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Engineering a healthier you

Northwestern University assistant professor using latest technologies to improve medical care

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Enid Montague is an assistant professor at Northwestern University Feinberg School of Medicine and an assistant professor in the McCormick School of Engineering and Applied Sciences. Her research is in designing health care systems and technologies that are based on the total patient.

Montague's latest work has been in trying to create electronic health record systems that, among other things, can take all the information we collect on ourselves — from apps and wireless, wearable devices such as those sophisticated pedometers — and make the data readily available to doctors.

Montague, 32, said applying engineering to medicine is a novel idea and a relatively new concept because heath care hasn't always been open to this type of innovation. I sat down with her recently; here's an edited version of our conversation:

Q: You recently published a study examining how a physician's eye contact affected a patient's outcome. It relates to electronic health records — and we'll get to that — but first talk about the study and what you found.

A: We found that when a physician made more eye contact with a patient, he or she was viewed as more likable and more empathetic. And less eye contact translated into the physician being seen as less likable and less empathetic. Eye contact was particularly important in new doctor-patient relationships. But if a patient had been seeing a physician over time, eye contact, while still important, was not as big of a deal.

Q: Why is this important in terms of electronic record keeping?

A: If a physician is constantly looking down at a computer to take notes, then that can affect the amount of eye contact he or she has with the patient.

For the study, we videotaped doctor-patient visits to see how patients and doctors communicated before doctors had to start using computers. We looked at nonverbal communications, such as even a pat on the back, and we wanted to take the really effective communication strategies and design systems that used the best of those.

Q: The computer becomes the third entity competing for attention. Is there an optimal amount of time for eye contact?

A: Yes. We can say that during a 15-minute visit, a doctor should make eye contact about 50 percent of that time. We've been trying to design systems that allow that.

Q: Why is eye contact or empathy important?

A: If you feel as though a person is empathetic to your needs, you might trust that person more, and trust is an extremely important part of the physician-patient relationship. It affects how the patient views the doctor's medical advice and whether the patient adheres to it. These days, patients view themselves as health consumers. They're looking for a certain type of experience. Some patients want the doctor to take a lead role in managing their care. Others see themselves as partners with the doctor in making a decision. Either way, trust is important.

Q: You've mentioned that you want to find ways for electronic record systems to communicate with devices such as the ones patients use to track their steps and monitor their calories and even heart rate. But a lot of people don't use these apps or devices because of big concerns about privacy. Is there anything being done to address this?

A: Researchers and designers are trying to learn more about what people want in terms of privacy. At the same time, they're working hard to make sure information is secure from one device to the next and to make sure it honors the person's privacy preference.

Another reason people don't use a lot of this technology is because much of it just isn't designed in ways to be easily integrated into people's lives. There are thousands of health apps, but many aren't very good. People try them for a few weeks but then drop off.

Q: What led to your interest in computers?

A: My parents were working-class people, and they worked a lot and kept me busy. My dad — I hate to say this because it's kind of sexist — would say he didn't know anything about girls. He didn't think we could play sports. So we worked on the computer a lot and played computer games and went to computer shows. It was the late 1980s, the early 1990s, and the Internet was beginning. All of this influenced my interest in computers and programming and started me to think in new ways.

Q: How does being a woman, and an African-American woman, in a male-dominated field affect what you do?

A: In some ways it's a bit isolating. But, although I'm an African-American woman, at any given time one aspect of who I am may be more important than another. For example, women in general tend to be the family member responsible for managing health information for everyone: their spouse, their children, their parents and even their spouse's parents. Some innovations in that area could be in helping those women manage that information more efficiently.

It's important to understand that there are people who have very different needs. Having a heightened awareness of people who might be considered "the other" and keeping that in mind when designing systems that work well for everyone is an asset.

Q: What's the next big breakthrough?

A: Technology is becoming more and more ubiquitous. We've seen technology get smaller and better at collecting more detailed information. There has been a lot of movement in wearable items such as bracelets, watches and bands that collect a lot of sophisticated information that can feed data back to you via your telephone or computer. I expect that to continue.

Q: It's an exciting time. What else are you working on?

A: It's too early to publicize, but I'm hoping to design technologies that all types of people can use, whether they're old or young or tech savvy or not. Usability is important. Even people who are tech savvy have trouble using some things that are not designed well.

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