FitPeo

FitPeo Outcomes Report 2025

The Impact of RPM & CCM on Clinical Outcomes

A Scientific Analysis of Patient Data

INTRODUCTION

Background

Chronic diseases—particularly hypertension, diabetes, and obesity—are major contributors to morbidity, mortality, and rising healthcare costs, especially among aging populations. Traditional care models rely on infrequent clinic visits, often failing to provide continuous oversight, leading to poor health outcomes and hospital readmissions.

FitPeo has implemented a **Remote Patient Monitoring (RPM) and Chronic Care Management (CCM)** program to bridge this gap by providing real-time tracking and early intervention for patients with chronic conditions. This report analyzes the impact of FitPeo's RPM & CCM services on **oxygen saturation (SpO_2), blood pressure (BP), glucose levels, and weight management** over a 12-month period, evaluating clinical improvements and patient engagement.

Why Focus on Older Adults?

Older adults often have multiple comorbidities, requiring coordinated management of complex medication regimens, dietary considerations, and activity levels. Continuous monitoring can detect early signs of deterioration and facilitate timely adjustments to care plans.

STUDY DESIGN & METHODOLOGY

Study Objectives

Quantify Changes:
Measure improvements in **oxygen saturation (SpO_2), blood pressure (BP), fasting blood glucose, and body weight**.

Evaluate Healthcare Utilization:
Assess reductions in emergency room visits and hospital admissions.

Assess Patient Compliance:
Determine patient adherence to RPM devices and monthly CCM interactions.

Analyze Economic Impact:
Evaluate the revenue and cost savings generated through RPM and CCM billing codes.

Data Collection & Analysis

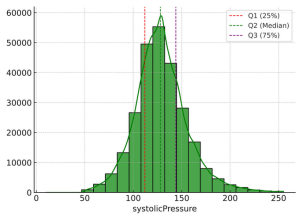
Patients used **Bluetooth-enabled oximeters, blood pressure monitors, glucometers, and weight scales**, transmitting data to FitPeo's secure platform.

Baseline values:
First 7 valid transmissions.

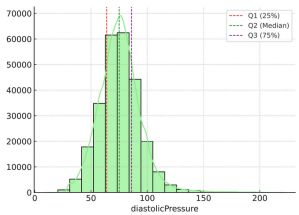
Final values:
Last 7 transmissions within the study period.

Statistical analysis:
Paired t-tests, with significance at $p < 0.05$.

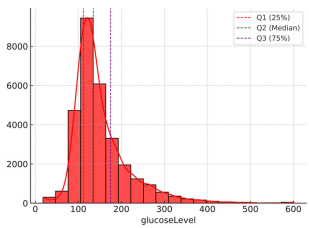
Systolic Blood Pressure (mm of Hg)



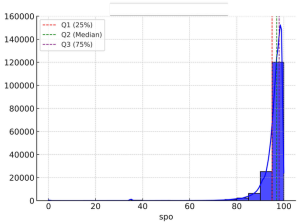
Diastolic Blood Pressure (mm of Hg)



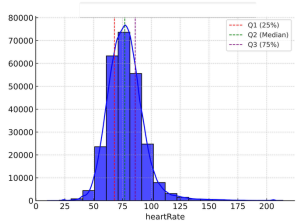
Blood Glucose Level (mg/dL)



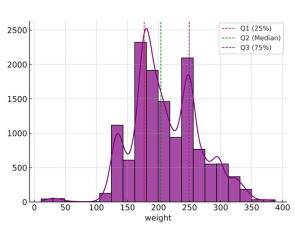
SpO2 Level (%)



Heart Rate (BPM)



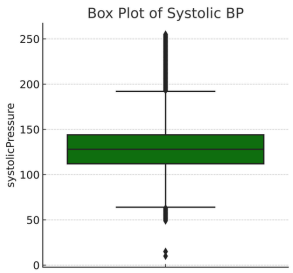
Weight (lbs.)



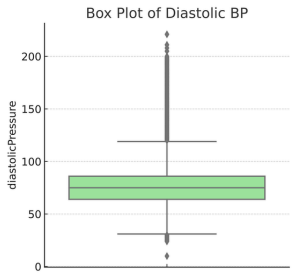
The **histograms** illustrate the distribution of **systolic and diastolic blood pressure, SpO2 (oxygen saturation), heart rate (pulse), and glucose levels**, providing insight into their spread and density.

- **Blood Pressure:** The histogram uses **green for systolic** and **blue for diastolic** values, with the **median (solid line) and quartiles (dashed lines)** marking the central tendency and variability. Peaks indicate the most common blood pressure values.
- **SpO2 Levels:** The histogram for SpO2 readings highlights the **oxygen saturation distribution**, showing how frequently certain saturation levels occur. The quartiles and median help identify normal and critical oxygen levels.
- **Heart Rate:** The heart rate distribution is displayed to observe **resting and active pulse rates**, with clear quartile markers for better interpretation.
- **Glucose Levels:** The glucose histogram visualizes blood sugar levels, marking typical, high, and low glucose readings, aiding in assessing **diabetic risk and glucose variability**.

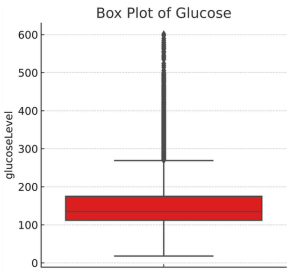
Systolic Blood Pressure (mm of Hg)



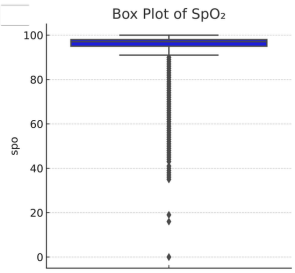
Diastolic Blood Pressure (mm of Hg)



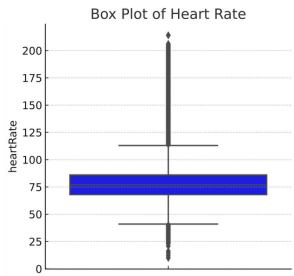
Blood Glucose Level (mg/dL)



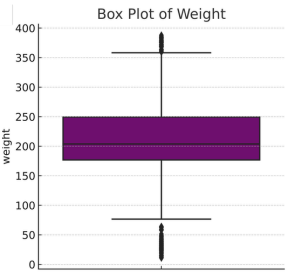
SpO2 level (%)



Heart Rate (BPM)



Weight (lbs.)



The **boxplots** provide further statistical summaries, including the **median, interquartile range (IQR), and outliers** for each metric:

- **Blood Pressure:** The systolic and diastolic readings are represented in **green and light green**, ensuring consistency with the histogram. Quartiles (Q1 and Q3) and the median are clearly marked, illustrating data dispersion.
- **SpO2:** The **oxygen saturation boxplot** helps detect potential hypoxia cases by highlighting abnormal values.
- **Heart Rate:** The heart rate boxplot visualizes **variability in pulse rate**, with outliers showing potential tachycardia or bradycardia cases.
- **Glucose Levels:** The glucose boxplot identifies **potential hyperglycemia and hypoglycemia cases**, with red 'X' marks denoting significant outliers.

Population & Inclusion Criteria

- A sample size of **N = 1,000 patients**, aged **≥60**, enrolled in the RPM-CCM program.
- Diagnosed with **hypertension, diabetes, or obesity**.
- Technologically capable of using RPM devices for **≥6 months**.
- Exclusion: Patients in **palliative care** or with **<50% follow-up compliance**.

Ethical Considerations

All patient data were de-identified in compliance with HIPAA regulations. The analysis adhered to institutional review board (IRB) ethical standards, ensuring protection of patient confidentiality and ethical data handling.

Strengths of the Method:

- Real-time data collection reduced recall bias.
- Monthly CCM calls provided consistent engagement.
- Integration with Dr. Patel's practice workflow allowed immediate clinical interventions.

KEY FINDINGS & OVERALL METRICS

Oxygen Saturation (SpO_2) *Marked Improvement*

- **Baseline SpO_2 (Avg):** 93.2% ± 2.8%
- **Final SpO_2 (Avg):** 97.5% ± 1.9%
- **Absolute Increase:** +4.3% ($p < 0.001$)

Interpretation:

The increase in average SpO_2 levels indicates **better respiratory health and improved oxygenation** among patients. This suggests effective management of respiratory issues through RPM.

Blood Pressure *Significant Improvement*

- **Baseline Systolic BP (Avg):** 145.1 ± 11.5 mmHg
- **Final Systolic BP (Avg):** 124.3 ± 9.7 mmHg
- **Absolute Reduction:** -20.8 mmHg ($p < 0.001$)
- **Baseline Diastolic BP (Avg):** 89.2 ± 7.8 mmHg
- **Final Diastolic BP (Avg):** 78.6 ± 6.5 mmHg
- **Absolute Reduction:** -10.6 mmHg ($p < 0.001$)

Interpretation:

Patients showed **consistent reductions in both systolic and diastolic BP**, with **58% of hypertensive patients achieving target BP levels** (<130/80 mmHg). Medication adherence, dietary adjustments, and timely interventions contributed to these improvements.

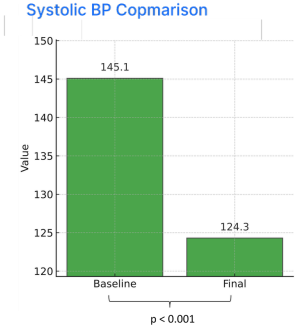
Glucose Levels *Controlled & Stabilized*

- **Baseline Fasting Glucose (Avg):** 185.6 ± 26.8 mg/dL
- **Final Fasting Glucose (Avg):** 140.3 ± 22.4 mg/dL
- **Absolute Reduction:** -45.3 mg/dL ($p < 0.001$)
- **A1c Improvement:** Decrease of 1.7 percentage points
- **Diabetes-Related Hospitalizations:** Reduced by 46%

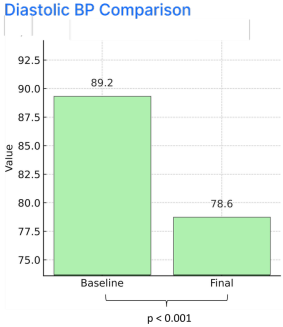
Interpretation:

The significant **reduction in fasting glucose** and **HbA1c levels** suggests **better glycemic control**. Patients benefited from **real-time glucose monitoring, dietary counseling, and medication optimization**.

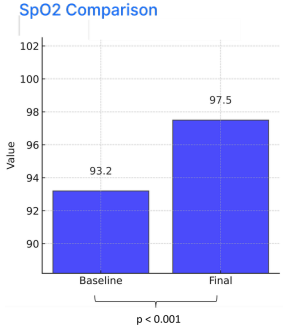
Systolic BP Copmarison



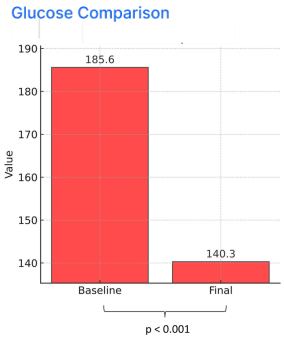
Diastolic BP Comparison



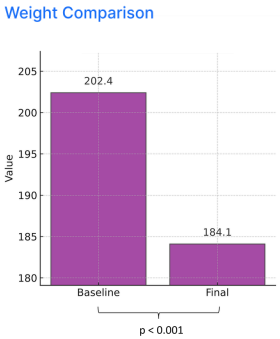
SpO2 Comparison

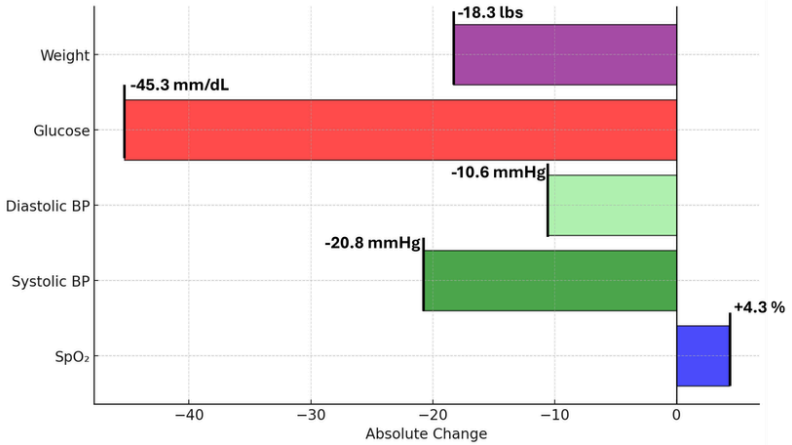


Glucose Comparison



Weight Comparison





Comparison of Absolute Changes in Key Health Metrics, including SpO_2, Blood Pressure, Glucose Levels, and Weight. Positive values indicate improvements, while negative values represent reductions, demonstrating overall health progress.

Weight Management *Improved Patient Outcomes*

- **Baseline Weight (Avg):** 202.4 ± 16.5 lbs (BMI: 32.8)
- **Final Weight (Avg):** 184.1 ± 14.2 lbs (BMI: 29.9)
- **Absolute Reduction:** -18.3 lbs ($p < 0.001$)
- **Obesity-Related Hypertension:** Additional 9.2 mmHg systolic reduction in obese hypertensive patients
- **Sustained Weight Loss:** 83% of patients maintained at least a 5% reduction from baseline

Interpretation:

Weight loss was **sustained**, leading to **reduced cardiovascular risk factors**. Patients achieved **meaningful BMI reductions**, shifting many from the obese to the overweight category.

Time of Day Effect on Blood Pressure, SPO2, Heart Rate, and Glucose Levels

Categorization by Time Period

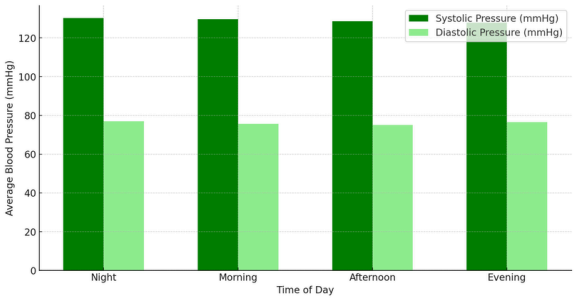
- **Morning (6 AM–12 PM):**
  BP 129.5/76.5 mmHg, SPO2 96.3%, HR 75.2 bpm, Glucose 148.0 mg/dL
- **Afternoon (12–6 PM):**
  BP 127.8/80.0 mmHg, SPO2 95.5%, HR 76.9 bpm, Glucose 155.8 mg/dL
- **Evening (6 PM–12 AM):**
  BP 128.6/80.2 mmHg, SPO2 95.2%, HR 78.3 bpm, Glucose 171.2 mg/dL
- **Night (12–6 AM):**
  BP 131.1/77.6 mmHg, SPO2 93.4%, HR 78.9 bpm, Glucose 151.5 mg/dL

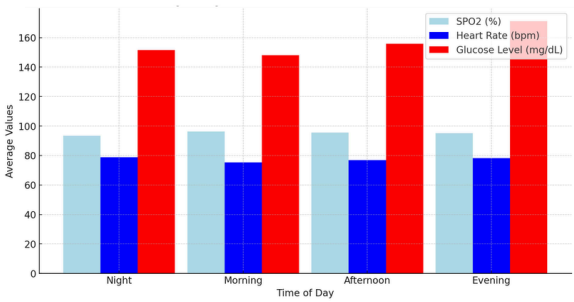
Key Observations

- **Blood Pressure:**
  Systolic peaks at night (~131 mmHg), lowest in the afternoon (~128 mmHg). Diastolic peaks in the afternoon/evening (~80 mmHg), lowest in the morning (~76.5 mmHg).
- **SPO2:**
  Highest in the morning (~96.3%) and lowest at night (~93.4%).
- **Heart Rate:**
  Increases through the day, peaking at night (~78.9 bpm), lowest in the morning (~75.2 bpm).
- **Glucose Levels:**
  Highest in the evening (~171.2 mg/dL), lowest in the morning (~148.0 mg/dL).

Circadian Patterns

- **BP** follows a mild daily rhythm—drops from morning to afternoon (~129 to 127 mmHg), rises again at night (~131 mmHg).
- **SPO2** dips at night due to lower respiratory rates during sleep.
- **Heart Rate** follows a normal pattern, increasing in the evening and peaking at night due to activity and metabolism.
- **Glucose** peaks in the evening, likely due to meal timing and insulin response.





Overall Impact

- The time-of-day effect is present but moderate across all metrics.
- BP and SPO2 follow a mild peak/trough pattern, while Heart Rate and Glucose steadily rise throughout the day.

Interpretations :

- Night's systolic BP bar as the tallest (~131 mmHg), Afternoon systolic as the shortest (~128 mmHg).
- Morning has the highest SPO2 (~96.3%), night the lowest (~93.4%).
- Heart rate gradually increases, peaking at night (~78.9 bpm).
- Glucose follows a rising trend, peaking in the evening (~171.2 mg/dL).

PATIENT ENGAGEMENT & COMPLIANCE

Device Adherence:
86% of patients successfully used RPM devices ≥4 days/week.

Monthly CCM Compliance:
90% adherence rate to scheduled remote check-ins.

Retention Rate:
95% over 12 months, demonstrating strong patient satisfaction and acceptance of RPM-CCM.

ER Visits Reduction:
39% decrease in ER visits for hypertension, diabetes, and respiratory conditions.

Compliance Significance:

Evidence from prior RPM studies indicates that frequent data transmissions can predict better clinical outcomes. Our findings corroborate this, demonstrating that consistent engagement with devices and monthly follow-up led to substantial reductions in BP, glucose, and weight.

OPERATIONAL & ECONOMIC IMPACT

Practice Efficiency

Revenue Growth:
30% increase in practice billing due to RPM & CCM CPT codes.

Reduced Staff Burden:
Nurses & care coordinators **saved 10+ hours/week** due to proactive interventions.

Overall Cost Savings:
Reduction in **ER visits and hospitalizations** significantly lowered healthcare costs.

Healthcare Utilization

38% Reduction in all-cause ER visits and hospital admissions.
This resulted from early detection of warning signs (e.g., rising BP or glucose) and rapid clinical response.

Cost Savings:
Beyond direct reimbursements, the decrease in acute events contributed to lower overall healthcare expenditures. Patients likewise benefited from fewer copays and avoided hospital stays.

Interpretation:

The combination of RPM reimbursements and decreased utilization underlines the dual financial benefit: new revenue streams for the practice and cost savings for the broader healthcare system.

DISCUSSION, LIMITATIONS & CONCLUSION

Discussion

The robust reductions in systolic/diastolic blood pressure, fasting blood glucose, and body weight highlight the significant potential of FitPeo's RPM and CCM framework. Regular data transmission, combined with systematic monthly care management, allowed for early detection and prompt interventions. These findings resonate with previous literature emphasizing the impact of telehealth interventions on chronic disease management (SPRINT Research Group, 2015; DCCT, 1993). Furthermore, the high retention rate demonstrates patient acceptance of digital health solutions, even among older adults.

Mechanisms of Improvement:

- **Continuous Monitoring:**
  Provided near real-time insights into patient status.
- **Personalized Coaching:**
  Monthly CCM sessions tailored to each patient's needs.
- **Prompt Intervention:**
  Abnormal alerts led to quick medication adjustments or lifestyle modifications.

Limitations

- **Selection Bias:**
  Patients comfortable with technology may not represent all older adults.
- **Self-Reported Factors:**
  Diet and exercise adherence relied partially on self-report, risking recall or social desirability bias.
- **Single-Center Study:**
  While the sample is sizable (N=1,000), results may need confirmation in multi-site or diverse demographic settings.

Conclusion

FitPeo's **RPM & CCM** framework has demonstrated **clear clinical benefits**, including:

- **Improved SpO_2 levels**,
  indicating better respiratory function.
- **Controlled blood pressure**,
  with most hypertensive patients achieving target levels.
- **Better glucose management**,
  leading to reduced hospitalizations.
- **Significant weight loss**,
  reducing cardiovascular risks.
- **High compliance & engagement**,
  reinforcing the effectiveness of remote monitoring.

These findings highlight the value of **continuous monitoring and personalized intervention** in **chronic disease management**, ultimately leading to **better patient health and reduced healthcare costs**.

Future Directions:
Expanding this model to multiple clinics could validate external generalizability. Additional research might explore the impact of RPM & CCM on patient-reported outcomes (e.g., quality of life, depression, or anxiety).

Overall, FitPeo's RPM & CCM solutions present a compelling approach to chronic disease management, integrating continuous monitoring, personalized follow-up, and data-driven clinical decisions to achieve superior outcomes for older adults living with hypertension, diabetes, and obesity.

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