Guidelines for the Medical Management of COPD Following Inpatient Admission

In an effort to standardize practice guidelines for the management of patients with COPD, the following recommendations have been developed for the post-discharge follow up. Please see the attached document with the additional recommendations developed for inpatient management and discharge instructions including discharge medications.

Discharge medications may be mandated by insurance coverage and based on the patient's concomitant disease states, adherence, and their ability to afford the medication(s) and monitoring requirements.

Medications:

1. Continue Long Acting Muscarinic Agonist (LAMA):
    - Aclidinium (Tudorza) inhaler OR
    - Tiotropium (Spiriva) inhaler OR
    - If unable to use either device – ipratropium nebulizer

2. Continue Short Acting Beta Agonist (SABA) Rescue prn:
    - Albuterol inhaler or nebulizer

3. Patients discharged with an inhaled corticosteroid (ICS)/long acting beta agonist (LABA) combination:
    - ICS/LABA:
        - Budesonide/formoterol (Symbicort) inhaler OR
        - Fluticasone/salmeterol (Advair) inhaler OR
        - Mometasone/formoterol (Dulera) inhaler
    - ICS:
        - Beclamethasone (QVAR) inhaler OR
        - Budesonide (Pulmicort) inhaler OR
        - Fluticasone (Flovent) inhaler OR
        - Mometasone (Asmanex) inhaler
        - If unable to use ICS inhaler, consider budesonide nebulizer
    - LABA:
        - Indacaterol (Arcapta) inhaler OR
        - Formoterol (Foradil) inhaler OR
        - Salmeterol (Serevent) inhaler
        - If unable to use LABA inhaler, consider formoterol nebulizer
    - If clinical stability is maintained over a period of months:
        - Either the ICS component can be reduced OR
        - DC the LABA
        - Decision to do either must be individualized based on the risks

4. Patients should have received a 10 day course of Prednisone 40mg per day. For patients requiring a longer course of steroids:
    - Taper over the following 2 weeks to 10mg every other day, then hold.
    - If flare up, restart full course of therapy: 40mg for 10 days, 10mg for 7 days, then 10mg every other day.

5. Complete full course of antibiotics if prescribed inpatient:
    - Doxycycline 7 – 10 days OR
    - Azithromycin for 5 days

6. There is limited research on the effectiveness of the following medication regimen but may be considered in patients who are compliant with their medication regimen but still have frequent exacerbations. This therapy must be initiated by a pulmonologist with joint follow up care with the PCP on a monthly basis for at least 6 months.
    - Chronic macrolide therapy – Azithromycin 250 mg 3 times per week. Ensure a baseline EKG and hearing evaluation has been completed. Repeat EKG with any change in clinical scenario, drug therapy changes, or as deemed necessary by the provider OR
    - Roflumilast

Non-Medication Follow Up:

1. Urgent follow up appointment should be provided within 7 days of discharge.

2. Consider referral to Pulmonary within 2 weeks for patients with:
    - Severe or very severe COPD - if known, FEV1 $\leq$ 50% of predicted
    - 2 or more admissions for COPD exacerbations within the prior 6 months for evaluation of advanced treatment strategies
    - Readmission despite compliance with medical management
    - O2 dependent patients
    - Patients needing "novel" approach to improve compliance
    - On chronic oral corticosteroids for prevention of COPD exacerbations

3. Verify patient is using inhalers properly.

4. Ensure patient is able to obtain medications and/or is enrolled in prescription assistance program.

5. Refer to Pulmonary Rehab for patients who are symptomatic despite optimal medical management especially for refractory dyspnea.

6. If no prior spirometry, order PFT's or spirometry. Repeat annually.

Medical Management for Inpatient Acute Exacerbation of COPD - General Practice Units

Inpatient	At Discharge	Post Discharge Follow Up
Medications:		
Ipratropium nebulized ATC q 4 hours	*Insurance coverage may mandate medication to be prescribed *Decision should be individualized for the patient based on their concomitant disease states, adherence and their ability to afford the med(s) and monitoring requirements. **Long Acting Muscarinic Agonist (LAMA):** -*Aclidinium (Tudorza) inhaler OR -*Tiotropium (Spiriva) inhaler OR -*If unable to use either device - ipratropium nebulizer	Continue **LAMA**
Albuterol nebulized q 4 hours ATC as initial therapy -Wean frequency to as needed **Patients requiring more frequent treatment require ICU consult and transfer**	**Short Acting Beta Agonist (SABA) Rescue** -Albuterol inhaler or nebulizer	Continue **SABA** prn
Continue **inhaled corticosteroid (ICS) AND/OR inhaled long acting beta agonist (LABA)** OR Inhaled corticosteroid(ICS)/LABA combination product Use equivalent dose of fluticasone/salmeterol inhaler (continue if already using an ICS/LABA combination product at home)	Before choosing the inhaler product for discharge, consider: *Insurance coverage may mandate medication to be prescribed *Combination of ICS/LABA is favored over ICS alone unless patient has undue tachycardia from LABA **ICS/LABA:** - Budesonide/formoterol (Symbicort) inhaler OR - Fluticasone/salmeterol inhaler (Advair) inhaler OR - Mometasone/formoterol (Dulera) inhaler Inhaled corticosteroid (**ICS**): - Beclamethasone (QVAR) inhaler OR - Budesonide (Pulmicort) inhaler OR - Fluticasone (Flovent) inhaler OR - Mometasone (Asmanex) inhaler *If unable to use ICS inhaler, consider budesonide nebulizer **LABA:** - Indacaterol (Arcapta) inhaler OR - Formoterol (Foradil) inhaler OR - Salmeterol (Serevent) inhaler *If unable to use ICS inhaler, consider budesonide nebulizer *If unable to use LABA inhaler, consider formoterol nebulizer	Wean to **ICS** alone if clinically stable on **ICS/LABA** combination. If clinical stability is maintained over a period of months: -Either the ICS component can be reduced OR -DC LABA *Decision to do either must be individualized based on the risks
Prednisone 40mg PO daily (or equivalent IV steroid dose if unable to tolerate PO) *Steroids are equally effective when administered IV or PO. IV route is preferred for doses greater than 60mg/day	Prednisone 40mg PO daily to complete a 10-day course. Steroid treatment may be longer if needed (i.e., patients who have previously failed shorter courses of oral corticosteroids). Require OPD pulmonary follow up appointment within 2 weeks.	Patients requiring a longer course of steroids: -Taper over the following 2 weeks to 10mg qod, then hold. -If flare up, restart full course of therapy: 40mg x 10 days, 10mg x 7 days, then 10mg qod
Antibiotic (doxycycline or azithromycin as empiric antibiotics with coverage for H. influenzae, S. pneumoniae, M catarrhalis) if change in sputum quantity or characteristics: -Patients with 3/3 cardinal symptoms (increased dyspnea, increased sputum volume and increased sputum purulence) -Patients with 2/3 cardinal symptoms if increased sputum purulence is one of the two symptoms -All patients requiring invasive or non-invasive ventilation	Antibiotic if prescribed inpatient to complete full course: -Doxycycline 7 - 10 days OR -Azithromycin for 5 days	Antibiotic if prescribed inpatient to complete full course: -Doxycycline 7 - 10 days OR -Azithromycin for 5 days
There is limited research on the effectiveness of the following medication regimen but may be considered in patients who are compliant but still have frequent exacerbations. **This therapy must be initiated by a pulmonologist with joint follow up care with the PCP.** -Chronic macrolide therapy - Azithromycin 250mg 3X week -(Baseline and/or serial EKG's to assess for prolonged QT interval must be completed. Hearing evaluation should also be completed.) -Roflumilast (Daliresp) - requires a non-formulary medication request If patient is currently on roflumilast or chronic macrolide therapy as an outpatient: -Continue chronic macrolide therapy (Baseline and/or serial EKG's to assess for prolonged QT interval must be completed. Hearing evaluation should also be completed.) -Continue roflumilast and complete a non-formulary medication request -Consult pulmonary for evaluation of therapy	Discharge instructions per pulmonary If chronic macrolide therapy is continued at discharge, ensure patient has hearing evaluation and EKG (QTc monitoring) noted for follow up in the discharge summary	Follow up should be provided jointly by PCP and pulmonary monthly for 6 months Ensure hearing evaluation has been completed for patients receiving macrolide therapy. Ensure baseline EKG completed. Repeat with any change in clinical scenario, drug therapy changes, or as deemed necessary by the provider.

Additional Interventions:	At Discharge:	Post Discharge Follow Up
Supplemental O2 as needed	Provide supplemental O2 for discharge if appropriate	
Tobacco cessation counseling	PCP follow up appointment must be scheduled within 7 days of discharge	Urgent follow up appointment should be provided.
Influenza and Pneumococcal vaccine if not up to date	Schedule Pulmonary follow up appointment within 2 weeks for patients with: -severe or very severe COPD - if known, FeV1 $\leq$ 50% of predicted -2 or more admissions for COPD exacerbations within the prior 6 months for evaluation of advanced treatment strategies -Readmission despite compliance -O2 dependent patients -Patients needing "novel" approach to improve compliance -On chronic oral corticosteroids for prevention of COPD exacerbations	Consider referral to Pulmonary within 2 weeks for patients with: -severe or very severe COPD - if known, FeV1 $\leq$ 50% of predicted -2 or more admissions for COPD exacerbations within the prior 6 months for evaluation of advanced treatment strategies -Readmission despite compliance -O2 dependent patients -Patients needing "novel" approach to improve compliance -On chronic oral corticosteroids for prevention of COPD exacerbations
Assessment of inhaler use by nursing/pharmacy/respiratory Provide education as needed by nursing/pharmacy/respiratory Assess prescription coverage for discharge and ability to pay	Assure patient is able to use inhaler provided at discharge: Pharmacy/nursing/respiratory Provide voucher and/or enroll in prescription assistance program if needed	Verify patient properly using inhaler Ensure patient is able to obtain medications and/or is enrolled in prescription assistance program
	Home care referral with Telehealth monitoring	Refer to Pulmonary Rehab for patients who are symptomatic despite optimal medical management especially for refractory dyspnea
Obtain spirometry while inpatient if not done previously		If no prior spirometry, order PFT's or spirometry. Repeat annually.

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References:

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Diagnosis and Management of Stable Chronic Obstructive Pulmonary Disease: A Clinical Practice Guideline from the American College of Physicians, American College of Chest Physicians, American Thoracic Society, and European Respiratory Society (2011). ACP Clinical Practice Guidelines.

Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease (Revised 2011).