Five questions: The recognition of clinical informatics as medical sub-specialty

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Clinical informatics, a field at the intersection of clinical medicine and information technology, has reached a new milestone: Physicians can now become board-certified in this medical sub-specialty.

Christopher Longhurst, MD, who is the chief medical information officer at Lucile Packard Children's Hospital Stanford and the leader of a new Stanford clinical informatics fellowship training program for physicians, talked with science writer Erin Digitale about this field's history and where it's going.

Q: First off, what exactly is clinical informatics?

Longhurst: In clinical informatics, we leverage information technology to improve outcomes for patients. Research has been done in this area since the 1960s and '70s, but what's different now is the ubiquitous nature of computing devices. Everybody has access to information and communications technologies. The majority of U.S. hospitals are implementing an electronic health record.

And yet electronic health records are not something most front-line doctors are really excited about—they can be seen as disruptive to the patient-care process. I really think we have yet to deliver on the promise of electronic health records. There's a tremendous opportunity to use data in those records to build a health-care system that can make personalized care recommendations and automatically learn from

patients.

Q: How is clinical informatics changing the way that medical discoveries are made?

Longhurst: The idea when I was in grad school was that randomized trials were the gold standard for medical evidence. But, increasingly, people are recognizing that this "level A" evidence is cost-prohibitive to generate. And the subjects are so narrowly selected that the results are not always generalizable. I know what medication to give a white male in his 50s because of high blood pressure, but what if I have a different kind of patient?

So a lot of people are advocating for a shift away from traditional trials toward using enormous, anonymized data sets gleaned from existing electronic medical records. The idea is that you can make valid conclusions based on retrospective research if the data set is large enough.

That's why we want to create a "patients like mine" button in every electronic health record that would essentially allow real-time comparative-effectiveness studies. Then, if you're treating a 40-year-old, half-Vietnamese, half-black woman for high blood pressure, you can instantly generate a similar cohort and see which medications have provided the best outcomes for those patients. It's a really exciting concept that has already been used once at Lucile Packard Children's Hospital Stanford to help make a treatment decision for a child with a rare autoimmune disease.

A "patients like mine" button would also help us start to understand what questions doctors ask. Today, we don't always know the information needs of physicians. If we start to collect this meta-data, we can better

focus randomized, controlled trials so that they match doctors' biggest questions.

Q: How does Stanford lead the field?

Longhurst: Stanford is often considered the place where clinical informatics all started. The father of this field, Ted Shortliffe, MD, PhD, was a graduate student at Stanford when, in the 1970s, he wrote a software program called MYCIN to make decisions about prescribing antibiotics. MYCIN performed better at those decisions than your average internist. Shortliffe came back to Stanford in the early '80s and founded the division of medical informatics, now the Stanford Center for Biomedical Informatics Research, starting the master's and PhD programs.

More recently, we have a really solid history of finding unique ways to use and study electronic medical records: In addition to making a treatment decision for a patient with a rare disease, we've provided automatic daily updates to parents whose infants are hospitalized in our neonatal intensive care unit, reduced unnecessary use of blood transfusions, assisted in selecting the appropriate IV fluid to give to kids and more, all under this one umbrella.

We have nine physicians who received the new board certification, placing us among the largest programs in the country.

Q: Why was this formal recognition of the field as a medical sub-specialty needed?

Longhurst: In the past, there was never a formal approach to ensuring that physicians were adequately trained in clinical informatics. Creation of the sub-specialty allows us to standardize elements of training, create

training opportunities and create a recognized credential for people seeking to hire in the field.

Q: What's the role of Stanford and Lucile Packard Children's Hospital Stanford in educating the next wave of clinical informatics specialists?

Longhurst: We're establishing a two-year fellowship to train more doctors. The unique thing about clinical informatics as a board-certified sub-specialty is that physicians from any specialty can pursue subspecialty training; physicians from a huge variety of backgrounds have expressed interest in our program.

We're really excited that the fellows will have hands-on opportunities to work in a variety of settings in the IT groups at Lucile Packard Children's Hospital Stanford, Stanford Hospital & Clinics and the Stanford University School of Medicine. We're also partnering with Kaiser Permanente and the Palo Alto Medical Foundation to provide opportunities for fellows to see community care networks, and with HP Labs for an industry opportunity.

Stanford's location in Silicon Valley and the partnership we have with industry, particularly HP Labs, is another factor that makes our fellowship program stand out. An unrestricted grant from HP to Lucile Packard Children's Hospital Stanford for fellowship training has already enabled us to support the development of a quality and safety dashboard for caregivers that can automatically alert us to a variety of potential problems in patient care.

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