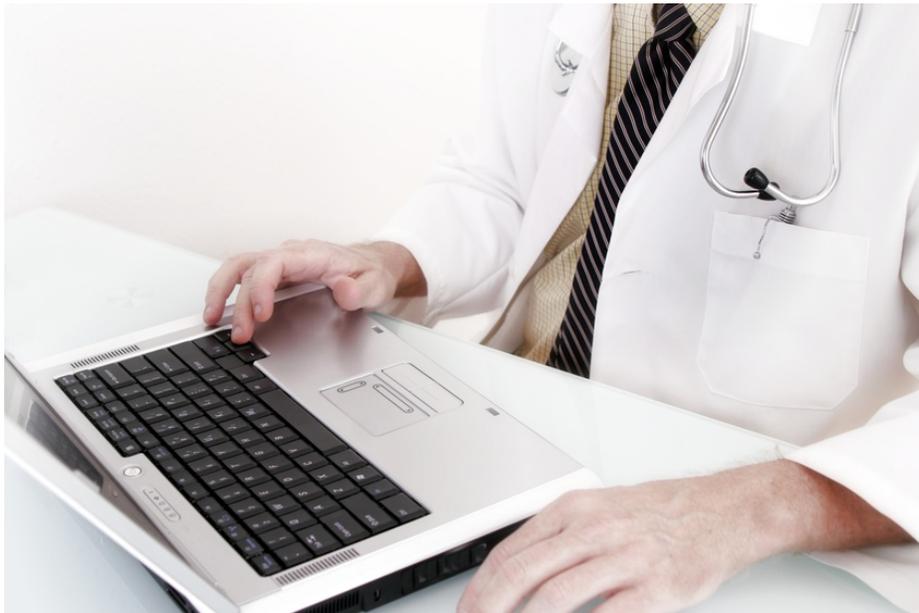


Standardized Data Available Through a Single Interface Can Improve Clinical Quality of Care and Public Health Reporting



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Executive Summary

The American medical community increasingly agrees that secure, efficient access to quality healthcare data is an essential part of providing excellent care at both the clinical and public health levels and reducing healthcare costs. The major obstacle is that health data is often “siloe” in separate provider offices and not exchanged. A solution to this obstacle is an electronic system that receives unformatted data from the sources, standardizes it, and makes it available in a user-friendly format to providers and public health agencies to improve the health of their patient populations. The Utah Health Information Network (UHIN) data warehouse offers this functionality.

The Need for Data in Healthcare

Efficient access to healthcare data is an essential component of keeping a community in good health. Physicians need their patients’ full records, including community data from other medical facilities where the patients receive treatment, in order to gain a complete understanding of their conditions and provide them with the best quality care. Public health agencies need the ability to identify and monitor emerging and extant population health risks. The difficulty lies in the fact that data is often stored separately in individual healthcare provider offices and not made readily available to the healthcare community, even when the data concerns one patient who receives care from multiple facilities.^{1 2} There is growing consensus in the medical community that care can be improved by incorporating quality data into decisions made about treatment and that this can be facilitated by effective technology.³ The increasingly widespread use of EHRs has been a step in the right direction, but the true value of data is realized when community data is made securely and efficiently available to healthcare professionals.

¹ Guilbert, Theresa W. MD, MS; Arndt, Brian, MD; Jonathan Temte, MD, PhD; et al. “The Theory and Application of UW eHealth-PHINEX, A Clinical Electronic Health Record-Public Health Information Exchange.” *WMJ* 2012; 111:124-133.

² Szczerba, Robert J and Marco D Huesch. “Why Technology Matters as Much as Science in Improving Healthcare.” *BMC Medical Informatics and Decision Making* 2012; 12:103. <http://www.biomedcentral.com/1472-6947/12/103>

³ Friedman, Daniel J and R Gibson Parrish II. “The Population Health Record: Concepts, Definition, Design, and Implementation.” *J Am Med Inform Assoc* 2010; 17:359 – 366. Doi:10.1136/jamia.2009.001578; Guilbert et al, Szczerba and Huesch.

Secure, efficient data sharing has been highlighted as a method for improving healthcare quality and access and decreasing healthcare costs by such groups as the American Medical Informatics Association⁴, the CDC⁵, physicians and public health officials⁶, and the Utah Beacon Community, IC3⁷. Many authors have called particular attention to the need for a standardized, accessible source for population health data and to the ability of data sharing to improve public health reporting and responses.⁸ One way to meet the need for data in clinical and public health practice is to gather the data from the disparate sources that currently generate and store it, standardize it using nationally-recognized normalized codes, and make it available to physicians through a health information exchange. The Utah Health Information Network (UHIN) offers data warehouse services that perform this function.

A User-Friendly Data Warehouse

The UHIN data warehouse utilizes functionality developed by Perfect Search with emphasis on flexibility and user-friendliness. The warehouse's design allows it to receive bulk loads of information from a variety of database platforms and from web connections. Natural Language Processing (NLP) is employed to analyze unstructured free-text data from transcribed reports and extract discrete data from them. ICD-9, SNOMED, and RxNorm codes are added to unstructured data sets during the indexing process. UHIN works with data sources to correctly map proprietary procedure codes to CPT codes and lab tests to LOINC codes (see Figure 1).

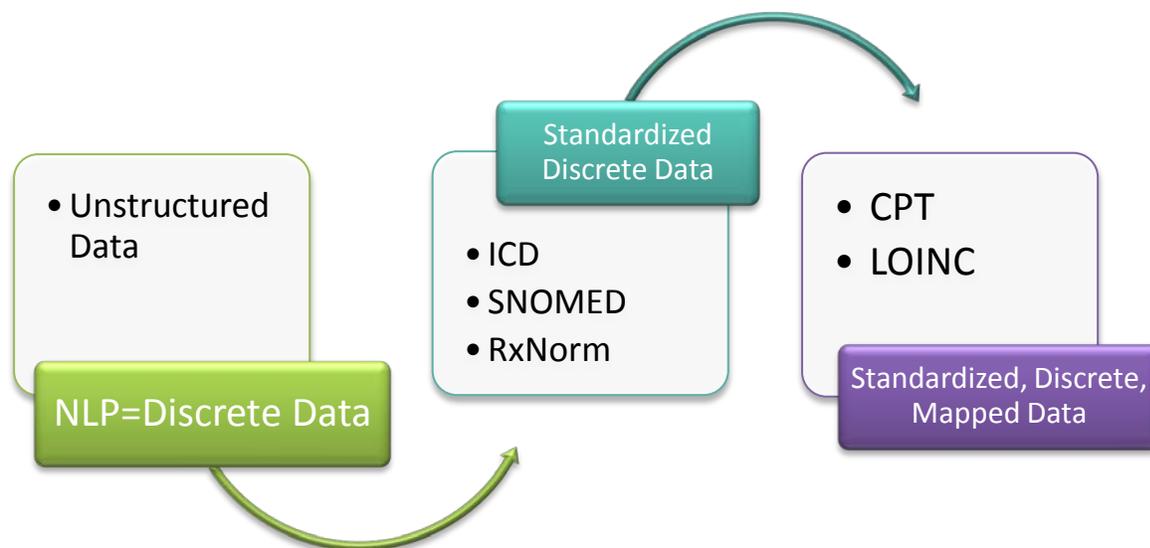


Figure 1

⁴ Detmer, Don Eugene. "Activating a Full Architectural Model: Improving Health through Robust Population Health Records." *J Am Med Inform Assoc* 2010; 17:367-369. doi:10.1136/jamia.2010.006098. Friedman and Parrish.

⁵ Jacobs JA, Jones E, BA Gabella, B Spring, RC Brownson. "Tools for Implementing an Evidence-Based Approach in Public Health Practice." *Prev Chronic Dis* 2012; 9:110324. DOI: <http://dx.doi.org/10.5888/pcd9.110324>.

⁶ Guilbert et al

⁷ See <http://www.healthinsight.org/Internal/Beacon.html> and <http://www.healthinsight.org/Internal/BeaconResources.html>

⁸ Detmer; Friedman and Parrish; Guilbert; Jacobs.

Customizable Queries and Data Display

The data warehouse offers users a flexible search experience by allowing them to use built-in queries or to create custom queries. Custom queries can incorporate a wide range of parameters, including demographic data, lab results and ranges, vitals, codes from standard dictionaries such as ICD or SNOMED, resource use, and status outcomes (see Figure 2). Queries can be generated individually or as compound queries across one or more data sets, and users can specify results from one query to be used as input for another query. Users can perform queries as needed or schedule queries in advance. Query results can easily be exported into dynamically created reports and dashboards.

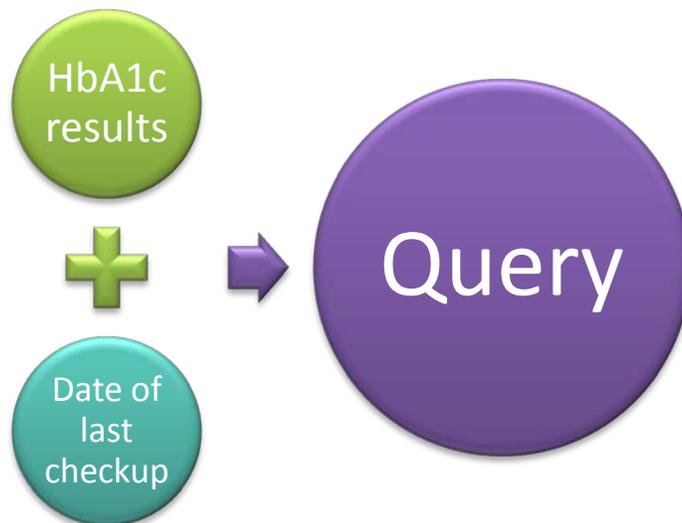


Figure 2

Users of the data warehouse can create custom reports that can contain any combination of data points stored in the system. These reports can be exported in a .csv format and easily imported into any third-party software or through connections made via an ODBC driver. The file format and connection method used by the data warehouse enable it to transfer data to any format and manipulate the exported data, including data catalogs and maps. One current use of the report functionality is for Utah Beacon Community clinics to receive customized reports on diabetic patients as part of the IC3 Beacon Program's efforts to improve care and results for patients with diabetes.

To ensure fast user access to key information, the UHIN data warehouse has the ability to create data marts based on specific patient attributes (e.g. physician, clinic, insurer, etc.). These data marts can be segmented into cohorts defined by specific risk factors, disease diagnoses, or any other data point designated by the user (see Figure 3). UHIN can create dashboards that monitor the health data of these cohorts and can generate alerts to the provider of record whenever specific information is received into the system. Alert triggers can be based on specific events, such as hospital admits or discharges, or based on specific time. These triggers can be attached to a query that exports the desired information from the data warehouse to the provider's EHR, via a comma-delimited file or via a Direct connection.

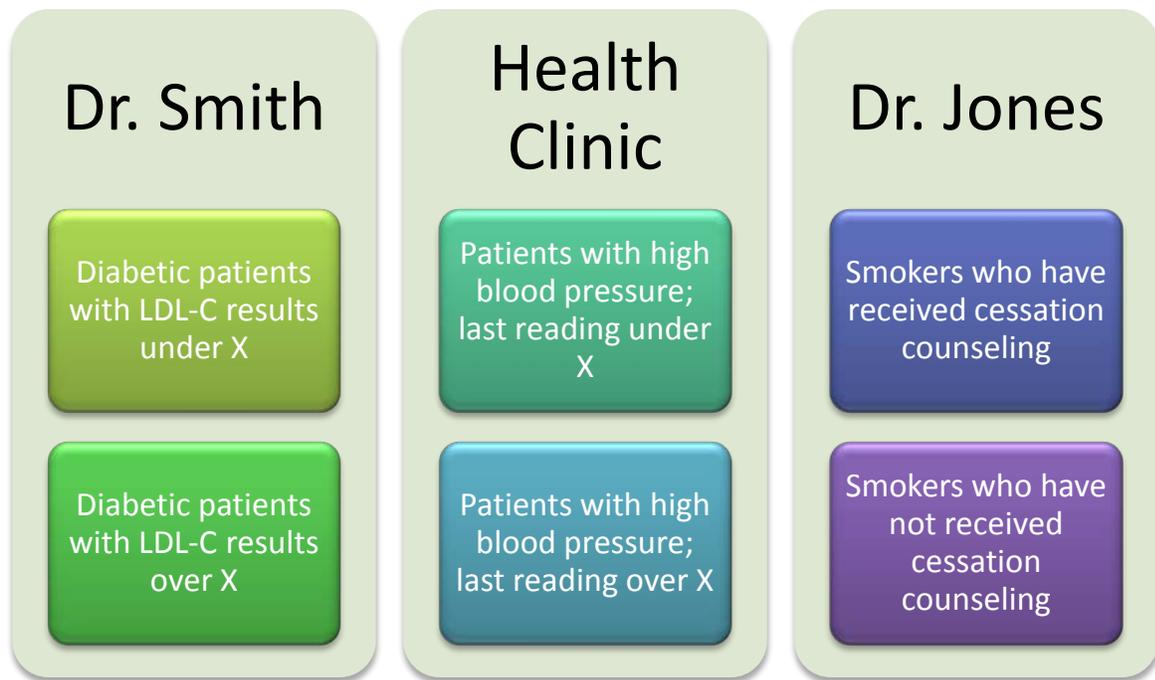


Figure 3

All data marts, cohorts, and dashboards can be customized to include the specific tools necessary for providers or ACOs to monitor their patient populations as efficiently as possible. UHIN will implement an analytics software package by the end of Q3 2013. This analytics package will enable UHIN to satisfy all required ACO reporting measures through the use of clinical and/or claims data as necessary.

The data warehouse also includes a trigger that identifies Utah state reportable conditions in incoming clinical data and automatically sends an alert about the condition to the Utah Department of Health. This functionality can be expanded to include reportable conditions for other states.

Conclusion

A solution exists to the problem of making medical data accessible to healthcare professionals for clinical care and public health improvement and monitoring. The UHIN data warehouse enables healthcare professionals to have the clinical data that they need at their fingertips in standardized format, while maintaining data security.

About UHIN

The Utah Health Information Network (UHIN) is a nonprofit coalition of healthcare providers, payers, state government and other stakeholders who have come together to reduce healthcare costs and improve healthcare quality and access by ensuring that providers, payers and patients can exchange information electronically. UHIN is a community-based organization that focuses on creating electronic data exchange solutions that work for the entire healthcare community, from single-provider offices to large integrated healthcare systems. For more information, please visit www.uhin.org.