Driving Outcomes By Scaling Population Health Management

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Massachusetts General Hospital
Conflict of Interest

Henry C. Chueh:
Consultant for SRG-Technology, Amazing Charts, The Wonderful Company
Agenda

• Learning objectives and impact areas

• Problem that population health management (PHM) solves

• Approach to PHM implementation at scale

• Key functionality of PHM technology

• Results at 2 large academic health centers

• Learning ecosystem and insider’s tips
Learning Objectives

1. Describe the critical functionalities in a population health management IT system

2. List the essential components of a population health management learning ecosystem that drive outcomes

3. Demonstrate how to resolve the challenges of scaling a population health management initiative
Today’s presentation impacts these areas.
Population Health Management

• Health care systems need to demonstrate the value of the care they provide

• Population health management (PHM) represents one solution

• PHM involves the use of health information technology to identify patients with gaps in care

• Successful implementation requires addressing a number of key problems as delivery systems and payers adapt to caring for populations
Challenges of Scale
Payor-related Problems

• Subset of patients
• Varying metrics
• Metrics arbitrary
• Poor patient attribution
Operations-related Problems

• Poor coordination
• Small projects
• Traditional office
Set Clear Goals...

Improve clinical outcomes for ALL MGH primary care patient populations

Incentivize improvement over time

Reduce administrative burden on providers and practices
1. Development of measures that are more clinically meaningful
2. Creation of a central Population Health Coordinator (PHC) program
3. Implementation of TopCare, an enterprise population health management IT system
Relevant Measures

We developed clinically meaningful measures that apply to all patients and avoid discrepancies of payor contracts.

Making docs much happier!

We have 19 Primary Care Practices at Massachusetts General Hospital.

We have 14 Primary Care Practices at Brigham & Women’s Hospital.

Partners Healthcare

ACO

BCBS

HP #HIMSS16

Internal Performance Framework (IPF)
We listened to our physicians, and asked them why they called the “old” measures “STUPID”

The Taxonomy of “Stupid”

- Not a clinically relevant issue
- Clinically important idea, but measure is not an appropriate proxy
- Attribution Error
- Payer-Specific idiosyncrasies
- Wrong denominator
- Numerator improperly measured
- Measurement process cumbersome/complicated/doesn’t allow for remediation
No Excuses = High Targets

100%

- Misattribution: Not my patient
- Improperly counted in denominator: errant claim
- Missed in numerator: changed insurer, missing claim
- Clinical judgment: special circumstances
- On maximal therapy or intolerant to therapy

70.1%

So, if we remove the problems … why can’t we reach 100%?
We created a central Population Health Coordinator (PHC) team to support population health initiatives across the entire primary care network.

They huddle with physicians, take care of appointments, test reminders, patient outreach, and clean up EHR documentation, allowing clinical providers to be clinical!
Diabetes Blood Pressure Control

Sites WITH coordinator
- Passing: 3.8%
- Pop. Shift: 0.6%
- Clin. Exp.: 0.7%
- Removed: 2.1%
- Pass Rate: 82.6%

Sites WITHOUT coordinator
- Passing: 1.0%
- Pop. Shift: 0.3%
- Clin. Exp.: 0.7%
- Removed: 1.2%
- Pass Rate: 85.4%

Pass Rate (%): 80% to 92%

8/31/14 to 12/31/14

HIMSS 2016
Coordination between central and distributed model is critical

Cardiovascular Disease Outcome: Pilot vs. Non-Pilot Practices (run chart)
Choosing Technology Wisely

Critical functionality to achieve results
The Challenge

To improve outcomes, you need tools that enable continuous improvement. The tools that need to work together are found in different vendor solutions.
Typical PHM IT strategy scenario

Essential PHM Pillars are:
1. Data Aggregation
2. Analytics
3. Care Coordination
4. Patient Outreach

Ok, let’s purchase a software package for each pillar!
Data es el rey!

Dude! English please!

Je sais ce qu'il faut faire

我跟患者只

Data Aggregation

Analytics

Care Coordination

Patient Outreach

Huh?
We implemented TopCare, which enabled us to identify all the gaps in care, track our outcomes, coordinate care appropriately, and intervene to close those gaps.
What we did on day 1 (June 30th 2014):
Manage **ALL** patients belonging to the MGH + BWH Primary Care Network

From managing ~70k contract patients to:

<table>
<thead>
<tr>
<th>Populations</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetics</td>
<td>~24k</td>
</tr>
<tr>
<td>CVE (CAD, PVD, CVD)</td>
<td>~18k</td>
</tr>
<tr>
<td>Colorectal CS</td>
<td>~108k</td>
</tr>
<tr>
<td>Cervical CS</td>
<td>~124k</td>
</tr>
<tr>
<td>Breast CS</td>
<td>~71k</td>
</tr>
<tr>
<td>Hypertension</td>
<td>~72k</td>
</tr>
<tr>
<td>Other</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Total Patients Actively Tracked</strong></td>
<td>~300k</td>
</tr>
</tbody>
</table>
### Clinical Setting

<table>
<thead>
<tr>
<th>Setting</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Health Centers</td>
<td>2</td>
</tr>
<tr>
<td>Primary Care Practices</td>
<td>30</td>
</tr>
</tbody>
</table>

### Clinical Providers

<table>
<thead>
<tr>
<th>Provider Type</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicians</td>
<td>1045</td>
</tr>
<tr>
<td>Delegates</td>
<td>261</td>
</tr>
<tr>
<td>Practice managers</td>
<td>58</td>
</tr>
<tr>
<td>DM Champions</td>
<td>64</td>
</tr>
<tr>
<td>DSME</td>
<td>29</td>
</tr>
<tr>
<td>Navigators</td>
<td>9</td>
</tr>
<tr>
<td>PHMs</td>
<td>33</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1499</strong></td>
</tr>
</tbody>
</table>
Our Results
All quality measures **improved**

Actively managing >300,000 patients over 6 months

<table>
<thead>
<tr>
<th>Measures</th>
<th>% Change over 6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast Cancer Screening Process Measure</td>
<td>+ 3.1%</td>
</tr>
<tr>
<td>Cervical Cancer Screening Process Measure</td>
<td>+ 7.7%</td>
</tr>
<tr>
<td>Colorectal Cancer Screening Process Measure</td>
<td>+ 2.6%</td>
</tr>
<tr>
<td>CVE LDL Process and Outcome Measure</td>
<td>+ 8.5%</td>
</tr>
<tr>
<td>Diabetes Eye Exam Process Measure</td>
<td>+ 7.3%</td>
</tr>
<tr>
<td>Diabetes HbA1c Process and Outcome Measure</td>
<td>+ 5.0%</td>
</tr>
<tr>
<td>Diabetes HbA1c Process Measure</td>
<td>+ 4.6%</td>
</tr>
<tr>
<td>Diabetes HTN Process and Outcome Measure</td>
<td>+ 6.9%</td>
</tr>
<tr>
<td>Diabetes LDL Process and Outcome Measure</td>
<td>+ 6.5%</td>
</tr>
<tr>
<td>Diabetes Nephropathy Process Measure</td>
<td>+ 3.4%</td>
</tr>
<tr>
<td>HTN BP Process and Outcome Measure</td>
<td>+ 4.4%</td>
</tr>
</tbody>
</table>
...from a high baseline at MGH

<table>
<thead>
<tr>
<th>Measure</th>
<th>6/30/14</th>
<th>12/31/14</th>
<th>Improvements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>80.5%</td>
<td>85.4%</td>
<td>+4.9%</td>
</tr>
<tr>
<td>(Outcome and Screening)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes Blood Pressure</td>
<td>81.2%</td>
<td>88.8%</td>
<td>+7.6%</td>
</tr>
<tr>
<td>(Outcome and Screening)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes A1c&lt;9</td>
<td>79.6%</td>
<td>85.9%</td>
<td>+6.3%</td>
</tr>
<tr>
<td>Diabetes A1c Screening</td>
<td>76.4%</td>
<td>82.2%</td>
<td>+5.8%</td>
</tr>
<tr>
<td>Diabetes Lipid Outcomes</td>
<td>59.5%</td>
<td>68.8%</td>
<td>+9.3%</td>
</tr>
<tr>
<td>Diabetes LDL Screening</td>
<td>81.0%</td>
<td>87.4%</td>
<td>+6.4%</td>
</tr>
<tr>
<td>Atherosclerotic CV Disease</td>
<td>62.1%</td>
<td>71.1%</td>
<td>+9.0%</td>
</tr>
<tr>
<td>(Outcome and Screening)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colorectal Cancer Screening</td>
<td>82.4%</td>
<td>85.5%</td>
<td>+3.1%</td>
</tr>
<tr>
<td>Breast Cancer Screening</td>
<td>89.1%</td>
<td>91.1%</td>
<td>+2.0%</td>
</tr>
<tr>
<td>Cervical Cancer Screening</td>
<td>87.4%</td>
<td>90.5%</td>
<td>+3.1%</td>
</tr>
</tbody>
</table>
Improved visibility into our populations: Breakdown of Cervical Cancer Gains

Pass Rate (%):
- 8/31/14: 81.8%
- 12/31/14: 87.0%

- Passing: 5.0%
- Pop. Shift: 0.1%
- Clin. Exp.: 0.2%
- Removed: 0.2%

n = 124,457

HIMSS 2016
Sources of Divergence

Cervical Cancer Screening Sources of Divergence

- Estimated BCBS Performance: 84.0%
- Attribution: DLC Algorithm: 1.76%
- Attribution: Exception: 0.01%
- Denominator: Partners Population Definition: 2.03%
- Denominator: Misdiagnosis Exception: 0.00%
- Numerator: Partners Passing Definition: 6.07%
- Numerator: Pass Exception: 0.00%
- Adjusted Partners Performance: 94.5%
<table>
<thead>
<tr>
<th>Measure</th>
<th>NNT or NNS (number needed to treat to prevent 1 death/stroke/MI)</th>
<th>Net Patients Newly in Control from 8/31-12/31 (Clinical Only, most conservative)</th>
<th>Lives Saved or Stroke / MI prevented</th>
<th>Estimated cost savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension BP Control</td>
<td>1:125 (death) 1:67 (stroke) 1:100 (MI)</td>
<td>667</td>
<td>~22</td>
<td>$795k</td>
</tr>
<tr>
<td>CVE Lipid Control</td>
<td>1:27 (composite death, MI, stroke) 1:83 (death) 1:39 (MI) 1:125 (stroke)</td>
<td>911</td>
<td>~9</td>
<td>$760k</td>
</tr>
<tr>
<td>Diabetes Lipid Control</td>
<td>1:28 (composite death, MI, stroke) 1:104 (MI) 1:154 (stroke)</td>
<td>6,133</td>
<td>~6</td>
<td>$471k</td>
</tr>
<tr>
<td>Diabetes Blood Pressure Control</td>
<td>1:125 (death) 1:67 (stroke) 1:100 (MI)</td>
<td>376</td>
<td>~14</td>
<td>$468k</td>
</tr>
<tr>
<td>Colorectal CA Screening</td>
<td>1:107 (death from colon cancer)</td>
<td>384</td>
<td>~14</td>
<td>$261k</td>
</tr>
<tr>
<td>Cervical Cancer Screening</td>
<td>1:1000 (death from cervical cancer)</td>
<td>289</td>
<td>~8</td>
<td>$345k</td>
</tr>
<tr>
<td>Breast Cancer Screening</td>
<td>1:368 (death from breast cancer)</td>
<td>1,140</td>
<td>~3</td>
<td>$188k</td>
</tr>
</tbody>
</table>
ESTIMATED 76 LIVES SAVED WITH 4 MONTHS EFFORT

~$3 Million OF EXPENSIVE TREATMENTS AVOIDED

Costs avoided: ~$20 per patient
Cost of this PHM initiative: ~$7 per patient
Learning Ecosystem

You **WANT TO TOUCH IT, TO SEE IF IT’S HOT**...

**BUT YOU DON’T WANT TO TOUCH IT BECAUSE IT’S PROBABLY HOT.**

Greenebach 2014
One direction, one goal

- Leadership committed to improvement across all patient populations
- Eliminate sources of inertia and excuses
- Identify meaningful outcomes that can be unanimously supported
- Create incentives to rally clinicians
“Overall, what impact did these activities have on the care provided to your panel of patients?”

Positive Impact: **85%** (102/120)

Survey Comments:
(PCP referring to central population manager)

“That woman is worth her weight in pure Spanish saffron!”

Reduce administrative burden!
Flexible Coordinating Teams

• Dedicating organization-level, non-clinical staff

• “Working the lists”: willing to work independently or directly with practices and clinicians
Using IT beyond reporting

- Real-time, actionable, rolling 12-month data
- More accurate attribution and diagnosis algorithms
- Locally configurable metrics
- Allows for clinical judgment “exceptions”
- Support for all-payer populations (at least three times as large as risk population)
We are thrilled that our population health management initiative was a tremendous success!!

- Healthy patients
- Lower costs
- Happy providers
4 notable Tips
Targeting high-risk patients is important...

Step 1: Measure

Step 2: Intervene

Step 3: Measure

Average HbA1c = 7.5

Intensive Insulin Therapy Intervention

Low-Risk

Month 1

Month 2

1000

# diabetics

High-Risk

Low-Risk
But get the big picture first!

Predictive Analytics

Low-Risk

Intervention

High-Risk

Descriptive Analytics

Inertia

Pre-Diabetic Patient

Prescriptive Analytics
Think multi-interventions

Tip #2

- High-risk for No-Show Prediction Model
- Call outreach
- Double booking
- Identify loss to follow-up

Intervention 1

- 100% show-up rate
- No-show rate: 60%

Intervention 2

- No-show rate: 65%

Intervention 3

- No-show rate: 66%

Final result:

- No-show rate: 70%

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We identify High-Risk patients

How to improve their outcomes?

• Why are they high-risk?
  – Poly-pharmacy
  – Multiple Comorbidities
  – Low-health literacy
  – Poor cognition

• High-risk for what?
  – Readmission
  – High-cost
  – Non-Adherence, etc…

• Is the risk modifiable?
• Do we have an intervention available?
• Is the intervention effective?
How about identifying optimal patients to match interventions?

- Low health literacy: Education support
- Financial challenges: Social work consult
- Meets palliative care criteria: Supportive Clinical Care Consultation
Which intervention is better?

Invest in a good balance!
Tip Conclusions

1. Don’t target high-risk patients only, look at how quickly low-risk patients are becoming high-risk
2. Use multi-interventions to optimize outcomes
3. Match the right high-risk patients to the appropriate interventions
4. Have an effective PHM IT system to compare effectiveness of your interventions
1. Describe the critical functionalities in a population health management IT system

2. List the essential components of a population health management learning ecosystem that drive outcomes

3. Demonstrate how to resolve the challenges of scaling a population health management initiative
85% Satisfaction Survey

All of our quality measures improved!

From 70k to 300k patients

Annualized to $9.6 M of expensive treatments avoided
Questions?

Thank you!

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