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SEPT. 18–21, 2023  
WYNN, LAS VEGAS

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**UChicago**  
**Medicine**

# Hypertension RPM: A Patient Portal and Population Health Hypertension Intervention

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# Learning Objectives

- Describe a digital and population health-based solution to address uncontrolled hypertension.
- Describe how to design, launch, and scale an equitable, high-value implementation of an RPM intervention, including the team members, EHR tools, and training required.
- Describe the reporting tools built into the EHR and visualization software to identify potential patients and monitor enrolled patients.

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# University of Chicago Medicine (UCM)

- **At the Forefront of Medicine** since 1927
  - University of Chicago Medical Center (UCMC) on Chicago's south side
  - Pritzker School of Medicine
  - Biological Sciences Division
  - Ingalls Memorial
  - Various Care Network outpatient sites throughout the Chicagoland area
- **Primary Care Group** at the **DCAM Outpatient Building** on the **UCMC Campus**
  - Large Academic Internal Medicine and Medicine/Pediatrics Clinic
  - ~40 Attendings/APPs and ~100 Residents/Fellows
  - ~26K patients last year, ~100K visits
    - ~61K visits for patients with HTN
    - ~13K unique patients

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In order to better address a major **chronic disease (hypertension)** with significant associated morbidity and mortality that **disproportionately impacts patients of color**, we piloted a remote patient monitoring (**RPM**) program for patients with uncontrolled **hypertension**, using **digital activation** to **improve control** and **reduce health disparities**.

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# People and Resources

## People (centralized team)

- Digital Navigator (Medical Assistant float pool)
- Physician informatics (2)
- Population health RNs (3-5)
- Ambulatory pharmacists (1-2)

## Resources (requiring funding)

- Bluetooth-enabled blood pressure cuffs
  - » Provided at no cost to patients
- Reporting & analytics
  - Clinical Data and Analytics (CD&A)
  - Medical informatics

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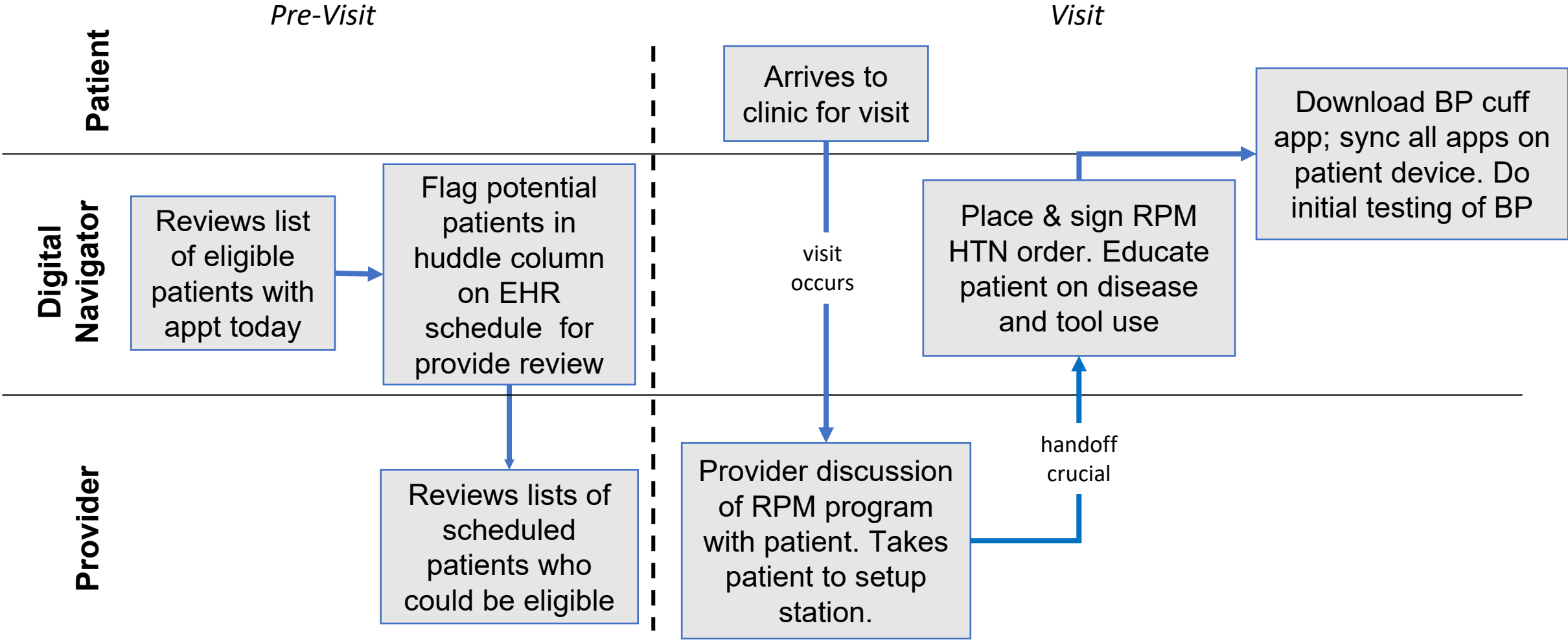
# Protocols

- Medical Assistant (MA) Protocols
  - Float-Pool MAs as **Digital Navigators**
  - **Digitally Activate** and Enroll Patients
  
- Nursing and Pharmacist Protocols
  - Medication Titration
  - Lab Ordering
  - Graduation and/or Resolving Incomplete

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# Enrollment Workflow



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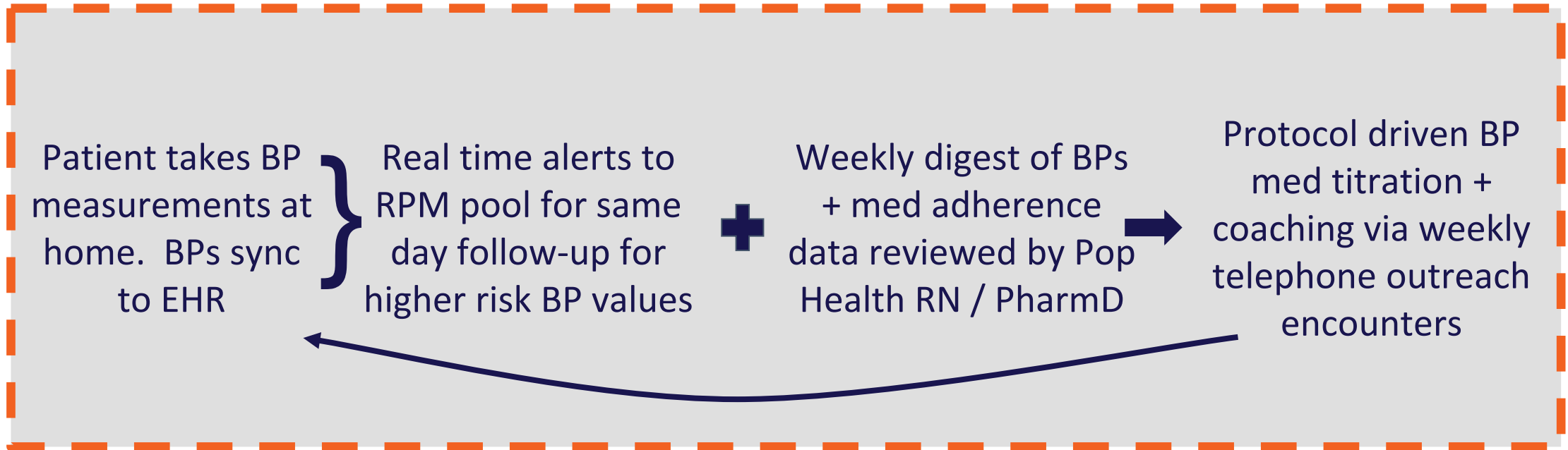
# Example EHR Summary Report of Potential Patients

| Time     | Patient Name   | Age - Years | Zip Code | Status    | Huddle Column | Special Med Orders (6mo)? | Is Pregnant? | Exclusion Event? | Exclusion Dx? | Encounter Provider    | Pt. Portal Status | Type      | Last Sys BP | Last Dia BP | # of BP Meds |
|----------|----------------|-------------|----------|-----------|---------------|---------------------------|--------------|------------------|---------------|-----------------------|-------------------|-----------|-------------|-------------|--------------|
| 9:00 AM  | Apple, Jake    | 67          | 60611    | Arrived   | Poss. RPM Pt. | 🚩                         |              |                  |               | BANDAGE, RACHEL       | Active            | Return Pt | 157         | 94          | 3            |
| 9:00 AM  | Plum, Jenny    | 79          | 60657    | Scheduled |               |                           |              |                  |               | URGENT CARE PHYSICIAN | Pending           | Return Pt | 166         | 70          | 2            |
| 10:30 AM | Cherry, Liza   | 37          | 60699    | Arrived   |               | 🚩                         |              |                  | 🚩             | STETHESCOPE, JOHN     | Expired           | Return Pt | 140         | 70          | 4            |
| 1:30 PM  | Apricot, Steve | 55          | 60637    | Scheduled | Poss. RPM Pt. | 🚩                         |              |                  | 🚩             | URGENT CARE PHYSICIAN | Expired           | Return Pt | 143         | 63          | 1            |
| 10:00 AM | Apple, Betty   | 69          | 60611    | Scheduled |               |                           |              |                  |               | URGENT CARE PHYSICIAN | Active            | Return Pt | 155         | 114         | 1            |

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# Monitoring Steps



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# Monitoring (Analytics Tools)

|                       | Number of Readings | Number of Systolics <140 (%) | Systolic Average [Min-Max] | Number of Diastolic <140 (%) | Diastolic Average [Min-Max] |
|-----------------------|--------------------|------------------------------|----------------------------|------------------------------|-----------------------------|
| <b>Last 7 Days</b>    | 8                  | 8 (100%)                     | 117 [105-128]              | 8 (100%)                     | 62.9 [57-72]                |
| <b>Last 7-14 Days</b> | 4                  | 2 (50%)                      | 140 [124-156]              | 4 (100%)                     | 73.5 [73-74]                |
| <b>Last 28 Days</b>   | 22                 | 14 (63.6%)                   | 133.2 [105-172]            | 22 (100%)                    | 71.1 [57-82]                |

| Patient         | 4W Goal | # of Entries | # of BP Meds | ACEi/ARB | CCB | Thiazide | B-Blocker | Engagement 7D v 7-14D | 14D Goal | #BP (7D) | # SBP <140 (7D) | % SBP <140 (7D) | AVG SBP (7D) | Range SBP (7D) |
|-----------------|---------|--------------|--------------|----------|-----|----------|-----------|-----------------------|----------|----------|-----------------|-----------------|--------------|----------------|
| Celery, Jim     |         | 1            | 1            | ✓        |     |          |           |                       |          | 1        | 0               | 0%              | 143          | [143-143]      |
| Lettuce, Neal   | ⚠       | 1            | 3            | ✓        | ✓   |          | ✓         | ↗                     | ⊘        | 6        | 3               | 50%             | 139          | [126-155]      |
| Squash, Candice | ⚠       | 20           | 2            | ✓        | ✓   |          |           | ↘                     | ⊘        | 2        | 0               | 0               | 149.5        | [144-155]      |

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# Results

- Over **60% of participants** enrolled in the program achieved BP control (defined as last BP <140/90 mmHg)
- >80% of enrolled patients were Black/African-American
- **Highly rated** by patient participants and the multi-disciplinary RPM health care team
  - MAs and RNs involved noted program was a meaningful part of their roles as clinicians

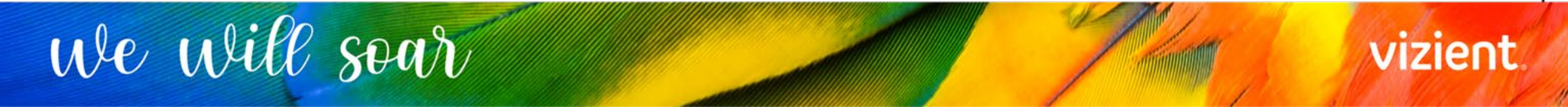
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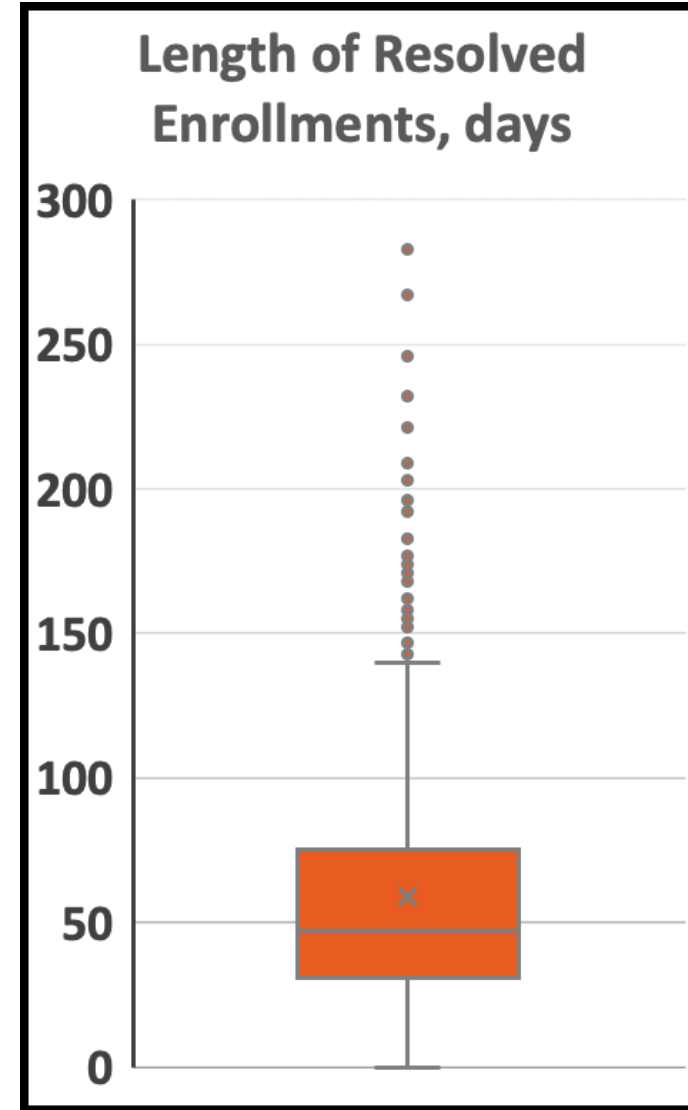
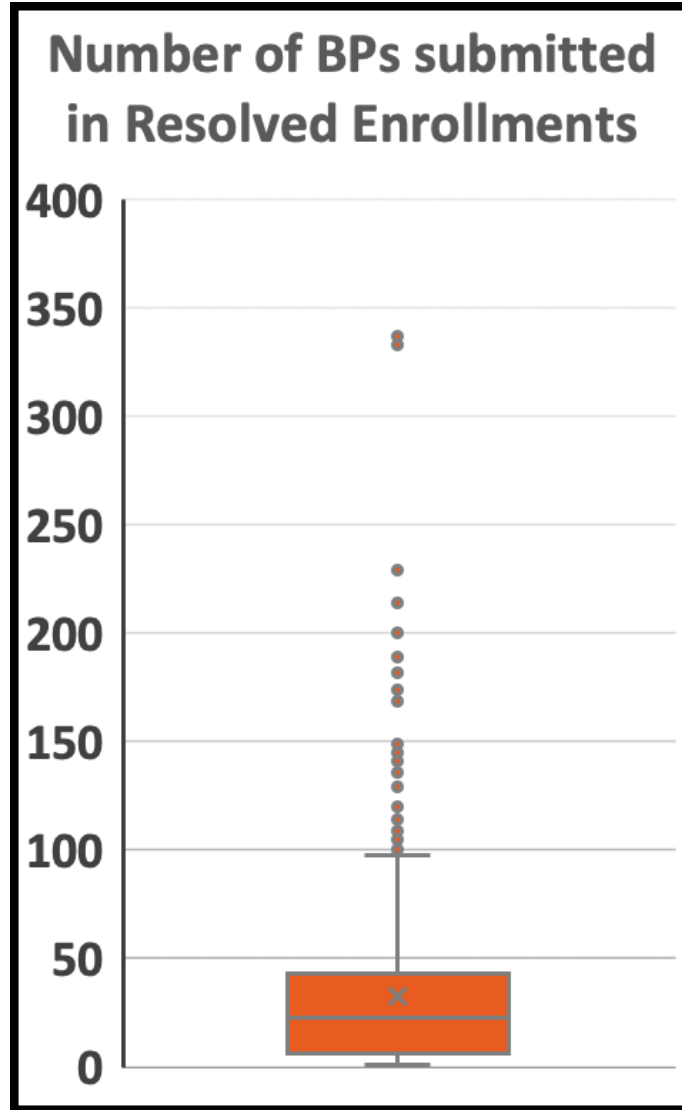
# Table 1. Pilot Participants from 5/17/2022 to 5/3/2023

| <b>Totals</b> |  | <b>n (%)</b> | <b>Ethnicity</b>                      | <b>n (%)</b> |
|---------------|--|--------------|---------------------------------------|--------------|
|               | Unique Patients                        | 884          | Not Hispanic or Latino                | 828 (93.7)   |
|               | Enrollments                            | 930          | Hispanic or Latino                    | 26 (2.9)     |
|               | Outreach Encounters                    | 6,276        | Unknown/Patient Declined              | 30 (3.4)     |
|               | Captured Blood Pressures               | 24,656       | <b>Current Medication Use</b>         |              |
| <b>Sex</b>    | Female                                 | 571 (64.6)   | ACE/ARB                               | 524 (59.3)   |
|               | Male                                   | 313 (35.4)   | CCB                                   | 492 (55.7)   |
| <b>Race</b>   | Black/African-American                 | 724 (81.9)   | Thiazide                              | 222 (25.1)   |
|               | White                                  | 98 (11.1)    | B-Blocker                             | 241 (27.3)   |
|               | Asian/Mideast Indian                   | 27 (3.1)     | <b>Resolved Enrollments</b>           | 812          |
|               | Native Hawaiian/Other Pacific Islander | 2 (0.2)      | Last Systolic <140                    | 508 (62.6)   |
|               | American Indian or Alaskan Native      | 1(0.1)       | Last Diastolic <90                    | 690 (85.0)   |
|               | Unknown/Patient Declined               | 35 (3.9)     | # of BPs recorded, mean (SD)          | 32.0 (39.3)  |
|               | More than one Race                     | 10 (1.1)     | Length of enrollment, mean (SD), days | 57.8 (40.4)  |

Source: EHR



# Results



Source: EHR

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# Key Components

Proactive enrollment by dedicated team with PCP endorsement

Digital navigator and multi-disciplinary team ownership

Provision of Bluetooth BP cuff & full tech setup at enrollment

Weekly review of BPs + pharmacy adherence data

Nurse + Pharmacist med titration protocol

Documentation of all outreach + med changes

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## Lessons Learned

- Patient Re-Engagement Needed
- Iterative Design Important
- IT Support Required
- Providers really want chronic disease help

## Future Steps

- Chatbot for post-monitoring
- Pulse/HR
- EHR encounter optimization
- Expansion
- Operational Dashboards

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# Key Takeaways

- Utilize existing staff
  - **Float Pool MAs as Digital Navigators**
  - Population Health Outreach team
  - Involve all levels of the clinic staff and leadership
- Involve Operational Leaders early
- Iterative Design
- Summarize and Visualize data and trends
  - Leadership
  - Daily Monitoring

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# Questions?



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