Essay on Evidence Based Medicine

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"It is difficult to get a man to understand something, when his salary depends upon his not understanding it[1]!" Upton Sinclair in The Jungle

All medical progress involves three stages: ridicule, violent resistance and finally, taken for granted.[2]

What is evidence-based medicine (EBM)[3]? It is a concept formulated to ensure that the very best information is used to make medical decisions. Everyone wants "good outcomes". Good means most benefit for least cost with a customer who is happy. The possibilities for discussion on "good" are endless, depending upon whose value system you put foremost. To an insurance company, good might be based on cost spent on outcomes. To the doctor, good might mean a happy client with regained good health. To the client, a doctor who listened, regardless of the outcome. To a hospital, the most revenue to help pay for the burden of the uninsured.

When one parses out each of those elements, one will come to the realization that at its core, EBM is a spiritual exercise in humility. Here is the crux. We humans like a comfortable groove and nestle in. When we get paid for that groove, all the better. The house of medicine has been held in high esteem for a century now because of the amazing miracle of antibiotics and immunizations. We health care providers are deeply trusted, and thereby rarely challenged in our comfortable groove of giving antibiotics and pills to treat illnesses. Is it the right thing? What about new drugs with toxicity? What about lifestyle medications? EBM is best used when it guides us in how to practice, with insight into how the guidelines and research was developed[4].

It is impossible to know everything. The human brain can only hold so much, and can only consider one point at a time, even when a list of contrary ideas is before us. The very nature of language is that it channels our thinking into singular points of reference. The total sum of knowledge is logarithmically unknowable, as each human being experiences the world differently. Until you realize that your patient is color blind, you may judge them for their errors in color understanding. New paradigms and conceptual constructs are constantly emerging to give us another

filter by which to judge quality. When evidence is categorized according to "type" of evidence, and the reader is given insight into the subsequent "strength" of proof, a layer of credibility is added[5].

We have all witnessed the ebb and flow of medical fashion, and medical myth. Queen Victoria had gout and went to Bath to soak in the hot springs to find relief. The nobility of England promptly all developed gout, and followed her. Only on exhuming skeletons 130 years later have we found that many of those Victorians were actually afflicted with lead poisoning from the consumption of expensive Port wine, made in Portugal with lead glazed bottles. But many were not. Gout was very fashionable.

The use of barbiturates in the 1950s for anxiety in women has been shown to have played a part in the death of Marilyn Monroe, one of America's modern goddesses. Only with the discovering of the cardiac ultrasound and the Holter monitor did we discover the phenomenon of mitral valve prolapse and episodic anxiety with the stretching of mitral leaflets. With new science, and new knowledge, the use of anxiety medication in women with MVP gave way to beta blockers. Then, with the advent of cardiac electrophysiology, more people with "anxiety" were found to need bypass tract ablation, resolving their anxiety by fixing abnormal cardiac electrophysiology. Massood Akhtar, at a tiny community hospital in Milwaukee, Wisconsin had the temerity to question prior "evidence" and founded the field of electrophysiology by refusing to accept traditional treatment of palpitations as sufficient[1].

This unpacks the core or what evidence-based medicine can and should do for us, the house of medicine. The journey of medical care should always be to aim for the source of the problem. We want to go "upstream" to the root cause. And that requires us to be restless in our questioning and unwilling to be constrained by prior tradition. Staring that journey always begins with an N of 1. At the same time, we are being paid for our services by someone who expects us to have their best interests at heart. We like that pay and in short order believe it is due to us. The inclination to be routine, to offer pablum as "standard of care" gets us paid, and the patient out the door with less than sufficient "evidence". Ask any primary care physician if they have ever tired of giving amoxicillin for otitis media, or sinusitis and you will see this in action.

[1] https://www.sciencedirect.com/science/article/pii/S0025712516311038

Hence, humility and curiosity. Evidence based medicine should be the goad in our comfort to be open to the new paradigms that we stumble upon. CIRS (chronic inflammatory response syndrome) is a new paradigm. Eddie Shoemaker has been a unique physician in that upon being confronted with new information about the use of an old-fashioned drug for diarrhea, he was confounded with unexpected data. A patient got unexpectedly cured of a mystery illness. An N of 1. And then an N=2. Following his instinct and the tools of published research, he assembled his 11-step pathway by keeping data and accumulating evidence. Expanding on an N of 1 to an N of 8,000 is a beginning, with thousands of new questions begging for resolution. His story is a classic example of the resistance new paradigms meet when the status quo, and the paycheck, are threatened.

He was humble enough to change his mind and start a journey of discovery, asking the question of why. Persistence and determination can look like pig-headed stubbornness to outside observers. But the core of evidence-based medicine is the accumulation of evidence, and changing one's mind, and changing one's mind in response to wherever that enquiry leads. That, is an inner journey of humble curiosity, with laser focus on the patient.

Changing one's mind. It's the mechanism by which every practitioner is willing to let go of prior sacred cows and allow a new paradigm of thought to infiltrate their comfort zone. Somewhat like putting on Blue Blocker sunglasses, wherein the world looks orange for a few minutes until the eyes adjust and enjoy the new view. When the evidence is before you, it is incumbent to be willing to think differently. Get out of your comfort zone and consider that your prior algorithm was wrong. Letting go is the willingness in one's own heart to admit to an error in prior ways of thinking, to acknowledge the world can look differently, and accepting a new paradigm. The joy therein is the deep satisfaction of finding something that works better.

The treatment of CIRS opens up huge opportunities for research. The new paradigm offered here is as broad as the discovery of antibiotics in its scope. Hidden in plain sight before us is adult depression, asthma, sinusitis, autoimmune disease, weight loss, chronic fatigue, ADHD, chronic pain, sleep deprivation, fibromyalgia, Alzheimer's all explained in part by CIRS. This may be 50% of the practice of medicine, in one stroke of the pen, a whole new world opened up.

That world is the innate immune system and the interplay of hypothalamic hormones. That is the upstream source that the discovery of the CIRS cytokine symphony offers us. Upstream from those hormones is the understanding of

inflammagen PAMP physiology. Upstream from that is the ecology of water damaged buildings. Upstream from that is the ……

The understanding of the mold cytokine pathophysiology opens up whole new avenues of opportunity to cure, prevent, ameliorate many illnesses by getting to their pathophysiological source. In the same fashion, this same type of enquiry may well merge with Dr. Stephen Gundry's lectin cytokine insight from foods that set off inflammation. Again, this is occurring in the arena of understanding the core physiology of our cytokines and innate immune response.

That brings us to the historical nexus we find ourselves at now. The journey of medical discovery is in three stages. First it is ridiculed, then resisted violently, then taken for granted. Where we are depends on how big a threat the world of medicine feels the treatment of CIRS presents to those whose salary depends on not believing what is before us. Organized health care, patterned into 15 minute blocks of time, with budgets and staff all dependent on adherence to a clock is deeply threatened by a challenge to its allocating a medical license to a particular single complaint. As physicians become part of networks, with medical directors and practice guidelines, economic incentives based on out of date guidelines become the inertia of tedious repetition. A multisystem illness can only be cared for as a series of single complaints. And the CIRS patients becomes opaque, completely invisible and completely ignored.

Back to EBM? What is it. "Evidence based medicine is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research."[i]

Evidence Based Medicine can be simplified into is a five-step process.

1. ASK the question: what is the best treatment for this malady?
2. ACQUIRE the information needed to treat the client via review of all sources available
3. APPRAISE the validity of the information, the size of the studies and the effectiveness of treatments. What are risk benefits. Are there controls,? Is it blinded? Are the numbers of subjects statistically valid?
4. APPLY the information in the most judicious fashion
5. SELF-ASSESS the process you have followed.[6]

The problems with evidence-based medicine are myriad. Not in concept but in the execution. Fake journals established by large companies with a vested interest in their outcome can generate low quality "research" that looks like evidence. Journals pressured to publish leading articles cut corners of editorial oversight. Large networks of physicians create hierarchies of leadership that inevitably become financially driven and rigidly oriented to pathways, often years out of date. Customer demand for seeming miracle cures allow inertia and income to drive the agenda. Hence, bypass graft surgery, bone marrow transplant for breast cancer and multiple other hugely expensive, never questioned therapeutic advances are never actually proven by 'Objective Evidence Based" data.

Vitamin D is an instructive example of another limitation. Chronic disease that requires decades of time to develop cannot be conducted with the design of a short term, randomized, placebo controlled trial. Many studies using 200 units of Vitamin D for 6 months have found no effect. But considering that a human being will make 1000 IU of D in a minute, in June, one has to consider that 200 IU is only 12 seconds of sunlight. How do you control for 5 minutes of sunlight? How do you control for the awareness now that Vitamin D requires a loading dose to achieve a new blood level? Or how do you account for the probability that some folks are resistant to Vitamin D and have dysfunctional Vitamin D receptors? Or, how do you account for the synergistic effect of Vitamin K2 to Vitamin D, and control for that if you didn't know about K2 first? Or how do you account for Vitamin D being part of a web of interactions, and then try to study it only in isolation without the rest of its supporting web? Each of these errors and research paradigm shifts have occurred with Vitamin D, And they give us pause as we see the same types of errors emerging in the critique of CIRS treatment.

Following this format for CIRS, one has to recognize that the 15 minute byte of time is laughably insufficient. But the CIRS pathway, as defined by 8,000 patients and the bravery of Mold Warriors who have challenged the standard of care many times follows exactly this path, getting to the real cause of the malady. Each step is not a step in isolation but part of a complete program dependent upon each of the prior steps being completely in sequence.

Starting with an N of 1, the new practitioner has to depend on the pioneer before who has put forward guidance and insight. But it is incumbent on the new practitioner to accumulate further data to justify their treatment and journey forward. As one accumulates an N of 100, one's one experience gains its own validity.

Conclusion. Evidence based medicine should be the relentless pursuit of truth using the best of statistical models to challenge our preconceived notions. It may work well for specific questions regarding specific single-intervention situations. Its utility becomes more difficult to realize when multiple variables are in play, and the chronic illness takes many episodes of exposure to develop. The physician of integrity will look first into their own heart and develop a sense of humility over prior sacred cows, and the temptation to be paid for the simple and routine.

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[1] Upton Sinclair, "The Jungle" ISBN-13: 978-0486419237

[2] Shopenhouer, 19th Century https://www.huffingtonpost.com/melissa-chu/the-3-stages-of-truth-in-_b_11244204.html

[3] Masic et al Acta Inform Med. 2008; 16(4): 219–225.

[4] Sackett DL, Rosenberg WM, Muir Gray JA, Haynes RB, Richardson WS. Evidence based medicine: what it is and what it isn't. *BMJ*. 1996Jan 13;312:71-72.

[5] Wikipedia: https://en.wikipedia.org/wiki/Evidence-based_medicine

[6] American Academy of Family Physicians. (2015). *Evidence-based medicine toolkit*. Retrieved from http://www.aafp.org/journals/afp/authors/ebm-toolkit/