Redundant and dangerous health research - how can you support better research practice?
SETTING THE STAGE

The scientific process involves a systematic approach at each step to avoid bias—but the awareness about current knowledge is not based upon a systematic/scientific approach

Hans Lund
ass. professor, University og Southern Denmark
professor, Bergen University College
The Scientific Ideal
The scientific ideal

"If I have seen farther it is by standing on the shoulders of giants"

Letter to Robert Hooke, 15. February 1676.

1643 - 1727
The scientific ideal

“If, as is sometimes supposed, science consisted in nothing but the laborious accumulation of facts, it would soon come to a standstill, crushed, as it were, under its own weight......

The work which deserves, but I am afraid does not always receive, the most credit is that in which discovery and explanation go hand in hand, in which not only are new facts presented, but their relation to old ones is pointed out.”

Lord Rayleigh at the 54th meeting of the British Association for the Advancement of Science held in Montreal in 1884.
(Thanks to I. Chalmers, LV Hedges, H Cooper, 2002)
CONSORT

CONSORT is a REPORTING GUIDELINE – what should clinical researchers report in their scientific article about clinical studies?

Altman et al 2001
The Helsinki Declaration states that biomedical research involving people should be based on a thorough knowledge of the scientific literature. That is, it is unethical to expose human subjects unnecessarily to the risks of research.

Ideally, the introduction should include a reference to a systematic review of previous similar trials or a note of the absence of such trials.

Altman et al 2001
The assumption
One would think:  
*No paper has ever been published without references to earlier published scientific results. What's the problem?*
The assumption

“Strictly speaking it seems hard to imagine any research not evidence-based. At least it seems impossible to imagine that articles published in journals with a high impact factor do not relates to earlier research”

Norwegian Accreditations Committee, in 2014 (nokut.no)
The Evidence
The evidence

Are we as researchers referring to all studies with no preferences, or not?
Two main issues ...

When formulating the Background of a study several studies show that authors of scientific papers:


In short:

**Authors are not systematic in the way they use earlier research**
The evidence

CUMULATIVE META-ANALYSIS OF THERAPEUTIC TRIALS FOR MYOCARDIAL INFARCTION

Joseph Lau, M.D., Elliott M. Antman, M.D., Jeanette Jimenez-Silva, M.D., Bruce Kupelnick, B.A., Frederick Mosteller, Ph.D., and Thomas C. Chalmers, M.D.

Abstract Background. The large volume of published randomized, controlled trials has led to a need for meta-analyses to track therapeutic advances. Performing a new meta-analysis of the many trials now available is not practical because of the size of the data base. This problem is addressed by cumulative meta-analysis, which includes sequentially analyzed trials in a manner that allows estimation of the cumulative effect at each stage. The cumulative meta-analysis of data from randomized trials of myocardial infarction has been performed previously, but the trial for aspirin was not included.

The effect of aspirin on mortality at three years was calculated for each trial included in the analysis, and the effect for each trial was weighted by the inverse of its variance. The effect of aspirin added to cumulative effect estimate at each stage is shown in the graph. The cumulative estimate of effect of aspirin was 0.999 (95% confidence interval, 0.59 to 0.92) was achieved in 1973, after only eight trials involving 2432 patients had been completed. The results of the 25 subsequent trials, which enrolled an additional 10,297 patients, had little or no influence on the cumulative meta-analysis of all 20 trials.

J Lau et al. New England Journal of Medicine, 1992
The evidence

Intravenous Streptokinase for Acute Myocardial Infarction

After 1977:
More than 16,000 received unnecessary placebo!

Lau et al. 1992
The evidence

A Systematic Examination of the Citation of Prior Research in Reports of Randomized, Controlled Trials

Robinson et al. 2011
The evidence

<table>
<thead>
<tr>
<th>TABLE 1 Overall Citation Rate for Each of the Four Groups Included in the Study</th>
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<tbody>
<tr>
<td>Total No. of Studies Actually Cited</td>
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<tr>
<td>----------------------------------</td>
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<tr>
<td>Internal fixation vs. arthroplasty</td>
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<tr>
<td>Total hip arthroplasty vs. hemiarthroplasty</td>
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<tr>
<td>Sliding hip screws vs. other forms of fixation</td>
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<tr>
<td>Effect of surgical delay in hip fracture patients</td>
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<tr>
<td>All studies</td>
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</tbody>
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 Poor Citation of Prior Evidence in Hip Fracture Trials

Ujash Sheth, BHSc, Nicole Simunovic, MSc, Paul Tornetta III, MD, Thomas A. Einhorn, MD, and Mohit Bhandari, MD, PhD, FRCSC

Investigation performed at the Center for Evidence-Based Orthopaedics, Division of Orthopaedic Surgery, McMaster University, Hamilton, Ontario, Canada
The evidence

Habré et al. BMJ, 2014

SUPERFLUOUS STUDIES

Ability of a meta-analysis to prevent redundant research: systematic review of studies on pain from propofol injection
The evidence