DEPARTMENT OF PRIMARY CARE HEALTH SCIENCES

Why don't Researchers and Clinicians use systematic reviews?

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Problems

Why don’t Researchers use systematic reviews?

Why don’t Clinicians use systematic reviews?

Researchers: Is there a problem?

- Clarke, JRSocMed 2007
  - RCTs 1997-2001: 2/55 placed new results in context SR, 7 referred to SR in Discussion
  - RCTs 2005: 5/18 refered to SR in Intro. None of 15 trials which were not 1st trials placed results in context of existing SR
- Cooper, Clin Trials 2005
  - 24 authors of trials added to Cochrane SR in 2002/3.
  - 11/24 aware of SR when designed their study
  - 8 used SR in design of study
- Goudie, J Clin Epi 2010
  - 6/27 RCT published 2007 used previous SR in sample size calculations.
  - 10/27 related results of new trial to existing SR

Does it matter?

- *Some* funders insist on use of SR when proposing new studies
- *Some* journals publishing new trials include summary of previous research findings and explain how trial affects summary

Avoidable waste in research…."*Doing studies that are unnecessary or poorly designed*" (Chalmers, Glasziou. Lancet 2009)

Reasons why systematic reviews may be underused when designing new studies

- There isn’t one
- Unaware it exists
- Inadequate critical appraisal skills
- SR don’t adequately highlight gaps in evidence
- Choose to ignore it

SR don't adequately highlight gaps in evidence

- PRISMA
  - "*a general interpretation of the results in the context of other evidence, and implications for future research*"
- 2,535 Cochrane reviews in 2005 (Clarke J Health Serv Res Pol 2007)
  - 3.2% explicitly stated *no more research* needed
  - 12% failed to specify population, intervention, outcome, 17% included all three
  - 82% made suggestions about interventions needed evaluating, 52% outcome measures, 30% appropriate participants

"*Systematic reviews tend to emphasise what has been found, rather than what has been studied and how*"

Wolfgang Viechtbauer, J Clin Epi 2010

Methods to use SR in study design

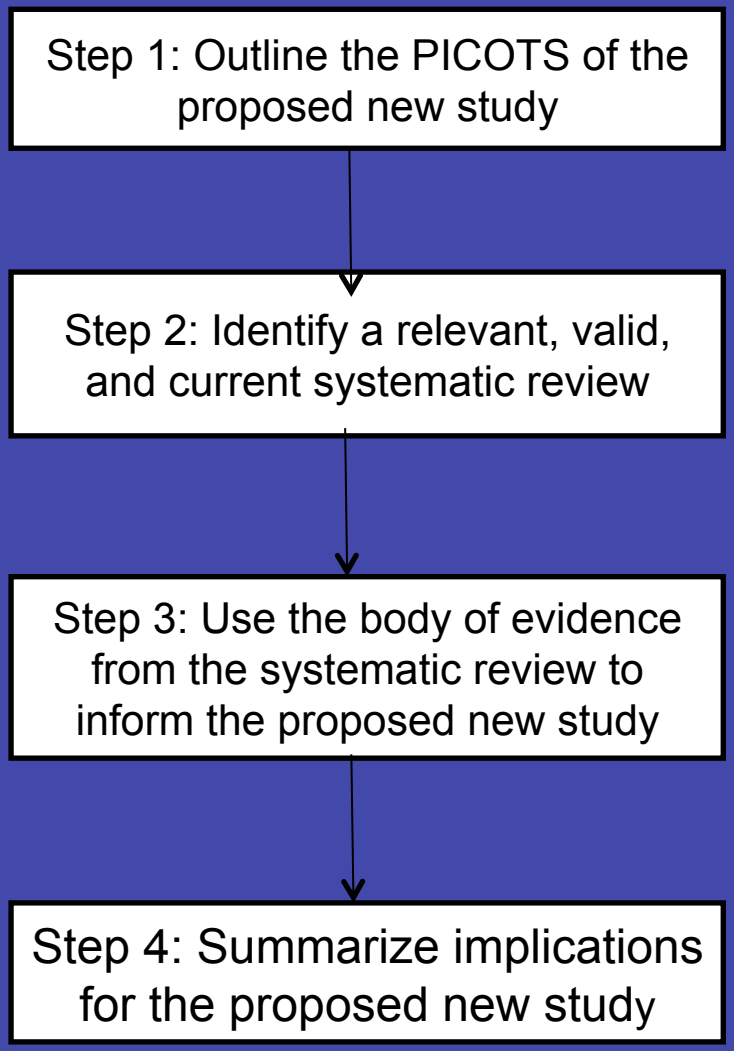
- Use existing meta-analyses for more accurate estimates of sample size and power (Sutton, Stats Med 2007)
- Value of Information (VOI) models (Meltzer, Med Decis Making 2011)
  - calculate probability that research would provide evidence for improved treatment decision, and gains to be expected from this.
- Framework using existing SR and meta-analyses (Sutton, BMC Res Methodol 2009)
  - Find or conduct an up to date SR
  - Can question be answered using advanced synthesis methods? (e.g IPD, mixed treatment comparisons)
  - Further trial only when these do not provide conclusive answer

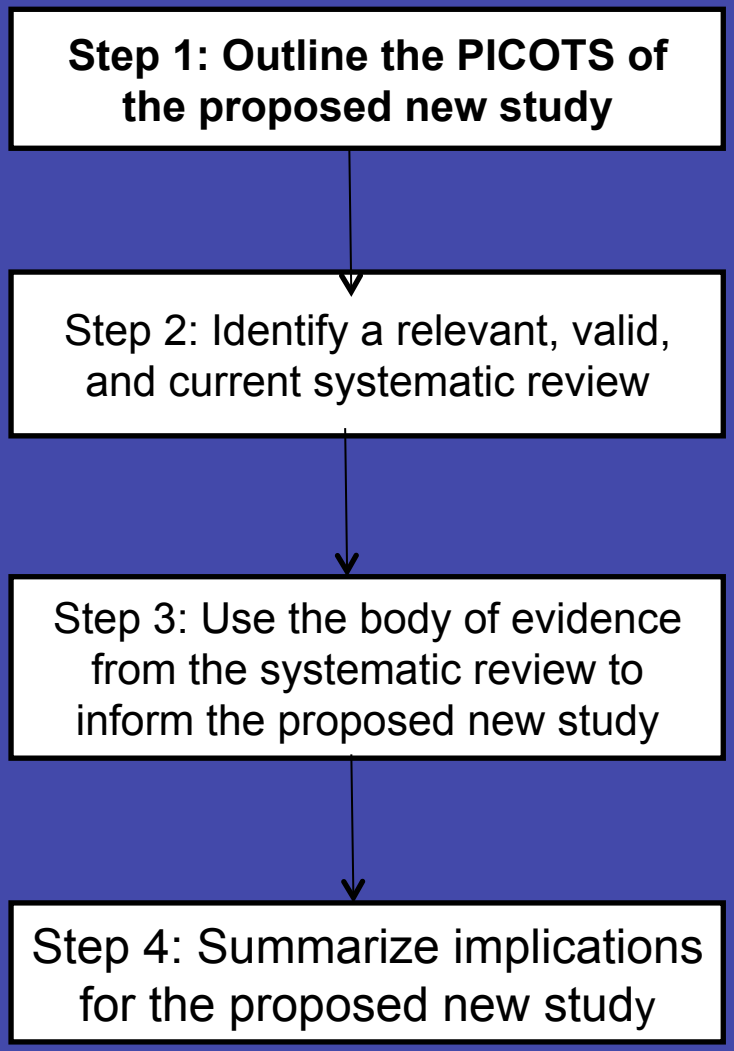
“Focus on sample size considerations should not draw our attention away from other design issues that can and should be informed by existing research”

Wolfgang Viechtbauer, J Clin Epi 2010

Aim: framework to help ***Re earcher*** use findings from SR in designing new clinical research studies

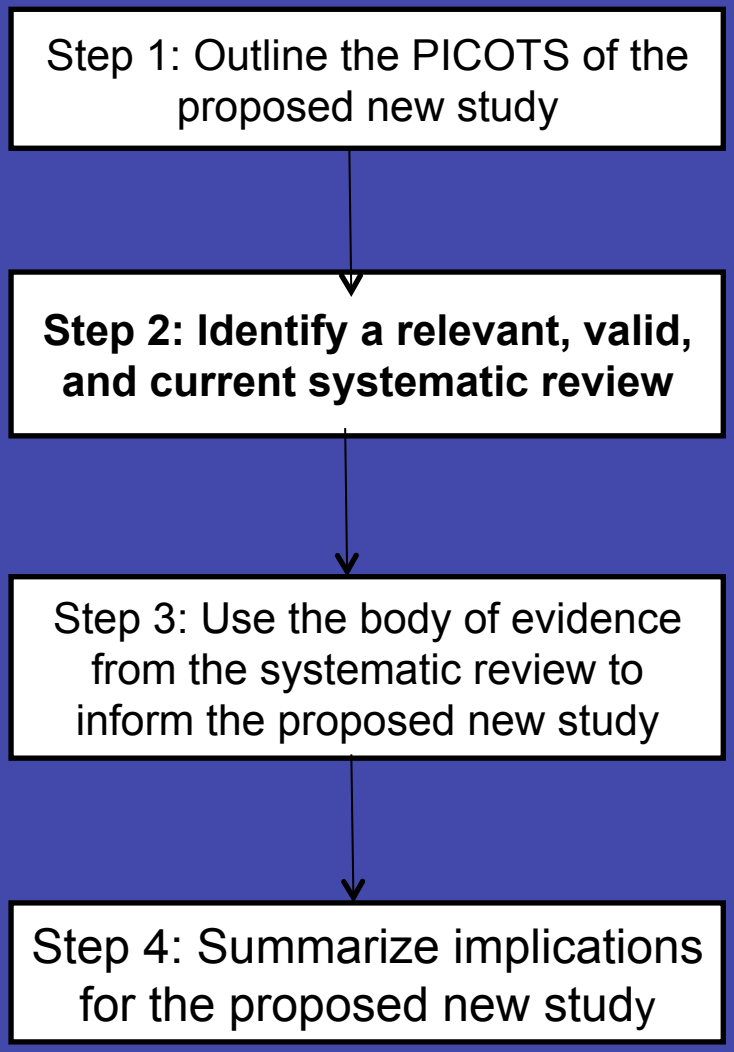
A framework to facilitate the use of systematic reviews and meta-analyses in the design of primary research studies.
Thompson M, et al. AHRQ Publication No. 12-EHC009-EF. Rockville, MD: Agency for Healthcare Research and Quality. January 2012. PMID 22299187


Step 1: Outline the PICOTS of the proposed new study
Step 2: Identify a relevant, valid, and current systematic review
Step 3: Use the body of evidence from the systematic review to inform the proposed new study
Step 4: Summarize implications for the proposed new study



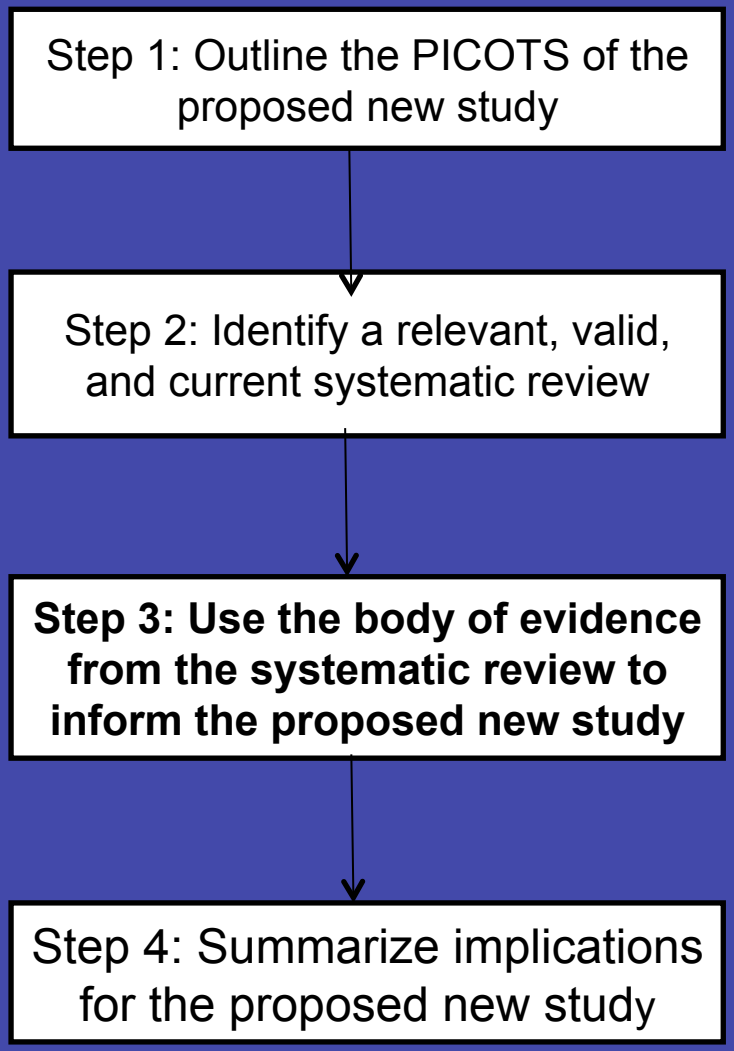
Step 1: outline elements of new study

- Patient group
- Intervention
- Control/comparator
- Outcomes
- Timing/duration follow up
- Setting
- Study type



Step 2: Identify a SR

- Is it relevant?
  - *Sufficiently* relevant
  - Compare PICOTS of proposed new study with that of the SR
  - Match on “most important” PICOTs elements
- Is it valid?
  - Rapid appraisal (eg Comprehensive search, Selection criteria, Validity of included studies, Similarity of included studies)
- Is it current?
  - Search date. Depends on clinical topic +/- 5 yr



Step 3: Use the body of evidence from the SR

A) What can be learned from the primary studies included in the SR?

B) What does the SR answer, and where do gaps remain?

A) What can be learned from the primary studies in the SR? *"in what ways should design of proposed study be modified based on details of previous studies?"*

Box 4: Comparing the details of the primary studies and the proposed study

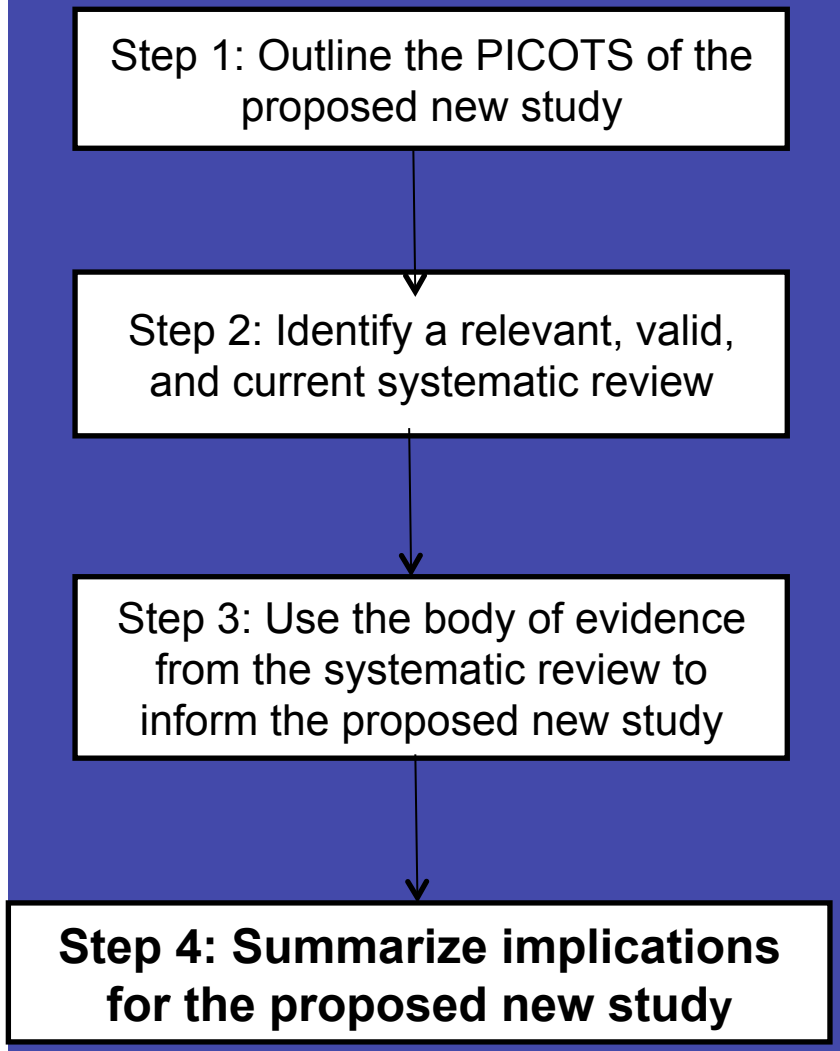
- **Patient group:** Compare details of planned included population, eligibility, and exclusion criteria.
- **Intervention:** Compare details of planned intervention in terms of type, dose, intensity, delivery of intervention, monitoring of intervention, presence of co interventions, feasibility in planned settings, and run-in periods.
- **Control or comparators:** Compare similarity of placebo planned and description of standard care.
- **Main/important outcomes:** Compare primary and secondary outcomes, short term or surrogate outcomes, composite outcomes, and clinically relevant outcomes.
- **Duration of followup:** Compare details of duration and process for followup and linearity of outcome with time (i.e. fewer measures may be needed).
- **Setting:** Compare details of setting (primary and secondary care, etc.)
- **Study design:** Compare study designs, sources of bias of included studies, feasibility of study designs higher in hierarchy, sample sizes and power calculations used, and feasibility of using data to assist with simulation for proposed study sample size or power calculations.

B) What does the SR already answer, and where do gaps remain?

- Proposed study questions answered adequately by SR
  - Evidence of effect (or no effect),clinicially signif, narrow CI
  - No need for new trial
- Proposed study question not answered adequately (or only partially answered)

Box 5: Reasons for failure of SR to address proposed study question

- **Insufficient data**: too few primary studies, or studies that are too small (sample size inadequate or not adequately powered)
- **Imprecise data:** insufficient evidence of effect or lack of effect
- **Potentially biased information:** primary studies were of inadequate quality to address the question
- **Inconsistency:** effect sizes from different studies go in different directions, or there are large differences between the effect sizes of different studies.



Step 4: Summarise implications for new study

- In what ways does proposed study address gaps identified by SR?
- Which study design features should be changed?
- Which study aims are already answered/redundant?
- Sample size and power calculations
- Search for similar research studies underway?

Framework limitations

- Further small trials may add to generalisability
- May prioritise research need based solely on evidence of effect (or of no effect)
- Need more explicit “signals” of need for advanced analyses, eg IPD
- Is it useable by most clinical researchers?
- Test whether it makes a difference, how?

Problem

- Why don’t clinicians use systematic reviews?

Reasons why systematic reviews may be underused by clinicians

- There isn’t one
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Reasons why systematic reviews may be underused by clinicians – external validity, implementation

- SR do not change clinical practice, their role is to provide evidence to inform guidelines
- Multiple clinical issues/ questions within a single clinical pathway/problem (diagnosis, treatment, prognosis etc)
- Mismatch between which SR are needed, and which ones get done/prioritised

NICE Clinical Guideline (CG102) Bacterial meningitis and meningococcal septicaemia

- Diagnostic value symptoms and signs for bacterial meningitis
- Diagnostic value of symptoms and signs for meningococcal disease
- Effect of pre hospital antibiotics
- Non specific tests in secondary care
- Diagnosis of viral vs bacterial meningitis
- Use of PCR to differentiate bacterial meningitis and meningococcal
- Use of skin tests to differentiate bacterial meningitis and meningococcal
- Use of lumbar puncture
- Contraindications to lumbar puncture
- Use of CT scan for bacterial meningitis
- Antibiotics for suspected bacterial meningitis and meningo in > 3 months and < 3 months
- Treatment of confirmed bacterial meningitis or meningococcal
- Fluid management of ……
- Type of IV fluid for …..

- Effectiveness of respiratory support
- Effectivness of steroids for bacterial meningitis
- Effectiveness of steroids for meningococcal disease
- Adjunctive therapies for bacterial meningitis and meningococcal
- Monitoring deterioration in ….
- Indications for transfer to tertiary care..
- Long term sequelae of bacterial meningitis
- Long terms sequelae of meningococcal
- Immunological testing for susceptibility

- 1 NICE Guideline
- 25 separate clinical questions
  - Diagnosis = 10
  - Treatment = 8
  - Prognosis = 4
  - Other 2
- SR for 9/25 questions….

Questions to discuss!

- Why don't researchers use systematic reviews?
  - Study design > sample size/power calculations?
  - Would a framework help?
  - How could this be tested/taken forward?
- Why don't clinicians use systematic reviews?
  - SR change practice by informing guidelines. True?
  - Mismatch between SR needed vs. which ones get done/prioritised – can this be done differently?