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## Con: Should Evidence-Based Medicine Be Used More in Clinical Practice?

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A junior resident begins treatment of an elderly woman in the Emergency Department, who complains of severe epigastric abdominal pain for the last 6 hours with associated fever and vomiting. She has a rigid abdomen with diminished bowel tones, guarding and rebound. She is requesting pain medicine, but the resident refuses to give her any medications perhaps recalling the dogmatic teaching of his surgical attending, who claimed it would “mask” the etiology of her pain. When I came to see my mother-in-law 6 hours later, she remained in severe pain in spite of having a clear diagnosis of gallstone pancreatitis, based on physical, laboratory and ultrasonographic findings, and still had not received any pain medication. This in spite of a pantheon of articles finding that pain medication either improves or doesn’t change the sensitivity of physical exam findings in patients with abdominal pain. Clearly, evidence-based medicine needs to be used more in clinical practice, but there are limits within the Emergency Department.

*In medicine one must pay attention not to plausible theorizing, but to experience and reason together... Conclusions drawn from unaided reason can hardly be serviceable.*

—Hippocrates

It is hard to believe that anything written now will have as much sustained relevance in medicine as the writings of Hippocrates nearly 2500 years ago. Prior to the advent of evidence-based medicine, medical practice was “plausible theorizing” based on a combination of knowledge of pathophysiology, clinical experience and common sense, a practice sometimes referred to as “authority-based medicine.” The practitioner arrived at a diagnosis based on history, physical exam and diagnostic reasoning, and when

the diagnosis or treatment course remained unclear, the clinician reflected on the applicable pathophysiology of the disease, or sought the counsel of a teacher/expert in the field. Historically, the “authority-based” approach led to significant improvements in patient care and treatment regimens; however, it also produced significant clinician-based variations in patient care.

Evidence-based medicine allows the comparison of different clinician-based treatment approaches and suggests which of them provide the best patient outcomes. Amongst the issues that have been examined is whether the use of analgesics in patients with abdominal pain masks the etiology of the pain. In fact, this issue has been addressed a number of times and the preponderance of evidence refutes the admonition against the use of analgesics in patients with significant abdominal pain.<sup>1-4</sup> The integration, albeit slowly, of this evidence and other evidence-based evaluations of clinical care has led to significant further improvements in patient outcomes.

Ever since the phrase “evidence-based medicine” was defined in a 1992 JAMA article entitled “Evidence-based medicine: a new approach to teaching the practice of medicine,” there has been significant pressure to integrate “evidence” into clinical practice.<sup>5</sup> This has led to a relative explosion of clinical diagnostic and treatment guidelines and algorithms in the medical literature. Concomitantly, residency programs have begun to actively promote evidence-based training as a way to optimize patient care. Prior to completely abandoning the teachings of “authority-based” medicine, however, it is important to remember that there are significant issues with practicing medicine from a purely evidence-based standpoint.

First of all, evidence-based medicine primarily focuses on the integration of randomized clinical trials and meta-analyses into clinical practice; however, not every clinical issue is significant enough to warrant a randomized clinical trial and other issues will never be examined in a randomized clinical trial for consent reasons. It is unlikely, for example, that a clinical trial comparing treatment modalities for chronic immersion foot in the homeless will ever be attempted, though

an informal survey of my senior colleagues would suggest multiple treatment options exist. The paucity of “hard” clinical evidence in these situations is worsened by the inability of evidence-based medicine to consider, evaluate and integrate other types of “soft” evidence, like case control studies, case reports, or professional experience. Utilizing this “soft” evidence, however, improves the care a majority of our Emergency Department patients receive, and needs to be integrated into evidence-based clinical practice and teaching in the future.

Secondly, even when a patient presents with a complaint that fits within an evidence-based algorithm, the recommended evaluation and treatment may not work for the specific patient or facility. Working in an urban Emergency Department primarily caring for the poor and indigent, it is clear to me that clinical trials don’t enroll many of my patients or deal with my flow issues. This issue is never clearer than when I review clinical decision rules addressing which patients with minor head injuries require a non-contrast head CT. Haydel et al. retrospectively derived and prospectively validated a series of decision rules for patients requiring Head CT.<sup>6</sup> Unfortunately, one of the findings correlated with a high risk patient was alcohol intoxication. Implementing this decision rule would permanently tie up one of our 2 scanners imaging intoxicated individuals with minor head trauma.

Similarly, Stiell et al. developed a “Canadian CT Head” rule to evaluate which patients with minor head trauma need a Head CT in an attempt again to cut down on the number of normal scans obtained.<sup>7</sup> Their rule was based on retrospective derivation of five high-risk criteria (failure to reach a GCS of 15 within 2 hours, suspected open skull fracture, evidence of basilar skull fracture, more than 2 episodes of emesis or age greater than 65) and two medium-risk factors (anterograde amnesia greater than 30 minutes and dangerous mechanism). While the rule is elegantly derived with excellent sensitivity and specificity for significant intracranial injury and manages to decrease the number of Head CT’s by at least 46%, I can’t use it as it is written. While it doesn’t require scanning all intoxicated patients, most of the chronic inebriates I take care of have evidence of minor head trauma of

unknown age or mechanism and often require more than 2 hours to get a double digit GCS, let alone a GCS of 15. If I followed either evidence-based decision rule, I would end up scanning nearly all of the intoxicated indigent patients in my Emergency Department at least once a day. In the end, my approach to these patients is an imperfect melding of evidence, experience and common sense.

Finally, there is a risk of “clinical paralysis” associated with practicing purely evidence-based medicine. I have had the pleasure of teaching a number of extremely intelligent residents, proponents of evidence-based medicine, who when faced with a complicated and critically ill patient are unable to decide on rapid, critical interventions. In talking with them afterwards, they report difficulty determining which treatment algorithm to apply in the absence of a complete “hard” data set. For example, the obtunded patient presenting with hypotension, a wide complex tachycardia and “high” blood sugar on fingerstick does not fall into any foreseeable or current evidence-based treatment algorithm. In order to apply and evidence-based treatment algorithm, one needs more data, but the patient needs intervention in order to survive long enough for you to get the data. Good “authority-based emergency medicine” training saves us in these scenarios by providing treatment algorithms which buy time for appropriate data collection.

Clearly, evidence-based medicine should be used more in clinical practice; however, the most important word in the statement is “more.” While evidence-based medicine has great potential to answer clinical questions, it currently only answers some of the questions and only addresses those answers within narrow populations. Clinicians need to integrate “evidence-based” and “authority-based” diagnostic and treatment algorithms in order to provide comprehensive care to patients within the Emergency Department. In the end, it is worth remembering the advice of the Roman statesman and philosopher Cicero, some 300 years after Hippocrates:

*Never go to excess, but let moderation be your guide.*

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## Rebuttal of Con

Chris Fee, MD

After reading both opening pieces, I am struck more by the similarities in our attitudes toward increasing the utilization of EBM in clinical practice than our differences. We do differ in our opinions of the utility of clinical experience and common sense (“plausible theorizing”). There are innumerable examples of how dangerous this approach to medicine can be. One could, through common sense and pathophysiologic knowledge, conclude that chest pain that does not resolve with nitroglycerine but subsides with administration of Maalox cannot be cardiac, but is likely to have a gastrointestinal etiology.

Many of our differences can be explained by failing to acknowledge the complete definition of EBM. Recall the full definition: “the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients.”<sup>1</sup> This does not imply that every medical decision must be supported by a RCT or meta-analysis. Clearly, not all clinical issues are significant enough to warrant a RCT. Many decisions necessitate the use of “current best” available evidence. If a clinical scenario exists that occurs frequently, presents sufficient risk to patients, and has no clear best approach, perhaps a study should be conducted. All it takes is a clinician/researcher with the interest, time, training, and resources. Other clinical questions will never be examined by a RCT due to ethical concerns, consent issues, or rarity of the event/illness. Thus, many of our

patients do receive care based upon “soft” evidence (the “best available” evidence). But do we truly know that “soft” evidence improves care of our patients, as my colleague states? The beauty of EBM is its dynamic nature and ability to evolve and incorporate new data as it becomes available. As we amass more information with time, we will have fewer clinical quandaries and less reliance upon “soft” evidence.

Every emergency physician understands the importance of throughput. However, this should not supercede providing appropriate care. EBM is rife with decision rules aimed at meeting both of these goals: the Ottawa foot, ankle, and knee rules, the Nexus and Canadian C-spine rules, Wells criteria for pre-test probability of deep venous thrombosis, and the Pneumonia Severity Index score to name a few. Correctly applying these rules may safely increase throughput by avoiding unnecessary tests and admissions.

My colleague unintentionally highlights another tremendously important component of EBM: one must know how to read, interpret, critique, and apply the literature. Is the study’s data internally consistent? Were the groups truly randomized? Were the statistical tools correctly applied and performed? Are the conclusions appropriate? These questions evaluate a study’s internal validity. The generalizability (or external validity) of a study must be assessed with

respect to one's own patients. My colleague identified a problem with external validity of the head CT rules with respect to his patients. His patient population is very different than those in the studies he mentions. Perhaps my colleague (or others) should study their population to formulate a more than "imperfect" approach to their care. We all know of patients like this who linger in a hallway awaiting "sobriety" only to find that they have a subdural hematoma. One must also be aware that data can be manipulated, resulting in misleading conclusions. The use of composite endpoints and survival to hospital admission (rather than hospital discharge) or other surrogate outcomes are cause for suspicion. Publication bias is yet another format for data manipulation (negative studies are far less likely to be published). This is one reason that meta-analyses are flawed.

Understanding how to safely and effectively utilize EBM in everyday clinical care does not come easy. EBM is a lifelong devotion. Clinical paralysis more likely results from a physician who is learning to integrate EBM into their practice. This seems to be more an issue of a clinician in training than a fault of EBM itself. "Good 'authority-based emergency medicine'" brings to mind all that is wrong with the old, paternalistic approach to medicine that undermines the EBM approach. The Clinicians for the Restoration of Autonomous Practice (CRAP) Writing Group sarcastically state that "proselytisation

[of EBM] is now occurring on a global scale and threatens the very existence of for profit, doctor centered, authoritarian medicine as we know it."<sup>2</sup>

Experience alone is not the answer, as the Choudhry article I noted earlier concludes.<sup>3</sup> Recent data shows that we have a lot of room for improvement when it comes to providing EBM-supported care to our patients and that improvements are attainable when treatment guidelines based on EBM are mandated and scrutinized.<sup>4,5</sup> It remains to be seen if adhering to these guidelines translates into reduced morbidity, mortality, and costs to the system. Despite our differences in approach to the topic, in the end, we both support the notion that EBM should be utilized more frequently in the clinical arena.

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