The Cochrane systematic review: a platinum standard of effectiveness in healthcare interventions

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Randomized controlled trials have long been considered the 'gold standard' of intervention focused healthcare research. Robust and adequately powered trials are considered essential to distinguish reliably between the effects of healthcare interventions and those due to bias or chance. The systematic review, which has been dubbed the 'platinum standard' (1), is considered to be fundamentally different to primary research as it identifies, evaluates and synthesizes the information presented in primary studies. Many investigators now even accept that systematic reviews should be viewed as primary research and that no new piece of research should be undertaken without first conducting one to find out what is already known (2).

Systematic reviews provide a logical synthesis of the research base by answering specific and narrowly focused clinical questions which are formulated explicitly according to four variables; population, intervention comparison and the clinically relevant outcome. A clearly defined, transparent, pre-specifed and reproducible process ensures a well balanced and impartial summary of the existing research evidence which can ultimately inform healthcare decision-making. These forms of research syntheses represent one of the best opportunities for clinicians to understand and translate the current best evidence, which has been assembled from a methodologically robust and comprehensive search for solutions to healthcare problems, into clinical practice.

Evidence is not the plural of anecdote and the days are long gone when a clinician might justify a healthcare decision based on *it seems to me… in my experience… I was taught*. Systematic reviews are not an assembly of anecdotes; they are a sensitive distillation of current best available evidence which then must be tempered with clinical expertise and patients preferences.

Evidence needs to recognize biological plausibility and causality between an intervention and an outcome whilst acknowledging the potential influence of systematic bias and random error in its generation. A summary of that evidence must have been assembled through the use of explicit methods which include a systematic search for, the critical appraisal of, and synthesis of relevant data. Thus the goal of a systematic review is to minimize systematic bias and to provide a valid summary of the best available evidence for a specific clinical problem.

Systematic reviews overcome some of the limitations of traditional narrative reviews but generally involve a lengthier and more structured process which combines strategies that aim to limit bias and random error whilst maximizing precision. These strategies are defined by *a priori* statements which pose a clear research question and set out criteria which will direct a comprehensive search for all relevant articles, and dictate the process of inclusion or exclusion of primary studies. The need for rigor in the production of systematic reviews has led to the development of a formal process for their conduct. This process has clearly designated steps to; identify primary studies and the methods which will be employed to assess their methodological quality and guide the way in which data will be extracted and the statistical techniques that will be used in its synthesis. Transparency and reproducibility are ensured through the documenting of all the decisions taken throughout this process and the review concludes with a summarizing of the results on which conclusions about the intervention can be based.

Systematic reviews are capable of providing a clearer picture whereas small or low powered clinical trials may show no statistical difference between the treated and controlled groups. Therefore the aggregation of data from a number of smaller individual studies can increase precision which may ultimately permit a more complete picture to emerge. These reviews can offer significant benefits for busy practitioners but they are still viewed by many clinicians as pure research and since many healthcare professionals may not have been prepared academically to identify and appraise evidence they may experience difficulty in interpreting and using them. However the expectation by clinicians of systematic reviews being able provide the 'last word' may lead to disappointment and not infrequently disillusionment (3) as many reviews merely illustrate the lack of high quality clinical trials that are available to answer many clinical questions.

The increasing demand for high level evidence of effectiveness of healthcare interventions has lead to a marked increase in the rate of publication of systematic reviews. The Cochrane Collaboration (4), which is one of the world's

largest producers of systematic reviews, is an international organization dedicated to improving healthcare for the world's population by preparing, maintaining and promoting the accessibility of its reviews of the evidence of the effects of healthcare interventions. These systematic reviews are available on the *Cochrane Database of Systematic Reviews* (CDSR) in *The Cochrane Library* (5), which is a regularly updated collection of evidence-based healthcare databases available on CD-ROM and on the Internet. The current issue of The Cochrane Library Issue 3, 2009 has over 3,916 completed reviews and 1,905 protocols or reviews in process covering a wide range of healthcare interventions.

There has been a steady increase in recent years in the number of registered Cochrane Oral Health Group review authors from Brazil, which currently stand at 49 individuals who are involved in 21 reviews at different stages of the editorial process which includes those that have already been published. This increased output, together with a greater recognition by Brazilian journal editors of the importance of this form of publication is to be commended and should contribute significantly to the research profile of individual authors and ultimately satisfy some of the more recently expressed concerns about the quality versus quantity of oral healthcare research in Brazil (6).

Disclaimer

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