

HEALTH SERVICES POLICY & PROCEDURE MANUAL

North Carolina Department Of Correction
Division Of Prisons

SECTION: Chronic Disease Guidelines

POLICY # CD-5

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SUBJECT: Pulmonary Disease

EFFECTIVE DATE: October 2007

SUPERCEDES DATE: None

PURPOSE

To assure that DOP inmates with Pulmonary Diseases are receiving high quality Primary Care for their condition.

POLICY

All DOP Primary Care Providers and Chronic Disease Nurses are to follow these guidelines when treating inmates with this chronic disease. Deviations from these guidelines are permissible only on a case by case basis. When deviations are made they must be clearly documented in the medical record along with a clear explanation of the rationale for the deviation.

PROCEDURE

PULMONARY DISEASE

(Document care on Pulmonary Flow Chart, DC-815.)

1. **Initial evaluation:** May be done by Chronic Disease Nurse (CDN) at the first housing assignment after processing. It should be completed within 30 days of arrival at the first housing assignment. If good control should see MD/PA within 60 days of the initial evaluation by CDN, if new diagnoses or partial/poor control must see MD/PA within 15 – 30 days.
 - A. **Vital Signs:** Blood pressure and pulse standing and lying, resp. rate, height and weight without shoes, and determine BMI.
 - B. **History of Present Illness:** Any current symptoms or side effects, compliance with medication. Pulmonary ROS – Ask if they are having any chest pain, SOB, edema, cough, sputum production, or exercise intolerance. Also ask about symptoms of anxiety/depression. These conditions are often present in patients with moderate to severe disease, particularly COPD.
 - C. **Pulmonary History:** When first diagnosed, previous medications and/or treatments, any previous problems with medications, any surgery or hospitalizations. Is there any personal history of asthma, chronic bronchitis, emphysema, COPD, pneumonia, TB or other chronic pulmonary infections, collapsed lung, lung cancer, asbestosis, brown/black lung? What is their immunization status (i.e. influenza and Pneumovax).
 - D. **Medications:** Complete list of all prescription and OTC medications (ask specifically about aspirin, Goody's Powders, NSAIDS) and herbal remedies they have been taking in the past 6 months.
 - E. **Social History:** Smoking, alcohol use, illicit drug use, exercise (how much and how often). Occupational history, specifically ask about any work in mining, cotton mills, ship building, or with asbestos.
 - F. **Family History:** Ask if there is any history of asthma, chronic bronchitis, emphysema, and COPD.
 - G. **Physical Exam:** Cardiovascular and pulmonary exam plus general if not done within the past 60 days, plus any other areas of concern identified from history.
 - H. **Assessment:**
 1. **Good Control:**
 - a. **ASTHMA** = no or minimal SOB, use of rescue inhaler \leq 2 days of the week, no or minimal impact on activities.
 - b. **COPD/CHRONIC BRONCHITIS/EMPHYSEMA** = stable symptoms over the past 3 months.
 2. **Partial control:**
 - a. **ASTHMA** = using rescue inhaler 3 – 5 days a week, but no serious attacks requiring ER/hospital visits in the past three months.
 - b. **COPD/CHRONIC BRONCHITIS/EMPHYSEMA** = mild to moderate worsening of symptoms, but no serious attacks requiring ER/hospital visits in the past three months.
 3. **Inadequate Control** = if the above are not met.

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- I. **PFT:** If diagnosis or level of control is uncertain and results will help determine correct therapy.
 - J. **Peak flow:** Do three attempts, encourage maximum effort and record the best result
 - K. **Labs:** BMP, Hepatic, and Lipid panels; dip stick urinalysis if not done in the past 6 months, have reviewed by MD/PA.
 - L. **Educate:** Usually it is best to discuss no more than one or two issues at a single visit and/or arrange for separate individual or group educational sessions (Listed in the order of importance)
 1. **Smoking cessation**
 2. **Proper use of inhalers**
 - a. **Stress** the need to take **preventative inhalers** (inhaled steroid, long acting beta agonist, anticholinergics, etc. when ordered by MD) on a **regular basis**.
 - b. **Make sick call** request if having to use **rescue inhalers > 2 days** a week for more than **3 weeks** in a row.
 - c. **Review** proper **MDI** and/or **spacer technique**.
 3. **Peak flow use** (when ordered by MD/PA)
 4. **Exercise:**
 - a. Goal: 30 – 60 Minutes of aerobic exercise 5 – 7 times a week.
 - b. If not doing regularly start with 10 – 15 minutes and increase by 1 minute everyday or every other day
 - c. Speed: As fast as they can walk without chest pain or severe SOB. Not so fast that they cannot carry on a conversation.
 5. **Avoidance of aspirin/NSAIDS**
 - M. **Assessment/Plan:**
 1. **Asthma:** Definition is based on pretreatment symptoms. (See table I for Diagnosis, see Table II for treatment)
 2. **COPD/Chronic Bronchitis/Emphysema**
 - a. **Definitions** (See Table III for Stages of COPD)
 - 1) **COPD:** The presence of airway obstruction ($FEV_1/FVC < 70\%$ after bronchodilation) due to chronic bronchitis or emphysema, which is usually progressive and may be partially reversible. Suggestive Features:
 - a) Mid-life onset
 - b) 10 – 20 or more pack year history of smoking
 - c) Slowly progressive symptoms
 - d) DOE which often progresses to dyspnea at rest
 - 2) **Chronic Bronchitis:** The presence of chronic productive cough for 3 months in each of two successive years where other causes of chronic cough have been excluded.
 - 3) **Emphysema:** The presence of abnormal permanently enlarged airspaces distal to the terminal bronchioles.
 - b. **Therapy** (See Table III also)
 - 1) **Stage 0:** At risk
 - a) STOP SMOKING
 - b) Influenza and pneumococcal vaccines
 - c) Exercise
 - d) Patient Education
 - 2) **Stage I:** $FEV_1/FVC < 70\%$, $FEV_1 \geq 80\%$, ADD:
 - a) **Beta₂-agonist MDI:** 1 – 2 puffs every 2 – 4 hours not to exceed 12 puffs per day
 - b) No evidence that these drugs alter the long term course of COPD, but they will often help symptoms even if there is no reversible component seen on PFT.
 - 3) **Stage II:** $FEV_1/FVC < 70\%$ & $FEV_1 = 50 - 80\%$ Consider adding one or more of the following:

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- a) **Ipratropium with or without Beta₂-agonist MDI:** 2 – 4 puffs 4 times a day either PRN or as a regular prescribed agent or
 - b) **Salmeterol:** 50 – 100 ug BID or
 - c) **Tiotropium:** 1 cap INH qd
 - 4) **Stage III:** FEV₁/FVC < 70% & FEV₁ = 30 – 50%
 - a) **Inhaled steroids:** consider if the patient has repeated exacerbations
 - b) **Oral steroids:** Should be avoided in the long term management of COPD
 - c) **Dietary Therapy:** Consider ordering a dietary consultation for patients who have a BMI < 20 or >30.
 - 5) **Stage IV:** FEV₁/FVC < 70% & FEV₁ < 30% or FEV₁ < 50% with chronic respiratory failure
 - a) **Oxygen:** In the appropriate patient this can both improve the quality and quantity of life
 - b) **pO₂ and O₂ Saturation (sO₂)** should be measured via ABG obtained after 30 minutes of normal air breathing
 - c) **If resting pO₂ & sO₂ do not meet criteria and patient is having severe dyspnea with exercise or sleep,** consider measuring pO₂ or sO₂ during these times
 - d) **Indications for oxygen therapy:**
 - 1) **pO₂ ≤ 55 or sO₂ ≤ 88%**
 - 2) In presence of EKG evidence of “P” pulmonale, hematocrit > 55%, or CHF. **pO₂ = 55 – 59 or sO₂ ≤ 89%**
 - 3) **If patient meets criteria at night or with exercise** oxygen should be prescribed for these indications
 - e) **Dosage**
 - 1) **O₂ flow rate adjusted so that resting pO₂ > 60 or sO₂ > 90%**
3. **Anxiety/Depression:** If the patient has symptoms which are poorly controlled and/or not currently being followed by Mental Health, refer patient to Mental Health for evaluation and/or treatment.
- N. **Convert medications to formulary:** If patient enters the system on non-formulary medications convert them to those available on formulary. Consult Central Pharmacy if you need assistance in making the conversion. Non-formulary requests will generally not be approved unless patient has been tried on the formulary agent first, even if current control is good.
- O. **Immunize**
1. **Pneumovax:** Administer if never received in the past. (If over 65 administer if not received since 65th birthday)
 2. **Flu:** Administer if appropriate time of year. If not, put on reminder list for vaccine.
- P. **Referral:** If being seen by Chronic Disease Nurse, refer to or discuss with MD/PA any patient who is having new or worsening symptoms, decrease in physical activity levels, or has a new abnormality or worsening on labs/studies.
- Q. **PULHEAT/Acuity level:** ***PULHEAT AND ACUITY LEVEL ARE TO BE REEVALUATED AT EVERY FOLLOW UP VISIT.*** Review their current rating and update as indicated. See PULHEAT guidelines for asthma or COPD for guidance. If being seen by Chronic Disease Nurse and she/he feels that there is a need for change in PULHEAT, she/he should review with MD/PA.
2. **Follow up evaluations:**
- A. **Frequency:** Minimum frequency of visits may be more frequent if clinical situation indicates a need for more frequent visits:
 1. **Good control:** See above for criteria.
 - a. **Chronic Disease Nurse** – every 3 – 6 months
 - b. **MD/PA** – every 6 - 12 months
 2. **Partial control:** See above for criteria.
 - a. **Chronic Disease Nurse** – every 2 – 3 month
 - b. **MD/PA** – every 3 – 6 months

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3. **Inadequate control:** See above for criteria.
 - a. **Chronic Disease Nurse** – every 1 – 2 month
 - b. **MD/PA** – every 1 – 2 months
 - B. **Vital signs:** Check sitting BP (also check standing BP if there are any complaints of dizziness or lightheadedness) and weight.
 - C. **Interval history:** Ask about the following:
 1. **Compliance with medications/ medication side effects**
 2. **Level of physical activity:** Ask if there has been any decrease since last visit
 3. **SOB:** How often, how severe (rate on a 1 – 10 scale), duration, what level of activity brings it on
 4. **MDI use:** Ask how many days of the week are they using their rescue inhaler
 - D. **Pulmonary review of systems:** Ask if they are having any chest pain, SOB, edema, cough, sputum production, or exercise intolerance. Self monitored Peak Flows.
 - E. **Other problems** – Ask if they are having any other problems/symptoms
 - F. **Health habits** – Ask about smoking, exercise, diet compliance
 - G. **Review MDI technique:** Re-educate if indicated
 - H. **Labs/studies:**
 1. **Peak flow** – Every visit
 2. **BMP** – annually if on steroids
 3. **Hepatic panel** – annually if on medications
 4. **Dip stick urinalysis** – annually
 5. **PFT** – as indicated by clinical situation
 6. **Oxygen saturation** – annually in stage II or III COPD
 - I. **Assessment/Plan:**
 1. **Evaluate control** – use criteria listed above under Initial Evaluation
 2. **Evaluate for anxiety/depression** – are there new symptoms or loss of adequate control of previously existing symptoms
 - J. **Education:** Review risk factors that have not previously been discussed and/or ones that are on going. Limit to one or two topics per visit
 - K. **Referral:** If being seen by Chronic Disease Nurse, refer to or discuss with MD/PA any patient who is having new or worsening symptoms, decrease in physical activity levels, or has a new abnormality or worsening on labs/studies
 - L. **PULHEAT/Acuity level:** ***PULHEAT AND ACUITY LEVEL ARE TO BE REEVALUATED AT EVERY FOLLOW UP VISIT.*** Review their current rating and update as indicated. See PULHEAT guidelines for asthma or COPD for guidance. If being seen by Chronic Disease Nurse and she/he feels that there is a need for change in PULHEAT, she/he should review with MD/PA



10/25/07

Paula Y. Smith, MD, Director of Health Services Date

SOR: Deputy Medical Director

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Table I. Clinical Features Before Treatment¹

<i>CLASS</i>	<i>SYMPTOMS²</i>	<i>NIGHTTIME SYMPTOMS</i>	<i>LUNG FUNCTION</i>
Mild Intermittent	<ul style="list-style-type: none"> • Symptoms ≤ 2 times a week • No symptoms & normal PEF between attacks • Attacks last few hours to a few days 	<ul style="list-style-type: none"> • ≤ 2 times a month 	<ul style="list-style-type: none"> • FEV1 or PEF $\geq 80\%$ predicted • PEF variability $< 20\%$
Mild Persistent	<ul style="list-style-type: none"> • Symptoms > 2 times a week • Attacks may affect activity 	<ul style="list-style-type: none"> • > 2 times a month 	<ul style="list-style-type: none"> • FEV1/PEF $\geq 80\%$ predicted • PEF variability 20 – 30%
Moderate Persistent	<ul style="list-style-type: none"> • Daily symptoms • Daily use of inhaled short-acting b2 agonist • Attacks affect activity 	<ul style="list-style-type: none"> • > 1 time a week 	<ul style="list-style-type: none"> • FEV1/PEF 61 – 79% predicted • PEF variability $> 30\%$
Severe Persistent	<ul style="list-style-type: none"> • Continual symptoms • Limited physical activity • Frequent attacks 	<ul style="list-style-type: none"> • Frequent 	<ul style="list-style-type: none"> • FEV1/PEF $\leq 60\%$ predicted • PEF variability $> 30\%$

1. The presence of one of the features of severity is sufficient to place a patient in that category. An individual should be assigned to the most severe grade in which any feature occurs.
2. Patients at any level of severity can have mild, moderate, or severe exacerbations. Some patients with intermittent asthma experience severe and life-threatening exacerbations separated by long periods of normal lung function and no symptoms.

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Table II. Stepwise Approach to Drug Therapy in Asthma

<i>CLASS</i>	<i>DAILY MEDICATIONS</i> ⁶	<i>QUICK RELIEF</i> ³	<i>EDUCATION</i>
I. Mild Intermittent	<ul style="list-style-type: none"> • None needed 	<ul style="list-style-type: none"> • Short-acting inhaled B2-agonist • Short bursts of PO prednisone if needed₄ 	<ul style="list-style-type: none"> • Basic facts about asthma • Inhaler/spacer technique • Role of medications • Environmental controls
II. Mild Persistent	<ul style="list-style-type: none"> • Inhaled low dose corticosteroids 	<ul style="list-style-type: none"> • Same as above 	<ul style="list-style-type: none"> • Same as above
III. Moderate Persistent	<ul style="list-style-type: none"> • Inhaled medium dose corticosteroids • If needed add long acting B2 agonist 	<ul style="list-style-type: none"> • Same as above 	<ul style="list-style-type: none"> • Same as above • Self monitoring (peak flow) • Develop action plan based on peak flow readings
IV. Severe Persistent	<ul style="list-style-type: none"> • Inhaled high dose corticosteroids AND • Leukotriene modifier and/or long acting B2 agonist AND • If needed PO prednisone⁵ 	<ul style="list-style-type: none"> • Same as above 	<ul style="list-style-type: none"> • Same as step III • Refer for individual education counseling

1. **Step down:** Review treatment every 2 to 6 months. If well controlled consider a gradual stepwise reduction in treatment to the lowest level of medications that will control symptoms and maintain lung function.
2. **Step up:** If control is not adequate or maintained, first review patient medicine technique, compliance, and/or environmental controls. Then if still not controlled consider a step up in therapy.
3. **Alternative therapy for quick relief:** Nebulizer with albuterol +/- ipratropium maybe be consider as an alternative to MDI particularly in severe attacks or in patients with poor MDI technique. Also Combivent MDI may also be more effective then albuterol alone and maybe considered when albuterol alone is in effective.
4. **Burst prednisone:** For severe exacerbations and those not improving with bronchodilators alone try a short burst of oral prednisone. Give 40 – 60 mgs per day for 7 to 14 days +/- a short taper. (Some recent studies have shown that tapers may not be needed for short bursts in asthma).
5. **Long term prednisone:** Start with 1 mg/kg/day up to 60 mgs then when controlled taper to lowest dose possible.
6. **Alternatives:** Though not usually considered as first line drugs (generally first line drugs should be tried before these agents) in some selected patients, theophylline or long acting oral B2 agonists maybe be helpful as add-ons or in replacement of the above. These drugs can be especially useful in controlling night time symptoms.

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Table III. Stages of COPD with Treatment

Stage	Characteristics	Treatment
0: At risk	<ul style="list-style-type: none"> • Chronic symptoms (cough, sputum) • Exposure to risk factors • Normal spirometry 	<ul style="list-style-type: none"> • Avoid risk factors • STOP SMOKING • Immunizations • Exercise training
I: Mild COPD	<ul style="list-style-type: none"> • $FEV_1/FVC < 70\%$ • $FEV_1 \geq 80\%$ • With or without symptoms 	<p>ADD:</p> <ul style="list-style-type: none"> • Short-acting bronchodilator if needed
II: Moderate COPD	<ul style="list-style-type: none"> • $FEV_1/FVC < 70\%$ • $50\% \leq FEV_1 < 80\%$ • With or without symptoms 	<p>ADD:</p> <ul style="list-style-type: none"> • Regular treatment with 1 or more long-acting bronchodilator • Consider dietary evaluation if over or underweight • Home exercise program
III: Severe COPD	<ul style="list-style-type: none"> • $FEV_1/FVC < 70\%$ • $30\% \leq FEV_1 < 50\%$ • With or without symptoms 	<p>ADD:</p> <ul style="list-style-type: none"> • Inhaled steroid if having repeated exacerbations
IV: Very Severe COPD	<ul style="list-style-type: none"> • $FEV_1/FVC < 70\%$ • $FEV_1 < 30\%$ or • $FEV_1 < 50\%$ with chronic respiratory failure 	<p>ADD:</p> <ul style="list-style-type: none"> • Long-term oxygen therapy if indicated by PaO₂

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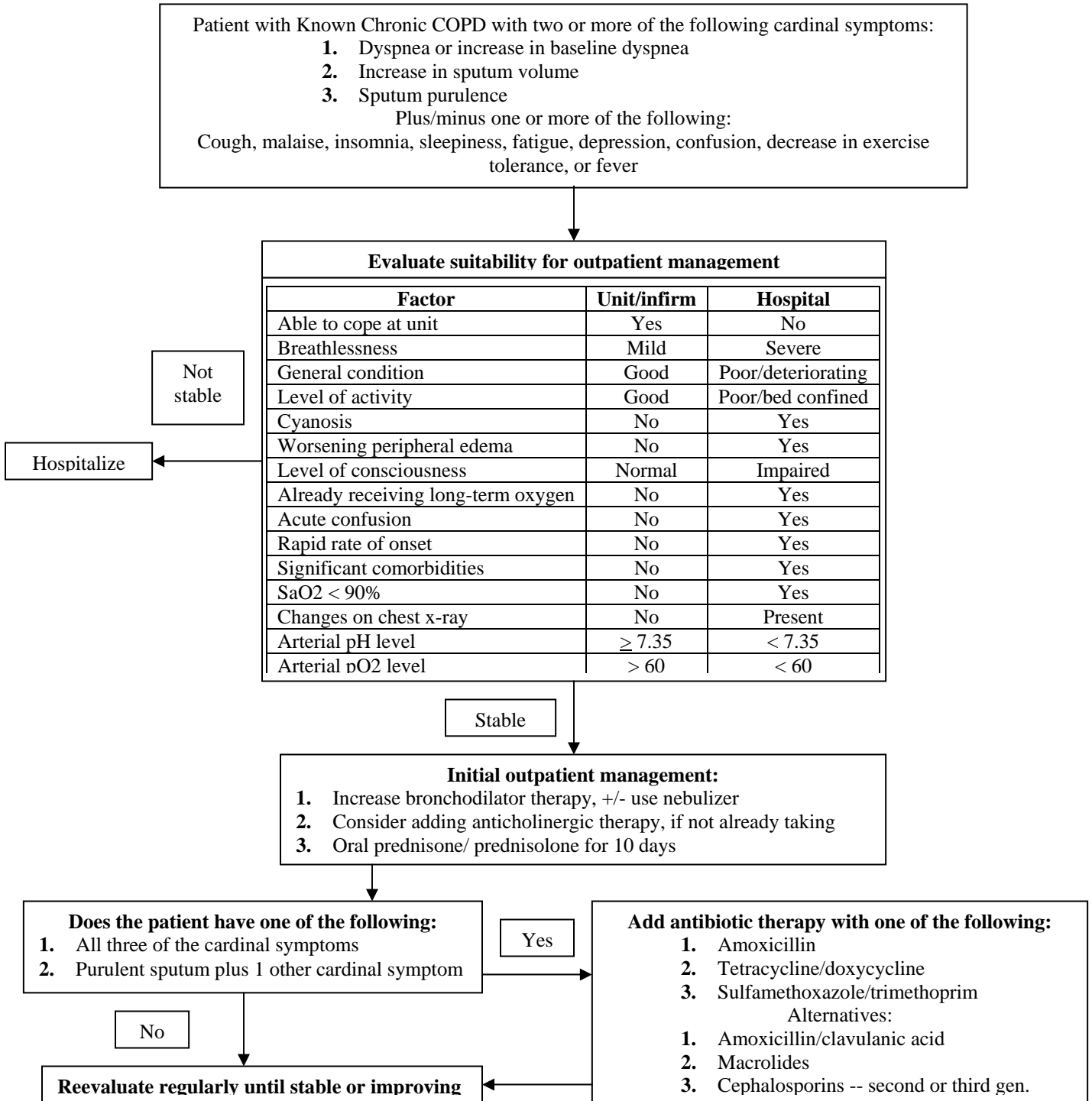
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Table IV: Management of acute exacerbations of COPD



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