Phone-based Prevention Program Improves Biometric and Cardiometabolic Risk Outcomes

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PROGRAM DESCRIPTION

- The Heart of New Ulm Project (HONU) is a 10-year demonstration project aimed at reducing heart attacks and coronary heart disease (CHD) in a rural Minnesota community (New Ulm, MN).
- The long-term goal is reduction of acute MI and the moderate-term (five-year) goal is to reduce modifiable heart disease risk factors at a community level.
- Interventions are delivered through worksites, health care and the community and focus on individual as well as environmental changes.
- Individuals at highest risk for having a heart attack (excluding those with active disease) are invited to participate in a phone-based coaching program called HeartBeat Connections (HBC). Participants receive individualized health behavior coaching from a registered dietitian or registered nurse. All encounters are documented within the electronic health record (EHR) for seamless coordination of care with primary care providers. Participants talk with a health coach in one to two-month intervals, depending on personal medication therapy and patient preference.
- Objectives of this program include:
  - Increasing the proportion of participants taking CHD preventive medications and those achieving recommended targets for lipids, blood pressure, nutrition, physical activity, tobacco and stress.

METHODS

- Eligible patients identified proactively through data from the EHR. Eligibility criteria: age (30-79), previous visit at clinic in past five years, no active heart disease or diabetes, meet AHA metabolic syndrome criteria or high (≥15%) Framingham risk.
- Patients were included in the analysis if they enrolled in HBC between August 1, 2010 and March 9, 2012, which gives at least a two-month follow-up period for all individuals.
- Baseline biometric values were defined as the most recent available measure prior to the individual's enrollment date. Current biometric values were defined as the most recent measure available after the program enrollment date.
- Behavioral measures were only available on program enrollees. Baseline measures are those from their first phone encounter and current measures are from the most recent phone encounter.
- Study design compares participants to eligible non-participants (i.e., opt-outs or unresponsive to mail/phone outreach attempts) for changes in biometric values. Changes in behavioral measures are examined among program participants.

Table 1: Comparison of biometric risk changes between participants and eligible non-participants in the HBC program between Aug 2010 – March 2012 (n = 1005)

	Enrollees (n = 323)			Non-Enrollees (n =682)		
Biometric Risk Factors	**Baseline**	**Current**	**Δ**	**Baseline**	**Current**	**Δ**
Blood pressure, mmHg	n = 284			n = 551		
SBP (mean (SD))	128.9 (14.6)	127.62 (14.2)	-1.3	129.1 (15.2)	127.6 (14.4)	-1.2
DBP (mean (SD)) * †	77.0 (9.7)	75.43 (8.9)	-1.6	77.1 (10.2)	75.9 (10.1)	-1.5
% hypertension ≥ 140/90 mmHg	22.2	19.4	-2.8	26.9	22.5	-4.4
Total Cholesterol mg/dL	n = 223			n = 342		
mean cholesterol (SD)	200.7 (35.9)	189.1 (30.8)	-11.5	197.7 (37.2)	191.0 (34.4)	-6.7
% high: ≥ 200 * † ‡	51.1	33.2	-17.9	47.1	38.6	-8.5
LDL , %	n =216			n = 339		
mean LDL (SD) * †	121.2 (31.0)	112.5 (26.0)	-8.7	120.1 (33.1)	115.6 (29.1)	-4.6
% high: ≥ 130 mg/dL † ‡	39.4	20.4	-19.0	35.7	30.7	-5.0
HDL, %	n = 223			n = 341		
mean HDL (SD)	44.3 (12.0)	44.8 (10.7)	0.5	42.6 (8.6)	43.0 (9.4)	0.4
% low : < 40 mg/dL †	65.5	59.2	-6.3	63.0	58.9	-4.1
Triglycerides, %	n = 224			n = 342		
mean triglycerides (SD) * † ‡	184.4 (123.5)	157.4 (85.7)	-27.1	177.9 (76.9)	163.5 (79.2)	-14.4
% high: ≥ 150 mg/dL * †	55.4	43.7	-11.7	61.1	49.1	-12.0
BMI, %	n = 266			n = 508		
mean BMI (SD) * †	33.3 (6.4)	33.0 (6.6)	-0.2	32.7 (6.3)	32.5 (6.2)	-0.2
% obese ≥ 30 kg/m^2	65.8	62.8	-3.0	66.7	64.8	-1.9

(-)Decreased change from baseline
† significant change at α = 0.05 for opt-ins ; *significant change at α = 0.05 for opt-outs
‡ changes differ by enrollment status at α = 0.05

Table 2: Comparison of behavioral and biometric changes among participants in the HBC program by number of encounters between Aug 2010 – March 2012 (n = 323)

	Enrollees with ≥ 6 encounters (n = 147)			Enrollees with < 6 encounters (n = 176)		
Behavioral Factors	**Baseline**	**Current**	**Δ**	**Baseline**	**Current**	**Δ**
	n = 133			n = 125		
Current Smoker	9.8	9.0	0.8	12.0	10.4	1.6
	n = 128			n = 156		
Low Stress Level * ‡	47.1	58.7	11.6	49.3	52.7	3.4
	n = 146			n = 169		
5+ Fruit & Veg/day † * ‡	31.5	67.8	36.3	30.8	47.9	17.1
	n = 143			n = 173		
Exercise > 150 min/wk * ‡	29.4	59.4	30.0	35.3	42.2	6.9
Medication Use (in, %)	**Baseline**	**Current**	**Δ**	**Baseline**	**Current**	**Δ**
	n = 147			n = 176		
Cholesterol meds † * ‡	32.7	47.6	14.9	42.0	48.3	6.3
Hypertension meds * ‡	34.7	42.9	8.2	60.8	62.5	1.7
Biometric Measures	**Baseline**	**Current**	**Δ**	**Baseline**	**Current**	**Δ**
Blood pressure, %	n = 145			n = 139		
Hypertension: ≥ 140/90 mmHg * †	14.5	17.2	2.7	30.2	21.6	-8.6
Total Cholesterol , %	n = 132			n = 89		
High: ≥ 200 mg/dL * †	49.3	31.3	-18.0	53.9	36.0	-17.9
LDL, %	n = 132			n = 84		
High: ≥ 130 mg/dL * †	36.4	18.2	-18.2	44.0	23.8	-20.2
HDL, %	n = 134			n = 88		
Low: < 40 mg/dL	64.9	60.4	-4.5	66.3	57.3	-9.0
Triglycerides, %	n = 134			n = 88		
High: ≥ 150 mg/dL *	57.5	43.3	-14.2	52.3	44.3	-8.0
BMI, %	n = 135			n = 131		
Obese ≥ 30 kg/m^2	63.7	59.3	-4.4	67.9	66.4	-1.5

(-)Decreased change from baseline
† significant change at α = 0.05 for < 6 encounters; *significant change at α = 0.05 for ≥ 6 encounters
‡ changes differ by enrollment status at α = 0.05

RESULTS

- 1005 patients who were eligible for the HBC program were included in the study sample. Of these:
  - 323 (30.2%) enrolled
  - 682 (69.8%) did not enroll for the following reasons:
    - 350 refused (33% of eligible)
    - 332 were unresponsive to recruitment efforts (31% of eligible)
- Out of 323 patients enrolled at any point, 131 (40.6%) have ended their enrollment. Most common reasons for program termination were:
  - 61 (46.6%) No response to efforts by coach to reach participant
  - 31 (23.7%) Completed program by reaching goals
  - 28 (21.4%) Participant chose to no longer participate
- More than half (54.8%) of enrollees were female compared to 44.4% of non-enrollees. The two groups did not differ on age, marital status, baseline blood pressure, cholesterol (total, HDL, LDL), triglycerides or body mass index (BMI).
- Changes in biometric measures in enrollees and non-enrollees were adjusted for gender, age and the time between baseline and current measures. Adjusted differences did not differ from unadjusted so only unadjusted are shown here (Table 1).

CONCLUSIONS

- A targeted clinical prevention program can meaningfully reduce cardiovascular risk factors among participants compared to eligible non-participants.
- Positive changes in biometric risk factors were two to four times greater in the enrollment group for total cholesterol, high LDL and mean triglycerides.
- Increased encounters were associated with larger magnitude of changes in behavioral risk factors but not biometric changes (Table 2). Behavioral findings are limited to those who elected to participate in HBC.
- 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.

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