The Office of the National Coordinator for
Health Information Technology

Update on Patient Identification and Matching Activities

HIT Policy Committee

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Background

- Accurately matching patients has been identified has a significant challenge for the past decade.
- ONC began work in this area in 2009, with a whitepaper developed with the Regenstrief Institute.
- In 2011, the HITPC made an initial set of recommendations that included standardization of data elements and other best practices.
- In late 2012 and 2013, a number of industry groups began work to improve patient matching, including the Care Connectivity Consortium, CHIME, HIMSS, HealtheWay, and CommonWell.
- In 2013, ONC contracted with Audacious Inquiry to identify issues related to patient matching.
- The scope of work was limited to clinical patient matching with a focus on standards needed. Issues of data quality or algorithmic matching came up in the discussions, but were not part of the scope.

Guiding Principles

Patient safety is the driving force for improvement in patient matching.

The real-world impacts on the workflow of administrative and clinical personnel must be carefully considered.

Patient matching is a complex problem; therefore, improvements will be multifaceted and incremental with no single solution or step that is final.

Potential improvements should apply all sizes and types of provider settings, a range of health IT adoption levels, and a broad set of "use cases."

Building a solid foundation for patient matching across institutions will ease the implementation burden of Meaningful Use Stage 3, while allowing for future innovation.

Goals of Project

- Improve patient matching based on an assessment of current best outcomes from a cross section of entities performing patient matching or that have a stake in the effectiveness of patient matching

- Identify key identifying attributes which can be standardized and consistently relied on for matching patients

- Identify processes and/or best practices to support improved patient matching

- Pursue improvements that will have the broadest impact against a range of matching scenarios / use cases

- The project was designed to be an inclusive and transparent review of the spectrum of works to date. It included an in-depth formal environmental scan and informal discussions with a broad set of stakeholders.

The key project components included:

- Literature review
- Environmental scan
- Initial draft recommendations
- A series of review and feedback loops

- An important part of the project was determining what was in scope versus out of scope.

Overview

- Sought feedback before and during process to ensure partners and participants are aware of methodology and questions asked as part of the environmental scan.

- Interacted with 50+ organizations, including HIOs, health systems, IDNs, MDM and HIE vendors, EHR vendors, Federal Partners (VA, DoD, SSA), and trade associations to establish a baseline of what we know today about improving patient matching.

- Standard questions for formal interviews with health systems/IDNs, HIOs, MDM/HIE vendors, and EHR vendors.

- Informal conversations with Federal Partners, trade associations, consumer organizations and other key stakeholders.

- Inconsistent formatting within data fields is widespread.
  - Variation in how a name is styled makes it harder to make a match.
  - Systems that use different fields have little in common with which to match.
- Mistakes in data entry, such as transposition, require sophisticated software to adjust or take them into account.
  - typographical errors
  - inadequate training of staff members creating the record,
- Smaller organizations and practices may not be able to afford sophisticated matching methods and algorithms, and their practice software may not offer such capability.
- Patient engagement efforts have not yet evolved to ensure that consumers can routinely access their demographic information to confirm and update it, either with the help of a staff member or independently via a portal.

- **Improve patient safety** with the right information, available at the right time for patient care.
- **Improve care coordination** as EHRs and health information exchange allow health data to be shared across multiple providers and among disparate organizations.
- **Empower patients and their caregivers** to be involved in ensuring health data is accurate and shared appropriately.
- **Implement standardization incrementally**, beginning with the most common demographic fields, while conducting additional research on adding fields over time.
- **Improve data quality** by focusing on technology improvements.
- **Improve data quality** by focusing on people and process improvements, such as training, data governance, data review policies, and best practices for data intermediaries to assist in identifying duplicates and mismatches.

1) Standardize patient identifying attributes in the relevant exchange transactions
2) Consider certification criteria to capture the data attributes that would be required in the standardized patient identifying attributes
3) Study the ability of additional, non-traditional data attributes to improve patient matching.
4) Develop or support an open source algorithm that could be utilized by vendors to test the accuracy of their patient matching algorithms or be utilized by vendors that do not currently have patient matching capabilities built into their systems.

1) Consider adding certification criteria to demonstrate the ability of a system to generate and provide to end users reports that detail potential duplicate patient records

2) Build on the initial best practices that emerged during the environmental scan by convening industry stakeholders to consider a more formal structure for establishing best practices for the matching process and data governance.

3) Develop best practices and policies to encourage consumers to keep their information current and accurate.

4) Work with healthcare professional associations and the Safety Assurance Factors for EHR Resilience (SAFER) Guide initiative to develop and disseminate educational and training materials detailing best practices for accurately capturing and consistently verifying patient data attributes.

Standardized patient identifiers should be used in the relevant exchange transactions.

- This does not require the standardization of the capture of the data elements, but rather the exchange of the data elements, which are commonly used for matching in HL7 transactions, IHE specifications, CCDA specification, and the eHealth Exchange.
- Data attributes and standards are detailed on the next slide.

Rationale

- The lack of data attributes that are populated consistently and in a standardized format within PID segments has been identified by the industry as a major impediment to more accurate patient matching.
- This method may also encourage vendors developing registration systems to conform to the enhanced PID segments, which would aid the patient matching process.
- This does not require vendors to modify the method their system uses to capture the data elements, reducing the cost of the modifications to only those required to update patient identifier information on HL7, CCDA, and IHE messages.

Data Attribute	Strategy for Improvement
First/Given Name	1) Improve data consistency and normalize data
Last/Family Name	1) Improve data consistency and normalize data 2) Follow the CAQH Core 258: Eligibility and Benefits 270/271 Normalizing Patient Last Name Rule version 2.1.0 (Addresses whether suffix is included in the last name field.)
Middle/Second Given Name (includes middle initial)	1) Improve data consistency and normalize data
Suffix	1) Improve data consistency and normalize data 2) Suffix should follow the CAQH Core 258: Eligibility and Benefits 270/271 Normalizing Patient Last Name Rule version 2.1.0 (JR, SR, I, II, III, IV, V, RN, MD, PHD, ESQ) 3) If no suffix exists, should be null.
Date of Birth	1) YYYYMMDDHHMMSS 2) If hhmmss is not available, the value should be null 3) Precise year, month, and day are required
Current Address (street address, city, state, zip code)	1) Evaluate the use of an international or USPS format
Historical Address (street address, city, state, zip code)	1) Evaluate the use of an international or USPS format 2) If unavailable, the value should be null
Phone Number (if more than one is present in the patient record, all should be sent)	1) Utilize an ISO format that allows for the capture of country code 2) Allow for the capture of home, business, and cell phone.
Gender	1) ValueSet Administrative Gender (HL7 V3): M, F, UN

Certification criteria could be introduced that would enable certified EHR technology (CEHRT) to capture the data attributes that would be needed in the standardized patient identifier content.

- CEHRTwould need to demonstrate the ability to capture the following list of data attributes, not currently required in the 2014 certification criteria: middle name or initial, suffix, current address, historical address(es), and phone (including home, business, and cell)
- Improve the ability of CEHRT to demonstrate the ability to record apostrophes and hyphens in the first and last name fields.

Rationale

- Not all of the data attributes being recommended to be required on PID segments are currently captured by CEHRT.
- There is variability in the ability to capture apostrophes and hyphens in CEHRT's name fields. For systems using deterministic matching, the variability of hyphens and apostrophes could create a false negative.

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Study the ability of additional, non-traditional data attributes to improve patient matching.

- Data attributes include: email address, mother's first and maiden name, father's first and last name, place of birth, driver's license number, passport number, or eye color.
- Statistical analysis can be performed with these data attributes to assess their ability to improve matching.
- In addition to a statistical analysis, patient privacy and security implications would also be evaluated.

Rationale

- EHR systems do not currently have the ability to capture the majority of these data attributes, and would require significant changes to current registration processes and vendor system capabilities.
- While the data attributes seem unique and stable, statistical analysis is required to verify this assumption. It would be premature to require these data elements without further study, which was outside of the scope of this project.

Develop or support an open source algorithm that could be utilized by vendors to test the accuracy of their patient matching algorithms or be utilized by vendors that do not currently have patient matching capabilities built into their systems.

- ONC should not require the use of a specific algorithm.
- ONC would need to evaluate development of a new open source algorithm or updating and supporting an existing open source algorithm that would require changes in order to accommodate the new required data attributes.

Rationale

- Vendors and health systems have spent time and resources developing their algorithms and utilize them as a business differentiator.
- A single mandatory algorithm would likely be unable to keep pace with technological innovations.
- EHR vendors that do not currently have the ability to perform patient matching would benefit from an open source algorithm that could be utilized in their products.

Consider adding certification criteria to demonstrate the ability of a system to generate and provide to end users reports that detail potential duplicate patient records

- These reports provide a list of potential duplicate patient records to practices and hospitals, allowing them to review the records and update as appropriate.
- CEHRT should clearly define for users the process for correcting duplicate records, which typically requires the merging of records.

Rationale

- Identifying duplicate patient records within an EHR system or master patient index is important to ensuring accurate matching of patient records.
- Not all EHR systems currently provide these reports to their users.

Build on the initial best practices that emerged during the environmental scan by convening industry stakeholders to consider a more formal structure for establishing best practices for the matching process and data governance.

- Potential best practices identified through the environmental scan include: regular reviews of potential duplicates, data governance programs that work to establish current rates and then improve false positive and false negative rates, training programs that can be replicated, policies that apply across a health system with multiple sites, and processes for a central entity, such as an HIO or Accountable Care Organization (ACO), to notify participants of matching errors and corrections.

Rationale

- The environmental scan identified some methods with potential for use throughout the healthcare industry, but it is unclear whether these best practices could be universally utilized, particularly in small ambulatory practices. The best practices require additional review and build-out by the industry to ensure universal applicability.

Develop best practices and policies to encourage consumers to keep their information current and accurate.

• Examples of best practices could include allowing patients to manage their own demographics via a patient portal, training registrars and clinicians to verify patient demographic information, and verification of a patient's identity via a photo ID and/or insurance card.

Rationale

• Patients are the primary source of demographic data used in matching and are often unaware of the importance of maintaining accurate demographic data with their providers.
• Currently, processes vary significantly across organizations for having patients update their demographic information.
• Meaningful Use Stage 2 places an increased emphasis on consumer engagement in healthcare.

Work with healthcare professional associations and the Safety Assurance Factors for EHR Resilience (SAFER) Guide initiative to develop and disseminate educational and training materials detailing best practices for accurately capturing and consistently verifying patient data attributes.

•	Data integrity programs should acknowledge the key role of the front office staff and registrars who are typically responsible for verifying the patient demographic information that is used in matching.

•	Specific best practices to address the issue of data accuracy could be weaved into a broader campaign emphasizing the positive impact of accurate patient data on clinical quality, care coordination, and the efficiency of payment processes.

Rationale

•	The accuracy of the data attributes themselves is important for minimizing false positives and false negatives.

•	The level of training for registrars and front office staff, as well as monitoring of their data entry accuracy varies widely across organizations.

Questions/Discussion