

Improving the Dissemination of Systematic Reviews in Emergency Medicine

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Although emergency clinicians of the early 21st century have an urgent need for just-in-time, on-demand clinical information, their time to access such information has likely never been as compressed. Increases in patient volume and complexity, patient care demands, emergency overcrowding, and the lack of access to resources have exacerbated the work frustrations for many emergency physicians. These concerns often take precedence over seeking the most relevant, up-to-date, and comprehensive evidence for patient problems.

Despite the fact that most patient problems presenting to emergency departments may be seen by many emergency physicians daily across North America, the appropriate treatment approaches are often not fully employed, and practice variation is impressive. For various reasons, the results from high level evidence, such as randomized controlled trials, are not readily available to busy clinicians, and keeping up to date is becoming increasingly difficult. Moreover, a valid, reliable, and up-to-date clinical bottom line to guide treatment decisions has been elusive.

However, access to information is not the only barrier to practicing “best evidence medicine.” Clinicians also need rigorously produced, “digested” information to assist them at the point-of-care. Because time is increasingly more compressed, the need for this digestible information has never been greater.

As an example, suppose that a patient with severe acute asthma presents to the ED and the physician is unfamiliar with the evidence on the effectiveness of intravenous magnesium sulfate (MgSO₄). By developing a clinical

question using the PICO methodology (ie, population, intervention, comparison, outcome), a search of MEDLINE for articles relating to acute asthma and MgSO_4 (restricted to the effect on admissions and pulmonary functions) would be possible. A general search of the literature would identify many trials in asthma, most of which are not emergency medicine-based, some with small study populations, and many with conflicting results. Finding, reading, and critically appraising the citations dealing with MgSO_4 alone can be time consuming and frustrating. Moreover, the studies often examine disparate populations, use different interventions, and report variable outcomes. This example illustrates how difficult the scientific literature can be to decipher and identify an “overall” treatment effect.

One possible solution to this clinical dilemma is to examine evidence from systematic reviews.¹ High-quality systematic reviews of therapies attempt to identify the literature on a specific therapeutic intervention using a structured, a priori, and well-defined methodology. Rigorously conducted systematic reviews are recognizable by their avoidance of publication and selection bias. For example, they include foreign language, both published and unpublished literature, and use well-described comprehensive search strategies to avoid publication bias. Their trial selection includes studies with similar populations, outcomes, and methodologies and use of more than one “reviewer.”

Systematic reviews regarding therapy would most commonly combine evidence from randomized controlled trials. In the event that statistical pooling is possible and clinically appropriate, the resultant statistic provides the best “summary estimate” of the treatment effect. A systematic review with summary pooled statistics is referred to as a meta-analysis, whereas those without summary data are referred to as qualitative systematic reviews. Both of these options represent valid approaches to reporting systematic reviews, and both are now increasingly commonly published in the medical literature.

Returning to the MgSO_4 acute asthma example, a computerized search would identify up to 10 primary references to clinical trials and many commentaries about the role of MgSO_4 in acute asthma. However, by seeking out one of a variety of systematic reviews,²⁻⁴ the clinician can more efficiently identify “distilled,” valid, and reliable evidence regarding the use of MgSO_4 in the treatment of asthma. Despite a number of different systematic reviews on the question, they reassuringly provide rather similar conclusions. The summary information suggests that patients with severe acute asthma improve more rapidly

and less frequently require hospitalization when treated with intravenous MgSO_4 .

Levels of evidence have been developed and employed in clinical medicine to reflect the degree of confidence to which results from research may be accepted as valid. The highest level of evidence (Level I) in therapy is awarded to rigorously conducted systematic reviews and “mega-trials.”⁵ Because mega-trials are unlikely to be available for most clinical emergency medicine questions, in many cases systematic reviews will represent the highest level of evidence on which to base clinical decisions.

Despite many publications illustrating the importance of methodologic quality in conducting and reporting both randomized controlled trials⁶ and systematic reviews,⁷ not all systematic reviews are created using the same rigorous methods described previously. Like most other research, there are shades of gray in methodologic quality associated with research in this field. Recently, *Annals* published research that gave failing grades to systematic reviews published in major emergency medicine journals.⁸ In an accompanying editorial, Schriger⁹ suggested that there are other considerations when applying evidence from reviews. However, no amount of manipulation or sleight of hand can salvage a nonsystematic review’s failure to meet or even report basic methodological criteria. Calls for better methods and more thorough reporting have now been heard in emergency medicine⁸ and other disciplines.¹⁰ It remains to be seen whether reviews will improve as a result.

The Cochrane Collaboration represents one source of high-quality systematic review information available to most clinicians with very little effort. The Evidence-Based Emergency Medicine (EBEM) section previously outlined the contents of the Cochrane Library and the work of the Cochrane Collaboration.¹¹ By way of review, the Cochrane Collaboration is a multinational, volunteer, collaborative effort on the part of researchers, clinicians from all medical disciplines, and consumers to produce, disseminate, and revise systematic reviews on therapeutic interventions. The quality of systematic reviews from the Cochrane Library has been demonstrated to be consistently high for individual topic areas and throughout the Cochrane.^{12,13}

Given the high quality of the Cochrane reviews, it would seem reasonable to expect emergency physicians to become familiar with this systematic review resource. Moreover, recently, a group of clinical researchers examined the Cochrane Library and found many of the reviews to be directly or indirectly relevant to emergency practice.¹⁴ However, there are problems associated with accessing

and understanding the Cochrane Library reviews. Clinicians have suggested that the lexicon used in systematic reviews is unfamiliar to them. Clinicians also want the reviews to be more “user friendly.”

We have taken a step toward simplifying and condensing the evidence presented in the Cochrane Library systematic reviews. In this issue of *Annals*, readers will discover 2 EBEM systematic review abstracts. The systematic review abstracts are the newest component of the *Annals* EBEM section. Initially, these systematic review abstracts will be published every other month. The *Annals* editorial board has supported many recent evidence-based medicine initiatives including the skills section, the EBEM Web site, and critiques. The EBEM systematic review abstracts represent another addition to this section.

In this issue of *Annals*, Dr. Gallagher and Dr. Lang initiate this new series with systematic review abstracts about angioplasty versus thrombolytic agents in acute myocardial infarction and thrombolytic agents in acute ischemic stroke, respectively. These reports will provide a summary of a single question from a review on the Cochrane Library, a “review of reviews” if you will. These differ from true narrative review articles because we are only reporting on the condensed summary of the focused clinical question answered in a Cochrane Review. These short EBEM abstracts will use a structured format to summarize the evidence presented in the Cochrane Library that is relevant to emergency medicine. The series will be edited by the EBEM section of the Editorial Board.

The systematic review abstracts will be presented in a standardized format (Figure). After the title, a clinical “bottom line” will be reported. This will be followed by a condensed version of the Cochrane Library abstract and contact information of the primary Cochrane authors. Next, an EBEM physician will provide a “clinical implications” section, in which the evidence will be placed in the

Figure.
Structure of the EBEM series Systematic Review Abstracts.

Title
Take home message
Condensed version of the Cochrane Library systematic review abstract (ie, objective, data sources, study selection, data extraction, main results, conclusions)
Contact information for the Cochrane Library systematic review authors
Clinical implications for emergency medical practice
EBM teaching points
Contact information for the <i>Annals</i> systematic review abstract commentor(s)

context of emergency medicine practice. Finally, several EBEM teaching points will be highlighted at the end of the section to enhance understanding of critical EBEM and systematic review concepts.

This EBEM feature will be made available on the *Annals* Web site (www.mosby.com/AnnEmergMed). Updates will be encouraged, and a bank of systematic review abstracts will accumulate over time. In the future, there may be some reviews added that are not from the Cochrane Library but are of methodologically high quality; however, for the foreseeable future, we will focus on reviews in the Cochrane Library that are relevant to emergency medicine.¹⁴

The EBEM section is an iteratively changing section, with an overall goal of bringing evidence to the emergency clinician. Therefore, as with other sections of the *Annals* EBEM section, reader feedback is encouraged. Our goal with this section of the EBEM series is to bring rigorously appraised systematic review evidence in a digestible, easily accessible format to the front lines of emergency medical care, where just-in-time information is urgently needed.

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