LEVERAGING EHR DATA TO IMPROVE BLOOD PRESSURE CONTROL

UNDIAGNOSED HYPERTENSION & HOME BLOOD PRESSURE MONITORING INTERVENTIONS

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Presented by:

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Our Partners

HCNNY

5 Health Plans

Leverage unique capabilities

NYS DOH

3 County DOHs

3 FQHCs

Collaborative, multi-dimensional approach to increasing blood pressure control
FQHC Population

Finger Lakes Community Health (Penn Yan)
- 1,639 pts. ages 18-85
- 498 (30.30%) with HTN

Hudson River HealthCare (Beacon)
- 4,223 pts. Ages 18-85
- 1,263 (29.91%) with HTN

Whitney M Young, Jr. Health Services (Albany Adult)
- 2,814 pts. Ages 18-85
- 1,259 (44.74%) with HTN
AIM Statement

By June 30, 2014 we will:

1. Achieve a 10% improvement above baseline in HBP control among adults currently diagnosed with HTN

2. Identify adults undiagnosed with HTN through innovative and sustainable systems changes
Reporting Platform

- Relational database/data repository (BridgeIT)
  - Uploads data nightly from center EHRs (eClinicalWorks)
- Report package allows for network-level aggregation and available at individual health centers with drill-down capability (i.e. registry functionality)
HCNNY Reports

Our HTN reports package encompasses:

- HTN Prevalence
- NQF 0018 BP Control by Stage and with JNC 8 comparison
- Undiagnosed HTN
- Accuracy in BP Measurement
  - Proper Recording (“bad data”)
  - Terminal Digit Bias (rounding to zero)
- Self-Management Goals
Examples of Reports

Hypertension Prevalence
Past 30 Days (Feb 2014) and Rolling 12 Months (Mar 2013 - Feb 2014)

<table>
<thead>
<tr>
<th>Health Center 1</th>
<th>Health Center 2</th>
<th>Health Center 3</th>
<th>Center Average</th>
<th>National Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>41.81%</td>
<td>40.90%</td>
<td>55.97%</td>
<td>46.23%</td>
<td>35.01%</td>
</tr>
<tr>
<td>30.38%</td>
<td>29.91%</td>
<td>44.74%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Feb-14 vs. Mar 13 - Feb 14
### BP Control by Stage:

<table>
<thead>
<tr>
<th>Health Center</th>
<th>Controlled Percent</th>
<th>Count</th>
<th>Stage 1 Percent</th>
<th>Stage 1 Count</th>
<th>Stage 2 Percent</th>
<th>Stage 2 Count</th>
<th>Total Percent</th>
<th>Total Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Center 1</td>
<td>52.31%</td>
<td>624</td>
<td>33.03%</td>
<td>394</td>
<td>14.67%</td>
<td>175</td>
<td>100.00%</td>
<td>1193</td>
</tr>
<tr>
<td>Health Center 2</td>
<td>59.82%</td>
<td>682</td>
<td>27.19%</td>
<td>310</td>
<td>12.98%</td>
<td>148</td>
<td>100.00%</td>
<td>1140</td>
</tr>
<tr>
<td>Health Center 3</td>
<td>73.76%</td>
<td>312</td>
<td>21.51%</td>
<td>91</td>
<td>4.73%</td>
<td>20</td>
<td>100.00%</td>
<td>423</td>
</tr>
<tr>
<td>Grand Total</td>
<td>57.85%</td>
<td>1747</td>
<td>29.50%</td>
<td>891</td>
<td>12.65%</td>
<td>382</td>
<td>100.00%</td>
<td>2756</td>
</tr>
</tbody>
</table>

### Definitions:
- **Stage 1 HTN:** SBP 140-159 or DBP 90-99
- **Stage 2 HTN:** SBP 160+ or DBP 100+
Undiagnosed HTN Overview

• Wanted to use data-driven registries to identify patients with potentially undiagnosed HTN and bring them in for follow-up visits

• No NQF measure
• Variation in how Undx HTN defined
• Used JNC-7 as guide *(defines HTN as 2+ elevated readings at 2 separate visits (>140/90 mmHg)*
Undiagnosed HTN Data

**Numerator:** Patients in the denominator who had at least two elevated BP readings (\(>=140 \text{ mmHg Systolic OR } >90 \text{ mmHg Diastolic}\)) at two separate visits in the past year.

**Denominator:** Patients ages 18 - 85 seen for at least two primary care visits in the past year without a diagnosis of hypertension either as an assessment in the progress note of the medical record (based on all historical data within the current EHR system) or as a documented problem on the patient’s problem list. Excludes pregnancy and ESRD.

<table>
<thead>
<tr>
<th>LastOfApptFacility</th>
<th>&lt;2 Elevated Readings</th>
<th>2+ Elevated Readings</th>
<th>Total Percent</th>
<th>Total Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Center 1</td>
<td>94.57%</td>
<td>5.43%</td>
<td>100.00%</td>
<td>792</td>
</tr>
<tr>
<td>Health Center 2</td>
<td>92.59%</td>
<td>7.41%</td>
<td>100.00%</td>
<td>1877</td>
</tr>
<tr>
<td>Health Center 3</td>
<td>92.42%</td>
<td>7.58%</td>
<td>100.00%</td>
<td>752</td>
</tr>
<tr>
<td>Grand Total</td>
<td>93.01%</td>
<td>6.99%</td>
<td>100.00%</td>
<td>3421</td>
</tr>
</tbody>
</table>

Rolling 12 Months – Mar 2013 – Feb 2014
Undiagnosed HTN Follow-Up Measures

**Design:** Longitudinal study of patient cohort identified as of 2/28/2014 as undiagnosed for HTN using undx HTN algorithm.

**Measures:**

- **Follow Up Visits**
  - Patients with a follow-up visit made from 3/1/2014 – present with diagnosis code 796.2: Elevated BP reading w/o diagnosis of HTN

- **Later HTN Dx**
  - Patients with an assessment or a problem list entry of HTN from 3/1/2014 – present.
Home BP Monitoring Intervention

Synopsis:
• Pilot intervention targeting Stage 2 pts. (or others)
• Includes home BP monitoring and follow-up support

Hypotheses:
1) Home BP monitoring will improve BP control by eliminating white coat syndrome and/or improving patient engagement (literature supports)
2) Patients who receive a no-cost home BP monitor will use it and report readings back to their PCP (evaluating)
“Dummy” Diagnosis added to Problem List:
ASTHO – Home BP Monitored for ASTHO Project
Home BP Monitoring Configuration

BP Self-Management data elements added under HPI
### Home BP Monitoring Intervention Data

**Preliminary data points as of 4/23/2014:**

<table>
<thead>
<tr>
<th>HPI BP Self-Management Item</th>
<th>Health Centers (Aggregate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home BP Monitors Given</td>
<td>191</td>
</tr>
<tr>
<td>Interpretation</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
</tr>
<tr>
<td>Very High</td>
<td>16 (11.9%)</td>
</tr>
<tr>
<td>High</td>
<td>54 (40.0%)</td>
</tr>
<tr>
<td>Normal</td>
<td>54 (40.0%)</td>
</tr>
<tr>
<td>Blank</td>
<td>11 (8.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>135</td>
</tr>
<tr>
<td>Unique Pts. Total</td>
<td>87</td>
</tr>
<tr>
<td># Readings (Range)</td>
<td>2 to 30</td>
</tr>
<tr>
<td>Mode</td>
<td></td>
</tr>
<tr>
<td>Phone</td>
<td>143</td>
</tr>
<tr>
<td>Paper</td>
<td>63</td>
</tr>
<tr>
<td>Portal</td>
<td>1</td>
</tr>
<tr>
<td>Machine</td>
<td>5</td>
</tr>
<tr>
<td>Blank</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>216</td>
</tr>
<tr>
<td>Unique Pts. Total</td>
<td>116</td>
</tr>
<tr>
<td>Reading Submissions No Longer Needed</td>
<td>16</td>
</tr>
</tbody>
</table>
Other Data-Driven Health Center Efforts

Summary of Activities

• Adoption of a standardized HTN treatment protocol, to include follow up on potentially undiagnosed patients

• In-service training on proper BP measurement

• Group HTN education classes in health centers

• Partnering with community programs to provide nutrition counseling, label reading, recipes, and other strategies to support low-sodium, healthy eating.

• Partnering with health plans to improve medication adherence
Challenges

• Variation in centers’ processes for entry of clinically valid BP results – *use of Repeat BP field*

• Home BP Monitoring Intervention - *How do we track who receives? How are readings documented in the EHR? Consistency of data entry*

• Measuring self-management goals – *documentation inconsistency; free text*

• Measuring effect of polypills vs. single pills on BP control – *complexity/intensity of effort required*
Lessons Learned

• Determine what triggers intervention completion

• Just because you can doesn’t mean you should – balance need to measure with need to keep clinical workflow simple

• Monitor data entry frequently – are fields being used and used correctly? Are changes needed?
Hypertension Prevalence:

• Past 30 day (Mar 2014) average 10 percentage pts. higher (45.5%) than rolling 12 mos. (Apr 2013 – Mar 2014) (35.1%), likely due to identifying undx. and increased adherence to clinical guidelines for initial dx.

BP Control:

• Rolling 12 months average: 7.8% increase (60.2% → 64.9%) from Sep 2013 – Mar 2014 (almost at goal!)

• Past 30 day average: 6.0% increase from Sep 2013 to Mar 2014 (63.5% → 67.3%), with one center at 79% (up from 70% at baseline, a 12.9% increase!)
Project Outcomes/Success Stories

Undiagnosed Hypertension

- 300+ patients identified as potentially undiagnosed
- 2 of 3 FQHCs: 0% undiagnosed rates for Feb & Mar 2014

Accuracy in BP Measurement:

- Expectation is 1% of readings would result in both a systolic and diastolic BP reading ending in zero.
- Measurement of terminal digit bias revealed significant rounding in one FQHC still using manual BP cuffs (30%)
- Rounding occurred in ~10% of BP readings at other FQHCs, despite use of automated BP machines
HCNNY’s Role in Project Success

• Experience and trust between partnering FQHCs and the health center-controlled network (HCCN)

• HCCN serves as accountable party to both DOH and the FQHCs → streamlines communications/follow-up

• HCCN staff have EHR product expertise → can suggest system design and workflow interventions

• HCCN has ability to access and aggregate de-identified EHR patient data → shifts reporting burden from FQHCs
Questions?

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