Standard of Care: Pulmonary
Physical Therapy Management of the patient with pulmonary disease

Case Type / Diagnosis:

This standard of care applies to any patient with obstructive or restrictive lung disease. Obstructive lung disease includes emphysema, chronic bronchitis, asthma, bronchiectasis and cystic fibrosis. Restrictive lung disease includes chest wall stiffness, deformity due to scoliosis, respiratory muscle weakness secondary to neuromuscular disease/disorders, tumor, atelectasis, pneumonia, interstitial fibrosis, occupational disease (mesothelioma), sarcoidosis and pulmonary edema, effusion or embolus. Patients status post (s/p) thoracic surgery or those who require prolonged intensive care are not included under this standard of care.

Indications for Treatment:

- Admission to BWH for a new diagnosis or an exacerbation of an existing pulmonary disease that leads to impaired motor function, range of motion, and endurance that affects the patient’s functional independence.
- Admission to BWH for an unrelated illness or surgery and has since developed a pulmonary dysfunction due to prolonged bed rest and/or as a complication of their illness or treatment.
- Prevention of deconditioning and complications from bed rest associated with hospital admission and pulmonary disease.

Contraindications / Precautions / Considerations for Treatment:

1. Contraindications
   A. Pulmonary Embolism (PE)
      a. The following are signs and symptoms of a PE and are indicative of an emergent medical situation. Notify the RN/MD immediately if the patient develops any of the following:
         - Rapid onset of tachypnea
         - Anxiety
         - Lightheadedness
         - Tachycardia
         - Chest pain
         - Dysrhythmia
         - Hypotension
         - Decreased SpO2
      b. If you are treating a patient with a known PE, determine whether the patient is therapeutically anticoagulated prior to treatment. See INR values below.
      c. INR: normal value 0.9 - 1.1, therapeutic range 2.0 – 3.0. Clarify activity orders from MD if INR > 3.0 Generally therapy will be deferred if INR > 4.0
      d. Inferior vena cava (IVC) filter may be placed when patients are at high risk for developing a new or recurrent pulmonary embolism (PE).
         i. Patients are usually on bed rest for 4-6 hours after the procedure. Physical therapy may resume once activity orders are advanced. INR does not have to be within therapeutic range after the filter is placed.
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2. Precautions
   A. Vital Signs
      a. Obtain parameters from the order entry
      b. Or if there are none specified, use BWH Rehab Services guidelines:
         HR: 50-120 bpm       SBP: 90-150 mmHg
         RR: <30 resting      SpO2: > 90%
         Avoid 20 mmHg increase in BP
         Avoid 20 bpm increase in HR
   
   B. Supplemental Oxygen
      a. Wean oxygen only with MD order, e.g. “titrate O2 to Sats > 95%;” and
         monitor oxygen saturation during treatment as indicated
      b. Patients who do not require supplemental oxygen at rest, may require it with
         activity.

3. Considerations
   A. Thoracentesis:
      a. Percutaneous needle aspiration of pleural fluid. May be used as diagnostic
         test or therapeutic procedure to relieve respiratory distress caused by a large
         pleural effusion
      b. A complication of the procedure may include a pneumothorax. Monitor
         oxygen saturation during this treatment.
      c. On the day of the thoracentesis, consider scheduling physical therapy
         following the procedure and once the patient is cleared by chest x-ray, since
         the patient should be less dyspneic with exertion.
   
   B. Bronchoscopy
      a. Flexible scope used for diagnosis or treatment by directly visualizing the
         upper airway and tracheobronchial tree.
      b. The patient may require increased supplemental oxygen for up to 8 hours
         following the procedure and may have decreased activity tolerance. Plan
         physical therapy intervention accordingly.
   
   C. Disease specific considerations for treatment
      a. For patients with obstructive lung disease focus on slow, prolonged
         exhalations, pursed lip breathing, and frequent rest breaks when coughing
      b. Patients with restrictive lung disease generally do better with exercises to
         improve inspiration, e.g. diaphragmatic breathing, and exercises to improve
         chest wall flexibility
   
   D. Pulmonary function tests (PFT)
      a. Expiratory flow rates are a measure of how easily the lungs can be ventilated
         and are a good indicator of the progression of COPD.
      b. FEV\textsubscript{1}/FVC = 75-85% of predicted values in healthy individuals
      c. Improvement in FVC or FEV\textsubscript{1} of greater than 15% is considered significant.
         Decrease in FVC or FEV\textsubscript{1} of greater than 15% is considered abnormal.
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E. Obstructive sleep apnea
F. Mechanical ventilation

Examination:
This section is intended to capture the minimum data set and identify specific circumstance(s) that might require additional tests and measures.

1. Chart Review
   A. HPI & PMH
      a. Onset and duration of symptoms, nature of dyspnea, previous medical and/or surgical treatments for pulmonary disorder.
      b. Use of home oxygen at rest and with activity
   B. HC
      b. Ongoing or new medical treatments
      c. Pulmonary function tests (PFT), Chest x-rays (CXR), Exercise tolerance test (ETT)
   C. Medications
      a. Prolonged, systemic steroid use
      b. Inhaler use and schedule

2. Social History
   a. Prior functional level, use of assistive devices, history of dyspnea
   b. Smoking history
   c. Home environment, and current/potential barriers to returning home
   d. Family/caregiver support system available
   e. Family, professional, social and community roles
   f. Patient’s goals and expectations of returning to previous life roles

3. Physical Examination
   a. Vital signs (HR, BP, RR, SpO2, supplemental oxygen)
   b. Range of motion (ROM)
   c. Strength
   d. Sensation
   e. Pain
   f. Endurance/ability to monitor fatigue (RPE) and SOB
   g. Breathing pattern and cough
   h. Posture including chest or spinal deformities
   i. Balance
   j. Functional mobility
   k. Gait

4. Cognitive-Perceptual and psychological considerations
   a. Level of alertness, orientation, and ability to follow commands
   b. Safety awareness
   c. Assess patient’s coping mechanisms to altered functional status and dyspnea
   d. Patient’s goals, motivators and learning style
   e. Knowledge of lung disease, breathing techniques, pacing, energy conservation and relaxation techniques
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**Evaluation / Assessment:**

The primary goal for inpatient physical therapy for a patient with pulmonary disease is to maximize his or her functional independence and endurance while minimizing secondary impairments as a result of their lung disease and hospital admission.

Potential impairments include but are not limited to: decreased endurance, strength, ROM, balance, and as well as impaired pulmonary response to low level workload, breathing pattern, posture, gait and impaired knowledge of pacing, self-monitoring and home exercises.

The predicted optimal level of improvement for these patients is to maximize their ability to return to their previous life roles and vocational and/or avocational activities using an assistive device, adaptive equipment and/or supplemental oxygen, as needed, over the course of 1-3 months. This prognosis may need to be modified due to any of the following factors: extent and progression of their lung disease, presence of co-morbidities, complications or secondary impairments, decreased cognitive status, barriers to returning to previous living environment and any other factors that may influence the patient’s ability to achieve functional independence.

Age specific considerations in this population include all the normal physiological changes that occur with aging. See Geriatric Physical Therapy: A Clinical Approach, by Lewis and Bottomley for more details. The physical therapist will consider all of the patient’s impairments whether they are disease or age based and will determine a comprehensive assessment, prognosis and rehabilitation plan for each patient.

Suggested goals may include: (1-2 weeks)

1. Maximize independent functional mobility
2. AROM bilateral UE/LE WFL as appropriate
3. Strength grossly > 3/5 throughout bilateral UE/LE as appropriate
4. Good balance in sitting and standing, with or without assistive device
5. Demonstrate independent pacing and monitoring of fatigue and/or SOB
6. Demonstrate independent exercise and endurance program
7. Good safety awareness with all functional mobility
8. Improve posture to maximize efficiency of breathing pattern
9. Maintain SpO2 > 95%* at rest and with activities on least supplemental oxygen
   (* or SpO2 as indicated by MD orders)
10. Report moderate or less effort (or RPE > 5/10) with all functional activities
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Treatment Planning / Interventions

Established Pathway ___ Yes, see attached. _X_ No
Established Protocol ___ Yes, see attached. _X_ No

This section is intended to capture the most commonly used interventions for this case type/diagnosis. It is not intended to be either inclusive or exclusive of appropriate interventions.

1. Intervention

Initiate physical therapy intervention, as appropriate, given the patient’s medical status and activity orders.

A. Therapeutic exercise program
   a. Progress from supine, sitting, and standing P/AA/AROM for UE/LE’s, as appropriate. Progress by adding repetitions and then resistance as tolerated.
   b. Breathing techniques and relaxation exercises including diaphragmatic breathing, pursed lip breathing and coughing
   c. Postural exercises to improve breathing pattern and chest wall flexibility

B. Endurance Training
   a. Increase tolerance to sitting in bedside chair
   b. Progress time, distance and frequency of ambulation. Recommend activity schedule to other healthcare providers or family members, as appropriate.
   c. Consider interval training using either exercises or gait to increase respiratory endurance.
   d. Initiate stationary bicycle training, as appropriate, according to departmental guidelines.

C. Functional Mobility Training
   a. Bed mobility and supine ⇔ sit ⇔ stand activities
   b. Transfer training (bed ⇔ chair ⇔ wheelchair ⇔ commode), using adaptive equipment, as appropriate (e.g. slide board)

D. Gait Training
   a. Assistive device prescription and weaning to least restrictive device, as appropriate, given weight bearing status
   b. Progress to stair training, as appropriate, prior to discharge home

E. Weaning supplemental oxygen
   a. Wean oxygen as appropriate given MD orders for SpO2 goal and monitor SpO2 during treatment.
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2. Patient/Family Education
   A. Discuss realistic expectations regarding functional outcomes, benefits of exercise and mobility training on health status and function, appropriate level of assist that patient requires from family and their anticipated rehab progression.
   B. Provide emotional support to the patient and family as needed.
   C. Instruct the patient in pacing activities, energy saving and relaxation techniques, monitoring his/her own level of fatigue, or SOB, and safe activity progression.
   D. Instruct the patient and family members in the following and assess their understanding via return demonstration:
      a. Therapeutic exercise and endurance program with prescribed mode, intensity, duration and frequency guidelines
      b. Breathing techniques
      c. Safe mobility techniques encouraging maximal independence.

3. Available handouts (post in room and/or distribute to patient upon discharge):
   A. Home exercise programs (Use Exercise Pro for individualized program)
   B. Energy Conservation Pamphlet
   C. Relaxation Techniques

4. Frequency of Treatment
   Patients will have follow-up physical therapy treatments based on individual need. The frequency of treatment for each patient will be determined by the acuity of his or her impairments and functional limitations. Refer to the BWH Guidelines for Frequency of Physical Therapy Patient Care in the Acute Care Hospital Setting, Cardiovascular/Pulmonary Practice Pattern.

5. Recommended Referrals to Other Providers
   Discuss the patient’s need for additional services with the primary team. A patient may benefit from the following services if appropriate:
   A. Occupational Therapy: For a patient who presents with cognitive or perceptual impairments, UE weakness or tone, or any other impairment that affects his or her ability to perform activities of daily living independently and for a patient who has UE splinting and/or adaptive equipment needs
   B. Speech and Swallowing: For a patient who presents with impairments that affect his or her ability to swallow without difficulty and/or who presents with a new language impairment. Also consider for patients who have difficulty with speaking due to breathlessness
   C. Respiratory Therapy: For a patient with brochopulmonary hygiene needs and complicated oxygen delivery needs beyond the typical set-ups available on the floors. The respiratory therapists are also responsible for all ventilator care.
   D. Care Coordination: For a patient who has a complicated discharge situation and the care coordination team is not involved.
   E. Social Work: For a patient who has a complicated social history and he or she requires additional support or counseling.
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Re-evaluation / assessment

Reassessment will occur under the following circumstances: all physical therapy goals are met, significant change in medical status has occurred, patient has not made the expected progress with physical therapy intervention, patient is discharged from services or facility, and/or within 10 days from the previous assessment.

Discharge Planning

Discharge planning will occur on an individual basis depending on the patient’s medical, physical and social needs and is a coordinated effort that occurs with the physician, care coordination, therapist(s), the patient and his or her family.

If the patient continues to have significant impairments and functional limitations and/or complicated medical needs at the time of discharge from the acute hospital, he or she may be discharged to an alternate inpatient facility (e.g. acute or sub-acute rehabilitation, inpatient pulmonary rehabilitation, skilled nursing facility (SNF), or extended care facility). The patient will continue to progress towards their physical therapy goals with eventual home discharge planning, as appropriate.

If the patient has met all inpatient physical therapy goals, he/she may be discharged home with or without services. Consider the following resources for continued physical therapy:
- Home PT (e.g. VNA)
- Outpatient PT
- Outpatient Pulmonary Rehabilitation
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Bibliography / Reference List


BWH Department of Rehabilitation Services Guidelines for frequency of physical therapy patient care in the acute-care hospital setting


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