Making Self Service Analytics Possible
Our Journey & Our Trade-Offs

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A comprehensive system of care
The road to self-service

1. “Make data/results easy to consume”
   Users must be able to grasp what the information presented to them means. A fire hose of information makes it difficult to determine where things are going off-kilter, where exceptions occur, or even get a handle on critical situations.

2. “Make it easy for me to ask questions & learn”
   Self-service must be an environment in which it is easy to discover and access information. The self-service information workers want to be able to personalize to their questions in an easy-to-use format. This enables decisions to be made faster.

3. “Make it easy for me to share what I learned”
   Self-service information workers’ need a personalized and collaborative decision making environment. Therefore, Information workers must become more self-sufficient to “deploy” their analytic applications to others, on their own timetable to a community of individuals.

4. “Make it easy to find the ‘hidden’ insights”
   Although reporting and simple analytics interfaces have achieved a high level of ease of use, we still need to make the more complicated analytics easy to use (machine learning, predictive analytics, etc.) to find the hidden patterns in data. Sophisticated analytics are often too intricate, complex, or difficult to construct for many information workers. Support for such sophisticated analyses, as well as making results easy to consume, greatly improves the productivity and knowledge.
The end user: Self-service for different needs

THE FARMER
• Regular access to data
• Know what they are looking for
• Predefined pathways
• Access small amounts of data
• Predictable access to data
• Predefined data

THE INVESTIGATOR
• Follow a theory
• Look over lots of data on a random basis
• Monitor groups of data regularly
• Look for causality / root cause
• Look for repeating occurrences of data
• Sometimes find arenas for further exploration

THE EXPLORER
• Unsure what they will find
• Inquisitive, die-hard experimentalists interacting with large data sets
• Makes requests that are far-fetched
• Expert in one subject area
• Requirements are totally unknown
• Often times finds nothing, but occasionally finds huge nuggets in unexpected places
• Looks for relationships of data rather than occurrences of data
The journey of self-service tools

As tools change, data remains the same.

IT involvement between every step.

STATIC REPORTING
AD HOC REPORTING
DISCOVERY VIA CUBES
VISUAL DATA MASH-UPS
PREDICTIVE ANALYTIC PLATFORM
COGNITIVE ANALYTICS MACHINE LEARNING

AMDIS Fall Symposium
Self-service data/analytics focus
QlikView 2016 Top 10 of 24 developed

1. Population Discovery
2. Urgent Care Dashboard
3. ED Dashboard
4. TCCN SMaRT
5. Bronchiolitis Dashboard
6. Asthma Guideline Dashboard
7. Radiology Efficiency Dashboard
8. Appendicitis Dashboard
9. Diabetes Dashboard
10. Readmissions & Returns

210,359 Session Counts (Last 12 months)
325 Unique Users (Last 12 months)
Population discovery demonstration
Pop Disco Self-Service Analytics

Use cases: Visiting our colleagues

WHY? UNDERSTANDING...

- Where can self-serve tools leverage value?
- Where does this tool fit in spectrum of reporting tools?
- How can we market self-serve analytics to users?
- What level of training is needed?
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
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<tbody>
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What we asked Pop Disco users

- Sample work flow in tasks and problem solving
- Examples of findings obtained
- Findings beyond population identification
- Publications resulting from use of Pop Disco
- Presentations resulting from use of Pop Disco
- Use of other reporting tools
- Limitations/Complaints/Suggestions

Publications resulting from use of Pop Disco

Use of other reporting tools

Limitations/Complaints/Suggestions

Presentations resulting from use of Pop Disco

Examples of findings obtained

Findings beyond population identification

Sample work flow in tasks and problem solving
How is Pop Disco used: Actual roles and workflows

Physician Director Outcomes & Population Health

Focus specialty groups on highest process priorities
- Example: Hematology and Hospitalist Services co-admitting patients, lacked common protocols. Who does what?

WORKFLOW
- Self-serve Pop Disco access to sickle cell patient reasons for admission, complications, procedures
- Met with combined groups, shared data, started discussion
- Protocols developed for high-risk patients

POINT
Groups not focusing on shared priorities. Dashboards and standard reports would not normally cover this
How is Pop Disco used:
Actual roles and workflows

Physician Director Outcomes & Population Health

Rabbit out of a hat
  • Example: Context—Lack of love for CDI programs

• Physician group working on CDI program asks for “Top 10–15 conditions”
• Medical director gets back to them before end of day with complete list

POINT
Doctors pay attention when attention span respected
How is Pop Disco used: Actual roles and workflows

Nurse Practitioner—Clinic Coordinator

**GOAL**
Multispecialty clinic for swallowing dysfunction. Small clinic, limited resources. Providers from multiple specialties.
- “We should have standard reports but…”

**WORKFLOW**
Responding to questions from providers:
- Which patients had surgeries requiring follow up?
- Match provider to procedure for clinic schedule.
- List patients and swallow studies for follow up.
- NP curiosity: follows rate of respiratory infections of clinic population—“What sort of winter are we having?”

**POINT**
Self-serve reporting may be excellent tool for population management on small scale
The small clinic tells its story

**OUR TEAM**

Aerodigestive diseases involve the areas of the mouth, throat, lungs and/or esophagus. When patients visit our center, they see physicians and specialists from multiple areas who work together to provide the best possible care. Our team monitors patients’ progress and performs joint appointments, procedures, and surgeries. This helps to minimize travel time, days out of school and anesthesia time. We rely on healthcare professionals from the following areas: Pulmonology, Gastroenterology, Otolaryngology, General Surgery, Nutrition, Speech Language Therapists, Nurse Practitioners, Nursing, Social Work, Case Management, and Respiratory Therapy.

<table>
<thead>
<tr>
<th>Patient Evaluation Experience</th>
<th>Without Coordination</th>
<th>With Coordination</th>
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<tbody>
<tr>
<td>Clinic Site Visits</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>GI Motility Tests</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Travel Time (estimate: 1.5 hrs)</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Missed day of work/school</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Missed lost work/school</td>
<td>same</td>
<td>same</td>
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**OUR INNOVATION**

Having a team of experts work together increases collaboration and innovation across the organization. A few of the impactful ways we have broken new ground together includes:

- Set precedent for multidisciplinary encounter documentation and billing in EPIC
- Advocated and introduced novel equipment and policies such as the AMT bridle, 14F G.J tube and a non-balloon G tube
- Established cross-specialty/populating practice for nurse practitioners and modeled NPs in telemedicine
- Reduced administrative and coordination of complex patients through centralized approach
- Efficiently used OR time and reduced anesthesia exposure for patients undergoing multiple procedures
- Set precedent for documenting and billing of multiple procedures done together.
How is Pop Disco used:  
Actual roles and workflows

**Physician Informaticist (“Surrogate User”)**

**GOAL**
- Obtain data AND improve study design for colleagues

**WORKFLOW**
- Experienced informaticist sits with researchers and discusses plans for research project
- Reviews data definitions, what data is readily available, surrogate data markers and general study design
- Refines study plans in real time with data and “what ifs”

**POINT**
Over two years: 20 projects, 6 papers, 10 abstracts, 2 presentations
How is Pop Disco used:
Actual roles and workflows

RN Manager Quality and Clinical Effectiveness

TASK #1
Monitor guideline and pathway compliance

WORKFLOW
• Pre-checked “dummy’ orders support pathways and guidelines
• Monitor the Migraine Guidelines, query patients with migraine for the associated dummy order indicating use of the order set
• Filter further to see that essential orders are present, and which providers are placing them

POINT
“One size fits all” method for monitoring guideline compliance
How is Pop Disco used: Actual roles and workflows

**RN Manager Quality and Clinical Effectiveness**

**TASK #2**

“Non-standardization” as probe for sub-optimal care
- Problem: Clinical area concerned about its outcomes or processes

**WORKFLOW**

- Quality manager looks at the relevant population volume, LOS to determine priority
- Observes distribution of diagnostic tests, medications to determine if wide variation in care patterns
- High volume entities with wide varieties of treatments are prime targets for initiatives geared toward standardization
- Data showing variations in care is discussion tool

**POINT**

1) Effective in identifying need for guidelines
2) Helpful tool in driving consensus
Monitoring behavioral health with Pop Disco

### Medications used for behavioral health

- **Guideline**
  - Chlorpromazine: 12
  - Diphenhydramine: 38
  - Halol: 29
  - Hydroxyzine: 31
  - Lorazepam: 42
  - Quetiapine: 64

- **Off guideline**
  - Clonidine: 43
  - Depakote: 48
  - Dextroamphetamine: 25
  - Propiolo: 24
  - Risperidone: 62
  - Trazodone: 20
  - Zyprexa: 6

**Medications suggested for behavioral health concerns with guideline**

**Medications used frequently for behavioral health concerns**
How is Pop Disco used: Actual roles and workflows

Physician Outcomes Researcher (Pediatric Surgeon)

- IRB preparation
- Identify charts to pull for clinical study

Strength is sample-size estimator

Chart review, source imaging, and Clarity reports are needed for publishable studies
QI efforts by Pediatric Surgery

Decreased CT use and admissions with increased standardized US report
Association of Duration of Symptoms and Secondary Signs in Ultrasound for Pediatric Appendicitis.


Return to the System Within 30 Days of Discharge after Pediatric Appendectomy.

Hepatic and splenic blush on computed tomography in children following blunt abdominal trauma: Is intervention necessary?

The Influence of Infectious Complications in Gastrochisis on Costs and Length of Stay.

Emergency Department Visits and Readmissions among Children after Gastrostomy Tube Placement.

Secondary signs may improve the diagnostic accuracy of equivocal ultrasounds for suspected appendicitis in children.

Presentation and management of pulmonary sequestration with total visceral inflow and outflow.

The contribution of practice variation to length of stay for children with perforated appendicitis.

The necessity of sociodemographic status adjustment in hospital value rankings for perforated appendicitis in children.

Assessment of variation in care and outcomes for pediatric appendicitis at children's and non-children's hospitals.
Publications enabled by Pop Disco for Pediatric Surgery

Division of Pediatric Surgery - Egleston Campus
PubMed Citations

Number of Publications

Year

Strengths

Strong tool for population identification

Flexible, interactive filtering allowed users to test:
- Accurately defined the target population
- The population is large enough to matter

Beyond population identification:
Frequency distribution of data
(example: probe for “non-standardization”)

Fits many clinical reporting needs
- Fills gaps of standard reports.
Limitations

This is one tool in the analytics tool kit—strengths and limitations are expected and can be part of training.

- Standard reports, chart pulls, and source imaging still often needed for publishable material
- Clinicians using “Surrogate Users” failed to get direct interactions from data, but good guidance on issues
- Helpful features not in use yet due to lack of training
- More publicity needed to recruit clinical users (planned)
Questions?

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