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Science and Conscience

Science gathers knowledge faster than society gathers wisdom.

–Isaac Asimov

A study reported by the National Institutes of Health on September 11, 2015 demonstrated such unequivocal results that it was aborted with 1 year left to go.[1]

The Systolic Blood Pressure Intervention Trial (SPRINT) concluded that achieving a target systolic blood pressure of 120 mm Hg reduced cardiovascular events by almost one third and death by almost 25% compared with a control group with a target systolic pressure of 140 mm Hg. This randomized clinical trial enrolled a sample of more than 9300 subjects, who were at least 50 years old, from about 100 medical centers and clinical practices across the United States and Puerto Rico. The study subjects were randomly assigned to either a control group—whose "target" systolic blood pressure was 140 mm Hg—or the experimental group—treated to reach a systolic pressure of 120 mm Hg.

In addition, the study results showed that older Americans treated aggressively to control blood pressure (120 mm Hg or less) experienced a decreased risk of stroke and heart attack without also increasing the feared risk of injury from falls associated with dizziness compared with the blood pressure target of 140 mm Hg.

One of my students asked, rather earnestly, "Why would NIH fund a trial on this scale to study something that seems so…intuitive?" It is a very good question. Studies have shown that hypertension is a prevalent, chronic disease in the US population and is the leading risk factor associated with stroke, ischemic heart disease, and kidney failure. These diseases, in turn, are the leading causes of morbidity and mortality in the United States. But when it comes to reducing blood pressure, if some is good, does that always mean that more is better? To cite one observer, "All these people had to do was ask my primary care doctor. She's treated my hypertension aggressively, largely with generic drugs. Seems to work well."[2]

This conundrum parallels a lot of today's politico-pop-culture rhetoric that frames the tension between autonomy of thought and global action. On the one hand, we have the physician who, through training and experience, knows what works and what does not for her own patient population. On the other hand, we have a US population whose health status compares unfavorably against that of other nations. Can we solve the problem of the latter using the tools and approach of the former?

Some deride the idea of population-based, public health approaches as socialism, with all its attendant negative connotations. It threatens the personal freedoms of medical professionals who have been trained to hone their knowledge empirically. Public health measures, managed care guidelines, and evidence-based protocols are sometimes seen as unwelcome, institution-driven, government-funded interference with the autonomy of professional practice. One only needs to live long enough with eyes wide open to realize how much we rely on science for the data-driven, high standards by which we thrive today. The public trust needs tangible, compelling evidence. This is why it makes sense to engage the professional rigor of an exhaustive clinical trial to validate whether reducing the target blood pressure of adults older than 50 another 20 points is a good thing.

Inexplicably, science seems to have met its match in today's contentious society. I cannot reconcile the optimistic joy of my Space Age childhood, when science was the hero of the day, with the rancor and anti-scientific sentiment that permeates the airwaves. Perhaps the greatest human achievement of the 20th century was the elimination of plagues through inoculation and vaccination. My children—knock wood—have never seen any of their peers suffer from polio, measles, diphtheria, small pox, or whooping cough nor been exposed themselves to the pains and risks of these highly contagious diseases. Through a combination of scientific investigation and sound public health policy, these once common and dreaded diseases were virtually wiped out in the United States in a generation.

Today, however, because of a perfect storm of fraud, media, and politics, there is a growing trend to ignore a century of life-transforming evidence and send children into the world without the defenses to fight these latent diseases. The initial benefit of herd immunity has provided a false sense of security to those who make this choice. Although massive, widespread vaccinations kept these infectious organisms largely out of our society, the protections to the unvaccinated are not absolute, particularly as more and more parents opt for the "freedom" to deny vaccines to their children. To what extent are "antivaxxers" reigniting diseases that most of today's doctors have never seen in practice? Even more frightening, what form might

these organisms take to get a foothold in a largely vaccinated population? How are these autonomous choices resulting in outbreaks that place society at risk? That unvaccinated children in developed countries are dying today of measles is a tragedy of global proportions.

Fluoridation is another area where scientific evidence is often ignored because the public health nature of the solution runs afoul of some communities' standards for non-governmental interference. Caries are the most prevalent disease in the world and can be passively ameliorated by adding a miniscule amount of fluoride to the community drinking water. Remarkably, a vociferous minority of Americans use the democratic process of municipal elections to block the implementation of this inexpensive, effective treatment to prevent infected teeth and their associated morbidity.

Within our own specialty lies the enduring challenge of how best to manage asymptomatic, disease-free wisdom teeth (third molars). Passionate advocates for third molar retention have described in graphic detail a patient who had a serious complication after removal of a seemingly asymptomatic wisdom tooth. Equally passionate are the advocates for third molar removal who brandish a panoramic radiograph demonstrating a large radiolucency around an impacted third molar and cite that as the key reason for removing wisdom teeth. Neither is correct. Empirical evidence, although compelling, is not a substitute for systematically derived scientific evidence.

We oral and maxillofacial surgeons have done our homework. With multiple studies using national data sets, the American Associate of Oral and Maxillofacial Surgeons leadership supports evidence-based guidelines. We recommend that third molars be evaluated by an oral and maxillofacial surgeon by the time a patient is a young adult to assess the presence of third molars and disease status and to discuss management options to ensure optimal patient-specific outcomes. Impacted teeth that demonstrate pathologic features should be managed operatively. In the absence of disease, patients can be offered the choice between extraction to prevent future problems and active clinical and radiographic surveillance.[3]

The inimitable Ben Franklin, while signing the Declaration of Independence, said, "We must, indeed, all hang together or, most assuredly, we shall all hang separately." The idea that we rely individually on a collective greater good is not a new one. By the 21st century, we should be comfortable with the notion that scientific discovery borne by inquiry, methodology, integrity, and rigor brings about actionable evidence. As a specialty and as scientists, we need to represent this standard to our patients and our communities. To deny scientific evidence is to imperil us all.

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References

1. Landmark NIH study shows intensive blood pressure management may save lives. Available at: http://www.nih.gov/news/health/sep2015/nhlbi-11.htm. Accessed September 22, 2015.
2. Armao M, Whalen J: Aggressive blood pressure treatment lowers death risk, study says. Available at: http://www.wsj.com/articles/aggressive-blood-pressure-treatment-lowers-death-risk-study-says-1441983946. Accessed September 22, 2015.
3. Wisdom tooth management. Available at: http://myoms.org/assets/uploads/documents/Ebook_Wisdom_Teeth_R.pdf. Accessed September 22, 2015.

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