

Efficacy of a Patient-Engagement Platform in Reducing Uncontrolled Hypertension in Community Health Clinics

Irina Yermilov¹, MD, MPH, MS; Randy Coatney¹, MBA; Harry Soza¹, MSEE; Kenneth Anderson^{1,2}, DO, MS

¹CAREMINDr Corporation, Los Gatos, CA; ²University of Iowa, Iowa City, IA

Presenter Financial Disclosures

Research support: CAREMINDr

Employment: CAREMINDr, PHAR (Partnership for Health Analytic Research)

Background

- Over 37 million US adults have blood pressure (BP) higher than 140/90 mmHg, which can lead to serious sequelae like myocardial infarction and stroke.
- Medication to treat hypertension is effective, yet, approximately 50% of patients do not take medication as prescribed.
- Non-adherence to cardioprotective medications increases a patient's risk of death from 50% to 80%.

Objective

- To measure rates of BP control before and after introduction of a novel digital hypertension management program at federally qualified health centers (FQHCs).

Method

Program overview

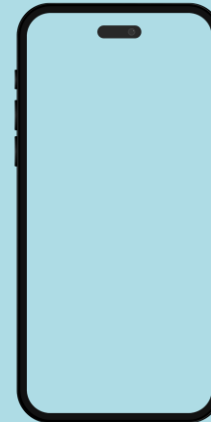
Physician
Rx



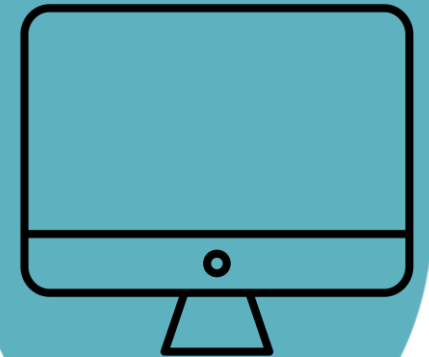
Staff
Onboard



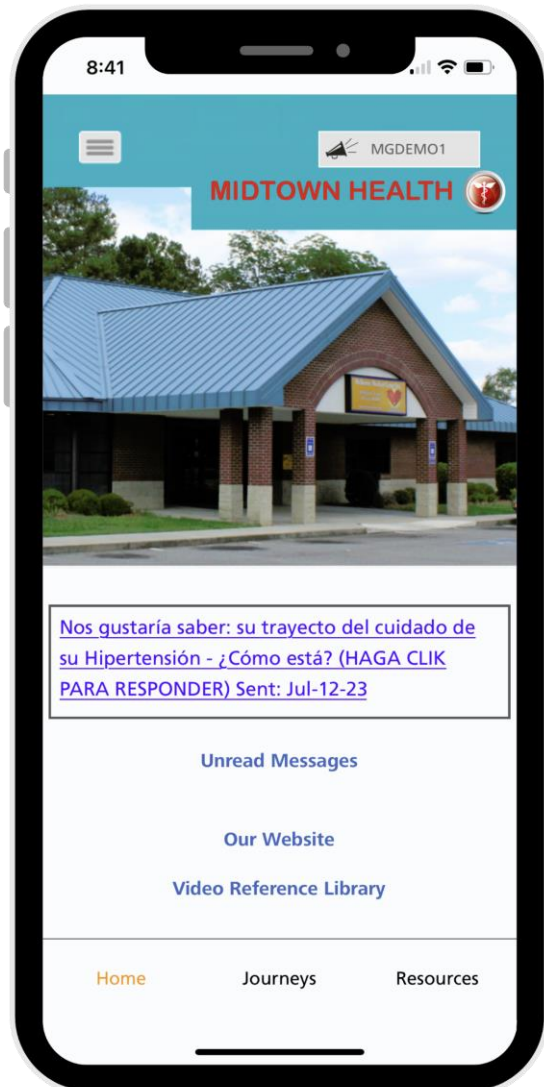
Patient
Check In



Staff
Review



Patient interface



The image shows a mobile application form for blood pressure and symptoms. The first section asks 'What is your most recent blood pressure reading - Top number?' with a slider set to 120 and a numeric keypad showing 1, 2, 3, and 4. The second section asks 'What is your most recent blood pressure reading - Bottom number?' with a slider set to 80 and a numeric keypad showing 1, 2, 3, and 4. The third section asks 'Have you had any of these symptoms over the past week?' with five radio button options: 'Blurry vision', 'Chest Pain', 'Dizziness', 'Headaches', and 'None'. At the bottom is a green 'Send In' button.

Clinic review of alerts



Emergency alert: patient received immediate guidance



High level alert



Low level alert

Patients Dashboard No-reply Alerts Archive Watchtower Reporting

CAREMINDr Logged in as: MG DEMO Cmdr Admin, CMD Logout

Export Search Reset

Filter by Alerts Most Recent

Pt#: 123456HH	Sts: Unread	Rev: None
Hypertension with daily blood pressure		
B9P4T2 8:17am 06/30/23	BP: 129/85	
Pt#: 456789	Sts: Unread	Rev: None
Hypertension with daily blood pressure		
G2Z2A8 8:17am 06/30/23	BP: 120/82	
Pt#: 5567856	Sts: Unread	Rev: None
Diabetes with daily blood glucose		
Z8K4L0 9:21am 06/29/23	BG: 333	
Pt#: 456789	Sts: Unread	Rev: None
Hypertension with daily blood pressure		
G2Z2A8 8:38am 06/29/23	BP: 185/100	
Pt#: HARRYATEST	Sts: Open	Rev: CMD
Hypertension with daily blood pressure		
Z8V8K2 11:12am 06/29/23	BP: 160/115	
Pt#: 5567856	Sts: Open	Rev: CMD
Depression Weekly - Spanish		
L1M6S5 9:21am 06/29/23		
Pt#: 123456HH	Sts: Unread	Rev: None
Hypertension with daily blood pressure		
B9P4T2 8:38am 06/29/23	BP: 152/92	
Pt#: BILLATEST	Sts: Unread	Rev: None
Hypertension with daily blood pressure		
C2K3C0 1:27pm 06/29/23		

Sts: Open Rev: CMD Pt#: HARRYATEST

JOURNEY INFO COMMENTS EVENTS

Sent-in On: 11:12am 06/29/23 Pt. Initials: HS Pt. Birth Year: 1928

Journey: Hypertension with daily blood pressure Pt. Gender: MALE Provider Code: 1234567890

Started: 9:24am 05/11/23 PMHID#: 2635438 Group: None

Journey: Hypertension with daily blood pressure

Low	Low	Low	High	High	High
Emerg	Crit	Warn	Warn	Crit	Emerg
85/50	90/60	95/65	140/90	145/95	180/120

SENT-IN BY USER ON: 11:12 am 06/29/23 (PDT)

What is your systolic blood pressure (top number) today? 160

What is your diastolic blood pressure (bottom number) today? 115

HTN Biometrics

Blood Pressure (mmHg)

Date	Systolic (mmHg)	Diastolic (mmHg)
05/11/23	131	90
05/17/23	138	86
06/29/23	160	115

Legend: Red line = Systolic, Blue line = Diastolic

Clinic review of engagement

20 No patient response
for ≥ 20 days

40 No patient response
for ≥ 40 days

CAREMINDr

Logged in as: MG DEMO Cmdr Admin, CMD | Logout

Export

Search

Reset

Filter by Alerts

Most Recent

40

Pt#: 89963254

Sts: Unread

Rev: None

Depression weekly

M5J4L9 | 8:40am 06/14/23

40

Pt#: 89963254

Sts: Unread

Rev: None

Diabetes with daily blood glucose

K4N5J1 | 8:40am 06/14/23

!

Pt#: 25488765

Sts: Open

Rev: CMD

Hypertension with daily blood pressure - Spanish

B4V1W0 | 11:59am 06/12/23

BP: 112/56

Pt#: 25488765

Sts: Unread

Rev: None

Hypertension with daily blood pressure - Spanish

B4V1W0 | 11:15am 06/12/23

20

Pt#: CHERIATEST

Sts: Open

Rev: CMD

Hypertension with daily blood pressure

F0G9K1 | 3:00am 06/08/23

20

Pt#: JOHNATEST

Sts: Open

Rev: CMD

Hypertension with daily blood pressure

X8R8Q7 | 2:55pm 06/07/23

20

Pt#: HARRYATEST

Sts: Unread

Rev: None

Hypertension with daily blood pressure

Z8V8K2 | 12:15pm 06/06/23

20

Pt#: RANDYATEST

Sts: Unread

Rev: None

Hypertension with daily blood pressure

D1Z9S5 | 9:50am 06/06/23

20

Pt#: 456789

Sts: Unread

Rev: None

Hypertension with daily blood pressure

G2Z2A8 | 8:55am 06/06/23

Sts: Open

Rev: CMD

Pt#: JOHNATEST

JOURNEY INFO

COMMENTS

EVENTS

Sent-in On: 2:55pm 06/07/23

Pt. Initials: JF

Pt. Birth Year: 1929

Journey: Hypertension with daily blood pressure

Pt. Gender: FEMALE

Provider Code: 1234567890

Started: 1:47pm 05/11/23

PMHID#: 2478677

Group: None

Pt#: JOHNATESTJF-1234567890

Birth: 1929

Gender: FEMALE

T-Code: X8R8Q7

Journey: Hypertension with daily blood pressure

Low Emerg

Low Crit

Low Warn

High Warn

High Crit

High Emerg

85/50

90/60

95/65

140/90

145/95

180/120

No Activity Alert

There has been no activity on this T-Code for 20 days

Last response sent in by patient:

SENT-IN BY USER ON: 2:54 pm 05/18/23 (PDT)

What is your systolic blood pressure (top number) today?

117

What is your diastolic blood pressure (bottom number) today?

82

HTN Biometrics

173

104

117

Analysis

- We retrospectively evaluated first and last systolic and diastolic BPs of patients who participated for ≥ 90 days (range 90-721 days).
- Study period: April 2021-April 2023.
- We considered BP $< 140/90$ mmHg to be controlled.
- Stratified by language (i.e., English, Spanish).

Results

2,500 patients participated for ≥ 90 days

39%

male

n=965

227 days

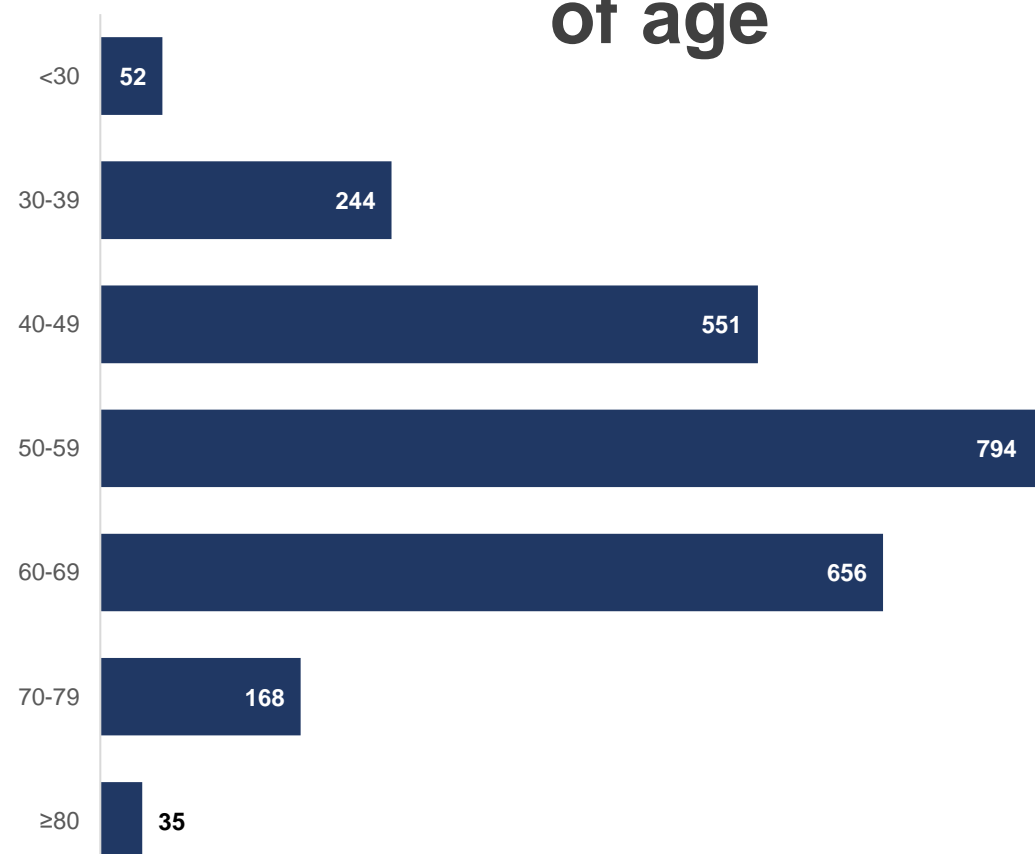
mean study period

22%

used Spanish language version

n=551

80% of patients 40-69 years of age



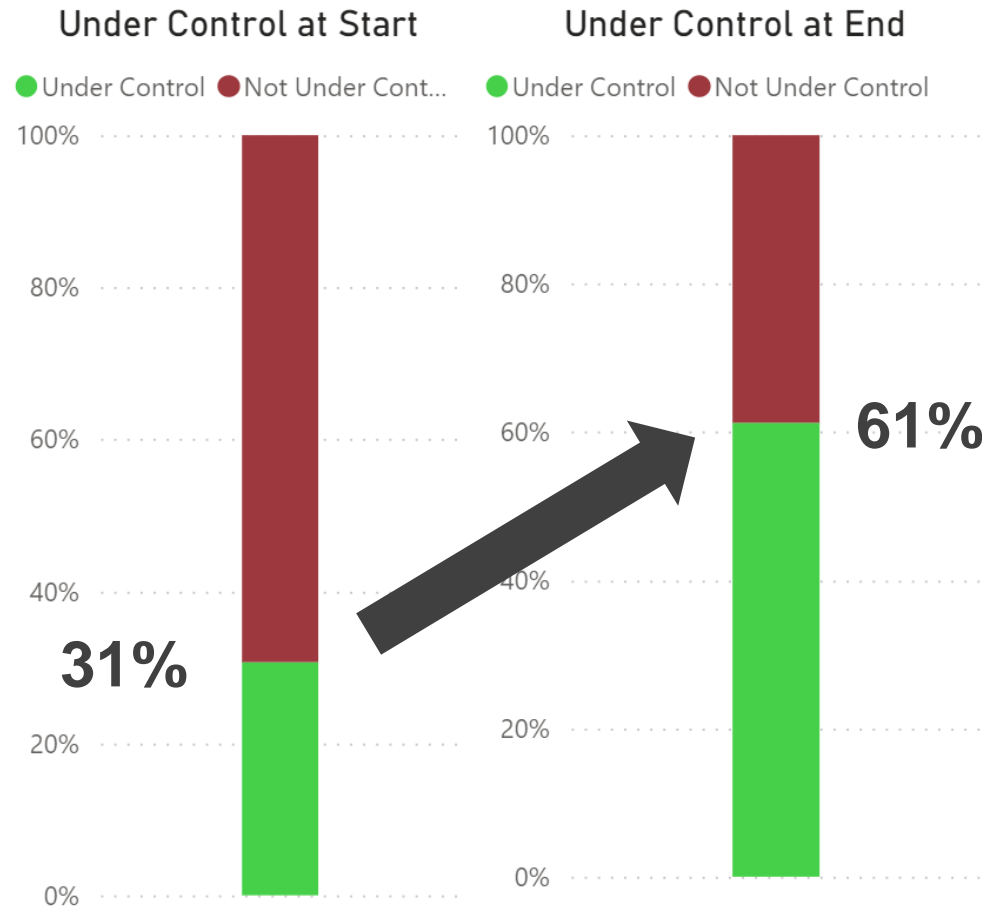
Mean (range): 53.9 (14-100) years

Patients were treated at 54 FQHCs



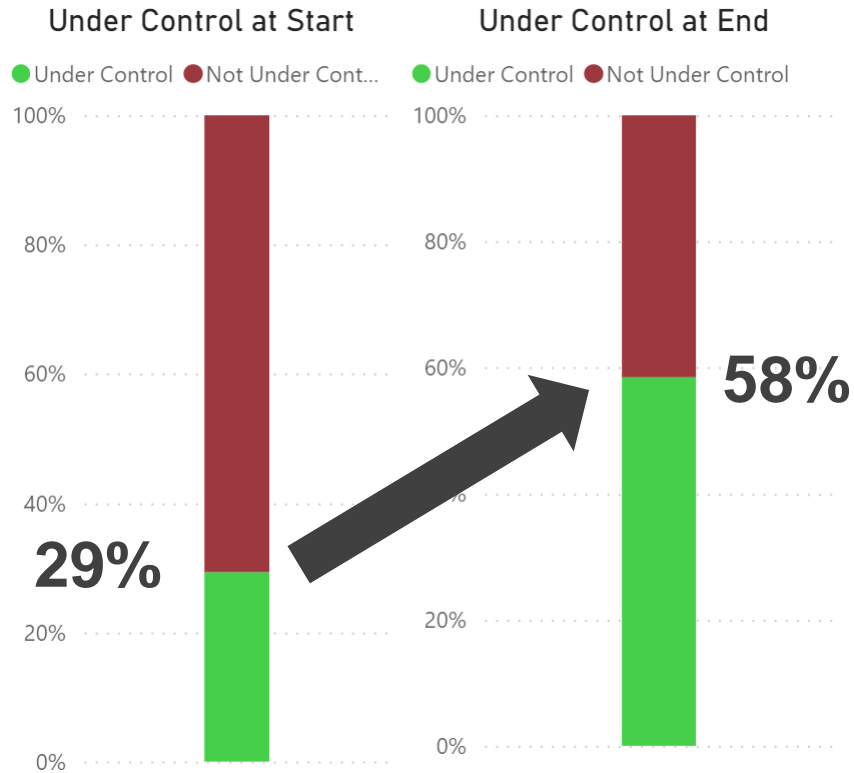
FQHC: Federally Qualified Health Center

55% of patients with uncontrolled BP achieved a controlled BP



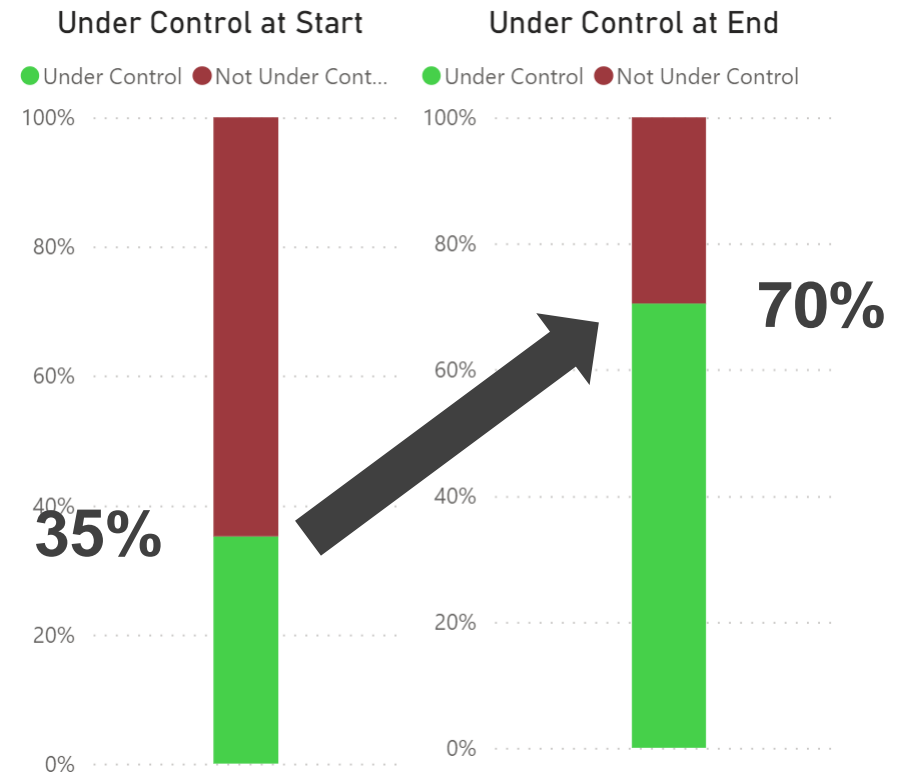
Patients using the Spanish version achieved better BP control

English



53% of uncontrolled to controlled

Spanish



66% of uncontrolled to controlled

Limitations

- This study did not include a comparator cohort that received standard of care.
- This study includes a traditionally underserved FQHC population and results may not be generalizable.

Conclusions

- This novel hypertension control program, which used technology to gather and prioritize data, improved BP control rates by over 55% in a real-world, underserved population with uncontrolled hypertension.
- BP control was higher in the Spanish-speaking population.
- Remote digital monitoring with intervention can improve clinical outcomes without significantly increasing the overall cost of care, thereby promoting value-based care strategies for chronic diseases such as hypertension.

Next steps

- Test different versions of the program to identify drivers of positive outcomes.
- Use this program as part of treatment plan for other conditions.

Questions?