VIEWPOINTS

The Convergence of New Technology With the Delivery of Health Care Services

J. Lyle Bootman, PhD, ScD

President, American Association of Colleges of Pharmacy
College of Pharmacy, The University of Arizona, Tucson

Submitted December 3, 2012; accepted December 9, 2012; published February 12, 2013.

Sometimes the most exciting developments don't make the big headlines. In early October 2012, at nearly the same time that the first presidential debate shook up the talking heads covering our national election and the tragic outcomes of errors made by one Massachusetts compounding pharmacy were becoming apparent to all, I spotted a story that received much less media attention but that was thrilling to me. The story was about the launch of the country's fastest genomic supercomputing platform. What made the news so reaffirming to me was not the fact that a new platform existed but that its purpose was to bring "genomic medicine into clinical practice by placing supercomputers in the hands of physicians at the point of care."

Probably before I comment further, I should disclose that the story mentioned above concerns a project undertaken by Dr. Patrick Soon-Shiong, chairman of NantHealth and the Chan Soon-Shiong Institute for Advanced Health, and that I am a founding board member of another entity which Dr. Soon-Shiong started, the Healthcare Transformation Institute. I have known Dr. Soon-Shiong for about 5 years and admire his innovation, determination, and enterprise in tackling some of medicine's biggest problems. But the news about the advance in genome analysis set off the best kind of prickles up my spine, not because of who is making it happen, but because, after what often feels like a long wait, it truly is starting to happen.

The "it" for me is the convergence of new technology with the delivery of health care services. This convergence, I strongly hope, will positively change many of the current problems we have in getting the right care to the right people. Let's look at the example above. The story is about NantHealth's broad collaboration with multiple groups, including a state insurance company, National LambdaRail, private telecommunications

companies, and premier semiconductor and computer companies. All of these players contributed to building a new supercomputer-based high-speed fiber network that cuts the time for genome analysis for cancer patients from 8 or more weeks down to an amazing 47 seconds per patient! Through supercomputing and wireless mobile health technologies, more than 8,000 practicing oncologists and nurses are now connected to the data. The new infrastructure has the capability to analyze 5,000 patients a day. This is the promise of genomics and pharmacogenomics starting to come to life in a meaningful way.

But what is even more important in the story is the fact that this critical genomics data clearly is making patients' lives better. Because these health care teams now have precise information about patients early in their treatment cycle, in the past year the number of cases where these doctors have made incorrect recommendations has dropped from 32% to virtually zero. This is an example of real personalized, patient-centered care. This is value in both outcomes and cost savings. This is a big advance, not just in medical treatment, but in the way medical care is delivered.

Another much simpler adaptation of how we're using new tools is the social network for health care professionals, Doximity. Because of federal HIPAA laws that require medical-grade security, health care professionals can't employ most social networks or e-mail for patient-related discussion. Doximity offers physicians and other health professionals, including pharmacists, the ability to engage in quick, HIPAA-compliant communications. My hope is that this and other medical applications will soon result not just in more information exchange among the experts and service providers, but also between patients and their doctors, pharmacists, and other team members.

As encouraged as I am by recent developments of technology making a significant improvement in the delivery of care and further empowering patients as members of their own health team, we as educators must

Corresponding Author: J. Lyle Bootman, PhD, College of Pharmacy, University of Arizona, 1295 N. Martin, PO Box 210202, Tucson, AZ 85721. Tel: 520-626-1657. E-mail: bootman@pharmacy.arizona.edu

seriously consider the impact these advances have for us and our students. As genomics data actually become much more accessible to clinicians and patients, pharmacists will need to be adept at incorporating pharmacogenomics into their daily practice. Are we providing our students with the knowledge and experiences they need as the landscape changes? Do students understand and appreciate both the complex science and the diverse technol-

ogies now transforming our health care environment? Are they prepared to counsel patients on the information revealed by genome analysis? And perhaps the most important question: How will we as academic leaders build the curricula that address the role that our graduates must fill? Collectively and individually, each of us must start today to develop the best practices that answer this imperative.