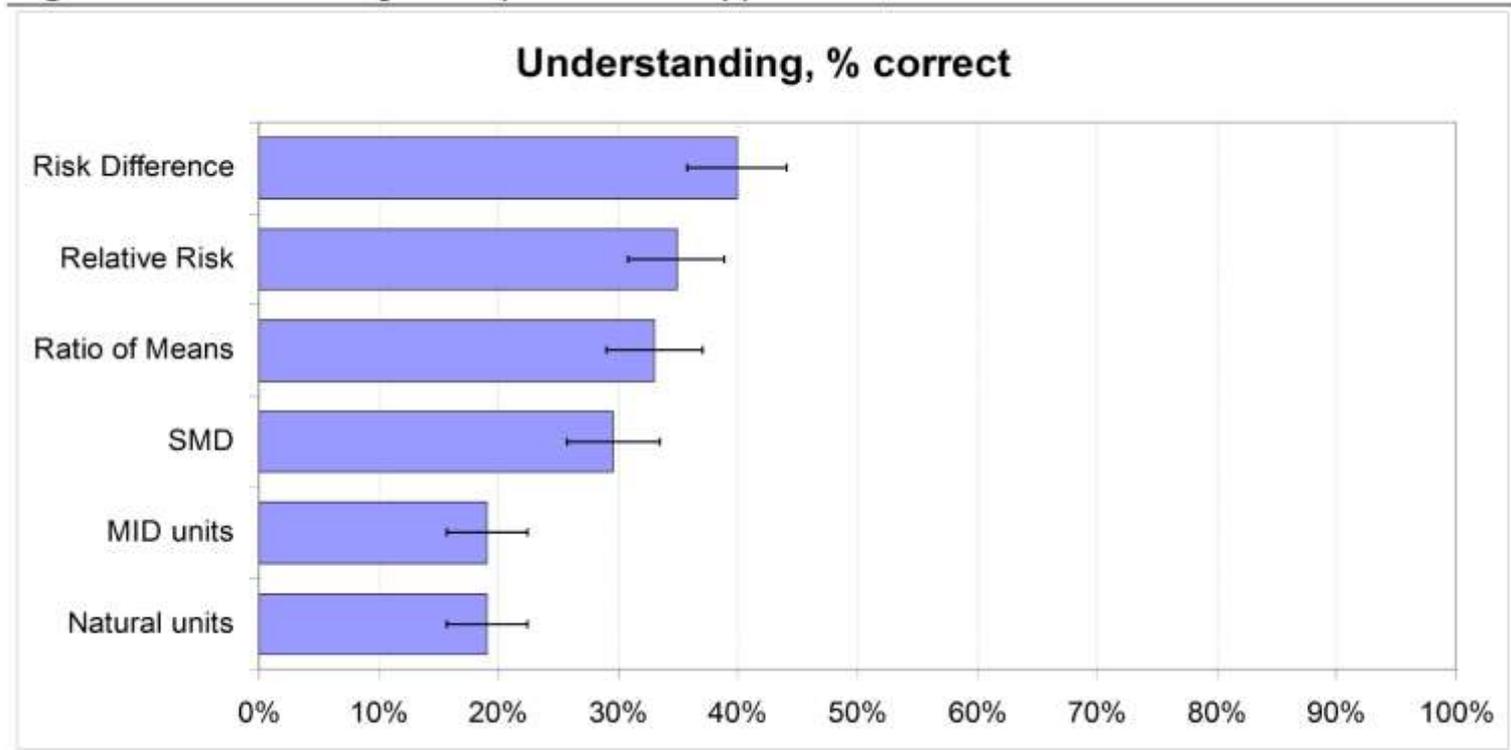
Understanding of research results, evidence summaries and their applicability—not critical appraisal—are core skills of medical curriculum

Kari A O Tikkinen ^{1,2} Gordon H Guyatt ³

Cross-sectional, paper-based survey

Academic centers in 8 countries, Internal and family medicine, 531/610 (87%)

Figure 3: Understanding of the presentation approaches, $n = 531$



Problem: Clinicians don't understand results
So how can they do shared decision-making?

Simplicity vs Methods Rigor

- Success of EBM, Users Guides and GRADE
 - Make complex simple – some sacrifice
- Lost balance: Cochrane RoB 2
- Alternative instrument
 - 12 experts: methods paper 1 1st/last, 2 others
 - Only one said no
- ROBINS-I right off the rails
 - Smart PhD at defence: "Torture"
- GRADE risks same problem

Conclusion

- Achieved goals
 - EBM has changed practice of medicine worldwide
 - Three principles widely acknowledged (V and P, SDM less)
 - GRADE now core in systematic reviews, guidelines
 - Guidelines becoming trustworthy, UpToDate, Dynamed
- Partially and unfulfilled
 - COVID: rapid trials, living reviews/guidelines, optimal format
 - Education clinicians understand magnitude of effects, SDM
 - Return optimal balance methodological rigor versus simplicity