Evidence-based resources simplified

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Clinical librarians ensure access to the best evidence-based resources for the clinicians and allied health professionals in their hospitals. Their directive is to support the clinical decision-making process. Because of the variety of resources available, it is difficult for clinicians to find resources that answer their clinical queries. A host of research guidelines, templates, and critical pathways are evolving in medicine. The development for this pattern of delivery of evidence-based resources is neither an attempt to "cookbook" medical care nor to threaten the importance of experience, logic, expertise, and patients' individual needs, but it is a way to provide organized information in a universe of complex resources.

Algorithm

Algorithms have been used in medicine for many years. They are the best way to practise in a certain circumstance given the current state of knowledge and experience. They also serve as excellent models on which to base teaching. The Mount Sinai Hospital evidence-based medicine (MSH EBM) algorithm was created to lay out a selection of the best evidence-based medical resources. The algorithm is a hierarchy of the best evidence-based medical resources, based on those that the Sidney Liswood Library at MSH in Toronto, Ont, assessed and selected for the hospital medical staff. The selected resources were either from purchased site licences or from free reliable resources (Cochrane Library, PubMed) and were based upon the clinical specialties, subspecialties, and MSH's centres of excellence (Women's and Infants' Health, Surgical Subspecialties and Oncology, Internal Medicine and Subspecialties, and Samuel Lunenfeld Research Institute). Hospital libraries should have access to the resources listed in the MSH EBM tool kit (**Figure 1**).

I originally created the algorithm in 2000 to help package the onslaught of new electronic resources offered to physicians. The reason for the tiering of items, such as POEMs over PubMed, was to factor in synthesis, best evidence, and efficiency in the time expended on the literature search. PubMed, although a standard medical index, does not weigh conclusively as the best evidence in comparison to Cochrane. The actual specific rankings, however, are debatable, and I am always looking for feedback in order to continually update and modify the algorithm. New knowledge, experience, and evidence integrate into new standards.[1] I suggest this algorithm not be chiseled in stone but, instead, be continually evaluated and

modified as new information resources accumulate. The interaction of Web tools and Intranet has provided a great opportunity to visually introduce medical students at MSH to the best evidence-based medical resources and the best-practice literature searches.

With the partnership of the University of Toronto libraries, this algorithm of evidence-based resources (**Figure 1**) is posted at **www.library.utoronto.ca/guides/ebm.pdf** for physicians, medical students, and evidence-based practitioners. The algorithm can also be accessed via MSH's library Intranet.

The intent of this algorithm is to simplify teaching research methodologies to medical students and to introduce new databases and resources to physicians. It is a useful marketing initiative and a creative packaging piece for the Sidney Liswood Library collection. This algorithm has also been incorporated into the teachings of the College of Physicians and Surgeons of Ontario and the Ministry of Public Health.
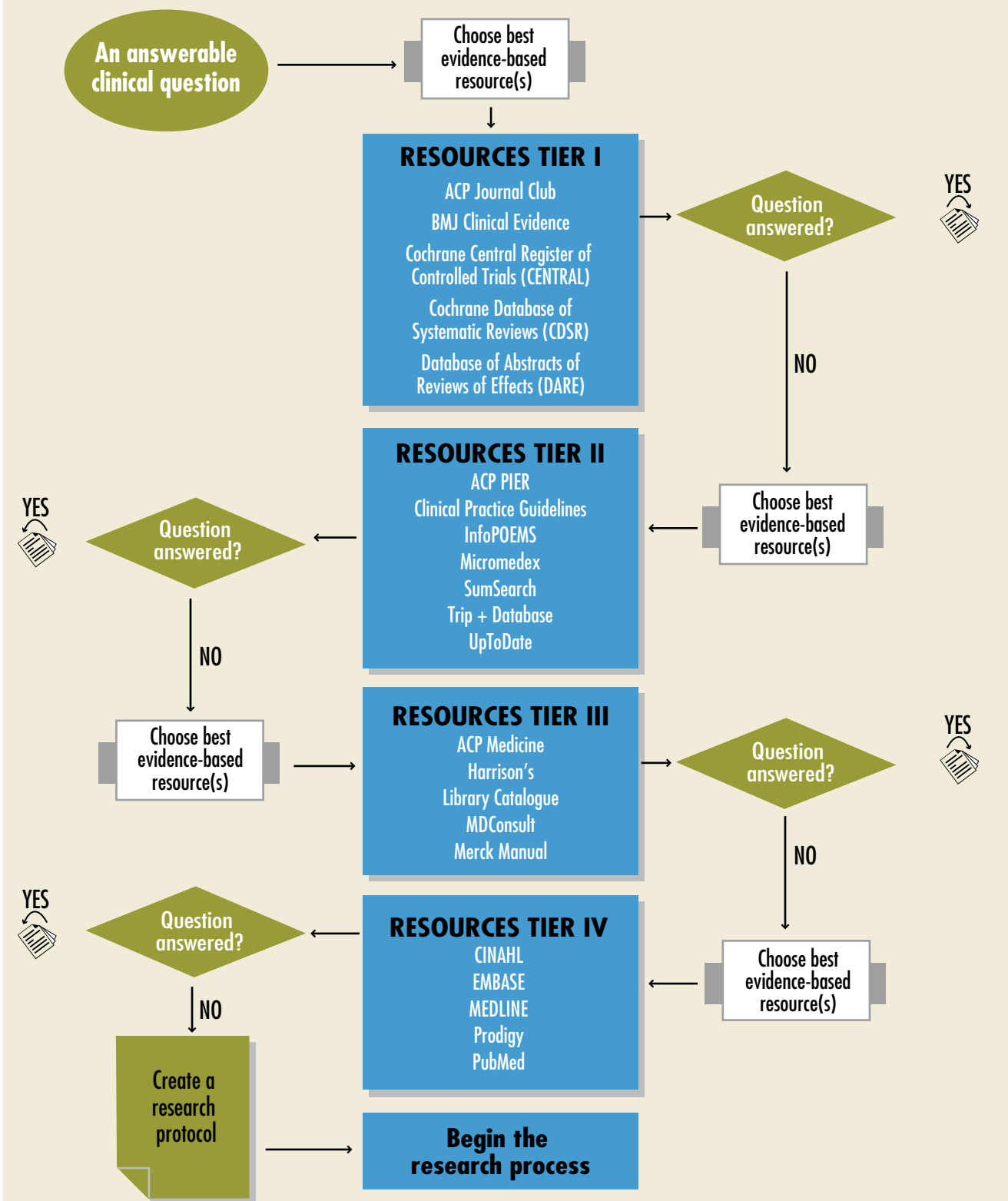
Description

For clarity, I recommend reading this article while viewing and interacting with the MSH EBM algorithm on-line or while viewing the MSH EBM algorithm given in **Figure 1**. The algorithm begins with an answerable clinical question. The circle denotes the standard starting point in any algorithm. On-line, this circle is a hyperlink to information on evidence-based practices with reference to literature searching of secondary published data. Most important, the PICO template is introduced.

PICO. The 4 components of PICO—patient or population, intervention, comparison, and outcome—are used to construct a clinical question. Framing a question that reflects the specific patient or service is the first and most important phase. A well-built question focuses the search and leads to more manageable search results.[2]

Tier I. The next step in the algorithm is choosing the best evidence-based resources. This box is a hyperlink to the website and a customized table that defines the authority, content, focus, and scope of each Tier I resource for the researcher's reference. It provides details and a profile of each resource. Within the Resources Tier I box, each resource is a hyperlink, which directs the clinician to our licensed access. Tier I, the recommended starting point, provides access to the most comprehensive systematic reviews of all medical and scientific literature.

Figure 1. Evidence-based medicine resources: *a tool kit.*

An answerable clinical question

Choose best evidence-based resource(s)

RESOURCES TIER I
ACP Journal Club
BMJ Clinical Evidence
Cochrane Central Register of Controlled Trials (CENTRAL)
Cochrane Database of Systematic Reviews (CDSR)
Database of Abstracts of Reviews of Effects (DARE)

Question answered? — YES

NO

Choose best evidence-based resource(s)

RESOURCES TIER II
ACP PIER
Clinical Practice Guidelines
InfoPOEMS
Micromedex
SumSearch
Trip + Database
UpToDate

Question answered? — YES

NO

Choose best evidence-based resource(s)

RESOURCES TIER III
ACP Medicine
Harrison's
Library Catalogue
MDConsult
Merck Manual

Question answered? — YES

NO

Choose best evidence-based resource(s)

RESOURCES TIER IV
CINAHL
EMBASE
MEDLINE
Prodigy
PubMed

Question answered? — YES

NO

Create a research protocol

Begin the research process

ACP—American College of Physicians.
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A medical query that can be answered in the Tier I process can take less than 10 to 15 minutes versus the documented 1-hour process clinical queries can cover.[3] The Resources Tier I box contains filtered information. Filtered resources appraise the quality of the study and recommend its application in practice.

Tier II. The Resources Tier II box suggests a number of credible resources. This tier includes InfoPOEMs, a resource with an appreciated approach to the delivery of medical information. Resources like InfoPOEMs provide highly valid, relevant information while requiring the least amount of time and effort to locate and apply the information to practice. To meet this goal, these new information sources have the opposite focus of many other information tools: to provide *less* information rather than more.[4] Patient-Oriented Evidence that Matters (POEMs) evaluates the effectiveness of interventions directly for patients and provides clinicians with evidence that what they do for patients makes patients live longer or live better.

Tier III. The Resource Tier III box directs users to authoritative full-text electronic medical textbooks, yearbooks, and clinics. A thorough search in Tier I and Tier II does not always find appropriate and meaningful published evidence; therefore, a search in primary literature is required.

Tier IV. Evidence can be found searching unfiltered databases like PubMed, EMBASE, CINAHL, and other standard medical indexes. This tier contains resources that index unfiltered information. Most of the information found in Tier IV is preliminary, as it does not directly address the question of whether a particular medical approach is in the best interest of patients.

Over the years, PubMed has been the database of choice for clinicians and librarians seeking medical information. PubMed is a comprehensive biomedical database and can access more than 17 million journal citations—a volume that makes retrieval challenging. The search is not intuitive; training is usually necessary or at least helpful, and the resulting list of citations can be overwhelming if not unmanageable. It is also a burden to determine the validity and relevance of articles; a way to resolve this issue is to search these databases by using proven clinical filters. The Clinical Queries feature within PubMed provides a way to limit search retrieval to articles about the 4 types of clinical research—diagnosis, etiology, therapy, and prognosis—and directs the search to be more sensitive or more specific.[4]

What it means
The emphasis to medical students at MSH is that time spent researching the best evidence-based resources can be substantially reduced by following the MSH EBM decision-making algorithm. If all resources are thoroughly utilized and the question is still not answered, physicians or medical students might have found a worthy medical question to begin a clinical trial or further investigational research and they should consider submitting a research protocol to the Research Ethics Board.

The algorithm helps to make sense of the various tools and resources. It is set up to use all the resources that MSH owns; however, physicians who are not associated with a teaching hospital or university should focus on the free resources within our tool kit and complement this evidence by purchasing an individual licence to Cochrane. Physicians can choose tools within Tier II and Tier III based on their subspecialties. A simplified package might consist of Cochrane, UpToDate, clinical practice guidelines, and PubMed.

Using relevant evidence-based resources helps minimize and prevent health care problems.[5] The MSH algorithm helps to ensure that quality information reaches clinicians and patients at a time of need.[6] The staff at Sidney Liswood Library continually reviews current and new published resources to ensure the library provides the best evidence-based resources to the physicians.

Conclusion
The MSH EBM algorithm offers added value for health care professionals by summarizing the resources available to answer clinical questions. The continually updated algorithm provides data to support the appropriate usage of each resource, which encourages not only optimal use of clinical resources, but also the use of best evidence-based medical resources in the information-seeking process. 🍁

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Competing interests
None declared

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