Using Clinical Analytics to Optimize Care Coordination Across Multiple Sites of Care
Goal

Delivering *actionable* data in ways that are useful to care teams on the front lines, helping to drive quality and performance improvement
Outline

• Importance of clinical analytics and comparative data

• Framework for acting on clinical analytics

• How organizations are optimizing care coordination with clinical analytics
  • Community Health Network
  • Mayo Clinic Health System
  • Wilmington Health

• Key Takeaways
Clinical Data Are Essential

- Healthy/Low-Risk
- At-Risk
- High-Risk
- Symptomatic
- Active Illness

80% of Costs

Timely, Clinical Data

Clinical Interventional Opportunity
How Does Humedica Help Provider Organizations?

Integrate clinical and claims data across the continuum of care to give providers a complete view of population health.

Better predict patients at-risk to reduce preventable cost via clinical analytics.

Improve performance via deep comparative clinical benchmarks.

Make it work easily so non-technical people can interact without extensive training and support.

Clinical Analytics Purpose-Built for Healthcare
What We Can Learn from Clinical Analytics and Comparative Data
Key Considerations for Delivering Actionable Data to the Front Lines

• Who
  • Who is framing the clinical and/or quality questions?
  • Who is planning for the resources necessary to support operationalizing clinical insights?
  • Who will drive the analytics in Humedica MinedShare?

• What
  • What are your clinical focus areas?
  • What will you choose to measure?
  • What are the common definitions? E.g., Cohort definitions, quality thresholds

• How
  • How will you deliver clinical insight to end users?
  • How will the data be sustainably integrated into operations?
Three Organizations Using Clinical Analytics to Optimize Care Coordination

Community Health Network

MAYO CLINIC HEALTH SYSTEM

WILMINGTON HEALTH

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Using Clinical Analytics to Optimize Care Coordination at Community Health Network

Mary Jane Lowrance, RN, MSN, MBA
Chief Nurse Executive
Community Physician Network
Community Health Network

• Established in 1956 as a not-for-profit hospital on the East side of Indianapolis
• 2013-over 200 sites of care, 8 hospitals and affiliates throughout Central Indiana
• Integrated multispecialty physician group, Community Physician Network, has more than 500 physicians providing comprehensive care at more than 100 locations
• >1,000,000 outpatient visits annually
• New conversion to EPIC (April-November 2012) for all sites of care, and 4 hospitals
• Leader in Quality Health First measures
How we all work together
TCN 2012 Stats

• Readmission Rate in 30 Days – All Cause
  • All DRGs – 18.3%
  • Only HF, PN and AMI – 2.1%
    • Avoided Loss in Reimbursement = $38,014
    • Decrease of 57.1% in 30 days Prior/After
    • Decrease of 65.0% in 6 months Prior/After

• ED Visits
  • Decrease of 28.6% in 30 days Prior/After
  • Decrease of 56.4% in 6 months Prior/After
Quality Data Assistants (QDAs)

- Practices were only doing so much with data
- Dedicated team to go after missing data, missing patients, missing revenue.
- 4 then 6, divided the work among 70+ practices
- Prep charts for the week to alert staff to protocols, contact patients for appointments or records, schedule appointments with providers as needed, update discreet data points to allow capture, obtaining records from outside sources to satisfy quality measures.
- Provide education to staff & providers to document for credit
## Quality Number Improvements

### CLMP, Carmel, Olio

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<tbody>
<tr>
<td><strong>Diabetes Care</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BP &lt; 135/85</td>
<td>61.30%</td>
<td>62.56%</td>
<td>67.20%</td>
<td>63.07%</td>
<td>4.13%</td>
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</tr>
<tr>
<td>BP Captured (Diab)</td>
<td>92.98%</td>
<td>94.78%</td>
<td>95.77%</td>
<td>93.34%</td>
<td>2.43%</td>
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</tr>
<tr>
<td>Diab LDL Controlled</td>
<td>64.16%</td>
<td>66.50%</td>
<td>68.12%</td>
<td>66.84%</td>
<td>1.28%</td>
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<tr>
<td>Eye Exam Captured</td>
<td>37.76%</td>
<td>45.22%</td>
<td>54.68%</td>
<td>44.23%</td>
<td>10.45%</td>
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<tr>
<td>Foot Examination</td>
<td>71.13%</td>
<td>80.23%</td>
<td>86.40%</td>
<td>76.38%</td>
<td>10.02%</td>
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</tr>
<tr>
<td>HbA1c &lt;= 8</td>
<td>na</td>
<td>na</td>
<td>79.54%</td>
<td>75.86%</td>
<td>3.68%</td>
<td></td>
</tr>
<tr>
<td>Hgb A1c Captured</td>
<td>63.00%</td>
<td>73.69%</td>
<td>82.65%</td>
<td>69.56%</td>
<td>13.09%</td>
<td></td>
</tr>
<tr>
<td>LDL Captured</td>
<td>72.61%</td>
<td>79.30%</td>
<td>83.67%</td>
<td>76.05%</td>
<td>7.62%</td>
<td></td>
</tr>
<tr>
<td>Nephropathy</td>
<td>58.89%</td>
<td>70.21%</td>
<td>81.99%</td>
<td>67.46%</td>
<td>14.53%</td>
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<tr>
<td><strong>Preventative Screenings</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Chlamydia</td>
<td>28.61%</td>
<td>46.22%</td>
<td>49.04%</td>
<td>48.98%</td>
<td>0.06%</td>
<td></td>
</tr>
<tr>
<td>Colorectal Screening</td>
<td>58.74%</td>
<td>65.54%</td>
<td>73.83%</td>
<td>65.21%</td>
<td>8.62%</td>
<td></td>
</tr>
<tr>
<td>Mammogram</td>
<td>64.11%</td>
<td>68.00%</td>
<td>71.40%</td>
<td>64.54%</td>
<td>6.86%</td>
<td></td>
</tr>
<tr>
<td>Osteoporosis Screening</td>
<td>52.31%</td>
<td>66.79%</td>
<td>78.38%</td>
<td>60.79%</td>
<td>17.59%</td>
<td></td>
</tr>
<tr>
<td>Pap Ages 21-29</td>
<td>62.59%</td>
<td>75.11%</td>
<td>75.96%</td>
<td>76.08%</td>
<td>-0.12%</td>
<td></td>
</tr>
<tr>
<td>Pap Ages 30-65</td>
<td>76.43%</td>
<td>80.56%</td>
<td>83.58%</td>
<td>76.67%</td>
<td>6.91%</td>
<td></td>
</tr>
</tbody>
</table>
Why We Needed Clinical Analytics

• Quality program was good but it lacked
• Claims data versus clinical data - BIG difference
• Risk stratification- who did we really need to get to?
• Humedica demo at AMGA blew me away

  ✓ flexibility to explore and change questions without needing to depend on reporting
  ✓ Simple, easy clicks versus asking and waiting weeks (or longer) for someone to run a report out of the EMR
Humedica MinedShare at CPN/CHNw

- Triple aim focused
- ACC formation
- Validation of Epic data
- True Population Mgt
  - Limited number of people with full access- important to define the questions accurately- so there is one version of truth.
- Push out model
HealthMark Pilot Model

Risk Stratification:
A standardized predictive process to identify the top 2% highest risk Healthmark insurance patients

Intensive Primary Care Team (IPCT): NCM’s
Assess and resolve the medical, social and behavioral barriers for the highest risk patients to improve their care delivery and satisfaction
- Decrease pharmacy costs
- Decrease ER utilization
- Use of community resources
CHF Predictive Model Report
DM High Risk Patient Tracker
Lessons learned so far

• Without the kind of data Mindshare can provide, you’re only getting part of the picture
  ✓ Uncoded patients (way more than anticipated)
  ✓ ER utilizers- $$
  ✓ Cause and effect answers
  ✓ Comparisons... how good or how bad
  ✓ Can make physicians believers
  ✓ Dedicated staff to pursue what is uncovered
  ✓ Now to bigger populations
Converting Data into Value in Care Coordination Efforts

Alan Krumholz MD, FAAP, DFACMQ
Mayo Clinic Health System

MCHS employs over 900 providers in Iowa, Minnesota and Wisconsin.
One System – Four Regions

- Moving from volume to value, but different approaches to contracting (commercial ACOs, employer contracts, no contracts)

- Focused on proactive patient management, but varied priorities and resourcing (PCMH, disease-specific outreach, etc.)

- Previously limited view of population and disparate access to claims data, but all looking for more sophisticated clinical analytics
What is “Informatics”

**Informatics**: The science of organizing and analyzing data into useful information, providing easier access to more knowledge for wiser decisions

Today’s Technology has Enabled Informatics
Alice’s Paradox

“If you don’t know where you are going any road will get you there!”

- Lewis Carroll, *Through the Looking Glass*

Corollary for Healthcare:

*To know how to improve we must measure it!*
Humedica MinedShare®

- Implemented in October 2012 to bring together clinical and cost data

- Governance and delivery focused on:
  1. Education
     - Weekly region-specific training sessions to analyze and discuss data trends
  2. Adoption
     - Formal request/review process that asks: “What are you going to DO with the data?”
SURE, IT'S GREAT TECHNOLOGY, BUT WE CAN'T FIGURE OUT HOW TO APPLY IT...
Adding the Clinical Dimension

- Patients missing BMI screening
- DM patients missing A1c test
- Coded HF patients

- Patients w/ BMI > 35
- DM patients w/ A1c > 9
- DM patients in control on A1c, LDL and BP
- Patients w/ EF < 40 but no HF code
- HF patients not on ACE/ARB
- HF patients at-risk for IP stay
Examples of Humedica MinedShare Reports in Use

• Preventive Services (E&Ms, mammograms, colonoscopies, BMI screenings, etc.)

• High Utilizers (ED frequent fliers, readmits, patients missing PCP follow-up visits, etc.)

• Chronic Disease Management (Diabetes, Hypertension and Heart Failure screenings, risk stratification and clinical outcomes, etc.)

• Panel Management (risk adjusted panel sizing, RVUs, control rates, E&M utilization, etc.)
Additional Humedica MinedShare Use Cases

- Uncoded chronic disease patients
- CHF patients missing EF reading
- Patients with > 5 ED visits (12 months)
- Mean RVUs by Risk Score (by PCP)
- CHF at-risk for admissions (MinedShare predictive model)
Population Risk Management: Clinically-Based, Predictive Modeling (CHF)
CHF Predictive Model Categories

![Graph showing CHF Utilization Management Report](image-url)
CHF Care Management: EF Measurements

CHF: % of Pts w/ Ejection Fraction Measurement

- Yes: 80%
- No: 20%

Pts w/ 1 Ejection Fraction Measure (Ever)

# of patients: 10042
Managing High Utilizers

High Utilization Report

Pts w/ >=5 ED Visits Last 12 Months by Chronic Cohort

Chronic Disease Profile (Ever)

Number of Patients

Hypertension
Dyslipidemia
Diabetes
COPD
Coronary Artery Disease
CHF
Pulmonary Asthma

Pts w/ >=5 ED Visits Last 12 Months by Chronic Cohort

MAYO CLINIC HEALTH SYSTEM
30-Day Readmissions by Provider
DM: The Impact of Uncoded Patients

DM: Coding Opportunity Analysis

DM Clinical and Coded Evidence of DM

- DM Evidence Type [Up to End of Time Period]

DM: Pts w/ DX and eGFR < 60 but No Renal Code

- Number of Patients [All Patients]

DM: Pts w/ DM Dx and eGFR < 60 but No Renal Code by Site of

- Most Frequent Site of Care [Last 24 Months of Data]

DM: Mean # of Hosp Admits for Coded vs Uncoded Pts

- Mean # of Hosp Admits [Up to End of Time Period]

DM: Rate of Pts w/ Readmission (30 days) by Time and Evidence

- Rate of Pts w/ Readmission [Up to End of Time Period]

DM: Mean # of ED Visits for Coded vs Uncoded Pts

- Mean # of ED Visits [Up to End of Time Period]
DM: The Impact of Uncoded Patients

DM: Coding Opportunity Analysis

DM Evidence Type [Up to End of Time Period]: Lab
Time Interval: Q2
2012
Rate of Pts w/ IP Visit Resulting in Readmission (30 days) [In Time Period]: 13.6%
13.6% = 105 (Number of Pts w/ IP Visit Resulting in Readmission (30 days) [In Time Period] in this Time Interval and DM Evidence Type [Up to End of Time Period] Category) / 773 (Total number in this Time Interval and DM Evidence Type [Up to End of Time Period] Category)

MAYO CLINIC HEALTH SYSTEM
Key Takeaways

• Learn your data before using it
  • **Examine**: Find the trends in your population
  • **Diagnose**: Focus on the actionable opportunities
  • **Treat**: Design evidence-based interventions

• Choose opportunities that are sized to current resources

• Balance centralized standards with customized application

• Design initiatives with measurement in mind
Clinical Analytics to Optimize Care, Improve Outcomes

AMGA Annual Conference
March 15, 2013
Brittany Crye, MHA
Jonathan Hines, MD
Wilmington Health

- 147 Providers
- 20 Locations
- Multispecialty group
How we’re using clinical analytics...

...to achieve cultural transformation
Care Coordination Process Flow

1. Interests/Issues
   - Review filters & Ensure clinical applicability

2. Pilot group
   - Critique query design and vet data for accuracy

3. CMO/CMIO
   - Employ patient registries to optimize care

4. Care coordinator/front line staff
   - Employ patient registries to optimize care

5. Clinical Analyst
Control & Governance

• Full privileges
  – Clinical Analyst
  – CMO/CMIO
  – COO
  – Sr. Director of Lean
  – Associate Director of Primary Care-PCMH

• Read-only
  – Pilot
Clinical Analytics Pilot

Members

• Consists of 10 providers
  – IM
  – FM
  – OB/GYN
  – Pediatrics
  – Endocrinology

• Director of Lean

• Associate Clinical Directors/Managers
Clinical Analytics Pilot Roles and Responsibilities

• Contribute to the development of meaningful, actionable metrics
• Challenge query proposals and design
• Multiple rounds of data vetting
• Share best practices
• Standardize documentation
• Review outreach program materials
• Champion forward thinking
• Promote cultural transformation
Clinical Analytics Pilot

1. Meaningful, actionable metrics

• Do metrics truly reflect the quality of care?
• Do our metrics align with standard recommendations in the literature?
• How to strike a balance between simplicity of measurement and complexity of the work?
• How will our efforts at measurement affect our requirements to standardize documentation?
• How to distinguish performance metrics from outreach metrics?
### Clinical Analytics Pilot

#### 1. Meaningful, actionable metrics

<table>
<thead>
<tr>
<th>Performance metrics</th>
<th>Outreach metrics</th>
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<tbody>
<tr>
<td><strong>Gaps in care</strong></td>
<td><strong>Gaps in care</strong></td>
</tr>
<tr>
<td>– Rate of Pts with E&amp;M visit in 15 months</td>
<td></td>
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<tr>
<td>– Rate of Pts with foot exam in 15 months</td>
<td></td>
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<tr>
<td>– Rate of Pts with eye exam in 15 months</td>
<td></td>
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<tr>
<td><strong>Quality of Care</strong></td>
<td></td>
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<tr>
<td>– Rate of Pts with A1c&lt;9</td>
<td></td>
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<tr>
<td>– Rate of Pts with A1c&lt;11</td>
<td></td>
</tr>
<tr>
<td>– Rate of Pts with A1c</td>
<td></td>
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<tr>
<td>• &lt;7 for 18-64 yo</td>
<td></td>
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<tr>
<td>• &lt;8 for 65-75 yo</td>
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<tr>
<td>– Rate of Pts with BP&lt; 140/90 on at least 70% of readings</td>
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<tr>
<td>– Rate of Pts with LDL&lt;100</td>
<td></td>
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<tr>
<td>– Rate of patients meeting D3 goals</td>
<td></td>
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<tr>
<td><strong>At-risk patients</strong></td>
<td></td>
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<tr>
<td>– Pts with A1c&gt;9</td>
<td></td>
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<tr>
<td>– Pts with A1c&gt;11</td>
<td></td>
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<tr>
<td>– Pts with BP&gt; 160/95</td>
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<tr>
<td>– Pts with LDL&gt;130</td>
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</table>
Clinical Analytics Pilot

2. Validate the Data

• Are the patient registries accurately attributed at the individual provider level?

• Do the variables identify the population in question?

• Is the clinical data mined correctly from the medical record?

• Is the clinical data reliably standardized in the medical record so that it can be mined?
Flexibility vs. Consistency

How to balance the flexibility while ensuring that you work from one version of the “truth”?

• Develop a small, diverse pilot group or think tank of engaged providers and key players to guide the development of queries

• Create a long-term and short-term plan to use as a roadmap to keep the clinic on track and focused

• Leverage the strengths of various quality reporting tools to obtain desired data

• Employ one person to take feedback and build graphs tailored to clinic’s needs and wants
Quality Demonstration Project

• Systematic approach to organizational quality initiatives

• Design for multi-step “experiment” that will allow us to examine which components of our data extraction tools have the greatest impact on the quality and completeness of care given at WH.

• Utilizes Humedica MinedShare, CINA, and Allscripts reporting module
Quality Demonstration Project

- Part A: POS Users vs. Non-Users
- Part B: Clinic-wide Transparency
- Part C: Outreach/ Population Management
- Part D: Compensation change
Quality Demonstration Project

Part A: POS Users vs. Non-Users

Compare POS users vs. POS non-users in primary care

Metrics to follow:
- Immunizations (flu, pneumonia, tetanus)
- Cervical cancer screening
- Breast cancer screening
- Colon cancer screening
- Bone density screening
## Wilmington Health Associates

### Patient Recommendation Report

#### Appointment Date: 4/12/2012 9:45:00 AM

**Active Diagnoses**
- **DIABETES MELLITUS (250.00)**
- **CONGESTIVE HEART FAILURE (428.0)**
- **HYPERLIPIDEMIA (272.0)**
- **ABNORMAL LIVER FUNCTION STUDIES (5)**
- **Benign Nevi vs. Papillomas (645.1)**
- **FOREIGN BODY, CORNEA (930.0)**
- **GASTROESOPHAGEAL REFUX (530.81)**
- **HYPERTROPHIC CICATRICIAL SKIN NOS (7)**
- **INJURY TO ULNAR NERVE (855.2)**
- **KERATOSIS, ACTINIC (702.0)**
- **KERATOSIS, SEBORRHEIC, INFLAMED (7)**
- **Lentigines/nevus/evs**
- **MELANOMA, MALIGNANT, FACE NEC/NO NEOP, USD, SKIN (238.2)**
- **MORE**

#### Active Meds
- MetFORMIN HCI 500 MG two 12/21/11
- GlipZIDE XL 5 MG daily 01/06/12

#### Labs
- **Trig:** 100 mg/dl 12/20/11
- **Chol:** 180 mg/dl 12/20/11
- **LDL:** 121 LAc 12/20/11
- **HDL:** 39 mg/dl 12/20/11
- Gluc, Fasting: 98 mg/dl 12/20/11
- Gluc, Random: 98 mg/dl 12/20/11
- HBA1c: 6 % 12/20/11
- MicroAb/Cr: 7.42 Calc 11/13/09
- **PSA**

#### Measures / Calculations
- **BP:** 122/84 1/06/12
- **CHD Risk:** 25% 2/14/10
- **BMI (Vt):** 31.1 (228lb) 1/06/12
- **Ideal Vt.:** 145-183
- **Est. CrCl:** 120.39 12/20/11

#### Diagnostic Testing

#### Insurance:
- BCBS SMART CHOICE
- NC State Health Plan
- **COB:**
- **Primary Pr:**

#### Routine Visits: Next Visit: 07/09/2012
- Last Visit: 07/09/2012
- Comp. Exam Visits: Next Visit: 09/20/2011

#### Next Appt. Date:
- **Tetanus:** 2-3 mos
- **Tdap:** 3 mos
- **Pneumoccal:** DM
- **Flu:** CAD
- **Herpes Zoster:** HTN

#### Goals
- **Goal not met:** BMI > 30
- **Goal not met:** A1c > 7.6%
- **Goal not met:** LDL > 70
- **Goal met:** Microalbumin/Creat Ratio <= 30
- **Goal met:** BP < 130/80
- **Goal met:** Nonsmoker

#### Action Items
- **PREV**
  - **DOC:** Document or perform Diabetic Foot Exam
  - **DOC:** Document or address Obesity Dx / Plan (yearly)
  - **MED:** Evaluate DM therapy plan due to A1c goal not met
  - **MED:** Consider ACEI or ARB* for Dx Heart Failure (EF % unknown / not documented in PPhr)
  - **MED:** Note: Drug therapy CrCl may exist: Address LDL, goal not met.
  - **MED:** Consider ASA / Anti-plt tx due to CAD / CHD Risk > 20%
  - **MED:** Consider Beta Blocker* for Dx Heart Failure
  - **REFER:** Consider referral for Diabetic Education (rec q 3 yrs)
  - **REFER:** Perform / Refer to Ophthalmology for Diabetic Eye Exam (yearly)

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Quality Demonstration Project

Part A: POS Users vs. Non-Users

Mammogram_Yrly Avg by Group

- Early Adopters
- Late Adopters
- Non Adopters
Track performance of individual providers on a host of quality metrics in response to routine, clinic-wide sharing of quality data

- **Metrics to follow:**
  - HTN
    - % of patients with last BP<140/90
  - Preventative Care
    - % of patients with breast cancer screening
    - % of patients with cervical cancer screening
    - % of patients with colon cancer screening
    - % of patients with influenza immunization
    - % of patients with pneumococcal vaccination
Quality Demonstration Project

Part B: Clinic-wide Transparency

Cervical Cancer Screening
Reporting period: 01/01/2012 to 12/31/2012

- December 2011
- June 2012
- December 2012
Assess how outreach efforts impact patient outcomes and compliance

**Metrics to follow:**
- Compare pilot group to non-pilot group on outreach metrics
  - A1c>9
  - A1c>9 and no DSME
  - No A1c in 15 months
- Track ROI
Quality Demonstration Project

Part C: Outreach/Population Management

Percent of DM Patients w/ A1c testing: Pilot vs. Non-Pilot

Time

Jan 2011-March 2012
April 2011-June 2012
July 2011-September 2012
October 2011-December 2012

% of patients

0.00%
10.00%
20.00%
30.00%
40.00%
50.00%
60.00%
70.00%
80.00%
90.00%
100.00%

Pilot
Non-Pilot
Quality Demonstration Project

Part D: Compensation change

Track global and individual performance following initiation of a compensation change that ties a portion of compensation to quality metrics.

Metrics to follow:

• TBD
Quality Demonstration Project

- Will allow us to incrementally evaluate the effects of each variable and determine next steps
  - POS tool (CINA)
  - Clinic-wide Transparency
  - Outreach
  - Tie to compensation
Lessons Learned...

1. You can’t make everyone happy
2. The data will NEVER be PERFECT, but it must be ACCEPTABLE and ACTIONABLE
3. Focus on a manageable number of cohorts, meaningful metrics, and quantifiable process improvements, etc.
4. Set feasible goals and involve a leader from every affected department
5. Accurately and Precisely track the metrics and record changes in the clinic for future explanation
6. Take care to avoid any action or attitude that could be interpreted as judgmental or worse-punitive.
7. Have fun with this!
Once you move away from the push of information to the pull of learning, you liberate creative powers in your people.

— *The New Social Learning*
Tony Bingham and Marcia Conner