Population Health Management
A Population Health Management System

FOCUSED ON OUTCOMES for ADDED VALUE and CONTINUOUS IMPROVEMENT
Jointly developed by

to improve

patient outcomes
quality performance
real cost savings
Improving outcomes and compiling invaluable PHM research and development for 10+ years

- **TopCare-Diabetes 0.1**
  - Released: 2003
  - MetroHealth Medical Center (MHMC)

- **TopCare-Heart Failure**
  - Released on 2008
  - Newton-Wellesley Hospital

- **TopCare-Diabetes 0.2**
  - Released on 2006
  - Massachusetts General Hospital (MGH)
  - Laboratory of Computer Science (LCS)

- **MGH LCS and SRG-Technology**
  - Fall 2012
  - Enter into partnership to build TopCare 2.0

- **MGH LCS scores Partners’ Population Health**
  - Summer 2012

- **TopCare 2.0**
  - Spring 2013-2014
  - Released at BWH, MGH

- **TopCare 2.0 Supports Partners**
  - June 2014
  - Internal Performance Framework (IPF)

- **Positive IPF outcome**
  - April 2015
  - Released

Valuable experience
Unique Delivery and Value

Targeted Outcome Improve tools for ACO quality measures
You determine which quality measures to improve.

Rapid Speed-to-Value
Target outcomes require only targeted data collection and workflow refinement.

Fast ROI
Outcomes targeted based on highest priorities so improvements are made where they matter most.
Use Case: Due for Diabetes test compliance

✓ **Problem:** A subset of diabetes patients failing to get required tests

✓ **Objective:** Improve and revamp workflow across the MGH primary care network to efficiently engage diabetes patients and improve patients outcomes.
Before:

Call Center → Hospital Administrator → Practice Manager → Physician

After:

Call Center → Hospital Administrator → Practice Manager → Physician

**Efficiency gained**

by identifying which patients should receive letter reminder.

<table>
<thead>
<tr>
<th></th>
<th>Without RMP (manual)</th>
<th>With RMP (automated)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cycle 1</td>
</tr>
<tr>
<td>Process rate (patient/h)</td>
<td>10-30</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>Total number of patients reviewed</td>
<td>200</td>
<td>220</td>
</tr>
<tr>
<td></td>
<td></td>
<td>73</td>
</tr>
<tr>
<td>Numbers of patients identified for letter</td>
<td>Variable</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>48</td>
</tr>
<tr>
<td>Total time for task completion</td>
<td>2 nurses, 1.5 month → ½ days/week</td>
<td>1 nurse → 73min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 nurse → 15min</td>
</tr>
</tbody>
</table>

Developed by:

![MGH General Hospital](https://example.com/mgh.png)  [Massachusetts General Hospital](https://www.massgeneral.org)  [Harvard Medical School](https://www.med.harvard.edu)

4 months into implementation

70x efficiency improvement

(gain over manual work by nurse*)

*Time needed to identify need for diabetes letter reminder went from 14.4 min/patient to 12.3 sec/patient with TopCare implementation.

Smart Scheduling

Algorithms and rosters for:

- Identifying patients at greatest risk of not showing up for their appointments.
- Identifying opportunities to schedule additional appointments to accommodate likely no shows.
- Initiate contact with patients.
"No-Shows" reduction ➔ 7% revenue increase
3 months into implementation

* Estimated based on ROI at MGH Primary Care pilot study: High Risk of No-Show > 15%, Calls to 20% of appointments
Use case: Heart Failure Inpatients

✓ **Problem:** Who/where are these inpatients?

✓ **Objective:** Identify at-risk heart failure inpatients while they are still at the hospital to allow for proper education regarding appropriate and available post-discharge services.
Increasing effectiveness in identifying at-risk Heart Failure Inpatients

Use case: Cancer Screening

✓ **Problem**: Evidence suggests HIT can improve quality of care, but at the cost of creating more work for physicians.

✓ **Objective**: Create an automated, non-visit based system for comprehensive preventive cancer screening that achieves similar screening rates as a system that requires PCPs to identify patients for outreach.
TopCare’s non-visit-based system for comprehensive preventive cancer screening achieved similar results as TopCare combined with PCP intervention.

Cancer Screening Rates Among Intervention and Control Patients Eligible for at Least 1 Cancer Screening Test During the Study Period
Use Case: No pending visits

✓ **Problem:** Diabetic patients who skip visits to PCPs get worse.

✓ **Objective:** Schedule follow-up appointments with diabetic patients and track their outcomes.
### 39% decrease
of BWH Diabetics with no pending PCP visit

<table>
<thead>
<tr>
<th>Practices with TopCare</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice I (270 patients)</td>
<td>83%</td>
</tr>
<tr>
<td>Practice II (966 patients)</td>
<td>76%</td>
</tr>
<tr>
<td>Practice III (478 patients)</td>
<td>65%</td>
</tr>
<tr>
<td>Practice IV (300 patients)</td>
<td>36%</td>
</tr>
<tr>
<td>Practice V (376 patients)</td>
<td>36%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Practices without TopCare (~7500 patients)</th>
<th>Percentage</th>
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<tbody>
<tr>
<td></td>
<td>58%</td>
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</tbody>
</table>
17% decrease of overdue Diabetes Mellitus labs

Impact of improved diabetics visits

TopCare Sites

Charles Morris MD, Tanya Zucconi
15% decrease of patients with HbA1c over 9

Impact of improved diabetics visits

Use Case: Improve clinical outcomes

✅ **Problem:**
- Population health management was poorly coordinated across a large primary care network
- Small population health initiatives were difficult to scale
- Existing office-based care setting not conducive to population health management

✅ **Objective:**
- Improve clinical outcomes for ALL patients belonging to the Massachusetts General Hospital and Brigham and Women’s Hospital Primary Care Network
- Incentivize improvement over time
- Alleviate administrative burden on providers and practices
Managing ALL patients belonging to the Massachusetts General Hospital and Brigham Women’s Hospital Primary Care Network
(Duration of presented case study: 4 months)

From managing ~70k

<table>
<thead>
<tr>
<th>Populations</th>
<th>~</th>
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<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><strong>300k</strong></td>
</tr>
</tbody>
</table>
Improving clinical outcomes

Performance improvement throughout (4 month period)

<table>
<thead>
<tr>
<th>Cancer Screenings</th>
<th>80.8%</th>
<th>82.8%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorectal Cancer Screening</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast Cancer Screening</td>
<td>87.1%</td>
<td>90.0%</td>
</tr>
<tr>
<td>Cervical Cancer Screening</td>
<td>80.0%</td>
<td>86.8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blood Pressure Control</th>
<th>77.6%</th>
<th>84.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension (Outcome and Screening)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes Blood Pressure (Outcome and Screening)</td>
<td>82.7%</td>
<td>87.8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lipid Control</th>
<th>62.0%</th>
<th>70.6%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVE (CAD = PVD + CVD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes (Lipid Control)</td>
<td>62.6%</td>
<td>66.6%</td>
</tr>
<tr>
<td>Measure</td>
<td>NNT or NNS (number needed to treat to prevent 1 death/stroke/MI)</td>
<td>Net Patients Newly in Control from 8/31-12/31 (Clinical Only, most conservative)</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Hypertension BP Control</td>
<td>1:125 (death) 1:67 (stroke) 1:100 (MI)</td>
<td>667</td>
</tr>
<tr>
<td>Colorectal CA Screening</td>
<td>1:107 (death from colon cancer)</td>
<td>911</td>
</tr>
<tr>
<td>Cervical Cancer Screening</td>
<td>1:1000 (death from cervical cancer)</td>
<td>6,133</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>376</td>
</tr>
<tr>
<td>Diabetes Lipid Control</td>
<td>1:28 (composite death, MI, stroke) 1:104 (MI) 1:154 (stroke)</td>
<td>384</td>
</tr>
<tr>
<td>Diabetes Blood Pressure Control</td>
<td>1:125 (death) 1:67 (stroke) 1:100 (MI)</td>
<td>289</td>
</tr>
<tr>
<td>Breast Cancer Screening</td>
<td>1:368 (death from breast cancer)</td>
<td>1,140</td>
</tr>
</tbody>
</table>
In 4 months, estimated
76 LIVES SAVED
(between Massachusetts General Hospital & Brigham Women’s Hospital)
Estimated treatments avoided: ~$20 per patient

Cost of this TopCare initiative: ~$7 per patient

Healthier patients and lower costs
Estimated $3.2M EXPENSIVE TREATMENTS AVOIDED
(between Massachusetts General Hospital & Brigham Women’s Hospital)
85% Of providers and managers say TopCare™ provides a positive impact.
Why TopCare

1. Quality improvement
   - Actionable, Real-time, Accurate data Performance Measurement and Incentive Structure

2. Workflow
   - Algorithms and workflows have been perfected over 10 years and will continue to be refined based on the tangible successes of our customers.

3. Outcomes
   - Saving lives and healthier patients
   - Lower costs leading to higher revenue
   - Improved provider/physician and manager satisfaction
TopCare Advantages

Targeted Outcome Improvement tools for ACO quality measures
You determine which quality measures to improve.

Rapid Speed-to-Value
Target outcomes require only targeted data collection and workflow refinement.

Fast ROI
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