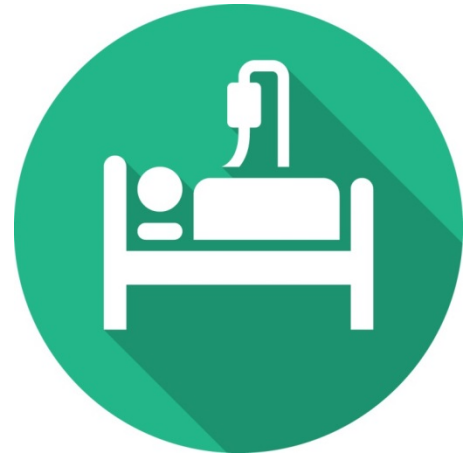


CLINICAL PATHWAY

Acute Medicine



Chronic Obstructive Pulmonary Disease



CHRISTIANA CARE
HEALTH SYSTEM

Chronic Obstructive Pulmonary Disease

Table of Contents (tap to jump to page)

INTRODUCTION	1
Scope of this Pathway	1
Pathway Contacts	1
CLINICAL PATHWAY	3
Diagnosis and Staging of COPD	3
Table 1: MRC Breathlessness Scale	3
Table 2: Combined Assessment of COPD Risk	4
Management of COPD Exacerbations	4
Initial Assessment	5
Outpatient Management and Care	6
Inpatient Management	7
Monitoring in the Hospital	9
Palliative Care	10
Discharge from the Hospital	11
PATHWAY ALGORITHMS	13
Algorithm 1: COPD Care Management Pathway	13
Algorithm 2: COPD Clinical Pathway	13
PATIENT EDUCATION MATERIALS	14
CLINICAL EDUCATION MATERIALS	15
REFERENCES	16
ACKNOWLEDGEMENTS	17

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a term used to describe lung diseases that include emphysema, chronic bronchitis, refractory (non-reversible) asthma, and some forms of bronchiectasis. This disease is characterized by increasing breathlessness. Christiana Care has established a COPD pathway to optimize care delivery and focus on the most effective clinical and transitional elements, setting our patients, families and providers up for success in managing this disease most effectively.

Scope of this Pathway

The pathway scope starts on presentation for possible inpatient admission at Christiana Hospital. Patients identified suffering from an exacerbation of COPD will initiate a series of clinical and care management pathways. Specified order sets will be triggered based on for clinician order based on COPD tags or fulfillment of other clinical/diagnostic criteria. These power plans will be embedded within standard workflows for providers and are aimed at directing best practice care delivery with consistency. Any patient previously admitted for COPD and at high risk for readmission will be seen by a COPD case manager who will focus on facilitating evidence based care delivery helping the caregivers and patient/families navigate our health care delivery system. Their COPD case manager will work to prepare the patient for a smooth discharge, which will include all transitional care elements for the first 30 days. This will start on admission and end 30 days post-discharge.

Pathway Contacts



The content of this pathway is developed and maintained by the Acute Medicine line of Christiana Care Health System. Questions or feedback about the content may be directed to:

**Administrative Lead: Francis A. Gott III, Administrative Director,
Pulmonary Services and Medical Critical Care**

phone: 302-733-3524

e-mail: fgott@christianacare.org

**Physician Lead: Vinay Maheshwari, M.D., Associate Chair of Specialty
Medicine**

phone: 302-733-5179

e-mail: vmaheshwari@christianacare.org



CLINICAL PATHWAY

Diagnosis and Staging of COPD

COPD disease severity is best assessed by combining the following aspects:

- Degree of airflow limitation based on spirometry
 - » GOLD 1: mild— $FEV_1 \geq 80\%$ predicted.
 - » GOLD 2: moderate— $50\% \leq FEV_1 < 80\%$ predicted.
 - » GOLD 3: severe— $30\% \leq FEV_1 < 50\%$ predicted.
 - » GOLD 4: very severe— $FEV_1 < 30\%$ predicted.
- Risk of Exacerbations
 - » 2 or more treated events within the past year.
- Symptoms
 - » Assessed by the Medical Research Council (MRC) Dyspnea Scale [Table 1].
- Comorbidities
 - » Cardiovascular diseases, osteoporosis, depression and anxiety, skeletal muscle dysfunction, metabolic syndrome and lung cancer, among other diseases, occur frequently in COPD patients. These comorbid conditions may influence mortality and hospitalizations, and should be looked for routinely and treated appropriately.

TABLE 1: MRC BREATHLESSNESS SCALE



GRADE	DEGREE OF BREATHLESSNESS RELATED TO ACTIVITIES
1	Not troubled by breathless except on strenuous exercise.
2	Short of breath when hurrying on a level or when walking up a slight hill.
3	Walks slower than most people on the level, stops after a mile or so, or stops after 15 minutes walking at own pace.
4	Stops for breath after walking 100 yards, or after a few minutes on level ground
5	Too breathless to leave the house, or breathless when dressing/undressing.

TABLE 2: COMBINED ASSESSMENT OF COPD RISK

PATIENT RISK	SPIROMETRY CLASSIFICATION	EXACERBATIONS PER YEAR	MRC
A-Low Risk/Less Symptoms	GOLD 1-2	≤ 1	0-1
B-Low Risk/More Symptoms	GOLD 1-2	≤ 1	≥ 2
C-High Risk/Less Symptoms	GOLD 3-4	≤ 2	0-1
D-High Risk/More Symptoms	GOLD 3-4	≤ 2	≥ 2

Management of COPD Exacerbations

- A COPD exacerbation represents an acute/subacute event that is characterized by a worsening of the patient's respiratory symptoms. Generally, this impacts daily activities and leads to a change in treatment plan.
- The most common causes for exacerbations appear to be viral and bacterial infections of the tracheobronchial tree.
- Treatment goals are aimed at minimizing the impact of the current exacerbation and to prevent the development of subsequent exacerbations.



- Short-acting inhaled beta2 –agonists (SABA's) with or without short-acting anticholinergics are usually the preferred bronchodilators for treatment of an exacerbation. They often require increased dosage or frequency.
- Systemic corticosteroids and antibiotics can shorten recovery time, improve lung function, reduce length of hospitalizations, and minimize the risk of treatment failure.
- Smoking cessation, vaccinations, Pulmonary rehabilitation and proper use of medications are non-pharmacologic measures that can prevent COPD exacerbations.

Initial Assessment

- Review baseline PFTs, specifically FEV1.
- Previous exacerbations, hospitalization, ED visits.
- Measure pulse oximetry.
- Consider ABG/VBG if concerns for hypoventilation.
- Consider chest X-ray to identify alternative or concomitant conditions.
- Consider EKG.

Assess risk factors for poor outcomes that suggest hospitalization required

Pre-Morbid Factors

- Severe underlying COPD (FEV1 <50% of predicted).
- Frequent previous exacerbations or hospitalizations (more than 3/year).



- Presence of comorbid conditions.
- Antibiotic use within the last 3 months.
- Advanced age.

Clinical Signs

- Use of accessory respiratory muscles.
- Hemodynamic instability.
- Evidence of right heart failure.
- Reduced consciousness.
- Uncontrolled arrhythmias.

Consider Hospitalization If:

Significant risk factors for poor outcome, anticipated need for ventilator support, and/or poor home support for care needs

Outpatient Management and Care

If criteria for hospitalization are not met, patient may be discharged home with the following as applicable:

- Instructions for increased inhaled medication therapy
- Oral steroids for 5-7 days
- Antibiotics if increased purulence or volume of sputum
- Assurance of adequate home medications and delivery equipment
- Instructions for follow up with health care provider in 5-7 days



- Patients at risk of having an exacerbation of COPD should be given self-management education, tools, and clear instructions to promote prompt attention to the symptoms of an exacerbation.
- Patients should be encouraged to respond promptly to the symptoms of an exacerbation by:
 - » Starting oral corticosteroid therapy if their increased breathlessness interferes with activities of daily living.
 - » Starting antibiotic therapy if their sputum is purulent.
 - » Increase their bronchodilator therapy to control their symptoms.
 - » These should be outlined in an Action Plan.

Patients given self-management plans should be advised to contact a healthcare professional if they do not improve.

Inpatient Management

Antibiotics

- Antibiotics should be used to treat exacerbations of COPD associated with increased sputum purulence and/or volume.
- Patients with exacerbations without more purulent sputum do not need antibiotic therapy unless there is consolidation on a chest radiograph or clinical signs of pneumonia.
- Initial empiric antibiotic treatment should include a PO beta-lactam derivative, macrolide, or a tetracycline.
- Considerations for pseudomonas risk factors, local resistance patterns, and other infections such as pneumonia may further guide antibiotic choices.



Vaccinations

- All patients with COPD should receive Pneumonia and Influenza vaccinations unless medically contraindicated.

Corticosteroids

- Corticosteroids are recommended if baseline FEV₁ is less than 50% of predicted and should be considered for most patients admitted with exacerbation.
- May shorten recovery time, improve FEV₁, and improve hypoxemia.
- Oral steroids should be administered unless there is barrier to PO administration.
- Initial dose: Prednisone 40-60 mg (or equivalent).
- Titration: Reduce over 7 to 14 days. There is no advantage to prolonged courses over 14 days except in select circumstances.

Inhaled Medications

- During exacerbations, Inhaled short-acting beta₂-agonists (SABA s) should be administered with increased dose and/or frequency.
- All SABA's show equal efficacy-there is no significant clinical benefit related to bronchodilation or tachycardia between SABA's.
- Anticholinergics and combination LABA/ICS should be considered as adjunctive therapy.

Smoking Cessation & Nicotine Replacement Therapy

- Smoking cessation is an important component of effective COPD treatment.



- Encourage COPD patients to stop smoking, identify barriers to successful cessation.
- If patient is an active smoker, administer Nicotine Replacement Therapy (NRT) if medical conditions allow.
- Ask about the willingness to quit smoking and provide direct referral to Delaware Quit Line.

Oxygen and Ventilation Support

- All patients should have intermittent or continuous pulse oximetry administered based on clinical condition. ABG's may be necessary in certain patients for oxygen assessment.
- Administer oxygen to maintain oxygen levels per oxygen protocol or individualized for patient specific levels.
- Non-Invasive Ventilation (NIV) should be used as the treatment of choice for acute and/or persistent hypercapnic ventilatory failure during exacerbations despite optimal medical therapy.
- NIV should be delivered in a dedicated setting with staff who have been trained in its application and have experience with use.
- Careful monitoring is required for those on NIV for acute respiratory failure with clearly outlined plans for escalation to invasive support if required.

Monitoring in the Hospital

- Patients' recovery should be monitored by regular clinical assessment of their symptoms.
- This includes regular assessments of dyspnea scores and ability to titrate inhaled medications by respiratory therapy.



- Functional capacity assessment by nursing and physical therapy.
- Intermittent arterial blood gas measurements should be used to monitor the recovery of patients with respiratory failure who are hypercapnic or acidotic, until they are stable.
- End Tidal CO₂ (ETCO₂) may have a role for ongoing assessment.
- Daily monitoring of PEF or FEV₁ should not be performed routinely to monitor recovery.

Palliative Care

Palliative care should be considered in patients with severe COPD associated with:

- Frequent exacerbations and hospitalization.
- Acute respiratory failure requiring invasive mechanical ventilation.
- Progressive symptoms of dyspnea with significant impairment of ADLs.
- Development of cor pulmonale.

Goals should include:

- Minimize symptoms, which can include severe cough and breathlessness.
- Assess and for associated anxiety, and depression.
- Education in breathing techniques and Pulmonary rehabilitation.
- Discuss disease prognosis and progression.
- Clarify goals of care.
- Encourage completion of Advance Directives and a DMOST form.



Discharge from the Hospital

Criteria for Discharge

- Inhaled short-acting beta2 -agonist therapy is required no more frequently than every 4 hrs.
- If previously ambulatory, patient is able to walk across room.
- Dyspnea does not prevent adequate eating or sleep.
- Clinically stable for 12-24 hrs, including gas exchange parameters.
- Patient demonstrates understanding on correct medication use.
- Assessment for durable medical equipment such as oxygen, NIV, etc have been completed and arrangements completed.
- Patients re-established on their optimal maintenance bronchodilator therapy before discharge.

Discharge Checklist

Should be completed prior to patient discharge

- Evaluate medication administration, patient understanding and review side effects.
- Evaluate medication affordability and access, modify as necessary if appropriate alternatives are available.
- Schedule follow up appointment with PCP or Pulmonologist.
- Arrangements for follow-up and home care (such as visiting nurse, oxygen delivery, nebulizer, NIV, etc).
- COPD education.



- Completion of COPD self-management Action Plan.
- If spirometry not known to be completed within last 3 years, arrange for outpatient spirometry.
- Place Pulmonary Rehabilitation order if criteria met.

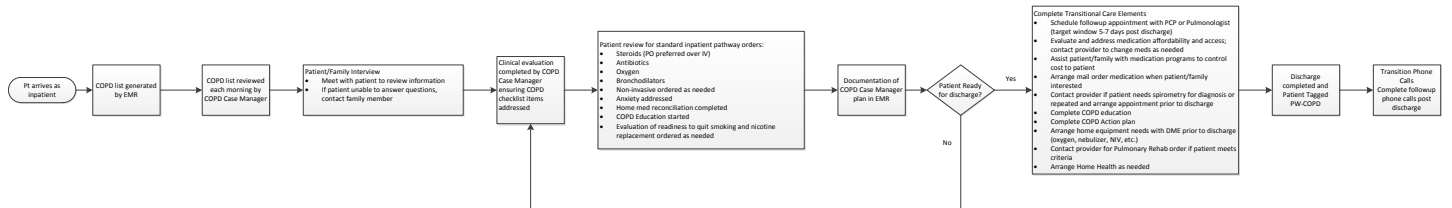
Criteria for Pulmonary Rehabilitation

- Pulmonary rehabilitation should be considered for all patients with COPD who have dyspnea or other respiratory related symptoms. This includes reduced tolerance to exercise restricted activities of daily living.
- Spirometry is required indicating obstructive disease.
- Pulmonary rehabilitation is beneficial for patients with early stage COPD with symptoms as well as advanced stage patients.
- Both active smokers and non-smokers derive benefit from rehabilitation.

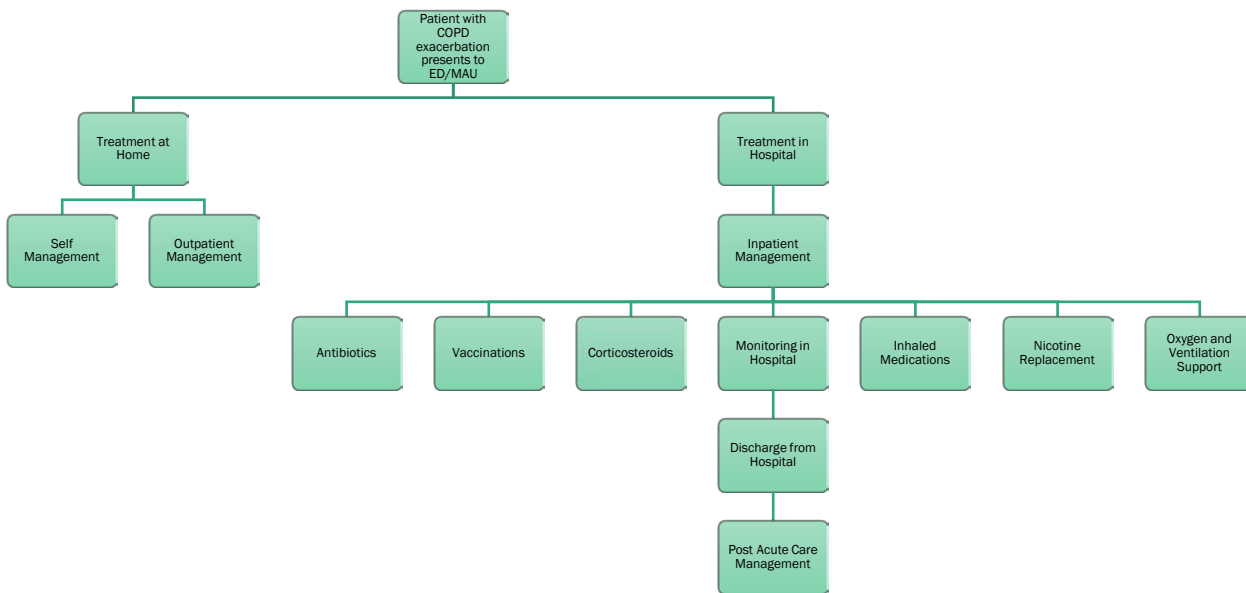


PATHWAY ALGORITHMS

ALGORITHM 1: COPD CARE MANAGEMENT PATHWAY



ALGORITHM 2: COPD CLINICAL PATHWAY



PATIENT EDUCATION MATERIALS



<http://www.copdfoundation.org/> The COPD Foundation has been established to speed innovations which will make treatments more effective and affordable, undertake initiatives that result in expanded services for COPD patients, and improve the lives of patients with COPD and related disorders through research and education that will lead to prevention and someday a cure for this disease.



CLINICAL EDUCATION MATERIALS



<http://www.goldcopd.org/> The Global Initiative for Chronic Obstructive Lung Disease (GOLD) works with health care professionals and public health officials to raise awareness of Chronic Obstructive Pulmonary Disease (COPD) and to improve prevention and treatment of this lung disease for patients around the world.



[Doctot GOLD COPD Strategy](#) for iPhone provides the GOLD strategy for assessing and treating COPD in a user-friendly and easily navigable format with interactive tables and charts. Physicians can easily record patient answers to questions about symptoms and functional status, and the app automatically generates and categorizes the patient's score on the Combined Assessment of COPD Scale.



REFERENCES

- <http://www.goldcopd.org>
- <http://pathways.nice.org.uk/pathways/chronic-obstructive-pulmonary-disease>
- American Thoracic Society COPD statements



ACKNOWLEDGEMENTS

- Vinay Maheshwari
- Fran Gott
- Dede Sullivan
- John Emberger
- Carmen Pal
- Mary Gant
- Mark Jones
- Albert Rizzo
- Patty Resnick
- Tom Dunlop
- Brian McGee



THE CHRISTIANA CARE WAY

We serve our neighbors as respectful, expert, caring partners in their health. We do this by creating innovative, effective, affordable systems of care that our neighbors value.



CHRISTIANA CARE
HEALTH SYSTEM

©2016 Christiana Care Health Services, Inc.

This work is licensed under the Creative Commons Attribution-Non Commercial-ShareAlike 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-sa/4.0/> or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.