Pulmonary Rehabilitation: Understanding the Fundamentals

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Disclosure

I have no actual or potential conflict of interest in relation to this presentation.

This presentation is strictly for informational/educational purpose only.
Objectives

• Understand the benefits of Pulmonary Rehabilitation (PR) in the COPD population
• Important components of a successful PR program
• Understanding the role of RT in the PR
• Understanding the proper billing and reimbursement structure for PR
• Assessing quality and outcome for PR patients
Definition

• “...a multidisciplinary programme of care for patients with chronic respiratory impairment that is individually tailored and designed to optimise each patient’s physical and social performance and autonomy.” (NICE)

• "comprehensive intervention based on a thorough patient assessment followed by patient-tailored therapies that include, but are not limited to, exercise training, education, and behavior change, designed to improve the physical and psychological condition of people with chronic respiratory disease and to promote the long-term adherence to health-enhancing behaviors“ (ATS) ERS)
The primary goal of a Pulmonary Rehabilitation program is to clinically manage and maintain the health of patients with chronic lung disease, thus enabling them to achieve a more satisfying lifestyle by restoring them to their fullest capacity through:

- Reduced respiratory symptoms and complications
- Reduced functional consequences of lung impairments
- Improved exercise performance
- Maintenance of emotional well being
- Reduced readmissions and hospitalizations
EVIDENCE SUPPORTING PULMONARY REHABILITATION:

As per the AACVPR, the demonstrated benefits of Pulmonary Rehabilitation include the following:

- Reduced respiratory symptoms such as dyspnea and fatigue
- Increased muscle strength and endurance
- Increased knowledge about lung disease and management
- Increased ability to perform tasks of daily living
- Increased quality of life
- Decreased depression and anxiety
- Reduced pulmonary exacerbations and decreased use of medical resources
- Ability to return to work or leisure activities
Ideal management of COPD

Current management of COPD in Canada

Early Diagnosis (spirometry) + prevention
Rx AECOPD Follow-up
End of Life Care

Self-management education/Smoking cessation
Long-acting bronchodilators
Short-acting bronchodilators
Pulmonary rehabilitation
Inhaled corticosteroids
Oxygen
Surgery

↓FEV₁
↑Dyspnea
Physical frailty and pulmonary rehabilitation in COPD: a prospective cohort study

Matthew Maddocks1, Samantha S C Kon2 3, Jane L Canavan2 4, Sarah E Jones2 4, Claire M Nolan2 4, Alex Labey2 4, Michael I Polkey2, William D-C Man2 4

Patients with COPD grouped according to Fried’s frailty criteria before and after pulmonary rehabilitation (n=574). Overall, rehabilitation led to a shift away from physical frailty towards a more robust state.
Results 60 patients underwent concealed randomization at the time of their hospital discharge (UC: n=30, mean (SD) age 65 (10) years, forced expiratory volume in 1 s (FEV$_1$) 52 (22)% predicted; PEPR: n=30, 67(10) years, 52 (20)% predicted). The proportion of patients re-admitted to hospital with an exacerbation was 33% in the UC group compared with 7% in those receiving PEPR (OR 0.15, 95% CI 0.03 to 0.72, p=0.02).

The proportion of patients that experienced an exacerbation resulting in an unplanned hospital attendance (either admission or review and discharge from the emergency department) was **57% in the UC group and 27% in those receiving PEPR** (OR 0.28, 95% CI 0.10 to 0.82, p=0.02).

Conclusions Post-exacerbation rehabilitation in COPD can **reduce re-exacerbation events** that require admission or hospital attendance over a 3-month period.
Results: A total of 122 patients were enrolled in the study; (n:86, n:36 groups 1 and 2, respectively.) After PR, both groups had better symptom scores as well as physical, social and emotional functioning. In addition, the groups had reduced dyspnea, anxiety and depression scores. After PR, the hypercapnic group improved significantly more in exercise capacity (Δ6 MWT 50 m. vs 40 m.) compared with normocapnic patients (p=0.044). The hypercapnic group demonstrated a significant reduction in the PaCO$_2$ levels after PR within (p<0.05) and between groups (p<0.0001).

Conclusions: Given the significant reductions in pCO$_2$ levels and significant increases in exercise capacity and QoL parameters after PR, the patients with chronic hypercapnic failure apparently benefited from the PR.
Contraindications

- Contraindications to pulmonary rehabilitation are infrequent, but include conditions that would place the patient at increased risk during exercise (e.g., uncontrolled cardiac disease) or present obstacles to participation (e.g., severe arthritis, neurologic impairment, cognitive or psychosocial disorders)
Target Population

- AACVPR (American Association of Cardiovascular and Pulmonary Rehabilitation) diagnoses associated [ICD-10 codes (effective 10/01/13)](https://www.cdc.gov/ncbddd/ldh/clinicians/conditions.html) that support medical necessity:

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Code</th>
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<tbody>
<tr>
<td>Neoplasm of uncertain behavior of trachea, bronchus and lung</td>
<td>D38.1</td>
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<tr>
<td>Defects in the complement system</td>
<td>D84.0- D84.1</td>
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<tr>
<td>Sarcoidosis of lung</td>
<td>D86.0</td>
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<tr>
<td>Sarcoidosis of the lung with sarcoidosis of lymph nodes</td>
<td>D86.2</td>
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<td>Cystic fibrosis</td>
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<tr>
<td>Alpha-1 antitrypsin deficiency</td>
<td>E88.01</td>
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<tr>
<td>Hypertensive heart disease without heart failure</td>
<td>I11.9</td>
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<tr>
<td>Septic pulmonary embolism without acute cor pulmonale</td>
<td>I26.90</td>
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<tr>
<td>Saddle embolus of pulmonary artery without acute cor pulmonale</td>
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<td>Other pulmonary embolism without acute cor pulmonale</td>
<td>I26.99</td>
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<tr>
<td>Primary pulmonary hypertension</td>
<td>I27.0</td>
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<tr>
<td>Other specified pulmonary heart disease (Eisenmenger's syndrome)</td>
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<tr>
<td>Emphysema</td>
<td>J43.0- J43.9</td>
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<tr>
<td>Chronic obstructive pulmonary disease, unspecified</td>
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<tr>
<td>Bronchiectasis</td>
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<td>Other interstitial pulmonary disease with fibrosis</td>
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</tr>
<tr>
<td>Systematic sclerosis (scleroderma)</td>
<td>M34.0- M34.9</td>
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<tr>
<td>Chronic respiratory disease originating in the prenatal period</td>
<td>P27.0- P27.9</td>
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<td>Ventricular septal defect</td>
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<tr>
<td>Embolism of cardiac prosthetic devices, implants and grafts</td>
<td>T82.817A- T82.817S</td>
</tr>
<tr>
<td>Embolism of vascular prosthetic devices, implants and grafts</td>
<td>T82.818A- T82.818S</td>
</tr>
</tbody>
</table>
The Centers for Medicare and Medicaid Services (CMS) guidelines are based on clinical practice guidelines and direct that the following components be included in a pulmonary rehab program:

- **Physician prescribed exercise**: includes techniques such as exercise conditioning, breathing retraining, step and strengthening exercises. Some aerobic exercise must be included in each pulmonary rehabilitation session.

- **Education or training**: Must be closely and clearly related to an individual’s care and treatment and be tailored to the individual’s needs. This includes nutritional counseling.

- **Psychosocial Assessment**: Evaluation of the individual’s mental and emotional functioning as it relates to the individual’s rehabilitation or respiratory condition.

- **Outcomes Assessment**: Evaluation of the patient’s progress as it relates to the individual’s rehabilitation goals and program.

- **Individualized Treatment Plan (ITP)**: describes the individual’s diagnosis, the type, amount, frequency and duration of the items and services under the plan and the goals set for the individual under the plan. The plan is written, established, reviewed, and signed by a physician every 30 days.
Management Structure

- Medical Director
- Program Director
- Clinical Professional
  - Respiratory Therapists
  - Exercise Physiologist
  - Registered Nurses
  - Physical Therapist
  - Nutritionist
  - Psychologist
  - **Based on AACVPR guidelines for therapist to patient - 1:3 (rehab portion)**
Regardless of the source, all referrals MUST be communicated to and agreed upon by both the patient and the patient’s primary care Physician.
Eligibility Determination Criteria

Step 1
- Admission Eligibility (Determined by PR Program Medical Director)
  - Recent Pulmonary Function Test results that confirms COPD stage II,II,IV
  - Correct diagnosis for PR based on ICD 10
  - Covered by the patients insurance
  - Physician prescription for PR

Step 2
- PR Eligibility (Determined by multidisciplinary team member evaluation)
  - 6 Minute Walk Test or Shuttle Walk Test – ATS clinical practice guidelines
  - Assessment of physical activity via International Physical Activity Questionnaire (IPAQ)
  - Psychosocial evaluation using a validated tool. Results may require further evaluation by Psych. MD, or NP
  - Nutritional status using a Nutritionist developed questionnaire. Results may require further evaluation by a Registered Dietitian.
  - Quality of life evaluation using a validated QOL questionnaire administered twice to determine achievement of expected outcomes- upon admission to and at completion of the pulmonary rehabilitation program.
  - Need for Physical therapy consult will be determined by the Pulmonary Rehabilitation Medical Director based on evaluation utilizing one or more of the following:
    - 5 times sit to stand test
    - Sit to Stand test
    - TUG test
    - Reach test

Step 3
- Patient admission interview
  - Every patient will be interviewed by the pulmonary rehabilitation Medical Director so as to determine appropriateness of admission.
Documentation Requirement for PR

- Prescription for PR
- PFT results preferably from the last 2 years
- CXR, EKG, Lab results
- Signed patient consent (date and time stamped) along with witness signature
- Medical clearance form from specialist
- Insurance authorization and proof of number of sessions approved for PR
- Prescription or protocol for providing supplemental Oxygen
- 6 minute walk test (6MWT); as per ATS guidelines
- Documentation of vital signs
- Initial Exercise Assessment and Prescription signed by the Medical Director of the PR
- Current Medication List
- The following list represents expected documentation for each episode of care
  - Initial evaluation
  - Plan of care
  - Re-evaluations, when indicated
  - **Daily Progress reports**
  - **Treatment notes**
  - Patient education topics
  - Discharge notes
  - Certifications and recertification (when indicated)
  - Any change in patients physical status
  - Emergency situations (when indicated)
Day 1

Patient orientation to the Rehab Center
- Brief tour of the facility
- Organizations Vision & Mission
- Overall goal of the PR program

Patient Exercise Assessment
- Assessment performed to determine the patient's level of physical activity.
- This assessment will be performed with the patient utilizing various exercise modalities to set minimal and maximal exercise limits, essential to the MD exercise prescription and the patient's treatment plan.

Exercise Prescription (Endurance)
- All patients receiving pulmonary rehabilitation will have an exercise prescription written by the clinician and approved by the pulmonary rehabilitation Medical Director.
- The exercise prescription is based on the patient's initial exercise assessment and must include, but is not limited to:
- Frequency, Duration, Modality, Target heart rate, Targeted METs
INDIVIDUAL TREATMENT PLAN (ITP)

• The results from the evaluation screen are essential to the development of the individual treatment plan (ITP), including goals, the selection of interventions, and expected outcomes.
• A plan of care is developed by the pulmonary rehabilitation team providing the services.
• The plan must be certified by a physician and must be re-evaluated and signed by a Physician every 30 days as per the AACVPR and CMS guidelines.
• The ITP is progressive plan
• The ITP must focus on 4 domains: Exercise, Nutrition, Education and the Psycho-social well being of the patient
The Customized ITP Must Include...

- **Diagnosis** - The diagnosis should be specific and as relevant to the problem being treated as possible. In many cases, both a medical diagnosis (obtained from the patient primary care physician) and an impairment-based treatment diagnosis are relevant.

- **Long Term Goals (LTGs)** -
  - LTGs should: pertain to the functional impairment findings documented in the evaluation; reflect the final level the patient is expected to achieve as a result of therapy in the current setting; be realistic, and should have a positive effect on the quality of the patient’s everyday functions; be function-based and written in objective, measurable terms with a predicted date for achieving the goals.

- **Type of Treatment** - The type of treatment includes the type of therapy and should describe the types of treatment modalities, procedures or interventions to be provided.

- **Amount of Treatment** -
  - Refers to the number of times in a day the type of treatment will be provided. Where not specified, one treatment session a day is assumed.
The Customized ITP Must Include...

- **Frequency of Treatment**
  - Refers to the number of times in a week that the type of treatment is provided. Two or three times a week is the norm. Treatment frequency of greater than three times per week requires documentation to support this intensity (can lead to audits).

- **Duration of Treatment**
  - Refers to the number of weeks, or the number of treatment sessions, for this plan of care. Therapists could also estimate the duration of the entire episode of care as 8, 12, or 26 weeks.

- **Treatment Intensity**
  - Refers to the number of repetitions and set per exercise.

- **Mode of treatment**
  - Refers to which particular exercise will be performed such as treadmill, weights, therabands, etc.

- **Patients own goals and expectations**
  - Focus on the short term goal and what the patient enjoyed doing and is currently limited.

- **Expected outcome**
  - Refers to predetermined goals as they relate to patient diagnosis.
Infection Control

- Pulmonary rehabilitation should abide by all currently established infection control policies such as and including hand hygiene and proper disinfection and cleaning of equipment based on manufacturers recommendation

- Equipment cleaning
  - Treadmills, bicycle, elliptical and recumbent upper body exerciser machine
    - Should be cleaned in between patient use and as needed with an approved hospital approved EPA wipe. Be mindful of manufacturer drying times to achieve effective disinfection (2,3 or 4 minutes)
  - Thera-bands
    - Are for individual patient use and should be disposed of afterwards. They are not to be cleaned, sterilized or wiped down.
  - Weights
    - Are vinyl coated and should be cleaned between patient use with an approved hospital EPA wipe. Be mindful of manufacturer drying times to achieve effective disinfection (2,3 or 4 minutes)
Patient Monitoring

• All patients should be monitored prior to, during and immediately after performing any modality and when necessary when patients condition/status demonstrates need.

• Patient monitoring is to include, but is not limited to:
  – Heart rate
  – Oxygen saturation via pulse oximetry
  – blood pressure
  – Respiratory rate
  – Patient perceived level of dyspnea (RPD) and exertion (RPE)
## The modified Borg Scale for assessing the intensity of dyspnea or fatigue

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Nothing at all</td>
</tr>
<tr>
<td>0.5</td>
<td>Very, very slight (just noticeable)</td>
</tr>
<tr>
<td>1</td>
<td>Very slight</td>
</tr>
<tr>
<td>2</td>
<td>Slight (light)</td>
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<tr>
<td>3</td>
<td>Moderate</td>
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<tr>
<td>4</td>
<td>Somewhat severe</td>
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<tr>
<td>5</td>
<td>Severe (heavy)</td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Very severe</td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Very, very severe (maximal)</td>
</tr>
</tbody>
</table>
Emergency Equipment & Location

- Emergency carts are located in the Cardio-pulmonary rehab center
- Oxygen cylinders, a selection of oxygen delivery devices (non-rebreather (NRB) and nasal cannula) will be easily available
- A small volume nebulizer
- 14 french suction catheter
- Portable suction
- An manual resuscitator bag will be kept in the pulmonary rehabilitation gym for emergency use
PR- RT Competency

All Respiratory Therapists performing pulmonary rehabilitation should have education in Carido/Pulmonary rehabilitation therapy as per the scope of their license and will also receive training additional training and validated competency in

- Basic safety techniques and exercise principles of Physical Therapy by a licensed Physical Therapist
- Motivational Interviewing
- In-service on using the various exercise equipment
- Competency using the EMR for documentation
- Administering and scoring various questionnaires
  - PHQ 9
  - Ferrans & Powers
All respiratory Therapists performing pulmonary rehabilitation will receive orientation. *See job specific orientation form for detailed list of orientation topics*

All Respiratory Therapists performing pulmonary rehabilitation will have competency performed initially and thereafter on an ongoing basis. Competency is to include, but is not limited to:

- Pulmonary Function Testing
- 6 Minute Walk Testing within American Thoracic Society (ATS) guidelines
- Basic principles of pulmonary rehabilitation within guidelines provided by the AACVPR and the American Thoracic Society (ATS)

All Respiratory Therapists performing pulmonary rehabilitation are expected to maintain competency by performing yearly continuing education. This can include but is not limited to:

- Attending AACVPR sponsored meetings, symposiums conferences and events
- Attending CAPRANS meetings
- Attending NBRC and AARC sponsored meetings, symposiums conferences and events
- View webinars
- Article and literature searches of topics relevant to pulmonary rehabilitation, patient education and exercise testing.
The pulmonary rehabilitation program will be overseen by a Medical Director whose duties will include but are not limited to functions as outlined in the Pulmonary Rehabilitation Medical Director Job description. Functions will include:

- Interpretation of pulmonary function testing to determine patient eligibility
- Admission interview to determine appropriateness of admission
- Review of all patient health information to aid in development of patient individual treatment plan
- Exercise prescription
- Meet with pulmonary rehabilitation team on an ongoing basis for process improvement projects
- Review each patient's individual treatment plan every 30 days as outlined by the AACVPR
- Physical therapy referral
- Nutritional, Psych, Diabetes and Case Management or other consultant referral(s)
PATIENT EDUCATION

- As one of the 4 domains essential to the patient’s individual treatment plan, education on various subjects/topics will be rendered to all patients in the pulmonary rehabilitation program.
- Education may include webinars, handouts, guest lecturers and speakers or attending events
- Noted will be patients willingness and ability to learn as well as any barriers to learning
- Education will be rendered with health literacy and teach-back in mind
- **LIMITED ENGLISH PROFICIENCY**
  - For patients requiring language interpreter services, an interpreter telephone is available.
- Home exercise prescription and education
Pulmonary Rehabilitation:

- PR is not just exercise or education but *must have the essential components*
- Typical PR program may meet three times a week, over an 8-12 week period of time, have approximately 10-15 hours of education and 30 hours of therapeutic exercise.
- The commitment by the PH patient is great but so are the benefits.
- The success of the PR program is also measured by the strength of the PR’s Medical Director who guides the multi-disciplinary team in evidence-based practice.
- The PR goals for the PH patient are not that different from the goals of PH medical management:
  - improve cardiovascular endurance, increase exercise performance, enhance ability to perform Activities of Daily Living (ADL), improve quality of life, reduce hospitalizations, decrease symptoms, especially dyspnea through breathing retraining and ensuring adequate oxygenation at rest and with activity.
Positive Outcomes from PR

- Patient will have a better understanding of how the underlying disease affects their lungs, oxygen consumption and exercise endurance
- Understand lung symptoms and decrease shortness of breath through breathing retraining and ensuring adequate oxygenation at rest and with activity
- Increase exercise performance that translates into improvements in activities of daily living
- Improve cardiovascular endurance through a safe and supervised exercise program
- Improve quality of life through education and therapeutic exercise
- Exercise in a facility that allows the patient to feel secure and safe because of the skill set of the pulmonary rehabilitation respiratory therapist working with them
- Multidisciplinary approach- PR team communicates with referring MD on patient’s progress in PR
- Directly contributes to the success of the PRs - self pay maintenance program
Quality & Outcome Assessment

- Six Minute Walk Test (SMWT)
- Shuttle Walt Test (SWT)
- Medical Research Council (MRC) Dyspnea Scale
- Hospital Anxiety and Depression Scale (HADS)
- Chronic Respiratory Questionnaire (CPQ)
- St Georges Quality of Life Questionnaire (SGQL)
- Ferrans and Powers Quality of Life Index (QLI)
- COPD Assessment Test (CAT)*
- BODE Index for COPD
• **G0237** — Therapeutic procedures to increase strength or endurance of respiratory muscles, face to face, one on one, each 15 minutes (includes monitoring)

• **G0238** — Therapeutic procedures to improve respiratory function, other than described by G0237, one on one, face to face, per 15 minutes (includes monitoring)

• **G0239** — Therapeutic procedures to improve respiratory function or increase strength or endurance of respiratory muscles, two or more individuals (includes monitoring)

• **G0424** — Pulmonary Rehabilitation, including exercise (includes monitoring), one hour, per session, up to two sessions per day
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<th>HCPCS Code</th>
<th>CY ’16 Rate</th>
<th>CY ’16 SI and APC</th>
<th>CY ’17 Rate Proposed</th>
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<td>$54.53</td>
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PR Reimbursement Model

- Poorly developed and pose the biggest risk for PR programs to stay open
- Bundled fee code (G0424) for COPD patients regardless of the acuity and severity of the illness
- Set reimbursement fee
- In accurate billing/charge from the institutions
- No strong advocacy from the community
Itemized Billing is Crucial

Account for every single service rendered

- Equipment, Peak flow,
- Oxygen
- Clinician reimbursement
- Disposables- Nasal cannula, blood pressure cuff, disinfectant wipes
- Physician
- Time for preparing ITP
- Printer, TV/DVD, Educational materials, Fridge
New Trends in PR

- **Telehealth-PR**
  - Cost effective, opportunity to extend PR in rural areas, reinforced self management, benefits post PR was the same compared to conventional PR

- **Home-based pulmonary rehabilitation**
  - Cost effective, limits the need to travel, patient outcome results were similar to standard PR

- **Music therapy and PR (wind instruments)**
  - ↓ Depression, ↓ Dyspnea, ↓ Fatigue

- **Tai Chi and PR (COPD)**
  - ↑ exercise capacity, ↑ balance, ↑ physical performance, ↑ quadriceps strength, HRQoL, ↓ anxiety
How to locate PR Program

• American Association of Respiratory Care (AARC)
  http://www.yourlunghealth.org/finding_care/qrc/pulm_care/index.cfm

• American Association of Cardiovascular and Pulmonary Rehabilitation, (AACVPR)


