After the Fact | Setting the Records Straight: Your Digital Health

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TRANSCRIPT

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Dan LeDuc, host: Chances are your doctor's bedside manner now includes a laptop. These days, medical records have gone electronic. The shift is transforming modern medicine—and promises to make it faster and more efficient. But as with anything involving technology, there can be glitches.

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For The Pew Charitable Trusts, this is "After the Fact." I'm Dan LeDuc.

Our data point for this episode is 96.

A study from the U.S. Department of Health and Human Services and the American Hospital Association found that 96 percent of hospitals used electronic health records as of 2017. And that number is up from 72 percent of hospitals in just 2011.

But the road from paper to electronic health records has been bumpy. Files get mismatched—mothers can get their daughters' records, or sometimes even total strangers'. And other problems can make for incomplete records or doctors or nurses entering information about you incorrectly, or even prescribing the wrong drug or dosage.

Just about nobody wants to go back to the days of handwritten records, but for the promise of electronic health records to be fully realized, there's still a lot more to be done. We'll get into a clinic later in this episode to learn more, but first we sat down with Ben Moscovitch, who heads the health information technology project at Pew.

Dan LeDuc: *[To Ben]* Electronic health records seem to have really become ubiquitous just in the last 10 years. What drove this new technology, and what did it replace?

Ben Moscovitch, project director, The Pew Charitable Trusts' health information technology initiative: Congress in 2009 passed the HITECH Act. And what that did was,

it provided billions of dollars to hospitals and doctors' offices to upgrade their systems from paper-based records to digital ones—to essentially transition from paper records that are stacked in files in the back room of a doctor's office to a series of electronic records with the aim that capturing patient information, their medications, their problems in an electronic format would better enable the exchange of this information across the different clinics where providers get care.

Dan LeDuc: And I mean, in this day and age, it seems like it makes perfect sense. Right? We're in a digital world. What are some of the additional advantages in terms of what our electronic records offer? When I travel and if something happens to me, can they be accessed? Are they just more up to date because they can be maintained electronically?

Ben Moscovitch: The vision that Congress had for electronic health records was to enable patients to get their information more easily, to enable clinicians, doctors that are taking care of the same patient to better share information, and to enable the more efficient ordering of medical interventions, like drugs, in a safer way for patients.

The challenge is that while certainly strides have been made in those areas, we haven't yet realized the full potential of EHRs. And that's because different electronic health record systems are not effectively communicating with one another, and there are still some challenges with the design, implementation, and customization of these systems, which can both lead to burdens on clinicians but also introduce some patient safety risks.

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Dan LeDuc: To get a closer look at some of those risks, we headed to MedStar Health's simulation center in Washington. Raj Ratwani is director of MedStar's National Center for Human Factors in Healthcare. He showed us around.

Raj Ratwani, director, MedStar Health National Center for Human Factors in Healthcare: This is one of our simulation centers. It's about a 4,000-square-foot simulation center. What we do here is a lot of testing of electronic health records. And what we look at specifically is, how do we integrate that technology into the clinical environment so that our physicians, nurses, and other clinicians can use it effectively, safely, and that our patients are treated well during that process?

Dan LeDuc: We're walking around here, and this looks like a small clinic.

Raj Ratwani: It does.

Dan LeDuc: I see beds, I see all sort of equipment we see when we go to hospitals, with screens and tubes.

Raj Ratwani: Yeah.

Dan LeDuc: What's the purpose of the screens? Because I'm guessing electronic health records, that's where they're going to show up, right?

Raj Ratwani: Yeah. So the facility is used for all kinds of testing with our clinicians. And specifically to electronic health records, what we do is, we essentially, as you described, set up a little clinic and a small patient room. So what we're looking at here are three different patient bays. And within each bay is typically a patient bed, we have a mannequin there, and then the computer set up, which is now how most of the care is delivered, is using electronic health records. So you'll see the computer technology, and we might also have some other technologies that we use to collect vitals and other diagnostic machines. And what we'll do is we'll set it up such that we can have a clinician, in one scenario, working on the computer in the patient room, to see how that kind of interaction goes. So if we have electronic health records set up in the patient room, how are they communicating with the patient? Can we make sure that they can safely use the electronic health record while also giving appropriate attention to the patient?

And what we've seen in many instances is that a lot of our clinicians are directing a lot of their attention to the computer, partially from usability challenges. Because it can be hard to interact with the computer, they have to focus on that more. And they are starting to pay less attention to the patients and losing that human touch and that human element.

Dan LeDuc: I'm guessing doctors don't like that.

Raj Ratwani: They absolutely don't. Doctors don't like it. Most doctors—I'd say 99.9 percent of them—came into medicine because they care about patients and want to spend time treating patients. Same with nurses, same with other clinicians. So as soon as we introduce this technology, which has lots of benefits, we also have to be thinking about how that might distract our clinicians and taking time away from the patient. So what we do is we actually set up different scenarios to look at how time with the patient might change based on where the electronic health record is actually placed. So what you're seeing now is the computer in the patient room in this particular bay. This particular setup has the computer on wheels, so we call that a workstation on wheels, and the physician can move that around. So they could use it there, and then you see them sort of tucked in the corner, out of view of the patient, but you might imagine them rolling that forward. And you could even turn it into sort of what we call a

pilot/co-pilot setup where the patient and the physician are looking at the computer together.

Dan LeDuc: Now, a generation ago, would a doctor just have had a pad of paper and written that down?

Raj Ratwani: That's right. They would have written that down.

Dan LeDuc: Okay. So they can still do that. And then they have to go out to the workstation here and type it in.

Raj Ratwani: And type it in, that's exactly right. And so there's advantages and disadvantages to that model. So one of the advantages is it's pulling the technology out of the room and might make the patient feel like they have more of that human element and that human touch back into the picture. The potential disadvantage is that you are now duplicating some work, because the physician is writing it down. There could be an error in that process of writing it down and then transcribing it back to the computer. So it introduces, potentially, a little bit more work and the opportunity for error. So one of the things we try and do is test out all those different models and see what works best for clinicians and, importantly, what works best for our patients.

Dan LeDuc: I think back as a kid—and I always thought that pharmacists were the most amazing people because they could read that scrawl that my doctor put on a prescription and sent me. Because I would look at it, and it didn't even look like English to me.

Raj Ratwani: Right, right.

Dan LeDuc: But all of that's being eliminated now.

Raj Ratwani: Yes.

Dan LeDuc: And actually, this is better.

Raj Ratwani: It is better.

Dan LeDuc: But there's 86 listings for one medication.

Raj Ratwani: Yes. That's right. In certain circumstances, there are. And I think that's a great example. You know, there were some errors associated with not being able to read that handwriting. That's been solved by electronic health records. And now in

certain circumstances, we have this new problem of really too much information. So how do we bring this down to being just the right information that our physicians need?

One of the biggest is usability. And when we say "usability," what we mean is how well can a clinician or a patient interact with the technology? And typically, we look at things like efficiency, effectiveness, satisfaction. Those are the three key pieces of usability.

So, efficiency is how much time does it take one to interact with the technology? Effectiveness is, can they actually accomplish their desired goal or their task with the technology? And satisfaction is, are you actually satisfied with it? And what we've seen is that sometimes the usability can be a real challenge, and that leads to a lot of frustration from our clinicians. And that contributes to things like burnout.

But it can also lead to direct patient safety consequences. So you may have circumstances—and we've documented, unfortunately, several of these—where the usability of this system might actually lead to some serious errors. It could be selecting the wrong medication, selecting the wrong patient, ending up with the wrong doses of a particular medication. And those can have very, very serious consequences for patients.

Dan LeDuc: Is some of that related to how the record itself is built? So that when the doctor puts in, "I've got a 14-year-old, and he weighs 110 pounds, and I need to have this much dosage." I mean, is all of that stuff—well, I would assume all of that sort of— all those criteria are accounted for in records, yet stuff can still go wrong.

Raj Ratwani: Yeah, it's a really challenging problem, because many of these usability challenges can occur at different stages. So we typically talk about this as being related to the different stages of design, development, and implementation. So design comes to—for our EHR vendors or developers that are creating these products—how do they design that technology? How does their development process unfold? And then, once that technology is actually purchased, how is it implemented?

So when we say "implementing the technology," what that means is the technology has to go into the clinical environment. And what often happens is it gets customized or configured in certain ways. So let's take this out of the medical world just to give a really concrete example. If you're using your smartphone, you might choose to have particular apps on there, and you might choose to organize it in some way that makes sense to you. Maybe all of your apps in one folder, maybe all of them out kind of laid up on that desktop, for lack of a better term.

I may want my information organized differently. So we may configure or customize our phones in different ways. So that brings in some variation when it comes to the usability of it. So usability really can come back to design, development, and implementation.

What's really important as we think about those different stages is ensuring that what's called a user-centered design process is used during those different phases. What user-centered design is all about is making sure that clinicians and patients, the way they think about the technology and the way they use it, is actually shaping the design, development, and implementation.

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Dan LeDuc: There's a lot at a stake. So I asked Ben what the government is doing to help.

Ben Moscovitch: Congress created the Office of the National Coordinator for Health IT, which is the federal agency that oversees EHRs. And one of the challenges with EHRs is that you're inherently having different organizations that aren't regularly business partners trying to communicate. And so how do you get these organizations to be communicating in a way that they can both understand? And that's where this federal agency comes in, and they can help set the rules of the road so that organizations that may be competitors or may not be inherently business partners can more effectively work together.

Dan LeDuc: Is that process working?

Ben Moscovitch: In some ways. There are new regulations from the federal health department that can address some of the barriers to the exchange of information. One way these proposed regulations do that is by setting standards for what are called application programming interfaces.

So we all actually use APIs probably every day. These APIs, application programming interfaces, are what allow travel websites to pull information from different airlines so that you can go to a single website and see different travel options and prices. That same approach can also be used in health care so that, for example, patients can aggregate their information on their smartphone from the many different hospitals that they may seek care.

Dan LeDuc: Are patients going to have a more active role in helping maintain their health information now?

Ben Moscovitch: APIs can certainly help get patients their health records so that they're informed about the medical care that they've received and can take appropriate follow-up action like getting a referral. APIs can also help clinicians and hospitals add new tools onto their EHRs that maybe their EHRs don't inherently have. It's much like an app store

on your phone. You can download an app onto your phone and use an app that a third party has developed. And that's what APIs can enable.

The second challenge with EHR interoperability is patient matching. So if Georgetown Hospital and GW Hospital want to communicate about the same patient because that patient wants their care to be better coordinated, how do they know they're talking about the same person?

I know I, for example, have moved a lot in the last 10 years or so, so there's different addresses for me in different systems. When people get married, they can change their last name. People also share information. There was one health system in Texas where they had more than 2,000 patients with the same name and a couple hundred of them also shared the same birthday—many of those records also likely refer to the same person.

Dan LeDuc: So, of those several hundred, we don't know how many could've been, yes, that is this all one person, and then how do you know if you've got the right one?

Ben Moscovitch: That's exactly right. And so the first key step to an interoperable health care system, one where data can be exchanged and follow the patient, is to know that you're actually talking about the same person. And currently, some research has shown that that fails about half the time.

Dan LeDuc: Half? That's a lot!

Ben Moscovitch: Yeah. One in two patients may not have their full record exchange. And so a clinician that is reviewing a record for a patient may, for example, not have access to a medication list or an allergy list and then prescribe a drug that the patient's allergic to.

The way patient records are matched today is through your typical demographic information: your name, your date of birth, your address, even your Social Security number. What we've found is that the Social Security number often includes typos, so you can't use it effectively to match records. Sometimes Socials can be stolen, so they can be used for fraud. And also, they're increasingly not captured in EHRs. So you're really relying on that basic demographic information, like name and date of birth and address. And even with those, typos can be entered, information can be changed because people move or get married, and a lot of other barriers.

What we've done research on is how to address some of those challenges. We did focus groups with patients, and what we heard almost to a person in our focus groups was that patients today are using their fingerprints, their face scans to unlock their phones,

go to Disney World, board an airplane on a daily basis. And so why can't biometrics also be used today to match their records?

Now, there's a lot of technical and privacy challenges to using biometrics for patient matching, but those are areas that we're exploring and seeing if there's any lessons learned from other industries where they are using biometrics already.

Pew has also done research on how the format of information can actually improve patient matching rates. Here's an example. When you log on to a website and order a package, often the website will convert the address that you type in into a different format, but the information is more or less the same. That format is one developed by the U.S. Postal Service. And our research has shown that simply using that U.S. Postal Service standard can improve match rates by 3 percent. So, for example, get match rates from 85 to 88 percent. And when coupled with a certain standard for last name, it can increase match rates by up to 10 percent, which could cut the unmatched records in half.

Dan LeDuc: Wow, that's amazing.

A lot has happened in 10 years, right? And we went from a law being passed to virtually every hospital and many major health care providers using these records. It happened really, really fast. So will the pace of change in the next 10 years, do you foresee it as— improvements coming as quickly?

Ben Moscovitch: We're at a turning point with electronic health records through these new regulations that the federal health department has released. And that's through what they're calling open application programming interfaces, which are standards-based APIs. Because these APIs will enable better extraction of data from the EHRs so that patients can get their information, so that new tools can be built on top of EHRs, and all sorts of other reasons. There's still a lot more work to do to focus on interoperability, and the effective exchange of data between different organizations, and to make sure that the usability of these systems can improve patient safety.

[Music fades in.]

Dan LeDuc: We have some great resources on this issue at our website, including a video with Raj talking about how doctors interact daily with electronic health records. You can check that out at pewtrusts.org/afterthefact.

 Thanks for listening. I'm Dan LeDuc.

Female voice: "After the Fact" is produced by The Pew Charitable Trusts.