Practical Issues:
Patient Education, Adherence, Inhaler Technique, and Pulmonary Rehabilitation

www.PILOTforPulmonary.org
Introduction to Pulmonary Rehab
COPD Case Study
Pulmonary Rehabilitation

COPD Case Study

• 61-year-old male with COPD w. 2 block exercise tol
• 58 pk/yr smoke. Hx, quit ‘05
• C/C DOE, worsening over the past year
• Dyspnea: mMRC scale 3
  Stops for breath after walking about 100 yards or after a few minutes on level ground
• Hospitalizations: 1  ED: 1 x
• Exacerbations: 3 x w. steroids/antibiotics
• Comorbid Conditions – HTN, GERD 3 x w. steroids/antibiotics
• Meds – SABA, LABA, LAMA, Metoprolol for HTN, Omeprozole for GERD
• ADLs – uses a shower stool, alt. QOD too fatigued
• Nutrition – BMI 22

Can Pulmonary Rehabilitation...

• Improve physical functioning?
• How?
• What education opportunities exist?
• What more would to like to know?
  PFTs
  6 MWD
  Oxygenation parameters
ATS/ERS 2013 Definition

“Pulmonary rehabilitation is a comprehensive intervention based on a thorough patient assessment followed by patient-tailored therapies that include, but are not limited to, exercise training, education & behavior change, designed to improve the physical & psychological condition of people w. chronic respiratory disease and to promote the long-term adherence to health-enhancing behaviors.”

Goals of Pulmonary Rehabilitation

• Control & alleviate symptoms
• Improve activity tolerance
• Promote self-reliance & independence
• Decrease need for acute resources
• Improve quality of life
• Improve treatment adherence and acute exacerbation prevention
Evidenced Based Guidelines

• 6-12 weeks, longer is often better
• Sessions should occur 2-3 x weekly
• 20 sessions – may include unsupervised exercise as well
• Education should be tailored to individual needs and be disease specific
• Exercise training should include aerobic and resistance training
• Most guidelines support training to 70–80% of maximum workloads
• Maintain oxygenation at least to 90% with exercise

Core Components

- Assessment
- Intervention

**EDUCATION** – for skill building and to entice behavioral changes that lead to a more active, healthier lifestyle

**EXERCISE** – Remain and/or gain independence w. ADLs

**NUTRITION** – support for making behavior changes that improve ventilatory efficiency

**PSYCHOSOCIAL** support for feelings of depression, fear, loss, isolation and progressive disability

**OXYGEN ASSESSMENT**

- Reassessments to monitor progress & modify therapy & training when warranted
- Outcomes and follow-up
More Evidence

- ATS/ERS Statement on Pulm Rehab (2014)
- GOLD Guidelines COPD (2019)
- ESC/ERS, CHEST Guidelines for PAH (2015, 2019)
- Cochrane Review (2007)
- Puhan et al. (2014)

Quality of evidence is high for patient-centered outcomes such as health-related quality of life & exercise capacity in stable patients.

Pulmonary rehabilitation following a COPD exacerbation has strong effects, & evidence for most outcomes demonstrates moderate to high quality of evidence.

Non-Pharmacologic Therapies:

• Pulmonary Rehabilitation (PR) Recommendation – “The majority of patients with IPF should be treated with PR, but PR may not be reasonable in a minority (weak recommendation, low quality evidence)

• Values – High value on moderate-quality data demo. Improvement in functional status and patient-centered outcomes and a low value on cost and uncertain regarding duration of benefit

• Remarks – Components need to be tailored to population

<table>
<thead>
<tr>
<th>Study</th>
<th>Duration</th>
<th>Max Capacity</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swigris – (IPF) 6-8 wks 60 % max</td>
<td>Resp Care. 2011;56:783-789.</td>
<td>↑ Functional capacity and fatigue</td>
<td></td>
</tr>
<tr>
<td>Nishiyma – (IPF) 10 wks 80% max</td>
<td>Respirology. 2008;13:394-399.</td>
<td>6 MWD ↑ 46 M</td>
<td></td>
</tr>
<tr>
<td>Huppman P – (ILD) 2013</td>
<td>Eur Resp J. 2013;42:444-453.</td>
<td>6 MWD ↑ 46 M, no change in dyspnea ratings, improved QOL</td>
<td></td>
</tr>
<tr>
<td>Holland AE – (ILD/IPF)</td>
<td>Cochrane Database Syst Rev. 2014:CD006322.</td>
<td>6 MWD ↑ 44 M on average Max exercise capacity, shortness of breath and QOL</td>
<td></td>
</tr>
<tr>
<td>Vainshelboim B – (IPF) 12 wks</td>
<td>Arch Phy Med Rehabil. 2016;97:788-797</td>
<td>Endurance training improves exercise tolerance, functional capacity, pulmonary function, dyspnea and QOL in patients with IPF, suggesting a short-term treatment efficacy for clinical improvement, and should be considered the standard care for IPF.</td>
<td></td>
</tr>
<tr>
<td>Perez-Bogerd S – (ILD)</td>
<td>Respir Res. 2018;19:182.</td>
<td>Improved exercise tolerance, health status and muscle force in ILD. Benefits maintained up to 1 year</td>
<td></td>
</tr>
</tbody>
</table>
Loss of self confidence
Increased activity avoidance
Further Deconditioning
Dyspnea
Weakness
De-conditioned
Hospitalization
Exacerbations
Exercise Reconditioning

Limitations to consider

• Circulatory, Gas Exchange Impaired, Hypoxemia
• Skeletal Muscle Dysfunction and Fatigue
• Exertional Dyspnea
• IPF/ILDs -- Coughing \( \rightarrow \) Desaturation \( \rightarrow \) Exhaustion
• Follow ATS/ACCP/AACVPR Guidelines – UE and LE resistance and endurance training

Exercise Components

- Upper/Lower Extremity Strength Training
- U/LE Endurance Training
- Flexibility & Stretching
- Oxygen in those with $\text{SpO}_2 < 88\%$
- Implementation of the Home Exercise Program (HEP)
Skills Training Topics

- Breathing Techniques
- LTOT Use – Self Monitoring & Titration
- Home Exercise Program
- Energy-Saving techniques
- *Exacerbation Recognition/Action Plan*
- Secretion Management
- Anxiety/Fear – Stress Management
- Nutrition, Advanced Directives and Travel
What do ILD patients want from PR clinicians?

- Disease-specific content
- End-of-life planning
- Honesty about their future and to listen to their concerns
- Education on treatment modalities needs to be relevant

Losses and Uncertainty

- Overwhelmed
- Sad
- Worried
- Scared about disease progression
- Uncertain

IPF Patients are...
- Often referred when disease is advanced
- Frustrated – unknown cause for deterioration in health

Some may have to make big decisions re: lung transplantation w/o fully being able to adjust to major lifestyle changes
Important Areas for Assessment

_The individual patient’s ability to:_

- Understand disease and treatments
- Ability to adhere to recommended treatments
- Ability to cope – depression and anxiety are common
- Dyspnea is strongly correlated with depression and functional status

Facilitating Emotional Support

• Group Support
• Okay to include COPD and ILD patients
• Provides opportunity for patients to disclose and discuss fears
• Can help significant others as well

• Referrals for individual counseling may be needed
• Evaluations by psychiatrist in some
• Possible treatment for depression and anxiety
• Goals include improve ability engage in own care and to make informed decisions about care
### Respiratory Care Plan Considerations

#### What you can do...
- Respect the journey
- Identify most limiting symptoms
- Lead with the positive
- Invite family & caregivers per patient choice

#### Help manage:
- Dyspnea
- Cough
- Support to navigate life w. supplemental oxygen
- Prevent hypoxemia
- Pulmonary Rehab
- Improve daily activity

*Convey competence, compassion and understanding*
Care of the ILD Patient

• Symptom Management – Dyspnea
• Cough – Benzonatate
• Fatigue
• Severe Exertional Hypoxemia – O$_2$
• Exacerbations
• Support for transplant
• Palliative care and hospice
Disease Specific Exercise Considerations

• COPD – dyspnea, oxygen needs, SABA pre-exercise
• Asthma – SABA pre-exercise, warm-up & cool down
• RA, Systemic Sclerosis, Lupus, Scleroderma and Sarcoidosis
• Joint and muscle pain
• ROM limitations
• IPF severe activity related hypoxemia and cough
LTOT Storage Options

- **Cylinders** – gas (need 2 regulators, 2 cylinder cart capacity for high flow uses >6 LPM)
- **Liquid** – Few DMEs providing service, higher costs, diminishing reimbursement from CMS
- **Concentrators** – standard up to 5 lpm, High flow 10 lpm in those w. HF needs
- **Portable & Transportable Concentrators** – continuous flow 3 lpm, Pulse 6
Patient Perceptions Of Supplemental O₂ Therapy USE

• 1,926 Survey respondents
  – 44% of COPD patients had problems with oxygen therapy
  – 51% of ILD patients had problems with oxygen therapy
• More than 50% of users experienced numerous & varied problems mainly having restricted mobility (38%) and isolation
• Equipment malfunctions
• Lack of testing and education
• Economic restraints were common

Educating Patients

- Unclear prescriptions – patients are often unable to articulate their prescriptions for rest, sleep and activity
- Assess patient expectations for reducing dyspnea
- Address underlying myths about O2: closer to death, now grounded to home
- Public embarrassment
- The logistics of storage and portage and the worries about running out of gas
Patient Education and Acceptance

• Provide information about why oxygen therapy is needed
• Provide written prescriptions
• Use rehab exercise sessions to help demonstrate use and benefits
• Be supportive, for many this is a difficult reality and often very embarrassing
• Be a resource on delivery options such as POCs
COPD Case Study
Pulmonary Rehabilitation

COPD Case Study

• 61-year-old male with COPD w. 2 block exercise tol
• 58 pk/yr smoke. Hx, quit ‘05
• C/C DOE, worsening over the past year
• Dyspnea: mMRC scale 3
  Stops for breath after walking about 100 yards or after a few minutes on level ground
• Hospitalizations: 1   ED: 1 x
• Exacerbations: 3 x w. steroids/antibiotics
• Comorbid Conditions – HTN, GERD
• Meds- SABA, LABA, LAMA, Metoprolol for HTN, Omeprozole for GERD
• ADLs - uses a shower stool, alt. QOD too fatigued
• Nutrition – BMI 22

Can Pulmonary Rehabilitation...

• Improve physical functioning?
• How?
• What education opportunities exist?
• What more would to like to know?
  PFTs
  6 MWD
  Oxygenation parameters
  How is our patient coping?
  Skills and abilities to administer inhaled meds?
Objective Findings

- PFTS
- FVC 3.75 L  72% predicted
- $\text{FEV}_1$  1.17 L  30% predicted
- $\text{FEV}_1$/FVC  31
- TLC 9.10 L  125%
- RV 4.80 L  189%
- DLCO 16.4  56% predicted
- $\text{FEV}_1$ post BD 1.44 L for 23% improvement for 37% pred. $\text{FEV}_1$

- Six Minute Walk Test – Pre PR
- HR 60 $\text{SPO}_2$ 99% on RA
- $\text{SPO}_2$ 97% at the end
- WD: 365 meters
- Moderate breathlessness & slight fatigue
- No rests and no pain
- Used SABA BD prior to testing
What Happened with PR Exercise Training?

Six Minute Walk Test – Pre PR
HR 60
Pre: SPO₂ 99% resting on RA
Post: SPO₂ 97%
Walk Distance: 365 meters
Averaging 2.2 mph
Breathing: moderate dyspnea  Fatigue: slight
No rests and no pain

TM- 1.0 x 8 min improved to 2.1 x 30 m.
Strength: 8 reps w. 3/2#, graduated to 4/4 for 2 sets of 12

Six Minute Walk – Post PR
Rest: HR 57 SPO₂ 97% RA
SPO₂ 98% @ the end
Walk Distance: 405 m
Averaging 2.5 mph
Symptoms:
Breathing: very slight breathlessness
Fatigue: none

40 m increase - exceeding MID
In Summary
Pulmonary Rehabilitation through a comprehensive evaluation and an individualized program can ...

• Control & alleviate symptoms
• Improve activity tolerance
• Promote self-reliance & independence
• Decrease need for acute resources
• Improve treatment adherence and acute exacerbation prevention
• Improve quality of life