Speaker Introduction

Steven J. Atlas, MD, MPH
Director, Practice Based Research & Quality Improvement
Massachusetts General Hospital

- Trained in Internal Medicine
- Practicing Primary Care Physician (PCP)
- Health Services Researcher
- Responsible for Quality Measurement and Assessment for Network
Conflict of Interest

Steven J. Atlas, MD, MPH

- Royalty: Beneficiary of an arrangement between Massachusetts General Hospital and SRG Technology - no payments have been received to date
- Consulting fees: SRG Technology
Agenda

• Integrating Population Health Management into Primary Care
  – Understanding provider workflow and organizational structure
  – Ensuring providers are practicing at the “top of their license”
  – Role of health IT infrastructure
  – Using data to drive decisions

• The above points will be illustrated in 3 case studies:
  1. Central Population Health Chronic Disease Management Program
  2. Collaborative Team Care Model to Manage Patients with Diabetes
  3. Patient Navigators for Comprehensive Cancer Screening
Learning Objectives

• Analyze what makes an effective combined workflow-informatics intervention that drives clinical outcomes
• Compare effectiveness of central vs. distributed approaches to patient outreach
• Measure the impact of patient navigation on patient outcomes
Value of Health IT STEPS™

Today’s presentation will impact all Health IT value STEPS
Population Health Management

• Application of public health principles to the health care delivery system
  – Well defined populations
  – Importance of surveillance
  – Role of prevention
  – Need to assess outcomes
  – Focus on those at higher risk for non-adherence: making it easier to do the right thing
Case Study 1: Implementing a Population Health Chronic Disease Management Program
• **Objective:**
  – Develop and implement a chronic disease population health management (PHM) program *with and without* central coordination using an established health IT tool in a large primary care network

• **Hypothesis:**
  – Practices assigned a central population health coordinator (PHC) will have larger increases in performance on quality measures compared to practices not assigned a PHC.
Background

- Prior research evaluated the value of population health management system when added to visit-based care
- Focused on preventive cancer screening
  - PCPs using non-visit based IT tool to identify women overdue for mammogram increased rates compared to usual care*
  - Compared an automated PHM reminder system using office staff support with or without PCP involvement: no difference in screening rates for breast, cervical or colon cancer†

* Atlas et al, JGIM 2011, AJMC 2012
† Atlas et al, JABFM 2014
Study Setting and Design

• **Setting**: Massachusetts General Hospital (MGH) primary care network
  – 18 primary care practices, including 6 community health centers
• **Design**: Before - after evaluation of PHM program over first six months (July 1 – Dec. 31, 2014)
PHC Allocation

• Central Population Health Coordinator Assignment
  – Insufficient resources to implement in all 18 practices
    • Non-randomly allocated based on interest from practice leader, baseline quality scores, practice size, nature and location of practice
    • Sought to equitably distribute available resources to get network buy-in, and maximize impact of the program for all practices
  – Pilot Program (n=8): 4 FTE central PHCs
  – Non-Pilot: Remaining practices (n=10): support for PHM IT tool training; existing staff responsible for administrative tasks
Patient Eligibility

• Validated algorithm identified primary care patients linked to specific PCP or practice

• PHC Focus - Chronic Disease Populations: Diabetes (DM), Cardiovascular Disease (CVD), Hypertension (HTN)
  – Patients identified using validated algorithms using billing claims, laboratory testing, problem lists, medications, and/or procedures

• Control Measures - Cancer Screening: Patients eligible for breast, cervical, or colorectal cancer screening
PHM Health IT Tool

- All practices utilized a PHM health IT tool for cancer screening since 2011
- PHM tool expanded to include registries for DM, CVD, and HTN in 2014
- Algorithms assign patients to chronic disease registries, and tool tracks goal attainment in near-real time
- Implemented **clinically relevant** outcomes for all patients
  - Whether appropriate testing performed (process)
  - Test at goal or on maximal therapy (outcomes)
  - Ability to document relevant exceptions
Central PHM Program

• PHCs were non-clinical staff who were integrated into practice workflow
• PHCs regularly “huddled” with physicians
  – Review patient lists to manage patients not at goal
  – Performed administrative tasks: appointment scheduling, ordering overdue laboratory testing, chart reviews, obtaining home blood pressure values and outside tests/labs
# Process and Outcome Measures

<table>
<thead>
<tr>
<th>Population</th>
<th>Measure</th>
<th>Time period</th>
<th>Based on Lab or BP Values</th>
<th>Maximal Rx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>LDL cholesterol</td>
<td>12 months</td>
<td>&lt;100 mg/dL</td>
<td>Moderate or high dose statin</td>
</tr>
<tr>
<td></td>
<td>A1c</td>
<td>6 months</td>
<td>&lt;9%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BP</td>
<td>6 months</td>
<td>SBP≤140, DBP≤90 or Age ≥ 60: DBP≤70</td>
<td>≥ 3 meds from different anti-hypertensive classes</td>
</tr>
<tr>
<td>CVD</td>
<td>LDL cholesterol</td>
<td>12 months</td>
<td>&lt;100 mg/dL</td>
<td>High dose statin</td>
</tr>
<tr>
<td>Hypertension</td>
<td>BP</td>
<td>6 months</td>
<td>SBP≤140, DBP≤90 or Age ≥ 60: DBP≤70</td>
<td>≥ 3 meds from different anti-hypertensive classes</td>
</tr>
</tbody>
</table>

*Clinical Exception Passes Process Measure: Terminal illness, competing comorbidity, contraindicated
Cancer Screening Process Outcomes (Control Measures)

• In eligible patients
• Breast: mammogram in past two years
• Cervical:
  – Pap smear completed in prior three years
  – Five years if 30-65 with a HPV test
• Colorectal:
  – Colonoscopy in past ten years
  – Sigmoidoscopy, barium enema, or CT colonography in past 5 yrs
Outcomes and Analysis

• Difference in differences over 6-months follow-up between PHC and non-PHC practices
• Primary Outcome: combined process and outcome measures
• Secondary outcome: process measures for cancer screening
• Analyses:
  – Included patients in registries at both time periods
  – Logistic regression with time period-by-PHC interaction term and accounting for clustering within patients using generalized estimating equation approach
  – Adjusted for age, gender, language, race, insurance, practice type, and patient-physician continuity
Primary Outcome: Proportion of Patients at Goal for Combined Measures

<table>
<thead>
<tr>
<th></th>
<th>PHC Practices</th>
<th>Non-PHC Practices</th>
<th>Difference in Differences*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>6-Months</td>
<td>Difference</td>
</tr>
<tr>
<td>Diabetes: LDL</td>
<td>62.1%</td>
<td>71.1%</td>
<td>9.1%</td>
</tr>
<tr>
<td>Diabetes: BP</td>
<td>77.7%</td>
<td>80.6%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Diabetes: A1c</td>
<td>67.2%</td>
<td>73.2%</td>
<td>6.0%</td>
</tr>
<tr>
<td>CVE: LDL</td>
<td>69.0%</td>
<td>78.0%</td>
<td>9.0%</td>
</tr>
<tr>
<td>HTN: BP</td>
<td>74.3%</td>
<td>78.0%</td>
<td>3.7%</td>
</tr>
</tbody>
</table>

* All p<0.001

Ashburner et al, AJMC in press
## Process Measures for Cancer Screening

<table>
<thead>
<tr>
<th></th>
<th>PHC Practices</th>
<th></th>
<th>Non-PHC Practices</th>
<th></th>
<th>Difference in Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>6-Months</td>
<td>Difference</td>
<td>Baseline</td>
<td>6-Months</td>
</tr>
<tr>
<td>Breast Cancer</td>
<td>90.7%</td>
<td>91.2%</td>
<td>0.5%</td>
<td>92.0%</td>
<td>92.9%</td>
</tr>
<tr>
<td>Cervical Cancer</td>
<td>92.4%</td>
<td>93.0%</td>
<td>0.6%</td>
<td>91.3%</td>
<td>92.8%</td>
</tr>
<tr>
<td>Colorectal Cancer</td>
<td>85.5%</td>
<td>86.8%</td>
<td>1.3%</td>
<td>87.8%</td>
<td>89.5%</td>
</tr>
</tbody>
</table>

Ashburner et al, AJMC in press
Limitations

• Practices not randomly assigned to receive a central PHC
• Differences in patient populations or staff willingness to implement PHM could account for better outcomes in practices with central PHCs
  – Adjusted for patient characteristics and practice type in our multivariable models and all differences persisted
  – Differences in cancer screening between PHC and non-PHC practices were small
• Improvements may level off over time
Conclusions

- PHM program using health IT significantly increased quality measures for patients with diabetes, CVD, and hypertension over initial 6 months.
- Central population health coordinators working closely with practices led to greater improvements in outcome measures.
- Supports using central personnel working with practice-based staff, but longer term follow-up is needed.
Case Study 2:

Diabetes Care Redesign
Breaking Down Traditional Silos

INTEGRATE PROVIDER SERVICES
Goals Reflect Evidence-Based Diabetes Care

• Medical therapies:
  – Metformin and lifestyle change for T2 Diabetes
  – Insulin initiation and titration for those clinically not at goal
  – Statin therapy to prevent CVD
  – ACE-I or ARB for hypertension control and to prevent ESRD

• Preventive strategies:
  – Diabetes education and self management programs (DSME-S)
  – Smoking cessation counseling
  – Eye screening every 2 year
  – Comprehensive foot care for prevention of ulcers
Incorporate Evidence Based Strategies into the Care Process

1. **Medication**
   - Metformin
   - Metformin + Sulfonylurea or Basal Insulin
   - Intensive insulin
   - ACE-I/ARB
   - Statin

2. **Diabetes Education**
   - Self management and support
   - Nutrition/ exercise
   - Smoking cessation
   - Foot care
   - Referral for eye exam

3. **Lifestyle and behavioral change**
   - Weight management programs
   - Depression screening
   - Social stressors
Diabetes Collaborative Team Care

Practice based teams, facilitating staff and patient engagement around diabetes-related care, especially for those not at goal

Staff Resources:
- Practice champion team (MD, NP, RN, MA)
- DSME-S
- Diabetes virtual visits
- Nutrition access
- Group visits
- Nurse outreach
- Diabetes peer-to-peer e-consults
- Documentation templates for EHR

Training:
- Multidisciplinary conferences
- Nurse competency training
- Population health coordinator training

Clinical and Educational Materials:
- Insulin handbook
- Diabetes guidebook
- Patient handouts available thru EHR
- Social media resources

Service coordination:
- MGH Diabetes Center
- Population Health
- Patient Centered Med Home
- Nurse leadership council
Diabetes Care Team Goals

• Keep care local
• Use all team members at top of licensure
• Link medical prescribing with education, lifestyle change, self management and support
• Improve team communication and documentation
• Encourage multi-disciplinary training, education and learning
• Promote continuous process improvement
• Integrate principles of population health
Results

- More patients eligible for insulin are now being treated
- Helped practices improve their diabetes team care
- Higher engagement of non-MD staff with diabetes care
- More resources available to PC practices (e.g. diabetes e-consult)
- 6 multidisciplinary conferences, with high provider ratings
- Multiple publications:
  - Insulin initiation and titration handbook
  - Primary care diabetes guidebook
  - Patient education materials
Proportion of Diabetic Patients with A1c>9%

Case Study 3:

Patient Navigation in Cancer Care
Background

• Patient navigation (PN) can improve rates of cancer screening in vulnerable populations

• Most cancer PN programs are located in community health centers and focus on screening for a single cancer

• Many patients who could benefit from PN may receive care in settings where on-site PN is not practical

• Some patients may be overdue for more than one cancer screening test
Objective

• To evaluate a patient navigation program to help
  – Vulnerable patients obtain comprehensive (breast, cervical, and/or colorectal) cancer screening
  – Within a large, diverse academic primary care network
  – Using a population-based information technology (IT) system
Pop Health for Cancer Screening

- Patient navigation implemented as part of a visit-independent, PHM system to identify adult patients overdue for cancer screening in an academic primary care network

<table>
<thead>
<tr>
<th>Name</th>
<th>Status</th>
<th>Trk Date</th>
<th>Lang</th>
<th>Nxt Apt</th>
<th>Breast</th>
<th>Cervical</th>
<th>Colorectal</th>
<th>Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guimaraes, Erica</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>RSO</td>
<td>NAVIGATOR - MGH</td>
<td>Help</td>
<td>Roster</td>
<td>Folders</td>
<td>Reports</td>
<td>Practice</td>
<td>SP</td>
<td>Prov</td>
</tr>
</tbody>
</table>
Patient Navigation Program

- Uses Algorithm to Identify High Risk
  - No-show history
  - Number of cancer screenings overdue
  - Non-English speaking

- Patient centered navigation
  - Breast cancer screening
  - Cervical cancer screening
  - Colorectal cancer screening

- Four part-time navigators
  - 2 FTEs
  - Each spoke 2-5 languages
Methods

• Study design: randomized controlled trial
  – Population health system with or without PN
• Study setting: 18 practice primary care network
• Eligible patients:
  – Overdue for at least one cancer screening test
  – High risk for non-compliance using algorithm
• Outcomes: screening completion rates at 9 month
  – Primary: intention-to-treat
  – Secondary: as-treated (excluding PN patients not contacted)
<table>
<thead>
<tr>
<th>Demographic</th>
<th>Intervention (n=792)</th>
<th>Control (n=820)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years), mean (SD)</td>
<td>56.9 (9.3)</td>
<td>57.1 (9.4)</td>
<td>0.68</td>
</tr>
<tr>
<td>Gender, female</td>
<td>479 (60.5%)</td>
<td>496 (60.5%)</td>
<td>1.0</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td>0.02</td>
</tr>
<tr>
<td>Asian</td>
<td>61 (7.7%)</td>
<td>82 (10.0%)</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>94 (11.9%)</td>
<td>83 (10.1%)</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>104 (13.1%)</td>
<td>71 (8.7%)</td>
<td></td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>44 (5.6%)</td>
<td>42 (5.1%)</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>489 (61.7%)</td>
<td>542 (66.1%)</td>
<td></td>
</tr>
<tr>
<td>Language, English</td>
<td>565 (71.3%)</td>
<td>608 (74.2%)</td>
<td>0.21</td>
</tr>
<tr>
<td>Insurance</td>
<td></td>
<td></td>
<td>0.34</td>
</tr>
<tr>
<td>Commercial</td>
<td>430 (54.3%)</td>
<td>410 (50.0%)</td>
<td></td>
</tr>
<tr>
<td>Medicaid</td>
<td>174 (22.0%)</td>
<td>200 (24.4%)</td>
<td></td>
</tr>
<tr>
<td>Medicare</td>
<td>147 (18.6%)</td>
<td>169 (20.6%)</td>
<td></td>
</tr>
<tr>
<td>Self-Pay</td>
<td>41 (5.2%)</td>
<td>41 (5.0%)</td>
<td></td>
</tr>
</tbody>
</table>
Cancer Screening by Study Group

Proportion completing cancer screening during study period among patients overdue for screening at baseline – Intention to Treat Analysis

- Breast: P=0.01
- Cervical: P=0.01
- Colorectal: P < 0.001

Limitations

• One academic primary care network
• Established patient navigation program
• Advanced information technology infrastructure to perform population management
• Many patients at high risk for not completing screening could not be reached or were deferred
• Patients might have obtained the screening outside of the practice network
Conclusions and Implications

• Network-wide patient navigation as a part of visit-independent, PHM system increased comprehensive cancer screening rates in vulnerable patients

• PN may help population health efforts decrease disparities in care while improving overall outcomes

• Efforts to address equity of care should be built into PHM systems
  – Algorithms to better identify vulnerable patients who could benefit from PN
  – Improved referral and tracking of high-risk patients
A Summary of Benefits Realized (1/2)

• **Satisfaction:**
  – Physician survey: 85% said + impact on care provided to their patients

• **Treatment/Clinical:**
  – 3-9% increase in chronic disease outcomes over 6 months
  – >1% decrease in patients with A1c>9 after 2 years
  – 14.8% increase in cancer screening among underserved patients

• **Electronic Data**
  – > 90% in sensitivity and specificity for PCP-Patient attribution
  – Improved data quality via patient feedback reporting
  – Data quality improvement via claims/EHR data reconciliation
A Summary of Benefits Realized (2/2)

- **Patient Engagement/PHM:**
  - Centralized pop health coordination improved chronic disease outcomes 2.3% to 4.9%
  - Increased engagement of non-MD staff with diabetes care
  - Multidisciplinary conferences, with high provider ratings
  - Patient navigation decreased disparities of care

- **Savings (in case study 1):**
  - Estimated treatment of disease avoided: ~$20/patient
  - Cost of initiative: ~$7/patient
  - ~$1.6M saved at MGH in first 6 months
Questions

• Thank you!

• Contact: satlas@mgh.harvard.edu

• Remember to complete online session evaluation