

Thinking Out Loud... The Discipline of Data, the Science of Care

“Six Sigma is the ultimate reductionist approach to the world. You get down to the genomic data file, the gene of a process, and what nucleic acids are involved in that. If you don’t narrow it to something manageable, you can’t get anything done.”

—Thomas Massaro, MD, Chief of Staff, Univ. of Virginia Medical Center

Elizabeth A. Evans

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Life is full of seeming contradictions. There are times when the rules of logic seem as strange as the ones Alice encountered in her Wonderland, when things appear topsy-turvy and out of kilter.

For example, is it not strange that a child of only eight years of age is able to control a 17-hand quarter horse to post and canter, and that the horse does so without hesitation? Is it not intriguing that intangible theorems accurately define and simplify our physical world with a sturdiness few of us encounter in our own lives? Is it not thought provoking that a patient, untrained in medical science, has the will to search for the origins of his/her symptoms and can often pinpoint a correct diagnosis with enviable accuracy? Is it not amazing that unseen genes, chromosomes, and DNA—the microscopic circuitry that defines who we are as we process ourselves in the physical world—are such powerful forces?

As we learn more about each, we potentially shed a therapeutic light on our common humanity, an underlying theme of the American

Society of Nephrology’s Renal Week 2003.

The Story of “Everyman”

In keeping with the theme of Renal Week, I present a true story of a young woman whose friendship I made in November 2002. It is the story of “Everyman.”

The woman is 28 years old, an artist and world traveler who had once been as fearless in her desire to explore other lands as she was ambitious to be a world-class artist. Between November 2002 and March 2003, however, something silently happened that affected her dreams. An invisible curtain drew soundlessly around her. She became semi-passive and neither planned her travels nor lifted a brush to paint a thought. Her friends were concerned and so was she.

During this time, she began a new journey with the help of those who could not speak... a bird named Charlie and a dog, Sadie, both pets of a friend, now her companions. She looked for steadfast rules that would explain what was happening to her. She roamed the Internet hoping to find clues. She

believed there was a cause for her new behavior.

After many months of research, she whittled down her diagnosis to two possibilities and presented them to her physician of 12 years. After studying her family history, going back two generations, her physician concurred that one of the diagnoses was highly probable and ordered the appropriate tests for the condition. The results confirmed my young friend’s diagnosis. She started the necessary therapy and began to regain her old self. Eventually, she revealed her symptoms and the results of her therapy to her grandmother, mother, and sister, as they, too, had experienced symptoms similar to hers over the years. They all now participate in a clinical study so that they can help advance our collective knowledge about this condition.

Part of this story is particularly poignant. One evening as we shared dinner, she declared that she had adopted an active role in her own care subsequent to seeing how members of my family addressed their medical information. She said that when she

observed our participation in our own care, she slowly began trusting herself to do the same. Taking our lead, she tapped reliable Internet medical resources and read respected medical books designed for the non-clinician. She rummaged through stacks of information and kept good records. She did not give up. Rather, she continued to hunt down the evidence she needed. She frequently and methodically reviewed her data and ultimately pinpointed the origin of her condition.

The Ultimate Reductionist Approach

In essence, her methodology, while simple, represents the “ultimate reductionist approach” within the clinical process—that is, the patient in search of evidence-based data to treat a medical condition, a method similar to the more complex Six Sigma methodology, which addresses variation within a process using evidence-based data.

What is Six Sigma? Six Sigma is a methodology that statistically measures the quality of each step within a process, the process being a proverbial “genomic data file” and each step a “gene.” A plus or minus of six standard deviations means that there are no more than 3.4 parts-per-million opportunities for failure to be produced—that is, defects-per-million opportunities (DPMO). Those using Six Sigma methodically incorporate its statistical findings into process performance, continuously measuring and analyzing the results and, when necessary, adjusting a step to optimize the process’ quality. The ultimate objective of Six Sigma is to eliminate as many defects from a process as possible.

Is there a connection between Six Sigma and the science of medical informatics? There is, and it is data... *valid, consistent, and complete data*. A scientifically engineered information system, such as the TIME® System (Total Information for Managing Effectively, AMI Healthcare Systems Group), provides a data-rich environment upon which Six Sigma can execute its statistical methods, where clinicians can analyze and measure data and clear away extraneous data, ultimately revealing an underlying process pattern.

Does this have a parallel to the science of medicine? Yes. When medical informatics assembles clinical data around domain processes, and the Six Sigma methodology interjects its discipline within diagnostic observations, therapeutic interventions, and results prognostication, we lay the foundation for statistically validated, evidence-based medicine.

Our company, Health Informatics, Inc., endorses a reductionist approach to information and champions data integration within clinical processes and across healthcare entities. We wholeheartedly maintain that validated data is the gene of the clinical information process and we aggressively blend it within the TIME System wherever and whenever it makes sense to do so. We hold it to be true that, when we infuse proven data into the care process, we tap a power similar to that which the theorem, the gene, the chromosome, and DNA exert in the physical world, and by so doing contribute to the quality of patient care, an objective of the renal community worldwide. **D&T**