

# Alberta Doctors' Digest

## From cryptocurrency to health records

In 2008, a severe global recession brought on in part by risky and questionable financial decisions made by large, reputable financial institutions shook our collective faith in centralized organizations to safeguard our financial futures. In response, an alternative decentralized form of electronic money was developed anonymously with the intent of shifting economic control away from large corporations toward [smaller individual players](#). Of course, we now know this electronic currency by its mainstream name, Bitcoin. Over the last decade, Bitcoin and its cryptocurrency derivatives have led to an astronomical interest fuelled presently by COVID-19 and the subsequent economic instability the pandemic has caused.

The term “blockchain” is often associated with Bitcoin and is sometimes mistakenly used interchangeably with cryptocurrency; however, they are not the same thing. Rather, blockchain is the foundational technology that allows cryptocurrency transactions to exist. Although blockchain technology is still relatively immature, it has brought massive shifts in how we view the previously unassailable roles of centralized banking and financial systems.

Even a decade ago, it would have been unimaginable that we would be conducting material financial transactions with virtually manufactured money. And today, despite all the rage of cryptocurrency, we still don't have a good understanding of its broader role in our society. Although perspectives are shifting, most people still view cryptocurrency as finicky, unstable and, most importantly, confusing. As comedian John Oliver describes, it is “... everything you don't understand about money, combined with everything you don't understand about computers.”

Despite this confusion, as of May 2021, Bitcoin alone had reached a staggering market cap of \$721.554 billion (give or take) with real world consequences that cannot be ignored despite our ignorance of its mechanics.

It is easy to draw parallels between our traditional health care systems and big, imposing financial institutions. Both systems are heavily government regulated and contain large amounts of restricted sensitive information on various databases. Currently, the responsibility of protecting personal health data lies with the health care provider and the organization they work for.

Typically, private information is held centrally within a local hardware platform or stored remotely on secure cloud-based servers. However, this system has created other barriers in terms of standardization with different platforms requiring different data points. The lack of standardization prevents compatible exchanges of information to other providers and often requires specialized software to interpret and extract the required information. Solutions to this situation currently include centralized government-regulated databases providing a common platform for standardized data. Although this

centralization allows for consistency and control of health information, it is also expensive to secure. Centralized databases make lucrative targets for malicious agents, with data breaches already commonplace and hackers making off with large swatches of valuable data at a time.

Unexpectedly, blockchain technology might be a helpful solution. At its basic core, blockchain serves as a decentralized record, helping to facilitate the exchange of secure information among members of a network. Each member can function as a node within the network and maintain a copy of the record, which is automatically reconciled as changes are made to it. Blockchain technology does not hold any personal information on its own; it is simply a way to verify the authenticity and credentials of an authorized user.

Currently, the primary focus of blockchain solutions in health care is to secure sensitive health data by leveraging the benefits of a decentralized network. An imperfect but adequate metaphor is akin to locking up your chocolate chip cookies in multiple jars and giving everyone a copy of a spreadsheet showing who owns which jars. When someone wants access to their cookies, ownership of the jar is verified by comparing copies of the spreadsheet, and the list is updated automatically once data is retrieved.

Decentralized networks in this way allow stronger patient-centered care by attaching access to medical records to a patient rather than a specific provider. This allows for better flow of health care information across patient encounters while giving patients more access to their own data. Responsibility of data security is also shared amongst all members of a network, which helps reduce the risks and costs on any single entity.

Some larger entities have been experimenting with blockchain technologies for the sharing of health data. IBM has been working on one such solution using their digital health passes in New York, which facilitate the verification of COVID-19 [vaccination status for travellers](#). The technology does not hold any health information on its own; rather, it facilitates the sharing of data in a reliable and trustworthy way.

Many, many challenges remain before blockchain technologies become feasibly and widely accepted in health care. However, these challenges are not insurmountable as the underlying technology continues to become more refined. World governments will also recognize a more urgent need to facilitate secure and efficient information transfers because accurate data around COVID-19 vaccinations and testing is paramount to global recovery.

For those interested in potential applications of blockchain solutions in a Canadian context, I suggest a review of a recent exploratory paper by [Cadoret et al \(2020\)](#). For those like me who are still confused about what blockchain is, IBM has put out an excellent 10-minute video highlighting the fundamentals.

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Editor's note: The views, perspectives and opinions in this article are solely the author's and do not necessarily represent those of the AMA.

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