Application of Blockchains to Patient-Centered Health Records

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Patient-Centered Health Record

NOSH

Open Source Health Record

Cloned

Patient

Physician

NOSH Practice Health Record

Standards

* New Open Source Health by Michael Chen, MD
Patient-Centered Health Record

Sign-in and access

• Licensed professionals
• Standards-based EHRs
• Family and others

Single Sign-On and Trust
Blockchains for Non-Institutional Trust

- Single Sign-On
- Credentials
- Audit
- Authenticity
- Security
- Payment
- Sharing
Blockchains are a (Public) Ledger
Blockchains are a Ledger…
+/- forever (no deletions)
Blockchains for Non-Institutional Trust

- Single Sign-On - security
- Credentials - revocation
- Audit - tamper-proof
- Authenticity - tamper-proof
- Security - open source
- Payment - sophisticated cash
- Sharing - loss of control
HIE of One*

Patient

Physician

NOSH Patient-Centered Health Record

NOSH Practice Health Record

Multiple Public and Private Blockchains

* Health Information Exchange of One - hieofone.org
Use Case: Write a prescription
Prescription Steps

1. NOSH Patient-Centered EHR
2. Physician’s Tablet
3. Physician single sign-on
4. Add a medication
5. Decision support (for physician and patient)
6. Biometric signature
7. Compliance
8. Pharmacy access
9. Payment
10. Optional adherence and adverse event reporting app
HIE of One Timeline

2016
• NOSH Patient-Centered EHR based on FHIR, UMA, and OpenID standards
• Independent decision support at the point-of-care demo with GoodRx
• http://hieofone.org live
• HIE of One paper wins one of the ONC Blockchain Challenge awards
• Blockchain ID demo based on Ethereum pre-alpha uPort password-less SSO

2017
• NOSH 2.0 is tablet-friendly
• Public uPort 1.0 app is available
• Blockchain timestamps
• Compliance and verified credentials
• FHIR and HEART integration with standards-compliant EHR

2018
• Optional adherence and adverse event reporting app
• Clinical pilot underway
Experience

- Standards are essential for patient-centered, longitudinal health records
- Physicians have given up control of their professional tools
- Physicians and patients have no market power for HIT
- Regulatory capture of standards drives information blocking
- Institutions fear transparency and this harms security, slows blockchain adoption
- Most blockchain health projects still assume institutional control
- Most blockchain health proposals confuse privacy with security
- HIE of One traction in segments ill-served by current EHRs
  - Start with behavioral health and community services
Thank You!

7th Annual PPR International Health Privacy Summit
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