Evidence-Based Medicine: Treating by Chance

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Evidence-based medicine is the basis for clinical guidelines and algorithms that is now considered a standard ruling for medical practice. The "evidence" refers to the results of large, double-blind, randomized clinical trials. That which is evidenced is the causal effect predicted for any action taken by the physician, and the algorithms reflect this: If the physician does this, then he/she causes that. From the probablities, the claim is that of numeric certainty of prediction.

This evidence is in the form of probabilities calculated for the findings of clinical trials, and the evidence claims scientific and numeric certainty in the probabilities. Because the numeric certainty applies to the group of patients studied, it is removed from the individual patient's case.

The current popular understanding of science is that it defines causation. Probability theory is the reigning theory of causation, and thus method of causal problem-solving, and medicine has adopted this method for clinical practice. The question asked is, "What is the probability that the patient has this or that, and what is probability of a given result of physician action?"

Why did medicine adopt probabilities as its guide for diagnosis and treatment? Why did a scientific theory overtake, or gain a place near-equal to the Hippocratic Oath as the guide for clinical decision?

Underlying this method of solution by probabilities is something more fundamental. Science in this form provides a dispassionate numeric, unbiased authority to any decision. The unbiased nature of the probability as an authority satisfies the view that truth for any action cannot be known perfectly. That is, the belief that the physician cannot ever know how to solve any problem without using probabilities. This is because the context for truth is a universe of Chance.

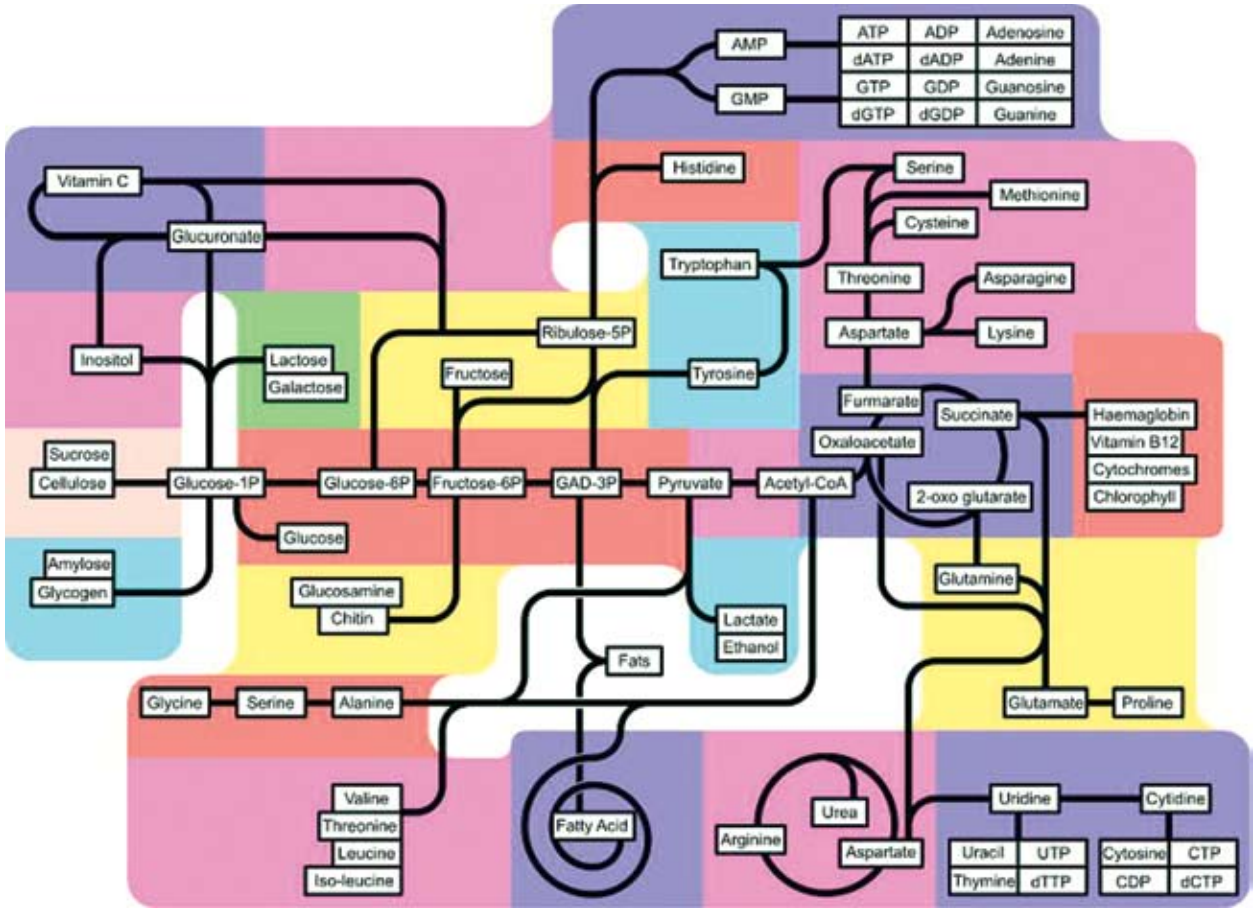
Thus, said in a different way, probability is a theory limited to the uncertainty of causation in a field of Chance. So, therefore, the fundamental underlying motive of evidence-based medicine is to satisfy the belief that no physician knows what he/she is doing, unless acting through probabilities of numeric certainty. If acting within a high probability, a failure to cure divests the physician of responsibility for the outcome, which then is due to chance—something outside the probability.

If acting within the probability, the in-

Measure	Definitions	How to calculate
Relative Risk (RR)	RR is how many times more likely it is that an event will occur in the intervention group relevant to the control group RR=1 means there is no difference between the two groups RR>1 means the intervention increased the risk of the outcome RR<1 means the intervention decreased the risk of the outcome	EER/CER
Relative Risk Reduction (RRR)	RRR is the reduction in rate of the outcome in the intervention group relative to the control group	(CER-EER)/CER
Absolute Risk Reduction (ARR)	ARR is the absolute difference in the rates of events between the two groups and gives an indication of the baseline risk and intervention effect	CER-EER
Number Needed to Treat (NNT)	NNT tells us the number of patients we need to treat to prevent one bad outcome	1/ARR or when the ARR is expressed as a decimal or 100/ARR when the ARR is a percentage

THE STATISTICAL METHOD OF TREATMENT

A sample table from the Centre for Evidence-Based Medicine at Oxford University, instructing physicians on using relevant information from randomized controlled trials. The acronyms in the "How to Calculate" column are CER for Control Event Rate, EER for the Experimental Event Rate, and ARR for absolute risk reduction. Here, statistics, not creativity, rules.



METABOLIC PATHWAYS: WHY STATISTICAL MODELING FAILS

Depicted here are the distinct metabolic pathways used by cells to transfer energy. This, not chance, is the interactive and dynamic physiology comparing the clinical context of medical expectation and forecast.

surance company or other interested parties potentially predict the outcome of millions of patients.

Clothed in a dispassionate but numerically certain and scientific approach to the patient, evidence-based decision now competes with the Hippocratic Oath. Medical ethicists claim that "to do no harm" means to follow the guidelines of evidence-based medicine. These physician or non-physician ethicists have not given up the Hippocratic Oath per se, but have folded evidence-based medicine into its territory.

Serving the Medical Oligarchy

This author was witness to the history of how this came to be. Evidence-based medicine came about so that a type of medical elite within academia—elite because they also claim the title of scientist—adopted the theory or method of determining causation for the purpose of prediction. Prediction carries the awe of the crystal ball for the patient, the certainty of an outcome of a gamble for the insurance company, and the authority of numeracy.

Because all physicians do not belong to the group of physician-scientists, the latter has become a type of oligarchy, which uses evidence-based medicine to control and judge the practice, certification, and continued licensing of all physicians. Those guidelines and algorithms written by the cadre of elite scientist-physicians make certain that the influence of the individual physician is minimized, by restricting his/her activity or decisions to those options provided by the probabilities of outcome determined from the large, double-blind, randomized trials.

These are physicians with a certain outlook on human ingenuity and creativity. Not only do they believe that creativity has no place in medicine, but they carry hatred and disdain for it, because in their limited view, it is not "scientific."

Killing for Chance?

But what drives the so-passionate push for evidence-based medicine? Passion suggests a purpose. What drives the physician who would deny a cancer patient or otherwise terminally ill patient a treatment which *might* work but has a low *probability* of working, and does so although the patient is requesting that therapy? Who is willing to kill for Chance?

In a Universe of constantly changing states of increased energy flux density,

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Doctors take the Hippocratic Oath, with its message that physicians should "do no harm." The statisticians of the large double-blind randomized clinical trials have not taken the Hippocratic Oath.

the physician must constantly improve the quality of diagnosis and treatment in order to improve the patient context within which disease occurs. This requires an understanding that it is within the context of living physiology, rather than Chance, that the principles and laws of life determine the results of any chosen action.

To improve the quality of medicine, creativity is necessary on the part of the physician. Creativity always involves the introduction of a new idea, a new intervention to the process. That intervention may be a new way of putting together the facts, other than that framework provided by probabilities, or a new thought object—for example, a new drug, new diagnostic technique, new diagnosis, or a treatment used in an innovative and expectedly successful way. A new method of problem solving.

This requires that the physician understand how his/her action will change the condition of the patient. This understanding is an expectation, and expectations lead to forecast. Neither expectation nor forecast carry numeric certainty. Nonetheless, progress at the bedside demands an analysis of expectation and product of forecast on the part of the physician

Creativity Is Not Allowed

But evidence-based medicine is concerned with prediction. Predictions are probabilities, and are calculated by the method of probability-based statistics. No additional factors other than those laid out for the purpose of the calculation of a probability against the empty background of Chance are allowed to enter the equation. No additional variables are ever allowed to enter the final calculation of the probability. Thus, creativity is not allowed to enter the diagnostic or treatment algorithm.

Instead of working within the context of Chance, the physician understands that the patient's condition, while measured by discrete observations, is really that of a continuum of changing physiological state. That state casts its shadow in the form of measured variables. The principles of this changing physiology must be tackled and mastered in order to forecast the effect of an intervention.

Because the physiologic state is constantly changing, new interventions are always required to gain a desired effect. Without creativity on the part of the physician, this cannot be achieved. Evidence-based medicine outlaws this creativity. As a scientific model for medicine, it guarantees a closed system of no progress.

The author's article "The Evil Intention of Evidence-Based Medicine" can be found here.

Detail from "The Doctor," an 1891 painting by Samuel Luke Fildes (1843-1927). Evidence-based medicine intends to eliminate the thinking process depicted here.