Clinical Policy Bulletin: 
Pulmonary Rehabilitation

Number: 0032

Policy
*Please see amendment for Pennsylvania Medicaid at the end of this CPB.

I. Aetna considers entry into a medically supervised outpatient pulmonary rehabilitation program medically necessary when all of the following criteria are met:

A. Member has chronic pulmonary disease (including alpha-1 antitrypsin deficiency, asbestosis, asthma, emphysema, chronic airflow obstruction, chronic bronchitis, cystic fibrosis, fibrosing alveolitis, pneumoconiosis, pulmonary alveolar proteinosis, pulmonary fibrosis, pulmonary hemosiderosis, radiation pneumonitis), or other conditions that affect pulmonary function such as ankylosing spondylitis, bronchopulmonary dysplasia, Guillain-Barre' syndrome or other infective polyneuritis, muscular dystrophy, myasthenia gravis, paralysis of diaphragm, sarcoidosis, or scoliosis; and

B. Member has dyspnea at rest or with exertion; and

C. Member has a reduction in exercise tolerance that restricts the ability to perform activities of daily living and/or work; and

D. Symptoms persist despite appropriate medical management; and

E. Member does not have a recent history of smoking or has quit smoking for at least 3 months; and

F. Member has a moderate to severe functional pulmonary disability as evidenced by either of the following:

- A maximal pulmonary exercise stress test under optimal bronchodilatory treatment which demonstrates a respiratory limitation to exercise with a maximal oxygen uptake (VO2max) equal to or less than 20 ml/kg/min, or about 5 metabolic equivalents (METS); or
- Pulmonary function tests showing that either the forced expiratory volume in one second (FEV1), forced vital capacity (FVC), FEV1/FVC ratio, or diffusion capacity for carbon monoxide (Dlco) is less than 60 % of that predicted; and

G. Member is physically able, motivated and willing to participate in the pulmonary rehabilitation program and be a candidate for self-care post program; and

H. Member does not have any concomitant medical condition that would otherwise imminently contribute to deterioration of pulmonary status or undermine the expected benefits of the program (e.g., symptomatic coronary artery disease, congestive heart failure, myocardial infarction within the last 6 months, dysrhythmia, active joint disease, claudication, malignancy).
II. Aetna considers pulmonary rehabilitation medically necessary for persons receiving a medically necessary lung transplantation (see CPB 0597 - Heart-Lung Transplantation, and CPB 0598 - Lung Transplantation).

III. Repeat pulmonary rehabilitation programs are considered not medically necessary. However, exceptions may be made for patients undergoing a repeat pulmonary rehabilitation program in connection with lung transplantation or lung volume reduction surgery.

IV. Aetna considers routine, non-skilled, or maintenance care not medically necessary, such as:

   A. Repetitive services for chronic baseline conditions; or
   B. When there is an inability to sustain gains; or
   C. When there is a plateau in patient's progress toward goals, such that there is minimal or no potential for further substantial progress; or
   D. When there is no overall improvement.

V. Aetna considers pulmonary rehabilitation experimental and investigational for all other indications because its effectiveness for indications other than the ones listed above has not been established.

VI. Aetna considers pre-operative pulmonary rehabilitation in persons undergoing surgery for lung cancer experimental and investigational because the effectiveness of this approach has not been established.

Pulmonary rehabilitation is not considered medically necessary in persons who have very severe pulmonary impairment as evidenced by dyspnea at rest, difficulty in conversation (one-word answers), inability to work, cessation of most of all usual activities making them housebound and often limiting them to bed or chair with dependency upon assistance from others for most ADL. According to available guidelines, persons with very severe pulmonary impairment are not appropriate candidates for pulmonary rehabilitation.

Notes:
- A typical course of pulmonary rehabilitation extends for up to 6 weeks or 36 hours of therapy.
- Coverage of pulmonary rehabilitation may be subject to applicable limits on short-term rehabilitation therapies. Please check benefit plan descriptions for details.
- For lung transplant candidates, pulmonary rehabilitation typically begins when the member is listed for transplant, and continues for 6 weeks after transplantation, at which time the member is transitioned to a home exercise program.
- Most Aetna plans exclude coverage of exercise equipment. Please check benefit plan descriptions for details. Itemized charges for the use, rental, or purchase of exercise equipment may not be covered expenses under these plans. This would include any charges for fitness center or health club memberships.

Background

Comprehensive pulmonary rehabilitation is an outpatient multi-disciplinary program directed to individuals with chronic pulmonary conditions and their families, usually by an inter-disciplinary team of specialists, in an effort to stabilize or reverse both the pathophysiology and psychopathology of their chronic pulmonary disease, with the goal of achieving and maintaining the individual's maximum level of functional capacity and independence in the community allowed by the patient's pulmonary handicap and overall life situation. Examples of conditions that may benefit from pulmonary rehabilitation include, but are not limited to, asthma, bronchiectasis, chronic obstructive pulmonary disease (COPD), cystic
fibrosis, pre- or postoperative lung transplant or lung volume surgery or pulmonary fibrosis (interstitial lung disease).

The goal of pulmonary rehabilitation services is not to achieve maximum exercise tolerance, but rather a level of function that allows for the transfer of treatment from the clinic, hospital, or doctor to self-care in the home by the patient, the patient's family, or the patient's caregiver. Unless the patient will be able to conduct ongoing self-care at home, there will be only temporary benefit from the pulmonary rehabilitation services. The endpoint of treatment, therefore, is not when the patient achieves maximal exercise tolerance or stabilizes, but when the patient or his or her attendant is able to continue pulmonary rehabilitation at home. To achieve sustained results, it is important that the patient continue with an at-home pulmonary rehabilitation regimen.

Primary objectives of pulmonary rehabilitation include: help to restore the ability to function at the highest level of independence in regards to activities of daily living (ADLs); and improving day-to-day functioning and coping strategies.

Pulmonary rehabilitation components may include assessment of the individual, education for the individual and family, breathing exercises, respiratory muscle training, general exercise and strengthening programs, nutritional interventions, psychosocial support and/or lifestyle modification. It is usually conducted in an outpatient setting.

Chronic obstructive pulmonary disease (COPD) is a diagnosis best reserved for those individuals with chronic bronchitis or emphysema who have demonstrated airflow obstruction on pulmonary function testing. Bronchial asthma is considered as a separate disorder, rather than being included under the term COPD; however, it is recognized that those with COPD may also have a component of asthma. Pulmonary rehabilitation is most useful for patients with COPD; however, certain aspects of the program may be selected for patients with other symptomatic pulmonary disorders.

Supervised pulmonary rehabilitation programs have been shown to be an effective method to control and alleviate as much as possible the symptoms and pathologic complications of respiratory impairment and to teach how to achieve optimal capability for carrying out activities of daily living in appropriately selected patients.

The 3 primary objectives of pulmonary rehabilitation services are: (i) to control, reduce, and alleviate the symptoms and pathophysiologic complications of chronic pulmonary disease; (ii) to train the patient how to reach the highest possible level of independent functioning for his or her activities of daily living within the limitations of the pulmonary disease; and (iii) to train the patient to self-manage his or her daily living consistent with the pulmonary disease process to obtain the highest possible level of independent function.

The ideal candidate for pulmonary rehabilitation is one with moderate to moderately severe disease, stable on standard medical therapy, not distracted or limited by other serious or unstable medical conditions, willing and able to learn about his or her disease, and motivated to devote the time and effort necessary to benefit from a comprehensive care program. Patients with very mild disease may not perceive their problem as severe enough to warrant a comprehensive care program, and patients with very severe disease may be too limited to benefit appreciably. Pulmonary rehabilitation is not a primary mode of therapy for obstructive airway disease; therefore, patients should be stabilized on standard medical therapy before beginning the program.

Every pulmonary rehabilitation program is individualized for a specific patient's needs and should include a comprehensive initial evaluation, established goals, an explicit treatment plan consisting of specific modalities with the stated frequencies, anticipated duration, and periodic re-assessments at scheduled intervals. A program developed in such a manner should be documented and results of the assessments recorded.

For many years, the standard of care for pulmonary patients included inactivity and bedrest, with
patients considered as passive recipients of medical treatment. The high incidence of impairment, disability, and handicap associated with COPD has led to the development of pulmonary rehabilitation programs. Such programs aim to improve the patient's ability to carry out the activities of daily living and, thereby, to improve their quality of life.

Many patients with COPD can be diagnosed, worked-up, and medically managed by their primary care physician or pulmonary specialist with resultant improvement in symptoms without the need for pulmonary rehabilitation. The goals of medical therapy are to slow the expected decline in lung function and, if possible, to improve lung function. Once the patient has been stabilized using standard medical therapy, it is unlikely that much additional improvement in pulmonary function can be expected. However, further efforts can be made by the physician to institute a rehabilitation program under his or her direction. The success of such a treatment is strongly influenced by the physician's interest and the participation of the patient and his or her family in following a program of education about the disease, avoidance of risk factors, cessation of smoking, reduction in exposure to pulmonary irritants, immunization prophylaxis for influenza and pneumococcus, a designed exercise training program, and control of secretions, all of which can be adequately accomplished without the need for a formal pulmonary rehabilitation program. The benefits of such a pulmonary rehabilitation are most evident as changes in the quality of life. The general philosophy of a program should be to encourage patients to assume responsibility for and to become active participants and partners in taking care of themselves.

An individualized exercise program directed by the COPD patient's primary care physician or pulmonologist, focused on improving function and quality of life, can reduce respiratory symptoms and limitations and reduce hospitalizations. The exercise program should be simple and task specific (e.g., walking, dressing, etc.). A graded aerobic exercise program (e.g., walking, or bicycling, 20 mins 3 times weekly) may be helpful to prevent deterioration of physical condition and to improve the patient's ability to carry out daily activities. Pursed-lip breathing to slow the rate of breathing and abdominal breathing exercises to relieve fatigue of the accessory muscles of respiration may reduce dyspnea in some patients. A home monitoring program, in which patients are asked to record the use of metered-dose inhalers (MDI) and symptoms, is useful. A home peak flow-meter will provide an objective record of the severity of the obstruction.

Before the patient enters a formal rehabilitation program, an accurate diagnosis of COPD or other chronic pulmonary disease must be made. Lung function tests will give an indication about the physical aspects of impairment caused by the disease. The patient should have received physician-directed medical management with optimization of pulmonary function tests and still have symptoms of dyspnea which interferes with the activities of daily living and/or work. For the purposes of evaluating the extent of the physical aspects of the disability and identifying limiting factors in the gas transport chain, it is essential that the patient undergo a true maximal exercise test according to physiologic criteria.

The initial assessment or evaluation by a pulmonary therapist should include: (i) a diagnostic work-up and evaluation of the patient's rehabilitation potential; (ii) a detailed description of specific problems the patient has in performing daily activities; (iii) chest X-ray or report review; (iv) pulmonary function testing; (v) exercise testing that assesses oxygen consumption and oxygenation at rest and with exercise; (vi) indication of a high level of motivation to participate in the program; (vii) determination of the appropriate type of care for the given pulmonary disability (e.g., select appropriate modalities, establish frequency and expected duration, etc.); (viii) setting of goals and objectives (e.g. improve strength, power, motion, flexibility, etc.); and (ix) anticipation of outcomes.

The initial assessment is lengthy since the patient's functional level needs to be evaluated and measured carefully before establishing an appropriate program. As noted above, regular re-evaluations (about every 2 or 4 weeks) which are dependent on the frequency of the program and the severity of the patient's illness are required throughout the program. The purpose is to measure progression (or regression) and set new goals, frequency of treatment, and anticipated duration.
Goals should be explicit and objectively measurable, e.g., progressively improve 6- or 12-min walk. They also need to establish an appropriate length of time to achieve the anticipated outcome.

Appropriate candidates for pulmonary rehabilitation programs have pulmonary disabilities with limitation of functional status resulting in a reduction of exercise tolerance, an interference with the person’s lifestyle and/or a restriction in the person's ability to perform the activities of daily living and/or work. Pulmonary rehabilitation programs are not indicated for persons whose pulmonary stress test reveals that activities are not limited by dyspnea.

Pulmonary rehabilitation programs do not benefit persons with very severe pulmonary impairment as evidenced by dyspnea at rest, difficulty in conversation (one-word answers), inability to work, cessation of most of all usual activities making him/her housebound and often limited to bed or chair with dependency upon assistance from others for most ADLs.

Appropriate candidates should have quit smoking for at least 3 months. This act reflects the patient's motivation and active commitment to a lifestyle change. Patients who quit on the first day of the program frequently start smoking soon after the program is completed.

Candidates should have moderate to moderately severe functional pulmonary disability as evidenced by either: (i) pulmonary function tests showing that either the FEV1, FVC, FEV1/FVC, or Dlco is less than 60% of that predicted; or (ii) a maximal pulmonary exercise stress test under optimal bronchodilatory treatment that demonstrates a respiratory limitation to exercise with a maximal oxygen uptake (VO2max) equal to or less than 20 ml/kg/min, or about 5 METS. This maximal pulmonary exercise stress test should be performed using treadmill walking or cycle ergometer with monitoring of work load, heart rate, EKG, and determinations of blood gas composition at rest and during exercise.

Appropriate candidates for pulmonary rehabilitation programs should not have any concomitant medical condition that would otherwise imminently contribute to deterioration of pulmonary status or undermine the expected benefits of the program (e.g., symptomatic coronary artery disease, congestive heart failure, myocardial infarction within the last 6 months, dysrhythmia, active joint disease, claudication, and malignancy). Candidates should not have another disabling or unstable condition which limits ability to participate fully and to concentrate on rehabilitation activities.

According to the American Association for Respiratory Care (AARC, 2002), potential contraindications to outpatient pulmonary rehabilitation include: acute cor pulmonale, ischemic cardiac disease, metastatic cancer, psychiatric disease that interferes with memory and compliance, renal failure, severe pulmonary dysfunction, severe cognitive deficit, and significant hepatic dysfunction. The decision to provide or withhold outpatient pulmonary rehabilitation should be based on a thorough, individualized assessment.

Pulmonary rehabilitation programs are not appropriate for persons who refuse to participate, or have a strong history of medical noncompliance.

A supervised pulmonary rehabilitation program is completed once the progress notes indicate that the patient has acquired the skills to self-monitor unsupervised exercise, or documentation from progress notes indicates no potential for gain or the absence of progress in the improvement in functional capacity at any time during the program. It should be noted that improvement in arterial blood gases and pulmonary function testing is not generally expected and is not required for measuring progress in a patient participating in a pulmonary rehabilitation program.

A typical course of pulmonary rehabilitation extends for up to 6 weeks or 36 hours of therapy. Additional pulmonary rehabilitation may be considered necessary with documentation of progress in the initial 6 weeks or 36 hours of pulmonary rehabilitation; documentation that the patient's performance capacity is expected to improve; and documentation of an assessment that indicates that continuation of the supervised exercise training is necessary to enable the patient to reach an
acceptable level of individual exercise tolerance consistent with the particular stage of that patient's disease.

The patient’s medical record should support the pulmonary rehabilitation services being rendered. Documentation should include: (i) a dated description of treatment received for each scheduled visit; (ii) periodic (usually at least every 5 visits) exercise testing demonstrating objective measurable findings of physical and functional status showing improvement from baseline assessments to substantiate progress achieved; (iii) periodic (usually at least every 5 visits) assessment with revision and/or re-statement of short-term goals and treatment plan; (iv) periodic (usually bi-weekly) team conference notes of individual goals and progress; (v) a treatment plan to attain goals with justification for continuing rehabilitation program, including frequency and duration; and (vi) evidence of communication with referring physician.

Pulmonary rehabilitation programs are also appropriate for lung transplant candidates. For lung transplant candidates, pulmonary rehabilitation typically begins when the member is listed for transplant, and continues for 6 weeks after transplantation, at which time the member is transitioned to a home exercise program.

Spruit and Wouters (2007) stated that pulmonary rehabilitation has been demonstrated to be an important part of the management of patients with COPD. Exercise training is the cornerstone of a comprehensive, multi-disciplinary pulmonary rehabilitation in COPD and has been shown to improve health-related quality of life and exercise capacity. However, not every COPD patient responds well to pulmonary rehabilitation. The authors noted that future studies should center on new modalities to conventional pulmonary rehabilitation programs to optimize its effects. These new additions include endurance training and long-acting bronchodilators; endurance training and technical modalities (e.g., inspiratory pressure support and inspiratory muscle training); interval training; resistance training; transcutaneous neuromuscular electrical stimulation; and exercise training and supplements (e.g., oxygen, oral creatine supplementation, anabolic steroids and polyunsaturated fatty acids). Currently, these new modalities of pulmonary rehabilitation have been reported to improve body composition, skeletal muscle function and sometimes exercise capacity. Nevertheless, the translation to an improved health-related quality of life is lacking, and cost-effectiveness as well as long-term effects have not been examined. Moreover, future studies should examine the effects of pulmonary rehabilitation in elderly patients with restrictive pulmonary diseases.

Nici (2008) noted that benefits derived from comprehensive pulmonary rehabilitation, when applied to patients who have lung cancer, should have significant impact on both survival and health status. Because pulmonary rehabilitation is known to improve exercise capacity, it is reasonable to expect that this treatment modality may provide more patients with a potential cure. In addition, improvement in symptoms and quality of life can prove critically important when long-term survival is not an outcome that can be impacted on. Studies thus far support the value of this treatment modality in the global approach to patients who have lung cancer. The author stated that future well-designed clinical trials will need to corroborate these findings.

In a prospective, randomized, controlled study, Eaton et al (2009) determined if early pulmonary rehabilitation, commenced as an inpatient and continued after discharge, reduced acute health-care utilization. Consecutive COPD patients (n = 397), admitted with an exacerbation, were screened: 228 satisfied the eligibility criteria, of whom 97 consented to randomization to rehabilitation or usual care. Both intention-to-treat and per-protocol analyses were reported with adherence being defined a priori as participation in at least 75% of rehabilitation sessions. Participants were elderly with severe impairment of pulmonary function, poor health-related quality of life and high COPD-related morbidity. The rehabilitation group demonstrated a 23% (95% confidence interval [CI]: 11 to 36%) risk of re-admission at 3 months, with attendees having a 16% (95% CI: 0 to 32%) risk compared with 32% (95% CI: 19 to 45%) for usual care. These differences were non-significant. There were a total of 79 COPD-related re-admission days (1.7 per patient, 95% CI: 0.6 to 2.7, p = 0.19) in the rehabilitation group, compared with 25 (1.3 per patient, 95% CI: 0 to 3.1, p = 0.17) for the attendees and 209 (4.2
per patient, 95 % CI: 1.7 to 6.7) for usual care. The body mass index, airflow obstruction, dyspnea and exercise capacity index showed a non-significant trend to greater improvement among attendees compared with those receiving usual care (5.5 (2.3) and 5.6 (2.7) at baseline, improving to 3.7 (1.9) and 4.5 (2.5), respectively, at 3 months). No adverse effects were identified. The authors concluded that early inpatient-outpatient rehabilitation for COPD patients admitted with an exacerbation was feasible and safe, and was associated with a non-significant trend towards reduced acute health-care utilization.

In a Cochrane review, Puhan et al (2009) evaluated the effects of pulmonary rehabilitation following COPD exacerbations on future hospital admissions (primary outcome) and other patient-important outcomes (mortality, health-related quality of life and exercise capacity). Randomized controlled trials comparing pulmonary rehabilitation of any duration after exacerbation of COPD with conventional care were selected. Pulmonary rehabilitation programs needed to include at least physical exercise. Control groups received conventional community care without rehabilitation. These researchers calculated pooled odds ratios (ORs) and weighted mean differences (WMD) using fixed-effects models. They requested missing data from the authors of the primary studies. A total of 6 trials (n = 219) were identified. Pulmonary rehabilitation significantly reduced hospital admissions (pooled OR 0.13 [95 % CI: 0.04 to 0.35], number needed to treat (NNT) 3 [95 % CI: 2 to 4], over 34 weeks) and mortality (pooled OR 0.29 [95 % CI: 0.10 to 0.84], NNT 6 [95 % CI: 5 to 30] over 107 weeks). Effects of pulmonary rehabilitation on health-related quality of life were well above the minimal important difference (WMD for dyspnea, fatigue, emotional function, and mastery domains of the Chronic Respiratory Questionnaire between 1.15 (95 % CI: 0.94 to 1.36) and 1.88 (95 % CI: 1.67 to 2.09) and between -9.9 (95 % CI: -18.05 to -1.73) and -17.1 (95 % CI: -23.55 to -10.68) for total, impact and activity limitation domains of the St. Georges Respiratory Questionnaire). In all trials, pulmonary rehabilitation improved exercise capacity (60 to 215 meters in 6-min or shuttle walk tests). No adverse events were reported (2 studies). The authors concluded that evidence from small studies of moderate methodological quality suggested that pulmonary rehabilitation is a highly effective and safe intervention to reduce hospital admissions and mortality and to improve health-related quality of life in COPD patients after suffering an exacerbation.

Shannon (2010) stated that over the last decade, evidence-based support for pulmonary rehabilitation in the management of patients with chronic lung disease has grown tremendously. A beneficial role of pulmonary rehabilitation has been largely shown among patients with COPD and in patients with pulmonary emphysema enlisted for lung volume reduction surgery. In these settings, significant reductions in dyspnea, and improvements in exercise performance and health-related quality of life have been clearly demonstrated following a program of pulmonary rehabilitation. Pulmonary rehabilitation is often advocated as an adjunctive intervention in patients with cancer; however, the benefits of this intervention in the cancer setting, particularly in the peri-operative setting for lung cancer, are only recently emerging. The author summarized these investigations and highlighted ongoing controversies regarding the utility of pulmonary rehabilitation in the surgical and medical management of patients with lung cancer. Recent small studies suggest that pulmonary rehabilitation may favorably impact lung cancer management by improving a variety of clinically meaningful outcomes such as performance status, chemotherapy-related fatigue, oxygen consumption, exercise tolerance, and health-related quality of life. These findings, although intriguing, have not been investigated in any large, controlled trials to determine their impact, if any, on surgical resectability and outcome or on tolerance to aggressive chemo-radiation therapy regimens. The author concluded that pulmonary rehabilitation shows promise as a therapeutic intervention in the management of lung cancer; however, well-designed, adequately powered studies are needed to examine outstanding questions regarding its exact role in guiding lung cancer management.

An official statement of the American College of Physicians (ACP), American College of Chest Physicians (ACCP), American Thoracic Society (ATS), and European Respiratory Society (ERS) (Qaseem et al, 2011) represents an update of the 2007 ACP clinical practice guideline on diagnosis and management of stable COPD and is intended for clinicians who manage patients with COPD. The ACP, ACCP, ATS, and ERS recommend that clinicians should prescribe pulmonary rehabilitation for
symptomatic patients with an FEV(1) less than 50% predicted (Grade: Strong recommendation, moderate-quality evidence). Clinicians may consider pulmonary rehabilitation for symptomatic or exercise-limited patients with an FEV(1) greater than 50% predicted (Grade: Weak recommendation, moderate-quality evidence).

Schmidt-Hansen et al (2012) stated that the preferred treatment for lung cancer is surgery if the disease is considered resectable and the patient is considered surgically fit. Pre-operative smoking cessation and/or pre-operative pulmonary rehabilitation might improve post-operative outcomes after lung cancer surgery. The objectives of this systematic review were to determine the effectiveness of (i) pre-operative smoking cessation and (ii) pre-operative pulmonary rehabilitation on peri- and post-operative outcomes in patients who undergo resection for lung cancer. These investigators searched MEDLINE, PreMedline, Embase, Cochrane Library, Cinahl, BNI, Psychinfo, Amed, Web of Science (SCI and SSCI), and Biomed Central. Original studies published in English investigating the effect of pre-operative smoking cessation or pre-operative pulmonary rehabilitation on operative and longer-term outcomes in greater than or equal to 50 patients who received surgery with curative intent for lung cancer were included. Of the 7 included studies that examined the effect of pre-operative smoking cessation (n = 6) and pre-operative pulmonary rehabilitation (n = 1) on outcomes after lung cancer surgery, none was randomized controlled trials and only 1 was prospective. The studies used different smoking classifications, the baseline characteristics differed between the study groups in some of the studies, and most had small sample sizes. No formal data synthesis was therefore possible. The included studies were marked by methodological limitations. On the basis of the reported bodies of evidence, it is not possible to make any firm conclusions about the effect of pre-operative smoking cessation or of pre-operative pulmonary rehabilitation on operative outcomes in patients undergoing surgery for lung cancer.

In a pilot, randomized, single-blinded study, Morano et al (2013) examined the effect of 4 weeks of pulmonary rehabilitation (PR) versus chest physical therapy (CPT) on the pre-operative functional capacity and post-operative respiratory morbidity of patients (n = 24) undergoing lung cancer resection. Patients were randomly assigned to receive PR (strength and endurance training) versus CPT (breathing exercises for lung expansion). Both groups received educational classes. Main outcome measures were functional parameters assessed before and after 4 weeks of PR or CPT (phase 1), as well as pulmonary complications assessed after lung cancer resection (phase 2). A total of 12 patients were randomly assigned to the PR arm and 12 to the CPT arm. Three patients in the CPT arm were not submitted to lung resection because of inoperable cancer. During phase 1 evaluation, most functional parameters in the PR group improved from baseline to 1 month: FVC (1.47 L [1.27 to 2.33 L] versus 1.71 L [1.65 to 2.80 L], respectively; p = 0.02); percentage of predicted FVC (FVC %; 62.5 % [49 % to 71 %] versus 76 % [65 % to 79.7 %], respectively; p < 0.05); 6-minute walk test (425.5 ± 85.3 m versus 475 ± 86.5 m, respectively; p < 0.05); maximal inspiratory pressure (90 ± 45.9 cm H(2)O versus 117.5 ± 36.5 cm H(2)O, respectively; p < 0.05); and maximal expiratory pressure (79.7 ± 17.1 cm H(2)O versus 92.9 ± 21.4 cm H(2)O, respectively; p < 0.05). During phase 2 evaluation, the PR group had a lower incidence of post-operative respiratory morbidity (p = 0.01), a shorter length of post-operative stay (12.2 ± 3.6 days versus 7.8 ± 4.8 days, respectively; p = 0.04), and required a chest tube for fewer days (7.4 ± 2.6 days versus 4.5 ± 2.9 days, respectively; p = 0.03) compared with the CPT arm. The authors concluded that these findings suggested that 4 weeks of PR before lung cancer resection improved pre-operative functional capacity and decreased the post-operative respiratory morbidity. The findings from this small pilot study need to be validated by well-designed studies.

In a Cochrane review, Dowman and colleagues (2014) examined if PR in patients with interstitial lung disease (ILD) has beneficial effects on exercise capacity, symptoms, quality of life and survival compared with no pulmonary rehabilitation in patients with ILD. These investigators searched the Cochrane Central Register of Controlled Trials (CENTRAL) (2014, Issue 6), MEDLINE (Ovid), EMBASE (Ovid), the Cumulative Index to Nursing and Allied Health Literature (CINAHL) (EBSCO) and the Physiotherapy Evidence Database (PEDro) (all searched from inception to June 2014). They also
searched the reference lists of relevant studies, international clinical trial registries and respiratory conference abstracts to look for qualifying studies. Randomized and quasi-randomized controlled trials in which pulmonary rehabilitation was compared with no pulmonary rehabilitation or with other therapy in people with ILD of any origin were included. Two review authors independently selected trials for inclusion, extracted data and assessed risk of bias. Study authors were contacted to provide missing data and information regarding adverse effects. A priori subgroup analyses were specified for participants with idiopathic pulmonary fibrosis (IPF) and participants with severe lung disease (low diffusing capacity or desaturation during exercise). These researchers planned to subgroup according to training modality applied, but there were insufficient data. A total of 9 studies were included, 6 of which were published as abstracts. Five studies were included in the meta-analysis (86 participants who undertook PR and 82 control participants). One study used a blinded assessor and intention-to-treat analysis. No adverse effects of PR were reported. Pulmonary rehabilitation improved the 6-minute walk distance with weighted mean difference (WMD) of 44.34 meters (95 % CI: 26.04 to 62.64 meters) and improved oxygen consumption (VO2) peak with WMD of 1.24 ml/kg/min-1 (95 % CI 0.46 to 2.03 mL/kg/min-1). Improvements in 6-minute walk distance and VO2 peak were also seen in the subgroup of participants with IPF (WMD 35.63 meters, 95 % CI: 16.02 to 55.23 meters; WMD 1.46 ml/kg/min-1, 95 % CI: 0.54 to 2.39 ml/kg/min-1, respectively). Reduced dyspnea (standardized mean difference (SMD) -0.66, 95 % CI: -1.05 to -0.28) following PR was also seen in the IPF subgroup (SMD -0.68, 95 % CI: -1.12 to -0.25). Quality of life improved following PR for all participants on a variety of measures (SMD 0.59, 95 % CI: 0.20 to 0.98) and for the subgroup of people with IPF (SMD 0.59, 95 % CI: 0.14 to 1.03). Two studies reported longer-term outcomes, with no significant effects of PR on clinical variables or survival at 3 or 6 months. Available data were insufficient to allow examination of the impact of disease severity or exercise training modality. The authors concluded that PR seemed to be safe for people with ILD. Improvements in functional exercise capacity, dyspnea and quality of life are seen immediately following PR, with benefits also evident in IPF. However, because of inadequate reporting of methods and small numbers of included participants, the quality of evidence was low to moderate. Moreover, little evidence was available regarding longer-term effects of PR.

**Individuals with COPD and Mild Symptoms:**

Rugbjerg et al (2015) stated that most guidelines recommend PR for patients with COPD and modified Medical Research Council dyspnea scale (mMRC) levels greater than or equal to 2, but the effectiveness of PR in patients with less advanced disease is not well established. These researchers investigated the effects of PR in patients with COPD and mMRC less than or equal to 1. The methodology was developed as a part of evidence-based guideline development and is in accordance with the principles of the Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group. These investigators identified randomized controlled trials (RCTs) through a systematic, multi-database literature search and selected RCTs comparing the effects of PR with usual care in patients with COPD and mMRC less than or equal to 1. Predefined critical outcomes were health-related quality of life (HRQoL), adverse effects and mortality, while walking distance, maximal exercise capacity, muscle strength, and drop-outs were important outcomes. Two authors independently extracted data, assessed trial eligibility and risk of bias, and graded the evidence. Meta-analyses were performed when deemed feasible. A total of 4 RCTs (489 participants) were included. On the basis of moderate-quality evidence, these investigators found a clinically and statistically significant improvement in short-term HRQoL of 4.2 units (95 % CI: -4.51 to -3.89) on St George's Respiratory Questionnaire, but not at the longest follow-up. They also found a statistically significant improvement of 25.71 m (95 % CI: 15.76 to 35.65) in the 6-minute walk test with PR; however, this improvement was not considered clinically relevant. No difference was found for mortality, and insufficient data prohibited meta-analysis for muscle strength and maximal exercise capacity. No adverse effects were reported. The authors concluded that they found a moderate quality of evidence suggesting a small, significant improvement in short-term HRQoL and a clinically non-significant improvement in walking distance following PR in patients with COPD and mild symptoms. This resulted in a weak recommendation of routine PR in these patients using the GRADE approach.

**Prevention of Acute Exacerbations of COPD in Persons with Moderate, Severe, or Very Severe COPD:**
The American College of Chest Physicians and Canadian Thoracic Society guideline on “Prevention of acute exacerbations of COPD” (Criner et al, 2015) states that in patients with moderate, severe, or very severe COPD who have had an exacerbation greater than the past 4 weeks, the panel does not suggest PR to prevent acute exacerbations of COPD.

Non-Cystic Fibrosis Bronchiectasis:

In a systematic review, Lee and colleagues (2016) examined the effect of PR (exercise and education) or exercise training (ET) on exercise capacity, health-related quality of life (HRQOL), symptoms, frequency of exacerbations, and mortality compared with no treatment in adults with non-cystic fibrosis bronchiectasis. Computer-based databases were searched from their inception to February 2016; RCTs of PR or ET versus no treatment in adults with bronchiectasis were included. Two reviewers independently extracted data and assessed methodological quality using the Cochrane risk-of-bias tool. A total of 4 trials with 164 participants were included, with variable study quality. Supervised outpatient PR or ET of 8 weeks improved incremental shuttle walk distance (WMD = 67 m; 95% CI: 52 to 82 m) and disease-specific HRQOL (WMD = -4.65; 95% CI: -6.7 to -2.6 units) immediately after intervention, but these benefits were not sustained at 6 months. There was no effect on cough-related quality of life (WMD = 1.3; 95% CI: -0.9 to 3.4 units) or psychological symptoms. Pulmonary rehabilitation commenced during an acute exacerbation and continued beyond discharge had no effect on exercise capacity or HRQOL. The frequency of exacerbations over 12 months was reduced with out-patient ET (median of 2 versus 1; p = 0.013), but PR initiated during an exacerbation had no impact on exacerbation frequency or mortality. The authors concluded that short-term improvements in exercise capacity and HRQOL were achieved with supervised PR and ET programs, but sustaining these benefits is challenging in people with bronchiectasis. They stated that the frequency of exacerbations over 12 months was reduced with ET only.

Sarcoidosis:

Lingner and associates (2015) stated that available data assessing the effectiveness of PR for patients with chronic sarcoidosis are scant; for Germany, there are none at all. To gain information about the benefit of in-house PR for patients with chronic sarcoidosis and for the health care system, these investigators intended to collect data in a prospective multi-center "real-life" cohort trial -- Prospective Catamnisis Study of Sarcoidosis in Pulmonary Rehabilitation -- will evaluate a multi-modal 3-week inpatient PR program for adult patients with chronic sarcoidosis over a 1-year follow-up time. Defined specific clinical measurements and tests will be performed at the beginning and the end of the rehabilitation. In addition, questionnaires concerning HRQOL and the patients’ symptoms will be provided to all patients. Inclusion criteria will be referral to 1 of the 6 participating PR clinics in Germany for sarcoidosis and age between 18 and 80 years. Patients will only be excluded for a lack of German language skills or the inability to understand and complete the study questionnaires. To rule out seasonal influences, the recruitment will take place over a period of 1 year. In total, at least 121 patients are planned to be included. A descriptive statistical analysis of the data will be performed, including multivariate analyses. The primary outcomes are specific HRQOL (St George's Respiratory Questionnaire) and exercise capacity (6-minute walk test). The secondary outcomes are several routine lung function and laboratory parameters, dyspnea scores and blood gas analysis at rest and during exercise, changes in fatigue, psychological burden, and generic HRQOL (36-item Short Form Health Survey). Funding was obtained on October 12, 2010; enrollment began on January 15, 2011 and was completed by January 14, 2012. Results are anticipated late summer 2015. The authors concluded that due to the large number of participants, they expect to obtain representative findings concerning the effectiveness of PR for patients with sarcoidosis and to provide a dataset of assessed objective and subjective short- and long-term changes due to PR. They stated that the results should form the basis for the planning of a RCT.
### CPT Codes / HCPCS Codes / ICD-10 Codes

*Information in the [brackets] below has been added for clarification purposes. Codes requiring a 7th character are represented by "+".*

#### Other CPT codes related to the CPB:

<table>
<thead>
<tr>
<th>Code Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>78580 - 78599</td>
<td>Diagnostic radiology, (eg, particulates) respiratory system</td>
</tr>
<tr>
<td>94010 - 94799</td>
<td>Pulmonary laboratory medicine</td>
</tr>
</tbody>
</table>

#### HCPCS codes covered if selection criteria are met:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G0237</td>
<td>Therapeutic procedures to increase strength or endurance of respiratory muscles, face-to-face, one-on-one, each 15 minutes (includes monitoring)</td>
</tr>
<tr>
<td>G0238</td>
<td>Therapeutic procedures to improve respiratory function, other than described by G0237, one-on-one, face-to-face, per 15 minutes (includes monitoring)</td>
</tr>
<tr>
<td>G0239</td>
<td>Therapeutic procedures to improve respiratory function or increase strength or endurance of respiratory muscles, 2 or more individuals (includes monitoring)</td>
</tr>
<tr>
<td>G0424</td>
<td>Pulmonary rehabilitation, including exercise (includes monitoring) one hour, per session, up to two sessions per day</td>
</tr>
<tr>
<td>S9473</td>
<td>Pulmonary rehabilitation program, non-physician provider, per diem</td>
</tr>
</tbody>
</table>

#### Other HCPCS codes related to the CPB:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A9300</td>
<td>Exercise equipment</td>
</tr>
</tbody>
</table>

#### ICD-10 codes covered if selection criteria are met:

<table>
<thead>
<tr>
<th>Code Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D86.0 - D86.9</td>
<td>Sarcoidosis</td>
</tr>
<tr>
<td>E84.0 - E84.9</td>
<td>Cystic fibrosis</td>
</tr>
<tr>
<td>E88.01</td>
<td>Alpha-1-antitrypsin deficiency</td>
</tr>
<tr>
<td>G65.0 - G65.2</td>
<td>Sequelae of inflammatory and toxic polyneuropathies</td>
</tr>
<tr>
<td>G70.00 - G70.9</td>
<td>Myasthenia gravis and other myoneural disorders</td>
</tr>
<tr>
<td>G71.0 - G71.9</td>
<td>Primary disorders of muscles</td>
</tr>
<tr>
<td>G72.0 - G72.9</td>
<td>Other and unspecified myopathies</td>
</tr>
<tr>
<td>J40 - J47.9</td>
<td>Chronic lower respiratory diseases</td>
</tr>
<tr>
<td>J60 - J70.9</td>
<td>Lung diseases due to external agents</td>
</tr>
<tr>
<td>J80 - J84.9</td>
<td>Other respiratory diseases principally affecting the interstitium</td>
</tr>
<tr>
<td>J85.0 - J86.9</td>
<td>Suppurative necrotic conditions of the lower respiratory track</td>
</tr>
<tr>
<td>M41.00 - M41.9</td>
<td>Scoliosis</td>
</tr>
<tr>
<td>M45.0 - M45.9</td>
<td>Ankylosing spondylitis</td>
</tr>
<tr>
<td>P27.0 - P27.9</td>
<td>Chronic respiratory disease originating in the perinatal period</td>
</tr>
</tbody>
</table>

*Suppurative necrotic conditions of the lower respiratory track includes bronchopulmonary dysplasia, pulmonary fibrosis*
**Dyspnea [at rest or with exertion]**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R06.00</td>
<td><em>Dyspnea [at rest or with exertion]</em></td>
</tr>
<tr>
<td>R06.09</td>
<td><em>Dyspnea [at rest or with exertion]</em></td>
</tr>
<tr>
<td>Z76.82</td>
<td>Awaiting organ transplant status [when patient is listed for transplant]</td>
</tr>
<tr>
<td>Z94.2</td>
<td>Lung transplant status</td>
</tr>
</tbody>
</table>

**ICD-10 codes contraindicated for this CPB:**

<table>
<thead>
<tr>
<th>Code Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C00.0 - C96.9</td>
<td>Malignant neoplasm [not covered for pre-operative pulmonary rehabilitation]</td>
</tr>
<tr>
<td>F17.200 - F17.299</td>
<td>Nicotine dependence [recent or has quit for less than 3 months]</td>
</tr>
<tr>
<td>I21.01 - I22.9</td>
<td>ST elevation (STEMI) and non-ST elevation (NSTEMI) myocardial infarction [within last 6 months]</td>
</tr>
<tr>
<td>I25.10 - I25.9</td>
<td>Chronic ischemic heart disease [symptomatic]</td>
</tr>
<tr>
<td>I47.0 - I49.9</td>
<td>Paroxysmal tachycardia, atrial fibrillation and flutter and other cardiac arrhythmias</td>
</tr>
<tr>
<td>I50.20 - I50.9</td>
<td>Heart failure</td>
</tr>
<tr>
<td>I73.89 - I73.9</td>
<td>Other specified and unspecified peripheral vascular disease [claudication]</td>
</tr>
<tr>
<td>I82.0 - I82.91</td>
<td>Other venous embolism and thrombosis [claudication]</td>
</tr>
<tr>
<td>M00.00 - M25.9</td>
<td>Arthropathies [active]</td>
</tr>
<tr>
<td>Z87.891</td>
<td>Personal history of nicotine dependence [recent or has quit for less than 3 months]</td>
</tr>
</tbody>
</table>

The above policy is based on the following references:

17. American Association for Respiratory Care (AARC). AARC clinical practice guideline: Pulmonary rehabilitation. Dallas, TX: American Association for Respiratory Care (AARC); 2002.


Amendment to
Aetna Clinical Policy Bulletin Number: 0032 Pulmonary Rehabilitation

There are no amendments for Medicaid.