




Appraising Evidence

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Process of Evidence-Based Medicine/Practice

1. Identifying information needs to develop a *focused question*
2. Finding the *best evidence* with which to answer the question
3. Critically appraising the evidence for validity and clinical usefulness
4. *Application* of findings into clinical practice
5. *Evaluating* the efficacy/performance of findings in clinical practice



Outline of Appraisal Process

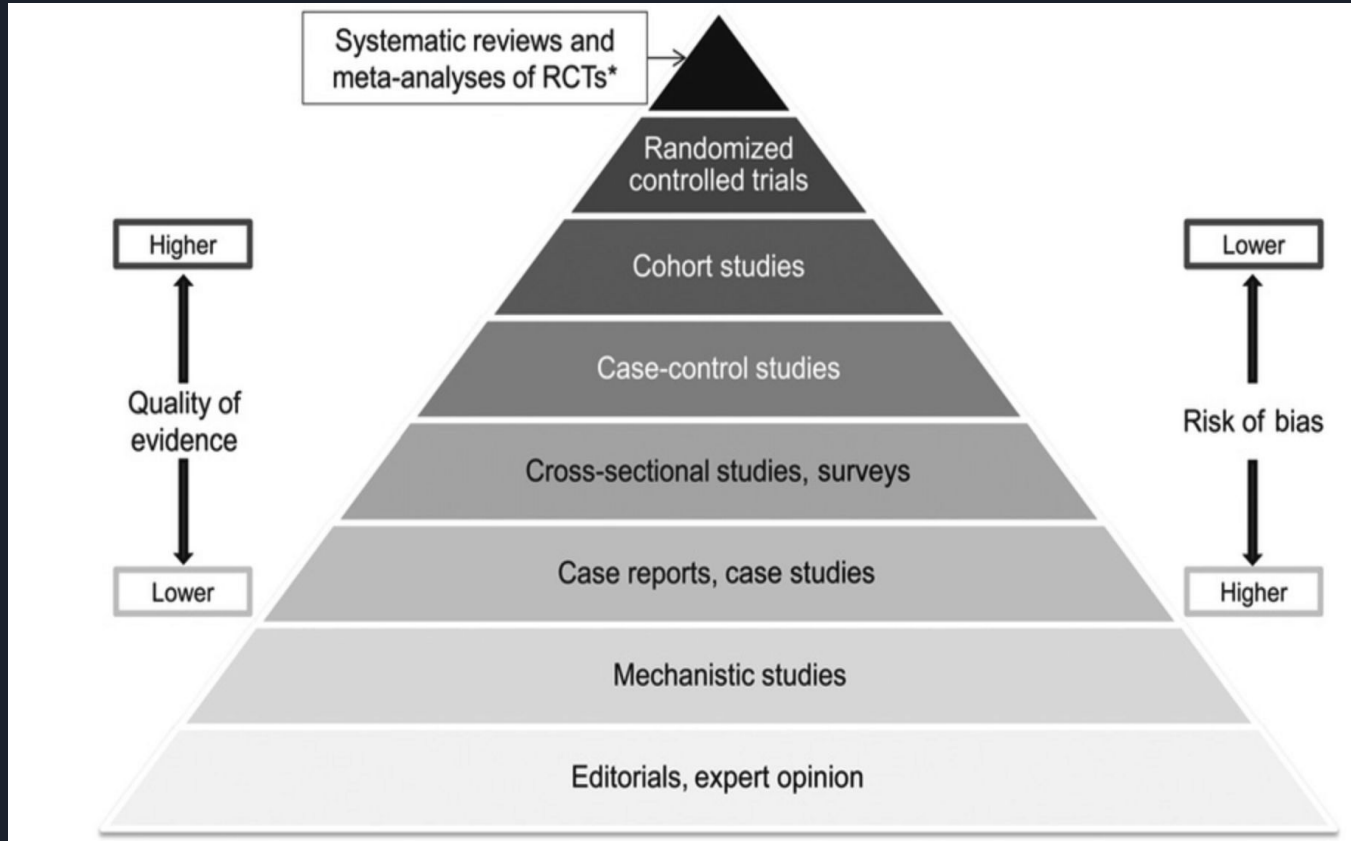
Critical appraisal entails evidence being assessed for:

- **Validity**
- **Clinical usefulness.**

Key concepts:

1. Study design
2. Validity (internal and external)
3. Reliability
4. Bias

Hierarchy of Study Designs






1) Study Design

Does the research address a focused question?

- **PICO(T) approach**
 - Population
 - Intervention/Exposure
 - Control/Comparison
 - Outcome
 - +/- Time (depends on study type eg. prospective analysis)

- Focused questioning makes searching for evidence easier, and findings more consistent/comparable



Does the research use valid methods to answer the proposed question?

- Evaluation of method itself to determine *internal* validity and *external* validity
- Requires analysis of full methodology



2) Validity

- ***Internal Validity:*** extent to which results showed a cause-effect relationship between independent and dependent variables
- ***External Validity:*** extent to which the study results could be extrapolated to the general population

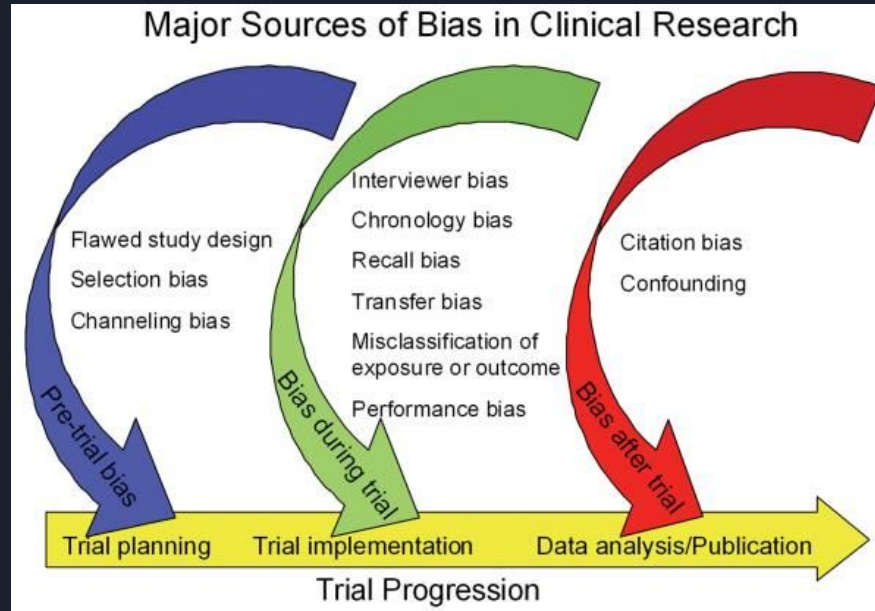


3) Reliability

- Replicability of results
- Detailed research methodology is important in order to show replicability of results (or lack thereof)

4) Bias

- Systematic error introduced into sampling
- Favouring one outcome or answer over others





Appraisal Process

1. Does the study address a clearly focused question?
2. Does the study use valid methods to address this question?
3. Are the valid results of this study important?
4. Are these valid, important results important to my patient/population?

If the answer to any of these is no...



01

Asking Focused Questions

- **P:** patient/problem
- **I:** intervention
- **C:** comparison
- **O:** outcome

02

Valid Methods

- Study design
- Internal and external validity
- Bias
- Inclusion and exclusion criteria

03

Important Valid Results

- Study size
- Able to replicate results
- Multiple studies with same results
- Power of study

04

Application to Patient/Population

- Demographics
- Availability of treatment option
- Risk vs benefit

Example: MMR vaccination and autism by Andrew Wakefield 1998

01

Asking Focused Questions

- P: children
- I: autism
- C: no autism
- O: MMR

02

Valid Methods

- Case report
- Selection bias
- No ethical clearance obtained
- Financial interests

03

Important Valid Results

- Sample size = 12
- Falsified results
- Multiple studies found no correlation

04

Application to Patient/Population

- Invalidity of results rendered study inapplicable



Conclusion

Appraisal of evidence is important!

- The existence of evidence does not make it significant
- Deeper inspection prevents poor quality evidence from slipping through the cracks (even the Lancet makes mistakes!)
- Procuring the best evidence that is relevant to practice improves patient care



References

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