Journey of a Journal
## Prepare   Present
Produce   Practice

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Outline

- How to make a Productive Reading
  - Steps of Evidence Base Medicine

- How to use the Knowledge effectively in Practice
  - Critical Appraisal

The five steps of EBM

1. Asking answerable questions
2. Search for the evidence
3. Critical appraisal of your results
4. Decide what action to take from your findings
5. Evaluate your new or amended practice

Clinical Problem ⟹ Define the question ⟹ Search ⟹ Appraise ⟹ Decide ⟹ Evaluate

Finding the evidence
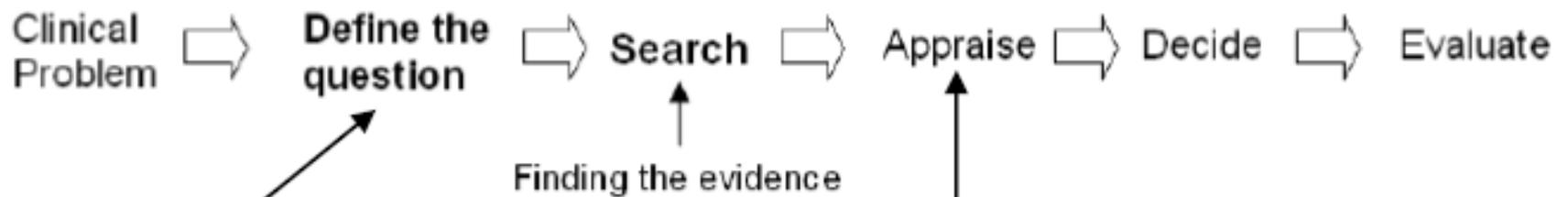
PICO tool:
Population
Intervention
Comparison
Outcome

Critical appraisal

Step 1. Define the question

- General Question
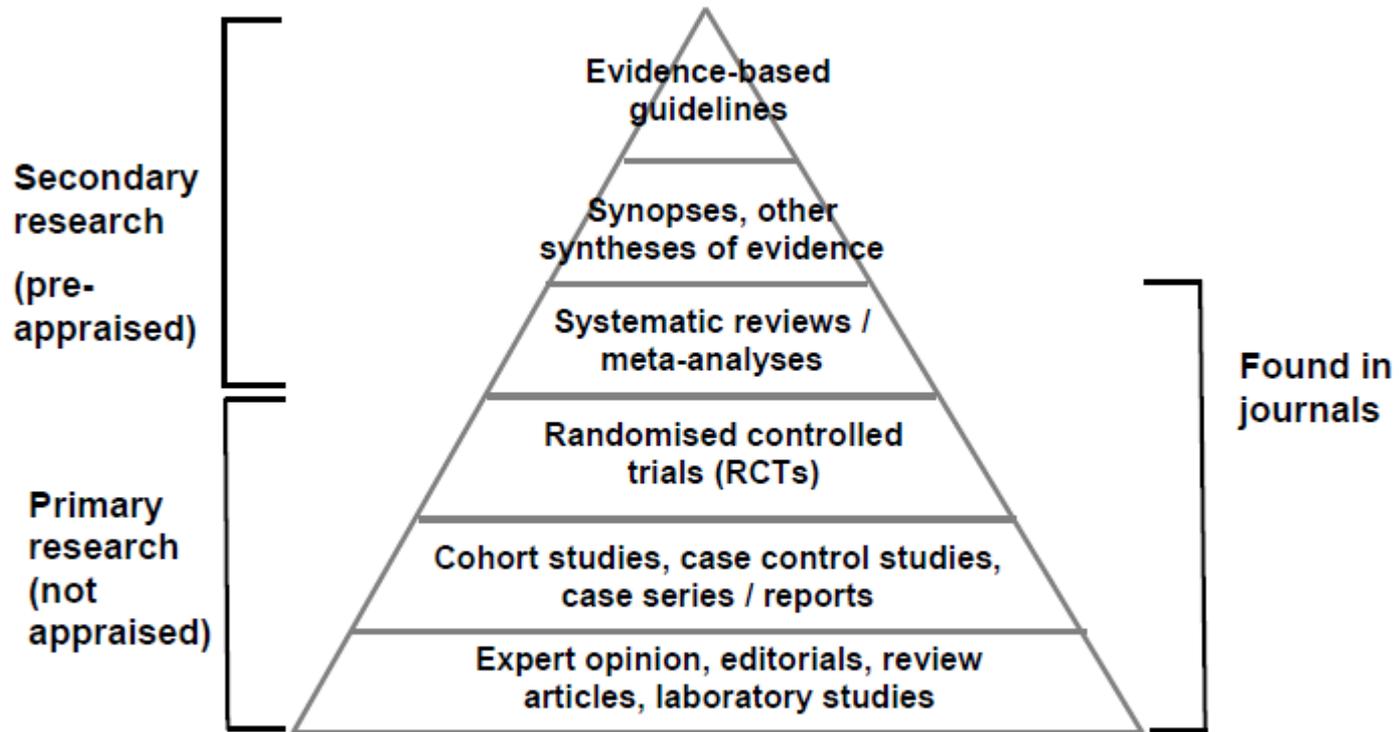 - Management of heart failure
  - Knowledge

- Specific Question
  - Is there benefit of warfarin in patients with severe heart failure to reduce thromboembolic complications?
  - Practice

PICO tools

▸ To Construct A Specific Question

1. Population
2. Intervention
3. Comparison
4. Outcome

Step 2. Searching the information or evidence

Adapted from (Haynes 2006).

Type of sources

- General Question (KNOWLEDGE)
  - Text
  - Data Base
  - Review articles

- Specific Question (PRACTICE)
  - Primary Research
  - Secondary Research
  - **The highest level of evidence available depends on the type of specific questions**

- The sources have different advantages and disadvantages

Review Articles vs. Original Articles

| REVIEW ARTICLES	ORIGINAL RESEARCH ARTICLES
Answer the general question	Answer the specific question
Broad and General view	Detail and Specific view
Useful for knowledge building	Useful for strengthening the accuracy of knowledge and for clinical practice
Low evidence level	High evidence level
Not favorable for critical appraisal	More readily to critical appraisal
Easy to Read	Need research methodology and statistical knowledge
Review from different sources more or less the same	Different researches may have different answers

Systematic Review and Meta-analysis

<u>Advantages:</u>
- allow for rigorous pooling of results;
- may increase overall confidence from small studies;
- potentially eradicate bias;
- may be updated if new evidence becomes available;
- may have the final say on a clinical query;
- may identify areas where more research is needed.

<u>Disadvantages:</u>
- expensive;
- time consuming;
- may be affected by publication bias – a test called **Funnel Plot** can be used to test for publication bias;
- normally summaries evidence up to two years before (due to the time required for the execution of the systematic review).
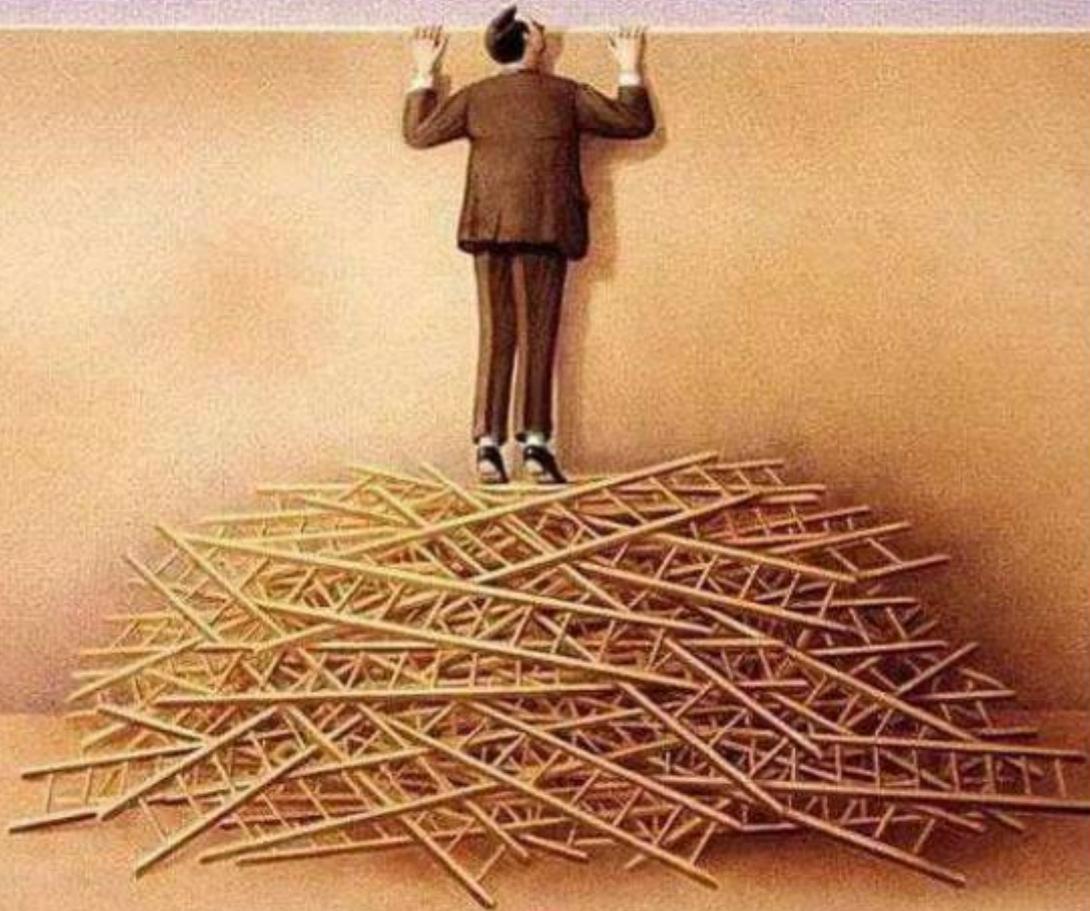
Step 3. Critical appraisal of articles

- Critical appraisal is the process of carefully and systematically examining research to judge its trustworthiness, and its value and relevance in a particular context. (Burls 2009)

- Critical appraisal is an important element of evidence-based medicine.

- Critical appraisal is essential to:
  - combat **information overload;**
  - identify papers that are **clinically relevant;**
  - **Continuing Professional Development (CPD)**
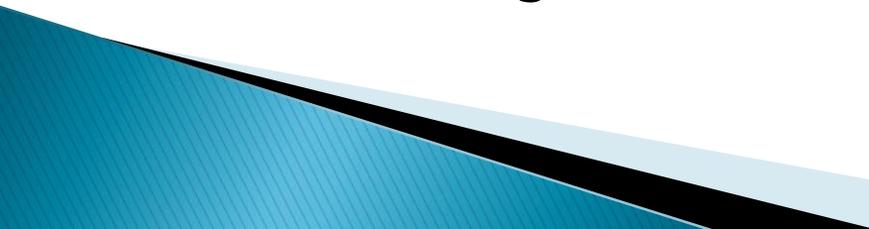
Bad Researches and Poor Source of Information

- Vegetarian diet and infertility (Chavarro et al. 2008)

- Link between suicides and phone masts (Johnston 2008)

- MMR Vaccine and Autism (Andrew Wakefield, the Lancet, 1998)

Critical Appraisal – In General

- Source

- Internal Validity
  - Study Question and Study Design
  - Methodology
  - Outcome

- External Validity
  - Population validity
  - Ecological validity
  - Historical validity
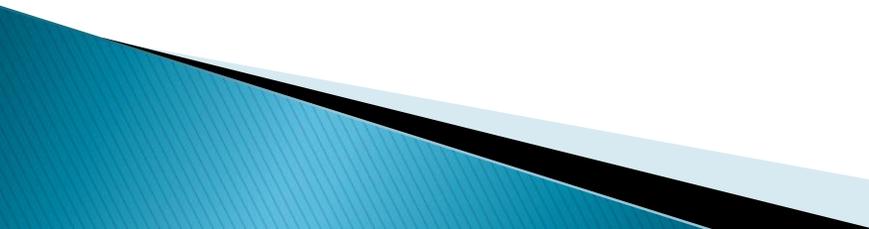
Internal Validity and External Validity

	Internal Validity	External Validity
Meaning	Internal validity is the extent to which the experiment is free from errors and any difference in measurement is due to independent variable and nothing else.	External validity is the extent to which the research results can be inferred to world at large.
Concerned with	Control	Naturalness
What is it?	It is a measure of accuracy of the experiment.	It checks whether the casual relationship discovered in the experiment can be generalized or not.
Identifies	How strong the research methods are?	Can the outcome of the research be applied to the real world?
Describes	Degree to which the conclusion is warranted.	Degree to which the study is warranted to generalize the result to other context.
Used to	Address or eliminate alternative explanation for the result.	Generalize the outcome.

# Critical Appraisal of Review Articles (Difficult to systematically appraised)

- **Sources**
  - Journal
  - Author
- **Internal Validity (difficult to appraised)**
  - Reference lists
  - Primary studies
    - Nature
    - Critically appraised or not
    - Description of the primary studies
- **External Validity**
  - Population validity
  - Ecological validity
  - Historical validity

Critical Appraisal of a Original Research Article

- Ten questions to ask – for critical appraisal a research article

1. Is the study question relevant?
2. Does the study add anything new?
3. What type of research question is being asked?
4. Was the study design appropriate for the research question?
5. Did the study methods address the most important potential sources of bias?
6. Was the study performed according to the original protocol?
7. Does the study test a stated hypothesis?
8. Were the statistical analyses performed correctly?
9. Do the data justify the conclusions?
10. Are there any conflicts of interest?

Critical Appraisal – In General

- Source

- Internal Validity
  ◦ Study Question and Study Design
  ◦ Methodology
  ◦ Outcome

- External Validity
  ◦ Population validity
  ◦ Ecological validity
  ◦ Historical validity
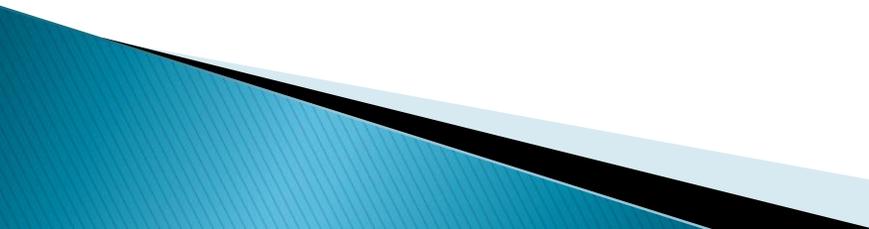
Sources
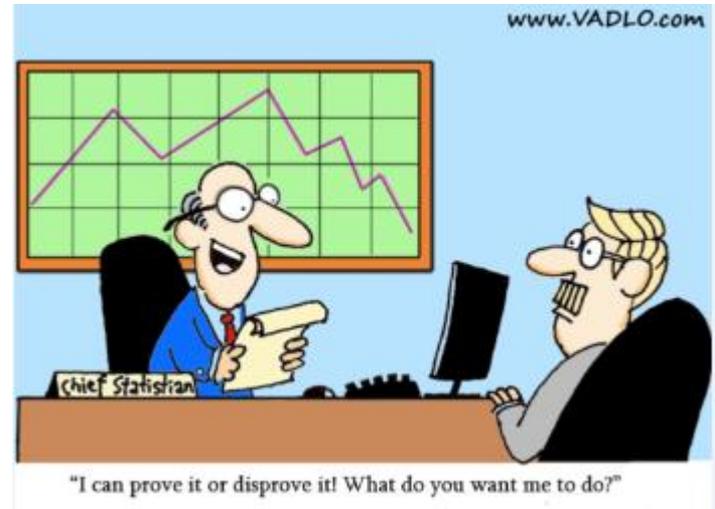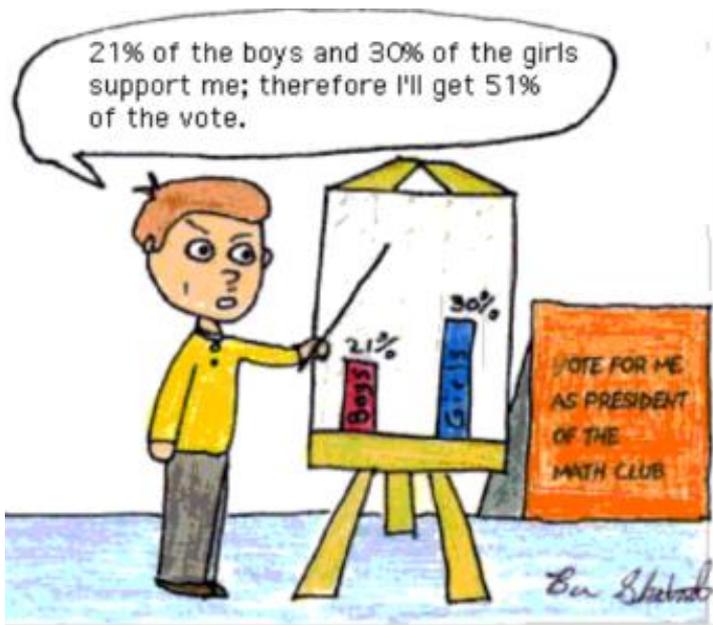
- ◦ Journal

- ◦ Author

- ◦ Funding

Journal Ranking

	A	B	C	D	E
1	Rank	Title	Type	Issn	**SJR**
2	1	CA - A Cancer Journal for Clinicians	journal	ISSN 154248	39.285
3	2	Nature Reviews Genetics	journal	ISSN 147100	33.238
4	3	Nature Reviews Immunology	journal	ISSN 147417	29.692
5	4	Annual Review of Immunology	journal	ISSN 073205	27.631
6	5	Nature Reviews Cancer	journal	ISSN 147417	21.53
7	6	Physiological Reviews	journal	ISSN 152212	16.888
8	7	Immunity	journal	ISSN 109741	16.467
9	8	New England Journal of Medicine	journal	ISSN 002847	15.736
10	9	MMWR. Recommendations and reports : Morbi journal		ISSN 105755	14.208
11	10	Nature Medicine	journal	ISSN 107888	14.205
12	11	The Lancet Oncology	journal	ISSN 147020	13.39
13	12	Cancer Cell	journal	ISSN 153561	13.169
14	13	Annual Review of Pathology: Mechanisms of D book serie		ISSN 155340	12.833
15	14	The Lancet	journal	ISSN 014067	12.467
16	15	Genome Research	journal	ISSN 154954	12.249
17	16	Journal of the American College of Cardiology	journal		
18	17	The Lancet Neurology	journal		
19	18	The Lancet Infectious Diseases	journal		
20	19	Clinical Microbiology Reviews	journal		
21	20	Journal of Experimental Medicine	journal		

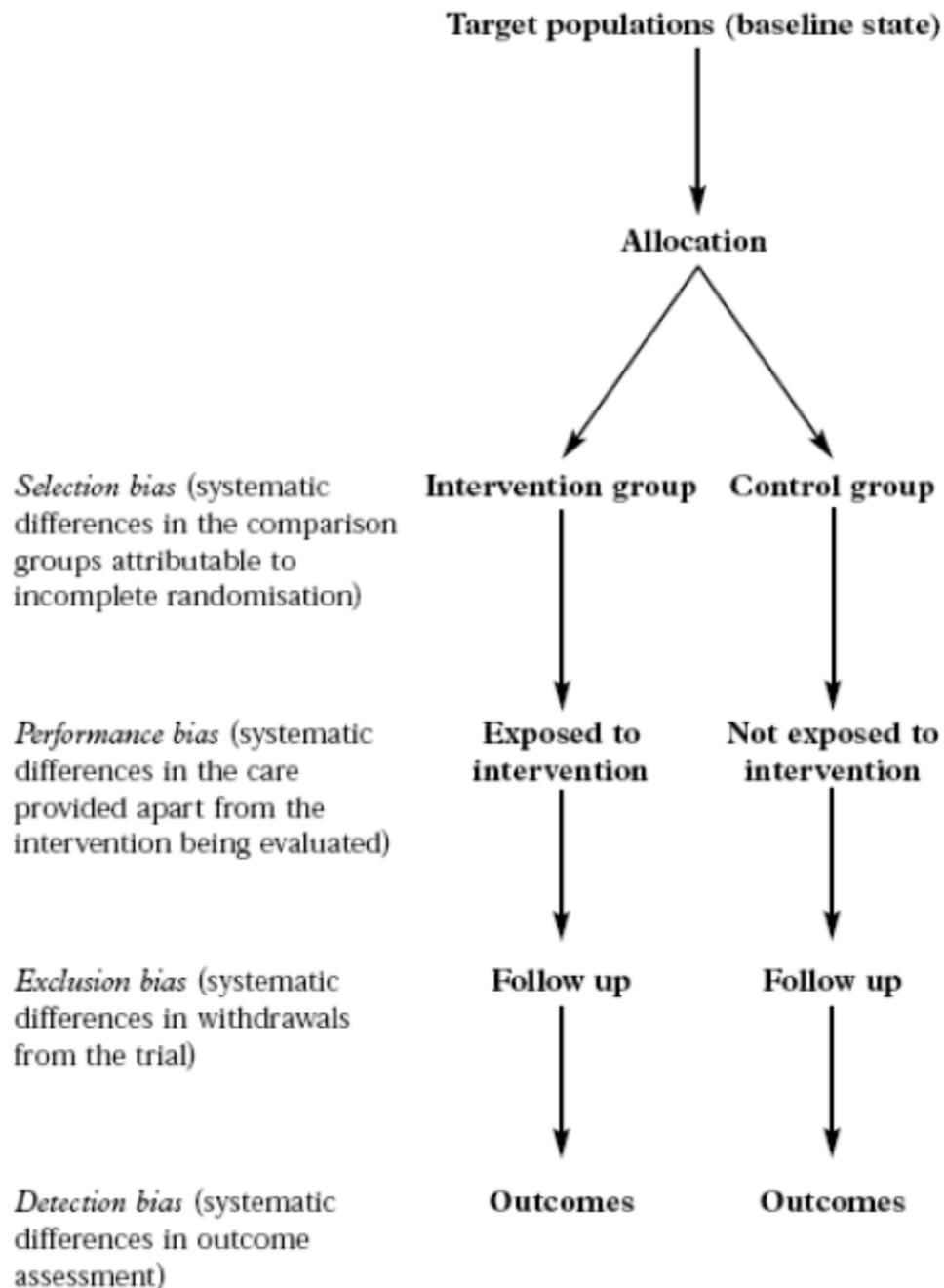|	A	B	C	D	E
1	Rank	Title	Type	Issn	**H index**
2	1	CA - A Cancer Journal for Clinicians	journal	ISSN 154248	131
3	2	Nature Reviews Genetics	journal	ISSN 147100	292
4	3	Nature Reviews Immunology	journal	ISSN 147417	316
5	4	Annual Review of Immunology	journal	ISSN 073205	267
6	5	Nature Reviews Cancer	journal	ISSN 147417	355
7	6	Physiological Reviews	journal	ISSN 152212	293
8	7	Immunity	journal	ISSN 109741	329
9	8	New England Journal of Medicine	journal	ISSN 002847	862
10	9	MMWR. Recommendations and reports : Morbi journal		ISSN 105755	112
11	10	Nature Medicine	journal	ISSN 107888	468
12	11	The Lancet Oncology	journal	ISSN 147020	231
13	12	Cancer Cell	journal	ISSN 153561	271
14	13	Annual Review of Pathology: Mechanisms of D book serie		ISSN 155340	94
15	14	The Lancet	journal	ISSN 014067	646
16	15	Genome Research	journal	ISSN 154954	248
17	16	Journal of the American College of Cardiology	journal	ISSN 073510	369
18	17	The Lancet Neurology	journal	ISSN 147444	227
19	18	The Lancet Infectious Diseases	journal	ISSN 147330	180
20	19	Clinical Microbiology Reviews	journal	ISSN 089385	224
21	20	Journal of Experimental Medicine	journal	ISSN 002210	386

http://www.scimagojr.com

Internal Validity

- Study Question
- Study Design
- Methodology
- Outcome

- Need good knowledge of research methodology and health statistic

"21% of the boys and 30% of the girls support me; therefore I'll get 51% of the vote."

VOTE FOR ME AS PRESIDENT OF THE MATH CLUB

www.VADLO.com

"I can prove it or disprove it! What do you want me to do?"

"Data don't make any sense, we will have to resort to statistics."

I can't tell you how sorry I am...your husbands death is really going to bugger up our weekly performance figures!

Internal Validity – Methodology – RCT

- allocation (randomization, stratification, confounders)
- blinding
- sample size (power calculation)
- follow up of participants (intention to treat)
- data collection (bias)

Target populations (baseline state)

Allocation

Intervention group   Control group

Selection bias (systematic differences in the comparison groups attributable to incomplete randomisation)

Performance bias (systematic differences in the care provided apart from the intervention being evaluated)

Exposed to intervention   Not exposed to intervention

Exclusion bias (systematic differences in withdrawals from the trial)

Follow up   Follow up

Detection bias (systematic differences in outcome assessment)

Outcomes   Outcomes

(Greenhalgh 2001)

Internal Validity – Methodology – Cohort

- Is the study prospective or retrospective?
- Is the cohort representative of a defined group or population?
- Were all important confounding factors identified?
- Were all important exposures and/or treatments, potential confounding factors and outcomes measured accurately and objectively in all members of the cohort?
- Were there important losses to follow-up?
- Were participants followed up for a sufficient length of time?

Internal Validity – Methodology – Case-Control

- Were the cases clearly defined?
- Were the cases representative of a defined population?
- How were the controls selected and were they drawn from the same population as the cases?
- Were study measures identical for cases and controls?
- Were study measures objective or subjective and is recall bias likely if they were subjective?
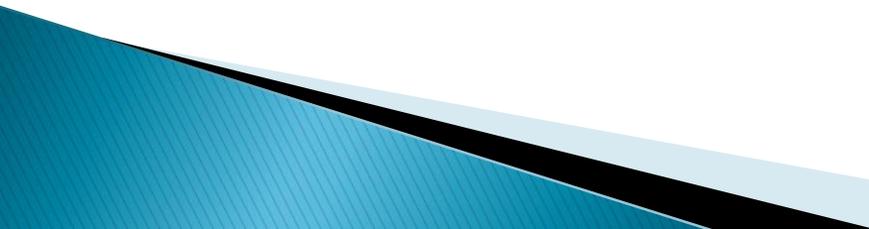
Internal Validity – Methodology – Meta-analysis

- Were all relevant studies included (i.e. was the search comprehensive and less bias)?
- Were selected articles appraised and data extracted by two independent reviewers?
- Was sufficient detail provided about the primary studies, including descriptions of the patients, interventions and outcomes?
- Was the quality of the primary studies assessed?
- Did the researchers assess the appropriateness of combining results to calculate a summary measure?

Bias in the location and selection of studies

- significant positive results are more likely to be submitted and accepted for publication (**publication bias**);
- published in a major journal written in English (**Tower of Babel bias**);
- published in a journal indexed in a literature database, especially in less developed countries (**database bias**);
- cited by other authors (**citation bias**);
- published repeatedly (**multiple publication bias**);
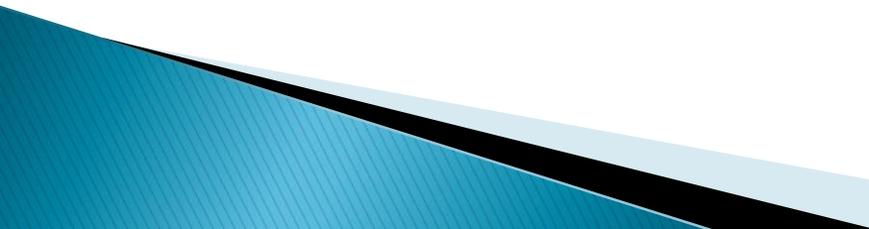
‣ Assessing the research methods used in the study can be done using **checklists** which are specific to the study design.

‣ The following checklists are commonly used:
  ◦ CASP http://www.casp-uk.net/checklists
  ◦ SIGN http://www.sign.ac.uk/methodology/checklists
  ◦ CEBMH http://cebmh.warne.ox.ac.uk/cebmh/ education_critical_appraisal

Methodology Checklist 2: Controlled Trials

SIGN

Study identification (*Include author, title, year of publication, journal title, pages*)		
Guideline topic:	Key Question No:	Reviewer:

Before completing this checklist, consider:

1. Is the paper a **randomised controlled trial** or a **controlled clinical trial**? If in doubt, check the study design algorithm available from SIGN and make sure you have the correct checklist. If it is a **controlled clinical trial** questions 1.2, 1.3, and 1.4 are not relevant, and the study cannot be rated higher than 1+

2. Is the paper relevant to key question? Analyse using PICO (Patient or Population Intervention Comparison Outcome). IF NO REJECT (give reason below). IF YES complete the checklist.

Reason for rejection: 1. Paper not relevant to key question ☐   2. Other reason ☐ (please specify):

SECTION 1: INTERNAL VALIDITY

	In a well conducted RCT study…	Does this study do it?	
1.1	The study addresses an appropriate and clearly focused question.	Yes ☐ Can't say ☐	No ☐
1.2	The assignment of subjects to treatment groups is randomised.	Yes ☐ Can't say ☐	No ☐
1.3	An adequate concealment method is used.	Yes ☐ Can't say ☐	No ☐
1.4	The design keeps subjects and investigators 'blind' about treatment allocation.	Yes ☐ Can't say ☐	No ☐
1.5	The treatment and control groups are similar at the start of the trial.	Yes ☐ Can't say ☐	No ☐
1.6	The only difference between groups is the treatment under investigation.	Yes ☐ Can't say ☐	No ☐
1.7	All relevant outcomes are measured in a standard, valid and reliable way.	Yes ☐ Can't say ☐	No ☐
1.8	What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?		
1.9	All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).	Yes ☐ Can't say ☐	No ☐ Does not apply ☐
1.10	Where the study is carried out at more than one site, results are comparable for all sites.	Yes ☐ Can't say ☐	No ☐ Does not apply ☐

SECTION 2: OVERALL ASSESSMENT OF THE STUDY

2.1	How well was the study done to minimise bias? *Code as follows:*	High quality (++)☐ Acceptable (+)☐ Low quality (-)☐ Unacceptable – reject 0 ☐
2.2	Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention?	
2.3	Are the results of this study directly applicable to the patient group targeted by this guideline?	
2.4	**Notes.** Summarise the authors' conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above.	

Methodology Checklist 3: Cohort studies

SIGN

Study identification (*Include author, title, year of publication, journal title, pages*)

Guideline topic:	Key Question No:	Reviewer:

Before completing this checklist, consider:

1. Is the paper really a cohort study? If in doubt, check the study design algorithm available from SIGN and make sure you have the correct checklist.

2. Is the paper relevant to key question? Analyse using PICO (Patient or Population Intervention Comparison Outcome). IF NO REJECT (give reason below). IF YES complete the checklist..

Reason for rejection: 1. Paper not relevant to key question ☐   2. Other reason ☐ (please specify):

Please note that a retrospective study (ie a database or chart study) cannot be rated higher than +.

SECTION 1: INTERNAL VALIDITY

	In a well conducted cohort study:	*Does this study do it?*
1.1	The study addresses an appropriate and clearly focused question.[i]	Yes ☐ No ☐ Can't say ☐

SELECTION OF SUBJECTS

1.2	The two groups being studied are selected from source populations that are comparable in all respects other than the factor under investigation.[ii]	Yes ☐ No ☐ Can't say ☐ Does not apply ☐
1.3	The study indicates how many of the people asked to take part did so, in each of the groups being studied.[iii]	Yes ☐ No ☐ Does not apply ☐
1.4	The likelihood that some eligible subjects might have the outcome at the time of enrolment is assessed and taken into account in the analysis.[iv]	Yes ☐ No ☐ Can't say ☐ Does not apply ☐
1.5	What percentage of individuals or clusters recruited into each arm of the study dropped out before the study was completed.[v]	
1.6	Comparison is made between full participants and those lost to follow up, by exposure status.[vi]	Yes ☐ No ☐ Can't say ☐ Does not apply ☐

ASSESSMENT

1.7	The outcomes are clearly defined.[vii]	Yes ☐ No ☐ Can't say ☐
1.8	The assessment of outcome is made blind to exposure status. If the study is retrospective this may not be applicable.[viii]	Yes ☐ No ☐ Can't say ☐ Does not apply ☐
1.9	Where blinding was not possible, there is some recognition that knowledge of exposure status could have influenced the assessment of outcome.[ix]	Yes ☐ No ☐ Can't say ☐ ☐
1.10	The method of assessment of exposure is reliable.[x]	Yes ☐ No ☐ Can't say ☐
1.11	Evidence from other sources is used to demonstrate that the method of outcome assessment is valid and reliable.[xi]	Yes ☐ No ☐ Can't say ☐ Does not apply ☐
1.12	Exposure level or prognostic factor is assessed more than once.[xii]	Yes ☐ No ☐ Can't say ☐ Does not apply ☐

CONFOUNDING

1.13	The main potential confounders are identified and taken into account in the design and analysis.[xiii]	Yes ☐ No ☐ Can't say ☐

STATISTICAL ANALYSIS

1.14	Have confidence intervals been provided?[xiv]	Yes ☐ No ☐

SECTION 2: OVERALL ASSESSMENT OF THE STUDY

2.1	How well was the study done to minimise the risk of bias or confounding?[xv]	High quality (++) ☐ Acceptable (+) ☐ Unacceptable – reject 0
2.2	Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, do you think there is clear evidence of an association between exposure and outcome?	Yes ☐ No ☐ Can't say ☐
2.3	Are the results of this study directly applicable to the patient group targeted in this guideline?	Yes ☐ No ☐
2.4	**Notes.** Summarise the authors conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above.	

Methodology Checklist 4: Case-control studies

SIGN

Study identification (*Include author, title, year of publication, journal title, pages*)

Guideline topic:	Key Question No:	Reviewer:

Before completing this checklist, consider:

1. Is the paper really a case-control study? If in doubt, check the study design algorithm available from SIGN and make sure you have the correct checklist.

2. Is the paper relevant to key question? Analyse using PICO (Patient or Population Intervention Comparison Outcome). IF NO REJECT (give reason below). IF YES complete the checklist.

Reason for rejection: Reason for rejection: 1. Paper not relevant to key question ☐   2. Other reason ☐   (please specify):

SECTION 1: INTERNAL VALIDITY

In an well conducted case control study:	*Does this study do it?*
1.1	The study addresses an appropriate and clearly focused question.[i]	Yes ☐ No ☐ Can't say ☐

SELECTION OF SUBJECTS

1.2	The cases and controls are taken from comparable populations.[ii]	Yes ☐ No ☐ Can't say ☐
1.3	The same exclusion criteria are used for both cases and controls.[iii]	Yes ☐ No ☐ Can't say ☐
1.4	What percentage of each group (cases and controls) participated in the study?[iv]	Cases: Controls:
1.5	Comparison is made between participants and non-participants to establish their similarities or differences.[v]	Yes ☐ No ☐ Can't say ☐
1.6	Cases are clearly defined and differentiated from controls.[vi]	Yes ☐ No ☐ Can't say ☐

1.7	It is clearly established that controls are non-cases.[vii]	Yes ☐ No ☐ Can't say ☐

ASSESSMENT

1.8	Measures will have been taken to prevent knowledge of primary exposure influencing case ascertainment.[viii]	Yes ☐ No ☐ Can't say ☐ Does not apply ☐
1.9	Exposure status is measured in a standard, valid and reliable way.[ix]	Yes ☐ No ☐ Can't say ☐

CONFOUNDING

1.10	The main potential confounders are identified and taken into account in the design and analysis.[x]	Yes ☐ No ☐ Can't say ☐

STATISTICAL ANALYSIS

1.11	Confidence intervals are provided.[xi]	Yes ☐ No ☐

SECTION 2: OVERALL ASSESSMENT OF THE STUDY

2.1	How well was the study done to minimise the risk of bias or confounding? [xii]	High quality (++) ☐ Acceptable (+) ☐ Unacceptable – reject 0 ☐
2.2	Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, do you think there is clear evidence of an association between exposure and outcome?	Yes ☐ No ☐ Can't say ☐
2.3	Are the results of this study directly applicable to the patient group targeted by this guideline?	Yes ☐ No ☐
2.4	**Notes.** Summarise the authors conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above..	

Methodology Checklist 5: Studies of Diagnostic Accuracy

This checklist is based on the work of the QUADAS2 team at Bristol Univeristy (http://www.bris.ac.uk/quadas/).

Study identification (*Include author, title, reference, year of publication*)

Guideline topic:	Key Question No:

Before completing this checklist, consider:

1. Is the paper really a study of diagnostic accuracy? It should be comparing a specific diagnostic test against another, and **not** a general paper or comment on diagnosis.

2. Is the paper relevant to key question? Analyse using PICO (Patient or Population Intervention Comparison Outcome). IF NO REJECT (give reason below). IF YES complete the checklist..

Reason for rejection: Reason for rejection: 1. Paper not relevant to key question □   2. Other reason □ (please specify):

Checklist completed by:

All the questions in the following sections have associated footnotes providing short explanations behind each of the questions. Users who want more detailed explanations should consult the QUADAS-2: Background Document.

DOMAIN 1 – PATIENT SELECTION

Risk of bias

In a well conducted diagnostic study...	Is that true in this study?
1.1 A consecutive sequence or random selection of patients is enrolled.[i]	Yes ☐ Can't say ☐ No ☐
1.2 Case – control methods are not used.[ii]	Yes ☐ Can't say ☐ No ☐
1.3 Inappropriate exclusions are avoided.[iii]	Yes ☐ Can't say ☐ No ☐

Applicability

1.4 The included patients and settings match the key question.[iv]	Yes ☐ Can't say ☐ No ☐

DOMAIN 2 – INDEX TEST

Risk of bias

In a well conducted diagnostic study...	Is that true in this study?
2.1 The index test results interpreted without knowledge of the results of the reference standard.[v]	Yes ☐ Can't say ☐ No ☐
2.2 If a threshold is used, it is pre-specified.[vi]	Yes ☐ Can't say ☐ No ☐

Applicability

2.3 The index test, its conduct, and its interpretation is similar to that used in practice with the target population of the guideline.[vii]	Yes ☐ Can't say ☐ No ☐

DOMAIN 3 – REFERENCE STANDARD

Risk of bias

In a well conducted diagnostic study...	Is that true in this study?
3.1 The reference standard is likely to correctly identify the target condition.[viii]	Yes ☐ Can't say ☐ No ☐
3.2 Reference standard results are interpreted without knowledge of the results of the index test.[ix]	Yes ☐ Can't say ☐ No ☐

Applicability

3.3 The target condition as defined by the reference standard matches that found in the target population of the guideline.[x]	Yes ☐ Can't say ☐ No ☐

DOMAIN 4 – FLOW AND TIMING

Risk of bias

In a well conducted diagnostic study...	Is that true in this study?
4.1 There is an appropriate interval between the index test and reference standard.[xi]	Yes ☐ Can't say ☐ No ☐
4.2 All patients receive the same reference standard.[xii]	Yes ☐ Can't say ☐ No ☐
4.3 All patients recruited into the study are included in the analysis.[xiii]	Yes ☐ Can't say ☐ No ☐

SECTION 5: OVERALL ASSESSMENT OF THE STUDY

5.1 How well was the study done to minimise bias? *Code as follows.*[xiv]	High quality (++)☐ Acceptable (+)☐ Unacceptable – reject 0 ☐
5.2 What is your assessment of the **applicability** of this study to our target population?	Directly applicable ☐ Some indirectness ☐ (Please explain in the following section for **Notes**)
5.2 **Notes.** Summarise the authors conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question.	

Methodology Checklist 1: Systematic Reviews and Meta-analyses

SIGN

Study identification (*Include author, title, year of publication, journal title, pages*)

Guideline topic:	Key Question No:

Before completing this checklist, consider:

Is the paper relevant to key question? Analyse using PICO (Patient or Population Intervention Comparison Outcome). IF NO reject. IF YES complete the checklist.

Checklist completed by:

Section 1: Internal validity

In a well conducted systematic review:		Does this study do it?
1.1	The research question is clearly defined and the inclusion/ exclusion criteria must be listed in the paper.	Yes ☐ No ☐ **If no reject**
1.2	A comprehensive literature search is carried out.	Yes ☐ No ☐ Not applicable ☐ **If no reject**
1.3	At least two people should have selected studies.	Yes ☐ No ☐ Can't say ☐
1.4	At least two people should have extracted data.	Yes ☐ No ☐ Can't say ☐
1.5	The status of publication was not used as an inclusion criterion.	Yes ☐ No ☐
1.6	The excluded studies are listed.	Yes ☐ No ☐
1.7	The relevant characteristics of the included studies are provided.	Yes ☐ No ☐
1.8	The scientific quality of the included studies was assessed and reported.	Yes ☐ No ☐
1.9	Was the scientific quality of the included studies used appropriately?	Yes ☐ No ☐
1.10	Appropriate methods are used to combine the individual study findings.	Yes ☐ No ☐ Can't say ☐ Not applicable ☐
1.11	The likelihood of publication bias was assessed appropriately.	Yes ☐ No ☐ Not applicable ☐
1.12	Conflicts of interest are declared.	Yes ☐ No ☐

SECTION 2: OVERALL ASSESSMENT OF THE STUDY

2.1	What is your overall assessment of the methodological quality of this review?	High quality (++) ☐ Acceptable (+) ☐ Low quality (-) ☐ Unacceptable – reject 0 ☐
2.2	Are the results of this study directly applicable to the patient group targeted by this guideline?	Yes ☐ No ☐
2.3	**Notes:**	

Internal Validity – Outcome

- Presentation of results
  ◦ clear
  ◦ Precise

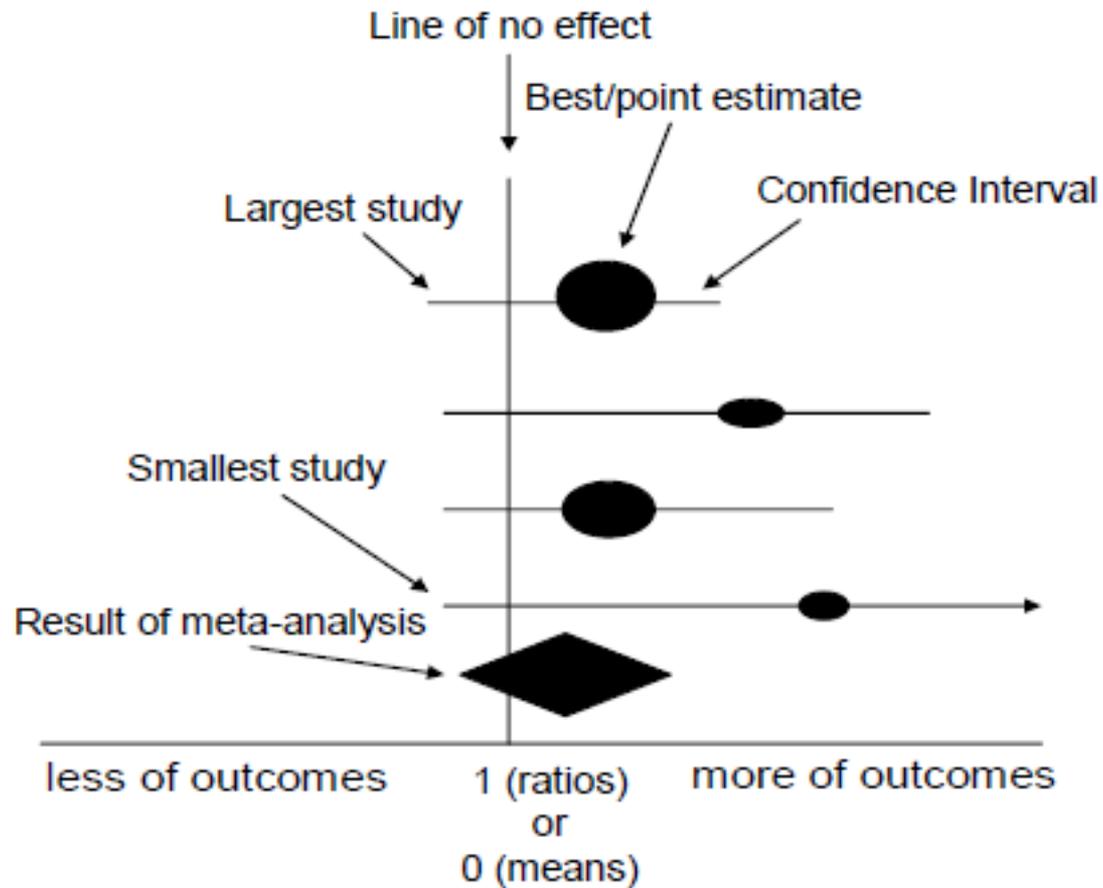- Outcomes
  ◦ Primary outcomes
  ◦ Secondary outcomes

Internal Validity – Outcome

- Statistics
  - Values
    - Proportion, Mean $\pm$ SD, Scattered diagram
  - Quantifying the risk / Analysis
    - Risk, Odd, RR, OR
    - Correlation
    - ARR, RRR, NNT
    - Sensitivity, Specificity, PPV, NPV
    - Blobbogram / Forest plot (For meta-analysis)
  - Significance
    - P value
    - Confidence interval

Blobbogram/Forest plot

Final and Quick Check

- Before making up your mind about the quality of the study, you go back to the journal's online version.
- These often publish responses from their readers right after publication.
- You will find it useful to compare your conclusions with this type of comments.
- Some of the authors have special knowledge that may confirm or challenge your conclusions.
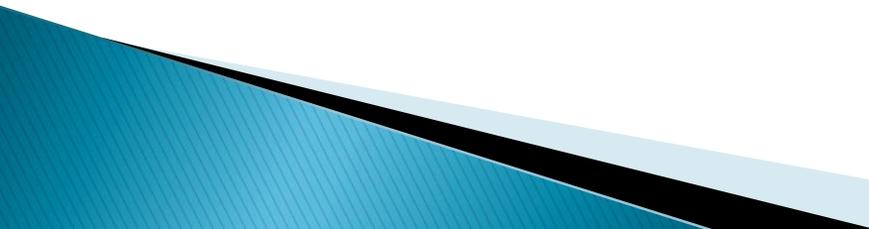
External Validity

▸ applicability to local population

1. Population validity
2. Ecological validity
3. Historical validity

Critical Appraisal of Clinical Guideline – Source

- Who were the guideline authors?
- The guideline should document authorship or group membership, and may classify this by clinical interest.
- Many guidelines are developed by a multidisciplinary group, thus involving important different perspectives in patient care.
- Check that conflicts of interest are declared and dealt with adequately. Assess the credibility of the authors.
  - Introduction
  - Credits
  - Appendix

- Is the funding support for guideline development clearly identified?
- The agency or funding group should be identified. If external funding was received, look to see that conflicts of interest are declared and whether potential biases from the funding source were taken into account.
  - Introduction or title page
 - Credits
  - Appendix

Critical Appraisal of Clinical Guideline – Internal Validity

- **Are the objectives of the guideline clearly stated?**
- The objectives of the guideline should be stated in an introduction setting out the purpose, scope, and target readership.
  - Introduction

- **How did the authors identify and classify the major issues to be addressed, and have they described this process?**
- An introduction or appendix should describe how the authors decided which questions were important, and how these questions were constructed.
- Alternatively, the guideline may reference a publication describing the process and state that this process was followed.
  - Introduction
  - Appendix
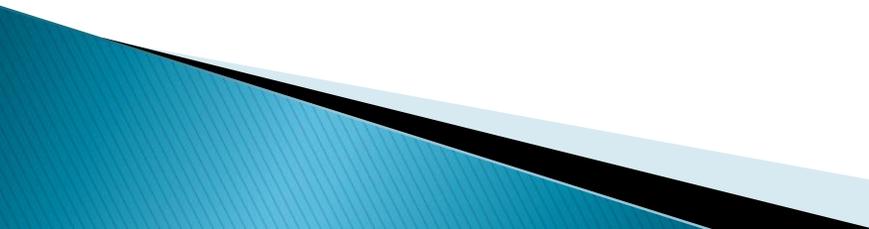
Critical Appraisal of Clinical Guideline – Internal Validity

- **Was a systematic review of evidence used to answer each question?**
- Ideally a published systematic review or a comprehensive search for all relevant studies should be described or referenced.
- Information should be adequate to ensure that the review methodology minimised bias.
  - ❑ Introduction
  - ❑ Appendix

- **Was follow-up sufficiently complete and was it long enough?**
- Each recommendation should be supported by a level or grade of evidence. The levels of evidence should be defined at some point in an introduction or appendix.
 - ❑ Introduction
  - ❑ Recommendations
  - ❑ Tables
 - ❑ Appendix
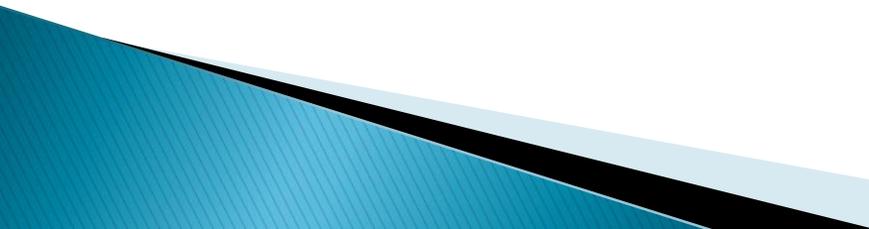
Critical Appraisal of Clinical Guideline – Internal Validity

- Did the authors assess the body of evidence and give an 'evidence statement' including benefits and risks before formulating each recommendation?
- A description of methods used to assess the strength of the evidence should be included.
- The authors should have taken the evidence identified in the systematic review into account in formulating each recommendation.
- The key points of the evidence should be summarised for the reader.
  - Body text
  - Point form within text
  - Tables

- Is each recommendation referenced to the published research?
- Readers should be able to identify the published research from the guideline, either with each recommendation or in the body of the text.
  - Body text
  - References

Critical Appraisal of Clinical Guideline – External Validity (Applicability)

- **Have patients individual situations, values and preferences been discussed in recommending implementation of the guidelines?**
  - The influence of individual patient variation and tailoring to the individual should be discussed.
  - Additional information on subgroups (e.g. elderly, comorbidities) should be presented if possible.
    - Discussion
    - Conclusion

- **Have resource and economic considerations been discussed in recommending implementation of the guidelines?**
  - The guidelines should consider cost-effectiveness and reduce inappropriate resource use.
    - Discussion
    - Conclusion
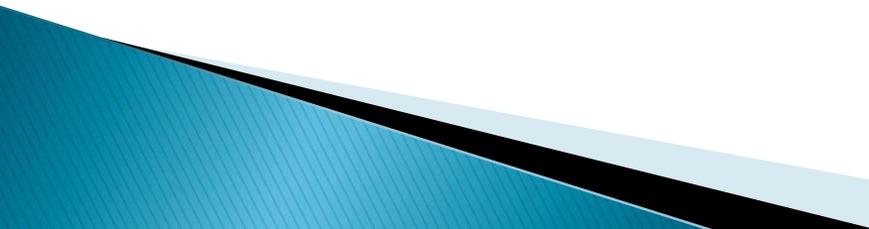
- Can the guidelines take into account clinically sensible variations in practice?
- Look at whether the guidelines be implemented flexibly, and whether different management options are given where the evidence supports more than one alternative.
  - Body text
  - Discussion
  - Conclusion

- Is the guideline written in clear, unambiguous language?
- Language must be appropriate for the readership or the guidelines will not be effective.
  - Guideline

- Are the guidelines recent or regularly updated?
- Revisions should take place every three to five years, or more often (or with supplements) if the field is rapidly changing.
  - Title page
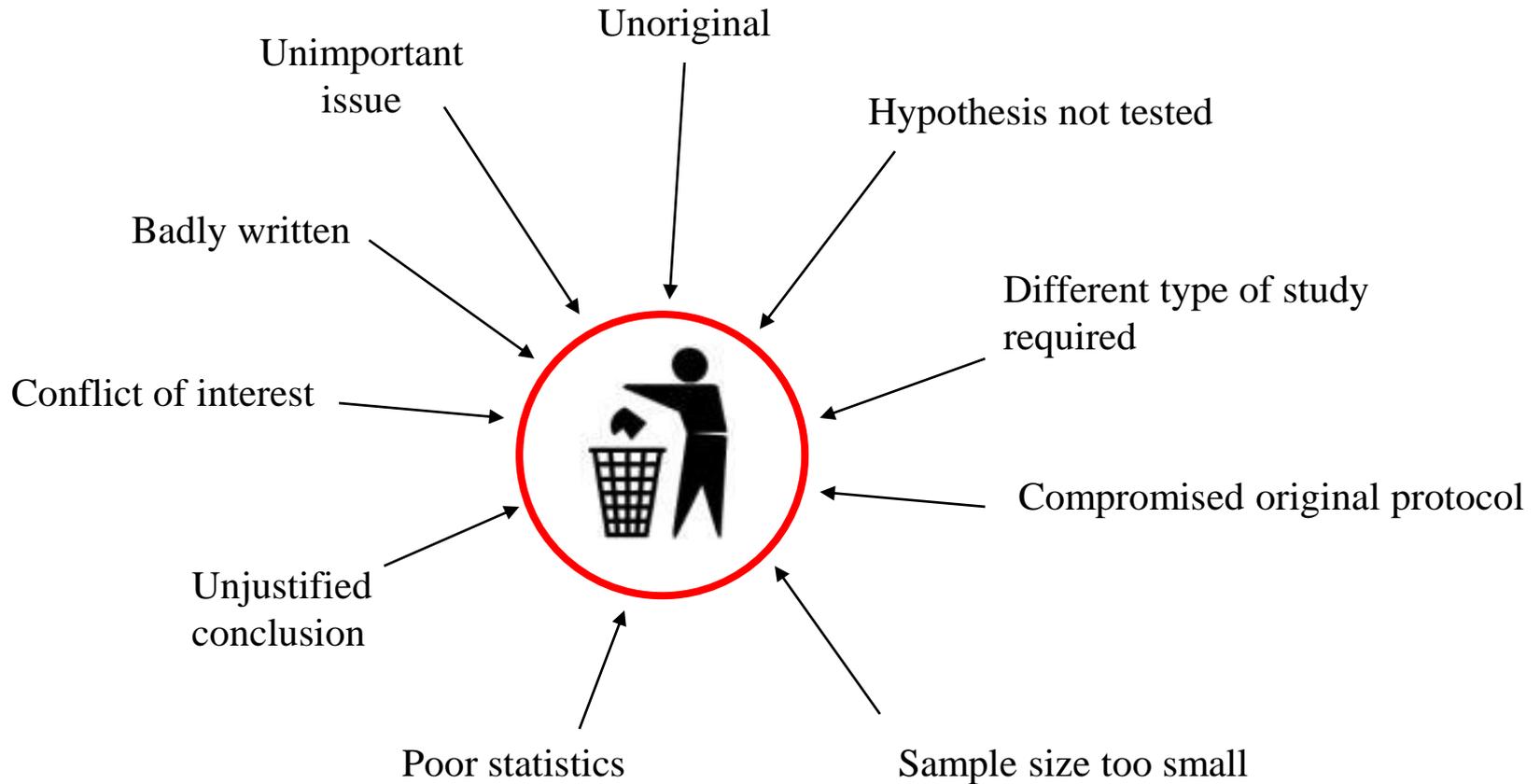 - Appendix
  - Addendum or supplementary guideline
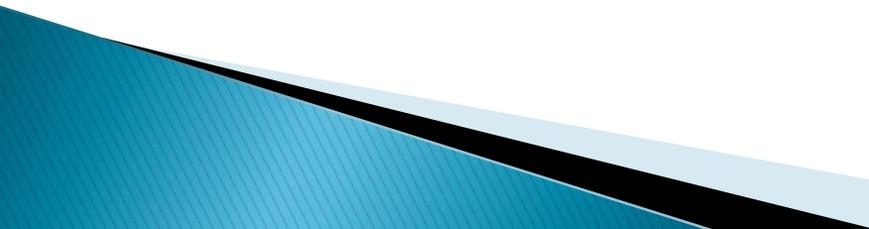
A scientific paper is really 3 separate papers

Title: Fishing for readers

Abstract: The "Reader's Digest" version

The body of the paper: The whole story

The science of 'trashing' a paper

Journal Club

- To set up an evidence-based journal club:
  1. choose a topic of interest in your group;
  2. one person performs a literature search and finds a paper to bring to the meeting;
  3. the paper is presented in the meeting, and the literature search is also explained;
  4. appraise the paper as a group.

- A journal club is an excellent form of continuing medical education (CME) and can be fun.
- The tools given in the references to this article should be sufficient to help you get going.

OHCM 10ᵗʰ Ed (Advice for doctors)

- Do not blame the sick for being sick.
- Seek to discover your patient's wishes and comply with them Learn.
- Work for your patients, not your consultant.
- Respect opinions.
- Treat a patient, not a disease.
- Admit a person, not a diagnosis.
- Spend time with the bereaved; help them to shed tears.
- Give the patient (and yourself) time: for questions, to refl ect, and to allow healing.
- Give patients the benefit of the doubt.
- Be optimistic.
- Be kind to yourself: you are not an inexhaustible resource.
- Question your conscience.
- Tell the truth.
- Recognize that the scientific approach may be finite, but experience and empathy are limitless.

Thank You