Transforming 3 billion health records into a succinct patient history in under 3 seconds: A demo and guide for physicians and IT professionals

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Healthcare Data and its Challenges

Healthcare billing data provides an opportunity for accessing a rich source of information that, when reformat ted properly, can be utilized to support clinical decision-making and treatment planning.

Healthcare patients can have long and complex treatment histories and their physicians may lack specific important clinical information such as past medications, health care visits, and care coordination contacts. Further, patients are treated by different physicians across treatment settings, such as the Emergency Room or specialty clinics. It is often difficult to quickly identify which patient are high risk for poor outcomes.

Timely access to patient’s full clinical history can be critical to helping physicians deliver informed and coordinated care.

Solution and Benefits

The award-winning Psychiatric Services and Clinical Knowledge Enhancement System (PSYCKES) allows physicians to review quality indicators (identify patient whose treatment could benefit from review) and obtain medication and service utilization information to support quality improvement and clinical decision-making for the Medicaid population.

Data Extraction and Preparation

PSYCKES for physicians was developed in 4 distinct phases:
1) Compared and stored metadata (> 3 billion records) in a standardized format.
2) Cleaned and validated data against data dictionary.
3) Applied evidence-based analytics to summarize the data as clinically meaningful constructs (e.g., episodes of care, medication trials, service settings).
4) Developed data visualization using appropriate tools (e.g., Oracle, MVC Architecture, Swift).

A single patient’s claims records are divided into multiple useful pieces and then connected using Oracle views and procedures. Dimensional Information like Diagnosis, Procedures and drug information is stitched together using National standard datasets (e.g., ICD10-CM/DSM-V/SNOMED, CPT codes, NDC/RxNorm, NPI).

How Physicians and Staff Use PSYCKES

Rapid review of treatment episodes, diagnoses, and clinical quality alerts
Comprehensive clinical histories that support clinical decision-making
Identify external physicians and patient healthcare contacts
Informed assessment and treatment planning
Review medication history and adherence
Identify co-morbid conditions
Support discharge planning
Support care coordination
Identify high risk patients

Clinical Data Delivery Across Multiple Platforms

Data Sources
- Medicaid Claims
- NYS OMH CMR
- Medication dispensing database
- Lab and Pathology
- Housing (CASR)
- Home and Care-coordination
- Assisted Outpatient Treatment (AOT)
- Master Data Management
- Program Licensing (CONCERTS)
- Incident Management

PSYCKES Platform and Clinical View

Secure Web-based, HIPAA compliant application that supports clinical decision making and quality improvement.
- Leverages >1 terabyte of data to display up to 5 years of information for over 8 million NYS Medicaid enrollees.
- Integrates information from 10 different data for all treatment settings.
- Summarizes data for over 12,000 diverse health professionals including clinicians, quality improvement staff, manage care providers.

PSYCKES Data Views and Functions:
- Patients Demographic Information
- Current Care Coordination
- Alerts and Incidents (e.g., suicide attempt)
- Quality Flags (e.g., Medication Adherence, Polypharmacy)
- Diagnoses (Behavioral Health and Medical)
- Medications
- Outpatient Services
- Hospital/ER Services
- Living Support/Residential
- Laboratory & Radiology
- Upload and View Documents & Assessments (e.g., Safety Plans, Discharge Plans, Advanced Directives)
- Other: Dental, Vision, Medical Equipment, Transportation

IT Considerations for Interoperability with EHRs

- Security and Storage: Data security and technical safeguards are critical, in particular, transmission security, authentication protocols, and controls over access, integrity, and auditing.
- Querying and Reporting: Detailed metadata structures and robust stewardship protocols to easily query large data sets.
- Updating Information and Sharing Across Platforms: Healthcare data is changing and requires relatively frequent updates to remain current and relevant. Emerging tools and strategies such as FHIR and public APIs are making it easier for organizations to share data easily and securely.
- Inter-disciplinary Team: Clinicians/ subject matter experts/ data analysts /IT programmers.

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