COPD: Helping Patients Breathe Better at Home So They Can Stay at Home

Speaker(s): Nikki Krueger, MPT, COS-C

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COPD: Helping Patients Breath Better at Home So They Can Stay at Home

Presented By: Nikki Krueger, PT, COS-C
Combined Sections Meeting
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Learning Objectives:

• Describe standardized scales to assess this patient population
• Describe the basics of the important medications and use this information for effective treatment planning
• Describe hands-on assessment skills related to examination of this patient population
• Describe the importance of the interdisciplinary approach and what each discipline has to offer
Review Anatomy of the Healthy Lung

Healthy Diaphragm

- **Inhale**: Diaphragm Flattens
- **Exhale**: Diaphragm Domes
- Attaches at:
  - Rib 6, Rib 8
  - T10
- Innervation:
  - Phrenic Nerve
Review Lung Anatomy

Chronic Obstructive Pulmonary Disease
Review Anatomy of the Diseased Lung

Chronic Obstructive Pulmonary Disease (COPD)

**Chronic Bronchitis**
- Healthy
- Inflammation & excess mucus

**Emphysema**
- Healthy
- Alveolar membranes break down

Comparison of Diaphragms

**Healthy Diaphragm**

**Hyper-inflated Diaphragm**
Important Clinical Tests

• **Arterial Blood Gases (ABGs)**
  – Assess the pH (7.35-7.45)
  – Assess PaCO2 (35-45mmHg)
  – Assess PaO2 (>80mmHg)
  – Assess Bicarb level (22-26 mmol/L)
  – Assess arterial SaO2 (>95%)
  – Values for COPD may show some type of resp failure:
    • **Resp Acidosis**: pH ↓, PaCO2 and HCO3 ↑ (Tip: probably a CO2 retainer
      – don’t turn up O2; work on exhale!)
    • **Resp Alkalosis**: pH ↑, PaCO2 and HCO3 ↓

• **Chest X-rays:**
  – Bony changes such as barrel chestedness and horizontal ribs; sometimes hard to see on just visual inspection of obese patient
  – Muscular changes such as flattened diaphragm (Tip: don’t bother with diaphragmatic breathing, pick another strategy)
  – **Tissue changes:**
    • Blebs and bullae with emphysema
    • Infiltrate/consolidation with chronic bronchitis
    • Bronchial narrowing with chronic bronchitis and asthma
    • (Tip: make sure pt is using appropriate meds pre-exercise)
Important Clinical Tests

• **Pulmonary Functions Tests (PFTs)**
  – Assess lung volume/capacity, ventilation, pulmonary mechanics, and diffusion
  – **COPD:** ↑vital capacity and total lung volume due to ↑residual volume and ↑functional residual volume (>120% expected). Expiratory flow rates ↓
  – **Tip:** this is NOT a good thing to have increased volume; increased volume = decreased efficiency of breathing

• **Pulmonary Exercise Tests**
  – May be called Cardiopulmonary Exercise Testing (CPX or CPET)
  – Analyzes the O2 uptake and CO2 production during exercise test
  – Patient breathes through a non-re-breather mask and may also have a line in so that serial ABGs can be drawn
  – Can be as simple as 6MWT or as taxing as TMT
  – Can be helpful in comparing subjective reports of DOE, with objective data related to ventilation/perfusion with activity
  – Will probably only find this report if referred from Pulmonologist; you can call and request report
  – **Tip:** results can help you know where to start with aerobic exercise
Clinical Examination – Vital Signs

• You need a good set of Vital Signs at every visit:
  – BP
  – O2 Sats (if you can get a reading)
  – Temperature, need to catch infection fast!
  – RR
  – PR and HR
  – Heart Sounds (check for S3 if CHF is co-morbidity)
  – LUNGS SOUNDS – every visit!!
Clinical Examination – Standardized Scales

• Standardized scales to rate breathing at rest and with activity
  – ACSM Dyspnea Scale (0-4): subjective rating!! (Appendix A)
  – Ventilatory Response Index (VRI) - count to 15: objective rating!! (Appendix B)

• Use the standardized scales with functional activity and with aerobic/strengthening activity

• Make sure to use the same scale throughout your episode, it is confusing to switch around

Clinical Examination – General Inspection

• Skin temp proximal to distal
• Any chest wall scars that will limit restrict breathing
• How did you find them?
  – Are they leaning to one side? If that is the preferred side, that side will be more mobile.
  – Do they need to prop forward or backward to breath comfortably? Tip: teaching a “breathlessness position” is a skilled service!! You are helping them understand their diaphragm!
  – Can they even find a comfortable position?
  – Are they already relying on accessory muscles?
Clinical Examination –
General Inspection

• Hypoxia:
  – Cyanosis = acute
  – Clubbing = chronic

• Posture:
  – Head forward – overuse of accessory muscles
  – Thoracic kyphosis – overuse of accessory muscles
  – Barrel chested – flattened diaphragm
Clinical Examination –
Assessment of Breathing

• Assess the pattern of breathing at rest
  – In supine/reclined (or as close as possible)
  – Normal = diaphragm, middle chest, upper chest
  – COPD = lots of upper chest breathing, either due to chronic SOB
    or due to diaphragm not viable

Clinical Examination –
Assessment of the Diaphragm

• Sniff Test:
  – You place your hand at the xiphoid process
  – Instruct the patient to sniff 3 times quickly
  – You note where the sniff happens:
    • If you feel the diaphragm contract under your hand and see the abdominal
      wall move outward, then the diaphragm is still viable
    • If you don’t feel anything, the abdomen doesn’t really move, and you see all
      the movement happening in the upper chest, then the diaphragm is no longer
      viable
  – TIP: We will use this as a treatment strategy later
Clinical Examination – Assessment of the Diaphragm

• Chest wall excursion with Inhale/Exhale:
  – Patient supine or reclined, thumbs at xiphoid and hands wrap around costal margins
  – Normal = 2-3” gap with inhale; COPD = inward movement of costal margins

![Figure 6.14: Palpation of diaphragmatic motion. A, At rest, B, At the end of a deep inspiration.]

Clinical Examination – Assessment of the diaphragm

• Mediate Percussion:
  – Middle finger of the non-dominant hand is tapped with middle finger of dominant hand
  – Find the resting diaphragm
  – Patient inhales and hold, percuss down to see how far the diaphragm moves with max inhale
  – Patient exhales and holds, percuss up to see how far the diaphragm moves with max exhale

• Sounds:
  – Dull sound = Organs
  – Resonant sound = Lungs
  – Hyperresonant = Emphysema
  – Dull/Absent = Chronic Bronchitis
Clinical Examination – Assessment of Cough

• Four phases of cough:
  1. Inspiration
  2. Glottal closure
  3. Increased abdominal/thoracic pressure
  4. Forced exhale

• Have them cough (without your coaching at first) and see which phase(s) they are struggling with

Clinical Examination – Assessment of Cough

• If something comes up, assess & document:
  – Color:
    • New yellow/green = infection
    • Pink/frothy = pulmonary edema = STOP coughing and call MD
  – Amount: trace, min, mod, max, copious
  – Viscosity: thin, thick
  – Odor: in general, don’t have to stick face in it!!!
  – Expenditure – cough is an aerobic workout

• Tip: secretions have to get to the proximal 1/3 of the bronchial tree in order for patient to expel them. For some of them, that’s A LOT of effort!!!
Clinical Examination –
Assessment of Aerobic Capacity

- Always take vitals pre, during/peak, and post
- Note the time it takes to recover to baseline
- Include the standardized scales; ACSM dyspnea, VRI
- Can use:
  - 2 MWT
  - 6MWT
  - Symptom limited TM – if they have TM in home
  - Symptom limited bike test – if they have bike in home
- This gives you a place to start with home program

“He’s complaining of chest pain, shortness of breath, cramps and dizziness. Do you sell earplugs?”
**Our Role in COPD Management**

COPD

Exertion

Due to air trapping

Exacerbation

Shortness of Breath

Debility

Inactivity

Decreased Conditioning

Disease Progression

**Problems/Interventions/Goals**

**RN: Medications**

- **Problem**: patient does not understanding the purpose/side effects of all meds; also unsure if patient is taking meds appropriately; patient feels good coming out of hospital so stops taking meds
- **Intervention**: med teaching and observation of patient taking/setting up meds
- **Goal 1**: Patient will demonstrate 100% accuracy with taking inhaled/nebulized med with no verbal cues for 3 concurrent visits in 2 weeks in order for pt to obtain full benefit of meds.
- **Goal 2**: patient will demonstrate 100% accuracy with setting up and taking oral meds 3 weeks concurrently with no verbal cues in 6 weeks, to show that pt can safely manage own meds in home alone.

**Adapted from Cooper. Respir Med 2009**
Problems/Interventions/Goals

Therapists: Medications

– **Problem:** patient with uncontrolled dyspnea on exertion (DOE)
– **Problem:** patient unable to clear secretions from airway
– **Intervention:** (among others) education on coordinating meds with activity
– **Goal:** patient will be (I) with completing nebulizer/inhaler regimen and airway clearance program prior to strengthening and aerobic exercise to achieve max benefits, within 4 weeks.

Medication Review - 
**Bronchodilators**

- Bronchodilator: relaxes smooth muscles in the lungs so that more air can move in and out
  - **Adrenergic Agonist:** increase airway patency through smooth muscle relaxation
    - **Rescue:** Proventil, Ventolin, ProAir, Primatene Mist (albuterol or albuterol sulfate)
    - **Long-Acting:** Serevent (salmeterol), Brovana (arformoterol), Perforomist (formoterol)
  - **Anticholinergic Agents:** increase airway patency through preventing bronchoconstriction
    - Ex: ipratropium (Atrovent) and tiotropium (Spiriva)
    - Both Long Acting drugs
    - Spiriva pills – DO NOT TAKE CAPSULES ORALLY - use in the handihaler device
Medication Review -
Bronchodilators

– Both are inhaled bronchodilators so go directly to lungs with little side effects

– Generally prescribed a “rescue” inhaler first, but if have to use >2x/wk, will be prescribed a long acting.

– TIP: if they don’t have what they need, you can help them by letting the doctor know the true picture. This really helps you and the patient!!!!

Medication Review -
Anti-inflammatory Agents

• Glucocorticosteroids/Corticosteroids
  – Prevent inflammatory-induced bronchoconstriction
  – Inhibit inflammatory cells
  – Decrease histamine response
  – Decrease edema
  – Improve lung function
  – 1-2x/day dosing; not indicated for acute bronchospasm
  – Med List:
    • Flunisolide (Aerobid), budesonide (Pulmicort), fluticasone (Flovent), ciclesonide (Alvesco), beclomethasone (Qvar), mometasone (Asmanex)
Is the Patient Using the Metered Dose Inhaler (MDI) Correctly???

1. Shake the inhaler
2. Exhale completely through closed mouth
3. Position the inhaler either
   a. 2” in front of mouth
   b. In mouth with opening behind front teeth
4. Begin to slowly inhale and then active inhaler
5. Continue to slowly inhale as long as possible
6. Hold breath for 5-10 sec
7. Exhale slowly through nose
8. If prescribed 2 puffs, wait 1-2 min and repeat process
9. Rinse mouth/throat with water after

http://www.stupidvideos.com/video/just_plain_stupid/House_MD_-_Season_5_Episode_11_-_How_Your_Inhaler_Works/

Does your patient need a Spacer?

If your patient is having trouble with coordination or timing of inhaler and is not getting full dose.....

Maybe they need a spacer or an air chamber to give them more time to inhale.
Are they getting accurate dosing with the nebulizer?

- **Do they have the right pieces?**
- **Does OT need to work on fine motor skills?**
- **Do we all need to work on deep breathing to get an effective treatment?**

### Medication Review - Combination Drugs-Long acting

- **Advair**: is a combination of two medications -- fluticasone, a corticosteroid, and salmeterol, a long-acting, beta-agonist bronchodilator. Advair is used for maintenance treatment of COPD.
- **Symbicort**: contains formotorol, a long-acting, beta-agonist bronchodilator, and budesonide, a corticosteroid.
- **Combivent (inhaler) or DuoNeb (nebulizer)**: contains two bronchodilators -- albuterol (a beta agonist) and ipratropium, an anticholinergic. Combination bronchodilator inhalers like Combivent, may help increase the bronchodilator effect of the medications, with the same or fewer side effects.
Medication Review -
*Mucoactive Agents*

- **Mucolytics:**
  - Reduce the viscosity of the mucus
  - Ex: acetylcysteine (Mucomyst, Acetadote)

- **Expectorants:**
  - Increase volume/hydration of secretions
  - May also induce coughing
  - Ex: most common is guaifenesin, which is found in most OTC cough meds, e.g. Duratuss, Mucinex, Amibid,
  - SE may include N/V or diarrhea

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Medication Review -
*Other drugs*

- **Antibiotics/Antimicrobials**

- **Decongestants/Anti-histamines: for upper airway sinus congestion and seasonal allergies**

- **Anti-tussives: if the cough is non-productive and taxing**

- **Drugs for smoking cessation**

- **Oxygen – remind pt to call vendor for service**
COPD Requires an Interdisciplinary Approach for Successful Intervention!

Problems/Interventions/Goals

RN: Shortness of Breath
- Problem: patient has SOB at reset or with minimal activity
- Intervention: education on rescue meds vs. long acting meds
- Intervention: education on stop light tool
- Intervention: education on relaxation, PLB, and Breathlessness positions
Problems/Interventions/Goals

RN: Shortness of Breath

– Goal 1: patient/caregiver will demonstrate (I) with knowing when to report signs/symptoms of SOB and who to report to, by correctly walking through scenarios using the stoplight tool, in 1 week, so that patient/caregiver have a plan for crisis situations.

– Goal 2: patient will verbalize with 100% accuracy which inhalers to take scheduled and which to take as a rescue, in 1 week, for better management of crisis situations.

– Goal 3: patient to be (I) with use of (*fill in scale here*), to correlate with when to use rescue inhaler, breathing techniques or relaxation in 4 weeks.

Problems/Interventions/Goals

• Therapists: Shortness of Breath
  – Problem: patient has SOB at rest or with minimal activity
  – Intervention: education on rescue meds vs. long acting meds
  – Intervention: education on stop light tool
  – Intervention: education on relaxation, PLB, and Breathlessness positions
Problems/Interventions/Goals

• Therapists: Shortness of Breath
  — Goal 1: patient to be (I) with use of (fill in scale here) to be able to self monitor, in 2 weeks
  — Goal 2: patient will be (I) with PLB/breathlessness positions as recovery techniques in 2 weeks for management of SOB.
  — Goal 3: patient will be (I) with PLB as a preventative technique in 4 weeks, to increase aerobic tolerance/functional mobility before DOE.
  — Goal 4: patient will achieve optimal breathing pattern, (describe the pattern here), to obtain max breathing potential with functional mobility in 8 weeks.

Breathing Technique – Pursed Lip Breathing (PLB)

• In through nose (smell the flower)
• Out through PURSED LIPS (like blowing a kiss)
• Exhale to Inhale ratio is 2:1
• You can incorporate diaphragm if it is viable
• Why do it? -
  — Keeps air in lungs longer for gas exchange
  — Provides positive pressure to pop open any closed alveoli
  — Is proven to bring BP/HR/RR down (i.e., relaxation) if done progressively slower
Breathing Technique – Pursed Lip Breathing (PLB)

- Is a learned skill!
- Teach in supine->sit ->stand->walking-> functional mobility
- Will need repeated training for carry over from all disciplines!!
- You can use Sniffing as a technique to cue PLB

Sniffing as a treatment for controlled deep breathing (diaphragmatic if possible, otherwise just PLB)

- Position the patient for success and keep your voice quiet
- Ask the patient to place a hand on the lowest point of breathing
- Quietly ask patient to sniff 3 times
- Draw attention to the patient’s pattern of breathing and what you would like the pattern to be with verbal or tactile cues
- Have them sniff 3 times again, then “let it out slowly”.
- Now “sniff in twice and a little deeper”, note any increase in chest wall excursion
- Continue to “one long, slow sniff”, then “more quietly”, then “more slowly”, and “even quieter”, etc…
- In the end, you are getting quality PLB, with prolonged time for gas exchange and maximizing exhale
- Also works as a relaxation technique
Breathing Technique –
Pursed Lip Breathing (PLB) - Devices

Breathing Technique –
Breathlessness Positions

- Remember the diaphragm has 2 jobs
  - Posture
  - Breathing
- Purpose of Breathlessness Positions is to eliminate the postural role so that patient can just use diaphragm, or chest wall muscles, to breathe
- Use in conjunction with PLB
Breathing Technique –
Breathlessness Positions

Any position that allows the diaphragm to only work on breathing, doesn’t have to do posture also.

• A note about posture when training breath
  – Posterior pelvic tilt, UEs at side, head forward facilitates the **diaphragm muscle fibers**
  – Anterior pelvic tilt, UEs in “hold ‘em up” position, and head neutral/ext facilitates **upper/middle chest muscle fibers**
  – Consider this during assessment and treatment
  – TIP: think about where/how the patient sits most often; can this be effecting how they breathe!
Breathing Techniques – *training the diaphragm*

- Facilitation of the diaphragm
  - Cueing
  - Scooping
  - Moment before inhale
- Inhibition of the upper chest
  - Moment before inhale

Breathing Techniques – *training the upper/middle chest*

- Facilitate upper/middle chest
  - Cueing
  - Moment before inhale
Breathing Techniques –
Other techniques

• Diaphragmatic breathing

• Segmental breathing

• What are you using?
Problems/Interventions/Goals

RN: Secretion Management
– Problem: patient with ineffective cough, increase secretion, risk rehospitalization
– Problem: patient knowledge deficit of how to manage secretions
– Intervention: med education on mucoactive drugs
– Intervention: assess/intervene on coughing

RN: Secretion Management
– Goal 1: is same as your goals for meds; to be (I) with set-up and taking meds as long as this includes mucoactive drugs.
– Goal 2: Patient to demonstrate good secretion management by knowing when to cough (work on airway clearance within 15 minutes of meds) and when to suppress cough (when cough is not timed with meds, is non-productive and taxing), within 4 weeks.
– Goal 3: Patient t to demonstrate (I) with s/s of exacerbation/infection with sputum color change/increased sputum production and who to report changes to, within 2 weeks.
Problems/Interventions/Goals

Therapists: Secretion Management

- Problem: patient with ineffective cough, increase secretion, risk of rehospitalization, poor aerobic tolerance due to poor air exchange
- Intervention: assess cough, cough techniques, airway clearance

Therapists: Secretion Management

- Goal 1: Patient to exhibit effective cough for efficient airway clearance to increase aerobic tolerance for functional mobility/ADLs in 4 weeks.
- Goal 2: Patient to demonstrate proper secretion management as evidenced by knowing when to work on cough (when timed with meds) and when to suppress cough (when not timed with meds) to conserve aerobic energy, in 6 weeks.
- Goal 3: Patient to be (I) with use of devices for better breathing techniques and secretion management as evidenced by return demonstration, for improved disease management to avoid rehospitalization, in 60 days.
Coughing Techniques –
A Few Hints

• Always work on coughing within 15 minutes of patient doing inhaler/nebulizer
  – Airways are the widest and most likely to get mucus out
• Make sure patient is well hydrated
  – Decreases viscosity of mucus, makes it easier to cough out
• Make sure that patient is seated and well supported to work on coughing
• Use the devices as necessary to help move air and sputum
• Make sure patient knows how and when to suppress the cough to save energy

Coughing Techniques –
Facilitating Inhale

• Think about opening the chest up to allow inhale:
  – Trunk extension
  – Arms up above head as much as possible
  – Head into extension
  – Eyes gaze upward
**Coughing Techniques – Facilitating Exhale**

- Just the opposite; help to SQUEEZE the cough out
  - Trunk flexion
  - Arms come down to side; can even be used to push into the costal angle to assist with forced exhalation
  - Head into flexion
  - Eyes gaze downward

**Coughing Techniques – Controlled Cough**

- The patient takes 3 breaths
- Exhales normally after the first 2 breaths
- Coughs forcefully after the 3rd
- Idea is that the first 2 breaths opens any closed spaces and gets air behind the secretions to help cough them up.
Coughing Techniques –
Other Techniques

• Postural Drainage:
  – Try to position the patient so that the lobe is draining toward the bronchial tree
  – Patient just lies in position for 5-10 or can supplement with techniques below

• Percussion/Vibration/Shaking:
  – All techniques that progressively increase in oscillation/frequency; all for 3-5 minutes
  – Knock the secretions off the chest wall so easier to cough up
  – Percussion – Inhale and exhale
  – Vibration/Shaking – Exhale only
Coughing Techniques –
Coughing/Breathing Devices

Flutter Valve
– The ball in the end of the valve vibrates the air
– The vibration shakes the secretions loose from the chest wall making it easier for the patient to cough up
– It is important for patient to exhale completely with device
– No muscle training, just secretion management

Coughing Techniques –
Coughing/Breathing Devices

Acapella valve
– Similar to Flutter valve, the ball in the end vibrates the air for secretion management
– But also provides resistance training for all expiratory muscles; resistance is changes with dial on the end
Incentive Spirometer

– This can be used if patient is having trouble with inhale, as well as exhale
– Helpful to have a visual cue to breathe deep and get air behind the secretions for better clearance
– Just make sure to supplement with work on exhale to avoid air trapping

Coughing Techniques – Coughing/Breathing Devices

Problems/Interventions/Goals

Therapists: decreased activity tolerance

• Problem: decreased ability to do ADLs/IADLs
• Problem: decreased gait tolerance/functional safety due to poor aerobic tolerance
• Intervention: education on pacing/energy conservation, aerobic training, strengthening, gait/balance training, ADL/IADL training, etc…
• Goal 1: Patient able to demo improved functional aerobic tolerance as evidenced by ability to shower with ACSM dyspnea scale score of __/4 and VSS in 6 weeks.
• Goal 2: Patient to tolerate 10 minutes of dynamic standing activity with ACSM dyspnea scale score of __/4 and vital signs stable to simulate improved aerobic tolerance for walking to mailbox, in 4 weeks.
Therapeutic Interventions–
A few tips

• SHORT intervals, MULTIPLE times per day!!!
• Use the diary for accountability
• Praise small progress; it will be a slow process
• We cannot fix the lungs but can make the whole pump more efficient!
• Make sure to do **strength and aerobic both**, not one or the other
• Be ok with just educating if they are having a “bad” day

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Therapeutic Interventions–
Let’s Brainstorm

• The BREATHING is the most important things at first
  – Teach them how to breathe at rest, then with activity and then you can do the activity
  – PLB with dynamic sit/stand activities – it doesn’t automatically carry-over
  – Recovery techniques: PLB, relaxation, visualization
  – Coughing: percussion, devices, timing with meds, education on when not to cough.
• Teach them:
  – Stretching, low level exercise for strength, high level exercise for strength
  – Restorator vs. walking for aerobic workout
  – Use an Activity Log to advance the things the patient is doing on their own
Problems/Interventions/Goals

• RN/Therapists:

• Problem:
  – lack of understanding of
    • disease management
    • s/s of exacerbation
    • interventions
    • risk of rehospitalization

• Intervention:
  – assess - CV/CP status; lifestyle and current way of managing disease; assess/intervene on meds; assess signs/symptoms of exacerbation; assess safety in home
  – educate on: disease process, breathing, exercise, airway clearance, energy conservation, self-monitoring, triggers; identify patient’s personal goals

Goal:
Patient to improve respiratory symptoms, as evidenced by decreased scores on dyspnea scales and decreased secretions, and the ability to remain in the home with the appropriate use of resources in 60 days.

Goal:
Patient to be (I) with stable disease management as evidenced by verbalizing/return demo of COPD education, in 60 days.

Goal:
Patient demonstrates improved ability to manage disease in home as evidenced by use of COPD Action Plan, resulting in decreased rehospitalization, in 60 days.
COPD Action Plan

Consider Speech referral

- If there are cognitive/memory issues that can be addressed to increase compliance issues with meds and exercise program
- If there is an issue with swallowing and SOB that needs to assessed
Consider Hospice Referral

- Consider that your documentation of decline can assist in qualifying a patient for Hospice
- This is a progressive disease, we want to help patient/family meet their goals through all stages of the diseases
- Comfort and symptom management become the number one goal towards the end stages and we can provide that in the home through Hospice!

Consider Hospice Referral

- It is not an exact science but some common indicators that patient will qualify for Hospice include
  - Dyspnea at rest
  - Frequent/recurrent pulmonary infections
  - Sats <88% on O2
  - Resting tachycardia >100bpm
  - Weight loss, >10% in past 6 months
  - PaO2 55mmHG determined by ABGs
  - FEV1 <30% after bronchodilators
  - Cor pulmonale/right heart failure
"Boy, am I out of breath. I had to run crying 'Wee, wee, wee!' all the way home."

Our Role in COPD Management

**Adapted from Cooper. Respir Med 2009**
Questions

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## ACSM DYSPNEA SCALE

<table>
<thead>
<tr>
<th>Classification</th>
<th>Descriptor</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>No dyspnea</td>
</tr>
<tr>
<td>1</td>
<td>Mild, noticeable</td>
</tr>
<tr>
<td>2</td>
<td>Mild, some difficulty</td>
</tr>
<tr>
<td>3</td>
<td>Moderate difficulty, but can continue</td>
</tr>
<tr>
<td>4</td>
<td>Severe difficulty, cannot continue</td>
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</table>
VENTILATORY RESPONSE INDEX (VRI)

Instructions: Have the patient take a deep breath and count out loud to 15 over an 8 second period of time. Snap or tap to help the patient keep pace. Listen for how many breaths are required to get to 15.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Able to get to 15 in a single breath</td>
</tr>
<tr>
<td>1</td>
<td>Able to count to 15, but requires 1 additional breath</td>
</tr>
<tr>
<td>2</td>
<td>Able to count to 15, but requires 2 additional breaths</td>
</tr>
<tr>
<td>3</td>
<td>Requires 3 additional breaths</td>
</tr>
<tr>
<td>4</td>
<td>Requires 4 or more additional breaths</td>
</tr>
</tbody>
</table>