Identifying Patients Before We Treat Them: Replacing the Buggy Whip with a High-Powered Electric Motor

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September, 2018

Basic Principles

- We are aiming to identify biologic entities (people) - not collections of text.

- Unless one is comparing against a gold standard - a biometric - one has no way of measuring the quality of an “identifier”.

- In this talk, I compare low-quality text-mashing vs. high-quality biology-based measurements.

- I’m focusing on safety - not on security or access control.

- I’m not attempting to compare the accuracy and precision of various biometric tools or algorithms.

Who is the patient?

- The most critical component of any medical system is to robustly identify the patient with a biological anchor. Today, this means biometrics.

Common practice in hospitals: text-mashing

- Take a collection of text strings
- For example: name, date of birth, maiden name, home address, etc., etc.
- Guess if they match each other - the “master patient index”
- “Probabilistic matching”, “Deterministic matching” and many other recent techniques all rely on trying to collate (mash together) various collections of text identifiers.
- These techniques don’t reliably link to the true identity of the patient.

Why are hospitals/clinics so reluctant to acknowledge that they mis-identify patients?

- They don't recognize it as a problem:
- "Our staff is very careful!"
- "We double-check all our work."
- "We check two identifiers." (the JCAHO fallacy)
- "We don't *know* about misidentifications" – so they must not happen.
  - –One company advertises "error-free patient identification"
    - – but there has been no measurement of the error rate.
- An LA County CMIO – "Only a minority of hospitals are positively identifying patients – or securely matching blood transfusions – therefore, it is just a "nice to have" and I decided not to purchase that feature."

- The public would be aghast.

Is this your hospital's/clinic's view of patient identification?

- 

The radiation oncology center of this exclusive tertiary medical center opted- out of the clinic's biometric ID system.

- "We know our patients. - We don't need this ID system."

- In a few short months of oncology treatment, a single patient encountered two instances of potentially disastrous misidentification:
  - "We're going to treat this tumor" (but it was someone else's)
  - "We're set up to irradiate your hip and shoulder … But … you don't have shoulder pain ??"

We know who the patient is - don't we?

- The Buggy Whip: "We ask name, birthdate."
- How about driver's license? (but we are not expert at recognizing those photos)
- Or third cousin's favorite color?
- We may go to absurd lengths to create a network of text strings.

Shortcomings of Text

- Many patients have the same name.
  - 20,000 Maria Garcia's in our population
    - In some communities, Judy Sznetski is equally common.
- Spelling and pronunciation mistakes
- Providers assume that *if* the text matches, it *must* be the same patient.

MPI Mavens Claim:

- “Our really experienced admissions clerks can sort out which of the 20,000 Maria Garcias is sitting in front of them”
- BUT:
  - Many of our clerks are not “really experienced” - unfortunately, they are not paid executive level salaries.
  - They have a heavy workload, can’t take the three hours that may be necessary to sort out which “Maria” it is.
  - Language barriers and patient misunderstandings get in the way.
  - Even experts get tired.

Rate of Mis-identification

- Duplicate medical records make up 7%-10% of medical records in most hospitals.

- “We don’t make mistakes.” - so the hospitals don’t bother to measure the error rate.

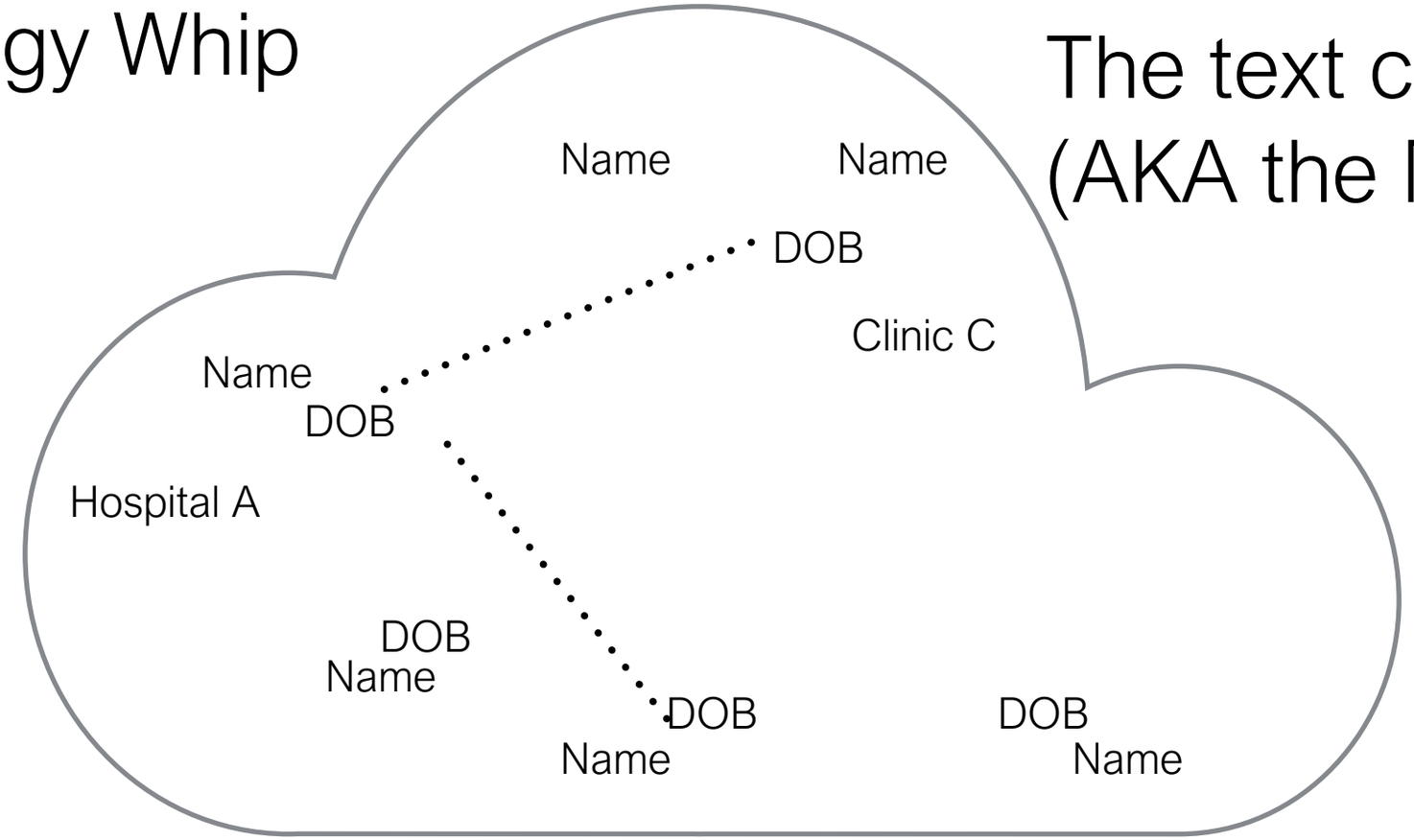
- Health systems - in an attempt to decrease duplicates - match a newly registered person with the wrong person in the database - an “overlay”.

- Systems spend millions of dollars to “clean up” their database- but they have no way of determining whether a putative duplicate is actually a duplicate - or an overlay.

The Master Patient Index

- Matches and hashes a bunch of text identifiers, to try to guess if patient identities match
- May decrease the number of separate entries in the database - but there is no definitive way of determining if these matched records are actually the same person - or a different person with similar identifiers.

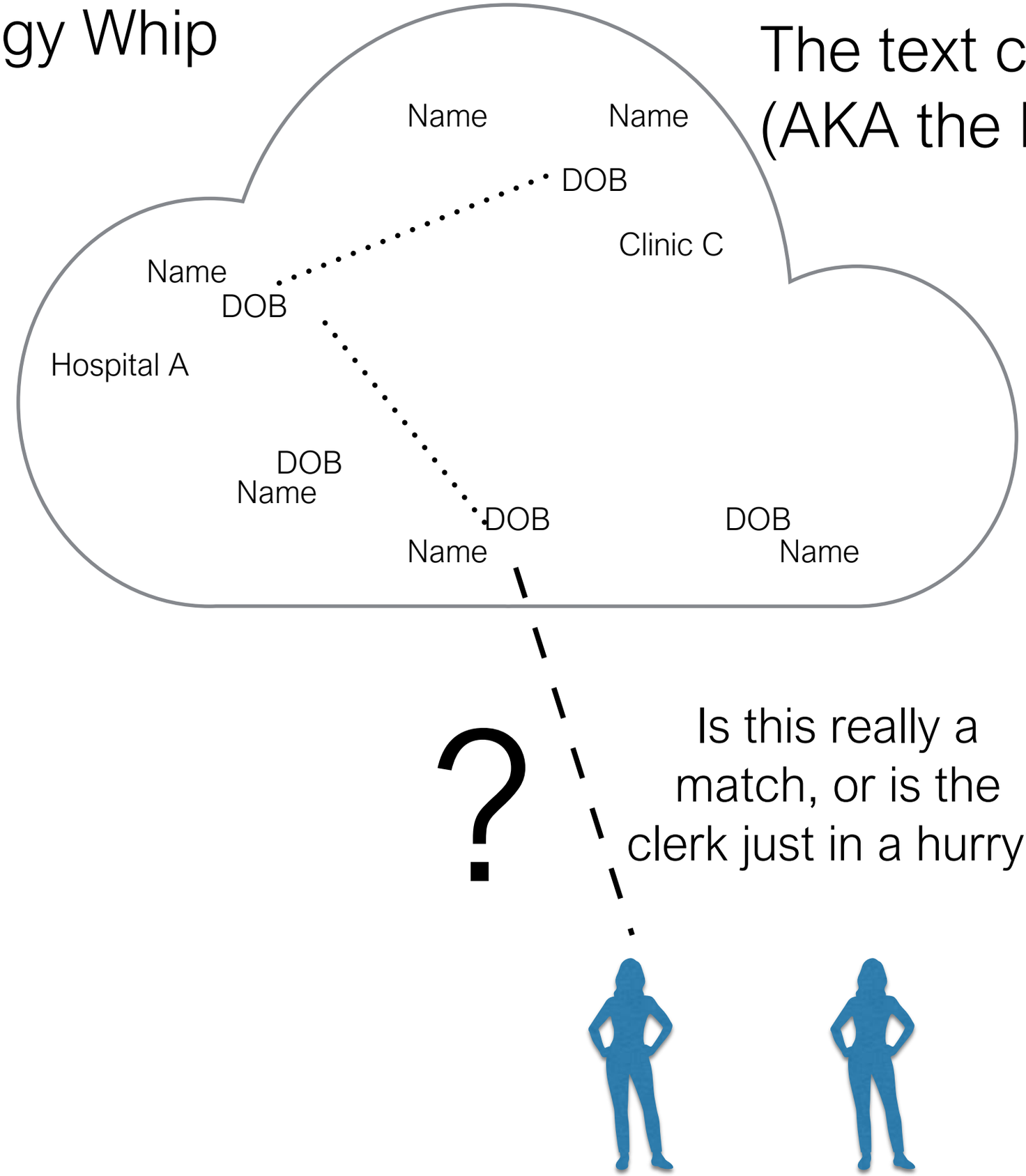
The Buggy Whip



The text cloud
(AKA the MPI)

Text-mashing
various
magical potions

The Buggy Whip



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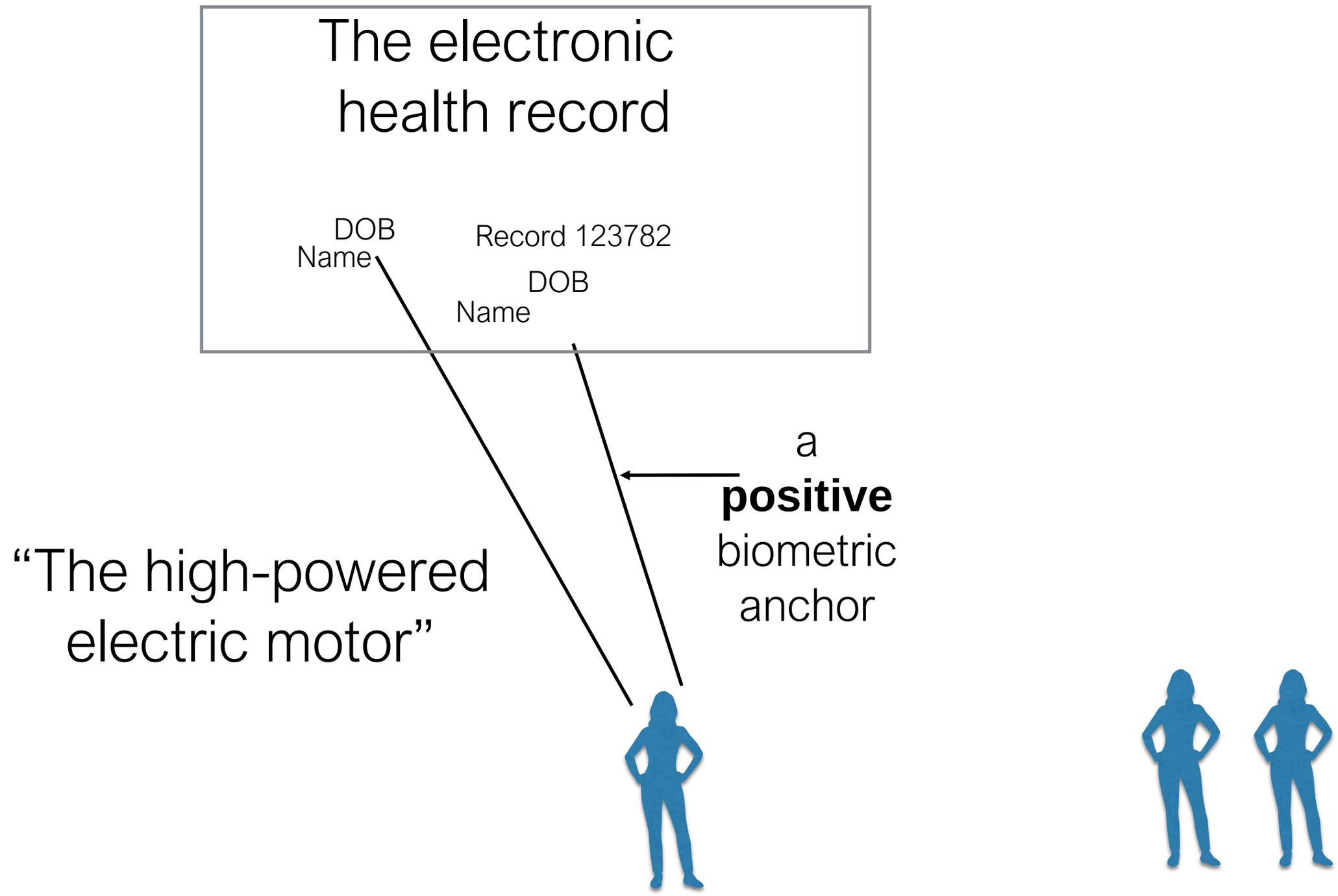
The electronic health record
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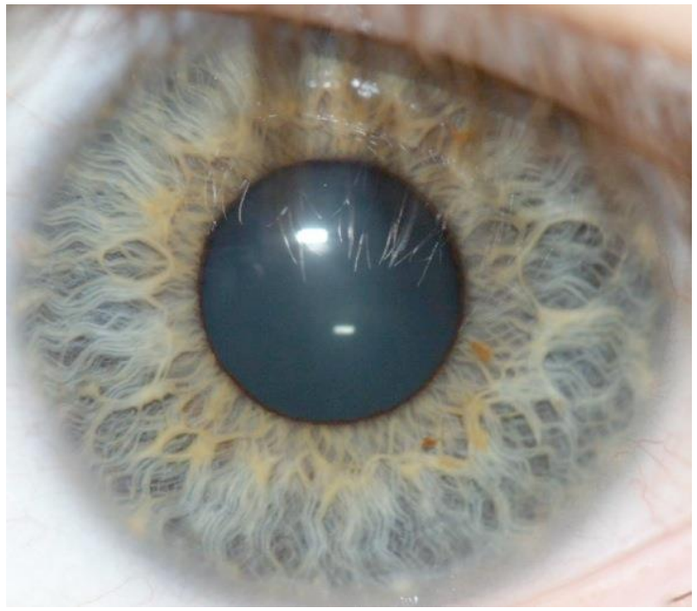
anchor
“The high-powered electric motor”

Biometric Tools



These, and several others

Biometric Tools

- Fingerprint (any or all of 10 fingers)
- Iris pattern
- Palm vein
- Finger vein
- Voice recognition
- Face recognition
- (Retinal scanning is obsolete)
- Other technologies

Patient ID: Many countries and agencies are WAY ahead of healthcare in the US

- India - has established a database of over 1 Billion residents! Face recognition, iris, 10-fingerprint. Only a few associated text fields. Required for many financial transactions, increasingly for healthcare.
- State of Georgia - DMV registrations
- Immigration, TSA, and airports, and many others
- 3-day conference on biometrics in DC, in May - Out of 800 participants, there was ONE healthcare practitioner

Not just hospitals and clinics rely on biometric identification

- Fingerprint
  - Four regional blood donor centers

Many health systems use biometric identifiers today

- Palm vein
  - Harris County, Texas
  - Scripps, San Diego
  - Sharp, San Diego
  - Carolinas Health System
  - Baycare, Florida
  - Bon Secours
  - St. Joseph Health System
  - Community Hospital Anderson
  - many others
- Iris/Photo
  - “more than 50 hospitals”
  - University Health System, Augusta, GA
  - Novant Health
  - UC San Diego
  - Community Medical Centers
  - Archbold Medical Center
  - Hugh Chatham Memorial
  - Martin Health System
  - Terrebonne General Medical Center
  - Delano Regional MC
  - Are YOU on these lists?

There may be headlines you don’t want to see

- Local hospital performs surgery on the wrong patent, because of name confusion

- Hospital CEO jailed after the hospital sent bills for medical procedures on patients who were never seen at the hospital

- Insurance company denies $2,500,000 in claims filed by hospital X for patients presenting fraudulent insurance identification

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- CFO: "But we didn't know that these patients were fraudulent!"

- Insurance company: "Why not? Some of those patients first went to Harris County, and were turned away because Harris could tell they were fake. Are your systems so weak? Why should we send any patients to you?"

The magical MPI

sweeping the problem under the rug

Text-Mashing is guesswork

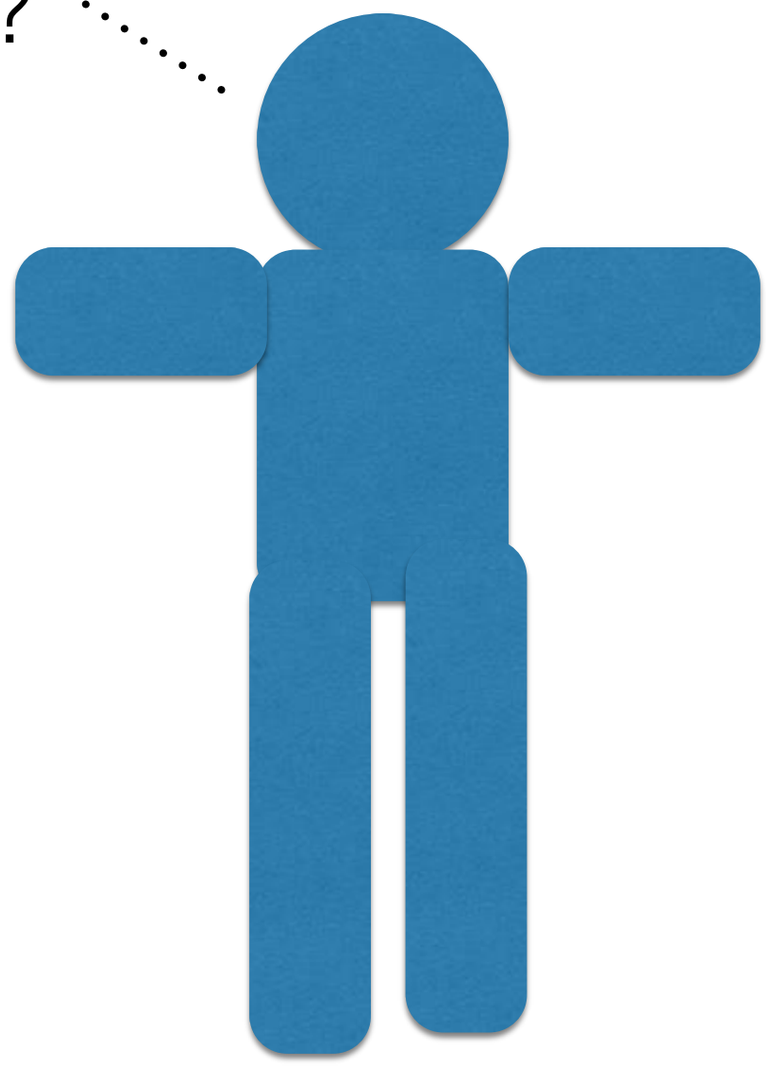
text that we ***think*** represents the patient

MPI text-mashing

our database, our patient care process

Does this correspond?

???

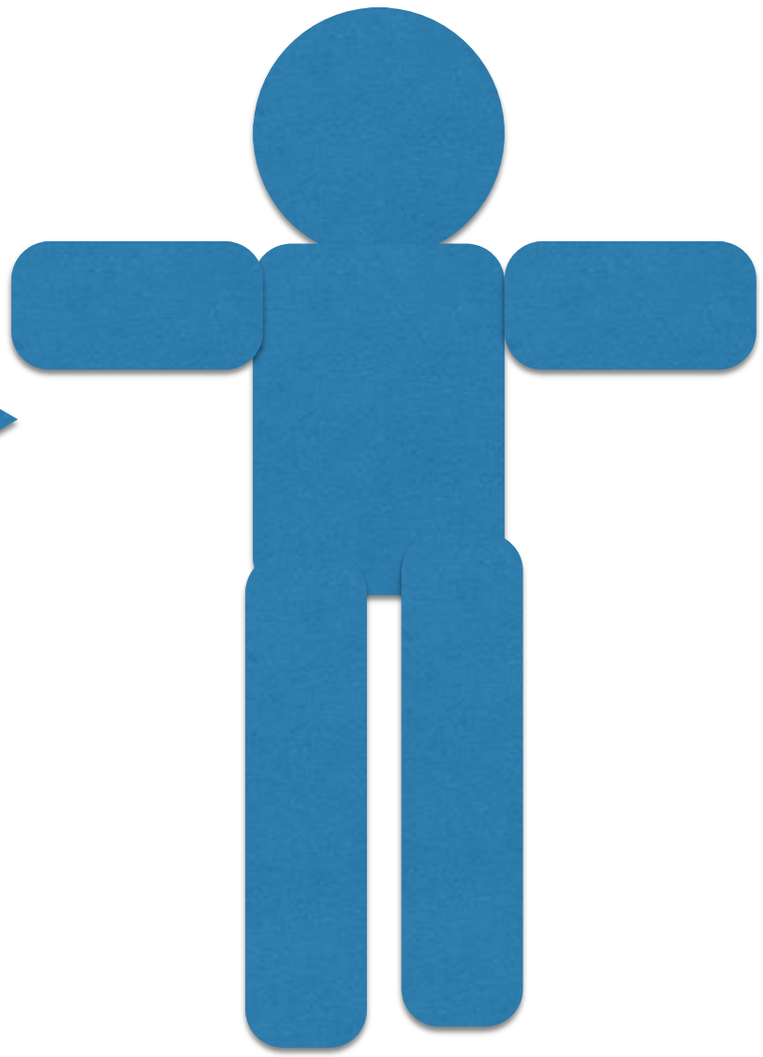


Biometrics = knowledge

our database, our patient care process

We **KNOW** who this patient is

Biometrics



What is the rate of patient mis-identification?

- "Zero" means your administrative and registration staff simply has not looked

- If they have measured it, they are probably embarrassed to admit that there is such a high rate of misidentification

- Organizations that measured it, then implemented a biologically-based identification schema - such as Carolinas Healthcare - found a 20+ fold decrease in misidentification

Why does it matter if we mis-identify the patient?

- Medical – treatment based on the wrong patient's results
  - Incorrect/incompatible transfusions - atypical antibodies Jka - may be fatal
  - Allergies - sometimes fatal reactions - your *brother's* record doesn't show that *you* are allergic to penicillin
  - Incorrect procedures - treating someone based on another person's history
  - Delayed or wrong therapies
  - Misplaced diagnosis: malignancy, HIV
  - Longer length of stay, higher costs
  - Adverse, sometimes fatal outcomes
- Breach of patient-provider relationship/trust
- What about the trauma patient, the comatose patient?
- An abundance of legal and liability issues
- A public relations disaster

Fraudulent and erroneous billing is also damaging

- Claim sent through with wrong patient ID - by accident -
  - Frequently, payor will refuse payment, leaving the hospital/clinic/physician holding the bag

- People fraudulently trying to obtain care (I look a lot like my brother's drivers license picture, he has insurance, and I don't)
  - In Texas, when Hospital H installed biometrics, six months later competitive hospital called the called Hospital H's biometrics vendor, asking for defense against the flood of fraudulent patients.

- Clinics sending a bill for a service when the patient wasn't present

- In many cases, the push for implementation of biometrics comes from finance, not from the quality improvement - safety division.

Fraudulent Identification

- The crimes:
  - Phantom billing - service never rendered
  - Medical identity theft
  - Medical identity sharing
- The defense:
  - Biometrics: Proof that the patient was actually present

Adverse medical consequences of fraud

- Provider falsely claiming to visit, and provide a (critically needed) home health service. Because health care provider failed to actually visit, the patient deteriorated and died.

- Child protective services attempting to take away a child - when a different person had the positive drug test

How do we do better?

- To identify patients, we must use a identifier that is robustly linked to who the patient is - biologically
- A text string or a driver's license is NOT a biological identifier
- Biological identifiers:
  - Biometrics (fingerprint, palm vein, iris scan, electronic face recognition, etc.)
  - DNA (perhaps sometime in the future)
- Not a panacea: every mechanism - even biometrics - has an error rate - but biometrics are orders of magnitude better than text mashing

Biometrics - the electric motor


ACCESS OK
CALIFORNIA
CLEAN AIR VEHICLE

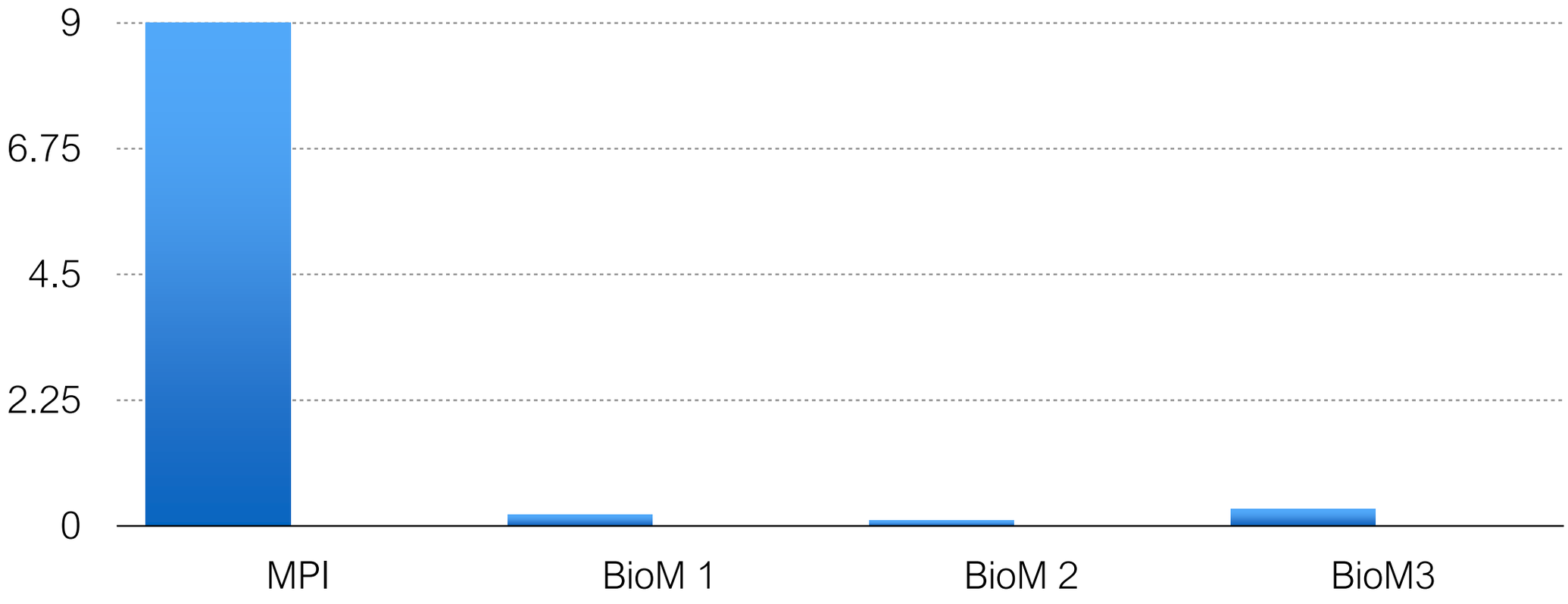

ACCESS OK

Every biometric has shortcomings, but …

- You need to be aware of the strengths and limitations of the tools you choose.
- Choose the tools that fit your circumstance.
- Use ***multiple*** tools.
- Remember that the ***worst*** biometric tool is better than the ***best*** text mash.

Error rate of various identification tools (notional)

11.25



Thank you!

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