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Introducing an Evidence-based COPD Care Bundle to Reduce Readmission Rates: A Quality Improvement Project

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Introducing an Evidence-based COPD Care Bundle to Reduce Readmission Rates: A Quality Improvement Project

Michael DiStasio BSN, RN

A DNP project submitted in partial fulfillment of the requirements for the degree of Doctor of Nursing Practice

Constance Glenn DNP, APRN, FNP-BC, CNE

Sacred Heart University Davis & Henley College of Nursing

April 2024

Approval Page

This is to certify that the DNP Project Final Report by

Michael DiStasio BSN, RN

has been approved by the DNP Project Team on

April 22nd, 2024

for the Doctor of Nursing Practice degree

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The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care and Implementation for Sustainability Framework used/reprinted with permission from the University of Iowa Hospitals and Clinics, copyright 2012

Acknowledgements

First, I'd like to thank my DNP Project Faculty Advisor, Dr. Constance Glenn. This project would simply not have been possible without her motivation and consistent, unwavering support. The confidence I gained over the past year was largely in part to her constant effort to keep me on track and focused on my goals. She helped me see the promise in my work, especially through adversity. I cannot overstate how impactful her presence has been on my life and for the completion this project.

I would also like to thank my amazing DNP Project Team. It wasn't easy to gain access to a large healthcare system, and I sincerely appreciate all the time offered to propose this project, and the guidance received to help set the project up for success. I want to thank XXX for her passion and inspiration. Her work with the COPD population was the major inspiration for the interventions proposed in this project. I thank XXX, for his enthusiasm and willingness to guide me through the data collection and analysis process. Additionally, I have the utmost thanks for unit staff. XXX, XXX, XXX, and of course, all the nurses, patient care technicians, and support staff who really made this project possible. I thank you for your efforts and the acceptance I received on your unit, which will always feel like a second home.

I finally would like to acknowledge my amazing wife Lea. She has been an anchor in my life, and without her support, I would not have succeeded in this program. She is a rock to lean on, and a voice of reason when times are hard. She deserves so much credit for helping to raise our young son, James, when I was off working on this project and finishing courses. I need to thank James as well for loving me unconditionally and keeping me on my toes. I hope I've made them both proud.

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Abstract

Background

Chronic obstructive pulmonary disease (COPD) is a progressive and debilitating lung condition, and a leading cause of readmission following an acute exacerbation. The Centers for Medicare and Medicaid Services (CMS) Hospital Readmission Reduction Program (HRRP) determines reimbursement penalties to hospitals when patients admitted with acute exacerbation of COPD are readmitted for any reason within 30 days of discharge. A regional medical facility (MF) identified 30-day readmission rates for COPD patients as a key improvement metric. Several gaps in the standardized care of patients with COPD on a pulmonary-focused medical-surgical unit (MSU) identified by key unit stakeholders provided impetus for this project.

Project Goals

1. Identify best practice strategies to reduce all-cause 30-day readmission rates in patients with COPD.
2. Educate staff on the evidence-based COPD clinical pathway at MF
3. Implement a checklist-based standardized nurse-driven COPD protocol.
4. Examine 30-day readmission rates and barriers to care metrics for patients COPD over a period of 12 weeks.

Methods

Staff on MSU were educated on the COPD inpatient clinical pathway located in EPIC and evidence-based best practice for patients with COPD. A gap analysis of barriers to care was performed and a nursing COPD bundle checklist was developed to guide and standardize the care of this population. Each patient with a history or diagnosis of COPD admitted to MSU received a daily COPD checklist. Nurses on the unit were asked to refer to the checklist to check

off each intervention in the care bundle performed. Completed checklists were returned to the Project Leader for data analysis upon patient discharge. Pre - and post-intervention 30-day all-cause readmission rates were compared along with key COPD driver and mobility data.

Results

A total of seven checklists accounting for 14 patient-days were utilized and collected over the one-month pilot period. Patients had their mobility assessed on 13 days (93.00%), were ambulated out of bed on 12 days (85.71%) and received COPD-specific patient education on 12 days (85.71%.). Of the three patients on supplemental oxygen, two had home oxygen requirements assessed via blood oxygen saturation readings (SpO2) while ambulating. Total mobilizations trended down over the pilot period while the rates of effective mobilization trended up. Post-intervention COPD readmission data was not available at the time of the project's conclusion due to the lag in software data publication.

Conclusion

While it was proposed that the 30-day all-cause readmission rate will decline, results from this 30-day pilot study concluded prior to the data becoming available. This project showed that a nurse-driven COPD care bundle is potentially an effective way to standardize care resulting in reducing 30-day patient readmissions for the COPD patient.

*Keywords**:** COPD, chronic obstructive pulmonary disorder, acute exacerbation of COPD, readmission, rehospitalization, risk factors, care bundle, interventions*

Introducing an Evidence-based COPD Care Bundle to Reduce Readmission Rates: A Quality Improvement Project

Problem Identification and Evidence Review

Problem Description

Chronic obstructive pulmonary disease (COPD) is a persistent and irreversible disorder of the lungs characterized by progressive airway inflammation, airflow limitation, dyspnea, cough, and sputum production (Han et al., 2023). COPD is one of a spectrum of respiratory diseases that include chronic bronchitis, emphysema, and asthma that share similar pulmonary symptomatology and characteristic airflow limitation (Han et al., 2023). Over 12 million Americans reported a diagnosis of COPD in 2020, and many additional cases go undiagnosed (American Lung Association, 2023).

Patients with COPD are susceptible to intermittent acute exacerbations (AECOPD) of pulmonary symptoms and subsequent hospitalization. Additionally, around 20% of patients discharged following an admission for COPD exacerbation are readmitted for any reason within 30 days (Press et al., 2021). Preliminary evidence suggests that over a third of patients admitted to the hospital for AECOPD did not receive recommended care (Press et al., 2021). This finding raises concern that high rates of readmission in this population reflect suboptimal quality of care, and result in significant financial penalties for the hospital. Under the HRRP, higher-than-expected 30-day readmission rates of patients admitted with COPD can incur up to 3% payment reduction penalties for hospitals that treat Medicare beneficiaries (Niera et al., 2020). Furthermore, it's estimated that 70% of the $50 billon annual cost of treating COPD is attributed to treating exacerbations requiring hospitalization (Press et al., 2021). Patients are negatively impacted by readmission in several ways. Readmissions are associated with a range of negative

outcomes including increased in-hospital mortality, shorter survival periods, poorer quality of life, increased cost, longer length of stays, and frequent readmissions (Alqahtani et al., 2020).

The 2023 Global Initiative for Chronic Obstructive Lung Disease (GOLD) report is an evidence-based guideline focused on the prevention and treatment of COPD. The guidelines point to rehabilitation, physical activity, and exercise as proven ways to reduce the frequency of exacerbations and improve secondary outcomes. One proposed mechanism of physical activity and its modulation of COPD is as follows: Lower rates of physical activity in patients with COPD precipitate a downward spiral of inactivity which leads to decreased quality of life and increased hospitalization and mortality rates (GOLD, 2023). GOLD (2023) cites the promotion and maintenance of physical activity as a challenge in this population.

Local Problem Description

MF reports a risk-adjusted COPD readmission rate benchmark of 23.3% and established a target readmission rate of 20.3%. Over the 2022 and 2023 fiscal years (FY22 and FY23), BH reported the median monthly 30-day readmission rate for COPD to be 23.7%. and 31.65% respectively. This data supports an organizational priority to continue ongoing efforts to reduce COPD readmission, improve the standard of care, and reduce healthcare costs in this population.

MSU is a medical-surgical inpatient unit located in MF which is currently in the process of adopting a focus on pulmonary patients. There is an ongoing effort to cohort patients with AECOPD on this unit. The reported 30-day readmission rate for COPD patients discharged from MSU over FY23 was 26%. Through collaboration and discussion between the project leader and major stakeholders, several triggering issues related to patient care have been identified. Of note, infrequent ambulation in the COPD patient population has been identified by the MF Respiratory Navigator as a key barrier to success in her efforts to reduce COPD readmission rates. This

aligns with the GOLD (2023) mechanism detailed above. In addition, there is a lack of awareness amongst nurses of the existing evidence-based inpatient COPD clinical care pathway located in EPIC, and subsequent lack of utilization of this pathway by the staff nurses. This pathway is a physician-driven approach which requires interdisciplinary coordination. Delayed or undocumented assessment for home oxygen (O2) requirements has also been identified as a barrier to discharge by unit clinicians, the Respiratory Navigator, and case management. To assess the need for home O2, it is necessary to obtain and document a patient's blood oxygen saturation (SpO2) reading at rest and with ambulation. There is an overall lack of awareness of this process amongst nursing staff. Home O2 assessment is historically lacking until the day of discharge, which can delay the discharge process.

Organizational Priority

This project has the support of the MF's Program Manager for Magnet Integration, the Respiratory Navigator at MF, MSU unit leadership, MSU nurse educator, and the Quality Improvement team. It was used to demonstrate the importance of evidence-based standardized practices including regular patient ambulation and oxygen titration and assessment to decrease 30-day patient readmission rates.

Clinical Question

An evidence search was performed to examine the key factors that contribute to COPD readmission and identify effective practices for the reduction of COPD readmission rates. A PICO question was developed for this search:

- In hospitalized patients admitted with COPD (P), does a nurse-driven evidence-based care bundle (I) affect all-cause 30-day readmission rates (O) over a period of three months (T) compared to the usual care (C)?

Evidence Search Plan and Results for External Evidence

Databases searched included CINAHL Ultimate, MEDLINE with full text, Cochrane Database of Systematic Reviews, and Trip. Keywords used included COPD or chronic obstructive pulmonary disease, acute exacerbation of COPD, readmission or rehospitalization, risk factors, care bundle, and interventions. Search methods and results are described in Appendix A. The Rapid Critical Appraisal (RCA) Tools from Melnyk & Fineout-Overholt (2019) were used for critical appraisal of selected articles. An example is provided in Appendix B.

Evidence Search Plan and Results for Internal Evidence

As discussed in the description of the local practice problem, the readmission rates for patients with COPD were not meeting goal metrics provided by the hospital. The initial gap analysis identified a lack of standardized care for patients with COPD. The main barriers to care were identified as low mobilization rates, improper or untimely oxygen titration, and a lack of home oxygen assessment and documentation.

Evidence Appraisal Summary, Synthesis, and Recommendations

A total of 11 articles were identified in the literature that focused on interventions to reduce readmissions of patients with COPD, improve secondary outcomes, and identification of risk factors for readmission. Appendix C displays a summary of the selected articles along with a level of evidence table. Synthesis of the evidence is in Appendix D. Seven of the articles are systematic reviews or meta-analyses, while the remaining 4 articles are a mixture of Level II, III, and V evidence.

In summary, evidence-based care bundles, pulmonary rehabilitation, exercise, and health coaching and education were associated with lower readmission rates and improved secondary

outcomes (Kendra et al., 2022; Ko et al., 2021; McCarthy et al., 2015; MacDonell et al., 2020; Shibuya et al., 2022). Additionally, risk factors for readmission include hospitalization in the past year, low socioeconomic status, medical comorbities, and discharge to a nursing home (Alquatani et al., 2020; Njoku et al., 2020). An optimal COPD care bundle would utilize best practice strategies such as those listed in the GOLD (2023) report while combining interventions that have shown to significantly reduce readmissions.

Project Plan

Project Goals

5. Identify best practice strategies to reduce all-cause 30-day readmission rates in patients with COPD.
6. Educate staff on the evidence-based COPD clinical pathway at MF
7. Implement a checklist-based standardized nurse-driven COPD protocol on a pulmonary-focused med/surg unit at MF.
8. Examine 30-day readmission rates and barriers to care metrics for patients COPD over a period of 12 weeks.

Framework

The guiding framework for this project is the Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care (Iowa Model Collaborative, 2017). The Iowa Model presents a stepwise, evidence-based approach for clinicians to make decisions about daily practices that affect healthcare outcomes. The process begins with identifying triggering issues and is highlighted in the Problem Identification sections of this proposal. Once a problem is identified and a team is formed, the clinical question is stated, and a body of evidence is assembled and appraised. This is highlighted in the evidence search sections of the proposal.

Once it has been determined that there is sufficient evidence, the practice changed is designed and implemented utilizing the Iowa Implementation for Sustainability Framework (Cullen et al., 2022). Further information on the implementation process can be found in the Project Implementation section. The last phase of the Iowa Model Involves evaluating the practice change and disseminating the results of the project. This information can be found in the Evaluation Plan and Dissemination Plan sections of this project. Permission to use this model was requested and received by the project leade.

Context

MF is part of a nonprofit multi-facility healthcare system (HS) that spans from Westchester County, New York, to Westerly, Rhode Island. MF is an acute care hospital that serves patients in both Fairfield and New Haven Counties. This project was implemented on MSU, a 27 bed, pulmonary-focused medical-surgical unit that frequently admits and discharges patients with COPD. This project focused on identifying patients who had been admitted to MSU with a history or active diagnosis of COPD. All patients with a history of COPD were included as CMS payment reductions are based on fee-for-service base operating diagnosis-related group payments which are determined at discharge (CMS, 2023). Therefore, it is difficult to determine which patients will qualify for readmission penalization. Staff nurses and patients are the primary targets of the proposed intervention. MSU utilizes the EPIC electronic health record (EHR) for documentation. The project team is listed in Table 1.

Table 1.

Project Team and their Roles

Person	Role
Michael DiStasio, DNP student	Project Leader
XXX	DNP project faculty advisor

XXX, MSU Unit Manager, Primary Project Mentor	Project review for compliance with health system standards. Practice Change Champion. Assist with dissemination of project through staff meetings and safety huddles
XXX, Respiratory Navigator	Give expert opinion and guidance on COPD readmission reduction strategies
XXX, MSU APSM	Practice Change Champion. Assist with dissemination of project through staff meetings and safety huddles.
XXX, BH Operations Improvement Specialist	Data acquisition and analysis

Key Stakeholders, Staff, and Buy-in

Key stakeholders involved in this initiative include the MSU unit manager and assistant manager, MSU floor nurses and charge nurses, MSU case manager, MSU Medical Director, MSU Nurse Educator, the Quality Improvement department at MF, Respiratory Navigator, hospital administration, respiratory therapists, physical therapists, and patients admitted to MSU with a history or diagnosis of COPD. Staff that are essential to the success of this project included the bedside nursing staff, patient care technicians, and hospitalists. This project introduces a nurse-driven care bundle which would not be possible without a multidisciplinary team effort. Buy-in was obtained throughout phases I-III of implementation, which are detailed in the following sections.

Description of the Practice Change

The proposed intervention encouraged early ambulation of COPD patients using a COPD Daily Care Checklist (Appendix E). Evidence supports the use of evidence-based care bundles, pulmonary rehabilitation, and exercise to reduce readmissions of patients admitted with COPD exacerbations and improve secondary outcomes (Appendix D). This checklist guided the nurse

through stay of patients with COPD from admission to discharge. The focus was on adherence to the evidence-based COPD IP pathway in EPIC. The items contained in the checklist aligned with the gap analysis of barriers to care and the 2023 GOLD guidelines. Nurses were provided educational sessions by the project leader on the COPD IP pathway with a primary focus on mobility/ambulation, oxygen titration, and home oxygen assessment. The checklist emphasized daily mobility assessments and encouraged patients to ambulate as soon as clinically appropriate to assess ongoing supplemental home O2 needs and prevent deconditioning. Mobility and functional status assessment was done in EPIC using the Activity Measure for Post-Acute Care (AMPAC), current practice on MSU. Lower scores on the AMPAC are correlated with higher rates of all-cause 30-day readmission (Arnold et al., 2021). Nurses were also encouraged to seek appropriate PT/OT/Pulmonology/Respiratory Navigator consults as soon as clinically appropriate. The back of the checklist contains key COPD-specific education and treatment points to guide nurses through daily care.

Education sessions were conducted for the nursing staff, patient care technicians, and unit leadership by the project leader. Following the education sessions, blank checklists were provided in a central location on the unit. Nurses were responsible for identifying patients with a history or active diagnosis of COPD and starting a new checklist for that patient. Each checklist had a preassigned number for data collection (i.e., Patient 1, Patient 2, etc.). The checklists assigned to a specific patient were transferred from the covering nurse to the oncoming nurse assigned to that patient during handoff to ensure continuity of care. There was no protected health information (PHI) on these folders or the checklists. Nursing staff were directed by the checklist to assess mobility and ambulate the patient out of bed as indicated. Nurses were also educated on oxygen titration and assessment of home O2 requirements by taking SpO2 readings

with exertion. The back of the checklist contains reminders to help facilitate the care of patients with COPD. When a patient was discharged or transferred off the unit, the checklist was placed in a collection folder located in a secure, central area of the unit, and stored until the data analysis phase. A timeline of the project is seen in Table 2:

Table 2.

Project Timeline

Date	Action
May 2023	Identify the clinical question, triggering issues and opportunities. Form a team.
June 2023 – August 2023	Assemble, appraise, and synthesize a body of evidence. Prepare primary proposal for presentation for DNP project team
August –September 2023	DNP project proposal oral and paper presentation
October 10th,2023	Submit primary Letter of Intent (LOI) to HS's Nursing Scientific Review Committee
December 15th, 2023	Submit exemption form to SHU IRB
January 10th, 2023	Initial LOI approval from HS, receive permission to submit Step II
January 22nd, 2024	Receive approval for project from SHU IRB
March 3rd, 2024	Receive Letter of Endorsement to begin QI from HS
March 5th, 2024	Begin educational sessions with staff
March 13th, 2024	Implementation proposed practice change begins
March 2023-April 2023	Analyze checklist data and adherence. Adjust implementation based on staff feedback
April 2024	Organize, synthesize, and report data from intervention period
April 12th, 2024	DNP project poster presentation
April 15th, 2024	DNP project final presentation

Resources

The anticipated resources for this project include all the individuals listed in Table 1, as well as the unit staff nurses, charge nurses, respiratory therapists, physical therapists, and hospitalists. Materials needed for this project were paper and printing for the COPD care checklists, educational PowerPoint, sign-in sheets, and unit folders for storing the checklists. All

equipment necessary for this project including pulse oximeters, recliner chairs, incentive spirometers, etc. is already accounted for in the MS budget or owned by and stored on the unit. This project did not incur additional costs to MSU, MF, or the HS.

Table 3.

Estimated Project Costs

Category	Costs
Personnel (estimated/adj. salaries of project team)	$12,500.00
Supplies	$165.00
Equipment	No cost
Training	$100.00
Outreach and communication	No cost
Outside expert	No cost
Total	**$12,765.00**

Dissemination Plan

Avenues for possible dissemination included the following:

- Internal dissemination via an abstract and executive summary presentation to the MF Nursing Scientific Review Committee
- An executive summary
- An abstract and poster presentation for DNP program faculty, staff, and students.
- Integration of the COPD checklist into a nursing tab in the IP COPD Care Pathway in EPIC

- Submission of an DNP Project abstract for presentation at a state practice organization event

Ethical Review and Project Approvals

The initial project proposal was presented and approved by the project academic advisor, lead mentor, the Program Manager for Magnet Integration at MF., lead respiratory manager, and staff. The project was then proposed to the HS Nursing Scientific Review Committee via a two-step Letter of Intent. Per the DNP program policy, this project was differentiated as quality improved via the QI checklist (Appendix F). Per Sacred Heart University Policy, this project was reviewed by the Institutional Review Board (IRB) and granted exemption as QI. IRB exemption and organizational approval for QI are found in Appendices G and H respectively. The Project Leader completed the Collaborative IRB Training Initiative (CITI) modules on bioethics and human subjects research prior to the start of this project (Appendix I).

Project Implementation

Design

The Iowa Model was the guiding framework for this practice change project. And approval for use was received by the project leader. The following subsections detail each phase of the practice change through the lens of Iowa Implementation Plan for Sustainability.

Phase 1: Create Awareness & Interest

The first phase of implementation created awareness of the problem to generate interest in the change. This was done by announcing the pilot via email messaging and through visual media distributed throughout the unit. Community leaders throughout MF were briefed on the practice change. Key stakeholders involved in this initiative are listed above. Key elements of the project were communicated to the nursing staff, August 2023.

Phase 2: Build Knowledge & Commitment

The next step of implementation involved building knowledge and commitment. Unit staff was formally introduced to the COPD Inpatient Pathway and educated on the practice change via 15 min sessions during daily huddles and in-services. The COPD Checklist was also added to the agenda of daily safety huddles. In addition, a printed PowerPoint presentation summarizing the project was created and posted on the unit as resource (Appendix J). Staff were asked to sign a sheet confirming review of the material. Educational materials were made and revised with feedback from MSU unit leadership, physicians on the unit, case management, and the Respiratory Navigator. Staff were be asked for feedback during initial education sessions to help simplify the change and ensure buy-in. During this phase, it was important to simplify the practice change as much as possible to maximize interest. The checklist was streamlined and condensed based on staff feedback.

Phase 3: Promote Action and Adoption

This phase involves "Trying the change" and monitoring compliance. The practice change, by nature of being a checklist, encouraged accountability and action. The project leader visited the unit regularly to collect and audit the COPD checklists and receive feedback from the unit staff. "Change Champions" were named to help promote action and adoption of the intervention. The Change Champions included the MSU assistant manager and two of the charge nurses. They assisted with checklist compliance, identifying knowledge gaps, and continued education at unit change of shift and safety huddles. Staff were offered incentives in the form of refreshments in appreciation for their commitment and celebration of progress. The project leader conducted a gap analysis of barriers to implementation during this period to maximize adoption of the practice change. Buy-in from unit leadership was essential during this phase.

Phase 4: Pursue Integration & Sustained Use

The final phase of implementation involves pursuing integration and sustained use. One goal of this project is to promote interdisciplinary action of standardized care. The next step to integrate this practice change will be to create a nursing tab in the EPIC COPD care pathway to enhance interdisciplinary use. This will also provide nurses with a simple and central location to document their COPD care. MSU will also pursue COPD-specific smart phrases to make documentation more efficient. Throughout the data collection period, individualized feedback was provided to nurses when a gap in care was identified. The primary outcome data will continue to be collected. The results of the pilot were be disseminated in the community in the form of a DNP Project Poster Presentation. These results were shared with the MSU unit staff, the quality improvement department, and unit governance. Any improvement in goal benchmarks will be celebrated with unit staff during a public display.

Evaluation Plan

Goal #1 was accomplished through the evidence review, appraisal, and synthesis process. Goal #2 was initiated in Phase 2 of the implementation process and continued via weekly meetings with unit staff. Evaluation of this goal was done by collecting the names of unit staff who receive each education item to confirm contact education (Appendix K). Goal #3 was evaluated after data collection occurred. Completed checklists were analyzed and compared with the total number of COPD patients admitted to the unit of the span of the intervention, serving as a measure of adherence and identification of needed areas of improvement. In addition, feedback was collected by unit staff throughout the implementation phase and the checklist modified accordingly to maximize adherence while maintaining the overall goals of this project. Finally,

Goal #4 was evaluated through analysis of pre- and post-pilot readmission rates which are available to the DNP student in aggregate form via a secure EPIC Tableau server. In addition, a pre- and post-pilot analysis of key COPD driver data and mobilization data served to evaluate Goal #4. Aggregate mobility data from MSU was available to the Project Leader via the EPIC Tableau server. Key metrics included total mobilizations and effective mobilizations and O2 saturation levels over the intervention period. Effective mobilization is defined as a documented mobilization that meets or exceeds the patient's AMPAC score.

Implementation Timeline

IRB exemption was received on January 22nd, 2024, and final approval from the HS Scientific Review Committee was granted on March 3rd, 2024. The Iowa Implementation for Sustainability Framework was used to guide the implementation process through each of the four phases. Utilizing this framework and the included strategies for implementation allowed for a synergistic process within evidence-based process model (Cullen, 2022). The education phase of implementation was initiated on March 5th, 2024. An email was sent to all unit staff detailing the project and future education session. Several in-services were conducted during unit safety huddles. A PowerPoint detailing the project was available on the unit in a central location, and staff were asked to review it and attest that they had received the education. The Unit Champion and select charge nurses were tasked with encouraging staff to review the material and report the practice change at daily change of shift and safety huddles. The project was then presented by the Project Leader at the March 13th staff meeting. Checklists were distributed on March 13th following the meeting, and the data collection phase began. Continuing education was offered one to two times a week at unit safety huddles.

Barriers to Implementation.

Table 4.

Barriers to Implementation and Strategies for Mitigation

Barrier	Strategy for Mitigating
Additional time and effort for nursing staff	Emphasized a collaborative, multidisciplinary approach Emphasized communication between nurses, PCAs, PT, and physicians Education and discussion on perceived negatives and benefits of change (benefit vs. risk)
Additional documentation	Ensure adequate knowledge of current EPIC capabilities Emphasized the importance of including mobility, oxygenation status, and ambulation in routine charting Pursue COPD-specific "dot phrases" in EPIC for more efficient documentation
Resistance to change from current practices	Create a "culture of change" Communicated the benefits (patient and family impact, cost savings) of the practice change Enlisted a Change Champion to enhance implementation and build the culture
Patient buy-in/education	Education on the benefits of early ambulation and risk/reward.
Checklist attrition	Keep the return folder in a central location on the unit Encouraged a smooth transition of checklists during nursing handoff Re-educated staff on the checklist process during unit safety huddles Pursue transition to electronic documentation of the COPD care bundle through EPIC
Few COPD patients on the unit at any given time	Ongoing hospital-driven effort to admit patients with COPD exacerbation to MSU

Additional Barriers to Implementation

In addition to the barriers listed in Table 4, there were two factors that delayed the start of the implementation phase subsequently limiting the amount of data available to the Project

Leader. Despite submitting the initial letter of intent to the HS Nursing Scientific Review Committee in October, the project did not receive final approval until March 3rd. Initial project proposals required corrections or additional information from stakeholders at MF. Coordination of these items proved a challenge due to the bimonthly meeting schedule of The Nursing Scientific Review Committee, limiting opportunities to re-present this project proposal.

One issue with early attempts at project approval was the reliance on PHI to deploy the checklist tool and collect data. The Project Leader would not have access to patient charts as originally planned, and the data collection and evaluation plans needed to be re-worked. Ultimately, the inability to identify checklists potentially contributed to high attrition rate.

Project Evaluation

Results

Checklist data was collected and reviewed. There was a total of seven completed checklists filled out over the 5-week pilot implementation period. Five checklists were lost to follow-up. Three patients were on supplemental oxygen during this period. There was a total of 14 patient-days logged across the seven completed checklists.

Table 5.

Checklist Data

Measure	Patient-days recorded
Total patient days	14
AMPAC assessed	93.00% (n=13)
Days out of bed	85.71% (n=12)
COPD education provided	85.71% (n-12)

Home oxygen assessment	75.00% (n=2)

In addition to checklist data, the AMPAC mobility data from MSU was collected over the implementation period from 3/14/2024 to 4/11/2024. The data can be seen in Figures 1 and 2. Overall, total mobilizations per day trended down. However, there was an increase in effective mobility rates. Effective mobility is defined as a mobilization at or above the target rate defined by the patient's AMPAC score.

Figure 1

AMPAC Mobility Data

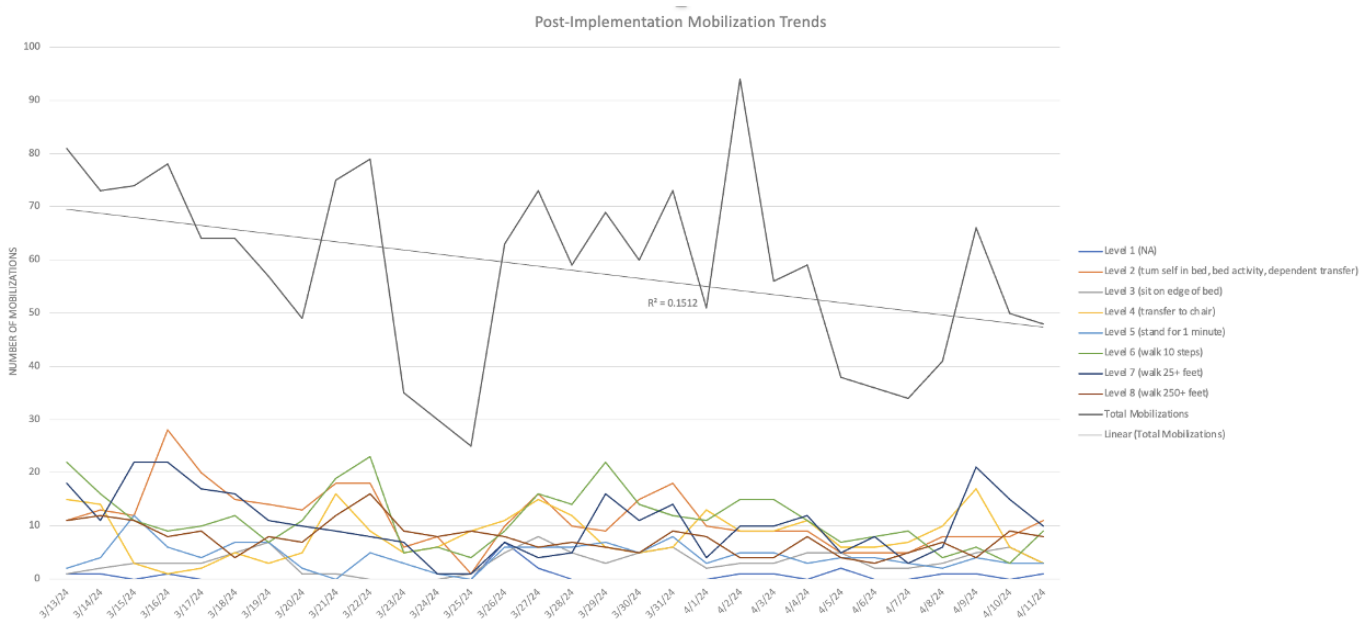
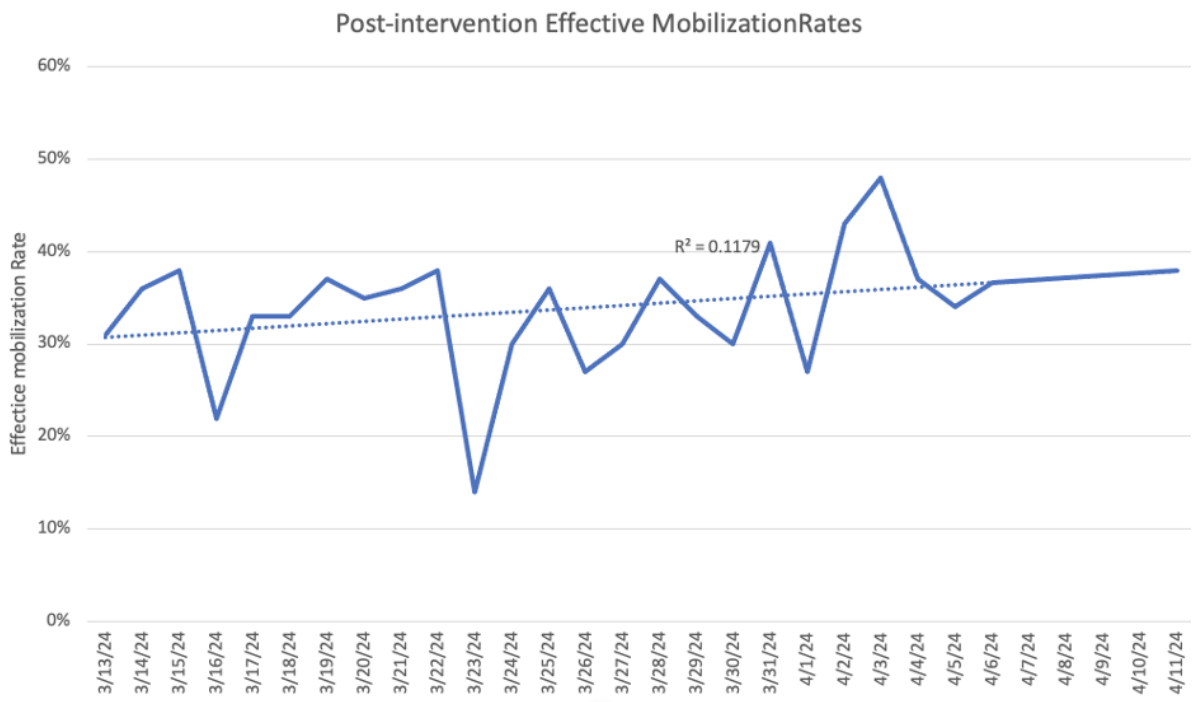


Figure 2

Effective Mobilization Rates



Process Evaluation

There were several limitations of this study which affect the reliability of the data. First, the pilot length prohibited the Project Leader from collecting primary outcome data, as 30-day all-cause readmission rates are a lagging indicator. The small sample of patients was another limitation. As the COPD patient population continues to grow on MSU, the reliability of the data will increase. Most patients on MSU over the implementation period did not have an active diagnosis of COPD exacerbation or a history of COPD. Efforts at MF to cohort patients with COPD on MSU are ongoing.

Proposed Return of Investment

The return on investment (ROI) can be demonstrated through cost avoidance calculations based on a hypothetical number of readmissions. For this calculation, the estimated cost of a COPD readmission was $19,000 (CMS, 2023). The estimated project cost of $12,765.35 was used for the savings and ROI calculations. These calculations are displayed in Tables 6 and 7.

Table 6.

Proposed Cost Avoidance per Readmission Prevented

Annual readmissions prevented	Annual cost avoided	Reimbursement penalty avoided
1	$19,000	$520
2	$38,000	$1040
3	$57,000	$1560
4	$76,000	$2080
5	$95,000	$2600

Table 7.

Proposed Return on Investment per Readmission Prevented

Annual readmission prevented	Total savings	ROI
1	$6,234.65	**49%**
2	$25,234.65	**197%**
3	$44,234.65	**347%**
4	$65,234.65	**511%**
5	$82,234.65	**644%**

Key Lessons Learned

First, it is clear from the cost analysis that prevention of COPD readmissions results in significant cost savings in reimbursement penalty dollars. Additionally, preventing COPD admission provides a significant ROI and reduces the overall cost burden of COPD significantly. Other interventions that focus on exercise training and education, such as pulmonary

rehabilitation, have shown similar promise in producing significant cost savings due to a reduction of hospital and skilled nursing facility days (Mosher et al., 2022).

Another key lesson was the importance of clear and frequent communication/messaging, ongoing education, and the value of obtaining consistent feedback from key stakeholders. The checklist process was unclear to some of the staff after initial education sessions. This was an opportunity to streamline the processes, add additional educational tools, and mold the checklist tool based on individualized feedback.

Dissemination

Internal Dissemination

The results of data collection phase were reviewed by the project leader and presented continuously with unit staff and unit leadership. The Respiratory Navigator reported positive feedback from unit staff on the ongoing COPD bundle processes and adherence to the practice change. The executive summary for this project will be presented to the HS Nursing Scientific Review Committee for further evaluation and internal dissemination. As discussed in Phase 4 of the implementation plan, the next steps for this project include integrating the COPD care bundle tool into EPIC to optimize its use. In addition, methods will be proposed to integrate COPD-specific smart phrases into EPIC to make documentation easier.

External Dissemination

The results of this project were disseminated externally in several ways. First, an abstract and executive summary (Appendix L) were drafted for submission to a state practice organization event. Additionally, a DNP Project Poster (Appendix M) was drafted and presented on April 12th, 2024, to the DNP faculty, student body, and guests at SHU. A final PowerPoint presentation of this project was presented to the DNP Faculty advisor, members of the Project

Team, and members of the SHU student body This paper will be submitted to the SHU digital repository.

Implications of Project Results to Organization and Practice Community

While the data analysis for this project is incomplete, it provided a valuable steppingstone in the transformation of MSU into a pulmonary-focused unit. It showed that adherence to a standardized care bundle is feasible in the practice setting. Future efforts will attempt to streamline the care bundle tool for ease of use. This project demonstrated the importance of standardizing care for patients with COPD. It also showed that nurses are integral to interdisciplinary care. The COPD IP care pathway is physician-focused, and efforts could be modified to include a nurse-focused section of the pathway. The educational opportunities presented in this project are in pursuit of expert status amongst nurses in COPD care. Finally, this project highlighted the importance of admitting patients with a COPD diagnosis to a pulmonary-focused unit that is well positioned to provide evidence-based care specific to the COPD pulmonary patient. As the staff on MSU continues to care for patients with COPD in a standardized manner, the potential to become experts in this field grows.

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Appendix A

Date of Search	Database	Search Terms	Limits Used	Articles Identified	Articles Reviewed	Articles Selected
6/29/2023	CINAHL Ultimate	COPD or AECOPD or chronic obstructive pulmonary disease and risk factors and readmission or rehospitalization	2012-2023, adults, English language, full text available	183	14	3
6/29/2023	CINAHL Ultimate	COPD or AECOPD or chronic obstructive pulmonary disease and interventions and readmission or rehospitalization	2012-2023, adults, English language, full text available	77	15	2
6/29/2023	MEDLINE with full text	COPD or AECOPD or chronic obstructive pulmonary disease and interventions and readmission or rehospitalization	2012-2023, adults, English language, full text available	1,336	22	2
6/30/2023	Cochrane Database of Systematic Reviews	COPD or AECOPD or chronic obstructive pulmonary disease and risk factors and readmission or rehospitalization	2012-2013, adults, English language, full text available	83	12	1
6/30/2024	Cochrane Database of Systematic Reviews	COPD or AECOPD or chronic obstructive pulmonary disease and interventions and readmission or rehospitalization	2012-2023, adults, English language, full text available	87	7	1
6/30/2023	Trip	COPD or AECOPD or chronic obstructive pulmonary disease and risk factors and readmission or rehospitalization	2012-2023, adults, English language, full text available	931	11	1

6/30/2023	Trip	COPD or AECOPD or chronic obstructive pulmonary disease and interventions and readmission or rehospitalization	2012-2023, adults, English language, full text available	726	12	1

Appendix B

RAPID CRITICAL APPRAISAL OF A RANDOMIZED CONTROLLED TRIAL (RCT) OR CONTROLLED CLINCAL TRIAL (CCT)

Project Title: Introducing an Evidence-based COPD Care Bundle to Reduce Readmission Rates

Date: June 8th, 2023
Appraiser's Name: Michael DiStasio

PICO(T) Question: In hospitalized patients admitted with COPD (P), does a nurse-driven evidence-based care bundle (I) affect all-cause 30-day readmission rates (O) over a period of three months (T) compared to the usual (C)?

Article Citation (in APA 6th ed format): Ko, F. W., Tam, W., Siu, E. H. S., Chan, K., Ngai, J. C., Ng, S., Chan, T. O., & Hui, D. S. (2021). Effect of short-course exercise training on the frequency of exacerbations and physical activity in patients with COPD: A randomized controlled trial. Respirology, 26(1), 72-79. https://doi.org/10.1111/resp.13872

Indicate the level of the study you are appraising: Level II - Randomized Controlled Trial

GENERAL DESCRIPTION OF STUDY

1. Purpose of study, including research question(s) or hypotheses: This study hypothesized that a short course of exercise training in the post-acute exacerbation of COPD period with periodic reinforcement exercise training and phone call reminders would reduce readmissions and increase physical activity in COPD patients.

2. Design/Method: Subjects were randomized into either and intervention group consisting of 4-8 weeks of training supervised by a physiotherapist and phone contact every two weeks by a case manager to provide support and reinforcement of continuous exercise or a usual care group which had no input from a physiotherapist or case manager. Readmissions were then assessed at 12 months. In addition, activities of all patients were assessed by an activity monitor as baseline, 3, and 12 months.

3. Sample: 136 subjects over 40 years old were randomized into either the intervention group (68 subjects) or the usual care group (68 subjects).

4. Setting: Prince of Wales Hospital in Hong Kong

5. Data Collection methods: The primary outcome was the rate of hospital readmissions. Secondary outcomes included activity measured by an activity monitor, Health-related

Quality of life, mortality, lung function, body mass index, and exercise capacity, which were all measured at baseline and at 12 months.

Indicate the level of evidence of the study you are appraising: Level II
Recommendation for article inclusion in your body of evidence to answer your question: Yes

QUALITY OF STUDY

Validity: Are the results of this study valid?

1. Were patients randomly assigned to treatment and control groups?

☒Yes ☐No ☐Unknown

Comments: Random assignment with 68 subjects in each group
(Note: If the study was not randomized, it should be assigned the level for a CCT)

2. Was the randomization conducted appropriately? ☐Yes ☐No ☒Unknown

How was the randomization conducted? (ex: computer-generated, coin-toss, etc.) Listed in supplemental materials which were not available to the appraiser.

- Was the intervention concealed from providers (were they blinded)? ☐ Yes ☒ No
- Was the randomization concealed from subjects (were they blinded)? ☐ Yes ☒No
- When applicable, was the randomization concealed from families (were they blinded)?
  ☐ Yes ☒No

Comments: Open-label study. The patients and therapists were aware due to the nature of the intervention. The research assistants who performed activity monitoring, lung function, walking tests, questionnaire tests, and collecting information on healthcare utilization were blinded to the randomization process.

3. Were the groups similar at the start of trial, with respect to known demographics and clinical variables? ☒Yes ☐No ☐ Unknown
   - Was the demographic data collected relevant to the intent to study? ☒ Yes ☐No
   - Were the clinical variables collected relevant to the intent to study? ☒ Yes ☐ No
   - Was a statistic calculated to verify the similarities/differences between the groups?

☐ Yes ☒No

Comments: Click here to enter text.

4. Aside from the intervention, were the group treated equally? ☒Yes ☐No ☐ Unknown
    - What did the control group receive? (check one)
        ☒No intervention
        ☐Current practice
        ☐Placebo
        ☐An intervention matched for time and attention

Comments: Click here to enter text.

5. Were all patients who entered the trial accounted for at its conclusion?
    ☒Yes ☐No ☐Unknown
    - What was the rate of attrition? Three patients in the intervention group died prior to 12-month follow-up, while two were lost to follow-up. Three patients also died in the control group while four were lost to follow-up and one did not complete the assessment at 12 months.
    - What reasons were given to explain why subjects did not compete the study? None given.
6. Were the patients analyzed in the group in which they were randomized?
    ☒Yes ☐No ☐ Unknown

Comments: Click here to enter text.

7. Was the study process well described and compete? ☒Yes ☐No ☐Unknown

Comments: Click here to enter text.

8. Was the study timeframe long enough to capture the effects of the intervention?
    ☒Yes ☐No ☐Unknown
9. Were the instruments used to measure the outcomes valid and reliable?
    ☒Yes ☐No ☐Unknown

Comments: 6-minute walk test, St. George's Respiratory Questionnaire, COPD assessment test, modified Medical Research Council score, lung spirometry testing according the American Thoracic Society and European Respiratory Society standards, metabolic equivalent of tasks, GT3XP activity monitor.

10. Was there freedom from conflict of interest? ☐Yes ☐No ☒Unknown
    - Sponsorship/funding agency
    - Investigators

Comments: Not disclosed. Study approved by the research ethics committee of the Chinese University of Hong Kong

11. Was the date range of the cited literature current? ☒ Yes ☐No ☐ Unknown
    - What date ranges were included? 1988 to 2019

- If older literature was included, why was it included? The articles from 1988 and 1992 were both referencing validated data collection tools that have been used for decades in this field.

Reliability: Are there valid study results important?

12. Did the study have a sufficiently large sample size? ☐ Yes ☐No ☒ Unknown
    - Was the power analysis conducted? ☐ Yes ☒No
    - Did the sample size achieve or exceed the po wer analysis requirement? ☐ Yes ☒No
    - Did each subgroup also have sufficient sample size? ☐ Yes ☒No

    Comments: No power analysis performed

13. What were the main results of the RCT or CCT?
    - Statistical significance (*p* value) Intervention group had significantly lower hospital readmissions for all causes, exacerbations requiring treatment with systemic steroids or antibiotics, and emergency room visits for AECOPD (p-value <0.05). The intervention group had a significantly lower time to first readmission (p-value 0.005%) The intervention group also saw significant improvements in mMRC score (dyspnea measure) and SGRQ symptoms (HRQoL) (p-value <0.05). No significant improvements were noted in exercise capacity.
    - Confidence interval and/or standard deviation Varies per test. For hospital readmissions for all causes: 95% CI of the difference between the intervention and control groups is -1.48, -0.02
    - How precise was the intervention/treatment?
      ☐Narrow ☒Wide
    - Effect size Not given

14. Were the results clinically significant? ☒ Yes ☐No ☐ Unknown
    - Were the following reported: NNT, NNH, OR, RR? ☐Yes ☒No

    Comments: Click here to enter text.

15. Were potential confounders identified? ☒ Yes ☐No ☐ Unknown
    - Were the potential confounders discussed in relationship to the results? ☒Yes ☐No

    Comments: Support by case manager's phone calls may have contributed to reduced readmission at 12 months. Unable to determine which part of the intervention lead to the statistically significant results. Single center study, sample largely male - may be difficult to generalize results. Activity monitors

only worn five days a week. Study conducted on patients with severe COPD requiring hospitalization thus results may not generalize to those with moderate to mild COPD.

16. Were adverse events identified? ☐Yes ☒No ☐Unknown
    Comments: Click here to enter text.

17. Were safety concerns including risks/benefits described? ☒Yes ☐No ☐ Unknown
    Comments: Study establishes through evidence review that early pulmonary rehab programs are safe and effective in this population.

Applicability/generalizability: Can I apply these valid, important results?

18. Can the results be applied to my population of interest? ☒Yes ☐No ☐ Unknown
    - Is the treatment feasible in my care setting? ☒Yes ☐No
    - Do the outcomes apply to my population of interest? ☒Yes ☐No
    - Are the likely benefits worth the potential harm and costs? ☒Yes ☐No
    - Were the subjects/participants in the study similar to my population of interest? ☒Yes ☐No
    - Were all clinically important outcomes considered? ☒Yes ☒No
      Comments: Click here to enter text.

19. Will you include the article/study in your practice decision to make a difference in outcomes? ☒Yes ☐No ☐Unknown
    - If yes, why would you do this and how would you do this? This study supports the inclusion of exercise/mobility as part of an evidence-based care bundle for patients with COPD.
    - If no, why would you not include the results to make a difference? NA

STRENGTH OF STUDY

Level of Study: ☐I ☒ II ☐ III ☐ IV ☐ V ☐ VI ☐ VII

Quality of study: ☐ High ☒ Medium ☐ Low

STRENGTH = LEVEL + QUALITY

What is the strength of the study? This was a relatively strong study

What is your recommendation for article inclusion in the body of evidence to answer your question? Not to include

☒Include this article in the body of evidence (place this article's information on the evaluation & synthesis tables)

☐Do NOT include this article in the body of evidence

Additional comments: Click here to enter text.

Appendix C

Evidence Summary Table

PICO Question: In hospitalized patients admitted with COPD (P), does a nurse-driven evidence-based care bundle (I) affect all-cause 30-day readmission rates (O) over a period of three months (T) compared to the usual care which does not utilize a standardized care bundle (C)?

Citation	Design/ Method	Sample/Setting	Intervention	Major Variables Studied and Their Definitions	Findings	Level of Evidence/Quality	Quality of Evidence: Critical Worth to Practice
Article 1							
MacDonell et al., 2020 Interventions to standardize hospital care at presentation, admission, or discharge or reduce unnecessary admissions for patients with acute exacerbation of chronic obstructive pulmonary disease: A	Systematic review	Adult patients with acute COPD hospitalization Databases used: Web of Science, EMBASE, and PubMed 21 included studies: 8 implemented a clinical intervention bundle at admission and/or discharge; six used a multidisciplinary care pathway; five used coordinated	Interventions or improvements related to the acute exacerbation of COPD model, or care pathway, or care management at presentation, admission, or discharge	IV: Interventions to standardize care (clinical care bundles which are groups of interventions implemented together, care pathways, coordinated case management, and health coaching) DV: length of stay, readmissions, utilization of health resources, patient's understanding of the disease, staff compliance with interventions	Care bundles: Increased compliance was associated with shorter LOS and lower readmission rates. Highlights the importance of standardization. Care Pathways: two studies showed enhanced teamwork practices and reduced patient anxiety Coordinated Case management: Can be resource intensive. Increased patient understanding of disease, intervention is	Level 1: Systematic review	Most studies did not include economic impact of the intervention, but some noted the potential for cost-savings through improvements in LOS or readmissions. There are significant benefits in standardizing the care of hospitalized patients with COPD.

scoping review		case management, and two used health coaching.			sustainable, have potential to reduce LOS, readmission rates, mortality, and healthcare costs. Health Coaching: Can be resource intensive. Unable to determine exact contributory effect of each individual component of coaching intervention		
Article 2							
Gardener et al., 2018 Support needs of patients with COPD: A systematic literature search and narrative review	Systematic review	Databases used: Medline (Ovid), EMBASE, PsycINFO, Cochrane Library, CINAHL Sample inclusion criteria: some or all patients diagnosed with COPD, aged 18 or older 31 papers included in the study All included studies addressed key aspects of support needs as	This study reviewed papers that included data identifying support needs in patents with COPD, as identified by patients with COPD. 13 domains of support needs were identified across four categories (physical, psychological, social, and spiritual)	This paper examined support needs of patients with COPD. “Support needs” is defined as “those aspects of managing life with COPD with which they need support”	The 13 domains are understanding COPD, managing symptoms and medications, healthy lifestyle, managing feelings and worries, living positively with COPD, thinking about the future, anxiety and depression, practical support, finance work and housing, families and close relationships, social and recreational life, independence, and navigating services.	Level V: Systematic review of qualitative studies	This study conceptualizes the support domains to further our understanding of patient’s support needs. These domains were synthesized from direct patient reports. This study provides an evidence base on which interventions to assess support needs may be

		identified by the patient.					modeled and enables clinicians to enhance patient support.
Article 3							
Bhattarai et al., 2020 Barriers and strategies for improving medication adherence among people living with COPD: A systematic review	Systematic review	Databases used: MEDLINE, CINAHL, EMBASE Inclusion criteria: Observational studies conducted on patients with COPD or health care professionals with focus on barriers to or facilitators of medication adherence Any age or sex with a diagnosis of COPD 38 selected studies, 37 of which were conducted using quantitative methods 24 countries, total population of	This review selected studies that measured rates of medication adherence among patients with COPD and analyzed prominent barriers and facilitators to adherence	**DV:** Rates of nonadherence, barriers to and facilitators of adherence Medication adherence: "the extent to which the person's behavior corresponds with the agreed recommendations from a health care provider"	Nonadherence rates ranged from 22% to 93% Over 30 factors contribute to nonadherence, including depression, comorbid conditions, concerns about medication, forgetfulness, reduced as well as better quality of life, smoking, choice of medicines, limited patient-clinician interaction, the use of multiple inhaler devices, and incorrect use of inhaler devices. Facilitators to adherence include positive beliefs about their medication, perceived treatment benefits,	Level I: Systematic review	STROBE checklist ranged from 46.67% to 90%. 8 studies reported potential sources of bias. Education on the benefits of treatment and proper inhaler technique is crucial to optimizing medication adherence

		343, 689					
Article 4							
Alqahtani et al., 2020 Risk factors for all-cause hospital readmission following exacerbation of COPD: A systematic review	Systematic review	Databases used: Medline, Scopus, Embase, CINAHL, International Pharmaceutical Abstracts Sample inclusion criteria: Patients readmitted due to COPD/COPD exacerbations 57 included studies Data from 30 different countries (primarily USA, Canada, and Spain)	Summary of described risk factors along with the OR for readmission at different time intervals.	Readmission/rehospitalization of COPD: more than one admission (as an inpatient, not including ED visits) due to COPD/exacerbation of COPD, where COPD was the primary diagnosis for the readmission/rehospitalization. IV: Risk factors (patient, provider, or system factors) DV: Readmission Rates: % of patients from each study to be readmitted. Generated at 30, 31-90, and >90 days. DV: Associated outcomes of rehospitalization	Hospitalization in the previous year was the main risk factor for readmission. Other risk factors associated with readmission include comorbidity (asthma), SES, and living or discharged to a nursing home. Outcomes associated with rehospitalization from COPD include increased in-hospital mortality, shorter survival period, poorer quality of life, increased cost, longer LOS, and frequent readmissions.	Level I: Systematic Review	50 included studies were of “good” quality, with 7 rating as “fair” Study indicates that COPD readmissions place a heavy burden on patients and the health system. Varied reports of readmission may be due to variation in the study population Results support the observation that most hospital readmissions are due to

							patient-driven factors that may be outside of hospital control. Interventions should be tailored to the local healthcare environment and guided by identified socioeconomic factors.
Article 5							
Shibuya et al., 2022 Pulmonary rehabilitation for patients after COPD exacerbation	Systematic Review/Meta analysis	Databases used: Cochrane Central Register of Controlled Trials, MEDLINE, Embase, CINAHL, PubMed, OvidSP Only RCTs that compared at least one month of pulmonary rehab to the usual care were included. Hospitalized patients following exacerbation of COPD	Pulmonary rehab (at least one month in duration) initiated during admission for COPD exacerbation or within four weeks of discharge following an admission for COPD exacerbation. A metanalysis was performed on data collected from two main groups (pulmonary rehab vs. usual care)	**IV:** Pulmonary rehabilitation vs. the usual care **DV:** Mortality and readmission rates Readmission explored at 3-6 months and within 1 years Mortality rates after 1 year	Patients who underwent pulmonary rehab had a significantly lower risk of readmission for up to 3-6 months (RR 0.51, [95% CI 0.37-0.70]; 471 total patients). Significant decreases in readmission from 3-6 months in both the early (RR 0.58, [95% CI 0.34-0.99]; 190 patients) and late (RR 0.48, [95% CI 0.32-0.71]; 281 patients) subgroups. Significantly lower risk of readmission within 1 year seen in pulmonary	Level I: Systematic review	Overall, all ten studies had some concerns for bias, with 3 rating “high risk” for bias using the Risk of Bias 2 tool per Cochrane Handbook for Systematic Review of Interventions. This study was consistent with GOLD reports that pulmonary rehab improves dyspnea, health

		10 studies included	along with a subgroup analysis that examined the timing of pulmonary rehab (initiated <1 week from admission vs. > 1 week from admission)		rehab group (RR 0.89, [95% CI 0.78-1.00]; 765 patients) No significant difference in 1 year mortality between pulmonary rehab and usual care groups.		status, and exercise tolerance in patients with COPD. Pulmonary rehab initiated in the hospital or within four weeks reduces 3–6-month readmission.
Article 6							
McCarthy et al., 2015 Pulmonary rehabilitation for chronic obstructive pulmonary disease	Systematic review	All included studies were RCTs Databases used: Cochrane Central Register of Controlled Trials, MEDLINE, Embase, CINAHL, AMED, PsycINFO, a select number of respiratory journals and meeting abstracts All patients had a clinical diagnosis of COPD with best (FEV1/FVC) ratio <0.7. Excluded	Pulmonary rehab, defined as any in-patient, out-patient, community-based, or home-based rehab program of at least four weeks duration that included exercise therapy with or without any form of education and/or psychological support delivered to patients with exercise limitation attributable to COPD.	**IV:** Pulmonary rehabilitation vs. usual care (conventional care) **DV:** health-related quality of life, functional and maximal exercise capacity	Pulmonary rehab leads to statistically significant improvements in health-related quality of life, dyspnea, fatigue, emotional function, mastery, and functional exercise.	Level I: Systematic review	Pulmonary rehabilitation should be included in part of the spectrum of treatment for patients with COPD.

		patients on continuous oxygen or who had an acute COPD exacerbation within four weeks of the intervention.					
Article 7							
Njoku et al., 2020 Risk factors and associated outcomes of hospital readmission in COPD: A systematic review	Systematic review	Databases used: Medline, Scopus, Embase, CINAHL, International Pharmaceutical Abstracts 57 studies included 37 retrospective studies, 20 prospective studies, two cross sectional studies 30 different countries, primarily USA, Spain, and Canada All studies were	Examined the risk factors associated with COPD exacerbation related readmission. Risk factors categorized as "patient factors", "provider factors". Or "system factors"	**IV:** Various risk factors **DV:** Readmission/rehospitalization of COPD defined as more than one admission due to COPD exacerbation where COPD was the primary diagnosis	Hospitalization in the previous year was the main risk factors for readmission. Comorbidity (asthma), socioeconomic status, and living or discharged to nursing home were also associated with readmission. Outcomes of rehospitalization included increased in-hospital mortality, shorter survival period, poorer quality of life, increased cost, longer LOS, and frequent readmissions	Level I; Systematic review	Quality identified as "good" for 50 studies, with seven studies rating as "fair" Results support the observation that most hospital readmissions are due to patient-driven factors that may be outside of hospital control.

		quantitative in nature, and focused on COPD readmission and risk factors					
Article 8							
Pooler & Beech, 2014 Examining the relationship between anxiety and depression and exacerbations of COPD which result in hospital admission: A systematic review	Systematic review	Databases used: PubMed/Medline, CINAHL, Embase, Web of Science, PsycINFO 24 studies included 20 quantitative studies, 3 qualitative studies, and one mixed-methods study High heterogeneity of adult population (multiple countries, COPD diagnosis, admissions with AECOPD, patients with no exacerbations in past year)	Examined the association between COPD exacerbations and anxiety/depression	**IV:** Comorbidities of anxiety and depression **DV:** Hospital admission/readmissions	There is a positive relationship between anxiety and depression and admissions/readmissions for acute exacerbations of COPD Mediating factors included perceived quality of life, severity of disease. Female sex, lower BMI, airflow obstruction, dyspnea, exercise (BODE) scores, low SES, persistent smoking, long-term oxygen therapy, decreased self-efficacy and compliance, a sense of loss, inability to cope, and previous admissions for COPD exacerbation. The presence of depression/anxiety increased length of stay	Level I: Systematic review	16 of 24 studies rated **** on the MMAT and eight scored *** The study highlighted the importance of identifying the presence of anxiety and depression in patients admitted to the hospital with COPD.

		All patients were >30 years old and had a COPD diagnosis with anxiety and/or depression comorbidities			and mortality rates after discharge Depression was underdiagnosed and undertreated		
Article 9							
Hegelund et al., 2020 The impact of a personalized action plan delivered at discharge to patients with COPD on readmissions	Randomized controlled trial with 3-month follow-up	Patients with doctor-diagnosed COPD admitted to the department of respiratory medicine at Næstved or Slagelse Hospital in Denmark with AECOPD between August 2016 and February 2017, had at least one prior admission for AECOPD in the preceding 3 months, and had passed the acute phase of their inpatient care.	A written, individualized, stepwise action plan supported with a patient-involved instruction provided at or post-discharge. This involved a structured coaching dialogue focused on self-management and instruction in accordance with international recommendations. Management of	**IV:** Written, individual, stepwise action plan supported by a patient-involved instruction provided at or post-discharge (and the usual care" vs. "usual care and treatment according to GOLD guidelines and the Regional Disease Management Guidelines" **DV:** Incidence of COPD-related readmissions during three months after discharge from index admission (when patient was included in the study) Secondary outcomes: Differences in Hospital Anxiety and Depression score	There were significantly less readmissions in the three months following intervention in the AP group. 23/49 patients had zero readmissions at three months in the AP group, compared to 0/50 patients in the control group ($p < 0.0001$) Median CAT scores decreased significantly in both groups at follow-up. Total HADS score decreased significantly in both groups from baseline to follow-up.	Level II: RCT	Many patients screened were not interested in participating the study or were lost to follow-up. This led to a small sample. Results emphasize the importance of symptoms awareness and self-management skills to prevent exacerbations

		33 patients that were randomized to the intervention completed the study, 42 patients in the control group completed the study A comparison of baseline characteristics between the two groups revealed no significant differences	and adherence to inhalation medication, including technique was also discussed AP based on CAT assessment of symptom burden	(HADS), COPD Assessment Test (CAT), drug inhalation therapy, use of long-term oxygen therapy and home nebulizers at inclusion and at follow-up, including number of therapeutic changes	HADS-D (depression) scores decreased significantly in the AP group only from baseline to follow-up		and readmissions. The CAT score is a useful tool for patients that supports awareness and recognition of symptoms Reduction of anxiety and depression and guideline-based medication therapy did not explain the observed reduction in readmission rate. Introducing a personalized action plan at discharge is feasible and efficacious in reducing hospital readmissions.
Article 10							
Ko et al., 2021	Randomized controlled trial	136 adults with COPD s/p AECOPD	4-8 weeks of training supervised by a	**IV:** 4-8 weeks of training supervised by a physiotherapist and phone	Physical activity and case manager reinforcement group saw less	Level II: RCT	Results support the idea that exercise/rehab

Effects of short-course exercise training on the frequency of exacerbations and physical activity in patients with COPD: A randomized controlled trial		admission	physiotherapist and phone contact every two weeks by a case manager to provide support and encourage exercise at home	contact every 2 weeks by case manager providing support and reinforcement of continuous exercise at home. **DV:** Readmissions at 12 months (time to readmission and number of readmissions), physical activity (measured by monitor) at baseline, 3 months, and 12 months	readmissions and increased time to first readmission at 12 months. There was no change in activity at 12 months.		should be emphasized in patients with COPD to prevent exacerbations and readmissions.
Article 11							
Kendra et al., 2022 Impact of a COPD care bundle on hospital readmission rates	Retrospective pre- and postintervention design	Patients within a single health care system over age 18 admitted with principal diagnosis of COPD. 189 subjects in the control arm and 127 subjects in the COPD care bundle arm.	Implemented a multidisciplinary COPD care bundle which included: use of admission COPD order set in EMR, DVT prophylaxis, evaluation for pulmonologist and PT consults, patient education by clinical pharmacist, escalation of COPD maintenance therapy (assessment of inhaler technique, patient preference,	**IV:** Implementation of an evidence-based interprofessional care bundle focused on inpatient, transitional, and outpatient care **DV:** 30-day all-cause readmissions Secondary outcomes: 60- and 90-day readmissions, escalation of pharmacotherapy, interprofessional interventions, hospital length of stay	There was a reduction in 30-day readmission rates by 9.9% (P = 0.017), 60-day readmission rates by 9.3% (P = 0.013) and 90-day readmissions by 14.9% (P <0.0001) There were more pulmonary consults (73.7% vs. 68.3%) and PT consults (69.3% vs. 36%) in the intervention arms. More subjects in the COPD care bundle received escalation of inhaler therapy than those in the control group (44.9% vs. 22.2%)	Level III: Non-randomized controlled trial	Study did not evaluate differences in severity of disease between the COPD bundle and control arms. It did not consider SES which has been associated with readmission rates. Bundles interventions, interdisciplinary approach, and early pulmonary

			insurance affordability, and pharmacotherapy optimization), smoking cessation consult, screening for chronic conditions such as lung cancer, anxiety, depression, OSA, and GERD, seven days of less outpatient pulmonary appointment arranged prior to hospital discharge.		Length of stay was high (not statistically significant) in the control arm (1 day vs. 4 days) There were statistically significant increases in the prescribing of SABA, SAMA, LABA, LAMA, ICS, and steroids at discharge in the COPD care bundle arm.		follow-up led to reduced readmission rates.

Levels of Evidence Synthesis Table

PICO Question: In hospitalized patients admitted with COPD (P), does a nurse-driven evidence-based care bundle (I) affect all-cause 30-day readmission rates (O) over a period of three months (T) compared to the usual care (C)?

X (copy symbol as needed)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Level I: Systematic review or meta-analysis	X		X	X	X	X	X	X				
Level II: Randomized controlled trial									X	X		

Level III: Controlled trial without randomization											X	
Level IV: Case-control or cohort study												
Level V: Systematic review of qualitative or descriptive studies		X										
Level VI: Qualitative or descriptive study, CPG, Lit Review, QI or EBP project												
Level VII: Expert opinion												

LEGEND

1: Macdonell et al., 2020; 2: Gardener et al, 2018; 3: Walpola et al., 2020; 4: Alqahtani et al., 2020; 5: Shibuya et al., 2022; 6: McCarthy et al., 2015; 7: Njoku et al., 2020; 8: Pooler & Beech, 2014; 9: Hegelund et al., 2020; 10: Ko et al., 2021; 11: Kendra et al., 2022

Appendix D

Outcomes Synthesis Table #1: Risk Factors for COPD Readmission

Risk Factors	**4**	**7**	**8**
Anxiety/depression	NE	NE	↑
Comorbidities (asthma)	↑	↑	NE
Hospitalization in the previous year	↑	↑	NE
Low Socioeconomic status	↑	↑	NE
Living in or discharged to nursing home	↑	↑	NE

Key: NE = not evaluated, ↑ = positively correlated w/ readmission for AECOPD

LEGEND
4: Alquatani et al., 2020; 7: Njoku et al., 2020; 8: Pooler & Beech, 2020

Outcomes Synthesis Table #2: Intervention Effect on Readmission

Intervention	1	2	3	4	5	6	7	8	9	10	11
Evidence-based COPD Care bundles	↓ +	NE	NE	NE	NE	NE	NE	NE	NE	NE	↓ +
Pulmonary rehabilitation/exercise regimen	NE	NE	NE	NE	↓ +	NE +	NE	NE	NE	↓ +	NE
Personalized action plan/health coaching	+	NE	NE	NE	NE	NE	NE	NE	↓ +	NE	NE

Key: NE = readmissions not evaluated; NC = no change; ↓ = decrease in readmission rates for AECOPD, + = improvements in one or more secondary outcomes (health-related quality of life, medication adherence, length of stay, etc.)

LEGEND
1: Macdonell et al., 2020; 2: Gardener et al, 2018; 3: Bhattarai et al., 2020; 4: Alqahtani et al., 2020; 5: Shibuya et al., 2022; 6: McCarthy et al., 2015; 7: Njoku et al., 2020; 8: Pooler & Beech, 2014; 9: Hegelund et al., 2020; 10: Ko et al., 2021; 11: Kendra et al., 2022

Appendix E

Patient #:

DAILY COPD CHECKLIST (All patients w/ history or diagnosis of COPD)

Date	AMPAC Assessed? (Y/N)	Ambulated OOB? (Y/N)	Home O2 requirements assessed and documented in flowsheets and note? (Y/N or not applicable)

DAILY CARE ITEMS

Room checklist:

- Recliner chair in room?
- Incentive spirometer in room and in reach?

Consults:

- PT/OT: Is this patient appropriate for PT consult?
- Respiratory Navigator: All patients w/ COPD should have this placed
- Pulmonology: Does patient have consult or follow up with pulm at d/c?

COPD Care and Education: (place date if addressed on shift, write NA if not applicable)

Ambulation									
O2 titration									
COPD med education									
Inhaler technique									
Smoking cessation									
Pursed lip breathing									

Appendix F

Differentiating Quality Improvement and Research Activities Tool

Question	Yes	No
1. Is the project designed to bring about immediate improvement in patient care?	X	
2. Is the purpose of the project to bring new knowledge to daily practice?	X	
3. Is the project designed to sustain the improvement?	X	
4. Is the purpose to measure the effect of a process change on delivery of care?	X	
5. Are findings specific to this hospital?	X	
6. Are all patients who participate in the project expected to benefit?	X	
7. Is the intervention at least as safe as routine care?	X	
8. Will all participants receive at least usual care?	X	
9. Do you intend to gather just enough data to learn and complete the cycle?	X	
10. Do you intend to limit the time for data collection in order to accelerate the rate of improvement?	X	
11. Is the project intended to test a novel hypothesis or replicate one?		X
12. Does the project involve withholding any usual care?		X
13. Does the project involve testing interventions/practices that are not usual or standard of care?		X
14. Will any of the 18 identifiers according to the HIPAA Privacy Rule be included?		X

Adapted from Foster, J. (2013). Differentiating quality improvement and research activities. Clinical Nurse Specialist, 27(1), 10–3. https://doi.org/10.1097/NUR.0b013e3182776db5

An answer of yes to all the items in l-l0 and no to all the items in 11-I4 indicates that this project meets criteria for a Quality Improvement Project. It also indicates that the project does not qualify as human subjects' research and does not have to go through the Institutional Review Board at Sacred Heart University.

Appendix G

Taber, Prof. Christopher B.

To: DiStasio, Michael

Mon 1/22/2024 12:33 PM

Cc: Alp, Feride F. 'Funda'; Londo, Madeline C.

Dear Applicant,
Thank you for your submission to the IRB requesting exempt review. Based on the application submitted, the IRB is pleased to approve your submission and we wish you great success in your research.

Sincerely,
Christopher Taber
Chair, IRB

Christopher B. Taber, PhD, CPSS*D, CSCS*D, USAW3, EP-C
Director, Exercise and Sport Science M.S. Program
Associate Professor
College of Health Professions
Sacred Heart University
(203) 396-6342

PIONEER PERFORMANCE CENTER

Appendix H

[redacted]

TO: Micheal DiStasio

FROM: [redacted] Nursing Scientific Review Committee Chair (On behalf of the Nursing Research and Evidence-Based Practice Committee)

DATE: 2/28/2024

RE: Introducing an Evidence-based COPD Bundle to Reduce COPD Readmission Rates

---

Micheal:

Thank you for submitting your Scholarly Project Application. On behalf of the Nursing Scientific Review Sub-Committee of [redacted] Nursing Research and Evidence-Based Practice Steering Committee, your scholarly project application has been reviewed and endorsed.

After committee review, the main purpose of the project was determined to improve the quality of care. Given the nature of the project, it is not seeking to generalize knowledge, generate new knowledge, or create a scientific inquiry. The project is not considered human subjects research. Your application will be entered into the [redacted] Office of Privacy and Corporate Compliance database. Your approval will expire in 12 months from the date of this letter.

Please remember to inform the Nursing Scientific Review Committee (NursingScientificReviewComm@[redacted]) when you conclude work on this project at [redacted]. **With that notification**, please include an abstract of your completed project to this email address as well. You may submit a word document or use the link provided: https://keysurvey.ynhh.org/f/41654125/170e/.

[redacted]

[redacted]
Nurse Scientist
[redacted]

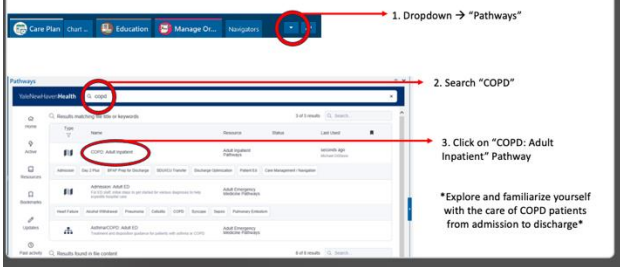
CC:
File
Student Faculty
Scholarly Mentor
Preceptor

Appendix I

The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care and Implementation for Sustainability Framework used/reprinted with permission from the University of Iowa Hospitals and Clinics, copyright 2012

Appendix J

Item 1: COPD IP Pathway in Epic: Where to Find



5

COPD Pathway Key Points

- This is a physician-driven pathway that utilizes current evidence-based practice to standardize the care of patients with COPD
- There are aspects of the pathway where nurses can fill in the gaps! It is important to understand and anticipate how COPD patients will be cared for in the hospital.
- Quality care is **interdisciplinary** and **patient-centered**

6

COPD Pathway – Discharge accelerators

************Discharge Accelerators************

To ensure a timely discharge, please order the following on HD#2 or 3:

- PT/OT/SLP consult and Social work consult if indicated
- COPD Navigator consult (LMH/WH) (BH/GH)
- **Order:** Referral to pulmonary rehabilitation so rehab team can meet patient prior to discharge
  - Please note that **MD** (not APP or other) **must place referral** by CMS regulations
- Evaluate for home O2 need (orders and information)
- Assess for chronic ventilatory insufficiency and need for home BPAP
- Assess for Home Hospital (BH & YNHH only)
  - How to refer a patient for Home Hospital
  - Services provided by Home Hospital
  - Benefits of Home Hospital
- Begin scheduling follow-up & referrals

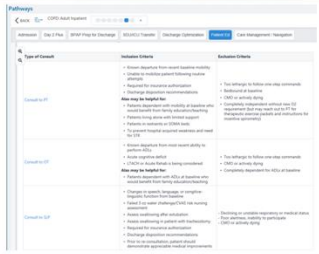
Key Points:

- Timely consults
- Home O2 evaluation (Nurse-driven)
- Follow-up appointments (Ensure appointments made at discharge)

7

COPD Pathway – When are consults indicated?

COPD Pathway – When are consults indicated?



Key Points:

- All patients with COPD who do not meet exclusion criteria should have a PT consult to help prevent hospital acquired weakness
- Patients who do not meet exclusion criteria can be ambulated by nursing and support staff prior to PT assessment
- Assess patients for OT/SLP consults as indicated
- Consults should be in by hospital day 2 or 3 to ensure timely discharge

8

COPD Readmission Reduction Bundle

A Guide to the COPD IP Pathway and Daily Checklist

1

Learner Goals

- Locate and familiarize the evidence-based COPD IP Pathway in EPIC
- Recognize indications for consults to PT/OT, SLP, Respiratory Navigator, and Pulmonology
- Understand oxygen titration and home O2 assessment
- Understand the importance of mobility assessment and ambulation for patients with COPD
- Implement a daily care checklist to guide and standardize care

2

Project Goals

- Standardize care of patients with COPD utilizing the daily care checklist and COPD IP Pathway
- Commitment to safe mobility and ambulation in COPD inpatient population
- Reduce readmission rates of patients admitted with COPD exacerbation

3

Background

- Patients with COPD are prone to exacerbation and readmission
- The CMS Readmission Reduction Program penalizes the healthcare system for readmission of COPD patients within 30 days of discharge (Press et al., 2021).
- Standardized care that focuses on ambulation, early consults, personalized patient education, and close follow-up has been shown to reduce readmissions in this population (MacDonell et al., 2020; Shibuya et al., 2022; Hegelund et al., 2020; Ko et al., 2021; Kendra et al., 2022).

4

Item 2: Oxygen Titration and Home O2 Assessment

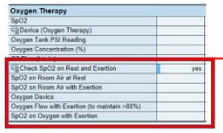
COPD exacerbation → Poor ventilation → CO2 retention →Hypercapnic RF and Respiratory acidosis

- Failure to titrate O2 (high SpO2) in patients with COPD can fuel hypoventilation and CO2 retention (Malhotra & Schwartzstein, 2022)
- Consider titration when SpO2 is ≥ 96% or consistently above O2 goal
- Goal SpO2 should be 88-92% for patients with COPD exacerbation (Stoller, 2023) – Check orders!

9

Oxygen Documentation

Click "yes" in this row to expand the column



This information needs to be documented in the flowsheets AND in a note for Case Management to set up home O2

Use DOTPHRASE ".oxygen" to hyperlink this information into nursing note

10

When to titrate?

- SpO2 goal is listed in Respiratory Orders
- Titrate as indicated to maintain saturation goal

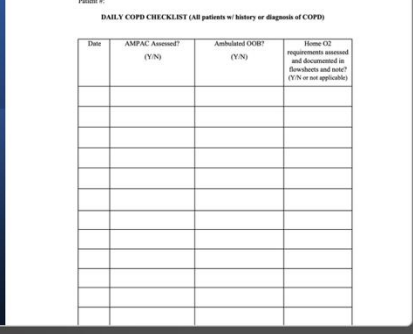
11

Item 3: Mobility and Ambulation

- All patients with COPD should be assessed for mobility and ambulated daily as indicated
- These patients should be out of bed to a recliner for meals if possible
- Ensure adequate documentation of mobility and ambulation in EPIC
  - AMPAC Q shift
  - Ambulation documentation under "Vitals" or patient care summary flowsheets
- Ambulation is a group effort!
  - RNs, PCTs, PTs, Respiratory Navigator.
- Goal: Daily ambulation w/ SpO2 measurements on exertion in conjunction with O2 titration

12

Item 4: Daily COPD Care Checklist



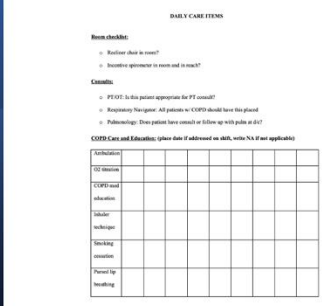
Patient #:

DAILY COPD CHECKLIST (All patients w/ history or diagnosis of COPD)

Date	AMPAC Assessed? (Y/N)	Ambulated OOB? (Y/N)	Home O2 requirements assessed and documented in flowsheets and note? (Y/N or not applicable)

13

COPD Care Checklist (Back)



DAILY CARE ITEMS

Room checklist:

- Recliner chair in room?
- Incentive spirometer in room and in reach?

Consults:

- PT/OT: Is this patient appropriate for PT consult?
- Respiratory Navigator: All patients w/ COPD should have this placed
- Pulmonology: Does patient have consult or follow-up with pulm at dc?

COPD Care and Education: (place date if addressed on shift, write NA if not applicable)

Ambulation										
O2 titration										
COPD med education										
Inhaler technique										
Smoking cessation										
Pursed lip breathing										

14

How to use the Checklist

1. Identify patient with active or historical diagnosis of COPD → Retrieve blank checklist from unit folder
2. Post COPD folder outside or inside patient room for checklist storage
3. Complete daily checklist for each day of hospitalization, report on checklist to oncoming nurse during handoff
4. When patient is discharged or transferred place completed checklist back in unit folder
5. Refer to back of checklist for COPD care bundle key points of emphasis

15

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16

Appendix K

COPD Care Bundle Sign-in Sheet

Name	Role

COPD PowerPoint Review (Please sign to attest that you have read and understand the material)

Name/Role	Date Reviewed

Appendix L

Executive Summary

Chronic obstructive pulmonary disease (COPD) is a progressive and debilitating condition characterized by lung inflammation with frequent acute exacerbations. Patients with COPD are prone to readmission following hospitalization. Readmissions lead to increased healthcare costs, reimbursement penalties, and poor patient outcomes. Evidence supports the use of an evidence-based care bundle to standardize the care of COPD patients in the inpatient setting to prevent readmission within 30-days. A regional medical facility has identified 30-day readmission rates for COPD patients as a key metric which has not met the target goal.

This project utilized the Iowa Implementation for Sustainability to guide implementation. A standardized checklist was created with input from key stakeholders at the facility. Nurses on a pulmonary-focused medical/surgical unit were educated on the COPD IP care pathway in EPIC and the evidence-based practices included in the checklist. The checklist emphasized Activity Measure for Post-Acute Care (AMPAC) mobility assessment, ambulation out of bed, oxygen titration, home oxygen assessment, and COPD-specific education including medication education, inhaler/breathing techniques, and smoking cessation. When a patient with a history or active diagnosis of COPD was identified, nurses were asked to begin a paper checklist for that patient and fill out the checklist for that date. The checklists and COPD care were integrated into daily unit safety huddles to streamline this process. Nurses passed the checklist on to the next shift upon giving their shift reports. When a patient with COPD was discharged or transferred from the unit, the checklist was returned to a central location on the unit and collected for analysis by the project leader.

The primary outcome of interest was COPD-specific 30-day all cause readmission rates. This unit-specific data was collected in via the secure EPIC Tableau sever which generates aggregate reports on CMS condition-specific readmissions. Process outcomes included mobility assessments completed, days out of bed, home oxygen assessment, and COPD-specific education provided. These outcomes were evaluated via the checklist tool data. Finally, unit-specific mobility data was collected for the post-implementation phase via the EPIC Tableau server, again in aggregate form.

A total of seven checklists accounting for 14 patient-days were utilized and collected over the one-month pilot period. Patients had their mobility assessed on 13 days (93.00%), were ambulated out of bed on 12 days (85.71%) and received COPD-specific patient education on 12 days (85.71%.). Of the three patients on supplemental oxygen, two had home oxygen requirements assessed via blood oxygen saturation readings (SpO2) while ambulating. Total mobilizations trended down over the pilot period while the rates of effective mobilization trended up. Post-intervention COPD readmission data was not available at the time of the project's conclusion due to the lag in software data publication. Feedback from unit staff at the conclusion of the implementation period found the education helpful but found the paper checklist tool to be cumbersome. Barriers to implementation included a short pilot period, small sample size, and checklist attrition. Future efforts will attempt to integrate an electronic version of the COPD care bundle into EPIC and pursue COPD-specific smart phrases to streamline the documentation process.

In summary, while the evidence-based COPD care bundle did not affect 30-day readmission rates over the short pilot period, preliminary data suggests that this tool was an effective way to standardize the care of COPD patients on an inpatient unit.

Appendix M

DR. SUSAN L. DAVIS, R.N., & RICHARD J. HENLEY COLLEGE OF NURSING
Sacred Heart University

Introducing an Evidence-based COPD Care Bundle to Reduce Readmission Rates

Michael DiStasio, BSN, RN
Faculty Advisor: Constance Glenn, DNP, APRN, FNP-BC, CNE

YaleNewHavenHealth
Bridgeport Hospital

RATIONALE

- Patients with COPD are susceptible to acute exacerbations (AECOPD) and rehospitalization.
- Nearly 20% of patients discharged following an admission for AECOPD are readmitted for any reason within 30 days (Press et al., 2021).
- Under the Centers for Medicare and Medicaid Services Hospital Readmission Reduction Program, hospitals face reimbursement penalties up to 3% for these patients.
- 30-day readmission rates for COPD patients have been identified by the clinical facility as a key metric to improve.
- There is an ongoing effort at the clinical facility to admit all patients with COPD to the same floor to ensure standardized, quality care for this population.
- Several gaps in the standardized care of patients with COPD have been identified by key unit stakeholders.

CLINICAL QUESTION

In hospitalized patients admitted with COPD (P), does a nurse-driven evidence-based care bundle (I) affect all-cause 30-day readmission rates (O) over a period of three months (T) compared to the usual care which does not utilize a COPD care bundle (C)?

BACKGROUND

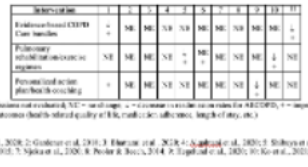
Internal Evidence – Facility reports a risk-adjusted COPD readmission rate benchmark of 23.3%.

- Target rate established at 5% below this rate, or 20.3%
- Reported median monthly 30-day readmission rate for fiscal year 2022 COPD is 23.7%
- As of June 2023, the reported median monthly 30-day readmission rate for COPD was 35% for the 2023 fiscal year

Gap Analysis: Barriers to Care

- *Low mobilization rates result in deconditioning*
- *Improper/untimely oxygen titration*
- *Lack of home oxygen assessment and documentation delays discharge*

External Evidence: Databases searched included CINAHL Ultimate, MEDLINE with full text, Cochrane Database of Systematic Reviews, and Trip. Keywords used included COPD or chronic obstructive pulmonary disease, acute exacerbation of COPD, readmission or rehospitalization, risk factors, care bundle, and interventions. The Rapid Critical Appraisal Tools from Melnyk & Fineout-Overholt (2019) were used for critical appraisal of selected articles.



OBJECTIVES

1. Identify best practice strategies to reduce all-cause 30-day readmission rates in patients with COPD.
2. Educate staff on the evidence-based COPD clinical pathway at the clinical facility.
3. Implement a checklist-based standardized nurse-driven COPD protocol on the pulmonary-focused med/surg unit.
4. Examine 30-day readmission rates and key drivers of readmission for patients with acute exacerbation of COPD over a period of 12 weeks.

METHODS

Framework – The Iowa Model Revised: Evidence-based Practice to Promote Excellence in Healthcare. The implementation phase was guided by the Iowa Implementation Plan for Sustainability.

Context – Hospital-based, 27 bed, pulmonary-focused medical-surgical adult inpatient unit.

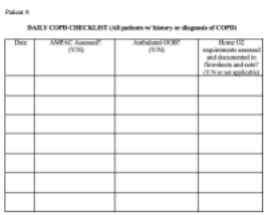
Participants – Nursing staff, patient care technicians, unit leadership, respiratory therapists, patients with a diagnosis of COPD.

Practice Change – Staff were educated on the evidence-based COPD inpatient pathway located in EPIC. Each patient with a history or diagnosis of COPD admitted to the unit received a daily checklist which bundled evidence-based practice for patients with COPD. Nurses used the checklist to guide their care and indicate when each care bundle item was performed.

Outcome Evaluation – Completed checklists were returned to the student for data analysis upon patient discharge from the unit. Pre- and post-intervention 30-day all-cause readmission rates were compared along with post-intervention key COPD driver and mobility data.

Timeline – Project implementation began on March 1st.

COPD CARE BUNDLE CHECKLIST



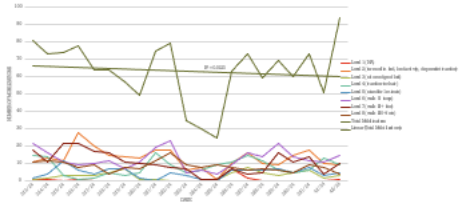
RESULTS

Demographics – Six patients were identified as having a history or active diagnosis of COPD and had at least one day of checklist use. Three patients required supplemental oxygen. A total of 12 hospital days were logged across all patients. One checklist was lost to follow-up.

Process Measures

- Mobility assessment was performed on 94% of days.
- Patients mobilized OOB on 91.67% of days.
- Patients received COPD-focused education on 83.33% of days.
- Two out of three patients on supplemental oxygen had SpO2 measured on exertion to assess home O2 needs.
- No significant effect on overall mobilization over the implementation period

Post-intervention Mobility Trends



Outcome Measures – 30-day readmission rates are a lagging indicator. Data collection and analysis is ongoing.

CONCLUSIONS

Limitations:

- Small sample, limited study length
- The average number of COPD patients on the unit at any time was 2-4. The overall heterogenicity of the unit population skewed the focus of the project
- Incomplete body of evidence for inpatient measures to reduce readmissions

Lessons Learned:

- Standardization of care is integral to optimization of outcomes within the population of patients with COPD.
- Focus on evidence-based care bundles helps support standardization of care

NEXT STEPS

- Continuing care standardization, education, data collection and analysis.
- Integration of COPD bundle tool into EPIC to improve documentation efficiency. Staff feedback suggests the use of a paper checklist is inefficient and prone to error.
- Unit continues pursuit of diagnosis-grouped admissions of COPD patients.

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See handout for references