Pulmonary Rehabilitation:
more than just an exercise prescription

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Objectives

- To describe the role of pulmonary rehabilitation (PR) to an audience of primary care providers (PCPs)
- To show that PR is a recognized standard of care for COPD patients and a necessary part of their continuum of care
- To promote the benefits of PR to prospective patients through increased PCP awareness
- To increase referrals from primary care providers of those patients that would benefit from participation in a pulmonary rehabilitation program
What is pulmonary rehabilitation?

Definition given by the American Thoracic Society (ATS) and European Respiratory Society (ERS):

"Pulmonary Rehabilitation (PR) is an evidence-based, multidisciplinary, and comprehensive intervention for patients with chronic respiratory diseases who are symptomatic and often have decreased daily life activities. Integrated into the individualized treatment of the patient, pulmonary rehabilitation is designed to reduce symptoms, optimize functional status, increase participation, and reduce health care costs through stabilizing or reversing systemic manifestations of the disease." (1)
What is pulmonary rehabilitation?

Pulmonary Rehabilitation is intended for patients compromised by their disease and motivated to:

• Regain quality of life
• Return to home and/or work activities
• Improve functional capacity
• Increase their understanding of lung disease
• Quit tobacco
• Decrease oxygen dependency
• Improve exercise tolerance
What is pulmonary rehabilitation?

Pulmonary Rehabilitation can help:

- Improve peripheral muscle endurance and strength
- Decrease exertional dyspnea
- Reduce anxiety
- Improve mood and affect
- Improve functional status
- Reduce ED visits and/or hospital admissions for exacerbation
- Assist patients in the self-management of their condition through effective self-monitoring, allowing for early medical intervention when appropriate
What is the primary goal of pulmonary rehabilitation?

"The primary goal (of pulmonary rehabilitation) is to restore the patient to the highest possible level of independent function, which is accomplished by helping patients learn more about their disease, treatments and coping strategies."

- Andrew Ries, MD, MPH, FCCP
  School of Medicine, University of California, San Diego
Evidence-based

In 1997, the American Association of Cardiac and Pulmonary Rehabilitation (AACVPR) provided evidence-based guidelines in conjunction with the American College of Chest Physicians (ACCP)(1). Pulmonary rehabilitation has now become a recommended standard of care for patients with chronic lung disease.

According to the AACVPR/ACCP(2) panel findings, there is strong evidence to show that pulmonary rehabilitation:

- Improves exercise tolerance
- Reduces anxiety and dyspnea on exertion
- Increases self-efficacy
- Improves health-related QOL (HRQOL)

(2) ACCP/AACVPR Evidence-Based Guidelines for Pulmonary Rehabilitation: Round 3: Another Step Forward, Ries, Andrew L. MD, MPH. Journal of Cardiopulmonary Rehabilitation and Prevention, July/August 2007 - Volume 27 - Issue 4 - pp 233-236
Strength of evidence supporting efficacy: American Thoracic Society (ATS)\(^{(1)}\)

<table>
<thead>
<tr>
<th>Component</th>
<th>Level of Evidence</th>
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<tbody>
<tr>
<td>Lower extremity training</td>
<td>A</td>
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<tr>
<td>Upper extremity training</td>
<td>A</td>
</tr>
<tr>
<td>Respiratory muscle training</td>
<td>B</td>
</tr>
<tr>
<td>Education and physiotherapy</td>
<td>B</td>
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<tr>
<td>Psychosocial support</td>
<td>C</td>
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<tr>
<td><strong>Benefits</strong></td>
<td></td>
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<tr>
<td>Dyspnea</td>
<td>A</td>
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<tr>
<td>Health-related quality of life (HRQOL)</td>
<td>A</td>
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<tr>
<td>Cost reduction</td>
<td>B</td>
</tr>
<tr>
<td>Survival</td>
<td>C</td>
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Key: A = High level of evidence; B = Moderate level of evidence; C = Low level of evidence

Evidence-based

A recent Kaiser Permanente study published in the *Annals ATS, April 08, 2014* (1), looking at the association between physical activity and 30-day readmission, found that regular physical activity at baseline was associated with lower risk of 30-day readmission for patients with COPD. The study’s findings "*further support the importance of physical activity in the management of COPD across the continuum.*"

Often, when all other treatment options have been optimized or exhausted, pulmonary rehabilitation remains a viable treatment modality for improving functional status, maintaining functional independence, and improving HRQOL.

(1) Annals ATS. First published online 08 April 2014 as DOI: 10.1513/AnnalsATS.201401-0170C
Which patient populations benefit from PR?

PR has been beneficial in the treatment of:

- COPD
- Emphysema
- Asthma
- Cystic fibrosis (CF)
- Bronchiectasis
- Lung cancer, status-post lung resection/chemo/radiation therapies
- Interstitial lung diseases (pulmonary fibrosis, sarcoidosis)
- Pulmonary hypertension (both primary and secondary PHTN)
- Thoracic cage abnormalities, such as kyphosis, kyphoscoliosis
- Patients undergoing consideration for lung volume reduction surgery (LVRS)
Which patient populations benefit from PR?

The landmark National Emphysema Treatment Trial (NETT)(1), designed to assess the efficacy of LVRS, indirectly demonstrated the effectiveness of PR in patients with severe emphysema.

Of the patients who participated in the multicenter clinical trial, 10% improved their exercise capability to such a degree after pulmonary rehabilitation that they were unwilling to proceed to randomization and accept the risks of surgery.

As a result, PR is now a requirement for all candidates seeking LVRS.

Chronic obstructive pulmonary disease (COPD) is the most common form of primary pulmonary disease. COPD is currently ranked as the 3rd leading cause of death in the USA\(^1\). According to the 2010 *Global Burden of Disease Study* published in the *Lancet* in 2012, analysis of data from 187 countries ranked COPD as the 3rd leading cause of death globally. Although most cases of COPD are caused by smoking, only 15%-25% of smokers develop COPD\(^2\). Prevalence in the US varies from 14 to 20 million people.

As primary care providers, you are often the first providers to see a person with COPD and you may be the *only* provider involved in their treatment and care.

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Systemic effects of COPD often include:

- Dyspnea on exertion
- Chronic cough
- Wheezing
- Airway inflammation
- Peripheral muscle dysfunction
- Lower extremity weakness

- Muscle wasting
- Limitations to physical activity
- Anxiety and depression
- Social isolation
- Lack of appetite
Components and structure of a pulmonary rehabilitation program

Multidisciplinary program ~ Phase II (outpatient)

• Under the supervision of a qualified medical director
• Pulmonary rehabilitation coordinator
• Other staff include respiratory therapists, dietitians and clinical exercise physiologists (CEPs)
• Protocol driven environment
• Progressive exercise
• Patient education
• Staff trained to assess and respond to cardiopulmonary events
Components and structure of a pulmonary rehabilitation program

It can take on average two-three weeks from physician referral to initial visit.

- Typically, 12-24 Visits over 90 days
- Attend 1-2x week
- Initial Assessment, 6 Minute Walk Test (6MWT)
- Breathing retraining
- Graded exercise & strength training
- Flexibility and balance exercises
- O2 provided to keep SpO2 ≥ 92% (Rx)
- Medical nutrition counseling
- Support for the caregiver/spouse/family
- Tobacco cessation if patient currently a smoker
Components and structure of a pulmonary rehabilitation program

Educational component. Weekly lectures cover:
- Basic cardiopulmonary anatomy & physiology (A&P)
- Chronic pulmonary disease management
- Medications
- Nutritional considerations
- Psychological considerations of living with lung disease
- Airway clearance techniques
- Travel tips and energy conservation
- End of life considerations and palliative care
- Community resources
- Life after pulmonary rehabilitation (Phase III)
Pulmonary rehabilitation in the pulmonary patient's continuum of care

Approximately 20-30% of patients treated in the ER for acute exacerbation of COPD (AECOPD) will relapse within 4 weeks of discharge\(^1\). Hospital staff involved in discharge planning need to be able to identify inpatients that could benefit from participation in a pulmonary rehabilitation program.

Participation in a pulmonary rehabilitation program has been shown to cut down on hospital readmissions and improve HRQOL. The joint AACVPR/ACCP guidelines recommend that patients should be provided with access to PR as soon as possible after an exacerbation requiring hospitalization\(^2\).

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Referral process

• Hospitalists cannot refer a patient for pulmonary rehabilitation, although they can recommend that a patient attend PR. Only primary care providers - and certain specialists, typically pulmonologists and/or cardiologists - can refer patients.

• At this time, only MDs and DOs are permitted to make referrals. ANPs and PAs can refer, but only if a physician counter-signs the order.
Referral process

- Signed orders can be faxed directly to the PR coordinator - typically, these are pre-printed forms w/ check-boxes and room for comments. Electronic orders can also be submitted if there is EMR compatibility.

- A recent\(^{(1)}\) pulmonary function test (PFT) will need to accompany the referral order. This provides supporting documentation for the referring diagnosis.

- If the patient does not have a recent PFT, this can be performed either in-office or ordered through the Respiratory Care department of a local hospital.

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\(^{(1)}\) Medicare does not specify how long before pulmonary rehabilitation the PFT is performed
**GOLD**(1): spirometric classification of COPD

<table>
<thead>
<tr>
<th>Stage</th>
<th>Classification</th>
<th>FEV1/FVC</th>
<th>FEV1</th>
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<tbody>
<tr>
<td>Stage II</td>
<td>Moderate COPD</td>
<td>FEV1/FVC&lt;0.70</td>
<td>FEV1 50-80% predicted</td>
</tr>
<tr>
<td>Stage III</td>
<td>Severe COPD</td>
<td>FEV1/FVC&lt;0.70</td>
<td>FEV1 30-50% predicted</td>
</tr>
<tr>
<td>Stage IV</td>
<td>Very severe COPD</td>
<td>FEV1/FVC&lt;0.70</td>
<td>FEV1 &lt;30% predicted or &lt;50% plus chronic respiratory failure</td>
</tr>
</tbody>
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Medicare will cover up to 36 visits in a lifetime for classifications of moderate, severe, or very severe COPD.

Post-discharge and Phase III

One of the biggest challenges for the patient after discharge from a pulmonary rehabilitation program is how to keep up the momentum and capitalize on the gains made while in PR.

Phase III (Supervised Exercise Program) gives the patient the ability to continue his/her exercise regimen in a safe and familiar environment while providing structure, supervision, and an opportunity to socialize and make new friends. In the context of Phase III, pulmonary rehabilitation can be seen not as an end in and of itself, but as the beginning of an ongoing process of personal growth and wellness.

A physician's order is necessary for referral to a Phase III program. Most programs are private pay and not reimbursed by insurance at this time. Scholarships may be available for those on limited incomes.
“I wish I’d known about this sooner.”

Some quotes from a few of our PR graduates:

- “It’s improved my life a lot.”
- “It’s good for my mind and soul. It’s helped a lot. I feel like skipping… it’s good!”
- “If I have a new question, I know that I can pose it to a staff member… the knowledge of having a healthcare ‘colleague’ is very reassuring.”
- “I’ve learned about many materials and methods which have enabled me to cope more effectively.”
- “Setting a schedule gives structure to my week… I feel this is an important component of my maturing self-esteem - not vegetating.”
Summary

- Pulmonary rehabilitation has been shown to improve exercise tolerance, reduce anxiety and dyspnea, and improve health-related QOL (HRQOL).
- Pulmonary rehabilitation remains widely under-utilized despite being a recommended standard of care.
- Patients should be considered for referral to a PR program who, despite optimal medical management, remain dyspneic on exertion and/or experience increased difficulty performing their activities of daily living (ADLs).
- Patients who participate in pulmonary rehabilitation have better outcomes than those who do not\(^1\).

\(^1\) Physical Activity Is the Strongest Predictor of All-Cause Mortality in Patients With COPD: A Prospective Cohort Study
Questions?