Harnessing the power of big data

By Joseph Conn | July 9, 2016

With the federal government spending tens of billions of dollars to push healthcare providers to install electronic health record systems, health information technology has been at the forefront of innovation in the healthcare industry for most of the past decade.

So it came as no surprise that the rise of health IT figured prominently in reader choices when they were asked which innovations are making the biggest differences in healthcare today—or will in the future.

Information technologies took three of the top five spots out of 31 possible choices. There were 543 respondents to the online poll. Each voter could make up to 10 selections in the poll taken to help celebrate Modern Healthcare’s 40th anniversary.

Electronic health records topped the innovations list, chosen by 53% of respondents. The internet ranked No. 3, chosen by 48%, and big data was No. 4, selected by 46%.

The intertwined healthcare payment/clinical reforms of accountable care and population health management placed No. 2 with nearly half (49%) of survey participants selecting them as a top innovation. Stem cell therapy ranked No. 5, with 43% of respondents choosing it.

An American Hospital Association survey shows 96% of U.S. hospitals now have an EHR. But even some of the biggest boosters of EHRs say they and other health IT systems are merely promising tools in a complex healthcare innovations armamentarium.

“We want to take advantage of all this data and make it applied at the point of care,” said Dr. Paul Tang, co-chairman of the federally chartered Health IT Policy Committee and chief health transformation officer for IBM’s Watson Health division. His firm’s goal is to harness the computing power of the Watson supercomputer and use big data to deliver actionable intelligence to EHRs for the purpose of population health improvement. “You can see how I’m wrapping in No. 2 and No. 4 to make No. 1 more potent,” he said of the survey responses.

There also were dissenters. EHRs, while significant, shouldn’t have been ranked first, according to Dr. William Bria, chairman of the Association of Medical Directors of Information Systems, a professional organization for physician informaticists. While he has been promoting their use for decades, he said he believes the poll overestimated the importance of EHRs to healthcare because patients weren’t surveyed. “No one is going to throw it (the EHR) away,” he said. “But to say the EHR is the alpha and the omega—no, it’s not.”

As healthcare moves toward more patient-centered care, Bria said, the importance of the EHR will fade and other technologies will become more useful. Bria cited devices that monitor, support and advise the patient, or secure provider-patient communication tools. “The internet has won the battle,” he said. “Everybody’s got access to it. The idea is we’ve got to directly communicate with the patients with it.”

Historically, innovation in medicine has centered on scientific discovery, said Dr. Harry Greenspun, managing director at the Deloitte Center for Health Solutions, a consultancy. “The striking thing about the (survey) list is the prominence of data—captured electronically, flowing among diverse stakeholders, analyzed thoughtfully, shared with patients, emanating from devices and empowering consumers,” he said.

The ability to transform the health system into one that can deliver evidence-based, patient-centric and value-driven care “hinges on successfully obtaining and harnessing data,” he said.

Dr. Margaret Collins is a professor of pathology and pediatrics at the University of Cincinnati and a pathologist participating in the Consortium of Eosinophilic Gastrointestinal Disease Researchers, a project of the National Institutes of Health. It tracks the causes and treatments of a GI tract disorder...
that’s fairly rare—1 in 10,000 Americans has the esophageal version—in which an overload of a particular type of white blood cell irritates and inflames the lining of the esophagus, stomach or colon or combinations of them.

The project is using Dropbox, a popular, internet-based file-sharing service. It’s been adapted to exchange PDF-based tracking forms and digitized pathology “slides” of tissue samples taken from the GI tracts of the study’s patient volunteers. With Dropbox, the files can be exchanged among nine participating research organizations across the country.

The way similar research projects are typically conducted, Collins said, is pathologists box up and carry their own slides, and share them at periodic, face-to-face meetings. Or, she said, the slides can be mailed to researchers between meetings. Both methods are suboptimal. Travel takes time and money. “It’s disruptive to the pathologist’s life, but it gets pathologists looking at the same slides at the same time.” Mailing slides gets expensive, too, she said, and “it also can result in the loss of or damage to the slides.”

The new method also depends on digital imaging, still fairly new in pathology. It’s good enough for research, but not yet approved for clinical diagnosis, Collins said. “I think in the next couple of years” it will be, she added. “The images are better and better every day, and the software gets better and better.”

For file sharing, however, the internet-based service is ready for prime time. “We’ll have multiple images of multiple pieces of tissue, a lot of data, so Dropbox for this is perfect,” Collins said. “The images (from participating researchers) are picked up here by one of our scanning technologies and are picked up by our pathologists very easily. It’s so intuitive. Once you’re shown how to do it, it’s just click and drag and drop. It doesn’t get easier than that.”

Dr. Marc Rothenberg, who heads the project as director of the Cincinnati Center for Eosinophilic Disorders at Cincinnati Children’s Hospital Medical Center, said several of the top 10 innovations chosen by Modern Healthcare’s readers are already having a major impact.

“I was recently asked about using big data in my research, and I realized that any cutting-edge research going forward will be imbedded (with) various forms of big data,” Rothenberg said. “The days of looking at single variables is over.”

The use of genomics to support cancer treatment is just one of many uses for genomics in the diagnosis and treatment of other disorders, he said.

“We have taken a similar early approach to probe and treat eosinophilic esophagitis,” Rothenberg said. It uses an innovative technology called EoEgenius, which reads a patient’s genetic code to aid clinicians in making a diagnosis of eosinophilic ailments.

The single biggest innovation “is actually the core business model of healthcare itself,” said Dan Michelson, CEO of Strata Decision Technology, a Chicago-based healthcare financial analytics firm. “The shift from making money by driving volume (and) growing the top line to making money by driving value-based (care) and the move to a capitated or bundled model for (payments) is a truly stunning shift. While we are still in the first inning, it has already changed the mental model and affected the investments of all of the major players.”

Soaring healthcare costs and, in turn, consumers’ impact on healthcare will be driving innovation as well, he said. Michelson points to the latest report by Milliman, the actuarial consultant, which pegged total average healthcare spending of a family of four this year at $25,826. Costs, according to the Milliman index, have tripled in the last 15 years.

“Clearly, this is unsustainable,” he said. “On the patient side, high-deductible plans are already driving patients to ask questions about price,” and that will create another innovation—“price transparency,” he said.

Healthcare IT entrepreneur Dr. Bertina Experton sees five of respondents’ top 10 selections—the top choice, EHRs, along with No. 2, accountable care and population health; No. 3, the internet; No. 4, big data and No. 8, wearable technologies—as an integrated whole.

“There is a new place for the healthcare consumer,” said Experton, CEO of Humetrix, a developer of mobile healthcare apps for healthcare providers and consumers. “The subscript is you can share your data—it’s not just that it’s in an EHR. The internet enables consumers to send and receive their information, while mobile devices afford them the means to store and create data.

“When we talk about value-based care and payment reform, (it) relies on a flow of information everywhere,” Experton said.

“A patient has access to that full flow of information, and then the patient is best-positioned to tell the providers where they have been and where they’ll go next.

“Even when you talk about big data, it implies access to small data from the individual consumer—and that requires consent of the consumer,” she said. “When you have technology touching the patient, whether it’s a mobile app or a tracker, you can really have patient-centered care and push that information back to the provider.”