Navigating The Transition to Population Health

The Challenge

Addressing the “transition straddle” requires a low cost / high quality care model approach, as this model is successful regardless of the extent of reimbursement model change or the time course of that change.

Successfully delivering higher quality at lower cost is dependent upon the programmatic reduction in clinical variability.

Reducing clinical variability requires providing meaningful data to providers across use cases.
Making Data Meaningful

Requirements
• Data that provides insight not simply information
• Insight delivered within use-case specific latency requirements
• Insights which expand clinical contextual awareness
• Insights supporting provider performance comparisons
• Insights that are accessible

Challenges
• Technical heterogeneity
• Data heterogeneity
• Business process variability
• Usability

Ascension Use Cases
• Transactional data at point of care
• Retrospective: Clinical performance reporting Provider Acute Care Costs
• Retrospective: Clinical performance reporting Antibiotic Use and Resistance
Foundational Capability:
Enterprise Data Management / Ecosystem Rationalization
Programmatic Approach

Successfully navigating the evolving Healthcare landscape will require a programmatic approach – a strategic, comprehensive, and sequential investment in data management and analytics. Providers who are able to do this - independently or in partnership - will be positioned to weather the turbulence and thrive as American healthcare transforms.
Analytics and Data Management
Ascension Technology Architecture Example

**ANALYTIC ENVIRONMENT**
- Oracle EDW
- Cloudera Hadoop Cluster

**POINT-OF-CARE INTEROPERABILITY PLATFORM**
- IaaS: Cerner CommonWell
- IaaA: InterSystems HIE

**DATA MANAGEMENT SUITE**
- Data Governance / MDM
- Identity Management
- Terminology Services

**ENTERPRISE DATA SOURCES**
- EHR/Clinical
- Social Media
- Governmental
- Administrative
- Care Management
- HR
- Financial
- Community Partners
Data Management Overhead

Invisible Cost of Data

Advanced reporting, analytics and clinical data exchange require significant data management effort 70-80 percent of the time; the cost of that work foots to data management in a highly variable data ecosystem.

Data management includes data ingestion (acquiring data from source systems both internal and external) and curation (profiling, validating, and normalizing the data); these processes convert raw data into a usable data resource.

The majority of Ascension data resources are devoted to developing data processing pipelines that automate data management; this automation creates data as a commodity – a scalable, economically sustainable and re-usable asset that can be distributed for reporting, analytics, research and point-of-care exchange.

Data processing pipelines are specific to each unique instance of each source data system; thus the overall variability of a technology ecosystem (number of unique system instances) is the primary determinant of aggregate data management overhead.
Enterprise Data Management
Perspective on Multi-Dimensional Continuum Data

National / State Health Policy
- Medicare / Medicaid reimbursement
- Healthcare reform efforts
- Accreditations / professional standards
- Hospital performance data
- Health initiatives / advocacy groups

Local Community Environment
- Medical care offerings
- Population SES
- Lay support networks
- MD practice organizations
- Guidelines and practice patterns
- Market structure / competition
- 3rd party payers / managed care
- Pay for performance initiatives
- Percent non profit

Organization / Practice Settings
- Leadership, structure, policies and incentives
- Delivery system design
- Clinical decision support
- Financial
- Patient education and navigation

Provider / Team
- Knowledge and communication skills
- Cultural competency
- Barriers, norms and efficacy
- Staffing mix and turnover
- Role

Family And Social Data
- Family dynamics & history
- Friends, network support
- Publicly available data that impacts patient behavior patterns

Person
- Demographics / Socio-demographics
- Social determinants
- Biological / Genomics
- Financial / Socioeconomic
- Health risk assessment
- Comorbidities
- Quality of life, ADL
- Knowledge, attitudes, beliefs
- Decision making preferences
- Social media and consumer interaction (behavioral, preferences, health devices, etc..)
Data Management Realities

In creating data management pipelines (commoditizing data), there are realities that govern development effort and cost. This overhead is:

Directly related to the amount of data required and variability of the data elements; data variability is both syntactic (the format of the data elements) and semantic (the meaning of the data elements).

Multiplied by the number of times the same data sets are "managed" by different stakeholders.

Persistent over time as long as source system variability exists.

Additional to the implementation and maintenance cost of applications (point of care solution or analytics platform).

Not effectively outsourced as it requires local knowledge of the data capture workflows, internal data models, and local data semantics.

Independent of the reporting, analytic or point-of-care solutions implemented; it is not impacted by business partnership or third party’s provision of reporting or analytic services.
Use Case 1:  
Transactional Data at Point-of-Care
Clinical Care Impact
Delivery of Health Information Across Points of Care

Providers need continuum data from disparate sources available at the point of care.

Because universal data standards are not broadly developed, making data available requires interoperability services – services that translate data structure and meaning between different systems.

Provision of interoperability services is expensive and time consuming. This overhead increases with the variability of the transactional systems that are included within an integrated network.

CIN will typically require a full or limited clinical and administrative dataset, and a claims data set, from each entity that participates.
CliniGraphic

An ontology-driven presentation of patient clinical information as it relates to a disease state or chronic condition. Relevant information from the patient’s longitudinal record is aggregated into a singular view to allow the clinician to quickly and efficiently determine how his/her health condition is being managed by displaying pertinent clinical indicators and highlighting gaps in care.
Clinical Inference Engine – Adjudication

Advanced Clinical Decision Support leveraging industry best practice content models and care standards.

The Clinical Inference Engine suggests that the patient may have diabetes based on clinical indicators presented to the clinician in the Evidence Summary.

Refer to the following slide for where these indicators are in the patient’s longitudinal record.
Scope and Capabilities

Longitudinal Clinical Patient Record for Clinicians

An exchange solution that allows healthcare organizations to share health information; to create composite health records for their patients; and to enable interoperability-driven applications, such as patient engagement or population health.

✓ Presentation of an expanded Longitudinal Clinical View through Clinician Portal which can be launched from the clinical source system and through rapid onboarding of disparate data sources

✓ Normalization and harmonization of discrete and non-discrete data through a Master Terminology Server and Natural Language Processing engine

✓ Advanced Clinical Decision Support leveraging industry best practice content models and care standards (Clinical Inference Engine)

✓ Ontology-driven Presentation of Disease States that highlight gaps in care (CliniGraphic)

✓ Enablement of Patient Portal and Care Management / Population Health Management solutions
Use Case 2:
Retrospective Performance Reporting –
Provider Specific Acute Care Costs
Acute Care Dashboard

Provide clinician with insight as to the cost of the care that they provide (direct costs / acute care)

Insight provided in context of MS-DRG and inpatient venue

Insight provided with intermediate latency (30 days)

Insights based on standardized resource categories and normalized cost accounting methodology

Insights provided within a self-service visualization
Technology Ecosystem Variability
Approach – Realization
## Ministry Analytic Comparison

Service Line: All, Discharge Date: 7/1/2017 - 1/31/2018

### Global Filters
- (All)  
- 7/1/2017  
- 1/31/2018  
- 1  
- 99.99  
- (All)  
- Additional Filters

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**Grand Total**

| 25,681    | 10,112          | $1,680,021       | $237,799,467       | $259,671,979             | $63              | $25           | $141          | $138        | $20          | $1,073    | $320       | $2,511                | 1.48               |

Prepared by: ACR/DataInsights
Use Case 3:

Retrospective Performance Reporting – Antibiotics Use and Resistance
The Centers for Disease Control focused on the “antibiotic stewardship” in the healthcare setting. The goal is to optimize the treatment of infections while protecting patients from harm and combatting antibiotic resistance.

Ascension progressed in antibiotic stewardship by implementing four strategies. One of those strategies was helping our hospitals achieve their goals by tracking and evaluating antibiotic use data and revealing the results as a way of strengthening local expertise. The results of this data driven approach recorded:

- **20 percent** overall reduction in hospital infections
- **22 percent** reduction in joint replacement infections
- **15.9 percent** reduction in c.difficile infections in facilities where the data information is currently implemented
Next Steps:
Population Health Management
Delivering Population Health Analytics
Expanding Analytic Capabilities

Optimizing Population Health care models requires a broad suite of analytic solutions supporting a range of capabilities – from simple performance reporting, to complex hybrid predictive modeling, to big data platforms enabling unstructured discovery using raw or minimally transformed data.

Driving maximal value from these analytics suites, however, requires the addition of a new skillset – that of the data scientist; traditionally directed towards research activities, data scientists are now critical to the optimization of both business and clinical outcomes.
Low Cost / High Quality Care Model Design
Accounting for the Social Determinants of Health

Optimization of care model quality outcomes, and control of care delivery costs, requires clinically integrated systems of care that progressively account for a larger component of the determinants of health beyond “traditional clinical” dimensions.

This expanded scope has significant implications for the approach to enterprise data management and analytics.
Questions