

# **Impact of a Goal-Directed COPD Care Model on Clinical and Patient-Reported Outcomes: A Pilot Feasibility**

## **Study**

### **Study Protocol**

**PI's: Sunita Mulpuru, Alan Forster**

**Co-I's: Justin Presseau, Jacqueline Sandoz, Wendy Laframboise, Caroline Tessier, Barbara d'Entremont, Jan Leahy, Nha Voduc, Aaron Leblanc**

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REB Correspondence:

Dr. Sunita Mulpuru  
The Ottawa Hospital – General Campus  
Division of Respirology  
501 Smyth Rd, Room 6356, Box 211  
Ottawa, ON K1H 8L6  
[smulpuru@toh.ca](mailto:smulpuru@toh.ca)

Correspondence Address:  
The Ottawa Hospital, General Campus, 501 Smyth Road, Box 211 Ottawa, ON K1H 8L6

## 1.0 PROJECT SUMMARY

Chronic obstructive pulmonary disease (COPD) is an incurable and progressive lung disease associated with poor quality of life (1). At The Ottawa Hospital (TOH), 20% of patients with COPD are readmitted to hospital within 30-days after discharge, and COPD is responsible for the highest 30-day readmission rate to the emergency room in Ontario when compared to other chronic diseases (2).

Integrated COPD care programs (ICPs) are promising interventions that have been shown to improve quality of life and readmission rates in the COPD patient population (3). ICPs are disease management programs which aim to systematically reduce fragmented patient care; a central problem in today's health system. ICPs often include patient education, self-management, access to a case manager, and care interventions that address the psychological and rehabilitative aspects of the disease (e.g. pulmonary rehabilitation) (4). Studies of integrated care program effectiveness have yielded conflicting results with respect to clinical outcomes. The interventions within the care programs are not often explicitly reported in a way that would allow for replication in other sites. Further, cost effectiveness of ICPs has not been well studied, and the most-appropriate target patient population which could benefit most from these care interventions has not been identified. Most ICPs were also designed as a 'one-size-fits-all' model, where all enrolled COPD patients would receive similar care. Lastly, patient reported outcome data in these studies is notably absent. (4,5).

To address these stated shortcomings, we developed a unique goal-directed COPD care program which streamlines most appropriate care and health resources based on the degree of frailty of a patient. This care model begins at the onset of a hospitalization and integrates ongoing disease management services and programs in the community after hospital discharge. Using this goal-directed frailty-based integrated system of care, we aim to improve the confidence of patients to cope with health challenges, improve health system outcomes, and reduce costs of care. In this preliminary study, we will determine whether it is feasible to implement our goal-directed, frailty-based COPD care pathway in a large hospital setting. We will also evaluate our ability to measure patient reported and important health service outcomes.

## 2.0 BACKGROUND

COPD is an incurable and debilitating lung disease that causes progressive breathlessness, disability, poor quality of life, and premature death (1). COPD is characterized by progressive airflow obstruction and recurring 'flare-up's' (also known as exacerbations) that often require patients to seek medical attention in an emergency department (1). Most cases of COPD are caused by long-term tobacco use and exposure to biomass fuels (1).

COPD affects over 300 million people worldwide and accounts for 5% of global deaths (10). It is the only chronic disease in which the mortality rate is still rising (11,12). COPD is also a leading cause for hospital admission and the number one reason for hospital readmissions among chronic illnesses in Canada (13).

COPD is estimated to exceed 700 million dollars annually to the Canadian health system (14). The majority of this cost is related to the hospitalizations and readmissions of COPD patients (14). The highest in-hospital costs are borne by patients with COPD who are frail and those with increased physical care needs (15,16).

A recent evidence synthesis performed by Health Quality Ontario (HQO) aimed to answer important questions relating to patient and caregiver experiences over the course of illness for patients with COPD (17). The authors reviewed and summarized a decade worth of qualitative evidence to understand the daily life experiences of patients with COPD. The resulting information offers valuable insights on the types of interventions that could have a substantial impact on the experiences of patients with COPD (17).

Below is a summary of several important themes identified by HQO in their knowledge synthesis of patients' experiences with COPD.

- Patients may not realize that COPD is incurable and fatal; some physicians themselves do not consider early COPD to be a fatal disease.
- Patients may not attribute repeated exacerbations to advancing disease, seeing them as temporary setbacks instead.
- Economic hardship, co-morbidities, language barriers, low health literacy can make coping difficult.
- Many factors that isolate COPD patients from social contact also isolate them from health care professionals (or seeking out health care).
- Lack of confidence in community -based services leads some patients to seek hospital admission, but patients also feel vulnerable when hospitalized.
- Patients feel dependent on others for care or traumatized by hospital care routines
- Upon discharge following an exacerbation, patients may face new levels of uncertainty about their illness, prognosis, care providers, and supports.
- Patients tend to be poorly informed about the long-term prognosis of COPD, and what to expect toward the end of life; lack of understanding impairs quality of life as disease progresses.
- A palliative care referral can convey the demoralizing message that care providers have “given up”.

These valuable insights from patients and their caregivers underscore the need for improved disease-specific education, the nature of symptoms and prognosis, re-enforcement around the use of pharmacologic and non-pharmacologic treatments over time, and readily available access to a health care professional who could connect the patient to the most appropriate health services.

Studies have demonstrated that Integrated COPD care models are associated with reduced readmission rates and improved quality of life in single center studies (3, 4, 19). However, studies of integrated care models make it difficult to discern which aspect of the care programs can be replicated and scaled in other sites and settings. It is also unclear which COPD patients derive most benefit from these programs, what effect there is on patient reported outcomes, and what resources are required to effectively run and scale these programs. As a result, the American Thoracic Society (ATS) has highlighted the need for further studies to evaluate components of care models on patient centered outcomes and to better define sub-types of COPD patients who might benefit from integrative care models (4).

Previous care models have used a 'one-size-fits-all' approach to care, in which all-comers with COPD are offered the same set of interventions and treatment. However, all COPD patients are not alike. Simply classifying patients by their lung function or age does not correlate with symptoms or outcomes (20). Patients with COPD are often managing multiple comorbidities, mental health conditions, addictions, and social factors that contribute to their overall health care utilization. These factors underscore the need to have a more personalized and multidisciplinary care-delivery approach in this patient population.

Based on our knowledge of existing integrated care programs, we developed a unique integrated care program specifically for COPD patients. This care model begins in the hospital setting when a patient is admitted with an acute COPD exacerbation. Evidence based care including disease-specific education is provided and a safe transition after discharge is planned by integrating the patient with a variety of community services (education, rehabilitation, home care, disease-specific outreach, etc.). Continuity of care for the patient is provided through healthcare providers who straddle both the community and hospital settings.

Our integrated care model is unique as it groups hospitalized patients with COPD into functional health states using a validated clinical frailty indicator (8). Specific health goals are correlated with each health state and recommendations are made to involve various care providers to meet these goals (see Appendix B).

The following are additional unique features of the proposed care model:

- The care model is organized into 3 phases of hospital care relevant to the rescue, optimization, and safe transition.
- Hospital care delivery will be integrated with community care delivery through the pre-existing COPD Outreach program for frail individuals with most severe disease (i.e. those most likely to benefit from close follow up and management). The outreach program consists of follow up phone calls at 3 and 12 months, a home visit, ongoing education, and a hotline that patients may call if they have concerns. Individuals with less severe disease will be linked to existing COPD education and maintenance pulmonary rehabilitation programs in the community to ensure ongoing support and follow up.
- The care model also incorporates testing to confirm the COPD diagnosis and reinforces the importance of performing spirometry to confirm the diagnosis. This is a 'real world' issue, as many patients presenting to hospital with "COPD" have never actually been formally diagnosed (20). Confirmation of diagnosis offers an opportunity to intervene with treatments to improve quality of life in the long term.

We will use a patient reported outcome measure engagement called 'Health Confidence' as an outcome for this care model. Health confidence has not traditionally been a patient reported outcome in COPD, but patients consistently indicate it to be an important issue (17). Improving the health confidence of patients can contribute to improved health outcomes, better care experiences, and likely fewer health care services with less cost (27).

### **3.0 OBJECTIVES**

The objectives of this study are to:

- a) Determine the feasibility of implementing a novel COPD care model on a respiratory ward in a tertiary care hospital using *quantitative* and *qualitative* implementation metrics.
- b) Determine the process measures and personnel required for successful replication of this care model intervention at other sites.
- c) Use the results of this pilot feasibility study to determine the optimal study design and plan for a larger scale analysis to study the effect of this care model on health system and patient-reported outcomes.

### **4.0 HYPOTHESIS**

We hypothesize that goal-directed care delivery which is tailored to the functional health status of patients will improve patient engagement (health confidence) and translate into improved health service and clinical

outcomes in the short and long term. To rigorously test this hypothesis, we must first demonstrate feasibility of this complex intervention.

## 5.0 MULTI-DISCIPLINARY STUDY AND CLINICAL CARE TEAM

- **Sunita Mulpuru, MD FRCPC MSc (Project Lead):** Dr. Sunita Mulpuru is a full-time respirologist in the Department of Medicine, Associate Scientist at the OHRI, and the clinical quality lead in the Division of Respirology. She has 70% protected time for clinical research activities, will supervise the project team, and contribute 0.2 FTE per week to this project.
- **Alan J. Forster, MD FRCP CP MSc (Project Co-Lead):** Dr. Alan Forster is a full-time internist in the Department of Medicine and the Vice President of Quality, Performance and Population Health at The Ottawa Hospital. He will facilitate the involvement of important stakeholders and provide oversight to scale the implementation of the care model.
- **Justin Presseau, PhD:** Dr. Justin Presseau is an associate scientist at the Ottawa Hospital Research Institute (OHRI) with expertise in implementation science and use of audit/feedback research techniques. He will provide methodological and analytical guidance for the implementation of the care model. He will contribute approximately 20 hours of time.
- **Jacqueline Sandoz, MD FRCPC and Wendy Laframboise, APN:** Dr. Sandoz and Ms. Laframboise are co-leads of the INSPIRED-COPD Outreach team at TOH. This innovative program is fully operational with permanent funding and will integrate with the hospital care model to ensure long term follow up for patients in the community. Dr. Sandoz and Ms. Laframboise will participate in the data acquisition, analysis, and contribute approximately 40 hours of time.
- **Barbara d'Entremont RN:** Barbara d'Entremont is the corporate coordinator for clinical pathways at TOH and facilitated the initial development of the COPD care pathway and order set. She will assist with ongoing pathway production.
- **Caroline Tessier RRT & Nha Voduc MD FRCPC:** Caroline Tessier is the lead respiratory therapist in the Pulmonary Function Test (PFT) laboratory at TOH. She will coordinate and supervise the involvement of certified respiratory educators on the respiratory ward and ensure delivery of standardized education. Dr. Voduc is a staff respirologist at TOH and medical director of the PFT laboratory. He was an author on the Canadian COPD Guidelines and will provide guidance to the project from a clinical perspective.
- **Jan Leahy RN:** Jan Leahy is the nurse manager on the 6NW ward at TOH. She is responsible for the nursing staff on the ward, and for coordinating hospital-based clinical care in Respirology, Thoracics,

and Otorhinolaryngology (ENT). She will assist with nursing staff engagement throughout the project and the development and revisions of care processes related to the care model.

- **Aaron Leblanc, MD, PGY-5 Respirology Resident:** Dr. Leblanc is a senior Respirology trainee who will participate in aspects of the study, including calibration of frailty ratings by nursing staff, data collection in focus groups, and manuscript writing.

## 6.0 METHODS

**6.1 Design:** a prospective, mixed-methods, cohort study design at The Ottawa Hospital (TOH) to evaluate feasibility of this complex intervention.

**6.2 Study population and Inclusion Criteria:** We will include adult patients admitted to the 6NW (Respirology ward) of the General campus at TOH with a primary diagnosis of acute exacerbation of COPD (AECOPD). The diagnosis is based on the admitting physician's assessment of the patient in the emergency room.

We will also include approximately 26 health care workers (nurses, physicians, and allied health professionals) who care for patients on the 6NW of the General campus at TOH who have implemented and worked with the COPD care pathway during the study duration.

**6.3 Time Frame:** Implementation and feasibility data will be collected for 50 patients who are hospitalized for COPD over the course of two flu seasons (2017-2018 and 2018-2019), which corresponds to the peak season for COPD-related hospitalizations (22).

**6.4 Consent Process:** Patients eligible for the study will be approached by the study respiratory nurse educator (RT), who is already part of the patients circle of care. The RT will ensure the potential participant understands the study and what it would require of them (two questionnaires: one in hospital and one during a 3-month post-discharge visit). If the patient accepts, the RT will ask them to review the Informed Consent Form and sign if they agree to participate in the study.

A member of the study team will approach Healthcare professionals (HCPs) who work on the Respiratory ward (6NW) of TOH, General campus and have used the COPD care pathway to participate in the study. The member of the study team will explain the study and ask if they would

like to participate. If they agree to participate, they will be given a consent form. The consent form requests a consent to complete a questionnaire and participate in the focus group with other HCPs. If the HCP chooses to participate, the signed informed consent is placed in one box, while the completed questionnaire is placed in another. This is to conserve anonymity of the questionnaire responses. Once focus group times and location are set, an email will be sent out by a member of the study team to inform those who consented to participate of the focus group time and location.

**6.5 Implementation of the Goal-Directed Care Pathway:** Patients enrolled in the study will receive standardized treatment using an initial physician order set followed by a clinical care pathway (Appendix B). The order set and care pathway will be physically added to the patient's chart for daily reference by the health care team.

The care pathway (see Appendix B) consists of orders to be executed by the nursing staff, attending physician, and allied health professionals (respiratory therapy, occupational therapy, and physiotherapy, where applicable) while the patient is hospitalized. None of the components of the pathway extend beyond standard care that would be provided at TOH.

To initiate the care pathway, the first nurse to admit the patient will complete a frailty assessment and document the patient's clinical frailty score (8). This validated frailty score is associated with a set of expected treatment goals and outcomes for the patient during hospitalization and will serve to guide the subsequent care for the patient.

Following the frailty assessment, the care pathway is divided into three phases: rescue, optimization, and safe transition. The interventions in each phase are tailored to the COPD patient based upon their frailty rating. Evidence-based pharmacologic treatments, consultations with allied health professionals, medical services (e.g. Palliative care), and multidisciplinary educational interventions (Appendix A) are ordered in each phase where appropriate. In the safe transition phase, follow up with primary care, and referrals to pulmonary rehabilitation and the COPD outreach program will be arranged where appropriate.

## 6.6 Sample Size:

**6.6.1 Patients:** We aim to recruit 50 unique patients over an 18-month period to use the care pathway. The Ottawa Hospital admits over 500 patients with acute exacerbations

of COPD annually and approximately 30% of these patients are admitted to the respiratory inpatient service (150 patients). Given that COPD exacerbations are twice as common in the winter months (22), we feel our recruitment target of 50 patients is feasible between November 2017 and May 2019.

**6.6.2 Health Care Professionals (HCPs):** We aim to recruit approximately 26 HCPs, 2 groups of 13 participants, to discuss of their personal experiences with the COPD care Pathway after an evaluation of the pathway.

## 6.7 Outcomes

**6.7.1 Primary: The primary outcome is the feasibility of using this COPD care model in a hospital setting.** In this practical experiment, feasibility will be defined by recruitment of 50 patients (3-4 per month x 18 months) to the care pathway, with an 85% completion rate (care model completion). This will be calculated using the number of completed pathway documents divided by the total number of care pathways initiated at the time of admission. We will critically review each document for completion.

**6.7.2 Secondary:** There are four secondary outcomes for this study.

**6.7.2.1 Qualitative Implementation Metrics:** Implementation of the care pathway will be evaluated by HCPs (nursing staff and allied health professionals). Participants are asked to complete a questionnaire and participate in a focus group with other HCPs. During focus groups, common themes for barriers to implementation will be identified using a-priori selected questions. We will consider success of implementation if no significant barriers are identified through group consensus in the focus groups and if 80% of questionnaire responses in each category fall into the “agree” or “strongly agree” responses.

**6.7.2.2 Knowledge Translation Metrics:** We will measure success in knowledge translation with achievement of 80% adherence to basic COPD care guideline standards including use of appropriate antibiotics, systemic steroids, bronchodilators, venous thromboembolism prophylaxis, and advanced directives documentation. Adherence will be calculated from direct review of the care pathway documents after completion.

**6.7.2.3 Patient Reported 'Health Confidence':** Health confidence is a measure of the engagement of a patient in his or her own health (24). Greater health confidence is associated with improved outcomes, better experiences with care, and improved health resource utilization and cost (24,25). Health confidence will be measured using a four-item scaled survey: 1) I know enough about my health, 2) I can look after my health, 3) I can get the right help if I need it, and 4) I am involved in decisions about me. Participants answer each of the statements with the following scale: strongly agree, agree, not sure, or disagree. Patients who report 'strongly agree' for each of the above-mentioned statements are considered to have a higher level of health confidence than participants who report 'disagree'. These statements have demonstrated adequate psychometric properties and construct validity in preliminary testing (26). Formal permission for utilization of this tool in this study was obtained from the developer (T. Benson, R-Outcomes Ltd., Bristol, UK). The health confidence survey will be administered at the start of the education session in hospital, and repeated at 3 months, during a follow-up visit in the Pulmonary Function Test laboratory of the Ottawa Hospital, General campus. We aim for 80% completion of the "Health Confidence Score" among patients using the care model.

**6.7.2.4 Patient Reported 'Quality of life':** Patients quality of life can be measured with the "Health Related Quality of Life Score", or 'howRu' tool which has been validated against other quality of life tools. This tool is a four-item scaled survey: 1) Pain or discomfort, 2) feeling low or worried, 3) Limited in what I can do, and 4) require help from others. Participants answer each of the statements with the following scale: none, a little, quite a lot, or extreme. Those who report 'none' for each of the above-mentioned statements are considered to have a better quality of life than those who respond 'extreme'. These statements have demonstrated adequate psychometric properties and construct validity in preliminary testing (26). Formal permission for utilization of this tool in this study was obtained from the developer (T. Benson, R-Outcomes Ltd., Bristol, UK). This survey will be administered at the start of the education session in hospital, and repeated at 3 months, during a follow-up visit in the PFT laboratory. We aim for

80% completion of the “Quality of Life Score” among patients using the care model

**6.7.2.5 Health Service Metrics:** We will use the Ottawa Hospital Data Warehouse (TOHDW) to measure length of stay, cost per weighted case, 30-day readmission, mortality, intensive care unit admission, intensive care unit length of stay, and number of hospitalizations in the 2-year window prior to the current admission. TOHDW is a relational database that captures clinical and administrative data for unique hospital encounters.

## 6.8 Data Sources:

- 6.8.1 **Electronic Health Record, COPD Pathway Documents:** We will collect patient-related data using and some feasibility data using a combination of vOacis and the COPD care model document. These data points are detailed in the case report forms.
- 6.8.2 **Focus Groups and Questionnaires:** We will gather data from focus groups of HCPs to assess our implementation outcomes, and questionnaires provided to the HCPs who use the care models.
- 6.8.3 **Patient Questionnaires:** We will gather data from the COPD Assessment Test (CAT) and Health Confidence scores (HCS) to assess the symptom burden and engagement of patients.
- 6.8.4 **TOH Data Warehouse (TOHDW):** Health service metrics including length of stay, cost per weighted case, readmissions, mortality, and ICU admissions will be ascertained from the Data Warehouse. A separate Data Specification Form (DSF) has been initiated for this data request.

**6.9 Data Collection:** The following figure illustrates when data will be collected for participant during the study. The two focus groups will be conducted during the pilot in March 2018 with HCPs (nurses, physiotherapists, occupational therapists, and dieticians) who have used the pathway. Questionnaires of HCPs will be gathered prior focus groups.

Patient data will be collected at three time-points:

- 1) **During hospitalization:** Includes COPD Pathway Phases 1 to 3. Patient data relating to demographics, frailty rating, COPD diagnosis, lung function, oxygen use, smoking status,

and symptom burden will be collected from the hospital chart. The study respiratory therapist will enter this data in a Case Report Form for Respiratory Therapists. Patient participants are asked to complete a baseline health confidence and quality of life questionnaire at the beginning of hospitalization (Part A – Patient In-Hospital Questionnaire).

- 2) **3-Months Post-Discharge:** Includes COPD Pathway Phase 4. During a post-discharge visit in the PFT laboratory of the General Campus at TOH, patient participants will be asked to complete a follow up questionnaire (Part B – Patient Post-Discharge Questionnaire). During this visit, a review will be undertaken of community services accessed by the patients, and any referral issues will be rectified if needed.
- 3) **At Study Conclusion:** Data collection in this phase will be from TOHDW. We will collect all health service outcome data up to 6 months post-discharge from the TOHDW. This will include initial hospital length of stay, mortality, ICU admission, 30-day readmission, and cost per weighted case.

|                        | DURING HOSPITALIZATION  |   |  |   | 3 MONTHS POST-DISCHARGE   | STUDY CONCLUSION |
|------------------------|---|---|--|---|---|------------------|
| STANDARD CLINICAL CARE | ADMISSION   | COPD PATHWAY PHASE 1  | COPD PATHWAY PHASE 2   | COPD PATHWAY PHASE 3  | COPD PATHWAY PHASE 4  |                  |
|                        | <ul style="list-style-type: none"> <li>- Admission w/ AECOPD from ER</li> <li>- MD completes Physician Admission orders</li> <li>- Pt moved to Respiratory ward (ENW)</li> <li>- COPD Clinical Pathway initiated</li> </ul> | <ul style="list-style-type: none"> <li>- Frailty rating completed by nurse (RN)</li> <li>- Pathway instructions followed</li> </ul>   | <ul style="list-style-type: none"> <li>- Pathway instructions followed</li> <li>- COPD Education session completed</li> </ul>  | <ul style="list-style-type: none"> <li>- Pathway instructions followed</li> <li>- Ensure completion of Pathway documentation</li> <li>- 3 month follow-up scheduled*</li> </ul> | <ul style="list-style-type: none"> <li>- 3 months post-discharge follow-up in the Pulmonary Function Laboratory at the Ottawa Hospital, General campus*</li> </ul>  |                  |
| DATA COLLECTION        |   | <ul style="list-style-type: none"> <li>- Focus groups with HCPs from ENW</li> <li>- Surveys pre and post focus group for HCPs from ENW</li> <li>- Patient demographics, medical history, COPD diagnosis, lung function, O<sub>2</sub> use, smoking status from EMR</li> <li>- Patient In Hospital Questionnaire (Part A)</li> </ul> | <ul style="list-style-type: none"> <li>- Focus groups w/ health professionals from ENW</li> <li>- Surveys pre and post focus group for HC professional ENW participants</li> <li>- Patient referrals to community programs and in hospital consultations from EMR</li> </ul> | <ul style="list-style-type: none"> <li>- Patient Post-Discharge Questionnaire (Part B)</li> </ul>   | <ul style="list-style-type: none"> <li>- Patient outcomes data from TOHDW: <ul style="list-style-type: none"> <li>- LOS</li> <li>- Mortality</li> <li>- ICU admissions</li> <li>- 30d re-admission</li> <li>- cost per weighted case</li> </ul> </li> </ul> |                  |

Figure 1 – Details for each point of data collection \* As part of the study, patient participants are invited for a 3month follow-up in the PFT laboratory.

## 7.0 STUDY TIMELINE

There are 5 distinct phases to the study: 1) pre-implementation, 2) hire, 3) educate, 4) implementation and data collection, and 5) finalize results and plan for next steps.



Figure 2 - Study Timeline

**Pre-implementation:** Finalize the COPD pathway documents, engage the nursing staff in initial education, trial the pathway on 5 patients, and conduct 2 PDSA (Plan, Do, Study, Act) cycles with subsequent pathway revisions, based upon preliminary nursing and physician recommendations.

**Hire:** Hire clinical research assistant and submit research ethics board application

**Educate:** Clinical care team regarding individual components and application of the care model (nurses, physicians, respiratory therapists, allied health). Create secure database to store study data.

**Implementation and data collection:** Implementation of the care model on the respiratory ward, data collection and organization, education sessions and post-rotation focus groups with each new group of physician trainees on the ward (once per month), focus groups (March 2018), and questionnaires with nursing and allied health staff.

**Finalize results and plan for next steps:** Write manuscript, plan the design of next steps (cluster randomized trial).

## 8.0 DATA MANAGEMENT

The data collected will be password protected and will not leave TOH. Only study personnel will have access to the study data. A study master list (containing MRN's) will be linked to a study ID. This master linking file will be kept separate from the main study dataset in a protected folder on a secure TOH sever.

Only the unique study ID will be used on the patient questionnaires and study case report forms. The study files will not be stored on the hard drives of portable devices or on USB keys.

## 9.0 FUNDING & COLLABORATION

The Ottawa Hospital Academic Medical Organization (TOHAMO) has awarded a \$100,000 grant to conduct this pilot project. The Lung Association and Ontario Thoracic Society has also awarded \$47,000 for this pilot project.

The Ottawa Hospital has provided in-kind resources for development of this project, via specific commitments from individuals in clinical nursing, nursing professional practice, respiratory therapy, pharmacy, senior management, and allied health care.

The Department of Medicine Patient Safety and Quality Committee has also provided in-kind support and resources for this project.

The Canadian Foundation for Healthcare Improvement (CFHI) has also provided in-kind support to this project to assist with scaling and promotion of the care pathway concept in COPD care.

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**Appendix A - Standard COPD Education Session in Hospital<sup>1</sup>**

1. Review the definition of COPD, symptoms, and the common causes.
2. Discuss the concept of 'COPD Flare-up's, including a definition, review of common triggers, and early recognition of symptoms.
3. Review strategies to prevent worsening of symptoms (exercise, good nutrition, smoking cessation, medication use).
4. Discuss smoking cessation where applicable and provide relevant community resources for smoking cessation (example: Ottawa MyQuit Program, Heart Institute Smoking Cessation Clinic, etc.)
5. Review medications used to prevent and relieve symptoms
6. Demonstrate and confirm inhaler technique with attention to the appropriateness of the inhaler delivery device
7. Demonstrate and review breathing and cough techniques to clear secretions
8. Discuss with patient the potential benefit of community COPD education programs for ongoing support, pulmonary rehabilitation programs (including maintenance rehabilitation), support from the COPD outreach team, and referral to the HealthLinks program offered by the Champlain LHIN
  - a. Review the best community program option for individual patients, based on patient preference, location, and services provided.

If appropriate, review and discuss exercise goals to consider once recovered from acute exacerbation.

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<sup>1</sup> Kruis, (2013) Adapted from the 'Living Well with COPD™' educational materials from the McGill University Health Center, in Montreal, Canada.

## Appendix B - COPD Care Pathway –Order Set (page 1 of 8)

The Ottawa Hospital  
Riverside CampusCLINICAL PATHWAY  
Chronic Obstructive Pulmonary Disease  
Exacerbation (COPD-E) Civic     General

| Clinical Frailty Scale (At baseline, at least 2 weeks before hospitalization) |         |   |  |   |                   |          |
|---|---------|---|--|---|-------------------|----------|
| Init.   | Diagram | Frailty Scale Description   | Expected Goal of Care  | Consider Consulting Services  | Date (yyyy/mm/dd) | Initials |
|   | OR      | <b>Well:</b> <ul style="list-style-type: none"> <li>No active disease symptoms</li> <li>Active occasionally, e.g. seasonally</li> </ul> <b>Managing Well:</b> <ul style="list-style-type: none"> <li>Medical problems are well controlled, BUT</li> <li>Not regularly active beyond routine walking</li> </ul>  | <ul style="list-style-type: none"> <li>Return to independent living</li> <li>Self manage breathing techniques, secretion clearance</li> <li>Recognize early symptoms of COPD exacerbation</li> </ul>   | <input type="checkbox"/> Respiratory Therapy (for teaching by CRE)  |                   |          |
|   |         | <b>Vulnerable:</b> <ul style="list-style-type: none"> <li>Not dependent on others for help, BUT</li> <li>Symptoms limit activities</li> </ul>   | <ul style="list-style-type: none"> <li>Return to independent living</li> <li>Self manage breathing techniques, secretion clearance</li> <li>Recognize early symptoms of COPD exacerbation</li> </ul>   | <input type="checkbox"/> Respiratory Therapy (for teaching by CRE)<br><input type="checkbox"/> Physiotherapy<br><input type="checkbox"/> Occupational Therapy   |                   |          |
|   | OR      | <b>Mildly Frail:</b> <ul style="list-style-type: none"> <li>More evident slowing</li> <li>Need help in high order instrumental activities of daily living (finances, transportation, heavy housework, medications)</li> <li>Progressive impairment of shopping, walking outside alone, meal preparation, housework</li> </ul> <b>Moderately Frail:</b> <ul style="list-style-type: none"> <li>Need help with <b>all outside activities</b> and with <b>keeping house</b></li> <li>Often have problems with stairs</li> <li>Need help with bathing</li> <li>Minimal assistance (cuing, standby) with dressing</li> </ul> | <ul style="list-style-type: none"> <li>Return home with additional services</li> <li>Consider relocation to assisted living facility if appropriate</li> <li>Self manage breathing techniques, secretion clearance</li> <li>Recognize early symptoms of COPD exacerbation</li> <li>Recognize need to modify activities and/or use additional equipment to maximize functional abilities</li> </ul> | <input type="checkbox"/> Respiratory Therapy (for teaching by CRE)<br><input type="checkbox"/> Physiotherapy<br><input type="checkbox"/> Occupational Therapy (consider cognitive screen)<br><input type="checkbox"/> Social Work |                   |          |
|   | OR      | <b>Severely Frail:</b> <ul style="list-style-type: none"> <li>Completely dependent on others for personal care (physical or cognitive)</li> <li>Stable, not at high risk of dying (within 6 months)</li> </ul> <b>Very Severely Frail:</b> <ul style="list-style-type: none"> <li>Completely dependent, approaching the end of life</li> <li>Could not recover even from a minor illness</li> </ul>   | <ul style="list-style-type: none"> <li>Strongly consider assisted living (either with services in current dwelling or by relocation to new facility)</li> <li>Understands severity of illness and the limits this places on functional ability</li> <li>Engage in advanced care planning discussions with the medical team and with the family physician upon discharge</li> </ul>                 | <input type="checkbox"/> Physiotherapy<br><input type="checkbox"/> Occupational Therapy<br><input type="checkbox"/> Social Work   |                   |          |
|   |         | <b>Terminally Ill:</b> <ul style="list-style-type: none"> <li>Approaching the end of life.</li> <li>Applies to people with a life expectancy less than 6 months, who are not otherwise evidently frail</li> </ul>   | <ul style="list-style-type: none"> <li>Strongly consider palliative care consultation</li> <li>Arrange hospice, long term care, or palliative care at home</li> </ul>  | <input type="checkbox"/> Social Work<br><input type="checkbox"/> Palliative Care (MD to complete)<br><br>If returning home:<br><input type="checkbox"/> OT <input type="checkbox"/> PT for services                               |                   |          |

CP 110 A (06/2017)

CHART

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## Appendix B - COPD Care Pathway –Order Set (page 2 of 7)

| Patient _____   | Chart No. _____  |
|---|--|
| <b>PHASE 1: Rescue Treatment</b>  |  |
| Start Date: yyyy ____ mm ____ dd ____   |  |
| Critical Path   | Patient Outcomes   |
| <p><b>Assessment/Treatment</b></p> <ul style="list-style-type: none"> <li>• Vital signs and SpO<sub>2</sub> q4h</li> <li>• Chest and respiratory assessment q shift and prn</li> <li>• Assess bowel function</li> <li>• Assess for anxiety q shift (if anxiety severe, consider psychology consult)</li> </ul> <p><b>Category Status</b></p> <ul style="list-style-type: none"> <li>• Ensure category status form completed by physician - Init _____ Date _____</li> </ul> <p><b>Activities</b></p> <ul style="list-style-type: none"> <li>• Activity as tolerated</li> <li>• Up in chair for meals (TID)</li> </ul> <p><b>Nutrition</b></p> <ul style="list-style-type: none"> <li>• As ordered/tolerated</li> <li>• BMI = _____ kg/m<sub>2</sub> – Init _____ Date _____</li> <li>• Consult Registered Dietitian using NUT 51 if BMI 21 or less, or patient report significant weight loss – Init _____ Date _____</li> <li>• Provide nutrition booklet to patient, if appropriate</li> <li>• Consult SLP if concerns with swallowing/aspiration - Init _____ Date _____</li> </ul> <p><b>Smoking Cessation Interventions</b></p> <ul style="list-style-type: none"> <li>• Provide patient nicotine replacement therapy as per orders (patch, gum, inhaler)</li> </ul> <p><b>Discharge Planning</b></p> <ul style="list-style-type: none"> <li>• Clinical Frailty Scale assessment (see left leaflet)<br/>- Init _____ Date _____</li> </ul> | <p><b>Assessment/Treatment</b></p> <ul style="list-style-type: none"> <li>• Vital signs within normal limits, afebrile</li> <li>• Optimal saturation achieved</li> <li>• Heart rate (less than 100 beats/minute at rest)</li> <li>• Decreased use of respiratory accessory muscles</li> <li>• Patient passing stool freely without difficulty</li> </ul> <p><b>Category Status</b></p> <ul style="list-style-type: none"> <li>• Category status completed</li> </ul> <p><b>Activities</b></p> <ul style="list-style-type: none"> <li>• Tolerating activity level</li> </ul> <p><b>Nutrition</b></p> <ul style="list-style-type: none"> <li>• Tolerating diet</li> </ul> <p><b>Smoking Cessation Interventions</b></p> <ul style="list-style-type: none"> <li>• No symptoms of nicotine withdrawal (headache, nausea, irritability, anxiety)</li> </ul> <p><b>Discharge Planning</b></p> <ul style="list-style-type: none"> <li>• Appropriate referrals completed and sent<br/>(See action items of Frailty Scale Leaflet)</li> </ul> |

## Appendix B - COPD Care Pathway –Order Set (page 3 of 7)

Patient \_\_\_\_\_ Chart No. \_\_\_\_\_

## PHASE 1: Rescue Treatment (continued)

Patient progress corresponds with clinical pathway: D: 8–12 h day shift E: evening shift, if applicable N: 8–12 h night shift

Date: (yyyy/mm/dd) \_\_\_\_\_

D  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_E  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_N  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_

Date: (yyyy/mm/dd) \_\_\_\_\_

D  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_E  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_N  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_

Date: (yyyy/mm/dd) \_\_\_\_\_

D  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_E  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_N  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_

Date: (yyyy/mm/dd) \_\_\_\_\_

D  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_E  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_N  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_

Date: (yyyy/mm/dd) \_\_\_\_\_

D  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_E  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_N  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_

|                     |   |  |
|---------------------|---|--|
| Variance Codes (VC) | 492 Not discharged by end of pathway – continued need for acute care<br>510 Not discharged by end of pathway – non-medical reason | NTV Non-Tracked Variance<br>OFF Ordered off clinical pathway |
|---------------------|---|--|

## Appendix B - COPD Care Pathway –Order Set (page 4 of 7)

Patient \_\_\_\_\_ Chart No. \_\_\_\_\_

| PHASE 2: Optimization Phase  |  |
|--|--|
| Start Date: yyyy ____ mm ____ dd ____  |  |
| Critical Path  | Patient Outcomes   |
| <p><b>Assessment/Treatment</b></p> <ul style="list-style-type: none"> <li>• Vital signs and SpO<sub>2</sub> q8h</li> <li>• Chest and respiratory assessment q shift and prn</li> <li>• Assess for anxiety q shift (if anxiety severe, consider psychology consult)</li> </ul> <p><b>Provide Patient/Family Education</b></p> <p>Mark off once completed with patient:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Provide standard COPD education - Init ____ Date _____</li> <li><input type="checkbox"/> Review inhaler device technique - Init ____ Date _____</li> <li><input type="checkbox"/> Review pursed lip breathing, deep breathing, and coughing exercises - Init ____ Date _____</li> <li><input type="checkbox"/> Review relaxation techniques and positioning to reduce dyspnea - Init ____ Date _____</li> <li><input type="checkbox"/> Write order for spirometry in the chart, if required to confirm COPD diagnosis (MD to cosign) - Init ____ Date _____</li> <li><input type="checkbox"/> Ensure that spirometry request sent to Module R prior to discharge (to be done as an inpatient, or outpatient, depending on availability) - Init ____ Date _____</li> <li><input type="checkbox"/> Write order in chart for referral to COPD outreach program if patient meets criteria and send referral - Init ____ Date _____</li> <li><input type="checkbox"/> If patient meets criteria for outpatient pulmonary rehabilitation, write order in chart to suggest referral to appropriate program (MD will send referral) - Init ____ Date _____</li> <li><input type="checkbox"/> If patient would benefit from community lung health resources after discharge from hospital (education, maintenance rehabilitation, etc.), write order in chart with referral suggestions (MD will send referral) - Init ____ Date _____</li> <li><input type="checkbox"/> Assess and qualify patient for home oxygen therapy if indicated</li> </ul> <p><b>Smoking Cessation/Counselling</b></p> <ul style="list-style-type: none"> <li>• Provide patient nicotine replacement therapy as per orders (patch, gum, inhaler)</li> </ul> <p><b>Activity/ADL's</b></p> <ul style="list-style-type: none"> <li>• Activity as tolerated</li> <li>• Up in chair for meals (TID)</li> <li>• Up to bathroom or commode – if able</li> <li>• Ambulate in hallway – if able</li> <li>• Assist and encourage with personal care</li> </ul> <p><b>Nutrition</b></p> <ul style="list-style-type: none"> <li>• As ordered/tolerated</li> </ul> <p><b>Initiate Early Discharge Planning</b></p> <ul style="list-style-type: none"> <li>• Ensure team is aware if patient is still requiring oxygen at rest, and was not on home oxygen</li> <li>• Assess and review pre-admission functional status</li> <li>• Ensure all applicable allied health team members consulted as per Clinical Frailty Scale</li> </ul> | <p><b>Assessment/Treatment</b></p> <ul style="list-style-type: none"> <li>• Vital signs within normal limits, afebrile</li> <li>• Optimal saturation achieved</li> <li>• Heart rate (less than 100 beats/minute at rest)</li> <li>• Decrease in anxiety</li> </ul> <p><b>Patient/Family Education</b></p> <ul style="list-style-type: none"> <li>• Adequate use of inhaler device (including mouth care)</li> <li>• Effective cough and expectoration techniques</li> <li>• Patient verbally expressing feeling less anxious</li> <li>• Spirometry suggested if required</li> <li>• Need for home oxygen assessed</li> <li>• COPD outreach and rehabilitation referrals suggested if required</li> </ul> <p><b>Smoking Cessation/Counselling</b></p> <ul style="list-style-type: none"> <li>• No symptoms of nicotine withdrawal</li> </ul> <p><b>Activity</b></p> <ul style="list-style-type: none"> <li>• Tolerating activity level</li> <li>• Increasing mobility level</li> <li>• Returning to baseline level of mobility</li> </ul> <p><b>Nutrition</b></p> <ul style="list-style-type: none"> <li>• Tolerating diet</li> <li>• Good swallowing function, no aspiration</li> <li>• Improvement in weight and oral intake</li> </ul> <p><b>Initiate Early Discharge Planning</b></p> <ul style="list-style-type: none"> <li>• Patient understands limitations in level of function and need for additional home services (or assisted living) if required</li> <li>• Patient and family concerns heard and relayed to allied health and physician team members</li> <li>• Home oxygen assessment started, if required</li> </ul> |

## Appendix B - COPD Care Pathway –Order Set (page 5 of 7)

Patient \_\_\_\_\_ Chart No. \_\_\_\_\_

## PHASE 2: Optimization Phase (continued)

Patient progress corresponds with clinical pathway: D: 8–12 h day shift E: evening shift, if applicable N: 8–12 h night shift

Date: (yyyy/mm/dd) \_\_\_\_\_

D  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_E  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_N  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_

Date: (yyyy/mm/dd) \_\_\_\_\_

D  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_E  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_N  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_

Date: (yyyy/mm/dd) \_\_\_\_\_

D  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_E  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_N  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_

Date: (yyyy/mm/dd) \_\_\_\_\_

D  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_E  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_N  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_

Date: (yyyy/mm/dd) \_\_\_\_\_

D  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_E  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_N  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_

## RT Signature

Signature: \_\_\_\_\_ Initials: \_\_\_\_\_

Variance Codes (VC) 492 Not discharged by end of pathway – continued need for acute care  
510 Not discharged by end of pathway – non-medical reason

NTV Non-Tracked Variance

OFF Ordered off clinical pathway

## Appendix B - COPD Care Pathway –Order Set (page 6 of 7)

Patient \_\_\_\_\_ Chart No. \_\_\_\_\_

| PHASE 3: Safe Transition  |   |                          |  |                          |   |                          |   |                          |   |                          |  |                          |                                |                          |  |
|---|---|--------------------------|--|--------------------------|---|--------------------------|---|--------------------------|---|--------------------------|--|--------------------------|--------------------------------|--------------------------|--|
| Start Date: yyyy ____ mm ____ dd ____   |   |                          |  |                          |   |                          |   |                          |   |                          |  |                          |                                |                          |  |
| Critical Path   | Patient Outcomes                            |                          |  |                          |   |                          |   |                          |   |                          |  |                          |                                |                          |  |
| <p><b>Assessment/Treatment</b></p> <ul style="list-style-type: none"> <li>• Vital signs and SpO<sub>2</sub> q shift</li> <li>• Chest and respiratory assessment q shift and prn</li> <li>• Assess for anxiety q shift (if anxiety severe, consider inpatient psychology consult)</li> </ul> <p><b>Activity/ADL's</b></p> <ul style="list-style-type: none"> <li>• Activity as tolerated</li> <li>• Up in chair for meals (TID)</li> <li>• Up to bathroom or commode – if able</li> <li>• Ambulate in hallway – if able</li> <li>• Assist and encourage with personal care</li> </ul> <p><b>Nutrition</b></p> <ul style="list-style-type: none"> <li>• As ordered/tolerated</li> </ul> <p><b>Medication Teaching</b></p> <ul style="list-style-type: none"> <li>• Page Respiratory Pharmacist to complete medication review           <ul style="list-style-type: none"> <li>- Init _____ Date _____</li> </ul> </li> </ul> <p><b>Smoking Cessation/Counselling</b></p> <ul style="list-style-type: none"> <li>• Continue nicotine replacement</li> </ul> <p><b>Follow-up Appointments/Services</b></p> <ul style="list-style-type: none"> <li>• Specialist follow-up arranged by clerks based on physician recommendations - MD Init _____ Date _____</li> <li>• GP follow-up arranged within 2 – 4 weeks of discharge (ask patient to call)</li> <li>• Referral to COPD community services sent (check all that apply):           <table> <tbody> <tr> <td><input type="checkbox"/> COPD outreach team</td> <td>MD Init _____ Date _____</td> </tr> <tr> <td><input type="checkbox"/> Lung Association Referral</td> <td>MD Init _____ Date _____</td> </tr> <tr> <td><input type="checkbox"/> Champlain Lung Health Referral</td> <td>MD Init _____ Date _____</td> </tr> <tr> <td><input type="checkbox"/> TOH COPD Education (PFT Lab)</td> <td>MD Init _____ Date _____</td> </tr> <tr> <td><input type="checkbox"/> TRC Pulmonary Rehabilitation</td> <td>MD Init _____ Date _____</td> </tr> <tr> <td><input type="checkbox"/> Montfort Pulmonary Rehabilitation</td> <td>MD Init _____ Date _____</td> </tr> <tr> <td><input type="checkbox"/> Other</td> <td>MD Init _____ Date _____</td> </tr> </tbody> </table> </li> </ul> <p><b>Discharge Planning</b></p> <ul style="list-style-type: none"> <li>• Ensure home oxygen arranged if necessary</li> </ul> | <input type="checkbox"/> COPD outreach team | MD Init _____ Date _____ | <input type="checkbox"/> Lung Association Referral | MD Init _____ Date _____ | <input type="checkbox"/> Champlain Lung Health Referral | MD Init _____ Date _____ | <input type="checkbox"/> TOH COPD Education (PFT Lab) | MD Init _____ Date _____ | <input type="checkbox"/> TRC Pulmonary Rehabilitation | MD Init _____ Date _____ | <input type="checkbox"/> Montfort Pulmonary Rehabilitation | MD Init _____ Date _____ | <input type="checkbox"/> Other | MD Init _____ Date _____ | <p><b>Assessment/Treatment</b></p> <ul style="list-style-type: none"> <li>• Vital signs within normal limits, afebrile</li> <li>• Optimal saturation achieved</li> <li>• Heart rate (less than 100 beats/minute at rest)</li> <li>• Decrease in anxiety</li> </ul> <p><b>Activity/ADL's</b></p> <ul style="list-style-type: none"> <li>• Tolerating activity level</li> <li>• Increasing mobility level</li> <li>• Returning to baseline level of mobility</li> </ul> <p><b>Nutrition</b></p> <ul style="list-style-type: none"> <li>• Tolerating diet</li> <li>• Good swallowing function, no aspiration</li> </ul> <p><b>Medication Teaching</b></p> <ul style="list-style-type: none"> <li>• Patient understands indication for use of long and short acting medications before discharge</li> </ul> <p><b>Smoking Cessation/Counselling</b></p> <ul style="list-style-type: none"> <li>• No symptoms of nicotine withdrawal</li> </ul> <p><b>Follow-up Appointments/Services</b></p> <ul style="list-style-type: none"> <li>• Patient receives written confirmation of appointment dates and times</li> </ul> <p><b>Discharge Planning</b></p> <ul style="list-style-type: none"> <li>• Ensure functional and psychosocial issues addressed by allied team members prior to discharge</li> <li>• Home oxygen arranged if eligible</li> </ul> |
| <input type="checkbox"/> COPD outreach team   | MD Init _____ Date _____                    |                          |  |                          |   |                          |   |                          |   |                          |  |                          |                                |                          |  |
| <input type="checkbox"/> Lung Association Referral  | MD Init _____ Date _____                    |                          |  |                          |   |                          |   |                          |   |                          |  |                          |                                |                          |  |
| <input type="checkbox"/> Champlain Lung Health Referral   | MD Init _____ Date _____                    |                          |  |                          |   |                          |   |                          |   |                          |  |                          |                                |                          |  |
| <input type="checkbox"/> TOH COPD Education (PFT Lab)   | MD Init _____ Date _____                    |                          |  |                          |   |                          |   |                          |   |                          |  |                          |                                |                          |  |
| <input type="checkbox"/> TRC Pulmonary Rehabilitation   | MD Init _____ Date _____                    |                          |  |                          |   |                          |   |                          |   |                          |  |                          |                                |                          |  |
| <input type="checkbox"/> Montfort Pulmonary Rehabilitation  | MD Init _____ Date _____                    |                          |  |                          |   |                          |   |                          |   |                          |  |                          |                                |                          |  |
| <input type="checkbox"/> Other  | MD Init _____ Date _____                    |                          |  |                          |   |                          |   |                          |   |                          |  |                          |                                |                          |  |

## Appendix B - COPD Care Pathway –Order Set (page 7 of 7)

Patient \_\_\_\_\_ Chart No. \_\_\_\_\_

## PHASE 3: Safe Transition (continued)

Patient progress corresponds with clinical pathway: D: 8–12 h day shift E: evening shift, if applicable N: 8–12 h night shift

Date: (yyyy/mm/dd) \_\_\_\_\_

D  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_E  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_N  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_

Date: (yyyy/mm/dd) \_\_\_\_\_

D  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_E  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_N  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_

Date: (yyyy/mm/dd) \_\_\_\_\_

D  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_E  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_N  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_

Date: (yyyy/mm/dd) \_\_\_\_\_

D  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_E  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_N  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_

Date: (yyyy/mm/dd) \_\_\_\_\_

D  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_E  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_N  Yes  No Signature: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_ NTV – circle above, VC \_\_\_\_\_

## Pharmacist Signature

Signature: \_\_\_\_\_ Initials: \_\_\_\_\_

Variance 492 Not discharged by end of pathway – continued need for acute care  
Codes (VC) 510 Not discharged by end of pathway – non-medical reasonNTV Non-Tracked Variance  
OFF Ordered off clinical pathway

## Appendix B - COPD Care Pathway –Physician Orders (page1 of 1)

| The Ottawa Hospital   LH/Ottawa   OCH/CHU  |                | PHYSICIAN'S ORDERS<br>Clinical Pathway (CP)  |  |
|--|----------------|--|--|
|  |                | □ Civic    □ General   |  |
| Medication Allergies/Reactions   |                | Substances or Food Allergies/Reactions   |  |
| □ None known   |                | □ None known   |  |
| Chronic Obstructive Pulmonary Disease Exacerbation (COPD-E) Admission Orders   |                |  |  |
| Init.  | Non-Medication | Init.  | IV and Medication (Medication, dose, route, frequency) |
| <input type="checkbox"/> Initiate clinical pathway for:<br>COPD – Exacerbation (CP 110A)<br>Admit to Service: _____<br>Attending Doctor: _____<br><br><input type="checkbox"/> Vital signs as per pathway<br><input type="checkbox"/> OR _____<br><input type="checkbox"/> Weight and BMI measurement (kg/m <sup>2</sup> ) on admission (Document BMI in pathway)<br><br>Diet:<br><input type="checkbox"/> NPO <input type="checkbox"/> High calorie, high protein diet<br><input type="checkbox"/> Diabetic diet<br><input type="checkbox"/> Other _____<br><br>Isolation Precautions:<br><input type="checkbox"/> Droplet Precautions<br><input type="checkbox"/> Airborne Precautions<br><input type="checkbox"/> Contact Precautions<br><br>Tests:<br><input type="checkbox"/> PA/Lateral chest x-ray (enter on CPOE)<br>OR <input type="checkbox"/> Portable chest x-ray (enter on CPOE)<br><input type="checkbox"/> EKG<br><input type="checkbox"/> CBC, Creatinine, Na, K, Cl, HCO <sub>3</sub> daily × 3 days<br><input type="checkbox"/> CK, Tnl<br><input type="checkbox"/> Arterial Blood Gas    OR <input type="checkbox"/> Venous Blood Gas<br><input type="checkbox"/> Nasopharyngeal swab for respiratory viruses<br><input type="checkbox"/> Sputum for bacterial culture and sensitivity<br><input type="checkbox"/> INR    OR <input type="checkbox"/> INR daily × 3 days<br><input type="checkbox"/> Other _____<br><br>Oxygen:<br><input type="checkbox"/> Titrate oxygen for saturations between 88–92% (policy PG 05-0-153)<br>OR <input type="checkbox"/> Titrate oxygen for saturations 92% or more<br>OR    _____<br><input checked="" type="checkbox"/> Notify RT if patient requires greater than 50% FiO <sub>2</sub><br><br>Non-invasive Ventilation:<br><input type="checkbox"/> Initiate Bi-Level Ventilation (consider if pH less than 7.35, increased work of breathing)<br><input type="checkbox"/> Bi-Level initial settings:<br>IPAP _____ cmH <sub>2</sub> O, EPAP _____ cmH <sub>2</sub> O<br><br>Category Status:<br><input type="checkbox"/> Category status completed |                | <b>IV Fluids:</b><br><input type="checkbox"/> Normal saline 100 mL/hour × 2 hours THEN reassess<br><input type="checkbox"/> Other _____<br><br><b>Corticosteroids:</b><br><input type="checkbox"/> Prednisone 50 mg PO daily × 5 days THEN reassess<br>OR <input type="checkbox"/> Methylprednisolone 60 mg IV q24h × 48 hours (If unable to take PO) THEN reassess<br>OR <input type="checkbox"/> Other _____<br><br>Select an antibiotic if patient has at least 2 of the following 3 criteria present:<br>1) Increased sputum purulence    2) Increased sputum volume    3) Increased dyspnea<br>Choose an antibiotic from a different drug class than was used in the last 3 months<br><br><b>Antibiotics (Dose adjustment may be necessary for renal dysfunction):</b><br><input type="checkbox"/> Amoxicillin-clavulanic acid <input type="checkbox"/> 875 mg PO q12h    OR <input type="checkbox"/> 500 mg PO q8h<br>OR <input type="checkbox"/> Azithromycin 500 mg PO daily × 1 day, THEN 250 mg PO daily × 4 days*<br>OR <input type="checkbox"/> Cefuroxime axetil 500 mg PO q12h<br>OR <input type="checkbox"/> Doxycycline 100 mg PO q12h<br>OR <input type="checkbox"/> Levofloxacin 750 mg PO q24h*<br>OR <input type="checkbox"/> Trimethoprim/sulfamethoxazole 1 DS tab PO q12h<br>If unable to receive oral antibiotics: <input type="checkbox"/> Ceftriaxone 1 g IV q24h<br>OR <input type="checkbox"/> Levofloxacin 750 mg IV q24h*<br><br><b>Antivirals (Dose adjustment may be necessary for renal dysfunction):</b><br><input type="checkbox"/> Oseltamivir 75 mg PO q12h × 5 days (Treatment Dose)<br>* May prolong QT interval (check before prescribing)<br><br><b>Beta Agonist Therapy (choose one):</b><br><input type="checkbox"/> Salbutamol (Ventolin) MDI 100 mcg:<br><input type="checkbox"/> 2–4 puffs q4h straight × 48h THEN reassess    OR <input type="checkbox"/> 2 puffs q4h pm<br>OR <input type="checkbox"/> Salbutamol (Ventolin) via nebulizer (If unable to administer via MDI):<br><input type="checkbox"/> 2.5 mg (2.5 mL) q ____ h straight × 48h THEN reassess    OR <input type="checkbox"/> 2.5 mg (2.5 mL) q ____ h pm<br><br><b>Anticholinergic Therapy (choose one):</b><br><input type="checkbox"/> Tiotropium (Spiriva) Handihaler 18 mcg capsule for inhalation daily<br>OR <input type="checkbox"/> Ipratropium (Atrovent) MDI 20 mcg, 2–4 puffs q4h straight × 48h THEN reassess<br>OR <input type="checkbox"/> Ipratropium (Atrovent) via nebulizer 250 mcg (1 mL) q ____ h straight × 48h THEN reassess<br>(if unable to administer via MDI)<br>OR <input type="checkbox"/> Other _____<br><br><b>ICS/LABA Therapy (If indicated, choose one):</b><br>Fluticasone/Salmeterol (Advair) Diskus 1 puff q12h:<br><input type="checkbox"/> 100 mcg/50 mcg    OR <input type="checkbox"/> 250 mcg/50 mcg    OR <input type="checkbox"/> 500 mcg/50 mcg<br>OR <input type="checkbox"/> Budesonide/Formoterol (Symbicort) Turbuhaler 2 puffs q12h:<br><input type="checkbox"/> 100 mcg/6 mcg    OR <input type="checkbox"/> 200 mcg/6 mcg<br>OR <input type="checkbox"/> Other _____<br><br><b>Nicotine Replacement Therapy:</b> Complete HEA 107 (nicotine replacement therapy)<br><br><b>DVT Prophylaxis:</b><br>Enoxaparin: <input type="checkbox"/> 40 mg SC daily    OR <input type="checkbox"/> 30 mg SC daily (if CrCl less than 30 mL/min)<br>OR <input type="checkbox"/> Heparin 5000 units SC q ____ h (if CrCl less than 30 mL/min)<br>OR <input type="checkbox"/> Other _____<br><br><b>Bowel Protocol:</b> Physician to complete constipation protocol SPO 226 |  |
| Date (yyyy/mm/dd)  | Time           | Physician (printed)  | Signature (Physician)                                  |
| Date (noted)   | Time           | Processed by   | Signature (Nurse)                                      |

SPO CP 110 (06/2017)

1-CHART

2-PHARMACY

Proof 5