

How to approach the literature in trauma and emergency care medicine

Introduction

Keeping up with the medical literature is a strenuous proposition, let alone understanding the hypothesis, research methodology, interpretation and potential clinical consequence of a scientific paper.

How to approach and read medical papers in the field of trauma and emergency care medicine? Hardly, any universal answer to this question can be justified. Obviously, the interest and focus of the reader will be biased from his/her place in the "chain of survival". Clearly doctors, paramedics, and nurses vary in their reading, knowledge, and focus. Although the common interest is to care for the traumatized or critically ill patient, do we share the same perspectives?

The following fable may serve as an illustration:

Four blind men come across an elephant. They decide to feel the elephant to determine what sort of creature it is. One blind man feels the back leg of the elephant. He says, "An elephant is like a tree." The second blind man feels the trunk. He says, "An elephant is like a snake." The third blind man feels the tail. He says, "An elephant is like a rope." The fourth blind man is afraid. He doesn't feel the elephant at all. The three blind men argue a long time about what an elephant is, and, based on their own personal experience, each is right.

The trauma and emergency care medical literature could be the elephant in this fable - multifactorial, complex, large, and difficult to get a complete overview of. The great interdependence of, and cooperation between a wide range of disciplines and professions to provide prompt and appropriate care is hardly found anywhere else in medicine.

Riding on the elephant - a team approach

The Trauma team consists of a heterogenous group of members from various professions. The paramedic grabs the tail, the anaesthesiologist clings to the hind leg, the surgeon hangs on to the tusks, the orthopedic looks into the trunk, and the nurse cleans up whatever is left behind - an individualized approach that may distort the true view of a great body. The outcome of "the chain of survival", while greatly dependent on optimal deliverance of each part involved, reflects the smoothness of transition in the chain. The goal of this journal is to provide information and updates for all involved parts in trauma and emergency medicine. With this in mind, a "first aid" on how to approach the literature may provide a helpful introductory step to the novice (1). Rather than describing research methodology and complex statistics, this review aims to clarify some fundamental points for general reading.

Why read medical papers?

"It is astonishing with how little reading a doctor can practise medicine, but it is not astonishing how badly he may do it." William Osler, 1849-1919

Most of us are taught that in order to be a competent professional we must keep abreast of the latest clinical practice, causal theories, novel diagnostic tests, and innovative treatments. Patients expect us to be updated and competent in our field of interest. Truly, these are reasons valid enough to keep you up all night studying.

Medical journals offer more than reports on recent discoveries; they provide a mixture of opinions and philosophy, arguments and gossip, history and theory, and advice. In fact, a medical journal can provide the reader with knowledge beyond the clinical dogmas, statistical p-values, and the "expert" opinions. Besides being a source of up-dated information on clinical discoveries and basic research, it should provide the reader with issues concerning ethics and moral, costs and benefits, and quality of life.

How to read a paper?

Bennett, tongue in cheek, has humorously classified the reading habits of doctors during their medical career (Table 1) (2). Likely, his classification also transfers to the trauma team - variation in basic knowledge, clinical expertise, education, and workload influence on reading habits.

The approach one takes to reading an article depends very much on the intent at the outset. Embarking on a critical search for scientific evidence is a different process than finding a decent literature update on a subject.

Table 1

Bennett's Classification for Reading Medical

Medical student	Reads entire article but does not understand what any of it means.
Intern Resident	Uses journal as pillow during nights on call. Would like to read entire article but eats dinner instead.
Chief resident Junior attending	Skips articles entirely and reads the classifieds. Reads and analyzes entire article in order to pimp medical students.
Senior attending Research attending	Reads the abstracts and quotes the literature liberally. Reads entire article, reanalyzes statistics, and looks up all references, usually in lieu of sex.
Chief of service Private attending	Reads references to see if he was cited anywhere. Doesn't buy journals in the first place but keeps an eye open for medical articles that make it into Times or Newsweek.
Emeritus attending	Reads entire article but does not understand what any of it means.

Understanding the framework of an article facilitates efficiency, as the informative purpose of an article may vary through form, layout, and content.

“Every (article) has a skeleton hidden between its boards. Your job is to find it. An (article) comes to you with flesh on its bare bones and clothes over its flesh... I am not asking you to be impolite or cruel. You do not have to undress it or tear its flesh off its limbs... you must read with X-ray eyes, for it is an essential part of your first apprehension of any (article) to grasp its structure.”

Mortimer J. Adler, 1940

The Bones Of An Article

The title gets the reader on the hook, and may summarize the message. For the wary at heart, the abstract may provide for further decisive information. An abstract contains a very brief summary of the information contained in the article. Some readers rely heavily on the abstracts, and for more than 60% of articles only the abstracts are read (3). Abstracts provide a useful taste of the contest, but they are rarely sufficient to make a meal in themselves. Abstracts may sometimes contain more wish than reality and present a distorted view of the work that follows, even in high-class journals (4). Thus, reading the entire article is mandatory if you intend to draw conclusions of your own, or incorporate the information in how you practice. Table 2 presents various types of articles commonly found in a scientific journal. Original research papers are usually hypothesis driven and may include advanced methodology. Consequently, they are likely the hardest articles to digest for the novice. Thus, after reading the introduction, many readers find themselves skipping the methods and results sections, only to (in the spirit of a suspense novel) find out what happens in the end. Knowledge of statistics and methodology is prerequisite for truly evaluating the message of original research.

Narrative reviews are often written by an expert in the field and provide updated state-of-the-art information. However, one should be aware of possible bias. An “expert opinion” might just be that; opinion, rather than evidence. Selective inclusion of studies, or focus on own research may not provide a balanced view. Also, journals vary considerably in the quality of published reviews (5)

Table 2

Overview of some types of papers found in a scientific journal	
Type of paper: Original/research paper	Key concepts: Hypothesis driven; state-of-the-art; translational, clinical or basic science
Editorial	Expert opinion (usually), comment on original/research paper
Case report	Novel, unique, timely, educational, or broad interest
Cohort study or case series	Well defined problem, outcome measures, aim and hypothesis
Review articles	Broad interest, controversy, educational, recent consensus
Letter/Correspondence	Broad interest, comment or critique, correction of important errors
Technique paper	“How I do it”, instructive, educational

Where to find a paper?

Even though the spirit may be willing, the eyes grow weak, and the task of sorting through the mounds of published material seems a losing affair. Battling the ever-growing contribution of papers is hardly accomplished by even the most dedicated reader. Figure 1 shows the expanding growth of new citations added to Medline over the past decades.

An arbitrarily performed Medline-search of the term “blunt trauma” during three decades (1970s, 1980s, and 1990s) revealed 1066, 2339, and 4154 hits, respectively – implying a near doubling of new citations each decade! The rate at which “evidence-based” reports and “guidelines” are reported are reaching almost epidemic numbers (6). The incredible amount of new information calls for a goal-directed habit of reading. The reader needs to identify sources from where up-dated information can be achieved. William Osler stated already in 1892 that in order to keep updated “(the physician) must receive six or ten journals” (7). In order to cover a subject a large number of journals need to be assessed. Locating journals that cover your field of interest is important. It is crucial that you tend to these journals regularly if you plan to keep up to date in your field.

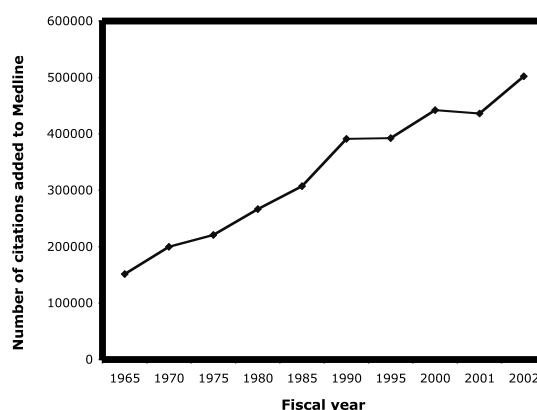


Figure 1. Number of citations added to Medline over time

The electronic environment has allowed for new ways of access to the literature. Searching is made feasible on the internet through PubMed and other search engines, and journals with full or partly free access can be found on certain websites (8-10). Readers can get the table of contents (TOC) of each new issue from most journals by e-mail (free sign up on the journals’ homepages), which makes it a lot easier to skim through a large number of journals, and to select which articles to read.

Efficient Reading

Not all papers are of crucial clinical importance. First, select what you need to read, and don’t read everything. Make priorities of what to read and where to find it. Skim the contents to get a preliminary overview. Secondly, categorize what you must read, what you need to know about, and what is superfluous. Furthermore, implement what you read in what



you already know. What does it add? How does it relate to previous studies you have read? Then, memorize what you've read. What are the key words? What is the conclusion or take home message? What did the author really try to tell you? Lastly, motivate yourself by setting tangible goals, specify your fields of interest, and work up a positive attitude towards reading!

In summary, keeping up with the literature takes a lot of endurance. However, if you made it to the end of this article, you should hopefully be well furnished to embark on the strenuous journey into the literature of trauma and emergency care medicine – hopefully enjoying the company of other readers on top of the elephants back.

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