Reducing COPD Hospitalizations and ED Visits Through Remote Monitoring: A Quality Improvement Project

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INTRODUCTION

- Chronic obstructive pulmonary disease (COPD) is costly and a third leading cause of 30-day readmissions.[1]
- Outcomes are worse among rural and underserved populations with Mississippi ranking among the states with the highest COPD burden.[2,3]
- At the University of Mississippi Medical Center (UMMC), frequent COPD-related hospitalizations was identified as a major quality gap.

OBJECTIVE

This quality improvement project was designed to evaluate whether integrating remote patient monitoring (RPM) with nurse follow-up and pharmacist-led medication optimization could reduce hospital and ED utilization while reinforcing preventive care for patients with COPD at UMMC.

METHODS

DESIGN:

- A retrospective chart review was conducted including patients enrolled in the RPM program for COPD between January 2023 and August 2025 at UMMC.
- Patients enrolled in the program received a telemonitoring kit with a Bluetooth-enabled pulse oximeter to record daily oxygen saturations.
- In addition to biometrics, patients responded to daily symptom-based questions.
- Declining oxygen saturations or worsening symptoms prompted nurse outreach, leading to escalation to the pharmacist is concerns for a potential exacerbation were identified.
- Nurses completed onboarding calls and monthly follow-up calls to reinforce self-management and monitor trends.
- Pharmacists performed medication reviews at baseline and every three months.
- The interprofessional care team was composed of registered nurses, physicians, and pharmacists.

PRIMARY OUTCOME:

- Difference in hospitalizations and ED visits for COPD exacerbations per year before RPM enrollment compared with during enrollment.

STATISTICAL ANALYSIS:

- Outcomes prior to RPM enrollment and during enrollment were compared within cohorts using bootstrapping
- $p < 0.01$ considered statistically significant

RESULTS

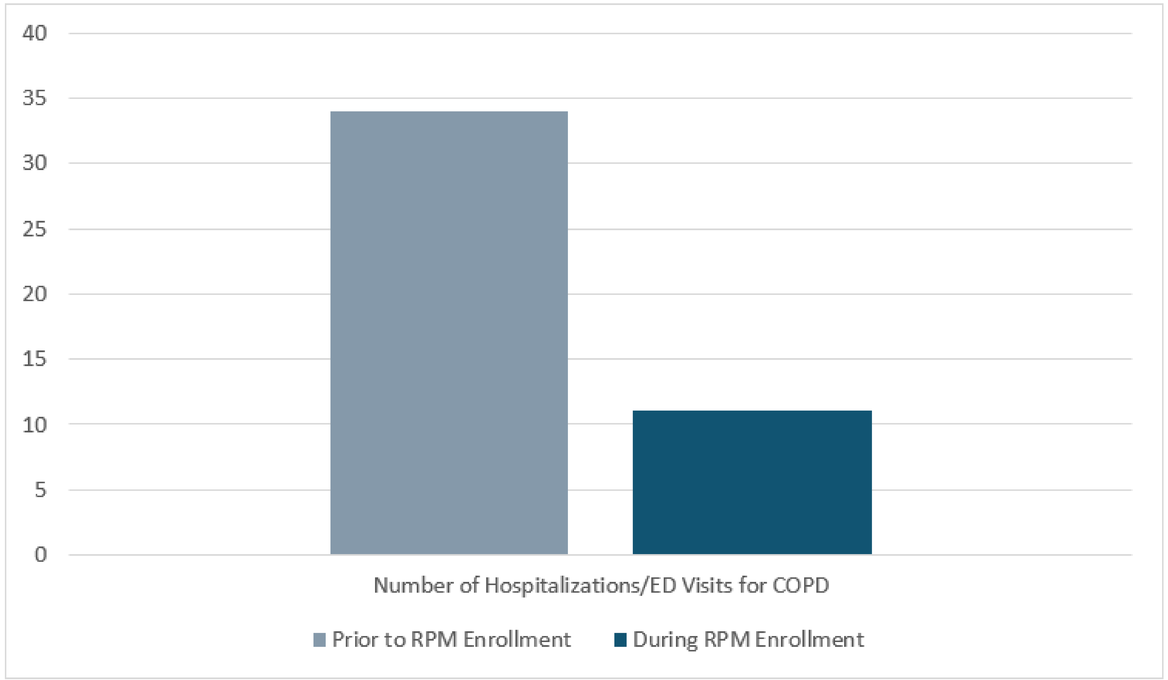
- 30 patients were enrolled and completed onboarding into the RPM program between January 2023 and August 2025.
- Average enrollment duration for RPM was 6.2 months.
- At enrollment, the average MMRC score among RPM patients was 3.4.
- The most common phenotypes were emphysema and chronic bronchitis.
- 97% of patients enrolled were classified as Group E within the GOLD Classification.

Figure 1: Care Team Interventions During RPM

Intervention Type	Number Completed/ Attempted
RN Intervention Calls	63
RN to PharmD Escalations - *Exacerbation Protocol Initiated*	23
RN Monthly Reviews (attempted)	84
PharmD 3-Month Reviews (attempted)	26

- 73% of monthly nurse reviews and 77% of pharmacist reviews were completed.

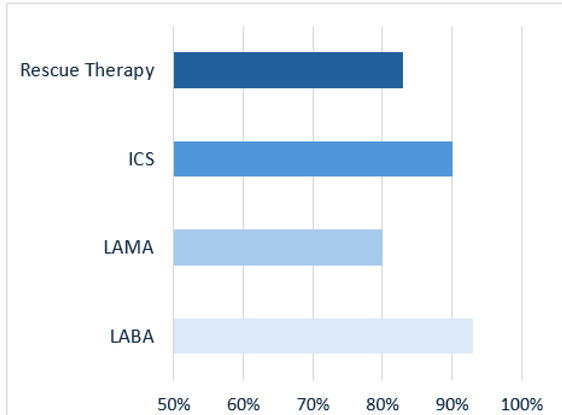
Figure 2: Change in Hospital Utilization



- Hospitalizations and ED visits for COPD exacerbation declined from 2.2 per year prior to enrollment to 0.7 per year during RPM participations, a decline of 68% ($p<0.001$).

RESULTS

Figure 3: Medication Use at RPM Enrollment



	LABA	LAMA	ICS	Rescue Therapy
% of Patients	93%	80%	90%	83%

DISCUSSION

- Implementation of a high-risk COPD RPM program at UMMC was associated with reduced hospitalizations and ED visits, supported by strong patient engagement and coordinated nurse–pharmacist care.
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- Single-institution findings may limit generalizability; future work will focus on sustainability, program expansion (e.g., tele-pulmonary rehab), and addressing non-compliance and digital or workflow barriers.

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