

Becoming an Information Master: A Guidebook to the Medical Information Jungle

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The medical information system is a "jungle" in which the unguided visitor can become lost or disoriented. This paper, the second in a series on becoming a medical information master, is a guidebook for traveling through this jungle. It focuses on techniques for efficiently obtaining patient-oriented evidence that matters (POEM). From original research to clinical experience, each source of medical information is valuable; the trick

is to learn which source is best for the specific information being sought. Armed with this guide, clinicians can find the most appropriate source of information, evaluate it quickly, and apply it confidently in their efforts to provide the best care for their patients.

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The strength of a profession lies in its expert generation of information and better management of it than other social groups.

—E.J. Huth, MD
*Annals of Internal Medicine*¹

In the first part of this series on information mastery,² we likened the current medical information system to a "jungle" and provided a map, the "usefulness equation," which is designed to help clinicians navigate through this jungle to the information that truly matters. Our goal in this second paper is to help you confidently venture into the medical information jungle, using the equation as a map. The map and guidebook do not provide a rigid route for exploring the jungle, since there are many paths available, but rather help you keep your destination in sight, since there are many detours and distractions to deter you, throw you off course, or lead you to the wrong destination.

The Usefulness Equation Revisited

$$\text{Usefulness of medical information} = \frac{\text{relevance} \times \text{validity}}{\text{work}}$$

The goal of information mastery is to determine the information source with the highest usefulness score. Working too hard to establish *validity* raises the *work* and decreases the overall *usefulness* of the information. On the other hand, a low work source may also have low *validity*, *relevance*, or both. The best source of information provides highly relevant and valid information and can be obtained with minimal effort.

The *relevance* of any information is based on the frequency of your exposure to the problem being addressed and the type of evidence presented. Medical information can be divided into either disease-oriented evidence (DOE) or patient-oriented evidence (POE). Patient-oriented evidence that justifies a change in your practice is termed patient-oriented evidence that matters (POEM). The trick to identifying a true POEM is to decide which outcomes matter to your patient (Table 1).

In an effort to conserve time when gathering information, you may choose to sidestep DOE. Similarly, the majority of patient-oriented information can be bypassed if it applies only to infrequently encountered problems or simply confirms your existing knowledge.

Once you come across a POEM, the next step is to

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Table 1. The Types of Evidence on Which Medical Decisions Are Based

Patient-Oriented Evidence that Matters (POEMs)	Disease-Oriented Evidence (DOEs)
<input type="checkbox"/> Mortality	<input type="checkbox"/> Pathophysiology
<input type="checkbox"/> Morbidity	<input type="checkbox"/> Pharmacology
<input type="checkbox"/> Quality of life	<input type="checkbox"/> Etiology
<input type="checkbox"/> Effect on clinical events	

assess the *validity* of the information. Although this task could be delegated to an "expert," each of us must accept responsibility for assuring that *validity* has been critically assessed. It is not enough to accept evidence at face value simply because it has been published in a well-known journal or comes from a specialist. If you think you have no time for this type of information management, you may be surprised to find out how much time you are already devoting to the task of gathering information. Time spent "here and there" glancing at journals, speaking with colleagues, and meeting with pharmaceutical representatives adds up over the course of a week. With planning, you not only can improve the productivity of your time but also can significantly increase the POEM: DOE ratio in the information you receive.

The Flora and Fauna of the Medical Information Jungle

As with any other trip, it is best to set your itinerary before entering the information jungle. The initial step is to define your *purpose* for obtaining information. Different goals will require different approaches (Table 2). You can (1) *hunt* for the answer to a question related to a specific patient, (2) *forage* through the jungle to stay informed about new developments in clinical medicine, (3) *retrace* your path by reviewing previously learned information, or (4) enter the jungle for *sport*—for enjoyment or to keep up with a specific area of interest.

Once you have determined your objective, the next step is to consider which source will be most useful, based

Table 2. Reasons for Entering the Medical Information Jungle (Why Clinicians Seek Information)

<i>Hunting</i> —To answer a question related to a specific patient
<i>Foraging</i> —To keep up with new developments in clinical medicine
<i>Retracing</i> —To review previously learned information
<i>Sporting</i> —For enjoyment or to keep up with a specific area of interest

Table 3. The Flora and Fauna of the Medical Information Jungle (Information Sources)

<input type="checkbox"/> Original research
<input type="checkbox"/> Academic reviews
<input type="checkbox"/> Medical cookbooks (practice guidelines)
<input type="checkbox"/> Translation journals
<input type="checkbox"/> Continuing medication education
<input type="checkbox"/> Experts
<input type="checkbox"/> Newsletters and survey services
<input type="checkbox"/> Pharmaceutical representatives
<input type="checkbox"/> Clinical experience

on a balance of the three equation factors: *relevance*, *validity*, and *work* (Table 3). Your skill in gathering information and evaluating the resources at hand will influence your choice of an information source. We will evaluate each source in the jungle, offering our suggestions for maximizing usefulness. These sources are by no means equivalent, and each may have a distinct role depending on the circumstances of your need for information.

The Research Literature

For the clinician attempting to nourish lifelong learning, medical journals may seem to provide slim pickings: a few scraps imbedded in a mass of materia nonmedica from pre-clinical test tubes that only scientists can digest and a malnourishing mishmash from preliminary clinical studies.

—R.B. Haynes
ACP Journal Club³

Recommendation

The search for POEMs begins when you scan a journal's table of contents. For articles that sound promising, read the conclusion of the abstract. If the outcomes are patient-oriented and have the potential to change your practice, read the study to assess its validity.

Clarification

Research journals can be used when *hunting* for answers to a specific question or when *foraging* for POEMs. You

may be tempted to bypass journals because of the high level of *work* involved, yet they are the fountain from which medical knowledge flows. Subscribing to various journals reduces the work because they are mailed directly to you. You can quickly scan the table of contents in your search for POEMs. Our main concern for *usefulness* initially lies with the *relevance* of the information.

Rationale

Medical journals can be divided into two main types. *Knowledge creation* journals publish studies that present new data and information or reviews that carefully synthesize knowledge from previously published research. *Translation* journals, controlled-circulation publications less affectionately described as “throwaways” or “freebies,”⁴ consist of expert reviews of current knowledge published in other journals. The information in these translation journals follows a *Reader's Digest* format that is appreciated by busy clinicians.

Your search for relevant articles in knowledge creation journals begins when you scan the table of contents, marking titles that indicate potential POEMs. Don't be surprised if you find few: when using strict criteria for clinical *relevance*, one group found that even the best averaged fewer than one clinically useful article per issue.³ Only a portion of these articles would have met our narrower criteria for POEMs.

The next step is to turn to the studies that pique your interest. *Don't begin by reading the article.* The goal at this point is to look for reasons *not* to continue reading the article because it is either not *relevant* or not *valid*. Begin by reading the conclusion sentence of the abstract: if the outcomes are patient-oriented and would change the way you practice, go forward. This “weeding” tool can help you avoid investing time with articles that are not relevant to your clinical practice.

The abstract is also useful as an initial screen for *validity*, especially if the article contains a structured abstract.⁵⁻⁷ Since the majority of POEMs will concern new therapies, look for the words “blind” and “randomized” in the study design section of the abstract. If not present, there is little reason to read further. The study design is not rigorous enough to warrant a change in practice, no matter what the outcome. POEMs discovered in other types of studies may be validated using additional criteria.⁸⁻¹⁴

CAUTION: limiting your *validity* assessment to the abstract carries with it the risk of being misled, as authors may not always resist the temptation to overstate the importance of their results.^{15,16} By skimming the abstract, once you do find what appears to be a POEM, it is time to buckle down and assess the *validity*. You can assess the

validity yourself, present it at your next local journal club, or run it by an “expert” (see section on Experts, page 493). The Evidence-Based Medicine Working Group's Users' Guides to the Medical Literature,^{8-14,17} from which we adapted the above screening guidelines, should be applied to the rest of the article.

If the screening process described seems restrictive, that is exactly what it is meant to be. By using this method, you will find yourself reading few articles; in fact, you may soon adopt the philosophy that it helps you reach your goal of not reading any research unless *forced* to by the good fortune of stumbling across an article that is relevant to your practice, ie, a POEM.

A CAVEAT: *not reading* does not equate with *not looking*; in fact, the time gained by this screening method gives you the opportunity to scan a wider range of clinical journals and to read other valuable features of journals that may identify POEMs in other sources.

Academic Reviews

The review article itself should be the product of scientific investigation in which the participants are original investigations rather than patients.

—R.B. Haynes
*British Medical Journal*¹⁸

Recommendation

Reviews are an excellent source in your search for POEMs. If the title and abstract or article conclusions hold the promise of POEMs, read on. Once you've located a POEM, the original research data must be evaluated for validity.

Clarification

Since reviews gather a large body of information into one place, they are an excellent means of surveying the medical literature for POEMs. A good review is easily readable and quickly pares down the medical literature by summarizing pertinent information and minimizing the risk of “gossip.”²

Rationale

There are several types of reviews. Textbooks, which can be considered a collection of review articles, are usually of the “bottom-line” type: the facts are presented with little

supporting evidence. The *validity* of the information is hard to evaluate and is further jeopardized by the long lag-time that precedes publication.

Reviews in most academic journals are more in-depth, and can be either a summary type or synthesis type. Summary-type reviews broadly paint the landscape of the topic being discussed, whereas synthesis-type reviews focus one or two questions and attempt to fashion an answer. The methods of screening and evaluation are different for the two types.

Accepting the conclusion of summary reviews may be risky. We usually do not have the ability to assess the *validity* of the supporting data. Many authors write summary reviews by first determining their conclusions and then finding appropriate research to support their contentions. As a result, the potential for unrecognized bias is high, ie, they reference only articles that support their predetermined conclusions.¹⁹

When the author presents information that seems to be a POEM, the original article *must* be retrieved for evaluation to confirm the author's contention. One evaluation of accuracy in reviews published in pharmacotherapy journals found that 24% of referenced statements did not accurately reflect the original articles.²⁰

Timeliness also may be a drawback of summary reviews, especially in a rapidly changing area of medicine. For example, following the publication of a meta-analysis showing that thrombolytic therapy resulted in a pronounced decrease in mortality, 6 years elapsed before the majority of reviews recommended its widespread use.²¹

The synthesis type of review is either a meta-analysis or an overview. These structured reviews attempt to answer one or two clinical questions. The authors identify all the primary literature, and using strict and reproducible criteria for selecting articles, derive a conclusion that is supported by the evidence.²² This approach reveals answers that could not be obtained by simply evaluating the separate trials, since smaller trials may lack statistical power to detect a difference. Synthesis reviews are most amenable to a *validity* assessment and can be evaluated using preexisting criteria set forth already by the Evidence-Based Medicine Working Group.¹⁴

Translation Journals

Buyer beware: unsystematic reviews lead to unsystematic conclusions. Readers looking for a shortcut to understanding evidence about health problems and patient care should at least look for reviews by those who have not taken shortcuts.

—R.B. Haynes
*British Medical Journal*¹⁸

Recommendation

Translation journals, which are "quick reads" most suited for sporting or retracing modes, are usually of little value in the search for an answer to a patient-related dilemma. New information, especially conclusions and specific recommendations of the author, should be suspect, since there usually is no way to evaluate their supporting evidence.

Clarification

Most translation journals arrive unsolicited in your mail. Their role is to translate the current medical literature into more palatable language that can be read by the vast majority of clinicians who are not researchers. Translation articles are generally fun to read and useful for *retracing* little-used information. Specific recommendations for a course of management or clinical practice, if in conflict with your current practice, should be viewed cautiously since their *validity* usually cannot be assessed.

Rationale

Translation journals are generally free publications that enlist specialists or other experts to interpret the research literature into a form that can be assimilated by nonresearchers. Because they offer short articles that can be quickly read and understood, they are well suited for the busy office setting. In our teaching settings, we occasionally use these articles to illustrate teaching points to residents, knowing that they are more likely to read them than the research literature. While the low *work* of these articles makes them appealing, herein lies their danger: if either *validity* or *relevance* is low, the overall usefulness will also be low.

The evaluation of these articles is similar to that proposed for summary reviews and continuing medical education presentations. Referenced statements that suggest a change in your practice (common POEMs) must be supported by original research that should be retrieved and evaluated. Watch for statements that are presented as undocumented facts. Use caution when you come upon wishy-washy phrases such as, "it seems," "may be effective," "should be useful," "so one must assume," "it appears," and "it may be." The phrases signal that the conclusion is based on DOEs or anecdotes.

Continuing Medical Education Information

People remember 90 percent of what they do, 75 percent of what they say, and 10 percent of what they hear.

—R.S. Wurman
*Information Anxiety*²³

Recommendation

To be useful, continuing medical education (CME) requires active involvement of the learner as well as the speaker. The CME consumer must always ask two questions: (1) is the information being presented based on POEMs that, if valid, would require a change in clinical practice? and (2) is the information valid?

Clarification

Getting something useful out of a CME presentation requires the active involvement of the listener, who must evaluate the information as it is being presented. The Information Master first has to determine the outcomes that matter in patient care, and then wait to see whether the speaker addresses them. When making specific conclusions, the speaker should be queried for the specific evidence since it is possible that these conclusions are based on DOEs or clinical experience rather than POEMs. Attention must be paid to the *validity* of the information. The expertise of the speaker alone should not be considered sufficient to validate the credibility of the evidence.

Rationale

Continuing medical education programs are popular information sources, recently rated highest by practicing internists as a source of keeping up with advances in medicine.²⁴

Although we may walk away from CME presentations with a sense that we have gained "something," often we fail to glean any true patient-oriented evidence that matters. Naftulin and colleagues²⁵ described this feeling as *educational seduction*: "[we] can be seduced into feeling satisfied that [we] have learned something despite irrelevant, conflicting, and meaningless content conveyed by the lecturer." Research evaluating the effectiveness of CME has found that, while test performance may be improved immediately following a presentation, actual clinical performance and patient or health care outcomes are

seldom improved.²⁶ The *work* factor for most CME is deceptively high. For primary care clinicians, CME talks often are given by speakers who are experts in a particular field. The majority of the hour-long presentation frequently is filled with well-made slides discussing various receptors, molecular structures, and so on, with the potentially useful bottom-line message coming at the conclusion of the talk. As with a professional basketball game, only the last 2 minutes of the presentation are important. To add further insult to injury, these talks often run late, and those who have to leave to get back to the office miss the only POEMs presented!

Addressing the *validity* of information presented at CME conferences is often difficult, if not impossible. Herein lies the greatest limitation of most CME: we have no way to separate fact from anecdote. We must therefore take an assertive approach by asking questions aimed at uncovering the level of evidence supporting any claim. The optimal CME process requires teamwork between two groups: the speaker *and* you, the learner. The speaker should present a good mix of POEM information highlighted by clinically relevant DOEs, acknowledging the differences between the two. Either structured assessment of validity for common POEMs should be performed by the speaker, or the information on which the recommendations are based must be identified for or supplied to the learner. As a listener, your role is to actively evaluate the information being presented. When a POEM is presented by the speaker that could bring about a change in your practice, you must determine the *validity* of this evidence either by questioning the speaker or "cross-checking" with other sources.

Experts

So many specialists fall into the habit of looking where the light is—that is, offering solutions only in territory familiar to them . . . wonderful examples exist of otherwise excellent researchers who are unable and unwilling to recognise evidence contrary to their beliefs.

—G. Hills
*British Medical Journal*²⁷

Recommendation

When using experts to answer clinical questions, the Information Master seeks out colleagues who are not only well versed and experienced regarding the dilemma but also have a demonstrated ability to evaluate evidence in an open-minded, patient-oriented fashion.

Clarification

The best experts are YODAs (named after the mythical Jedi master in the *Star Wars* epics), an acronym for Your Own Data Appraisers. YODAs consider POEMs first when forming a recommendation, even when this evidence conflicts with disease-oriented evidence, accepted dogma, or their own anecdotal experience. When POEMs are not available, they use the best available DOEs combined with clinical experience and will identify these as the basis of their recommendations. In addition, YODAs should demonstrate to you that critical evaluation of *validity* has been performed for both POEMs and DOEs. An expert who can offer this combination of wisdom and accompanying evaluation of evidence is one who should be highly valued.

Rationale

We call on experts usually for one of two reasons: (1) when *hunting* for information to answer a specific patient-management question, or (2) to comment on the *validity* of information obtained as a result of our *foraging* for POEMs. Though the *work* involved—a phone call or a “curbside chat” over coffee—is usually low, the *relevance* and *validity* of the information requires careful scrutiny.

Content experts are thoroughly versed and experienced in the subject of interest and worthy of turning to when *hunting* for advice regarding management of a specific case, especially when POEMs are not available or when we need a quick answer. We must be cautious, however, because generalizing advice received about a specific patient may be hazardous, especially when the supporting evidence stems only from DOEs. Content experts may be unable or unwilling to look beyond DOEs. Chalmers²⁸ has shown that recommendations of experts are highly correlated with their training and the sources of their income. Another concern when accepting the opinion of a content expert at face value is that of variability. Research has shown that not only is it difficult to get a group of experts to agree on the interpretation of data, it is also difficult to get experts to agree with *themselves*.²⁹

Newsletters and Other Survey Services

News is anything you didn't know yesterday.

—Turner Catledge

Quoted in *Information Anxiety*²³

Recommendation

Newsletters and other literature surveys are the Range Rovers that can take you through much of the information jungle. Consider them annotated tables of contents to many journals, all collected into one place, and use them to quickly identify potential POEMs in the current literature that can be obtained for further evaluation.

Clarification

Abstracting services such as newsletters, computerized services, and journal features can be used to scan the medical literature for POEMs quickly and painlessly. However, these abstracts should not be relied upon to provide all of the information necessary to evaluate the research. The original study still must be obtained and evaluated.

Rationale

Many newsletters and several literature survey services are available to the family physician. These can be lumped into three basic categories: abstracting services, review services, and true newsletters. *The Ambulatory Medicine Letter*, *Journal Watch*, *FP-IM Database*, and the *Family Practice Newsletter*, for example, provide abstracts and sometimes commentary on articles of interest to family physicians. Review services, such as *The Medical Letter* and *Primary Care Reports*, do not survey the literature but focus on a few topics with each issue. True newsletters such as *Drug Therapy Update* and *Medical Sciences Bulletin* are a hybrid, providing cursory reviews of the current literature along with topical news from other sources. The review services and true newsletters can be evaluated using the criteria already mentioned for review articles and continuing medical education. We will focus in this section on how to get the most from an abstracting service.

Abstracting services offer the allure of extremely low *work*. Someone else scans a large array of the medical literature, selects relevant articles, and presents the high points for quick scanning. As in many endeavors, quantity is substituted for quality in many of the newsletters, increasing your *work* by requiring you to wade through many abstracts of articles not relevant to clinical family practice to find the POEMs. On average, only one in four abstracts in these newsletters reports on controlled clinical trials.³⁰

Newsletters should be considered an easy screening method for finding POEMs, but they should not be relied

upon to provide all of the information necessary to evaluate the *validity* of an article. When a POEM is found in a newsletter or abstracting service, the original article *must* be obtained for closer scrutiny. Several researchers have documented the tendency of abstracts to be misleading in that they overemphasize positive conclusions or conclude more than can be supported by the evidence in the article.^{15,31,32}

The ideal abstracting service would search the entire medical literature and report all POEMs and *only* POEMs. Since POEMs are few and far between, this limitation would result in many thin newsletters. A close approximation of this ideal is the *ACP Journal Club*, a bimonthly supplement to the *Annals of Internal Medicine*. Although it focuses only on the literature of internal medicine, its value lies in its use of pre-stated criteria to select only highly valid articles that the editors critically analyze and summarize using an expanded structured abstract format. *The Journal of Family Practice* recently introduced a similar regular feature oriented to primary care clinicians.

Pharmaceutical Representatives

The best defense the physician can muster against [misleading] advertising is a healthy skepticism and a willingness . . . to do his homework. He must cultivate a flair for spotting the logical loophole, the invalid clinical trial, the unreliable or meaningless testimonial, the unneeded improvement and the unlikely claim. Above all, he must develop greater resistance to the lure of the fashionable and the new.

—P.R. Garai
*Drugs in Our Society*³³

Recommendation

Put your pharmaceutical representatives to work for you. Use them to obtain hard facts about their drugs, as well as to obtain relatively obscure information from their drug information departments. Teach them that you are interested in POEMs, not DOEs. Do not rely on them to synthesize available evidence into a conclusion that would alter your current practice.

Clarification

Good pharmaceutical representatives are experts on the drugs they sell and can instantly provide you with facts about their drugs, such as the indication, dose, side-effect

profile, and pharmacokinetics. Their inherent limitation is their inability to provide credible information regarding when it is appropriate to use a given drug.

Pharmaceutical reps can serve as an excellent screening source for potential POEMs. This is especially true if you take an active rather than passive role by requesting only new information, including original research articles. If you effectively convey to the rep that you are interested only in POEMs, your work will be decreased even more.

Rationale

One of the most highly prepared and effective educators of clinicians is the "don't-get-no-respect" pharmaceutical representative. This rep gets more training in educational methods and communication theory than most medical school professors, and as a result, is more effective in changing practice behaviors than just about any other information source.³⁴⁻³⁶

The *work* associated with obtaining information from pharmaceutical reps is usually low. In a matter of minutes they present three or four points about their drug that are easy to understand and remember. The *relevance* and *validity* of any evidence must be carefully scrutinized. The evaluation process of the information presented by a pharmaceutical rep begins with deciding on the requirements for the appropriate POEM rather than allowing the rep to do it. We generally want to know that a drug we choose to offer to our patients, as compared with the alternative therapies, is some combination of safer, more effective (as defined by what matters to patients), easier to use, or less expensive.

Pharmaceutical reps should be relied on heavily for data about their drugs, but not for a synthesis of "when" and "for whom" the drug should be used. Clinical information regarding effectiveness should be evaluated carefully: it is not enough to accept the reps' (or, in the case of after-dinner hired guns, the pharmaceutical company's experts') assessment of the literature on the absolute or comparative effectiveness or safety of their drug vs another.

We have previously outlined the potential hazards of leaving the assessment of evidence to a pharmaceutical representative.³⁷ Your best defense against misdirection from a rep is to keep your eyes on your destination (POEMs) and not waver when presented with scenic detours, such as unique tablet shape, dissolution characteristics, or the effect of a drug on intermediate endpoints (ie, DOEs).

Medical Cookbooks: Clinical Guidelines, Practice Policies, and Others

Rigid enforcement of . . . guidelines could harm patients, interfere with the individualization of care, increase costs, and promote unfair judgments against clinicians who deviate from them for good reasons.

—S.H. Woolf

*Archives of Internal Medicine*³⁸

Clinical freedom implies the obligation to do what is best for the patient at all times, not the right to do whatever one pleases.

—Clinical Resource and Audit Group

*Clinical Guidelines*³⁹

Recommendation

Quickly peruse clinical practice guidelines for POEMs, checking validity by assessing the level of evidence. When a guideline conflicts with your day-to-day practice and is not based on high-quality evidence, shelve it until better evidence comes along.

Clarification

The goal of a guideline is to provide a statement supported by available information that helps clinicians make sound medical decisions. In a large sense, they are no different from textbooks, journal articles, and expert opinion that have always guided medical practice, except that they are developed more systematically.⁴⁰

Rationale

Guidelines that are evidence-based rather than consensus-based can be evaluated to determine what type of evidence is supporting them. *Validity* can be checked by determining the level of evidence on which the recommendations are based. Guidelines are supported by the best evidence *available at the time they were written*. Thus, many guidelines are works-in-progress, subject to change when better evidence becomes available.⁴¹

Guidelines largely have not had an effect on patient care.⁴²⁻⁴⁴ This may be because primary care clinicians are not involved in the process of creating them.⁴⁵ It also may be that guidelines are being created before the clinician consumer is aware of a need for them. Clinicians who are

unaware of problems with specific practice behaviors have a low motivation to adopt a new set of clinical rules.

Guidelines must always be assessed to determine whether outcomes that matter to patients were considered and to determine the strength of evidence supporting each recommendation. When both needs are satisfied, confirming a valid POEM, it becomes the clinicians' responsibility to adopt the guidelines. Information masters, in their perpetual search for POEMs, realize that the best guidelines are collections of POEMs that have already been assessed for *validity* by a group of YODAs.

Wait a Minute! What About Clinical Experience?

Clinical science and clinical expertise both have their essential place in medicine. There is potential danger in attempting to replace one by the other, in banning intuitive knowledge from the realm of the "rational" and in placing explicit, quantitative, calculating technique over implicit, intuitive human understanding as the ideal for clinical medical knowledge.

—D.R. Gordon

*Biomedicine Examined*⁴⁶

Recommendation

The usefulness of clinical experience is highest when you are able to accurately assess validity. You should cautiously generalize clinical experience until the evidence has been confirmed by patient-oriented studies.

Clarification

Just as we described original research as the fountain from which all knowledge springs, clinical experience is the fertile ground from which ideas, suggestions, and hypotheses grow. Without clinical experience, we cannot formulate the questions that provide us with the drive and need to experiment and evaluate.

A major conflict occurs when our beliefs, gained at least in part by experience, do not "jibe" with knowledge derived from patient-oriented research. But is there really a conflict? POEMs, as we have defined them, focus on doing the best for our patients; our views shaped by clinical experience have this same goal. The difference lies in the methods.

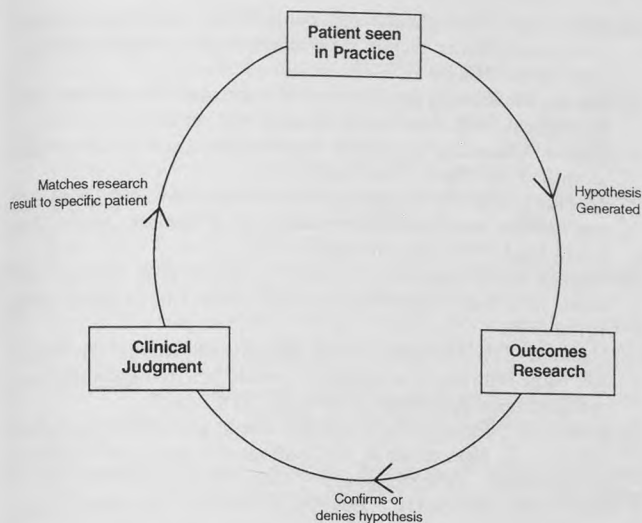


Figure. The circle of clinical reason, showing the relationship between clinical and research experience involved in the process of determining whether general information is applicable to specific patients.

Rationale

It is not easy for the clinician to look to the medical literature for useful information. POEMs are relatively uncommon, and “real-world” research—the so-called outcomes movement—has surfaced only in the last few years.⁴⁷

Both clinical experience and POEMs should be seen as part of the circle of clinical reason (Figure). The circle begins when, through clinical experience, we form hypotheses relating to what seems to benefit our patients. Outcomes research then takes these hypotheses and tests them in a real-life yet controlled setting. This process gives us a general answer based on a “collective experience,” with a validity that cannot be achieved with individual experience. The circle of reason is complete when clinical experience is used to determine whether this general information is applicable to specific patients.

Flaws in this circle of reasoning, however, can lead us to the wrong conclusion. One such flaw is called the *fallacy of division*, the erroneous assumption that what is true of the whole must also be true of its parts. To hold that the results of an outcomes-based study must be rigidly applied to every member of a group is inappropriate. Rarely do patients seen in practice match up exactly with study criteria, and we should not attempt to force their management into the mold created by outcomes-based research.

The converse of the fallacy of division is the *fallacy of hasty conclusion*, which occurs when we inappropriately consider the outcome that occurred in one patient or a small group of patients and apply it as a general rule.

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Another Way To Skin a Cat: Applying Evidence-Based Medicine to Primary Care

Our approach to information management is quite different from the “Users’ Guides to the Medical Literature” developed by the Clinical Epidemiology Department at McMaster University and recently published by the Evidence-Based Medicine Working Group.^{8-13,48,49} These guidelines provide an excellent framework for evaluating clinical research trials and are most effective when you are in the *hunting* mode, trying to answer a specific patient-related question.

Using the *hunting* mode for directing forays into the research literature may be the optimal method of obtaining information. If this approach is to be effective, it requires a good library and 1 or 2 hours a week of uninterrupted time,¹⁷ the latter of which is a luxury not frequently available to the busy clinician. Current evidence shows that the research literature is infrequently used by primary care clinicians,⁵⁰⁻⁵² even when computer access is provided.⁵³ To make matters worse, when computer searching was performed to answer practice-generated questions, less than 1% of articles retrieved contributed to a change in clinical management.⁵⁴ In other words, usefulness of the research literature is low for many clinicians because the *work* involved when using it frequently outweighs its potential *validity* and *relevance* factors. In addition, trying to wedge the *hunting* mode into the narrow time constraints of having a few minutes here and there can be detrimental. To conserve time, your tendency might be to stop searching before all the relevant information is found and evaluated. This haphazard approach increases the possibility of not getting the whole story and creating “medical gossip.”² When *foraging*, however, rather than pursuing an answer to satisfy a particular patient-related question, you are acting on your interest in updating your current practice patterns, but change should take place only when necessary. Your major focus is on determining what to read by sifting through a mountain of information looking for POEMs. This is the mode of information gathering most applicable to the “few minutes here and there” style of many primary care clinicians.

Finally, the Evidence-Based Medicine approach focuses mainly on the research literature and rigorous reviews, since these information sources can be more readily assessed to determine *validity*. Because this approach is probably the best for evaluating clinical research, we turn to it in our suggestions for managing this source, but we believe that, with some care, other valuable sources of medical information also can be successfully evaluated.

Before using evidence gained from clinical experience to justify an approach to every patient, we *must* apply the rigors of the scientific method. The seeming opposites of medical practice—clinical science and clinical experience—are inseparable. Efforts by insurance companies or the government to shut out clinical expertise through rigid enforcement of guidelines or policies are just as misguided as those of the clinician who forgoes any knowledge gained through patient-oriented research in favor of practice-guided understanding.

The Responsible Guide

We began this paper with the clinician poised to venture into the medical information jungle. Now we must confront the existence of an even larger and more intimidating jungle—the managed care jungle. We must always be there as the patient's responsible guide in finding the safest, most successful and economical route.

The role of guide is often referred to as “gatekeeping,” with the clinician controlling access to medical care. To ethically and effectively perform this complex task, the clinician must maintain competence, a crucial element of which is the attainment of information mastery.

While it is true that the overall approach to information management put forth in this series takes some brain-time and some chutzpah, it is our *responsibility* to make these POEM/DOE distinctions along the way, especially when facing others in the medical community who place great value on intermediate (DOE) outcomes. We must accept this role and actively pursue excellence in doing so by being a true information master.

It is not enough simply to be able to gather and evaluate patient-oriented information: the final step is to incorporate this new knowledge into our practice. We may not have all the right answers, but we need to find and verify those that do exist. For the rest, we need to start asking the right questions.

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