SUCCESES AND CHALLENGES
DEVELOPING AN ENTERPRISE
CLINICAL ANALYTICS SOLUTION
– Ambulatory Information Management (AIM)

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Mr. Dennis Sweeney, Tellogic Inc. Principal

- Supporting Dignity Health as Program Director for strategy, architecture, design, development, implementation of the Dignity Health’s Ambulatory Information Management (AIM) clinical intelligence and analytics solution

- Supporting the technical aspects of Dignity Health Clinical Integration / Accountable Care Organization initiatives

- Has 20 years experience formulating enterprise-wide healthcare technology strategies, managed multi-million dollar data warehouse and business/clinical intelligence projects, and provides critical technical expertise to healthcare organizations

- Masters in Business Administration (MBA) from Adelphi University, Executive Masters in Business Administration (EMBA) from ULCA Anderson School and his Bachelors in Chemical Engineering (BSChE) from Rensselaer Polytechnic Institute.

Dignity Health, - one of the nation’s five largest health systems and the largest hospital provider in California.

Tellogic Inc. – provides consulting on Healthcare data management with expertise in IT data strategies, design, development, and implementation solutions.
Background:

Founded in 1986, Dignity Health is one of the nation’s five largest health systems

Mission:

We are committed to furthering the healing ministry of Jesus. We dedicate our resources to:

- Delivering compassionate, high-quality, affordable health services;
- Serving and advocating for our sisters and brothers who are poor and disenfranchised; and
- Partnering with others in the community to improve the quality of life.

FY12 Community Benefits and Care of the Poor (Including Unpaid Cost of Medicare): $1.6 billion
Dignity Health
Ambulatory Information Management (AIM)

• Dignity Health, in 2010, completed a business/clinical intelligence reporting and data needs assessment, which established the strategy & architecture, and led to the AIM solution development

• Ambulatory Information Management’s (AIM) program initial focused retrospective clinical analytics requirements
  - Core functionality on data integration, data aggregation, and business intelligence reporting to support the clinical and business needs across Dignity Health
  - The AIM Solution supports authorized users to generate reports on clinical, financial, and operational activities
  - Reporting is at the organization, provider, and patient-specific levels
AIM Architecture Framework

Gathering

- Member
- Claims
- Diagnosis
- Pathology
- Medical Order
- Facility
- Quality
- Utilization
- Benchmark

39+ Sources

Staging

Integrated Data

Congregated Data

Integrated Data Repository

- Members
- Claims
- Diagnosis
- Pathology

Summarized Data Marts

Confirmed Data Mart

Data Delivery

BI Tools

- Data Mining
- Network Management
- Actuarial

Analytic Apps

- Query Tools
- Medical Management
- Financial Performance Measures

Supporting the End-to-End Information Management Spectrum
AIM Volume Metrics – Big Data in Health Care

• Daily processing of >500 GB data

• Managing & reporting:
  - Distinct Patients : 3,257,969
  - Encounters (CY 2012): 6,778,560
  - Providers: 32,993
  - Orders: 31,860,400

• Ingesting data from over 40 different Health Information Systems
  - EMRs, ADTs, Billing, Quality & Surgery Systems
AIM Business Intelligence Reporting Focus

**Retrospective**
- Clinical Quality Measures
- PQRS / GPRO
- Meaningful Use
- Patient Centered Medical Home (PCMH)
- ACO/Clinical Integration

**Perspective**
- Point of Care reports
- Pursuit Lists
- Chronic Disease Registry identification
- Population Health Management

**Predictive**
- Identification of patients for Care Coordination/Care Management

Provider Performance

Patient Care Needs

Future
Clinical Analytics Challenges
Big Data Four Dimensions*

Big data spans four dimensions: Volume, Velocity, Variety, and Veracity*

- **Volume**: Ever-growing data of all types, gigabytes, terabytes, to petabytes—of information

- **Velocity**: Sometimes a few minutes is too late. For time-sensitive processes such as patient critical results & fraud detection, big data must be used as it streams into your enterprise in order to maximize its value.

- **Variety**: Big data is any type of data - structured and unstructured data such as text, sensor data, audio (ie. Dragon), video, click streams, log files and more.

- **Veracity**: 1 in 3 business leaders don’t trust the information they use to make decisions.

  - Applying this statistic healthcare: Clinicians cannot act upon information if they don’t trust it. Establishing trust in data presents a huge challenge.

Data Veracity (or Data Quality) Challenges

- Provider Workflow Induced
- Standards Adherence (RxNorm, SNOMED, Proprietary)
- Non-Structured data
- ETL Processing Induced
- System Generated
- Corrupted / invalid data (Nulls, bad dates, typos)
- Transaction / Data Loading Induced
Healthcare Data – HIPAA & Privacy

Meeting HITECH / HIPAA requirements
Audit and Privacy

- HITECH & Health Insurance Portability and Accountability Act (HIPAA) requirements on accessing Personal Health Information (PHI)
  - Business Intelligence (BI) & Analytics designed for “what if” analysis
  - Retrospective clinical quality reporting permits aggregated reports for population health management on clinical quality metrics but needs to allow drilling down to the patient level information

- Challenge
  - Required auditing and reporting on end users appropriate access to Personal Health Information (PHI)
Drilling Down through Clinical Quality Reports

Approach:

• No Ad Hoc Reporting
• Limit data available to end users – minimum data set
• Clinical Quality Reports designed for different user roles and levels
• Limit the level that a user can access
• Permit privileged users, with full auditing capture, access to specific patient level information
• Capture audit trail on every parameter driven report

- Org Level
  • Aggregated Metrics for the Organization and/or Facility

- Provider Level
  • Aggregated metrics for Providers

- Patient Lists
  • Pursuit lists of patients by attributed provider meeting a clinical quality reporting metric criteria

- Patient Specific
  • Patient specific information for follow up on identified populations
Retrospective Reporting
Success Examples
Meaningful Use Quality Metrics

• Dignity Health certified the Ambulatory Information Management System (AIM) along with the EMR components to be Meaningful Use certified as “Dignity Health Ambulatory EHR”

• Over 270 eligible providers able to attest

• Reports support Meaningful Use attestation requirements and support providers to identify patients for follow-up care items
Supporting Population Health – Patient Centered Medical Home

• Dignity Health’s Ambulatory Information Management (AIM) solution provides clinical intelligence, analytics, and reporting:
  - Collects, normalizes, and integrates patient clinical and operations data from multiple systems
  - Analyzes the clinical data and stratifies each patient to chronic disease registries
  - Provides retrospective reports on Clinical Quality Measures
  - Provides perspective Point-of-Care report giving the Provider information of the evidence-base clinical diagnostic procedures recommended based on each individual patient situation

On Oct 15, 2012, St Joseph’s Medical Group Peoria North successfully received National Committee for Quality Assurance / Patient Centered Medical Home (NCQA/PCMH) Level 3 accreditation
“… we could not have reached this level without the help and support of the AIM team. (The AIM Team) was a major part of the ability to submit reports that supported requirements needed to demonstrate compliance with the 2011 NCQA standards. . . . reports that were ‘must have’s and critical factors’”
  Donna Johnson, Practice Manager
  Michelle Alcoba, RN – Leader of NCQA Accreditation and Case Management
Additional Clinical Analytic Successes

• Surgical Site Infection Reporting to National Healthcare Safety Network (NHSN)
• Group Practice Reporting Option (GPRO)
• Accountable Care Organization / Clinical Integration Quality Reporting
• Provider Profiling / Performance
• Physician Task reporting
• Compliance Reporting
Case Study Example
Various Sources of Data for Point of Care
Patient Care – AIM Point of Care Case Study

• Fifteen month old child is brought in as a new patient that previously had been seen at a different clinic
• Provider has access and reviews the patient’s electronic medical record on immunization history
• Electronic Medical Record (EMR) immunizations indicate child maybe due for next pneumonia vaccine
• Parent of child is unsure of the child’s immunization status
Electronic Medical Record - Immunizations

- In reviewing the patients immunization record in the EMR, indication that child may only have received two shots and requires third immunization in series

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AIM Point of Care identifies the number of immunizations

- Based on age of patient the POC shows immunizations and status
- Indication is the patient has received three pneumonia immunizations in the series
AIM POC Drill down to source of information

- Drilling through the AIM POC to identify the dates and the source of information
- AIM POC is able to leverage the EMR and also the charges to identify the immunization history
Case Study Summary

- Provider Reviewed the past visit/encounter information
  - Able to identify that the patient did in fact have immunizations up to date
  - Most recent immunizations was just not recorded in the immunization section of EMR
- AIM POC able to prevent:
  - Potential of patient receiving additional immunization
  - Additional costs to the patient and insurance
  - Incorrect EMR immunization record
- Additional outcomes:
  - Education program for standardization in clinical data capture
  - Development of operational analytical reports to identify similar situations
AIM Summary
Summary / Lessons Learned

• Establish a strong clinical analytics strategy
• The framework architecture is critical for success
• Data Quality is not just about the data issues
• Data Quality improvement is a continuous process
• Use an agile approach - start small and expand
  - Identify short term opportunities
  - Bring value quickly and expand the solution
  - Continuously determine and adjust “what else” or “how else” the information would be of value
• There is no limit to clinical analytics reporting needs
Questions / Open Discussion
Thank You

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