

Centennial Thoughts

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IN THE PAST FEW YEARS I have looked forward to this issue of the *Rhode Island Medical Journal* (RIMJ), the first in its second century of publication. When I took the position as editor-in-chief in January 1999, succeeding the late Stanley M. Aronson, MD, the fate of the journal was uncertain due to cost concerns. It obviously has survived, a justifiable cause for celebration.

During this time, I've published columns that were written independent of the content of the journal. Most issues have a theme; for example, cancer updates, cardiovascular disease, hepatitis, etc., and, since the guest editors write an introduction, it obviated the need for an op/ed by me, who knows a lot less about the topic than these experts.

However, for this issue, I was asked to write something related to the symbolism of the 100th anniversary, perhaps looking back over the past century or looking forward to the next. While that might seem like an easy assignment, with lots of choices to focus on, it hasn't been easy for me. I am not a good predictor.

A few decades ago I confidently predicted that our insurance system couldn't get worse and would, at some point, have to improve. That prediction was miserably wrong as each year makes the last look better. At this time no one



knows what healthcare delivery will look like in the next year, let alone the next hundred. And while Martin Luther King famously noted that the arc of history "bends towards justice," I have been impressed that the arc of healthcare in the United States does not.

I do have some thoughts on the science and practice of medicine, though, having practiced through almost four decades of it. The status of medicine in 2017 strikes me as being much like the opening of *A Tale of Two Cities*, being the best of times and the worst of times, although, to be honest, not really the worst. Since science never goes backwards, any moment in time that we choose will be the best scientifically. Our knowledge in the medical sciences is astounding, although translating many advances to useful, applicable treatments has lagged. For example, the gene for Huntington's disease (HD) was discovered over two decades ago. There is now only one treatment approved for HD, a drug approved only recently, that has been around for decades, is now extraordinarily expensive and helpful only for controlling the chorea, a problem that is fairly minor compared to the dementia and behavior problems, and, probably not much better than drugs an order

of magnitude or more less expensive.

A large number of other disorders have had their genetic etiologies found, yet none of these advances have yet led to treatments. We have learned a great deal about Alzheimer's disease, but have not found any drugs of significant benefit for the symptoms and none for the disease itself, although we may be close. On the other hand, for many years monoclonal antibodies were developed

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that appeared initially to have little benefit but in recent times this technology has produced tremendous clinical advances and promises to deliver on the promise of "precision medicine."

Psychiatric medications have improved mildly over the past 6 decades but understanding of mechanisms has not. The greatest advances in stroke and heart disease have been the introduction of statins and the increasingly aggressive control of blood pressure and the use of low-dose aspirin. As always, public health investments produce the greatest rewards.

I believe that in the near future genetic technology will allow for precisely targeted treatments of inherited diseases such as Huntington's disease, various cancers, and other disorders that

have genetic etiologies. I expect that interventions will allow “bad” genes to be turned off, or “good” genes enhanced, depending on whether the disorder is a “gain of function” disorder (ie, the abnormal protein is toxic) or a “loss of function” disorder (ie, the abnormal gene leads to under-production of the necessary protein). Of course, I also worry about how the technology will be controlled, whether we will have rich people “ordering” genes for intelligence, appearance, personality, and creativity to be inserted into their baby’s genome.

While antibiotics have improved considerably, particularly for the treatment of viral disorders, the vast numbers of species of microorganisms and their rapid life cycle make their evolutionary speed a real challenge to the development of pharmacological interventions. The occurrence of HIV as a new disease, recent outbreaks of Ebola, or the memory of the great influenza epidemic of 1918 are reminders that we are likely to be attacked by new infectious disorders with novel implications.

Organs, even body parts, may well become replaceable. Not long ago an ear

was “grown” using the patient’s own cells. We might well enter an era when organ donations will be an historical footnote, a good idea, but primitive in its application.

I expect that we will get a lot better at making diagnoses. The increased resolution of imaging modalities, particularly magnetic resonance imaging (MRI), has been astounding. When I was in training, I can recall the famous chair of the radiology department joke about MRI, “the test of the future that will always be in the future.” That improvement is likely to continue although how that will alter our practice will have a limit. More important will be imaging modalities that will tell us about biochemistry and physiology. These are already here but are crude. Combined, these technologies may well produce the whole body scan from Star Trek, followed by computer-guided, robotic surgery or other treatments.

I don’t view this as a rosy future, however. Aside from the worries over genetic engineering, I have concerns about costs and their implications for healthcare, as well as what it will mean

to have an increasing and increasingly aged population. The threat of an overabundance of riches has Malthusian implications. The half full cup is also half empty.

The underlying concerns over the future of American medicine, and possibly the future of mankind, center on mankind itself. Our science is evolving at an ever-increasing pace, but humans are not. We are the same people, with the same limitations as our cave dwelling ancestors. ❖

Author

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