PRINT-New blockchain technology allows patients to share personal data for medical benefits

Cryptocurrency is the new frontier in finance - opening new opportunities and possibilities. From funding budding entrepreneurs to helping Ukraine crowdfund its defense against Russia, it is disrupting finance on a global scale. So too is the platform used for those crypto deliveries – blockchain which has the potential to transform multiple industries, including health care.

John Vozenilek, MD., vice president/chief medical officer for OSF Innovation and Digital Health describes blockchain technology as an immutable ledger that records transactions and that leaves an indelible mark that shows every time a transaction has occurred. So, the ledger technology allows for enhanced security in the transfer of data and medical records for research, community collaborations, even ensuring the integrity of pharmaceuticals used by hospitals and medical clinics.

Dr. Vozenilek says data security and the permission-based use of protected patient medical information is the highest and best use of blockchain in health care. For example the chain allows patients to elect how their data and which kinds of information about them they'll allow for use in medical research. Those decisions could be made in advance, through smart contracts, and not through one-on-one consultations with providers about clinical trials.

"In our future state, if patients wanted to be made aware of a broad diversity of studies, they could elect to be available and they could sub-elect which pieces of data they would like to share. So, this allows us to do this type of *confidential* matching that exceeds our ability to do this in a one-to-one scale with a scale that can be highly automated.**"**

With blockchain, patients could self-select which types of data could be open. So for example, a diabetic could agree to allow their glucose meter and blood pressure readings to be available on the blockchain portal, but not their name, income, address or phone number. Dr. Vozenilek provides an analogy.

"The output of the patient experience would be smart contracts that would permit the access. It's sort of the key in the lock and the patient in our future holds the key to how that lock is opened."

Why would patients want to provide the keys to their personal, protected health information? Vozenilek says they could have a personal interest in contributing to research about their condition or because of their family history, they might want to offer support to collaborators trying to unlock information about the role of genetics and ancestry in a particular disease. Sharing sensitive data could provide insights to social determinants of health. And, there could be rewards for contributing to open portals where researchers could be provided access to make specific queries.

"There's a way in our proposed system that patient rewards, reward health and wellness behaviors. Getting to their doctor's appointments more readily; getting to healthier foods more readily – those are the types of rewards that we're considering."

Blockchain can ease and expand collaborations

Partnerships with community organizations to address patients' social determinants of health such as, food, transportation or income insecurity could become automated and much easier with blockchain. Data about patient needs outside of a medical office would no longer have to be shared in ways in which it's vulnerable to hackers. Instead, it could be securely shared on the blockchain to help OSF and other partners help patients help themselves.

"When it comes to discreet and sensitive patient data that's being shared for a good, mutually-shared beneficial purpose, and of course ours is the best health care outcomes for every patient who comes to

us, where we can partner with patients to allow them to open the locks to help us serve them better; that's where blockchain really excites me."

With a transaction that is more secure and tamper-proof, skeptical patients who can be convinced of the integrity of the blockchain might be more willing to participate in research, including those who are among diverse populations with a distrust of the health care system. Dr. Vozenilek hopes that will result in robust research which can help improve health equity.

There have been questions about the energy consumption to support mining for cryptocurrency such as Bitcoin that can be exchanged on a blockchain, and about the power needed for supercomputers to handle huge amounts of data and computations. Ultimately, Dr. Vozenilek believes blockchain can be environmentally sustainable by using platforms that distribute computing across many hubs, rather than using supercomputers.

"We want to partner with the platforms that are out there today that are really looking at environmental impact and ensuring that the energy consumption required is highly sustainable."

Organizations such as OSF HealthCare are rushing to understand how they can use blockchain-distributed ledger technology to innovate processes, products and transactions. OSF HealthCare will partner with universities to begin to envision strategy but it is also hosting an open LinkedIn webinar March 24 to gather input from anyone with a passion or interest in blockchain.

"We would also like to embrace the know-how that exists within our community. There are several members within our community and in our region who have thought really hard about how blockchain can change lives. We want to partner with those individuals and bring them into community here to see how we can use blockchain technology to advance the health care of our community."

For those interested in learning more or who want to contribute ideas about how to leverage blockchain technology to transform health care, you can register here for the March 24 LinkedIn live webinar.