

A Primer on the Cochrane Collaboration, Its New Priorities in Out-of-Hospital and Emergency Health, and the Role of *Annals of Emergency Medicine*

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0196-0644/\$-see front matter

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doi:10.1016/j.annemergmed.2006.11.002

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[Ann Emerg Med. 2007;49:351-354.]

INTRODUCTION

Systematic reviews are important contributions to knowledge translation and the practice of evidence-based emergency medicine. Systematic reviews represent a priori methods to synthesize evidence on a well-defined question by using comprehensive and explicit search techniques, specific inclusion criteria, and methodologic quality assessment, followed by evidence synthesis. Therapeutic systematic reviews have demonstrated the clear benefits of low-molecular-weight heparin in acute venous thromboembolism,¹ intravenous magnesium in severe asthma,² and the role of angioplasty in acute myocardial infarction.³ They have also demonstrated the harm associated with nonevidence-based treatments (aminophylline in acute asthma).⁴ Finally, they have demonstrated the risks associated with not translating research evidence into practice. For example, impressive delays were demonstrated in adopting evidence-based treatments such as thrombolytics in acute myocardial infarction⁵ and removing ineffective and harmful treatments such as routine lidocaine infusion in acute myocardial infarction.⁶

One of the primary and best-respected sources of systematic reviews is the Cochrane Library, produced by the Cochrane Collaboration. The Cochrane Collaboration is an international, multidisciplinary, not-for-profit organization that aims to produce, disseminate, and update systematic reviews in therapeutic interventions. The goal of the Cochrane Collaboration is to help patients, health care providers and policymakers make well-informed decisions about health care. Cochrane reviews have been compared to paper-based⁷ and industry-supported⁸ reviews and in both cases found to be more methodologically rigorous and valid.

COCHRANE PRODUCTS

Since its earliest development, when there were only a few medical disciplines represented within the library, the current

library 2006 (issue 4) has amassed a large amount of useful information covering many specialties (Figure 1). Many of the Cochrane reviews are directly or indirectly relevant to emergency practice,⁹ and given the high quality of these Cochrane reviews, it would seem reasonable to expect emergency physicians to become familiar with the products within this evidence-based resource.

Cochrane Database of Systematic Reviews

This is the primary product of the Collaboration. These comprehensive systematic reviews start as published review protocols (similar to the registration of clinical trials) and are followed by the completed reviews. The library requires that the reviews be periodically updated or updated when important new evidence becomes available. In the current version, there are 2,893 completed reviews and 1,646 protocols in preparation.

Cochrane Central Register of Controlled Trials

This register represents a compilation of controlled clinical trials obtained by systematic searches of MEDLINE, EMBASE, CINAHL, and other databases, as well as the hand-searching efforts of the Cochrane Collaboration. The result is a collection of 479,462 controlled clinical trials that may be searched to identify individual references to clinical trials.

Database of Abstracts of Reviews of Effects (DARE)

Often, high-quality systematic reviews are published in paper journals, and a group from the Cochrane has developed a repository for non-Cochrane reviews that are assessed for quality and summarized. There are more than 5,758 DARE abstracts in the current version of the library.

Other Resources

There are other resources that are useful for researchers (and interested clinicians) such as the Cochrane Handbook, a large collection of methodology publications, and contact details for various Cochrane entities.

Overall, the products of the Cochrane Library are important resources for clinicians, researchers and policymakers.

Cochrane Collaboration Quick Facts
Established in 1993
12 Cochrane centers (and 14 branches)
About 15,000 people working in >90 countries
Accurate information about the effects of health care available worldwide
Free access to abstracts of systematic reviews
The Cochrane Library
About 3,000 complete reviews in the library
>1,500 Protocols of pending reviews
Full access available in some countries (eg, United Kingdom, Australia) and some regions (eg, some Canadian provinces)
Full access often available through organizations or health professionals working in academic institutions
For more information, go to http://www.cochrane.org .

Figure 1. Quick facts about the Cochrane Collaboration.

COCHRANE STRUCTURE

Like many large organizations, the Cochrane Collaboration has developed an organizational structure (Figure 2) to meet the needs of producing high-quality evidence; those unfamiliar with Cochrane may find some of these entities confusing. The main groups are listed below:

Steering Group

The steering group consists of democratically elected representatives who provide guidance for the Collaboration. The steering group sets policy for the organization, using input from its subgroups.

Cochrane Centers

The Cochrane Centers worldwide promote the Cochrane Collaboration, coordinate Cochrane activities in their international locale, provide training and support for review authors and Cochrane review groups, and undertake methodologic research. There are 12 national centers; however, some of them have branches in other countries where there is a

linguistic or regional link, and many of these 14 branches have come into existence in recent years.

Methods Groups

Specific methods groups examine issues of methodologic importance to the Cochrane Collaboration. Examples are Statistical Methods Group, Information Retrieval Methods Group, Non-randomized Controlled Trials Methods Group, and Diagnostic Methods Group. These groups provide advice to the Collaboration and guidance to the review groups.

Review Groups

The Cochrane review groups consist of disease-based entities whose members produce the reviews found in the Cochrane Library and who maintain the specialized registers that contribute to CENTRAL. These are the centers of protocol development, review production, storage, and updating and also have full-text articles of many of the articles on their registers. The editorial boards of the review groups are made up of clinicians and methodologists who strive to ensure that the reviews are of a high standard and are clinically relevant.

Fields

The Cochrane Collaboration has developed groups known as fields. A Cochrane field is an entity that focuses on a dimension of health care rather than on a specific health care problem. Examples include the Child Health Field, the Health Promotion and Public Health Field, the Primary Healthcare Field, and the Complementary Medicine Field. The primary role of a Cochrane field is to facilitate the work of the Cochrane review groups and to ensure that Cochrane reviews related to a specific area of health care are both relevant and accessible to specialists, reviewers, researchers, and consumers.

Despite the relevance of many reviews to out-of-hospital and emergency care, until recently, the Cochrane Collaboration had lacked a focus in these areas. Because of involvement by out-of-hospital and emergency medicine clinicians and researchers, some review groups have successfully focused part of their efforts on acute care (eg, Cochrane Airways Group). Out-of-hospital and emergency medicine involvement has been limited in other groups; consequently, topics of interest to *Annals* readers have perhaps not been a priority. The development of the Cochrane Prehospital and Emergency Health Field is an important attempt to compensate for this deficiency. The Cochrane Prehospital and Emergency Health Field was registered as an official entity of the Cochrane Collaboration in August 2004 and now has more than 3,000 registered members. The focus of the Cochrane Prehospital and Emergency Health Field is out-of-hospital (management up to the delivery in the emergency department), emergency (up to hospitalization), and disaster medicine. One of the functions of the field is to develop and maintain a register of studies relevant to the areas of out-of-hospital and emergency health care. The Cochrane Prehospital and Emergency Health Field has developed a validated search

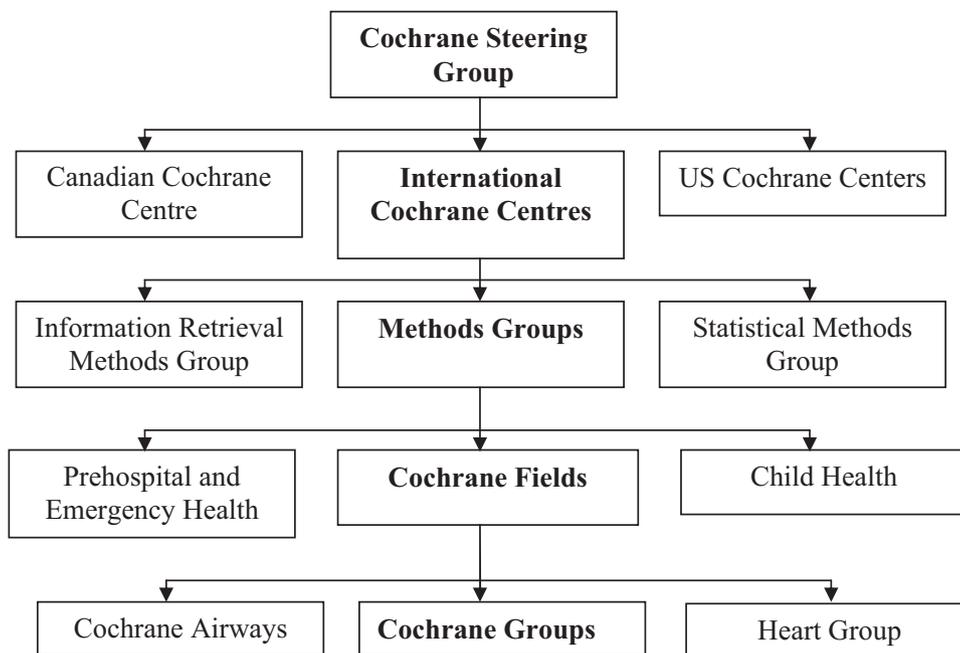


Figure 2. The Cochrane administrative structure with examples relevant to emergency medicine readers.

strategy to identify systematic reviews and reports of trials in the Cochrane Library that were based on research that had been conducted in the out-of-hospital environment.

One of the concerns about the Cochrane evidence is that it is overly specialized, complicated, and lengthy to be a routine resource for busy clinicians. Recognizing this, *Annals* has taken a leadership role in systematic reviews and evidence-based medicine in the out-of-hospital and emergency fields in a number of important ways. First, *Annals* has simplified and condensed the evidence presented in the Cochrane Library systematic reviews. In this issue, Jones¹⁰ highlights the lack of evidence available on which to base vasopressor decisions in patients with sepsis. Some may wonder why such information is valuable. One of the goals of systematic reviews is to identify the gaps in evidence between research and practice. In this case, the call for more research in this setting is important.

Second, as reported by Smith et al¹¹ in the same issue, *Annals* has led the scientific journals focused in this area and published the largest number of out-of-hospital randomized controlled trials. More important, the Smith et al¹¹ article illustrates the paucity of high-quality evidence available in this field and the urgent need to increase this area of research and evidence synthesis. Although the evidence within Cochrane is highly relevant to the practicing emergency clinician, the need for this evidence synthesis in out-of-hospital and emergency medicine remains urgent.

Finally, Jones et al illustrate an important methodology to *Annals* readers.¹² Their article uses Cochrane-like methods to synthesize the evidence available on an emerging diagnostic test (procalcitonin) in the detection of bacteremia. The translation

of knowledge about diagnostic testing is of obvious importance to the clinical practice of emergency medicine; however, the methodology for diagnostic test systematic reviews is not as well developed as those for therapy. The Cochrane Collaboration Screening and Diagnostic Tests Methods Group is in the process of establishing recommended methodology so that diagnostic test systematic reviews can be added to the Cochrane Library (<http://www.cochrane.org/docs/diagnostictestreviews.htm>). The Rational Clinical Examination EBEM Series in *Annals* is another useful source of diagnostic systematic reviews.¹³

Overall, there are encouraging developments for clinicians who wish to use the highest level of evidence on which to base important clinical decisions. There are a growing number of reviews that are either directly or indirectly relevant to emergency and out-of-hospital care providers. The Cochrane Prehospital and Emergency Health Field is an important development, and those interested in this form of research synthesis and dissemination should contact the field and actively participate (www.cochranepehf.org). There remains much work to be done to improve the quality of systematic reviews in emergency medicine because some emergency medicine reviews have been shown to be lacking in methodologic rigor.¹⁴ Consequently, *Annals* will continue to highlight Cochrane and Rational Clinical Examination reviews, has formally adopted the quality of reporting meta-analysis (QUOROM) guidelines for reporting systematic reviews,¹⁵ and will continue to strive to publish the highest quality systematic reviews in our field.

Supervising editor: Donald M. Yealy, MD

Funding and support: The authors report this study did not receive any outside funding or support.

Reprints not available from the authors.

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