

The Scientific Method

Terry “R” Wood, DVM

Modern science places ultimate importance on “the scientific method”, and minimizes experience, common sense, and response to treatment.

In case it seems I am exaggerating, please hear an experience of a friend of mine. He was attending a human medical conference, and the theme was urging practitioners to ignore any methodology that had not had double blind, placebo controlled studies i.e. the “gold standard” of the scientific method of modern medicine. At the question and answer portion of the address, he asked a question challenging this concept. He asked the speaker about jumping out of airplanes with parachutes. He asked if it was a valid conclusion to use a parachute when exiting an airplane, at altitude, if no one had been pushed out of a plane without a parachute, at altitude, to determine if a parachute was an adequate means of surviving the fall. The speaker, a licensed physician who took the Hippocratic Oath at graduation, said, “yes, people should be pushed out of the plane, at altitude, to make it a valid conclusion.” My friend then asked if he understood him correctly, that he was advocating people should be killed to validate the scientific principle of jumping out of airplanes with and without parachutes, and the speaker answered affirmatively. He placed the scientific method over the conclusion a fourth grader could make, and even advocated needless deaths to uphold the scientific method. My friend reported the whole lecture hall got very silent, but no one stood to support him

There are many instances of modern medicines that have had double-blind, placebo controlled studies, that eventually had to be taken off the market or used with restrictions eg. fen-phen, Vioxx, Celebrex, hormone replacement therapy, etc. If the scientific method is so fool proof, why did the studies fail to discern the dangers of these drugs?

I also read about a study where an MD, PhD physician felt people presented to Level I trauma centers for treatment should not receive morphine for pain relief. He felt the physiologic downside of morphine outweighed the analgesic benefits. So, a double blind, placebo controlled study was written up, and half of the patients received saline and half received morphine for analgesia. Neither the physician nor the patient knew what they were administering/receiving. The study had to be stopped early on, because the study coordinator realized their death rate was skyrocketing i.e. every patient that received saline died, and every patient that received morphine lived. In this case, common sense won out, the study was stopped, and morphine was given to all patients for analgesia.

(The fact this even came up shows a lack of understanding of the importance of analgesia. I have seen an atlas of wounded survivors of the Civil War, and it is very gruesome. Many veterans had extremely serious and disfiguring wounds, traumatic amputations, etc and they survived. No antibiotics were available, and only the most primitive of surgical care was available, usually amputation of injured body parts without

the benefit of anesthesia. How then did these soldiers survive? Morphine, for pain relief. Laudnum was widely available, and it was used liberally. The phrase, “those that ignore history are doomed to repeat it” comes to mind.)

In the Middle Ages, it was common knowledge to suck on a purple rag if one had a sore throat. Why not red, yellow or blue? They didn't work! Now we know the aniline dye used to dye cloth purple is actually two sulfa molecules held by a chemical bond easily broken down by saliva. Therefore, people were actually bathing their throats in sulfa, and their sore throats got better.

A point I feel that needs repeating over and over is common sense needs to be employed as part of the scientific method. I think there is a place for double blind, placebo controlled studies. However, I think experiences-good and bad-should be given strong consideration in evaluating any given methodology. Many treatments are not understood well at all, yet they are employed because it is obvious they work. This means even in evaluating the scientific method, evidence-based medicine is the ultimate judge. Responsible investigators will stop a study if it is obvious too many people are hurt or killed by the study. They place human life and common sense over the scientific method, and ultimately use their judgment and experience to determine whether the “study” should be continued or not. I think this is how it should be!

Physicians and veterinarians are judged by the competency of their peers. This competency, or standard of practice, is based on the scientific method. In theory, this protects patients from charlatans and dangerous practices. In fact, this prevents patients from receiving necessary and adequate care. Physicians are loath to prescribe any treatment that deviates from the standard of care. If they do, they are liable for medical malpractice, and could end up losing their insurance coverage, and possibly even their license to practice medicine. Paradigm shifts are almost impossible to occur because of this. Patients are even brow beaten into accepting the standard of care, as the threat of loss of insurance coverage or possible arrest occurs if they dare to refuse a standard treatment and opt for a scientifically unproven treatment.

When I am discussing this with physicians and veterinarians who believe in the ultimate supremacy of the scientific method, they are quick to point out how the placebo effect can be the reason patients got better, and not the treatment itself. In effect, they would rather the patient stayed sick and possibly died, just to avoid any hint of the placebo effect. Many studies speak about the power of the human spirit in conquering many diseases and illnesses. Rather than fighting and downplaying the placebo effect, why don't we study it, and try to make it work for us on purpose? After all, the goal is to get our patients well, not just to validate the supremacy of the scientific method!

I have studied and used molecular minerals extensively in my veterinary practice the last ten years. I have seen many repeatable, positive effects from the use of molecular minerals. Since I am practicing on dogs and cats, I think the placebo effect can be thrown out, so it is not clouding the issue at all. However, when I talk with devotees of the scientific method, they discount my theories and experience entirely. They say they

are not valid treatments if I can't point to multiple double blind, placebo controlled studies. Neither I, nor the company that produces the minerals has the millions of dollars available to hire these studies done by recognized researchers in a research university setting. However, I did receive an extensive education that taught me to think, adapt, and do what I think is best for my patients. Veterinary medicine does not have the extensively detailed protocols human medicine has. We still have latitude to do what we think is best for our patients, while withstanding the test of comparison to our peers.

Fluid therapy is a great example of a principle where I am advocating a paradigm shift. I have found by using molecular minerals, I can use a fraction of the IV fluids I was taught to use. In fact, I am able to achieve optimal cellular hydration, while minimizing the consequence of overzealous fluid administration ie diarrhea, hypertension, cerebral edema, pulmonary edema, and increased cardiac workload. I was taught in veterinary school to calculate IV fluid based on pre-existing deficits, maintenance, and on-going losses. Then, blast the IV fluids into the catheter and rise for your ovation. I first heard of the problems of this thinking when I heard Dr. Rebekah Kirby speak at the 1994 OVMA meeting. She was advocating the use of hetastarch to try and overcome the problems associated with overzealous IV fluid administration. I then heard Dr. Steve Haskins speak about IV fluid therapy at the 2007 OVMA meeting, and I learned about the three fluid bins, and where specific fluids would go. However, my experience with molecular minerals put me "over the top" and allowed me a greater understanding of IV fluids, fluid shifts, and hydration. I utilize these principles in practice almost every day. For example, I had a parvo puppy go the emergency clinic one Sunday, and the owner dropped the puppy off at my office the following Monday at 8AM. The puppy had received aggressive, standard IV fluid treatment. However, when I observed his behavior, he was actually suffering from pulmonary edema, and could only breathe in the "sitting dog" position. I was very busy that morning, and had one of my assistants give a dose of molecular minerals orally, and within 3 minutes, the puppy was able to lie down, breathe normally, and go to sleep. When I was able to examine the puppy a couple of hours later, I pulled his IV catheter, and got him well with only 200 cc more of SQ fluids, and more oral molecular minerals. I have several articles detailing my principles in much greater detail.

In conclusion, I think physicians and veterinarians are more than automatons following recipes. I think they have the training to think and to modify treatment protocols to benefit their patients. I think they should be able to do this without fear of reprisals of medical malpractice and loss of licensure by their medical board. I also think patients should have the right to choose different practitioners and different treatments.

With this in mind, I am calling for a paradigm shift in IV fluid selection and administration, cellular hydration, and fluid shifts and hydration. I think it is time to realize there is a better, safer, and more effective way of administering IV fluids and achieving optimal cellular hydration. By embracing this paradigm shift, many immediate patient benefits can be achieved, and I welcome studies to further our collective understanding of this vital subject.

I am going to quote an article I read in the Thursday, June 5, 2008 edition of The Daily Oklahoman on page 8A. It is titled “Med school students seeking objectivity from drugmakers”, and it is reprinted from the San Francisco Chronicle, by Bernadette Tansey.

“SAN FRANCISCO -- Drug companies shower medical school faculty members with pricey dinners, free samples and other inducements to influence their prescribing patterns, an organization of U.S. medical students says.

Med students are trying to change that.

The American Medical Student Association issued its second annual report card this week on conflict-of-interest policies at 150 medical degree-granting universities.

California dominated the honor roll. The University of California, Davis; UC San Francisco; and UC Los Angeles captured three of the seven A grades across the country. But only 15 percent of U.S. medical schools made the top of the class with a grade of A or B, based on their adoption of rules such as barring drug companies from distributing lavish gifts to physicians.

Sixty of the schools, or 40 percent, got an F on the student association’s 2008 Pharm-Free Scorecard. But changes are coming fast, the med students’ group said.

‘At a tipping point’

“We’re at a tipping point,” said Rebecca Sadun, who is the director of student programming for the medical students’ association.

“Schools are beginning to realize the critical role they play in eliminating conflicts of interest and training future physicians to make evidence-based decisions.”

Dr. Neal Cohen, vice dean of the UCSF medical school, said he helped draft conflict-of-interest rules that have been in effect for about a year.

The aim is to assure both students and patients that the medical care provided is free of bias.

Student groups had a significant impact on the policies, Cohen said.

One student saw his mentor accept a \$100 dinner from a pharmaceutical company representative and promise to switch some of his patients to the company’s drug, she said.

Smaller gifts such as pens that bear a drug logo can be the most pernicious freebies because doctors are more likely to prescribe the product, Sadun said.”

This article appeared several days after I had written my rant on the scientific method. Needless to say, I was heartened to read the words evidence based medicine. I believe that is one of the pitfalls of the current system utilizing the scientific method. It is possible to do a Pub Med search and find many articles detailing scientific studies about certain drugs and/or procedures. However, the studies are focused on usually just one aspect and fail to detail possible problems, because that was not the focus of the study. Again, I think there is a place for these studies, but if evidence based medicine is employed, potential problems will be reported and not ignored.

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I would like to write the response I received from Dr. Brian McLaren, Queensland, Australia, after he read this article.

“First there are 5 ways of learning:

“At your mothers knee” – great for language, when you are too young to invent your own, but it introduces obvious variations.

“Trial and Error” – Great if the error is not fatal, but one tends to stop when one finds a system that works. This may or may not be the best solution.

“Instruction from an Authority” – this is OK if the authority is nonbiased and correct. Authorities always wear funny clothes e.g. priests, judges, army officers, medical registrars. In the 16th Century Francis Bacon called for an end to reliance on authority as absolute truth.

“Deductive and Inductive Reasoning” – An example of the first is: - Cold decreases fluid infiltration in injured body tissue (major premise). Oedema from infiltration occurs when an ankle is sprained (minor premise). Oedema from infiltration occurs when an ankle is sprained (minor premise). Application of ice will decrease ankle oedema following a sprain (conclusion). An example of Inductive reasoning is the reverse type of logic, developing generalizations from specific observations. It begins with experience and results in generalized conclusions that are probably true. No new information can be discovered, just the application of existing knowledge in a different reproducible way. However, the following statement, attributed to Gallen, illustrates the potential for abuse of logic. “All who drink of this remedy recover in a short time, except those who die, therefore, it is obvious that it only fails in incurable cases”.

“The Scientific Method” – This is supposed to be a systematic, empirical, controlled, examination of hypothetical propositions about the association among natural phenomenon. Although this is supposed to be the highest form of acquiring knowledge it is by no means infallible especially when applied to human behaviour.”