

ABPTRFE

American Board of Physical Therapy
Residency & Fellowship Education

Description of Residency Practice: Cardiovascular and Pulmonary

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DRP Cardiovascular and Pulmonary Physical Therapy

Preamble

The American Board of Physical Therapy Residency & Fellowship Education, a board-appointed group of the American Physical Therapy Association, has created the following “Description of Residency Practice” to reduce unwarranted curriculum variability; provide residents minimum consistency in learning experiences for that area of practice; and streamline the accreditation process for reporting.

This DRP is the product of collaborative work by ABPTRFE and the American Board of Physical Therapist Specialties through the practice analysis for specialty revalidation.

While all programs are required to meet the comprehensive curriculum and program requirements as outlined within “ABPTRFE Quality Standards for Clinical Physical Therapist Residency and Fellowship Programs,” the purpose of the DRP is to 1. Establish a consistent curriculum expectation for residency programs within the same area of practice. 2. Provide consistency in program reporting for accreditation processes. The DRP allows flexibility for programs to incorporate additional learning experiences unique to the program’s environment that are beyond the minimum standard expectations.

The DRP for each residency area will undergo revalidation at least once every 10 years. The process for revalidation will be a collaborative process with ABPTS.

I. Type of Program

Cardiovascular and Pulmonary is a clinical area of practice.

II. Learning Domain Expectations

A residency program must have a curriculum inclusive of the learning domains identified within that area’s current validated analysis of practice.

The following information is extracted directly from chapter 2 of the Cardiovascular and Pulmonary Physical Therapy “Description of Specialty Practice.”¹

A. Knowledge Areas of Cardiovascular and Pulmonary Practice

- **Foundation Sciences**
 - Cardiovascular and pulmonary anatomy, including embryologic development.
 - Physiology of cardiovascular, pulmonary, and related organ systems.
 - Exercise physiology.
 - Kinesiology/biomechanics.
 - Pathology/pathophysiology.

¹ “Cardiovascular and Pulmonary Physical Therapy Description of Specialty Practice.” 3rd ed. Alexandria, VA: American Physical Therapy Association; 2017. Reproduced with permission. © 2017 American Physical Therapy Association. All rights reserved.

- Pharmacology
- **Behavioral Sciences**
 - Ethical and legal implications.
 - Management and leadership sciences.
 - Psychology and mental health.
 - Sociology and social justice.
 - Teaching and learning.
- **Clinical Sciences**
 - Cardiac, vascular, and thoracic surgery.
 - Cardiovascular and pulmonary pathophysiology.
 - Cardiovascular and pulmonary medicine (pediatric/adult/geriatric).
 - Cardiovascular and pulmonary rehabilitation.
 - Critical care medicine (including American Heart Association Advanced Cardiac Life Support, as allowed by state law).
 - Emergency and trauma.
 - Exercise science.
 - Public health:
 - Epidemiology and population health (e.g., risk factor assessment, socioeconomic and cultural disparities, genetics).
 - Health promotion, wellness, and nutrition.
 - Technological advances in medicine:
 - Artificial devices, regenerative medicine, telehealth, and other emerging advances.
 - Imaging and interventional radiology.
- **Critical Inquiry Principles and Methods**
 - Identifies appropriate cardiovascular and pulmonary physical therapy research questions.
 - Critically appraises current theory/literature supporting the identified problem.
 - Develops appropriate project design and methodology, including relevant statistical tools analysis.
 - Disseminates project results through presentations to peers, other health care professionals, and the public, as appropriate.
 - Mentors others in the collaborative investigation processes.
 - Engages in activities such as clinical research trials, treatment efficacy studies, quality assurance or utilization review projects, formal systematic reviews, and development of peer-reviewed clinical practice guidelines.

B. Professional Competencies of Cardiovascular and Pulmonary Physical Therapists

- **Professional Behaviors**
 - Pursues advanced knowledge, skills, and abilities through lifelong learning (e.g., residency and fellowship training, seminars, structured self-study, professional meetings, journal clubs, etc).
 - Uses patient-centered ethics and values in complex clinical decision making.
 - Devotes time and effort to resolve complex problems.
 - Demonstrates active membership and involvement in professional organizations related to cardiovascular and pulmonary practice.
- **Leadership**
 - Facilitates conflict resolution.
 - Participates in activities beyond immediate scope of responsibility in order to expand, improve, or define the practice or awareness of cardiovascular and pulmonary physical therapy.
 - Seeks opportunities to mentor others.
 - Shapes system policies and procedures, selecting the most effective method to build consensus.
 - Serves as change agent specific to health behaviors.

- **Education, Theory and Practice**
 - Advocates for involvement in formalized advanced credentialing and/or professional development opportunities, such as clinical residencies and fellowships.
 - Mentors physical therapists, physical therapist assistants, physical therapy students/residents/fellows, and other health care professionals by participating in clinical education and research related to cardiovascular and pulmonary physical therapy.
 - Provides evidence-based educational programs to a variety of audiences, including students, other health care professionals, the general public, political groups and candidates, and third-party payers.

- **Administration**
 - Creates institutional intra- and interprofessional guidelines and competencies as an interdisciplinary team member.
 - Develops, implements, and evaluates the effects of policies and procedures on the cardiovascular and pulmonary physical therapist practice.
 - Resolves issues related to delivery of services staff productivity, quality assurance, cost containment, and third-party reimbursement in cardiovascular and pulmonary physical therapist practice settings.

- **Consultation**
 - Performs a needs assessment of individuals or private/public organizations, related to cardiovascular and pulmonary health disparity or wellness issues.
 - Provides expertise and/or second opinions regarding patient or client management to both intra-and interprofessional team members.
 - Performs peer review, including publications/manuscripts, chart reviews, performance reviews, or teaching evaluations.
 - Provides expert opinion to legal entities, corporations, third-party payers, and regulatory agencies.

- **Evidence-Based Clinical Practice**
 - Identifies, synthesizes, and integrates current cardiovascular and pulmonary literature, including clinical practice guidelines, into clinical practice.
 - Evaluates the efficacy and effectiveness of new and established examination tools, interventions, and technologies, and integrates into cardiovascular and pulmonary clinical practice as appropriate.
 - Selects, collects, and interprets appropriate patient and practice management outcomes.
 - Self-reflects to further clinical mastery and expertise, based on outcomes data.

C. Psychomotor Skills of Cardiovascular and Pulmonary Physical Therapists in the Patient/Client Management Model

- **Examination**
 - History:
 - Reviews and interprets the clinical significance for physical therapy of all available patient or client data, including but not limited to: general health status; physical examination findings and process notes from other health care team members; cardiovascular/pulmonary clinical tests and diagnostic imaging studies; dynamic physiological monitoring (e.g., electrophysiological tracings, pulmonary artery pressures); and medical/surgical and pharmacologic interventions.
 - Conducts an efficient, effective, and focused patient or client interview to anticipate and detect cardiovascular and/or pulmonary management issues by ascertaining current and previous systems, general health status, psychosocial considerations, environmental exposures, patient understanding of cardiovascular and pulmonary disease processes and impairments, risk factor information, vocational history, history and motivation for lifestyle changes(s), and patient or caregiver goals.

- Systems review:
 - Selects and applies appropriate tools for screening the cardiovascular and pulmonary, musculoskeletal, neuromuscular, and integumentary systems.
 - Recommends action(s) based on screening results. Possible actions include: retain as a client to benefit from PT services, refer/consult other providers, or no further intervention recommended.
- Test and measures:
 - Selects and prioritizes appropriate tests and measures based on the results of initial history and systems review.
 - Performs clinical tests and measures accurately, including:
 - Aerobic capacity/endurance (e.g., maximal or submaximal tests, such as graded exercise tests, 6-Minute Walk Test, gait speed, etc).
 - Collaboration in maximal symptom-limited exercise tests (e.g., VO₂ max test with collaborate on additional tests, breath-by-breath analysis).
 - Ventilatory muscle performance and endurance (e.g., inspiratory muscle trainers).
 - Measurement of edema.
 - Palpation (e.g., pulses, musculoskeletal, provocation testing).
 - Circulation (e.g., arterial, venous, lymphatic):
 - Abdominal-jugular reflex.
 - Ankle brachial index.
 - Auscultation of bruits.
 - Auscultation of heart sounds.
 - Electrocardiographic tracings (e.g., 12-lead).
 - Jugular venous distension.
 - Claudication pain.
 - Dynamic physiologic response(s) to position change, activity/exercise (e.g., cardiac index).
- Education, work, community, social, and civic life:
 - Determines capacity to perform life roles (e.g., metabolic equivalent [MET] level), in order to navigate school/work environments, perform community ambulation, attend religious/spiritual services, etc.
 - Determines environmental factors/barriers that impact patient or client endurance.
- Joint integrity and mobility (e.g., chest wall excursion and rib mobility/intervertebral joint mobility).
- Mental function:
 - Observes/screens for symptoms of anxiety, depression, delirium, etc.
 - Observes patient or client ability to learn and retain information.
- Posture:
 - Observes dynamic postural response to ventilatory demands.
 - Self-care, domestic life.
 - Performs critical care mobility tests (e.g., Activity Measure for Post-Acute Care [AM-PAC], Short Physical Performance Battery [SPPB]).
 - Administers disease-specific questionnaires (e.g., Minnesota Living With Heart Failure Questionnaire, St. George's Respiratory Questionnaire).
 - Ventilation, respiration, and airway clearance.
 - Performs pulmonary auscultation.
 - Examines cough and ability to clear airways.
 - Examines artificial airways.
 - Evaluates breathing patterns and applies ventilation strategies.
 - Examines mechanical ventilation settings.

- Performs spirometry and pulmonary function testing.
- Tissue oxygenation – fraction of inspired oxygen to peripheral oxygen saturation ration (FiO_2/SpO_2).
- **Evaluation**
 - Differentiates among functional and structural impairments, activity limitations, participation restrictions, environmental factors, and risk factors that require compensatory strategies versus intervention strategies, focusing on recovery of normal function.
 - Relates impairments, activity limitations, participation restrictions, and psychosocial factors to the patient's or client's and caregiver's expressed goals.
 - Analyzes observed physiological responses to interventions, and adapts or terminates appropriately.
 - Develops an individual exercise prescription based on analysis of exercise test results.
 - Determines need for and titrate supportive devices during exercise (e.g., supplemental oxygen, Venturi mask).
 - Recommends specific interventions based on analysis of cardiovascular and/or pulmonary disease risk factors.
 - Responds to potentially life-threatening changes in physiologic status.
 - Integrates data from monitors, tests, screens, and evaluations used or performed by other health care professionals.
 - Determines appropriateness of delegation of aspects of patient or client management to other physical therapy providers (e.g., physical therapist assistants).
 - Determine needs of patient or client that indicate interprofessional referral (i.e., to other health care professionals).
- **Diagnosis**
 - Analyzes examination data to develop a physical therapy differential diagnosis(es).
 - Differentiates among elements of ICF classification that are responsive to physical therapist intervention.
 - Refers patient or client to other professionals for findings that are outside the scope of the physical therapist's knowledge, experience, or expertise.
- **Prognosis**
 - Predicts optimal level of improvement of function, including time to achieve that level, with a high level of accuracy.
- **Plan of Care**
 - Prioritizes interventions related to the severity, acuity, and chronicity of disease and comorbid conditions, patient or client goals and attributes, resources, and risk factors.
 - Determines aspects of patient and client management that may require ongoing or episodic services to ensure safety and effective adaptation based on lifespan and changes in physical function.
- **Intervention**
 - Coordination, communication, and documentation:
 - Consults and communicates interprofessionally regarding evidence-based justification of plan of care, critical and potentially life-threatening conditions, and changes in patient or client status to member(s) of the health care team in a timely and appropriate manner.
 - Participates in and/or leads patient rounds, conferences, and team meetings, as appropriate for setting.

- Advocates for increased utilization of cardiovascular and pulmonary specialty services by referring practitioners.
- Collaborates with patients, families, care providers, organizations, and the public to implement programs or services for risk factor reduction and cardiovascular and pulmonary health and wellness.
- Patient- or client-related education:
 - Educates patient or client about the plan of care, responsibility for health maintenance, and self-management in a patient-centric manner adjusted for health beliefs and level of learning.
 - Educates patients, clients, and caregivers in therapeutic interventions that integrate specialty techniques (e.g., airway clearance, suctioning, exercises) as part of the plan of care.
 - Educates patients or client in self-monitoring during therapeutic intervention and activities of daily living.
 - Educates patient or client in strategies to optimize activities and participation adjusted for disease state and severity, within available resources and support systems.
 - Adjusts patient or client education according to learner's ability to independently demonstrate knowledge and perform skills.
- Procedural interventions:
 - Implements and tailors interventions based on the patient's or client's anatomic and physiological changes according to acuity, chronicity, and lifespan development.
 - Negotiate barriers to interventions with the patient or client, including cognition, literacy, language, emotional state, socioeconomic status, and scarcity of resources, resulting in optimized adherence.
- Specific intervention techniques:
 - Therapeutic exercise:
 - Modifies exercise parameters based on physiologic monitoring.
 - Trains peripheral skeletal muscles to optimize oxygen transport and central and peripheral endurance.
 - Implements techniques to improve strength and/or endurance of ventilatory muscles and to develop breathing retraining strategies (e.g., inspiratory muscle training devices).
 - Determine need for and titrates supportive devices during exercise (e.g., supplemental oxygen, Venturi mask).
 - Exercises patients or clients with hemodynamic support/monitoring devices:
 - Extracorporeal membrane oxygenation.
 - Intra-aortic balloon pump.
 - Mechanical circulatory devices (e.g., total heart, ventricular assist devices).
 - Pulmonary artery catheters.
 - Modifies exercise interventions based on pathologies and medical/surgical precautions (e.g., sternal stability and pursed-lipped breathing for dynamic hyperinflation).
 - Exercises patients or clients with ventilatory support devices (e.g., invasive and noninvasive mechanical ventilator).
 - Functional training in self-care and domestic, education, work, community, social, and civic life:
 - Optimizes endurance for patient or client activity and participation.
 - Implements energy conservation techniques to optimize activity and participation performance.
 - Manual therapy techniques:
 - Mobilizes ribs and intervertebral joints to facilitate posture and ventilatory patterns.

- Performs range of motion activities to facilitate posture and ventilation.
- Mobilizes soft tissue to facilitate posture and ventilation.
- Techniques to improve ventilation and respiration, including airway clearance techniques:
 - Performs suctioning (via artificial airway, oral, nasotracheal, or tracheal).
 - Manages oxygen delivery systems during treatment.
 - Provides manual ventilation during intervention.
 - Performs assisted cough techniques – manual and mechanical.
 - Manages mechanical airway clearance devices, such as high-frequency chest wall oscillators (e.g., Vest®), positive expiratory pressure (PEP) devices, and oscillating PEP (e.g., Acapella®, Flutter®, intrapulmonary percussive ventilation).
 - Performs self-management of airway clearance techniques, such as autogenic drainage, active cycle of breathing, pursed-lipped breathing, and self-suctioning.
- **Outcomes:**
 - Assesses improvement of patient's or client's activities and participation based on best available evidence and patient- or client-specific variables (e.g., history, diagnosis, complications).
 - Chooses appropriate assessment measures to determine initial and long-term responses to intervention.
 - Utilizes applicable, evidence-based outcomes measures/questionnaires/scales.

III. Practice Settings

The clinical curriculum of all accredited residency programs must include a variety of practice settings, as noted below. A resident should experience a minimum of 5% of patient-care practice hours within each setting based on the minimum patient-care practice hours outlined within “ABPTRFE Quality Standards for Clinical Physical Therapist Residency and Fellowship Programs.”

If a residency program is unable to provide each participant with an opportunity to engage in patient care activities within these settings, the program must provide additional learning opportunities (e.g., observation, didactic, journal club, research) related to patient care within these settings for the minimum required hours noted above.

The minimum required practice settings for cardiovascular and pulmonary residency programs are:

- Acute care facility.
- Outpatient facility.

IV. Patient Populations

The clinical curriculum of all accredited residency programs must include a variety of patient populations, as noted below, specific to sex and age. A resident should experience a minimum of 5% of time in each patient population based on the minimum patient-care practice hours outlined within “ABPTRFE Quality Standards for Clinical Physical Therapist Residency and Fellowship Programs.”

If a residency program is unable to provide each resident with an opportunity to engage in patient care activities within these populations, the program must provide additional learning opportunities (e.g., observation, didactic, journal club, research) related to patient care within these populations for the minimum required hours noted above.”

The minimum required patient populations for cardiovascular and pulmonary residency programs are:

Age

- Pediatrics (0-21 years of age).
- Adults (22-59 years of age).
- Geriatrics (60 years of age to end of life).

Sex

- Female.
- Male.

V. Medical Conditions

The clinical curriculum of all accredited residency programs must include a variety of medical conditions associated with the program's area of practice (see list below).

If a residency program is unable to provide each resident with an opportunity to engage in patient care activities within most of these conditions, the program must provide additional learning opportunities (e.g., observation, didactic, journal club, research) related to patient care within these conditions.

Programs must use the ABPTRFE template when submitting documentation to ABPTRFE. Medical Condition Form templates are in the [Residency/Fellowship Education HUB](#).

Medical Conditions
Cardiovascular and Pulmonary
Cardiovascular Conditions
<i>Conditions Seen Frequently</i>
Aneurysms (aortic, abdominal)
Atherosclerotic disease (coronary atherosclerosis, peripheral arterial occlusive disease, peripheral arterial disease, intermittent claudication)
Cardiomyopathy (all types, including viral, EtOH, and others)
Cardiovascular complications of diabetes
Cor pulmonale/right heart failure
Heart failure with reduced or preserved ejection fraction
Hypertensive heart disease
Hypertension
Ischemic conditions (angina, myocardial infarction [acute/chronic], intermediate coronary syndrome)
Patients at high risk for development of cardiovascular disease or complications
Peripheral vascular complications of diabetes
Rhythm disturbances/dysrhythmias (status post ablation)
Status post aortofemoral or other vascular bypass grafts
Status post cardiac pacemaker insertion (permanent, all types)
Status post coronary artery bypass graft

Status post defibrillator implant
Status post heart valve replacement
Status post vascular stent placement
Valvular disorders
Venous stasis, with or without cellulitis
<i>Conditions Seen Occasionally</i>
Ischemic conditions, Prinzmetal angina
Lymphedema
Other orthostatic intolerance
Pericarditis
Postural orthostatic tachycardia syndrome
Septal defect, atrial or ventricle
Status post aortic aneurysm repair
Status post aortic dissection repair
Status post correction of congenital heart defects
Status post extracorporeal membrane oxygenation (ECMO)
Status post heart transplant
Status post heart-lung transplant
Status post intra-aortic balloon pump (IABP)
Status post implantable loop monitor
Status post ventricular assist device placement
<i>Conditions Seen Rarely</i>
Coarctation of the aorta
Common ventricle
Eisenminger syndrome
Lymphadenopathy
Patent ductus arteriosus
Tetralogy of fallot
Transposition of great vessels
Pulmonary System
<i>Conditions Seen Frequently</i>
Acute respiratory failure
Acute upper respiratory infection
Adult respiratory distress syndrome
Atelectasis, adult primary

Emphysema
High risk for development of pulmonary disease or complications
Pneumonia (aspiration, bacterial, viral)
Postoperative pulmonary complications (other than atelectasis)
Primary pulmonary hypertension
Pulmonary artery hypertension
Pulmonary edema
Pulmonary effusion
Pulmonary embolism
Pulmonary fibrosis, primary/idiopathic
Status post other thoracic surgery
Status post tracheotomy
<i>Conditions Seen Occasionally</i>
Asthma
Bronchiectasis
Bronchiolitis obliterans
Bronchitis (acute or chronic)
Bronchopneumonia
Cystic fibrosis
Empyema
Influenza
Lung abscess
Neoplastic disease (carcinoma in situ [bronchus/lung], malignant neoplasm [larynx / pleura, trachea / bronchus / lung])
Orthopedic impairment (fractured ribs, flail chest, kyphoscoliosis)
Paralysis of the diaphragm or hemidiaphragm
Pneumococcal pneumonia
Pneumothorax
Pulmonary fibrosis, iatrogenic (radiation/chemotherapy)
Sarcoidosis
Status post abdominal surgery
Status post esophagectomy
Status post lung reduction or resection
Status post lung transplant, single or double
<i>Conditions Seen Rarely</i>
Atelectasis, newborn

Bronchopulmonary dysplasia
Graft versus host disease
Hepatopulmonary syndrome
Meconium aspiration
Pneumoconiosis
Spinal cord lesion or injury (cervical, thoracic, lumbosacral)

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