

Blockchain & Smart Contracts in Healthcare

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Why Use Blockchain Technology in Health Care?

- Decentralization allows for uninterrupted data accessibility
 - Protects against phishing attacks
- Data anonymity preserves patient privacy
 - Patients are **only** identified by a cryptographic public key
- Append only nature of blockchain prevents unauthorized changes and improves data reliability
- Smart contracts can intelligently grant access to data based on a set of parameters



What Was Implemented?

- Implemented
 - Data pulling from json file
 - Data storage in blockchain
 - Public Key, Timestamp, Index, Condition, Insurance, etc
 - Simple user sign in authentication
 - Testing the patient blockchain
- To Be Completed
 - Smart Contracts to share patient data with authorized parties.

Sample Program Output

```
Enter Your Username:
admin
Enter Your Password:
password
User Authenticated!

Blockchain Verified!

Block 1!

Timestamp: 2021-02-08 03:16:17.648101
Index: 1
Public Key: 0475386968e9ef1ed25a80667d23d40199bc69144d98383154eeb6b523d97c4cbe4608dee5afb86eeee4fad8c08bb1ad98d2cca60cb8b138e8c0f2bff1162e324a
Condition: Peanut Allergy
Medications: Epinephrine Autoinjector
Appointments: 2/15
Insurance Provider: USAA
Hash: 19ae6e63165dd9949dc1284dd67a47faad51f8442139c4264ff7be8545b42ea0

Block 2!

Timestamp: 2021-02-08 03:16:17.649105
Index: 2
Public Key: 04c8ffcd1d610c6047408fd2362a26cce595ee60f6a36613feaaaf66ac7fa346a7bcdeeeb9e9b1891be2aa356aaea7de81fe326200c26691342b3429b3ba1092c68
Condition: Dust Mite Allergy
Medications: fexofenadine
Appointments: 2/11
Insurance Provider: Liberty Mutual
Hash: b3e7e70066fb8873887a4471a6e58104c736af3873faed573a8824f403776d7d

Smart Contract Created
```

Broader Applications To The Healthcare Industry

- Blockchain can revolutionize how health records are stored and accessed
 - If a server hosting patient data storage goes down, records can still be accessed
- The decentralized nature of blockchain protects against certain cyber attacks such as phishing
- Smart contracts can execute medical agreements immediately once authorized
- Public blockchains could provide clinical researchers with valuable data for evaluating the effectiveness of medical treatments