Team-Based Telemonitoring for Hypertension and Diabetes in Academic Family Medicine: Clinical Outcomes and Educational Integration

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INTRODUCTION

- Chronic conditions such as diabetes and hypertension require frequent monitoring.[1]
- Workforce shortages in medically underserved areas like Mississippi limit effective chronic disease management.[2]
- Remote patient monitoring (RPM) can expand primary care capacity, support timely intervention, and enhance patient engagement in chronic disease care.[3]
- Academic family medicine clinics provide a natural setting for interprofessional education, allowing learners opportunities to engage in collaborative, technology-enabled care through RPM.

OBJECTIVE

The objective of this study was to evaluate an interprofessional RPM program for hypertension and diabetes and its integration into resident and pharmacy trainee education within academic family medicine clinics.

METHODS

DESIGN:

- Retrospective chart review conducted of patients in RPM programs for hypertension or diabetes at University of Mississippi Medical Center (UMMC) Family Medicine clinics from January 2020 through April 2024.
- RPM was integrated into routine care with telemonitoring and standardized workflows.

INTERPROFESSIONAL EDUCATION (IPE) COMPONENT:

- Family medicine residents participated in medication titration, either independently with guidance or delegated to pharmacists under collaborative practice agreement (CPA).
- Pharmacy residents and students were involved in data review, medication reconciliation, and interprofessional case discussions.
- Team-based workflow included RNs, pharmacists, residents, attending physicians, and specialty providers.
- IPE was embedded throughout RPM workflow and patient management.

PRIMARY OUTCOME:

- Hypertension cohort: change in mean systolic and diastolic blood pressure at program completion
- Diabetes cohort: change in hemoglobin A1c at program completion

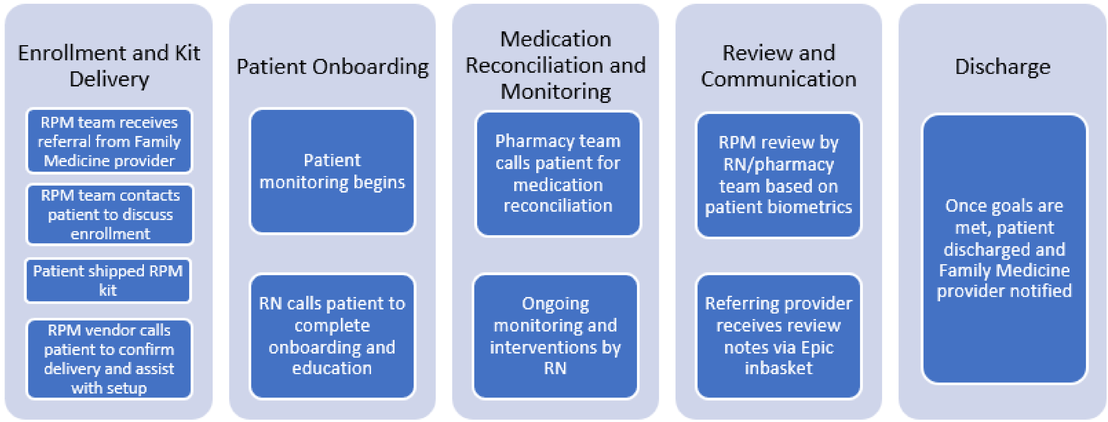
STATISTICAL ANALYSIS:

- Baseline vs. follow-up outcomes were compared within cohorts using paired t-tests or Wilcoxon signed-rank tests.
- $p < 0.05$ considered statistically significant

RESULTS

- 237 patients were enrolled in the RPM programs with 94 completing the programs and included in the analysis.
- Reasons for noncompletion included patient request, insufficient monitoring, or loss to follow-up.

Figure 1: RPM Workflow



- **Hypertension cohort:** 70 patients; mean age 59.5 years; 65.7% female; 94.3% Black/African American
- **Diabetes cohort:** 24 patients; mean age 60.4 years; 62.5% female; 87.5% Black/African American
- Most participants were retired or disabled.

Figure 2: Change in Blood Pressure

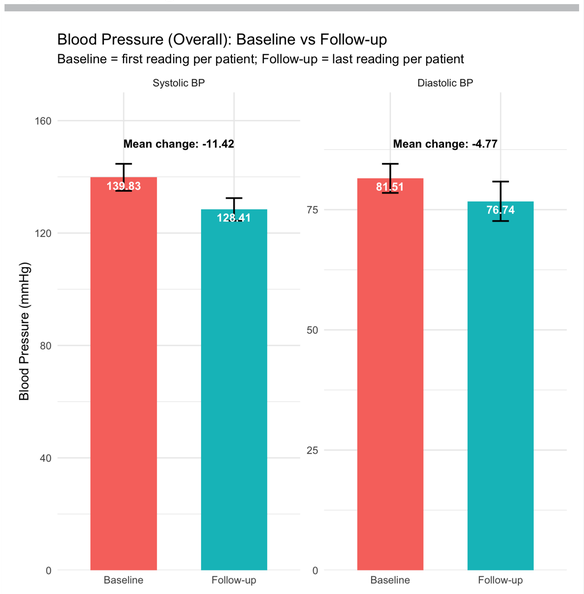
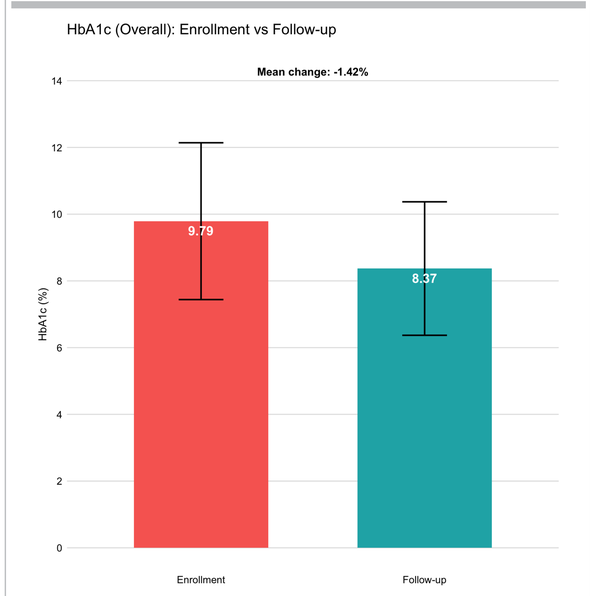


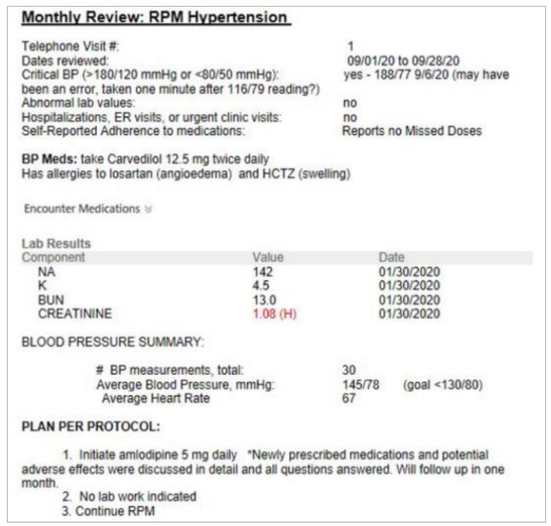
Figure 3: Change in HbA1c



- Patients experienced clinically meaningful reductions in blood pressure and HbA1c.
- Patients with uncontrolled baseline BP (≥130/80 mmHg, n=43) experienced an even greater reduction in systolic BP (-14.6 mmHg, $p = 0.0004$)

RESULTS

Figure 4: Sample Monthly Review Note



Monthly Review: RPM Hypertension

Telephone Visit #: 1
Dates reviewed: 09/01/20 to 09/28/20
Critical BP (>180/120 mmHg or <80/50 mmHg): yes - 188/77 9/6/20 (may have been an error, taken one minute after 116/79 reading?)
Abnormal lab values: no
Hospitalizations, ER visits, or urgent clinic visits: no
Self-Reported Adherence to medications: Reports no Missed Doses

BP Meds: take Carvedilol 12.5 mg twice daily
Has allergies to losartan (angioedema) and HCTZ (swelling)

Encounter Medications

Lab Results

Component	Value	Date
NA	142	01/30/2020
K	4.5	01/30/2020
BUN	13.0	01/30/2020
CREATININE	1.08 (H)	01/30/2020

BLOOD PRESSURE SUMMARY:

# BP measurements, total:	30	
Average Blood Pressure, mmHg:	145/78	(goal <130/80)
Average Heart Rate	67	

PLAN PER PROTOCOL:

1. Initiate amlodipine 5 mg daily *Newly prescribed medications and potential adverse effects were discussed in detail and all questions answered. Will follow up in one month.
2. No lab work indicated
3. Continue RPM

DISCUSSION

- Team-based RPM embedded in family medicine improved blood pressure and glycemic control, with the largest gains among patients with uncontrolled baseline measurements.
- Integration of residents and pharmacy trainees provided a hands-on collaborative care learning experience.
- Sustainability and wider adoption may be supported by programs like CMS ACCESS, which align payment with outcome-based, technology-enabled chronic care models.[4]

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