Primary Cardiovascular Disease Prevention is Leaving the Office: Early Results from the HeartBeat Connections Integrated Telemedicine Program

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PROGRAM DESCRIPTION

- HeartBeat Connections (HBC) is a telem medicine program that integrates with and complements primary care. Dietitian and nurse-led telephonic coaching focuses on controlling key cardiovascular (CVD) risk factors, and includes initiation/alteration of dyslipidemia and hypertension medications.
- Patients eligible for HBC program are identified prospectively through data from the electronic health record (EHR). Eligibility criteria: age 40-79, previous visit at clinic in past five years, no active heart disease or diabetes, meet AHA metabolic syndrome criteria or high (≥15%) Framingham risk.
- All encounters are documented within the EHR for seamless coordination of care with primary care providers.
- Program objectives focus on improving CVD risk factors, such as increasing the proportion of participants taking preventive medications and achieving optimal levels for lipids, blood pressure, nutrition, exercise, and stress.

HBC is part of a broader initiative, The Heart of New Ulm Project (HONU), which is a 10-year demonstration project aimed at reducing heart attacks and CHD in a rural Minnesota community (New Ulm, MN).

METHODS

- Patients were included in study if they had all recruitment activities completed resulting in a program order status (i.e., opt-in or opt-out) between August 2010 and March 2012.
- Over the first six months following this order status, EHR-derived changes in LDL cholesterol, blood pressure, body mass index (BMI), and smoking were compared between those who did and did not participate.
- Baseline biometric/smoking values were the most recent available measure prior to the program order date. Follow-up biometric/smoking values were the measure closest to 6 months after the program order date (within range of 2-12 months).
- Behavioral measures other than smoking were only available for enrollees. Baseline measures are those from their first phone encounter and follow up measures are from the phone encounter closest to 6 months after enrollment.
- Mixed model analysis of variance was used to compare changes in measures for non-enrollees, enrollees with 1-4 encounters, and enrollees with ≥5 encounters.

RESULTS

- 1035 patients who were eligible for the HBC program were included in the study sample. Of these, 332 (32%) enrolled.
- Among enrollees, 82% were still engaged in the program after six months.
- Enrollees and non-enrollees were comparable at baseline on age, marital status, blood pressure, cholesterol (total, HDL, LDL, triglycerides) and BMI. The groups differed on gender (non-enrollees were more likely to be male 55.4% vs. 47.1%) and smoking (23% smokers among non-enrollees vs. 16.8% among enrollees).
- Mixed model analyses indicated a significant group-by-time interaction for LDL cholesterol (p=0.001). Over six months, non-enrollees lowered their LDL by 6.5 mg/dL, whereas HBC enrollees who completed 1-4 and ≥5 telephone encounters lowered their LDL by 4.5 and 16.1 mg/dL, respectively. The proportion who met the program goal of LDL <100 mg/dL increased by 69% in enrollees (vs. 24% in non-enrollees).
- Smoking decreased significantly among enrollees; it was the only measure that saw the most improvement among those with fewer encounters. Among enrollees, smoking decreased by 67% in those with 1-4 encounters compared to 33% in those with ≥5 encounters and 21% in non-enrollees.

ENROLLEES SAW IMPROVEMENTS IN BEHAVIORAL RISK FACTORS WITH INCREASED IMPROVEMENT FOR THOSE WITH MORE ENCOUNTERS FOR STRESS, MEDICATION USE, AND MEDICATION ADHERENCE.

CONCLUSIONS

- HBC enrollees significantly improved LDL and smoking status in high CVD risk adults compared to non-enrollees.
- Enrollees saw increased improvement in fruit and vegetable consumption, physical activity, stress level, aspirin use, medication use/adherence.
- Increased enrollees were associated with larger magnitude of changes in LDL, medication use, and stress.
- Positive changes in the non-participant group may be attributed to the broader HONU project and the interventions available in worksites and throughout the community. Additionally, bi-annual provider trainings are conducted to provide physicians and mid-level providers with an opportunity to learn about the role of the medical provider in the project and available treatment options for the management of all individuals at high risk for CHD.
- Such real-world, systems-based innovations can serve as a platform to target and engage at-risk populations, thereby enhancing primary cardiovascular care in rural and other underserved areas.

Table 1: Model-based changes in targeted risk factors among adults at high CVD risk who were invited to participate in the HBC program, stratified by level of program engagement

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Baseline</th>
<th>Follow-up</th>
<th>Change</th>
<th>Baseline</th>
<th>Follow-up</th>
<th>Change</th>
<th>Baseline</th>
<th>Follow-up</th>
<th>Change</th>
<th>Baseline</th>
<th>Follow-up</th>
<th>Change</th>
<th>Baseline</th>
<th>Follow-up</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDL (mg/dL)</td>
<td>126.9±2.8</td>
<td>110.8±2.6</td>
<td>-16.1±2.6</td>
<td>126.9±2.8</td>
<td>110.8±2.6</td>
<td>-16.1±2.6</td>
<td>126.9±2.8</td>
<td>110.8±2.6</td>
<td>-16.1±2.6</td>
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</tbody>
</table>

Table 2: Comparison of behavioral measure changes among participants in the HBC program by number of encounters

<table>
<thead>
<tr>
<th>Behavioral Measure</th>
<th>Total = 150</th>
<th>Enrollees with ≤4 Encounters</th>
<th>Enrollees with &gt;4 Encounters</th>
<th>Did Not Enroll</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>50.0±3.1</td>
<td>50.0±3.1</td>
<td>50.0±3.1</td>
<td>50.0±3.1</td>
</tr>
<tr>
<td>BMI</td>
<td>31.2±2.6</td>
<td>31.2±2.6</td>
<td>31.2±2.6</td>
<td>31.2±2.6</td>
</tr>
<tr>
<td>Hypertension prevalence</td>
<td>38.3±2.5</td>
<td>43.4±2.8</td>
<td>33.2±2.3</td>
<td>30.0±2.8</td>
</tr>
<tr>
<td>Smoking prevalence</td>
<td>23.2±2.5</td>
<td>21.1±2.6</td>
<td>25.6±2.5</td>
<td>27.1±2.9</td>
</tr>
</tbody>
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