Chronic Disease Network and Access Program 2009

Management of COPD

Guide for Health Professionals

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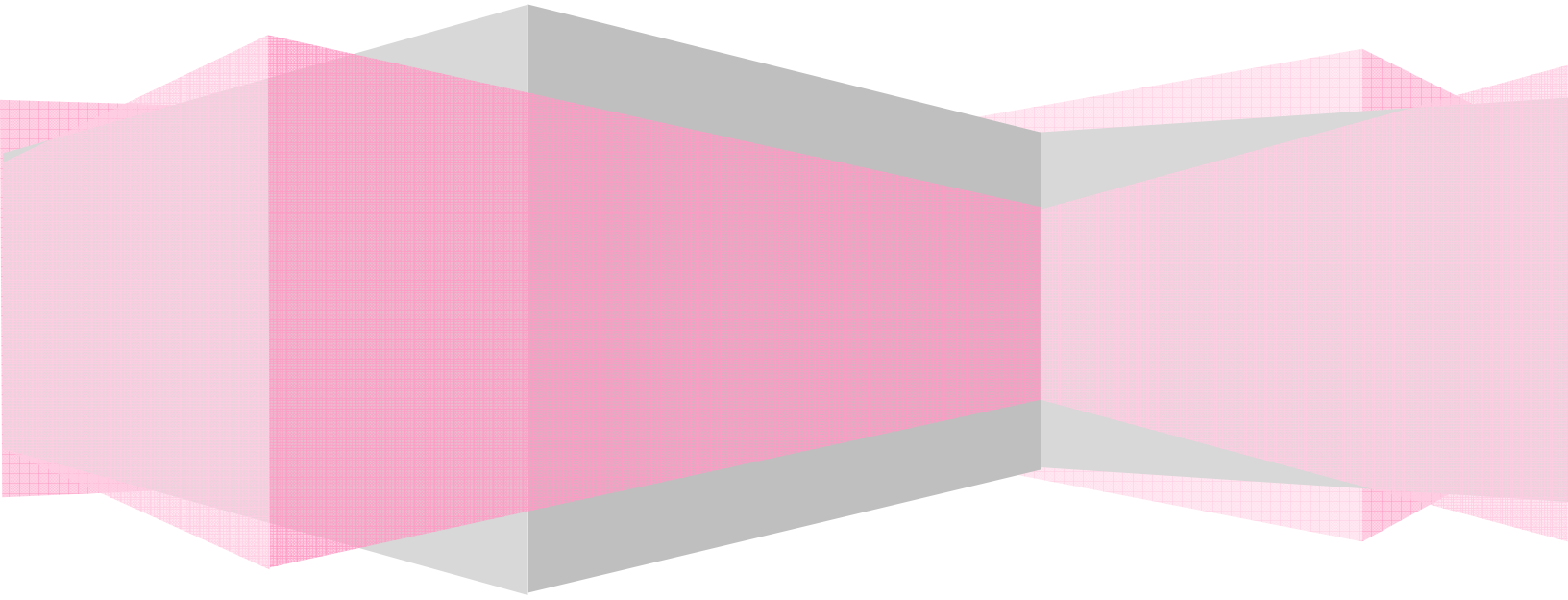

These materials are available for download on the CD NAP website

www.ehealth-north.sk.ca

2009 These materials were developed by the Clinical Subcommittee of the Chronic Disease Network and Access Program of the Prince Albert Grand Council and its partners and funded by the Aboriginal Health Transition Fund.

It is recommended that prescribers evaluate their patients' individual circumstances and conditions before any diagnosis or treatment is made or procedure followed that may be based on suggestions by the authors of this resource. Prescribers should consult product monographs before prescribing any of the medications mentioned or discussed in this resource.

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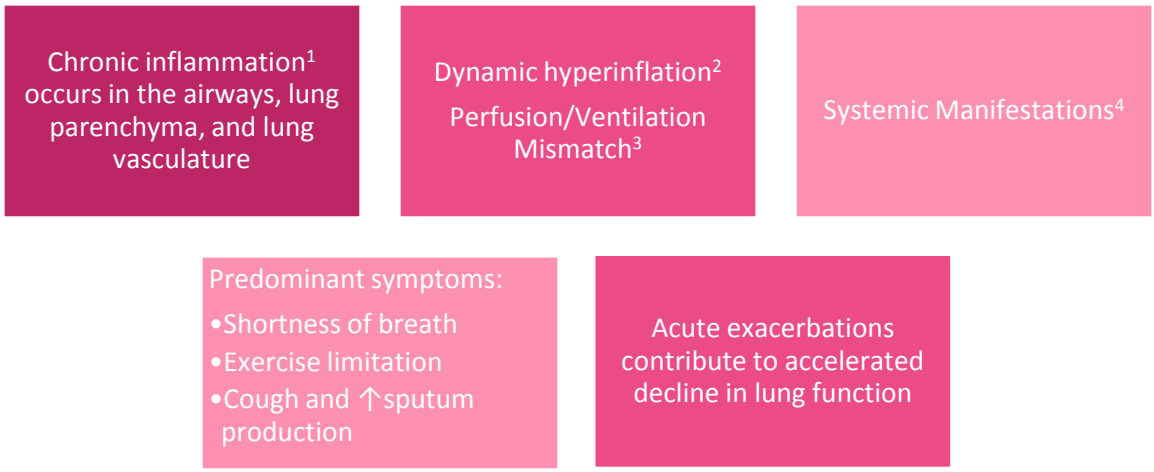
COPD – Definition

- Chronic Obstructive Pulmonary Disease
- "COPD is a respiratory disorder **largely caused by smoking** characterized by progressive, partly reversible **airflow obstruction**; **systemic manifestations**; and **increasing frequency and severity of exacerbations**".



1. Exposure to a noxious substance (ie tobacco smoke) initiates an inflammatory response that involves neutrophils, macrophages, T-cells, and inflammatory mediators. These mediators damage lung structure and sustain inflammation which persists long after the noxious substance has been removed. Chronic inflammation causes hypertrophy and hyperplasia of the mucous glands; remodelling of the airways and smooth muscle contraction which restrict airflow; and destruction of bronchioles and the capillary bed.
2. Dynamic hyperinflation means the lungs cannot completely empty (to residual volume) on exhalation. Air becomes trapped in the lungs
3. There are areas of the lungs that are well perfused but not well ventilated and vice versa. The lungs no longer efficiently oxygenate the blood, resulting in hypoxemia. Serious consequences include pulmonary hypertension and right heart failure.
4. Include: skeletal muscle dysfunction, malnutrition, osteoporosis, metabolic disorders, pulmonary hypertension, arrhythmias, heart failure, ischemic heart disease, glaucoma and cataracts, depression, anxiety and panic disorders.

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COPD-Diagnosis

- Post-bronchodilator $FEV_1/FVC < 0.70$[1] indicates airflow obstruction. Spirometry is necessary to establish the diagnosis of COPD[2]

However...

- Most patients are not diagnosed until the disease is well advanced (symptoms may not be recognised until 40-50% of lung function is lost[3].
- Spirometry should be targeted at persons at risk for COPD to establish earlier diagnosis and initiation of treatment.

Patient History should include:

1. Tobacco use (current and past)
2. Assessment of breathlessness using MRC scale
3. Assessment of complications of COPD (ankle edema, weight loss, etc)
4. Identify comorbidities (anxiety, depression, osteoporosis, glaucoma, CVD,etc)
5. Current treatment

Patient Clinical Assessment (to help establish diagnosis, severity of COPD and to rule out other pathology):

- physical exam
- pulmonary function tests (including lung volumes and diffusing capacity)
- exercise tests (for advanced COPD in preparation for Pulmonary Rehab Program enrollement)
- ABG if FEV_1 <40% and oximetry <92%;
- venous blood test for anemia, polycythemia;
- BMI;
- strength and endurance testing for skeletal muscle function;
- radiology;
- echocardiography to assess pulmonary hypertension;
- sputum cytology and C&S

1. FEV_1/FVC is a ratio of the volume of air blown out forcibly in 1 second compared to the total volume that could be blown out. If the patient can only blow out 70%, there is an obstruction. Normal predicted values for FVC_1/FVC are typically based on populations of matched age, gender and height. Predicted values are derived from Caucasian populations; predicted values in First Nation populations have not been derived.
2. Differential diagnosis: CV conditions, pulmonary embolus, deconditioning, obesity, anemia, interstitial lung disease, other lung pathology.
3. Patients may be unaware of the disease, not able to recognise worsening of symptoms, and develop strategies to cope with increasing symptoms. For example, patients may believe that increasing dyspnea is a normal factor of aging, so do not seek medical attention until functional ability is severely impaired.

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Screening for COPD

- **Current/past smokers ≥ 40 years old who answer *yes* to any of the following:**

- Spirometry is recommended.
- Note that an acute exacerbation is a common initial clinical presentation of COPD. Spirometry should be considered for current/past smokers who present with a RTI (once acute symptoms subside).

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Risk Factors for COPD

Environmental factors:

- Tobacco smoke (active and passive exposure)
- Occupational agents (ex asbestos, coal, gold, silica dust, wood smoke, fibreglass dust, solvent fumes)
- Air pollution (outdoor: smog, ozone, fuel combustion exhaust, volatile compounds; indoor: cooking and heating fumes)

Host factors:

- AAT deficiency (genetic disorder in which there are low levels of alpha-1 antitripsyn in the lung and blood; consider if COPD presents in a young adult, especially with a family history of AAT deficiency)
- Childhood viral infections
- Bronchial hyper-responsiveness or asthma
- Lung growth
- Other genetic factors (other proteolytic enzymes and antiproteases may be involved)

Other potential factors:

- Sex/gender (women seem predisposed to the effects of smoking and the environment)
- Socioeconomic factors
- Alcohol use (excessive alcohol intake is an independent risk factor for COPD)

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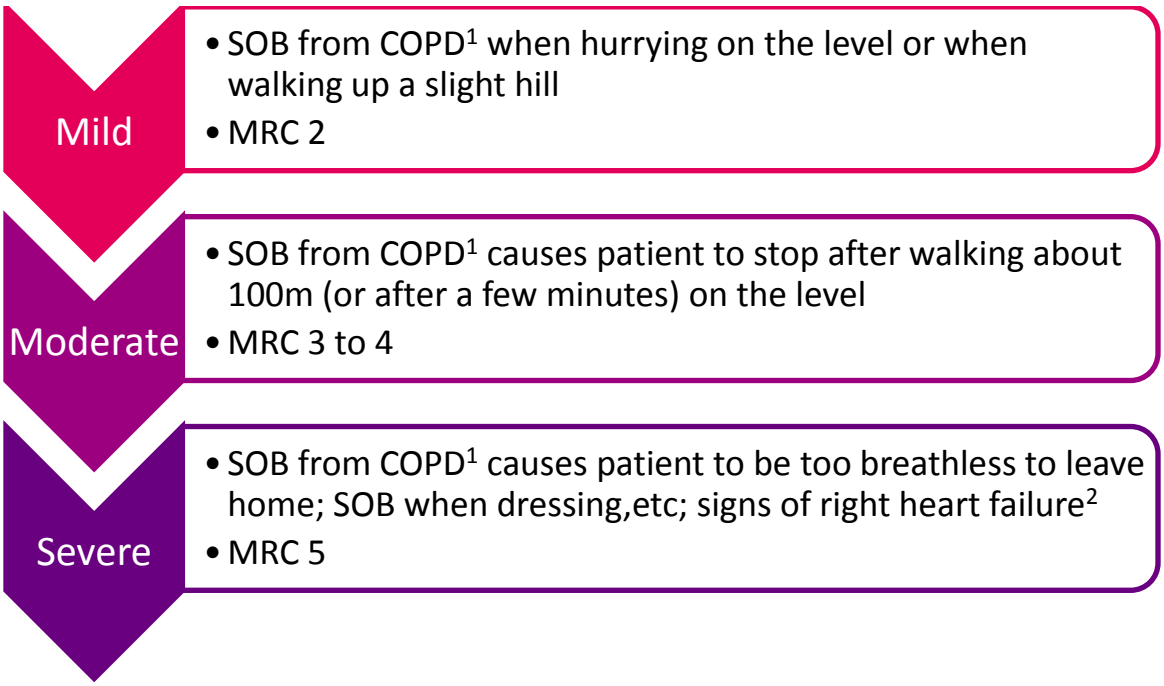
Classification of COPD Severity

- Once a diagnosis of COPD has been established with spirometry, severity can be classified by *Symptoms and Disability* or by *spirometry.*

Canadian Thoracic Society Classification of Severity by *Symptoms and Disability:*



1. Symptoms may not accurately reflect COPD disease severity if other non-COPD conditions are present that also cause SOB (ex cardiac dysfunction, anemia, muscle weakness, metabolic disorders). Care should be taken to classify severity of COPD in patients with comorbid diseases or other possible causes of SOB.
2. Or presence of chronic respiratory failure.

Canadian Thoracic Society Classification of COPD Severity by *Impairment of Lung Function*

MILD: $FEV_1 \geq 80\%$ predicted; $FEV_1/FVC < 0.7$

MODERATE: FEV_1 50% to <80% predicted; $FEV_1/FVC < 0.7$

SEVERE: FEV_1 30% to <50% predicted; $FEV_1/FVC < 0.7$

VERY SEVERE: FEV1 <30% predicted; $FEV_1/FEV < 0.7$

*FEV_1 = Forced Expiratory Volume in 1 second = volume of air forcibly exhaled in 1 second, compared to cohorts of the same age, height, weight, and gender.

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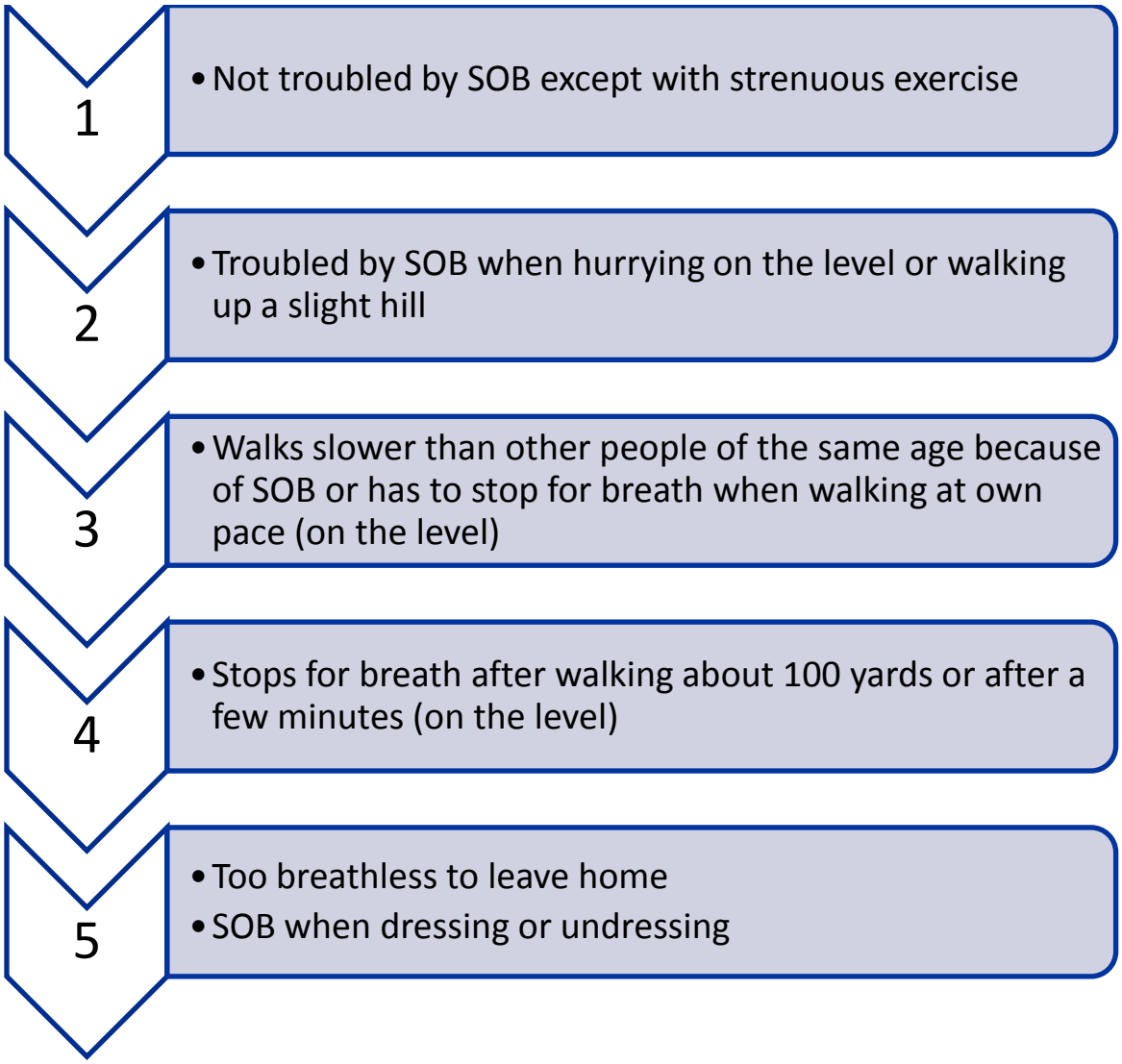
Classification of COPD Severity cont`

MRC[1] Dyspnea Scale:



BODE Index (Assess Risk of Death)

Body Mass Index	(↓BMI = ↑risk of death)
Airflow Obstruction	(↑obstruction = ↑risk of death)
Dyspnea	(↑dyspnea = ↑risk of death)
Exercise Tolerance	(↓exercise tolerance = ↑risk of death)

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When to Refer to a Specialist

- Diagnostic uncertainty
- Symptoms disproportionate to degree of airflow obstruction[1]
- Accelerated decline in lung function[2]
- Possible alpha$_1$-antitrypsin deficiency[3]
- Symptom onset at young age
- Severe or recurrent acute exacerbations
- Failure to respond to treatment

1. IE Patient complains of more severe symptoms or disability than spirometry results would suggest.
2. Lung function normally declines at a rate of about 15-20mL per year starting at 40-50 years of age. In smokers the rate of decline is up to 80mL/year
3. AAT deficiency is a genetic disorder involving low levels of the enzyme alpha$_1$-antitrypsin in the lungs and blood. This enzyme is a protease inhibitor which protects tissue from destructive enzymes such as elastase produced during the inflammatory process. A deficiency in AAT results in uninhibited tissue breakdown from inflammation.

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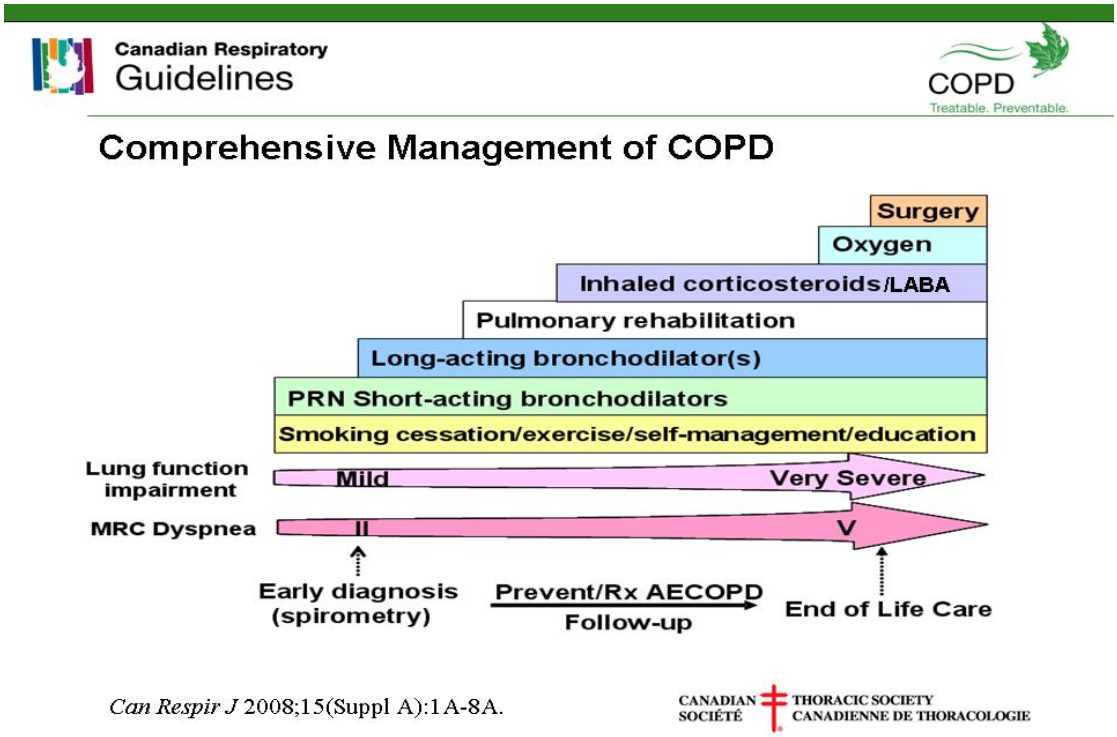
Management of COPD

Goals:

- Prevent disease progression (by smoking cessation)
- Alleviate symptoms
- Improve exercise tolerance
- Prevent and treat exacerbations
- Improve overall health status
- Reduce mortality

Components:

- Smoking cessation
- Education and Self Management Skills
- Pharmacologic agents
- Exercise and Pulmonary Rehab
- Vaccinations (including annual flu shot and pneumonia shot every 5 years)
- Comprehensive case management for advanced disease



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Smoking Cessation

- **...is the single most effective intervention to reduce the risk of developing COPD slow its progression...**

25% of Canadians smoke

Those who start smoking in their teens can expect a 15 year ↓ life expectancy

Those who start smoking in their teens have a 50% ↑ risk of dying from tobacco-related disease

85% of cases of COPD are due to smoking

15% of tobacco-related deaths are due to COPD

Smoking cessation slows the rate of decline in lung function to almost that of a non-smoker

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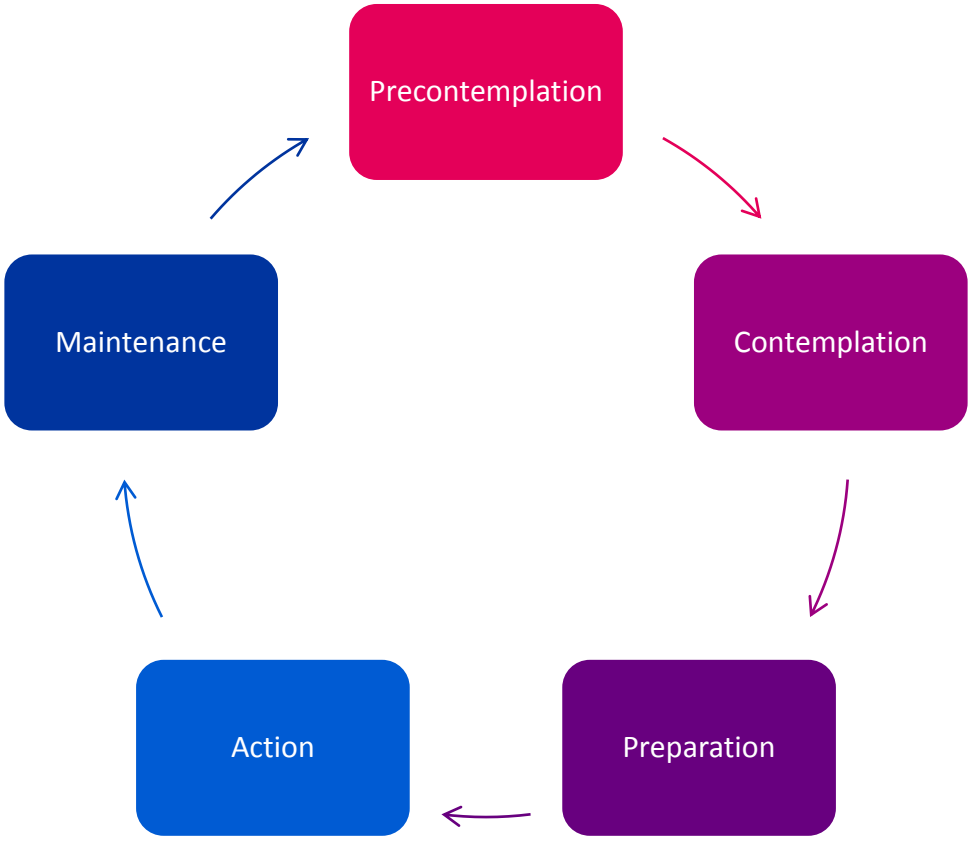
Smoking Cessation cont'

- **A combination of counselling (individual or group) and pharmacologic agents increases success**
- **Assess Stage of Change (ie readiness to quit) and offer support to help patient progress through each level (including possible relapse) to maintenance stage.**



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Smoking Cessation – Pharmacologic Agents

Medication	Dose	Use	Duration
Nicotine Gum[1]			
Nicorette	2mg[2] Maximum 24pieces/day	1 piece/hour or prn	Up to 12 weeks[3]
Nicorette Plus	4mg[4] Maximum 24pieces/day	1piece/hour or prn	Up to 12 weeks[3]
Thrive[2,3,4]	As per Nicorette Gum		
Nicotine Lozenge[5]			
Thrive	1, 2mg[6] Maximum 30mg/day	1 lozenge q1-2h 1 lozenge q2-4h 1 lozenge q4-8h	6 weeks 3 weeks 3 weeks
Nicorette			
Nicotine Patch[7]			
Nicoderm	21mg/24h[8] 14mg/24h 7mg/24h	1 patch/24 hours[9] 1 patch/24 hours[9] 1 patch/24hours[9]	4 weeks 2 weeks 2weeks
Nicotine Inhaler[10]	10mg/cartridge 6-12 cartridges/day	Puff on cartridge x 20min or prn	Use for up to 12 weeks initially, then taper over 6-12 weeks
Bupropion[11]			
Zyban	150mg AM x 3days then 150mg BID[12]	Stop smoking between day 8 and 14	7 to 12 weeks[13]
Varenicline[14]			
Champix	0.5mg AM x 3days then 0.5mg BID x 4 days,then 1mg BID[15]	Stop smoking after 7 days	12 weeks[16]

Source: CTS recommendations for management of COPD -2007 update

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Smoking Cessation – Pharmacologic Agents cont'

1. Do not chew as per non-medicated gum; chew 2 or 3 times, then park gum between gingival and cheek for 30-60 seconds. Repeat for 30 minutes. Do not eat or drink 15 minutes before or after using gum.
   Side Effects: burning, jaw pain, hiccups
   Contraindications: recent MI; unstable angina; severe cardiac arrhythmia; recent stroke; pregnancy and breastfeeding (? Yet many experts believe use of NRT is safer than smoking in pregnancy); <18 years of age; dental problems; TMJ; ***be aware of potential harm to children and pets if not properly disposed of**
   Drug Interactions: coffee, acidic beverages ↓absorption (separate use by ≥15 minutes)
2. If <25 cigarettes (1pack) is smoked per day
3. Or longer if required. Taper by at least 1 piece every 4 to 7 days.
4. If ≥25 cigarettes (1pack) is smoked per day.
5. Suck lozenge until strong taste, then park in cheek. Repeat as long as required or until lozenge is gone (about 30 minutes).
   Side Effects: sore gums, teeth, or throat; hiccups; heartburn
   Contraindications: As per nicotine gum. ***be aware of potential harm to children and pets if not properly disposed of***
   Drug Interactions: As per nicotine gum.
6. Strength to use depends on interval to first craving upon awakening: <30minutes, use 4mg; > 30minutes, use 2mg.
7. Place patch on relatively hairless area between neck and waist. Apply patch to different place each day. See package insert for tips to maximize adhesion.
   Side Effects: Local skin irritation; vivid dreams
   Contraindications: *not* contraindicated in CVD; with caution post MI or stroke (though safer than smoking?); pregnancy and breastfeeding; <18 years of age ***ensure proper disposal of used patches***
   Drug Interactions: smoking ↑ side effects
8. Heavy smokers may need 2 patches to start. Start with lower dose if < 10 cigarettes/day. Tapering and duration should be individualized.
9. May remove patch at night if vivid dreams are troublesome, however craving for nicotine in the morning may be quite strong. Using nicotine inhaler, lozenge, or gum first thing in the morning may be helpful
10. Ten puffs = 1 puff from cigarette. Do not eat or drink 15 minutes before or after using inhaler.
    Side Effects: throat irritation; cough; rhinitis; dyspepsia
    Contraindications: as per nicotine gum
11. Can be used with NRT, but monitor BP. Decreases weight gain.
    Side Effects: insomnia, dry mouth, tremors, skin rashes, serious allergic reaction
    Contraindications: current seizure disorder; current/past diagnosis of bulimia or anorexia nervosa; concurrent use of other agents containing buproprion; recent/current withdrawal from alcohol, benzodiazepines or other sedatives; current/use within 14 days of MAOI; use with caution in situations that may reduce seizure threshold (history of head trauma, prior seizure disorder, CNS tumor, excessive alcohol use, stimulant/opioid addiction, diabetes)
    Drug Interactions:
12. ↓ dose in renal or hepatic impairment (not recommended)
    Ensure at least 8 hours between doses. Do not give second dose close to bedtime to avoid insomnia. If insomnia persists, reduce dose to 150mg AM
13. Consider longer treatment for smokers who suffer significant mood swings or who continue to experience strong cravings after discontinuing bupropion.
14. Safety in children <18 unknown.
    Side Effects: nausea, abnormal dreams, constipation, vomiting, flatulence, dry mouth
    Contraindications: severe renal impairment; pregnancy and breastfeeding;
    Drug Interactions: cimetidine; possible ↑adverse effects with NRT; ? safety with bupropion
15. 0.5mg BID if CrCl < 30mL/min. Use ↓dose in elderly or those suffering intolerable side effects.
16. Those who are still not smoking after 12 weeks of varenicline use may continue for another 12 weeks.

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Education and Self-management Skills[1]

Outcomes of Education and Self-Management:

- ↑ QOL
- ↑ Patient satisfaction
- ↓ Health Care expenses
- ↓ Exacerbations and better management of them when they occur

Components:

- Smoking cessation
- Proper use of medications and oxygen
- Pulmonary Rehab (where available) and exercise
- Management of acute breathlessness and exacerbations
- Reducing and dealing with fatigue
- Addressing nutrition issues
- Addressing psychosocial issues
- Improving sleep
- Addressing sexuality issues
- Planning for leisure and travel
- End-of-life planning

1. Refer to 'COPD Toolkit' for more information and resources. To obtain a COPD Toolkit, contact the Lung Association of Saskatchewan (info@sk.lung.ca) or CDNAP.

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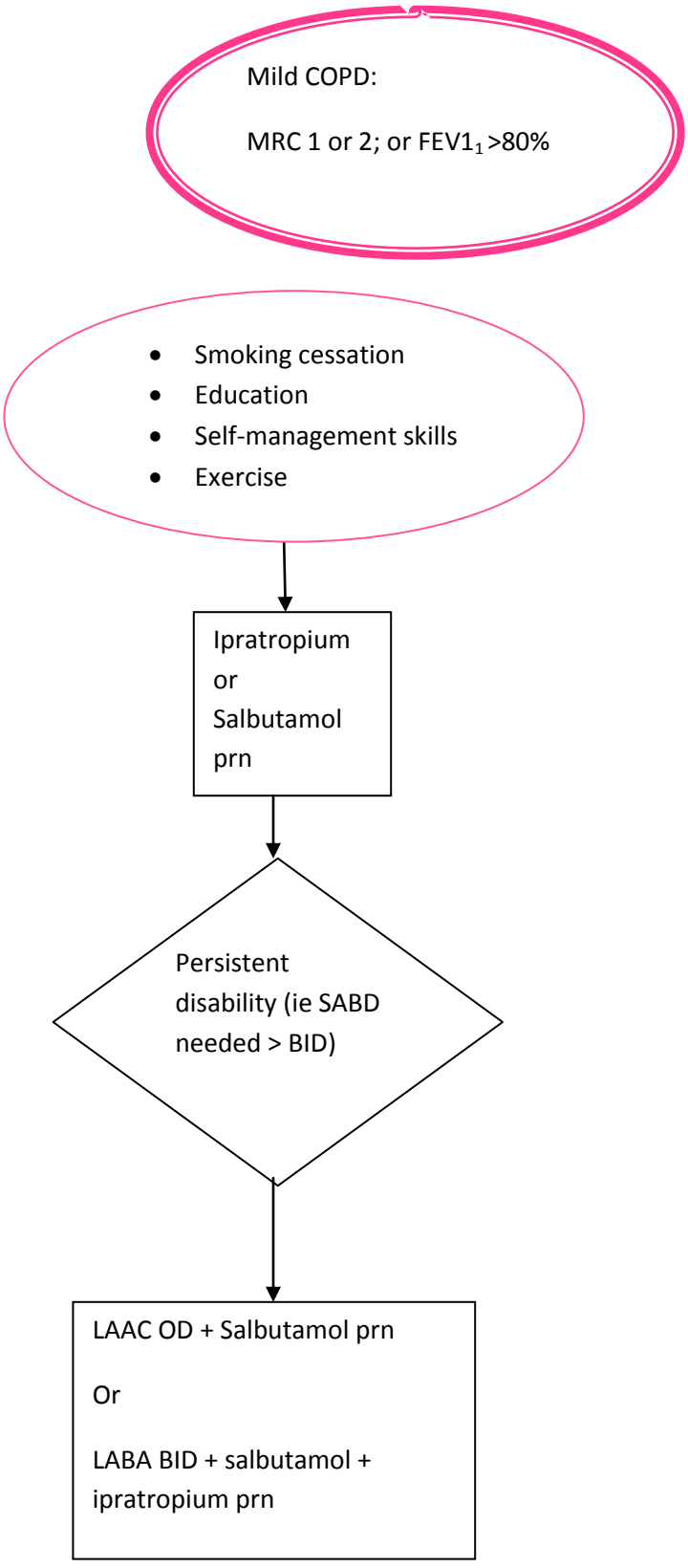
Pharmacologic Management of COPD



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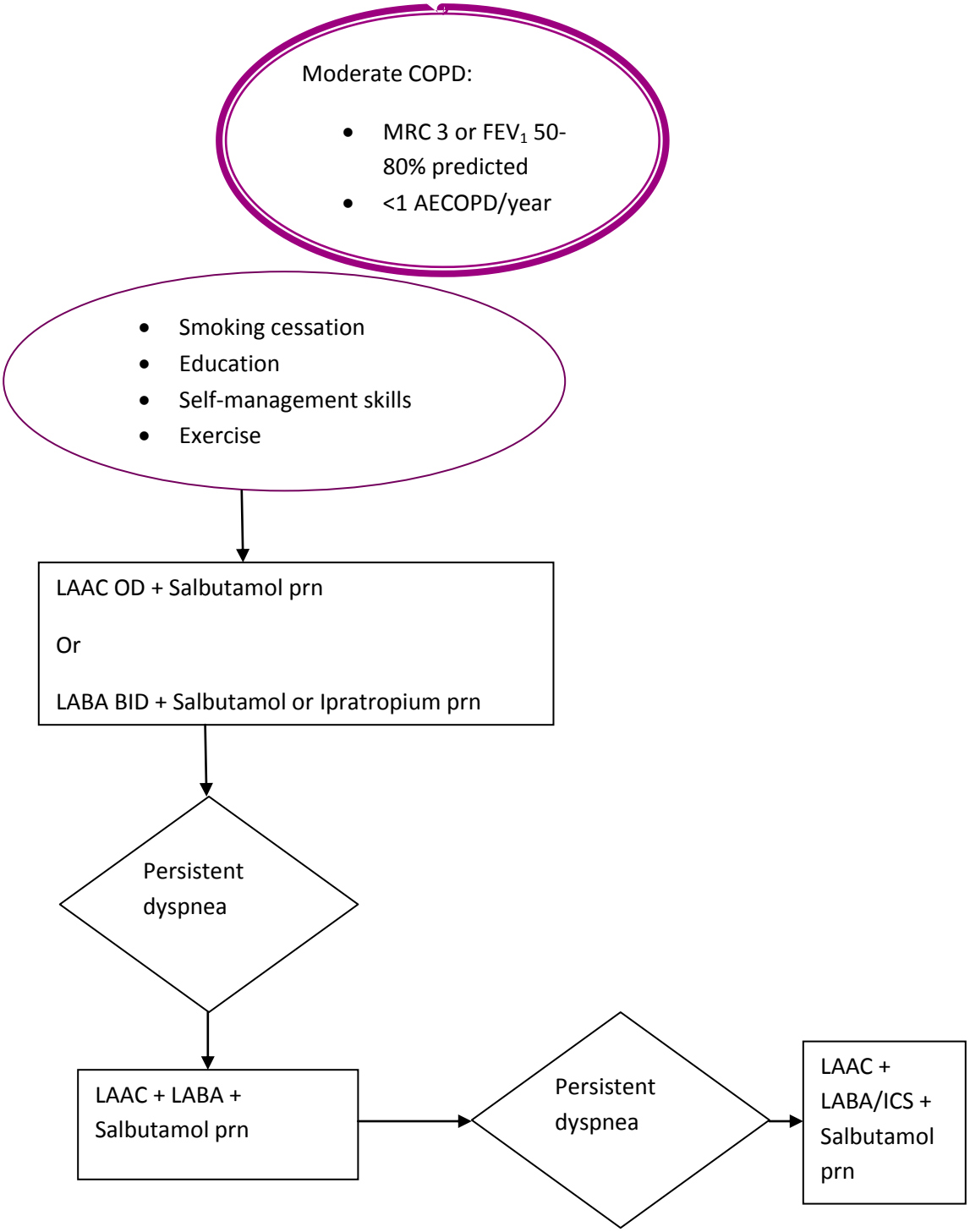
Pharmacologic Management of COPD cont'



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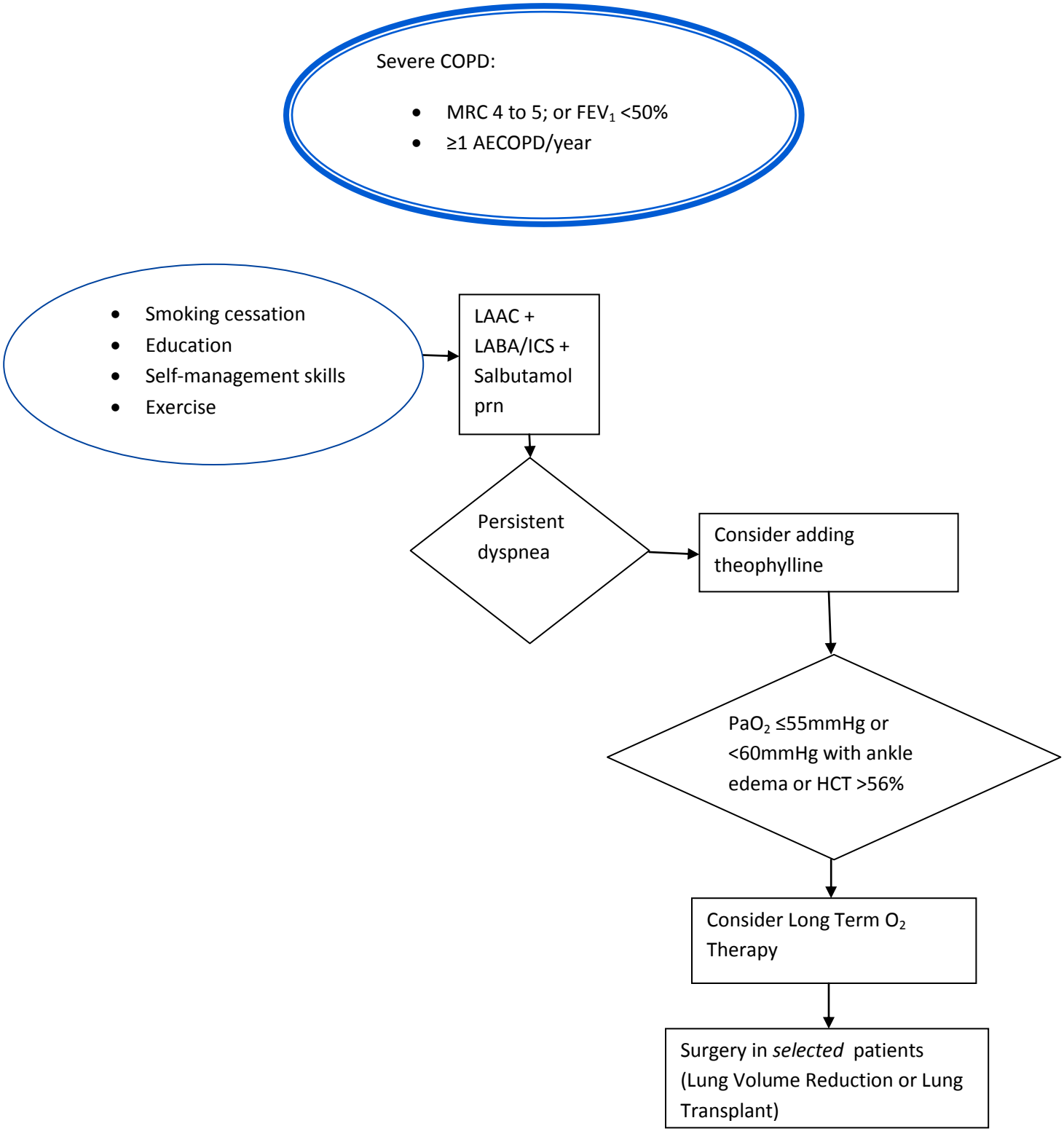

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Pharmacologic Management of COPD: Inhaled Medications

Drug	Trade Name	Dose
Short-acting Beta Agonist[1]		
Salbutamol	Ventolin	100mcgMDI; 1.25, 2.5, or 5.0 mg nebs ii puffs or 1 neb (2.5-5.0 mg) PRN
Terbutaline	Bricanyl	500mcg PDI PRN
Short-acting Anticholinergic[2]		
Ipratropium	Atrovent	20mcg MDI; 250, 500mcg nebs ii puffs QID (or PRN) or 1 neb QID
SABA/SAAC		
Ipratropium/Salbutamol	Combivent	500mg/2.5mg neb QID
Long-acting Anticholinergic[3]		
Tiotropium	Spiriva	18mcg HH OD
Long-acting Beta Agonist		
Salmeterol[4]	Serevent	50mcg PDI BID
Formoterol[5]	Foradil	12mcg PDI
	Oxeze	6mcg, 12mcg PDI BID
Inhaled Corticosteroid[6,7]		
Beclomethasone	QVAR	50mcg, 100mcg MDI i-ii puffs BID
Budesonide	Pulmicort	100, 200, or 400mcg PDI 0.25, 0.50. 1.0 mg nebs BID
Ciclesonide	Alvesco	100, 200, or 400mcg MDI OD or BID
Fluticasone	Flovent	50, 125, or 250mcg MDI 100, 250, or 500mcg PDI
LABA/ICS Salmeterol/Fluticasone	Advair[4,7]	25mcg/125, 25mcg/250mcg MDI i-ii BID 50mcg/100mcg, 50mcg/250mcg, 50mcg/500mcg PDI BID
Formoterol/Budesonide	Symbicort[5,7]	6mcg/200mcg, 12mcg/200mcg PDI i-iv inh BID

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Pharmacologic Management of COPD

Inhaled Medications cont'

1. Onset 5-15minutes; Peak 60-90 minutes; Duration 3-6 hours
   Side Effects: tremor; ↑ HR (especially nebulised); nervousness; ↑QT; headache; ↓K^+; ↑insulin secretion; hyperglycemia
2. Onset 5-15minutes (usually later than SABA); Peak 60-120minutes; Duration 4-8 hours
   Side Effects: Dry mouth; blurred vision if contact with eyes (ie close eyes while using); tremors or palpitations; urinary retention (especially elderly men); glaucoma (use with caution)
3. Side Effects: as per short-acting anticholinergics
4. Slower onset, so cannot be used for rescue.
   Side Effects: as per short-acting beta agonists
5. Fast onset so provide temporary relief of symptoms
   Side Effects as per short-acting beta agonists
6. Note that single-entitiy Inhaled corticosteroids are not recommended for treatment of COPD. They should be used only in combination with a LABA
7. Side Effects: oral thrush, reversible voice changes (use spacer and rinse mouth after using); weight gain (salt and water retention), osteoporosis, cataracts, skin thinning with easy bruising at high doses

Drug	Trade Name	Device	Description
Salbutamol	Ventolin	MDI	blue
Salbutamol	Ventolin	Diskus	blue
Salbutamol	Ventolin	Nebules	
Terbutaline	Bricanyl	Turbohaler (PDI)	White/blue dial
Ipratropium	Atrovent	MDI	Clear- green cap
Ipratropium	Atrovent	nebules	
Ipratropium/Salbutamol	Combivent	nebules	
Tiotropium	Spiriva	HandiHaler	grey
Salmeterol	Serevent	Diskus	green
Formoterol	Oxeze	Turbohaler	White-green dial
Beclomethasone	Qvar	MDI	Cream or Brown
Budesonide	Pulmicort	Turbohaler	White-brown dial
Budesonide	Pulmicort	Nebules	
Ciclesonide	Alvesco	MDI	Beige or Orange
Fluticasone	Flovent	MDI	Cream or Orange
Fluticasone	Flovent	Diskus	Orange
Salmeterol/Fluticasone	Advair	MDI	Purple
Salmeterol/Fluticasone	Advair	Diskus	Purple
Budesonide/Formoterol	Symbicort	Turbohaler	White-red dial

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Pharmacologic Management of COPD

Inhalation Devices

Choose device that best suits needs and abilities of the patient

Refer to package insert for proper use of device

Assess inhaler technique at each COPD-related visit

Recommend valved spacer with MDI to increase lung deposition

MDI – Metered Dose Inhaler

- Requires coordination of inhalation with pressing canister for proper lung deposition
- Requires some strength to press canister: may not be useful in the elderly or those with arthritis
- Recommend valved spacer to increase lung deposition

PDI – Powder Dose Inhaler (Diskus, Turbohaler)

- Must be kept dry
- Breath-actuated

HH – HandiHaler

- Capsule inserted into device, then pierced prior to inhalation; ie medication is not within the device but dispensed separately.

Nebules

- Nebulizer requires electricity; very expensive without added benefit
- Generally not recommended in the outpatient setting; significant medication enters the room air and can affect the eyes.

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Pharmacologic Management of COPD

Oral Agents

Drug	Trade Name	Dosing
Theophyllines[1]		
Aminophylline	Phyllocontin	350mg BID
Oxtriphylline	Choledyl[2]	300mg TID
Theophylline	Uniphyl; Theodur	400-600mg/day[3]
Corticosteroids[4]		
Dexamethasone	Decadron	7.5mg/day x 10-14 days
Prednisone		0.6mg/kg/day x 10-14 days[5]
Methylprednisolone	Medrol	0.5mg/kg/day x 10-14 days

1. Efficacy is related to serum concentration, so must be taken regularly to be effective. Therapeutic window is narrow, so dose must be adjusted to serum concentration. To avoid toxicity, keep level at low recommended or subtherapeutic range. Do not initiate during AECOPD. These offer modest improvements in pulmonary function, symptoms, and exercise tolerance, but may be useful in some patients. Typical starting dose may be Theo-Dur 200mg BID or Uniphyll 400mg HS.
   Side Effects: nausea, vomiting, diarrhea, insomnia, ↑HR, headaches, irritability, nervousness, heartburn; toxicity: arrhythmias, seizures, coma, death
   Drug Interactions: many potential including ↑theophylline levels with amiodarone, cimetidine, ciprofloxacin, clarithromycin, erythromycin, fluvoxamine, isoniazid, propranolol, mexelitine, verapamil; ↓theophylline levels with alcohol, carbamazepine, phenobarbital, phenytoin, rifampin, tobacco smoking
2. Available in oral tablets and elixir.
3. Dose interval depends on preparation used (ex for SR give 300mg BID). Take with food
4. **Chronic use of oral corticosteroids should be avoided in COPD patients because of their limited benefits and potential side effects. Short-term use of oral corticosteroids does have demonstrated efficacy in AECOPD.**
   Side Effects (from short term use): glucose intolerance; ↑ appetite; weight gain; mood changes; ↑BP; fluid retention; insomnia; vivid dreams; stomach upset; ↓K^+
   Drug Interactions: oral diabetic agents (↑BG); NSAIDs (↑risk of GI ulcer); diuretics (↓K^+)
   Do not abruptly discontinue oral corticosteroid after long-term use (>14 days). Withdrawal symptoms such as fatigue, weakness, fever, joint pain, ↓BP, or cardiovascular collapse may occur. A suggested tapering schedule for prednisone (or equivalent dose of alternative agent) is ↓dose by 2.5 to 5 mg every 3 days. The dose may be temporarily increased, then tapered again slowly if disease flares during tapering.
5. Maximum 50mg/day.

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Pulmonary Rehab Program

- Should be offered early in disease (MRC 2-3)

Components:

- Exercise training
- Psychosocial support (for social isolation, depression)
- Nutrition counselling
- Occupational therapy and energy conservation strategies

Benefits:

- ↓ SOB
- ↑ exercise endurance
- ↑QOL
- ↓ leg discomfort
- ↓ fatigue
- Reduced resource utilization due to AECOPD
- Trend toward ↓ mortality compared to standard care

Exercise Training:

"All COPD patients should be encouraged to maintain an active lifestyle…EXERCISE IS MEDICINE!!"

Goal: ↓ disability, resulting in improved function for self-care, as well as productive and recreational activities

Type of Exercise*	Benefit	Duration/Frequency
Aerobic Training	↑endurance, endurance, ↓SOB, ↑QOL	30 minutes x 3-5 days/week
Strength Training	Develop and maintain muscle strength and mass; ↑exercise capacity, ↓SOB, ↑QOL	5-15minutes x 2-3 days/week
Flexibility Training	Improve/maintain joint range of motion; maintain independence in ADLs; best posture for breathing	5-15 minutes x 2-3 days/week

*As physical limitations and comorbidities allow. Note that strength training and flexibility training alone are not beneficial for COPD, but are useful when combined with aerobic training.

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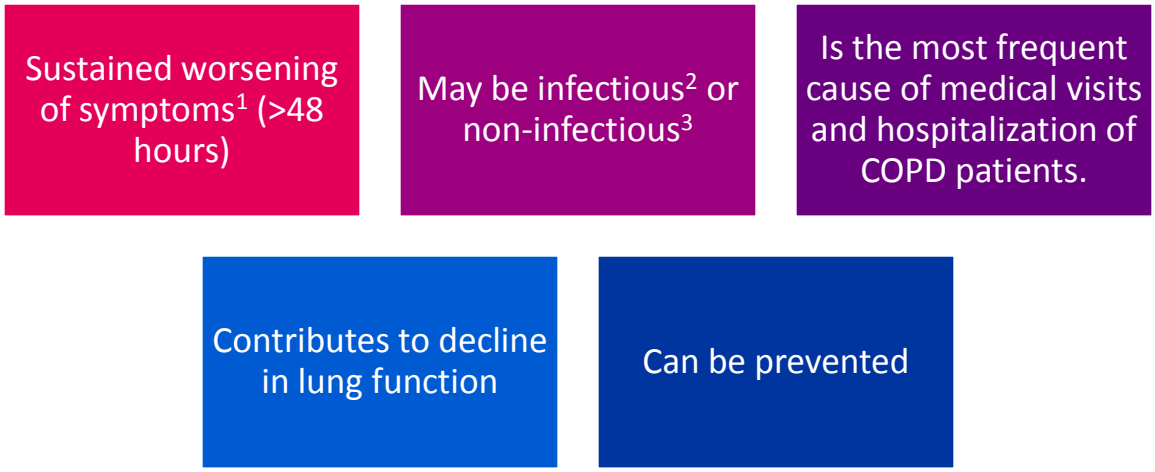
Acute Exacerbation of COPD



1. IE dyspnea, cough, or sputum production. Results in increased use of current medications or use of additional medications.
2. 50% are infectious; many are viral. Most likely pathogens: *Haemophilus influenza; Moraxella catarrhalis; Streptococcus pneumonia; Klebsiella spp;* other Gram-negative spp.
3. Non-infectious causes: environmental exposure (smoke, dust, etc)
   : emotions (laughing, crying)
   : stressful event, anxiety
   : non-compliance with medications
   : other pulmonary causes that are non-infectious
   : GERD, CHF, and other non-pulmonary causes

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Acute Exacerbations of COPD

Assessment:

- Based on symptoms (cough, dyspnea, sputum volume and color)
- History and physical exam
- ABG, pulse oximetry
- CXR
- Sputum culture (if another exacerbation occurs within a few months of a previous infectious exacerbation)
- Note that spirometry is not useful because FEV_1 is always declined and patient may be too breathless to perform the test.

Goals of Treatment:

- Return to baseline symptoms, lung function, and QOL
- ↓ morbidity and mortality
- ↓ risk of relapse

Prevention:

- Smoking cessation
- Influenza vaccine yearly
- Pneumonia vaccine every 5 years
- ICS/LABA if >1 AECOPD/year or FEV_1 <60% predicted
- Tiotropium +/- LABA if FEV_1 <60%
- Implement self-management skills (nutrition, exercise, sleep)
- Use Self-Management Plan

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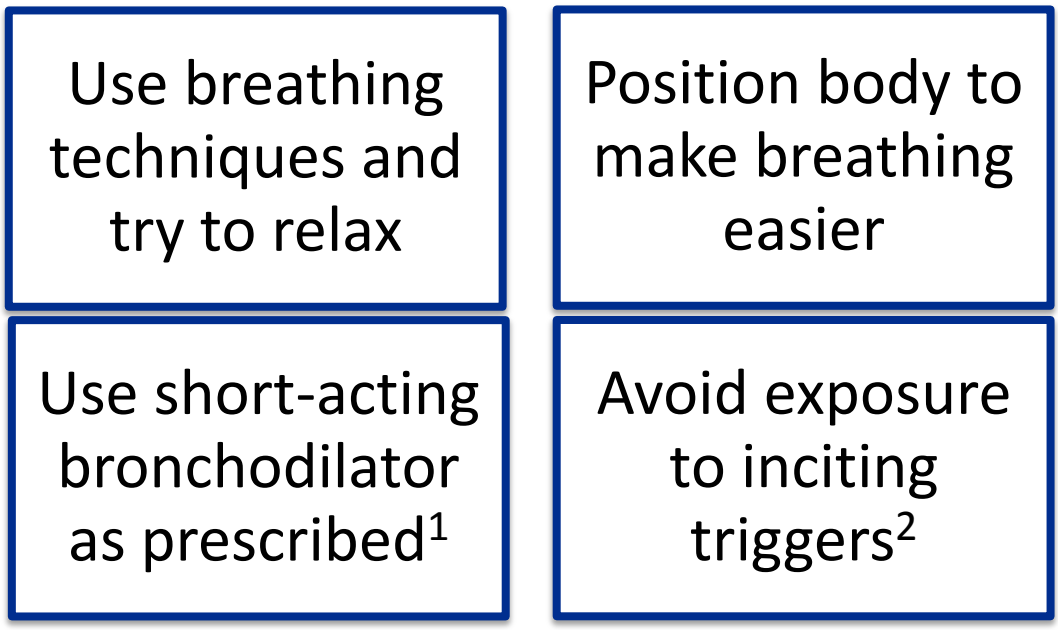
Management of Non-Infectious ACOPD



1. Ex ii puffs of Salbutamol. For environmental causes, may repeat in 20 to 45 minutes if needed.
2. Pollutants, sudden temperature change, wind, heavy exercise.

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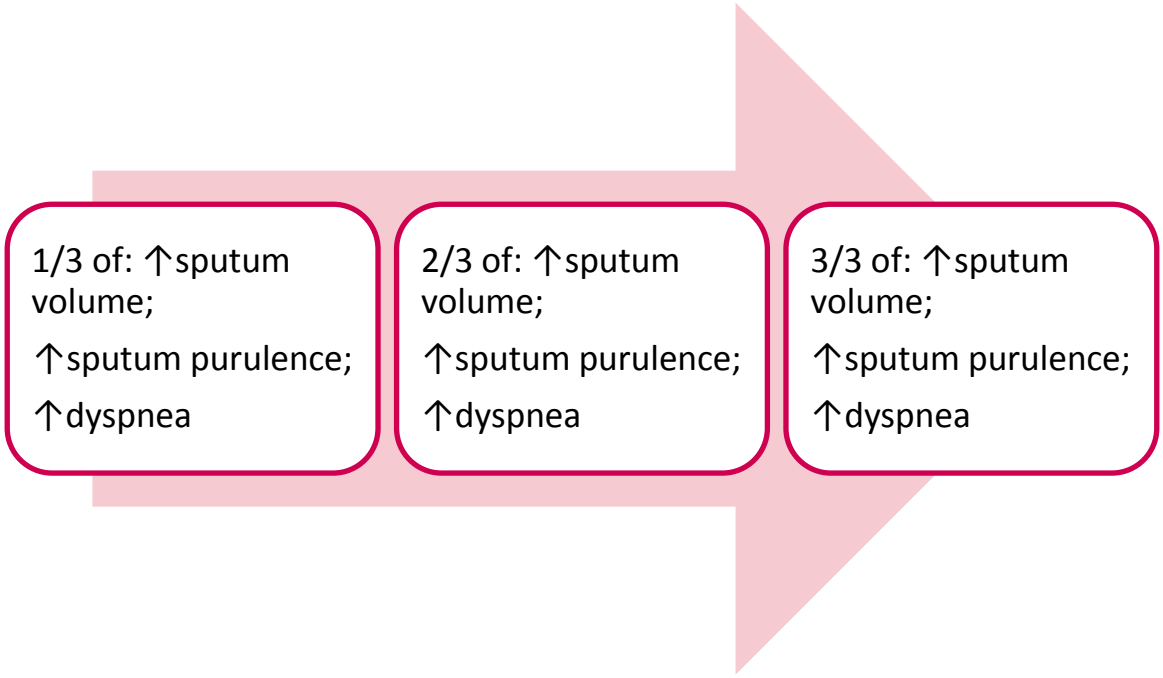
Management of Infectious AECOPD

Usefulness of Antibiotic:



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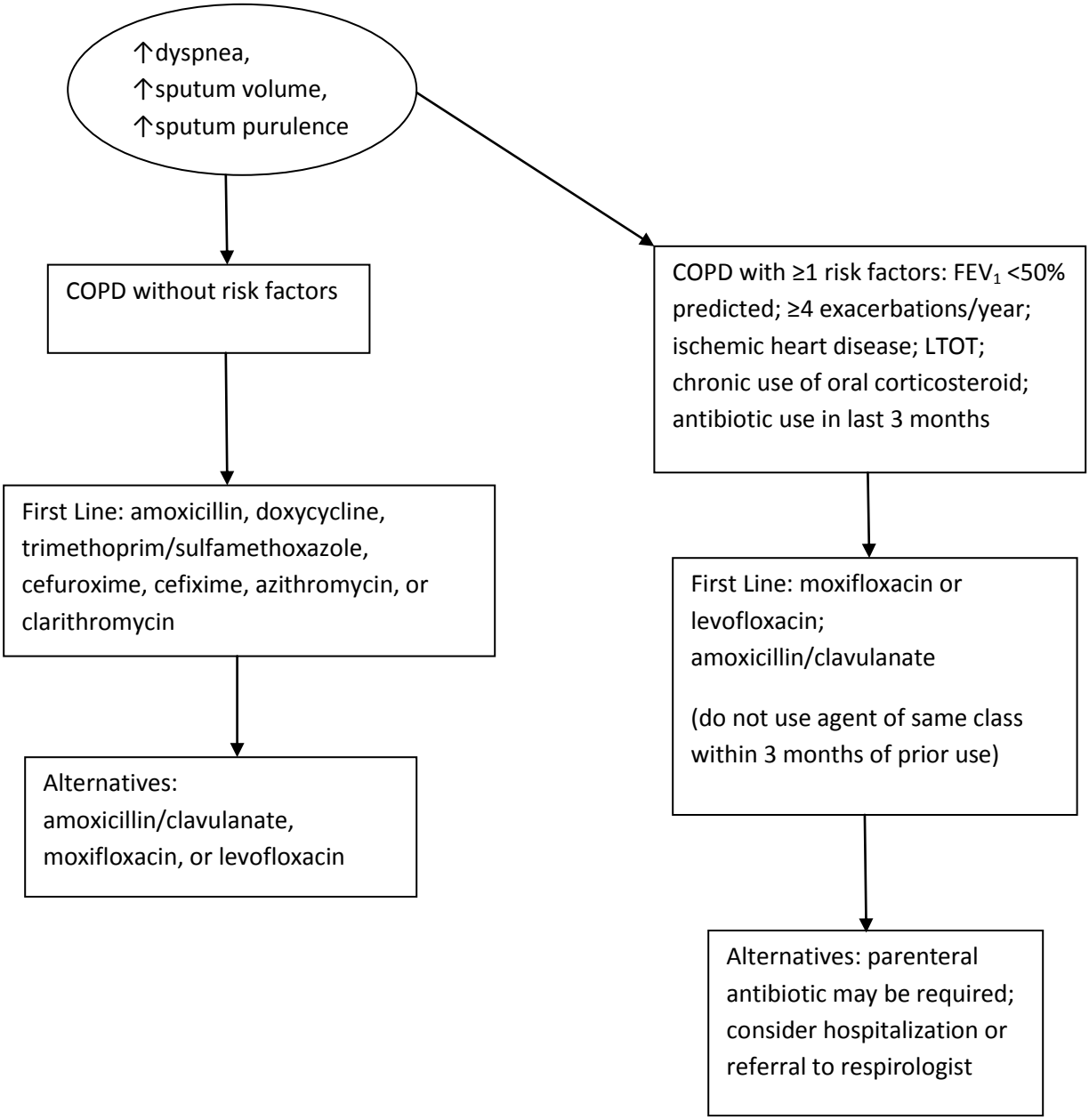
Management of Infectious AECOPD



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Management of Infectious AECOPD cont'

Drug	Trade Name	Dosing
Penicillins[1,3,11]		
Amoxicillin		500mg TID x 7-10 days
Amoxicillin/Clavulanate[2]	Clavulin	500mg TID or 850mg BID X 7-10 days
Tetracyclines		
Doxycycline[4,11]	Vibra-tabs	100mg BID x 1 day then 100mg OD X 7-10 days
Sulfonamides[3,5,11]		
Trimethoprim/ Sulfamethoxazole	Bactrim 400mg/80mg; Bactrim DS 800/160mg	i DS BID or ii regular BID x 7-10 days
Cephalosporins[1,11]		
Cefuroxime	Ceftin	500mg BID x 7-10 days[6]
Cefixime	Suprax[3]	400mg OD x 10-14 days
Extended-spectrum Macrolides		
Azithromycin[7]	Zithromax	500mg OD x 1 day then 250mg OD X 4 days
Clarithromycin[3,8,11]	Biaxin	500mg BID x 7-14 days or 100mg XL OD x 7-14 days
Quinolones[9,11]		
Moxifloxacin	Avelox	400mg OD x 5 days
Levofloxacin[3,10,]	Levaquin	500mg OD x 7 days

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Management of Infectious AECOPD cont`

1. Side Effects: rash, anaphylaxis (rare); diarrhea, nausea, vomiting, anorexia, abdominal discomfort
   Drug Interactions: ↓efficacy of oral contraceptives
2. Side Effects as per amoxicillin, but increased epigastric distress
3. ↓dose in renal impairment
4. Side Effects: GI upset, photosensitivity
   Drug Interactions: ↓absorption with iron or antacids (separate dose by 2 hours); ↓doxycycline level with alcohol, phenobarb, phenytoin, rifampin, carbamazepine; possible ↓efficacy of oral contraceptives
5. Drink plenty of water while taking this medication.
   Side Effects: nausea, rash, SJS (rare)
   Drug Interactions: ↑effect of warfarin (monitor INR); ↑ phenytoin level
6. Take with food.
7. Side Effects: GI upset
   Drug Interactions: ↑digoxin level
   Contraindications: coadministration with pimozide
8. Side Effects: GI upset, bitter taste
   Drug Interactions: many potential including: ↓level with rifampin; ↑warfarin effect; ↑ levels of some benzodiazepines, buspirone, carbamazepine, cyclosporine, digoxin, ergots, statins, theophylline, disopyramide
   Contraindications: coadministration with pimozide
9. Side Effects: usually well-tolerated; headache, dizziness may occur; tendon rupture (rare)
   Drug Interactions: ↓absorption with antacids, sucralfate, iron, calcium, magnesium (separate dose by 2 hours); ↑level of theophylline, cyclosporine; avoid in patients on Class IA or III antiarrhythmics
   Contraindications: predisposure to prolonged QT interval; predisposure to seizures; pregnancy; children <18 years
10. May ↑warfarin effect
11. Some evidence suggests that shorter duration (5 to 7 days) may be adequate in the absence of complicating factors such as bronchiectasis.

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Self-management Plan of Action

- Is a written tool developed by the physician or respirologist that helps the patient identify early changes in symptoms and determine what action is to be taken to prevent and manage AECOPD.
- Includes: use of pharmacologic agents and non-pharmacologic measures to be taken when patient is feeling well;
  use of SABD for exacerbations; preventing, avoiding, or controlling environmental factors that cause exacerbations;
  how to identify and manage respiratory infection;
  takes into consideration comorbid conditions in the diagnosis and treatment of COPD.

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Self-management Plan of Action

Patient Name:

I Feel Well

My Symptoms: I sleep well and my appetite is good. I am able to do my exercises.

My Actions: I avoid things that make my symptoms worse. I plan each day in advance. I take my medications as prescribed. I eat healthy food. I do my exercises on a regular basis.

I Feel Worse (Environment/Stress)

My Symptoms: I am more short of breath than usual. I may cough, wheeze, or have sputum.

My Actions: I use my breathing techniques and try to relax. I avoid what made my symptoms worse. I take ____puffs of____ and repeat in 20 to 45 minutes 2 or 3 times if I need to.

If my symptoms do not improve or get worse, I call my doctor (Tel:_____)

I Feel Worse (Respiratory Infection)

My Symptoms: I am more short of breath than usual. I have more sputum than usual. The sputum is green or yellow.

My Actions: I call my doctor (Tel:_____). I use my rescue inhaler (_____) more often as recommended by my doctor. I take my antibiotic and anti-inflammatory as prescribed by my doctor.

If my symptoms do not improve or get worse, I go to the hospital or medical clinic.

I Feel Much Worse or I Am In Danger

My symptoms are worse or my symptoms have not improved after 48 hours of treatment.

My Actions: I see my doctor or go to the hospital or medical clinic.

If I am extremely short of breath, agitated, confused and/or drowsy or I have chest pain, I call 911 and get emergency medical treatment.

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Abbreviations

AAT – Alpha-1 Antitripsyn

ABG – Arterial Blood Gases

AECOPD – Acute Exacerbation of COPD

BMI – Body Mass Index

BP – Blood Pressure

CNS – Central Nervous System

COPD – Chronic Obstructive Pulmonary Disease

CrCl – Creatinine Clearance

CVD – Cardiovascular Disease

FEV_1 – Forced Expiratory Volume in 1 Second

FVC – Forced Vital Capacity

GERD – Gastro-esophageal Reflux Disease

HH – HandiHaler

ICS – Inhaled Corticosteroid

inh – inhalations

INR – International Normalized Ratio

K^+ - potassium

LAAC – Long-acting Anticholinergic

LABA – Long-acting Beta-Agonist

LTOT – Long Term Oxygen Therapy

MAOI – Monoamine Oxidase Inhibitor

MAOI – Mono-amine Oxidase Inhibitor

MDI – Metered Dose Inhaler

MI – Myocardial Infarction

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Abbreviations cont'

MRC – Medical Research Council

nebs – nebules

NRT – Nicotine Replacement Therapy

PDI – Power Dose Inhaler

QOL – Quality of Life

RTI – Respiratory Tract Infection

SAAC – Short-acting Anticholinergic

SABA – Short-acting Beta-agonist

SJS – Stevens-Johnson Syndrome

SOB – Shortness of Breath

TMJ – Temporomandibular Jaw Syndrome

TMJ – Temporomandibular Joint Syndrome

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