2021 CARDIOVASCULAR & PULMONARY SPECIALIST CERTIFICATION CANDIDATE GUIDE
Dear Fellow Physical Therapist:

Congratulations! By acquiring the Cardiovascular and Pulmonary Specialist Certification Candidate Guide, you have been proactive in your interest in and pursuit of specialist certification. The specialist certification program has been designed to identify and define physical therapy specialty areas and to formally recognize physical therapists who have attained advanced knowledge and skills in those areas.

Certification also assists the public and health care community in identifying therapists with acknowledged expertise in a particular field of practice and demonstrates that physical therapists are devoted to addressing the unique needs of the people with whom we work.

Certification is achieved through successful completion of a standardized online application and examination process. Coordination of this program is provided by the American Board of Physical Therapy Specialties, the governing body for approval of new specialty areas and certification of clinical specialists. Specialty councils representing the ten recognized specialty areas have been appointed to delineate and describe the advanced knowledge, skills, and abilities of clinical specialists; determine specific requirements for certification; and develop the certification examinations.

The dedicated volunteers currently giving their time and service to the development of this process are listed in the rosters in the beginning of this booklet. APTA established this program in 1978 to provide formal recognition for physical therapists with advanced clinical knowledge, competence, and skills in a special area of practice. The program evolved from the membership of special interest sections of APTA as a way to encourage and facilitate the professional growth of individual members and thereby facilitate growth of the entire profession.

Certified specialists have clearly demonstrated their commitment to service by the variety, depth, and consistency of their professional involvement. Their desire to attain formal recognition of their advanced clinical knowledge, competence, and skills reflects their devotion to their profession and their patients. In these times of dramatic health care reform, dedication to public service by providing high quality physical therapy services is paramount.

If you share these personal and professional principles, then you are in the right place! Please join the growing number of physical therapists who have chosen this pathway of professional development.

Thank you for your interest and I wish you success in this endeavor.

Sincerely,

Marie Johanson, PT, PhD
Board-Certified Orthopaedic Clinical Specialist
Chair, American Board of Physical Therapy Specialties
ROSTERS

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TABLE OF CONTENTS

1. GENERAL INFORMATION
   1.1. American Physical Therapy Association .......... 5
   1.2. American Board of Physical Therapy Specialties .......... 5
   1.3. Specialty Council ............................................. 5
   1.4. Additional Physical Therapy Examinations .......... 5
   1.5. National Board of Medical Examiners® ................. 5
   1.6. Prometric .................................................... 5
   1.7. Restriction of the Term Board-Certified Specialist .......... 5

2. CERTIFICATION REQUIREMENTS
   2.1. General Requirements ......................................... 5
   2.2. Other Requirements ............................................. 5
   2.3. Steps to Complete Certification ............................ 7
   2.4. Maintenance of Specialist Certification (MOSC) .......... 7
   2.5. Ineligibility for Certification ............................. 8

3. APPLICATION PROCESS
   3.1. Application Deadline .......................................... 8
   3.2. Procedures for Application Review ........................ 8
   3.3. Services for Persons with Disabilities .................. 9
   3.4. Certification in More Than One Specialty Area ........ 9
   3.5. Submission of Application .................................... 9
   3.6. Application Review Fee ...................................... 9
   3.7. Time Limit for Active Application/Reapplication ........ 9
   3.8. Address Changes .............................................. 9

4. SCHEDULING THE EXAM
   4.1. Examination Fee and Scheduling Permit ................. 10
   4.2. Test Dates .................................................... 10
   4.3. How to Schedule an Appointment at a Testing Center .......... 10
   4.4. Refunds and Cancellations .................................. 10
   4.5. Rescheduling an Exam ....................................... 10

5. PREPARING FOR THE EXAM
   5.1. Description of Specialty Practice (DSP) ................. 10
   5.2. Exam Content Outline ....................................... 10
   5.3. Preparation for the Exam .................................... 10
   5.4. Review Materials and Courses ............................. 11
   5.5. Study Groups ................................................ 11
   5.6. Exam Development ......................................... 11
   5.7. Exam Question Format ...................................... 11
   5.8. Answer Strategy ............................................ 11
   5.9. Tutorial ....................................................... 11

6. SITTING FOR THE EXAM
   6.1. Computer Testing ............................................ 11
   6.2. Test Centers and Testing Conditions .................... 11
   6.3. Exam Time .................................................. 11
   6.4. Admission to Test ........................................... 11
   6.5. Testing Regulations and Rules of Conduct ............ 12
   6.6. Irregular Behavior During the Examination Process .......... 12
   6.7. Canceled or Delayed Exam Administration or Problems at the Testing Center .......... 13
   6.8. Exam Deferral ............................................... 13
   6.9. Equipment Malfunction .................................... 13
   6.10. Incomplete Examinations .................................. 13

7. EXAM RESULTS
   7.1. Exam Results and Notification ............................ 14
   7.2. Scaled Scores ............................................... 14
   7.3. Passing Scores ............................................. 14

8. CONFIDENTIALITY
   8.1. Confidentiality of Applicant Identity .................... 14
   8.2. Confidentiality of Examination Content ................ 14

9. GROUNDS FOR DISCIPLINARY ACTION .................... 14

10. PROCEDURES FOR REVIEW OF DECISIONS
    10.1. Reconsideration of Decision Regarding Eligibility to Sit for the Exam .......... 14
    10.2. Appeal to ABPTS of Specialty Council’s Decision Regarding Eligibility to Sit for the Exam .......... 14
    10.3. Procedures for Review of Certification Actions .......... 15
    10.4. Appeal to APTA Board of Directors of ABPTS Decision to Deny Certification .......... 15

11. EXAM CONTENT OUTLINE & SAMPLE QUESTIONS
    11.1. Exam Content Outline ................................ 15
    11.2. Diagnoses Seen by Cardiovascular & Pulmonary Clinical Specialists .................. 15
    11.3. Sample Questions ........................................ 16
    11.4. Sample Cardiovascular & Pulmonary Data Analysis Form ........................ 19

12. CARDIOVASCULAR AND PULMONARY SPECIALTY APPLICATION DATA ANALYSIS DO’S AND DONT’S ....... 21

13. CASE REPORT SCORING RUBRIC ............................ 22

14. RESOURCE GUIDE INFORMATION ............................ 24
1. GENERAL INFORMATION

1.1. American Physical Therapy Association

The American Physical Therapy Association (APTA) is a national professional organization representing more than 100,000 physical therapists, physical therapist assistants, and physical therapy students throughout the United States. Its goals are to serve its members and to serve the public by increasing the understanding of the physical therapist’s role in the health care system, and by fostering improvements in physical therapy education, practice, research, and professional development.

APTA established the specialist certification program in 1978 to provide formal recognition for physical therapists with advanced clinical knowledge, experience, and skills in a special area of practice, and to assist consumers and the health care community to identify physical therapy specialists.

1.2. American Board of Physical Therapy Specialties

Coordination and oversight of the specialist certification process is provided by the American Board of Physical Therapy Specialties (ABPTS), which is the governing body for approval of new specialty areas and certification of clinical specialists. ABPTS comprises board-certified physical therapists from different specialty areas; a physical therapist member of the APTA Board of Directors; an individual with expertise in test development, evaluation, and education; and a nonphysical therapist member representing the public.

The American Physical Therapy Association (APTA) prohibits preferential treatment or adverse discrimination on the basis of race, creed, color, gender, age, national or ethnic origin, sexual orientation, disability or health status in all areas including, but not limited to, its qualifications for membership, rights of members, policies, programs, just wages, activities, and employment practices.

1.3. Specialty Council

The Specialty Council, representing the area of cardiologic and pulmonary physical therapy, has been appointed to delineate the advanced knowledge, skills, and abilities for their specialty areas; to determine the academic and clinical requirements for certification; and to develop the certification examinations and oversee the maintenance of specialist certification. The Council comprises 4 board-certified specialists in the practice area.

1.4. Additional Physical Therapy Examinations

Individuals interested in Clinical Electrophysiology, Geriatric, Neurologic, Oncologic, Orthopaedic, Pediatric, and Sports, and Women’s Health, Wound Management (first test administration 2022) certifications must complete a separate online application, on APTA’s Specialist Certification Program website (www.abpts.org).

1.5. National Board of Medical Examiners

The National Board of Medical Examiners® (NBME®) is a nonprofit organization that strives to provide the highest quality testing and research services to organizations involved in the licensure and certification of medical and health science professionals.

NBME provides test development, test administration, editorial production, and psychometric services to ABPTS and the specialty councils.

1.6. Prometric

NBME currently delivers the specialist certification examinations by computer through Prometric. Prometric administers testing programs for educational institutions, professional associations, corporations, and other organizations. Examinations are delivered in test centers that have secure rooms dedicated to test delivery.

Note: Prometric test center locations are subject to change, and there is no guarantee that a center listed on the Prometric website at the time of application will be available for a future ABPTS administration. The most efficient way for candidates to check for test center locations is to log on to www.prometric.com/ABPTS and select “locate a test center.” This provides the most up-to-date information.

1.7. Restriction of the Term Board-Certified Specialist

APTA’s House of Delegates adopted a policy that no physical therapist shall purport to be a “Board-Certified Clinical Specialist” unless (s)he has successfully completed the certification process as developed by the American Board of Physical Therapy Specialties (HOD 06-94-23-39). In addition, ABPTS does not permit applicants for certification to state that they are “board eligible.”

2. CERTIFICATION REQUIREMENTS

2.1. General Requirements

Applicants must hold a current permanent/unrestricted license to practice physical therapy in the United States or any of its possessions or territories. In addition, applicants are required to pay the application review and examination fee.

Applicants must meet the minimum eligibility requirements for the 2021 examination when the application is submitted, excluding the Advanced Cardiac Life Support Certification requirement that must be submitted no later than one-month prior to examination. Applicants are encouraged to apply prior to the deadline to expedite the application review process. However, due to the COVID-19 pandemic, applications can be submitted through October 1, 2020, if more time is needed. Applicants must submit a complete application and review fee for each specialist certification exam.

ABPTS does not permit applicants to use the same direct patient care hours for different specialty areas.

2.2. Other Requirements

Advanced Cardiac Life Support Certification: Applicants must be currently certified in Advanced Cardiac Life Support (ACLS) by the American Heart Association.

Research & Evidence Based Practice Requirement:
All applicants must submit evidence of an activity involving research and evidence-based practice, directly related to the cardiovascular and pulmonary specialty area. This requirement is met by submitting either a Data Analysis Project or a Case Report. See below for the criteria of each
Option 1: Data Analysis Project

Applicants must submit evidence of involvement in the formulation and execution of a clinical data analysis project directly related to the cardiovascular and pulmonary specialty area within the last ten years and as a licensed physical therapist. The Acceptable data analysis projects include:

• treatment efficacy studies, such as a quality assurance or utilization review project
• program analysis
• structured surveys
• formal systematic reviews
• formal clinical research trials

Projects that will not fulfill this criterion include:

• projects that do not start with a question or purpose
• do not devise a methodology to answer the question, collect data, determine the results, and reach a conclusion

Examples of projects that are not acceptable include:

• literature review
• case report
• development of patient education materials

Projects must be completed and dissemination concluded at an appropriate level and degree that is congruent with the scope of the project at the time of application submission. Examples of appropriate and reasonable dissemination include:

• if the project conducted is a funded research project, then a conference presentation or publication would be a reasonable expectation
• if the data analysis project is a quality assurance project, then appropriate dissemination would be to the primary stakeholders of the project’s results (i.e. presentation or in-service)

Submission of the data analysis project should be in the form of:

(1) a brief statement that describes your specific involvement (study design, data collection, data analysis, etc) AND

(2) a project description that includes an abstract summarizing the project in which you participated (written in standard form, i.e., purpose, methods, results, and conclusions); and a brief statement of the limitations of the study design/methodology, method of disseminating the results, and how the project has changed the candidate’s practice of cardiovascular and pulmonary physical therapy.

Whether the applicant fulfills the data analysis project requirement will be evaluated according to the following questions:

1. Is the project related to cardiovascular and pulmonary physical therapy?  
2. Has the applicant submitted evidence of participation that demonstrates scholarly activity and knowledge of the research process?  
   • Acceptable roles in the project include defining the study question or purpose, devising the study methodology, and data analysis.

Participation in data collection only does not fulfill this requirement.

3. Has the project been completed, and the results disseminated to advance the practice of cardiovascular and pulmonary physical therapy?  

Successful applicants will be able to answer yes to all of the above questions. Please see the document posted on the ABPTS website for additional guidance to project submission.

NOTE: Additional information, concerning the “do’s” and “don’ts” on the specialty application data analysis, may be found on page 21 of this guide.

Cardiovascular and Pulmonary Specialty Council Statement on Submission of the Same Data Analysis Project by Two or More Candidates

The Cardiovascular and Pulmonary Specialty Council recognizes that the data analysis project may take many forms and may have many physical therapists (PT) working on the same project who desire to pursue specialist certification. The intent of the requirement is not for each candidate to present a unique data analysis project, but to demonstrate an understanding of research methods through project design and development, data collection, data analysis, formulation of results, and dissemination of outcomes at an appropriate level. The Council will accept the same project from different candidates; however, the Candidate Guide states that the applicant must submit “evidence of participation that demonstrates scholarly activity and knowledge of the research process”. Each candidate must independently compose and submit evidence of his or her unique contributions and participation throughout the research process that satisfy the requirements for certification. Each candidate must notify the specialist certification program staff that they are submitting an application with the same Data Analysis Project as another candidate at the time of submission and provide the other candidate’s name and/or application number.

Option 2: Case Report

Applicants must submit one case report demonstrating specialty practice in cardiovascular and pulmonary physical therapy. This case report must be based on a patient/client seen within the last three years and as a licensed physical therapist. Note: (See below for other requirements.)

Purpose: The purpose of the case report is to document competency in patient/client management in the specialty area. Patient management in a clinical case reveals clinical reasoning skills that are essential to demonstrating competency in the cardiovascular and pulmonary physical therapy specialty area. Guidelines for case selection: Patient/client management has five elements – examination, evaluation, diagnosis, prognosis, and intervention – which lead to optimal outcomes of care. Please select a typical case in your practice where you can provide evidence that demonstrates your competency in all five elements. The case should demonstrate the specialized care of a cardiovascular and pulmonary physical therapist. ABPTS may audit your submitted case report to verify its authenticity.

Instructions (see rubric on page 22 for specific criteria
• Follow the online format to enter information for the case report addressing each of the required questions in the designated boxes (i.e. CARE guidelines). Relevant clinical information may be presented using tables, graphs, bullet-point, etc.
• Each case must include information that supports the appropriate evaluation, plan of care development, and treatment interventions for the case. The applicant should describe the synthesis of information and clinical reasoning that occurred, within the context of what is known in the literature, as well as why the given tests, measures, and interventions were selected.
• At least five references from the literature should support the clinical decision making described in the report. These references should not be more than ten years old unless it is a seminal study.
• The document you submit should be no more than seven pages in length.
• The case should indicate contemporary specialist practice as depicted in the Description of Specialty Practice for Cardiovascular and Pulmonary Physical Therapy. An individual evaluating your competency should be able to rate your performance from reading your case using the scoring rubric described below.
• All patient identifiers should be removed.

Process for Submission of a Case Report:
1. The candidate must sign a notarized attestation indicating that the report describes what actually was done for the patient and does not represent an embellishment of the case. (Note: this can be done through notarization of the exam application itself. A separate notarization of the case report is not required).
2. A case will be evaluated within 3 months of submission.
3. A case that does not meet the screening criteria will be returned with an explanation. A case rated as not competent will be returned with the rater’s comments. A case rated as not meeting the screening criteria or not competent may be resubmitted after corrections are made, or replaced with another case, but only once.
4. Each case will be reviewed by a trained rater in the specialty area. Any case that does not meet criteria according to the initial reviewer will be reviewed by a second reviewer. Any discrepancy between the raters will be referred to a third, trained rater.
5. A candidate whose case is not rated as competent may submit a written request to the American Board of Physical Therapy Specialties (ABPTS) for reconsideration per existing ABPTS policy and procedures for reconsideration requests.

In addition, all applicants must meet requirements for Option A or Option B.

Option A:
Direct Patient Care: Applicants must submit evidence of 2,000 hours of direct patient care as a licensed United States physical therapist (temporary license excluded) in the specialty area within the last ten (10) years, 25% (500) of which must have occurred within the last three (3) years. Direct patient care must include activities in each of the elements of patient/client management applicable to the specialty area and included in the Description of Specialty Practice (DSP). These elements, as defined by the Guide to Physical Therapist Practice, are examination, evaluation, diagnosis, prognosis, and intervention.

Practice Settings: The Cardiovascular & Pulmonary Specialty Council recommends that direct patient care include patient/ client management of individuals with primary injury diseases or other conditions involving the cardiovascular and pulmonary system in both acute care and rehabilitation settings. Applicants may not include experience in the specialty area that will occur after the application deadline.

Option B:
Applicants must submit evidence of successful completion of an APTA-accredited post professional cardiovascular and pulmonary clinical residency completed within the last 10 years that has a curriculum plan reflective of the Description of Specialty Practice: Cardiovascular and Pulmonary Physical Therapy (DSP). Experience from residencies in which the curriculum plan reflects only a portion of the DSP will not be considered.

Applicants who are currently enrolled in an ABPTRFE-accredited clinical residency, or enrolled in a residency program that has been granted candidacy status, may apply for the specialist certification examination in the appropriate specialty area prior to completion of the residency. These applicants are conditionally approved to sit for the examination, as long as they meet all other eligibility requirements, pending submission of evidence of successful completion of the ABPTRFE-accredited clinical residency to APTA’s Specialist Certification Program no later than one month before the examination window opens. To verify your residency program’s accreditation status, please visit www.abptrfe.com.

2.3. Steps to Complete Certification
Certification as a Physical Therapy Clinical Specialist consists of two major steps:

STEP 1. You must submit evidence that you have fulfilled the minimum eligibility requirements as defined by the specialty council. This includes completion of all required application forms, fees, documentation of the required practice hours, and other requirements specified by the specialty council.

You must meet all requirements by the application deadline. Due to the COVID-19 pandemic, the Specialty Council will allow late submissions through October 1, 2020. The ACLS requirement must be met 30 days prior to the examination test window opening.

STEP 2. Following completion of Step 1 and approval of the application, the candidate must sit for and receive a passing score on the computer-based certification exam.

Certification is awarded for a period of 10 years. ABPTS has adopted a model of continued competency throughout the years of certification rather than a one-time recertification process as the certification period lapses. This model is titled “Maintenance of Specialist Certification (MOSC).” Please review details of the MOSC program in Section 2.4.

24. Maintenance of Specialist Certification (MOSC)
ABPTS has developed a model for maintaining certification that focuses on continuing competence of the physical therapist specialist. This new model has been titled the “Maintenance of Specialist Certification” and includes the following elements:

- Professional Standing and Direct Patient Care Hours
- Commitment to Lifelong Learning Through Professional Development
- Practice Performance Through Examples of Patient Care and Clinical Reasoning
- Cognitive Expertise Through a Test of Knowledge in the Profession

Requirement 1: Professional Standing and Direct Patient Care Hours

- In years 3, 6, and 9, a specialist must submit evidence of current licensure as a physical therapist in the United States or any of its possessions or territories.
- In years 3, 6, and 9, a specialist must submit evidence of 200 hours of direct patient care acquired in the specialty area within the last 3 years. Direct patient care hours accrued in year 10 may be applied to the year 3 requirements for the next MOSC cycle.

Requirement 2: Commitment to Lifelong Learning Through Professional Development

- Each board-certified specialist is obligated to participate in ongoing professional development, within his or her designated specialty area, which leads to a level of practice consistent with acceptable standards. Each specialist may choose to pursue professional development that leads to a level of practice beyond prevailing standards.
- A web-based system to track continuing competence in a specialty area will be developed. This system will provide an individual account tracking mechanism for each specialist to record professional development activities during years 3, 6, and 9 of his or her certification cycle. There is not an hour requirement in this area, but the specialist must show evidence of professional development activities (equivalent to 10 MOSC credits) within two of the three designated activity categories in years 3, 6, and 9. By year 9, a specialist must have accrued a minimum of 30 MOSC credits and demonstrated professional development in each of the three designated activity categories. These activities include professional services, continuing education coursework, publications, presentations, clinical supervision and consultation, research, clinical instruction, and teaching.

Requirement 3: Practice Performance Through Examples of Clinical Care and Reasoning

- The purpose of this requirement is to document continuing competency in patient/client management in the specialty area.
- The specialist will use an online system to complete one reflective portfolio submission in years 3, 6, and 9 of his or her certification cycle. These reflective portfolio submissions will be used to demonstrate the specialist’s use of clinical care and reasoning. Each submission must have a reflective component and must have documentation that reflects clinical reasoning.
- These reflective portfolio submissions will not be scored but will be screened for completion of required information and reflection.

Requirement 4: Cognitive Expertise Through a Test of Knowledge in the Profession

- During year 10 of the certification cycle, the specialist will be required to sit for a recertification examination, comprising approximately 100 items. The exam will be specialty specific, assess an individual’s cognitive expertise in the specialty area, and reflect contemporary specialist practice.
- The exam blueprint breakdown for this exam will mirror that of the initial certification exam, as noted in the various Descriptions of Specialty Practice. Items will be coded and pulled from existing specialty item banks.
- Successful completion of requirements 1-3 are prerequisites for sitting for the recertification exam. If a specialist fails to receive a passing score after the first attempt, he or she will be permitted to sit for the exam one additional time and will maintain his or her certification during this one-year grace period.

Any additional questions/concerns should be addressed to staff at spec-recert@apta.org or 800/999-APTA (2782), ext 3390.

2.5. Ineligibility for Certification

Item writers and reviewers are not eligible to sit for the specialist certification examination in their specialty area for two years from the date of involvement in the process.

Specialty council members, ABPTS members, and cut-score study participants are prohibited from sitting for the specialist certification exam for a period of two years from the date of participation in the certification process.

3. APPLICATION PROCESS

3.1. Application Deadline

Completed applications and application review fees for the 2021 specialist certification examinations must be submitted online to the APTA Specialist Certification Program. Applicants are encouraged to apply prior to the deadline to expedite the application review process. However, due to the COVID-19 pandemic, the Specialty Council will allow late submissions through October 1, 2020.

3.2. Procedures for Application Review

The Specialist Certification Program staff will conduct the initial review of all submitted documents within approximately six weeks. Then your application will be forwarded to the Specialty Council for their expert review. This final review process will take approximately 20 business days from the time the Council receives the documents, and should the council have questions or need clarification about documents submitted the Specialist Certification staff will contact you via email. The applicant must resubmit requested documentation within 10 business days after email notification is received. Only one resubmission is permitted for an exam cycle.

If the applicant does not resubmit by the specified deadline or if the Specialty Council determines that the
resubmitted documents do not meet the certification requirements, the record will indicate that he or she has not met the minimum eligibility requirements and is not approved to sit for the 2021 exam.

3.3. Services for Persons with Disabilities

The American Board of Physical Therapy Specialties (ABPTS) provides reasonable and appropriate accommodations in accordance with the Americans with Disabilities Act (ADA) for individuals with documented disabilities. The purpose of test accommodations is to provide access to the examination program. While presumably the use of accommodations will enable the individual to better demonstrate his/her knowledge or skill, accommodations are not a guarantee of improved performance, test completion, or a particular outcome.

The ADA defines disability as a physical or mental impairment that substantially limits one or more major life activities as compared to most people in the general population. Examples of major life activities include, but are not limited to, walking, seeing, hearing, and learning.

It is the responsibility of the person with a disability to provide advance notice and appropriate documentation of the disability with a request for test accommodations. If an applicant identifies functional limitations or special needs that would prevent him or her from taking the certification exam under standard testing conditions, ABPTS in consultation with its testing agency, will evaluate and respond to that applicant’s needs for special arrangements.

Any requests must be submitted to ABPTS, accompanied by the appropriate forms and uploaded at the time of the online application submission for the exam. The request for testing accommodations must include verification of the disabling condition from a professional specializing in the relevant area and a description of the requested accommodation. Applicants will be notified in the fall of the decision regarding the request and the accommodations that will be provided. If accommodation is not requested in advance, availability of accommodation cannot be guaranteed.

You may also visit testing accommodations for additional details about available APTRA-approved testing accommodations, and to review a list of pre-approved personal items permitted during testing that do not require a special testing accommodation request.

Note: Certain testing accommodations may require shared cost with candidate.

3.4. Certification in More Than One Specialty Area

Applicants must submit a complete set of online application materials and fees for each specialist certification exam. A certified specialist who applies for certification in a second specialty area is not permitted to submit the same direct patient care hours that he or she submitted for certification in the first specialty area. The Specialist Certification Program staff will review previously submitted applications for duplication of hours.

3.5. Submission of Application

It is the applicant’s responsibility to ensure that the application is completed according to instructions.

In addition, it is imperative that you enter your name on the application exactly as it appears on the identification form you intend to present at the testing center. Please note that the way your name is written on the application is also the way your name will appear in the APTRA membership database.

Applicants who opt to pay the review fee by check should send the application fee with the appropriate payment form described in Section 3.6 below in a single mailing to:

APTRA
Specialist Certification Application
P.O. Box 75701
Baltimore, MD 21275

3.6. Application Review Fee

The nonrefundable application review fee must be submitted with your online application to the APTRA Specialist Certification Program. Due to the COVID-19 pandemic, the Specialty Council will allow late submissions through October 1, 2020, and allow the fee to be paid in two payments. If a partial payment option is selected, the final partial payment is due November 30th.

Payment of the review fee may be made by check (payable to APTRA) or by credit card (MasterCard, VISA, Discover, or American Express). The Payment Form must accompany your fee for check payments. The applicant review fees are listed below:

APTRA Member: $870
Non-APTRA Member: $870
Member/Non-APTRA Member Reapplication: $170

Note: Reapplications and associated fee are due by October 1, 2020.

3.7. Time Limit for Active Application/Reapply

Applicants files will remain active for only 2 consecutive exam administrations. However, eligibility for the second exam administration requires an online reapplication submission by October 1, along with a $170 reapplication fee, as well as the current examination fee by December 28. This policy applies to those who choose to delay sitting for the exam, those who are not approved to sit for the examination, and those who do not pass the exam. Eligible reapplicants will receive reapplication information by e-mail directly from the Specialist Certification Program. To reapply, you must submit an online reapplication, verification of current licensure to practice physical therapy, updated direct patient care hours, and any other requested documentation. The APTRA Specialist Certification Program must receive this documentation by the reapplication deadline for the next scheduled exam. Reapplicants must meet the current practice requirements to be eligible to sit for the exam.

After 2 consecutive exam administrations, you must submit an entirely new application and initial applicant review fee to apply for specialist certification.

3.8. Address Changes

Should your mailing address, e-mail address, or phone number change, please notify the APTRA Specialist Certification Program immediately. The Specialist Certification Program maintains separate records from
4. SCHEDULING THE EXAM

4.1. Examination Fee and Scheduling Permit
The examination fee is submitted after you have been notified that you are eligible to sit for the exam. Due to the COVID-19 pandemic, the exam fee deadline has been extended until December 28, 2020.

You may pay the examination fee by check (payable to APTA) or by credit card (MasterCard, VISA, DISCOVER or AMEX), by mail or online. Please note that both first-time and repeat test takers must pay the following examination fees:

- APTA Member: $810
- Non-APTA Member: $1,535

If you are planning to sit for the examination in an international location, make sure that you enter in that your online application.

Before the end of December, after your examination fee has been received, APTA's Specialist Certification Program will send you an e-mail with instructions on how to access and download your electronic scheduling permit online. You must print your scheduling permit before you contact Prometric to schedule a test date. Check to make sure that the information on your permit is correct, and that your name (first name, middle initials, last name) exactly matches your name on the identification you will use on the day of the examination. If the name on your permit does not match the name on your identification, you must contact APTA immediately. Name changes or corrections cannot be made within seven business days of your scheduled testing date. You will be denied admission to the test if the first and last name on the permit does not match the name on your identification.

4.2. Test Dates
The examination will be administered at test centers worldwide between February 27 and March 13, 2021.

4.3. How to Schedule an Appointment at a Testing center
The Specialist Certification Program will notify approved candidates when they may begin to schedule a date to sit for the examination. Candidates are not eligible to schedule a session until they have paid their exam fee and have their scheduling permit.

You must download your scheduling permit before contacting Prometric to schedule a testing appointment. To schedule a testing appointment, you will need to provide Prometric with your scheduling number that is included on your scheduling permit. Appointments are assigned on a first-come, first-served basis; therefore, you should schedule an appointment as soon as possible after you have accessed your scheduling permit. If you defer scheduling you may not be able to make an appointment at your preferred test site or for your preferred test date. You should report any problems in scheduling a testing appointment to the Specialist Certification Program at least four weeks before the first day of the testing window to give ABPTS an opportunity to resolve the problem.

Prior to your testing appointment, you can log in at the URL provided by the Specialist Certification Program to access and reprint your permit if necessary.

4.4. Refunds and Cancellations
The Applicant Review Fee is not refundable. You must notify the specialist certification program staff through the on-line application system deferment process if you decide, for any reason, not to sit for the 2021 exam. Upon receipt of written notification, your examination fee will be refunded minus 20% of the fee. Please allow 6-8 weeks for processing.

4.5. Rescheduling an Exam
If you are unable to keep a testing appointment and would like to reschedule, you must contact Prometric 3 business days prior to your appointment. The rescheduled test date must fall within the testing window. Fees from your previously scheduled test will be transferred to the rescheduled exam as follows:

a. If you contact Prometric three business days prior to your test date, you will be permitted to reschedule without penalty. If you provide less than two business days’ notice, Prometric will charge a $101 fee to reschedule your examination (rescheduling fees vary for international sites).

b. If you cancel your appointment within two business days of do not appear on your test date, you must contact Prometric Candidate Cares at the phone number listed in the permit and pay a $101 fee to reinstate your eligibility record in order to reschedule your appointment within the testing window (rescheduling fees vary for international sites).

5. PREPARING FOR THE EXAM

5.1. Description of Specialty Practice (DSP)
The Descriptions of Specialty Practice (DSP) are documents developed for each specialty area that outline the knowledge, skills, and abilities related to clinical practice in the specialty area. The DSP content is based on a detailed practice analysis conducted by the specialty council. A practice analysis involves extensive research, including survey data and judgments of subject matter experts, of the knowledge, tasks, and roles that describe advanced specialty practice. The specialty council develops the written exam from the DSP and includes a percentage of questions from each of the major content areas identified in the practice analysis. Because applicants will find the DSP for their specialty area helpful in organizing exam preparation, a copy is made available electronically to each new applicant upon submission of their application and payment of the application review fee. If you wish to purchase an advance copy of the DSP, please contact APTA’s Member Services at 800/999-2782.

5.2. Exam Content Outline
The content outline for the exam that specifies the percentage of questions in each major content area is found on page 15. The content outline is presented as an approximation of the test construction and should not be interpreted as an exact distribution of test items.

5.3. Preparation for the Exam
You declare your intent to sit for the specialist certification exam at the time of application and are expected to begin preparation for the exam at that time. You are responsible for determining the method and amount of preparation necessary for the exam. Results from candidate surveys suggest that helpful methods of examination preparation include, but are not limited to, advanced level texts, Physical Therapy, and other journals containing current physical therapy research.
You may also want to review the Description of Specialty Practice and the content outline to determine what content will be covered on the exam and to direct your study efforts.

5.4. Review Materials and Courses
Resource guide information prepared by APTA’s Cardiovascular & Pulmonary Section can be found on page 24. Some sections hold review courses related to advanced practice in their specialty area. Applicants should contact their section directly to receive information. Neither ABPTS nor the specialty councils review or endorse the content of review materials and courses.

5.5. Study Groups
The APTA Specialist Certification Program maintains a list of candidates who are interested in participating in study groups. To be included in study group listings, select “participate in study group” and answer “yes” on the online application. The study group list of candidates who have indicated their interest will be generated by the end of November 2020.

5.6. Exam Development
The specialist certification examinations are developed by specialty councils of ABPTS. APTA has contracted with the NBME to assist in the development, administration, scoring, and reporting of results for the certification examinations. Using the DSP as a basis, the specialty councils make the final determinations regarding the exam content and the number of items in each area.

Questions (items) for the exam are solicited from content area experts currently practicing in the specialty area representing the full range of practice settings and focus in all regions of the country. Item writers attend workshops and receive instruction to enable them to write high quality, practice-related test items. Test items undergo extensive editing and review by subject matter experts and professional test editors before specialty councils approve them to be placed on the examinations.

5.7. Exam Question Format
Questions (items) are designed to test synthesis and analysis levels of cognitive skills, as well as content knowledge. The exam is composed of objective multiple-choice questions with four or five answer choices. The questions either stand alone or are part of a series that relates to a presented case study. Beginning on page 16 are sample questions that are representative of the format of questions for each exam, but may not necessarily reflect the ability level or content of the items. There are 200 items on the exam, consisting of 50 questions in each 1½-hour time block.

5.8. Answer Strategy
You should consider answers to each question carefully and eliminate the least likely ones instead of randomly selecting an answer. Please keep in mind that there is no penalty for incorrect responses. Since test scores are based on the actual number of questions answered correctly, it is to the candidate’s advantage to select an answer for each question rather than leaving any blank. There is only one best answer for each question.

5.9. Tutorial
After you are approved to sit for the examination, the Specialist Certification Program will make available a tutorial so that you may practice using the testing software prior to your test day. The tutorial can be accessed on the APTA Specialist Certification website (www.abpts.org/SpecCertExamTutorial/). You should acquaint yourself with the testing software well before your test date. Test center staff are not authorized to provide instruction on use of the software.

The tutorial will also be available at the beginning of the examination session. You may use up to 10 minutes before beginning the examination. The test driver is easy to understand and requires little prior computer experience.

6. SITTING FOR THE EXAM

6.1. Computer Testing
The specialist certification examinations are administered by computer. The examination questions are presented on computers, and candidates provide their responses using a mouse or keyboard. NBME works with Prometric to deliver these examinations worldwide at more than 300 test centers. Approved candidates should contact Prometric as soon as possible once they have their scheduling permit to schedule a testing appointment. Candidates may take the test on any day that it is offered during the testing window, provided that there is space at the Prometric test center of choice.

6.2 Test Centers and Testing Conditions
Prometric provides computer-based testing services for academic assessment, professional licensure, and certification. Please be aware that there may be test takers from other professions taking examinations during your test administration. Their exam schedule may differ from your schedule, and they may arrive and depart at different times.

These test centers provide the resources necessary for secure administration of the examination, including video and audio monitoring and recording, and use of digital cameras to record the identity of candidates.

6.3 Exam Time
You should arrive 30 minutes before your scheduled testing appointment.

The official exam time begins the moment that you enter your Candidate identification number. There are 200 questions on the exam. The exam is administered during a seven (7) hour testing session, which consists of a brief tutorial (up to 10 minutes), four 1½-hour test-blocks, and 50 minutes of optional break time to be used in between any block. Please note that if you finish a section early, you may not use the extra time for a different section of the exam, however, this time will be available as additional break time.

If you have unused time after you complete the examination, you will be given the opportunity to complete an online survey about the test administration. The purpose of the survey is to evaluate the test scheduling and delivery procedures. Your responses will be kept confidential, and the time you take to complete this survey will not detract from your allotted examination time.

6.4. Admission to the Test
You should arrive at the test center at least 30 minutes before your scheduled testing time on your testing day. If you arrive late, the test center administrator may refuse you admission. If you arrive more than 30 minutes after
your scheduled testing time, you will not be admitted. In that event, you must pay a $101 fee to Prometric to reinstate your eligibility record in order to reschedule your appointment within the testing window (rescheduling fees vary for international sites).

Upon arrival at the test center, you must present a printed copy of your scheduling permit or present it electronically (e.g., via Smartphone) and an unexpired, government-issued form of identification (such as a current driver’s license, valid passport, or military ID) that includes both your photograph and signature. If your identification contains your photograph but not your signature, you may use another form of unexpired identification that contains your signature, such as student/employee identification card or a credit card, to supplement your photo-bearing, government-issued identification.

As a security procedure, you will be photographed before you begin taking the examination. You will also sign a test center log, and store your personal belongings in your assigned locker.

You will be scanned with a handheld metal detector and be asked to empty and turn out your pockets prior to entry into the testing room to confirm that you have no prohibited items. You will be required to remove eyeglasses for visual inspection by the test center administrators. Jewelry, except for wedding and engagement rings, is prohibited and hair accessories are subject to inspection. You should not wear ornate clips, combs, barrettes, headbands, and other hair accessories. Any examinee wearing any of these items may be prohibited from wearing them in the testing room, and asked to store such items in their locker. These inspections will take a few seconds, and will be done at check-in and upon return from breaks.

If you brought a printed copy of your scheduling permit, the Test Center Staff will collect it. You will be provided with laminated writing surfaces and markers. You will be instructed to write your name and Candidate Information Number (CIN) on one of the laminated writing surfaces provided. Your scheduling permit will be retained by the Test Center Administrator. You may request access to the permit during the examination if it becomes necessary for you to rewrite the CIN on the laminated writing surface. Test Center Staff will escort you to your assigned testing station and provide brief instructions on use of the computer equipment. Laminated writing surfaces and markers issued are to be used for making notes and/or calculations during the testing session. They should only be used at your assigned testing station, and only after you have begun your examination by entering your CIN. You must enter your CIN to start the examination, which will begin with a brief tutorial prior to the first test block. If you have filled the laminated writing surfaces and need additional space for making notes, you will need to notify test center staff and a replacement will be provided. Laminated writing surfaces must be returned to test center staff at the end of the testing session.

Important Note: You will not be admitted to the testing room without presenting either a printed or electronic copy of your permit and an unexpired, government-issued form of identification (such as a driver’s license or passport) that includes both your photograph and signature.

The name on your scheduling permit must exactly match the name on your identification form. The only acceptable difference would be the presence of middle name or middle initial, or suffix on one document and its absence on the other. If you do not present your permit and required identification on the exam day, you will be denied admission to test. In that event, you must pay a fee to Prometric to reschedule your test (see section 4.5 for additional instructions).

Important Note: You will not be admitted to the testing room without presenting either a printed or electronic copy of your permit and an unexpired, government-issued form of identification (such as a driver’s license or passport) that includes both your photograph and signature. The name on your scheduling permit must exactly match the name on your identification form. The only acceptable difference would be the presence of middle name or middle initial, or suffix on one document and its absence on the other. If you do not present your permit and required identification on the exam day, you will be denied admission to test. In that event, you must pay a fee to Prometric to reschedule your test (see section 4.5 for additional instructions).

6.5. Testing Regulations and Rules of Conduct
Test center staff monitor all testing sessions. Candidates must follow instructions of test center staff throughout the examination. Test center staff are not authorized to answer questions from candidates regarding examination content, testing software, or scoring.

If staff observes a candidate violating test administration rules or engaging in other forms of irregular behavior during an examination, the test center staff will not necessarily tell the candidate of the observation at the time of the examination. Test center administrators are required to report such incidents to NBME; each is fully investigated.

Candidates may not bring any personal belongings into the testing area, including but not limited to the following:

- Mechanical or electronic devices, such as cellular telephones, calculators, watches of any type, electronic paging devices, recording or filming devices, radios
- Outerwear such as coats, jackets, head wear, gloves
- Book bags, backpacks, handbags, briefcases, wallets
- Books, notes, study materials, or scratch paper
- Food, candy, gum, or beverages

If you bring any personal belongings to the test center, you must store them in a designated locker outside the testing room. You should keep in mind that the lockers are small and that mechanical or electronic devices stored in lockers must be turned off. Making notes of any kind during an examination, except on the laminated writing surface provided at the test center, is not permitted and removal of those materials from the secure testing area during a testing session or break is prohibited. Some pre-approved personal items are permitted in the testing room, subject to inspection by test center staff

Note: Although the site provides noise-reducing headphones, you are encouraged to bring your own cordless soft-foam earplugs (subject to inspection).

6.6. Irregular Behavior During the Examination
Process Irregular behavior includes any action by candidates or others when solicited by a candidate that subverts or attempts to subvert the examination process. Test center administrators are required to report any
irregular behavior by a candidate during the examination. Irregular behavior may include, but is not limited to, the following:

- Seeking and/or obtaining access to examination materials
- Impersonating a candidate or engaging another individual to take the examination by proxy
- Giving, receiving, or obtaining unauthorized assistance during the examination or attempting to do so
- Making notes of any kind during an examination except on the erasable writing surface provided at the test center
- Memorizing and/or reproducing examination materials
- Failure to adhere to test center regulations
- Possessing unauthorized materials during an examination administration (e.g., recording devices, photographic equipment, electronic paging devices, cellular telephones, reference materials)
- Any other behavior that threatens the integrity of the specialist certification examinations

Looking in the direction of the computer monitor of another candidate during the examination may be construed as evidence of copying or attempting to copy, and a report of such behavior may result in a determination of irregular behavior. Candidates must not discuss the examination while a session is in process. Test center administrators are required to report all suspected incidents of irregular behavior. A candidate who engages in irregular behavior or who violates test administration rules may be subject to invalidation of their examination.

6.7. Canceled or Delayed Exam Administration or Problems at the Testing Center

Every effort is made to administer an examination at the scheduled test time and location. On occasion, however, exam administrations may be delayed or canceled in emergencies such as severe weather, a natural disaster that renders a Prometric Testing Center (PTC) inaccessible or unsafe, or extreme technical difficulties. If Prometric closes a testing center where you have already scheduled a testing appointment, it will reschedule the examination appointment at no additional charge.

In that event, Prometric will attempt to notify you in advance of your testing appointment to schedule a different time and/or center. Rescheduling an appointment for a different time or center may occur at the last minute due to limited availability of seats in a PTC.

One week prior to testing, you are advised to confirm your appointment with Prometric and maintain flexibility in any travel arrangements you may make.

If you experience an emergency situation on the day of your examination that you feel may jeopardize your ability to perform effectively on the examination, you may be eligible to postpone sitting for the examination until 2022. However, please note that if you opt to still sit for the examination and are not successful, this is not a basis for appealing examination results and your ability to sit again in 2022 at no additional cost may be in jeopardy.

Any candidate once checked in and seated at a test station, who is delayed to take the examination by more than 30 minutes because of technical difficulties, is responsible for reporting the delay to the Specialist Certification Program at 800/999-2782, ext 8520, as soon as possible. For such cases, the candidate may be eligible to choose to reschedule his or her examination at no additional charge. Before deciding to reschedule, you should be sure that there is another appointment available during the testing block. The test administration will not be considered “irregular” if you choose to remain and test despite the delay.

You will receive the maximum number of hours available to candidates to complete the exam even if the test is delayed.

Any candidate once checked in and seated at a test station, who has a concern or complaint about the test center environment, should immediately report the problem to the test center administrator. If you feel that the problem was not resolved to your satisfaction, you should contact the Specialist Certification Program at 800/999-2782, ext 8520, as soon as possible.

6.8. Exam Deferral

Candidates may defer their examinations through the ABPTS online application system located at www.abpts.org. It is recommended that you review the deferral guidelines before submitting your deferral. Please note you will receive an email confirming the deferral.

6.9. Equipment Malfunction

Should you experience any difficulty with the computer, please notify the test center administrator immediately. Do not wait until you have completed the exam to bring equipment malfunctions to the attention of the test center administrator. Once again, if you feel that the problem was not resolved to your satisfaction, you should contact the Specialist Certification Program at 800/999-2782, ext 8520, as soon as possible.

Please note that, occasionally, a computer at the test center may need to be restarted. Prometric has appropriate safeguards in place to ensure the integrity of candidate examination data. As soon as a candidate answers a test item, the response is immediately copied and saved on the candidate’s directory on the server at a center. If there is a computer restart, the driver locates the results from the directory and picks up where the examinee left off. The system does not change or delete any responses. Thus, examination data are captured at the instant a candidate responds to a question; the computer can be restarted, if necessary, without losing or corrupting examination data.

6.10. Incomplete Examinations

After you start taking an examination, you cannot cancel or reschedule that examination unless a technical problem prevents you from completing your examination. As noted in section 6.9, if you experience a computer problem during the test, notify test center staff immediately. The testing software is designed to allow the test to restart at the point it was interrupted. In most cases, your test can be restarted at the point of interruption with no loss of testing time. If you do not finish the exam for any reason you are not permitted to resume the incomplete sections of the test. You must reapply for the next regularly scheduled administration (see section on “Reapplication” 3.7). The examination fee is nonrefundable for incomplete examinations.

7. EXAM RESULTS
7.1. Exam Results and Notification

After ABPTS meets in May 2021 to make certification decisions, score reports will be prepared for online distribution in late-June 2021. The score report specifies your examination score, the passing score on the examination, and feedback on your performance in the major competency areas tested. In late-June 2021, the Specialist Certification Program staff will send you an e-mail notification announcing that score reports are available online, including instructions on how to access and download your score report.

Although there is a time lapse between the close of the examination window and the availability of examination results, much is happening during this period of time. Key validation takes place after the exam window closes in March. Key validation is a process of preliminary scoring and item analysis of the exam data, followed by careful evaluation of the item-level data, to identify potentially flawed or incorrect items prior to final scoring. During April and early May, standard setting committees are convened at the NBME to participate in content-based standard setting studies. The outcome of each committee’s standard setting meeting is the recommendation of a passing standard of each of the specialty examinations during their May meeting. NBME then scores the specialist certification examinations and candidates are notified of their exam results as soon as this information is received by the Specialist Certification Program.

7.2. Scaled Scores

While your score is based on the number of questions answered correctly, it is a scaled score. ABPTS requires a scaled score of 500 to pass the examination. Scaling is a procedure that converts raw scores (number of correct responses) to a more easily interpretable scale. The purpose of scaling scores is to simplify things by keeping the passing score at the same number (e.g., 500) for all exam forms, while the raw scores necessary for passing may vary for different forms.

7.3. Passing Scores

The certification examinations assess a clearly defined domain of knowledge and skills. You will be certified upon achievement of a passing score on the examination. The passing score is based on a detailed analysis of exam data and a recommended performance standard from a panel of clinical subject matter experts. This panel includes physical therapists in the specialty representing diversity in practice setting, years of experience, theoretical perspective, and geographic region.

Upon receiving board-certification, the candidate will:
- receive a certificate recognizing board certification as a specialist in an area of physical therapy
- be entitled to note they are “board-certified” in their specialty
- receive a board certified specialists lapel pin in his or her specialty area
- be recognized by his or her colleagues at APTA’s annual Ceremony for Recognition of Clinical Specialists at APTA’s Combined Sections Meeting
- be included in the online Directory of Certified Clinical Specialists in Physical Therapy

8. CONFIDENTIALITY

8.1 Confidentiality of Applicant Identity

Applicant names, application documents, and test scores are considered confidential. Only Specialist Certification Program staff, members of the American Board of Physical Therapy Specialties, members of the Specialty Council, and designated staff at the NBME and its subcontractors shall have access to this information. Applicant identity can be released for study group purposes only, with the consent of each applicant. Copies of test scores will be released only at the written request of the candidate.

8.2. Confidentiality of Examination Content

All candidates must sign/acknowledge the Affidavit & Pledge of Confidentiality in their online application for certification. Candidates must not disclose examination content to others or reproduce any portion of the examination in any manner. The examination of any candidate who violates these security rules will not be scored.

9. GROUNDS FOR DISCIPLINARY ACTION

Applicants or candidates who are determined to have engaged in fraud, misrepresentation, or irregular behavior in the application or examination process, to have disclosed examination content to others or reproduced any portion of the examination in any manner, or to have violated the Affidavit & Pledge of Confidentiality will be subject to disciplinary action, to be determined by ABPTS, which may include, without limitation, withdrawal of any certification granted and permanent or temporary exclusion from the certification process. Before taking disciplinary action, ABPTS will give the individual written notice of the evidence against the candidate and an opportunity to respond.

10. PROCEDURES FOR REVIEW OF DECISIONS

10.1 Reconsideration of Decision Regarding Eligibility to Sit for the Exam

An applicant whom the Specialty Council has determined to be ineligible may request the Council to reconsider its denial of eligibility. The request for reconsideration must specify the grounds on which it is based. An applicant may submit new information in support of his or her request for reconsideration. An applicant may challenge the Specialty Council’s application of the eligibility requirements to his or her case, but not the requirements themselves. An applicant may not appeal to ABPTS unless he or she has first submitted a request for reconsideration to the Council. An applicant must submit his or her request for reconsideration no later than two weeks from the date of the denial letter. For purposes of determining compliance with the foregoing deadline, a request for reconsideration will be deemed submitted on the postmark date. The Specialty Council will notify the applicant in writing of its decision on reconsideration.

10.2 Appeal to ABPTS of Specialty Council’s Decision Regarding Eligibility to Sit for the Exam

An applicant who wishes to submit an appeal must contact the Specialist Certification Program for a complete copy of the procedures.

An applicant whom the Council has determined upon reconsideration to be ineligible may appeal the decision to ABPTS. An applicant may challenge the Council’s application of the eligibility requirements to his or her case, but not the requirements themselves. The applicant must submit his or her appeal no later than two weeks from the date of the Council’s decision on reconsideration. The appeal must be in writing and must
be addressed to the Chair of ABPTS at the APTA Specialist Certification Program. For purposes of determining compliance with the foregoing deadline, a request for reconsideration will be deemed submitted on the postmark date. The appeal must specify the grounds on which it is based.

The Appeal Committee, a committee of ABPTS, will be responsible for the review and disposition of requests from applicants for appeal of a Specialty Council decision. The Appeal Committee will make its decision no later than 30 days from the date of receipt of the request for appeal. The Appeal Committee will send written notification of its decision to the Chair of the Specialty Council and the applicant by certified mail, return receipt requested, no later than 7 days from the date of its decision.

10.3 Procedures for Review of Certification Actions
A candidate who wishes to request that ABPTS reconsider its decision to deny certification must request a complete copy of procedures from the Specialist Certification Program.

The purpose of the ABPTS reconsideration procedure is to enable a candidate to challenge an ABPTS decision denying certification and to seek relief from untoward circumstances associated with the onsite administration of the examination and errors in the transmission of examination responses due to technical malfunction. To be considered, the request must include supporting evidence of technical malfunction.

Candidates must submit a request for reconsideration in writing and address the request to the Chair of ABPTS at the APTA Specialist Certification Program. To request reconsideration, the candidate must submit a written request no later than 2 weeks after the date of the letter notifying the candidate of exam results. For purposes of determining compliance with the foregoing deadline, a request for reconsideration will be deemed submitted on the postmark date. The request for reconsideration must specify the grounds on which it is based and the corrective action sought. Within seven days of the receipt of a request for consideration ABPTS will acknowledge in writing the receipt of the request, including the date on which the request was received.

10.4 Appeal to APTA Board of Directors of ABPTS
Decision to Deny Certification
A person may not appeal to the APTA Board of Directors unless he or she has submitted a request for reconsideration to ABPTS. A candidate who wishes to submit an appeal must request a complete copy of procedures from the Specialist Certification Program. Any candidate adversely affected by the ABPTS decision on reconsideration may appeal to the APTA Board of Directors within 14 days of receipt of the ABPTS notification of the Appeal Committee's decision. A candidate must submit this appeal in writing, and the candidate must address it to the President of the APTA at the APTA Governance Department. The candidate must also send a copy of the written appeal to the Chair of ABPTS at the APTA Specialist Certification Program. The appeal must set forth arguments in support of the candidate's position. ABPTS will send written acknowledgment of receipt of the appeal to the candidate within seven days after ABPTS receives the candidate's written appeal request.

11. EXAM CONTENT OUTLINE & SAMPLE QUESTIONS

11.1 Exam Content Outline
All questions on the exam relate to competencies outline in the document Description of Specialty Practice: Cardiovascular & Pulmonary Physical Therapy (2017). The content outline lists major content areas and components of the exam. The exam comprises case histories, each accompanied by multiple choice questions. The cardiovascular and pulmonary diagnoses that may be included in the exam content are listed below in section 11.2 with their frequency of occurrence.

<table>
<thead>
<tr>
<th>Category</th>
<th>% of Exam</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional behaviors: leadership, education, and administration</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Consultation</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Evidence-based practice</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>History taking and systems review</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Tests and measures</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Evaluation: Analyzing, interpreting, diagnosis, prognosis, outcome determination</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>Interventions: Procedural interventions; coordination, communication, and documentation</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Foundational, clinical, and behavioral sciences</td>
<td>14%</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

11.2 Diagnoses Seen by Cardiovascular & Pulmonary Clinical Specialists
The following lists the most common patient diagnoses seen by specialists. They are listed by frequency seen and rank ordered within each category. The distribution of cases used in the specialist certification exam will reflect the frequency of these diagnoses, based on the survey of specialists: frequently (60% of exam items), occasionally (30% of exam items), and rarely (10% of exam items).

- Cardiovascular Diagnoses Seen Frequently
  - Atherosclerotic Disease, Coronary Atherosclerosis
  - Atherosclerotic Disease, Peripheral Vascular Occlusive Disease
  - Chronic (Left Side) Heart Failure
  - Patients at High Risk for Development of Cardiovascular Disease or Complications
  - Hypertension
  - Rhythm Disturbances/Dysrhythmia
  - Atherosclerotic Disease, Peripheral Vascular and Cardiovascular Complications of Diabetes
  - Hypertensive Heart Disease
  - Ischemic Conditions, Myocardial Infarction
  - S/P Invasive or Surgical Procedures, Coronary Angioplasty
  - S/P Invasive or Surgical Procedures, Coronary Artery Bypass Graft
  - Ischemic Conditions, Angina
Cor Pulmonale/Right Heart Failure
S/P Invasive or Surgical Procedures, Cardiac Pacemaker Insertion
Atherosclerotic Disease, Intermittent Claudication
Cardiomyopathy
Valvular Disorders
Atherosclerotic Disease, Venous Stasis
S/P Invasive or Surgical Procedures, Aortofemoral or Other Vascular Bypass Grafts
S/P Invasive or Surgical Procedures, Valve Replacement
Aneurysms
S/P Invasive or Surgical Procedures, Vascular Stent Placement
S/P Invasive or Surgical Procedures, Defibrillator Implant
Ischemic Conditions, Intermediate Coronary Syndrome
S/P Invasive or Surgical Procedures, Intra-aortic Balloon Pump

Diagnoses Seen Occasionally
S/P Invasive or Surgical Procedures, Aortic Aneurysm Repair
S/P Invasive or Surgical Procedures, Aortic Dissection Repair
Pericarditis
S/P Invasive or Surgical Procedures, Ventricular Assist Device Placement
S/P Invasive or Surgical Procedures, Heart Transplant
Congenital Defects, Septal
Ischemic Conditions, Printz Metal Angina

Diagnoses Seen Occasionally
Congenital Defects, Patent Ductus Arteriosus
S/P Invasive or Surgical Procedures, Extracorporeal Membrane Oxygenation
S/P Invasive or Surgical Procedures, Correction of Congenital Heart Defects
Lymphedema
Congenital Defects, Coarctation of the Aorta
Lymphadenopathy
Congenital Defects, Tetralogy of Fallot
Congenital Defects, Common Ventricle
Congenital Defects, Transposition of Great Vessels
Congenital Defects, Eisenmenger Syndrome

Pulmonary Diagnoses Seen Frequently
Pulmonary Edema
Emphysema/Bronchitis (Acute or Chronic)
Pulmonary Artery Hypertension/Primary Pulmonary Hypertension
Asthma
Pneumonia (Bacterial, Viral, Pneumococcal, Aspiration, Bronchopneumonia)
Atelectasis, Adult Primary
Pulmonary Effusion
High Risk for Development of Pulmonary Disease or Complications
Acute Respiratory Failure
S/P Surgical Procedure, Abdominal Surgery
Postoperative Pulmonary Complications (Other Than Atelectasis)
S/P Surgical Procedure, Tracheotomy
Acute Upper Respiratory Infection
Pneumothorax
S/P Surgical Procedure, Other Thoracic Surgery
Adult Respiratory Distress Syndrome
Pulmonary Embolism
Bronchiectasis
Pulmonary Fibrosis, Primary/IIdiopathic
Neoplastic Diseases, Carcinoma In Situ (Bronchus/Lung)
Orthopedic Impairment, Fractured Ribs

Diagnoses Seen Occasionally
Orthopedic Impairment, Kyphoscoliosis
Cystic Fibrosis
Neoplastic Diseases, Malignant Neoplasm (Trachea/ Bronchus/ Lung/Larynx/Pleura)
S/P Surgical Procedure, Lung Reduction or Resection
Influenza
S/P Surgical Procedure, Lung Transplant (Single or Double)
Bronchiolitis
Pulmonary Fibrosis, Iatrogenic (Radiation/Chemotherapy)
Lung Abscess
Empyema
S/P Surgical Procedure, Esophagectomy
Orthopedic Impairment, Flail Chest
Spinal Cord Lesion or Injury, Cervical
Sarcoidosis

Diagnoses Seen Rarely
Graph Versus Host Disease
Spinal Cord Lesion or Injury, Thoracic
Spinal Cord Lesion or Injury, Lumbosacral
Pneumoconiosis
Tuberculosis
BPD
S/P Surgical Procedure, Heart-Lung Transplant
Atelectasis, Newborn
Hepatopulmonary Syndrome
Meconium Aspiration

11.3 Sample Questions
Case 1
A 57-year-old man is brought to the emergency department because of right-sided chest pain, worsening shortness of breath, and a three-day history of coughing and fever. He has no recent history of loss of consciousness, trauma, or vomiting. Medical history includes alcohol abuse, peptic ulcer disease, partial gastrectomy, atrial fibrillation treated with rivaroxaban and metoprolol, positive Mantoux screening six years ago that was treated
pharmacologically for one year, and multiple pneumonias. The patient is divorced and does not have contact with his two children. He used to work as a baker but is currently unemployed. He lives alone in a second-floor apartment; there are four steps without a railing to enter the building, one flight of stairs with a railing to enter the apartment, and no stairs within the apartment. On examination, he appears cachectic and sallow-skinned. Temperature is 39.4°C (103.0°F), heart rate is 130 beats/min, respiratory rate is 32 cycles/min, and blood pressure is 80 mmHg and palpable. Physical examination shows moderate shortness of breath. Auscultation of the chest discloses S and S heart sounds, a grade II/VI systolic ejection murmur, and coarse crackles throughout the lung fields that are greater on the right than the left. There is dullness to percussion over the right posterior base and right mid-lung areas. No edema is noted. Complete blood count shows:

- Leukocyte count: 14,200/mm³
- Hematocrit: 34.9%
- Hemoglobin: 12.4 g/dL
- Platelets: 242,000

Arterial blood gas analysis on room air and on 100% oxygen via face mask shows:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Room Air</th>
<th>100% Oxygen via Face Mask</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.38</td>
<td>7.37</td>
</tr>
<tr>
<td>PCO₂</td>
<td>25 mmHg</td>
<td>38 mmHg</td>
</tr>
<tr>
<td>PO₂</td>
<td>40 mmHg</td>
<td>115 mmHg</td>
</tr>
<tr>
<td>HCO₃⁻</td>
<td>18 mEq/L</td>
<td>23 mEq/L</td>
</tr>
</tbody>
</table>

Sputum Gram stain shows occasional gram-positive diplococci in chains and 3+ polymorphonucleocytes. Radiography of the chest shows right lower lobe and potential right middle lobe consolidation. Twelve-lead ECG shows sinus rate is 140, PR interval is 0.14, and QRS interval is 0.08.

Case 1 Questions

1. Which of the following is the best rationale for the relationship between the patient’s vital signs and arterial blood gas analysis on room air findings?
   A. The altered blood pressure is due the HCO₃⁻ level
   B. The altered heart rate is due to the PaCO₂ level
   C. The altered respiratory rate is due to the PaO₂ level
   D. The altered temperature is due to the pH value

2. Which of the following is the most likely cause of this patient’s pulmonary findings?
   A. Acquired from the community in this chronically malnourished host
   B. Aspiration due to long-term alcohol abuse
   C. Inflammation resulting from inhaled allergen in flour dust
   D. Tuberculosis based on previously positive Mantoux screening

3. Which of the following is the best physical therapy treatment for this patient’s pulmonary dysfunction at this time?
   A. Diaphragmatic breathing to improve his cough effort
   B. Use of postural drainage, percussion and shaking for secretion removal
   C. Pursed-lip breathing to improve hypocapnia
   D. Use of a threshold device for inspiratory muscle training

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Case 2

A 38-year-old man is admitted to the emergency department because of chest discomfort and weight gain. Medical history includes morbid obesity, obstructive sleep apnea on bilateral positive airway pressure support, nonschemic cardiomyopathy, ejection fraction of 15%, diastolic heart failure, placement of an internal cardiac defibrillator (ICD), hypertension, hyperlipidemia, anxiety, and restless leg syndrome. Medications on admission include torsemide, metolazone, spironolactone, aspirin, metoprolol, lisinopril, and albuterol sulfate. The patient is married with two children and receives disability compensation. He is morbidly obese with a body mass index of 60.4 kg/m². Temperature is 36.5°C (97.7°F), heart rate is 106 beats/min and irregular, respiratory rate is 18 cycles/min, and blood pressure is 132/69 mmHg. Oxygen saturation is 92% on room air. Thoracic auscultation discloses decreased breath sounds throughout with no audible crackles. Edema of the lower extremities is noted. Laboratory studies show:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leukocyte count</td>
<td>10,900</td>
</tr>
<tr>
<td>Erythrocyte count</td>
<td>5.02</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>13.4 g/dL</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>40.6%</td>
</tr>
<tr>
<td>Platelets</td>
<td>220,000</td>
</tr>
<tr>
<td>Serum</td>
<td></td>
</tr>
<tr>
<td>Creatinine</td>
<td>1.1 mg/dL</td>
</tr>
<tr>
<td>Urea nitrogen</td>
<td>18 mg/dL</td>
</tr>
<tr>
<td>Sodium</td>
<td>138 mEq/L</td>
</tr>
<tr>
<td>Potassium</td>
<td>2.2 mEq/L</td>
</tr>
<tr>
<td>Calcium</td>
<td>9.4 mg/dL</td>
</tr>
<tr>
<td>Chloride</td>
<td>91 mEq/L</td>
</tr>
<tr>
<td>HCO₂</td>
<td>32</td>
</tr>
</tbody>
</table>

Cardiac enzyme studies show troponin T of 0.06 and CK-MB of 2. Chest radiography shows moderate cardiomegaly and a centrally predominant diffuse interstitial prominence that is compatible with mild pulmonary vascular congestion without frank pulmonary edema. Twelve-lead ECG shows atrial rate of 109 and irregular, PR interval of 0.164, QRS interval of 0.106, and a rhythm with multifocal ventricular premature beats. ICD interrogation shows 10 shocks delivered during the past six weeks for nonsustained ventricular tachycardia at a rate of 150 to 200. Nitroprusside sodium by intravenous drip is administered in the emergency department. Four hours after admission, the patient is transferred to the coronary care unit. Repeat laboratory studies are performed, and furosemide is administered via intravenous drip. On hospital day four, he is switched to oral administration of bumetanide.

Case 2 Questions

1. Upon admission to the emergency department, which of the following would be the expected results of cardiac auscultation?
   A. Early diastolic murmur
   B. Pansystolic murmur
   C. S₃ heart sound
   D. S₄ heart sound
2. Which of the following best describes the physiologic intention of treatment with nitroprusside sodium?
   A. Decreasing afterload
   B. Decreasing cardiac output
   C. Increasing myocardial VO₂max
   D. Increasing preload

3. Which of the following laboratory findings was most likely responsible for the delay in the initiation of furosemide until the patient arrived in the coronary care unit?
   A. Decreased creatinine
   B. Hypercalcemia
   C. Hypokalemia
   D. Increased troponin T

4. The patient begins physical therapy on hospital day three. He reports lower extremity weakness, low back pain, and right ankle pain. He rates the low back pain as a 3/10 and the ankle pain as a 7/10, which increases to 9/10 on weight bearing. On further questioning, he reports that the ankle pain has occurred during other hospitalizations, but not always in the same lower extremity or in the same location in the extremity. The pain does not occur at home. Which of the following best explains this patient’s pain?
   A. Hyperuricemia caused by rapid diuresis
   B. Ischemic pain caused by gravity-minimized supine position for days
   C. Osteoarthritic pain in the lower extremities caused by three days of bed rest
   D. Restless leg syndrome causing trauma from the hospital bed rails

5. Which of the following is the most appropriate test to determine the patient’s ability to take steps in his room with an assistive device?
   A. Activity Measure for Post-Acute Care (AM-PAC)
   B. Berg Balance Scale
   C. Egress Test
   D. Functional reach test

Case 3

A 74-year-old woman is admitted to the emergency department because of shortness of breath associated with chest tightness. She has a one-week history of dyspnea on exertion that occurs at 30 feet (9 m) of ambulation. She has had moderate improvement with sublingual administration of nitroglycerin. Medical history includes coronary artery disease, coronary artery bypass grafting 10 years ago, anterior myocardial infarction, angioplasty seven years ago, diastolic heart failure one year ago, and supraventricular tachycardia. Heart rate is 130 beats/min and irregular, respiratory rate is 24 cycles/min, and blood pressure is 148/76 mmHg. Oxygen saturation is 92%. Physical examination shows jugular venous distention and a right carotid bruit. Auscultation of the chest discloses an irregular heart rhythm with a grade IV/V systolic murmur heard best at the apex. An S3 heart sound is present; no S4 is noted. Crackles are heard in the lower lung fields that are greater on the left. Extremities show 2+ distal pulses bilaterally and no edema. ECG discloses atrial fibrillation with a rapid ventricular rate of approximately 130. There is evidence of depressed ST segments in leads II, III, and aVF. Echocardiography shows normal ventricular cavity size, 3+ mitral regurgitation, ejection fraction of 44%, and hypokinesis of the inferior wall.

Case 3 Questions

1. Which of the following is the best explanation of the auscultatory findings in this patient?
   A. Hypertrophic cardiomyopathy as indicated by carotid bruit
   B. Pneumonia as indicated by crackles in the lower lung fields
   C. Pulmonary edema as indicated by the absence of an S4 heart sound
   D. Valvular structural abnormality as indicated by systolic murmur

2. Which of the following is the best rationale to explain this patient’s cardiac dysfunction?
   A. Decreased preload from inactivity resulting in altered jugular venous distention
   B. Demand coronary ischemia from pulmonary pathology causing congestive heart failure
   C. Hypoperfusion in the posterior descending coronary artery causing congestive heart failure
   D. Mitral regurgitation from valvular insufficiency causing anterior descending coronary ischemia

3. Which of the following is the best indication for a coronary angiography at this time?
   A. History of congestive heart failure and rapid ventricular response atrial fibrillation
   B. History of coronary artery bypass grafting with current ST depression
   C. History of myocardial infarction with systolic murmur over the left apex
   D. History of supraventricular tachycardia with crackles in the lower lung fields

Case 4

A 45-year-old man receives outpatient physical therapy because of left calf pain that occurs with running at speeds of greater than 10 minutes per mile. The pain is relieved when he slows to a jog or stops. The physical therapist suspects that the pain is related to the peripheral arterial system. Ankle brachial indexes (ABIs) are performed correctly bilaterally: left ABI is 1:1 using the right dorsalis pedis systole, and right ABI is 1:3 using the left dorsalis pedis systole. He has 1+ pulses in the left dorsalis pedis bilaterally and 2+ pulses in the posterior tibial arteries. Which of the following is the most appropriate next step to determine the cause of this patient’s left lower extremity pain?

A. Perform a capillary refill test
B. Perform an exercise ABI test
C. Perform a rubor of dependency test
D. Retest both ABIs using the systole of the posterior tibial artery

Key:
Case 1. 1.c 2.a 3.b
Case 2. 1.c 2.a 3.b 4.c 5.b
Case 3. 1.d 2.c 3.b
Case 4. 1. b

11.4 Sample Cardiovascular & Pulmonary Data Analysis Form (Required of Initial Certification Candidates Only)

The following 4 examples are provided to illustrate the kind of information that satisfies the data analysis requirement:

Example 1:

Description of Applicant’s role:
I first reviewed the literature to determine what information was available on the topic of cardiopulmonary content in entry-level physical therapist education programs. I asked colleagues about previous surveys of the content of physical therapy entry-level curricula. With the assistance of my co-workers, a 42-item survey instrument was developed and sent to 154 entry-level physical therapist education programs. I tallied, collated and conducted standard descriptive analysis of the information from those surveys returned.

Abstract of project:
Introduction Because of the high prevalence of cardiovascular and pulmonary disease in our society, these conditions are commonly encountered by physical therapists in clinical practice. Entry-level physical therapy (PT) education programs must prepare new graduates to manage cardiovascular and pulmonary disease as primary diagnoses or comorbidities, and in the development of preventive intervention strategies. There are no published reports of cardiopulmonary physical therapy content in entry-level physical therapist education programs. Therefore, the purpose of this study was to identify and describe cardiopulmonary curricular content in entry-level physical therapist education programs.

Methods A 42-item survey was developed and mailed to 154 entry-level physical therapist education programs in the United States. The survey addressed the following topics: instructional format, number of credit hours devoted to cardiopulmonary content, faculty characteristics, overall curricular characteristics.

Results Of the surveys returned, 105 were analyzed. Fifty-two percent of the responding programs are housed in public academic institutions; 47% in private institutions. In approximately 45% of the educational programs, cardiopulmonary curricular content is presented as discrete modules or as separate titled courses (<11% and 34%, respectively).

Discussion As regards the number of hours (semester equivalent) of curricular content devoted to the area of cardiopulmonary physical therapy, approximately 15% of PT programs devote fewer than 3 hours; 53% provide 3 to 4 hours; 12% provide 5 to 6 hours; and 19% provide more than 6 hours of cardiopulmonary content. This information may be useful in future deliberations regarding the structure and content of entry-level physical therapists educational curriculums.

Limitations of Project Issues that impacted the implementation of the project included e.g. subject availability, institutional limitations, time constraints. While the data reported here provides preliminary report on quantity of time dedicated to cardiopulmonary content, it does not offer information about the quality of instruction or teaching methods used, which may be as important or more important to student learning objectives than the metrics reported here.

Dissemination of Results The results of the study were presented by me e.g. during an inservice within the institution, state meeting, national meeting, published in a journal, poster presentation.

Changes to Practice Changes that occurred in practice as a result of the study were e.g. departmental changes, institutional changes, changes in policies and procedures, or why changes in practice did not occur.

Example 2:

Description of Applicant’s role:
I was responsible for implementing the exercise training of the four patients from our medical center. Additionally, I participated in the acquisition of data during the formal exercise testing of these same patients. I assisted in the analysis of the data and in the formulation of conclusions based on the data from these four, and other, patients in the study.

Abstract of project:
Introduction The use of left ventricular assist devices (LVAD) for end-stage heart failure (HF) has risen dramatically over the past five years. Patients with LVAD are active and participate in exercise training (ET) programs. However, little is known about the effects of ET upon the cardiorespiratory function (CRF) of this population. The purpose of this study was to evaluate the effects of ET upon CRF in patients with a LVAD.

Methods 6 patients with a LVAD (5 males, 1 female; mean age (SD) 50 (+8 years) with end-stage HF (LV EF = 19+4%) underwent a symptom limited treadmill test with respiratory gas analysis a mean of 8 weeks after LVAD implantation and again after a mean of 16+12 weeks of aerobic and strength ET at a Borg RPE of 11-16/20, for 20-30 minutes, 3-5 x/week.

Results Exercise test results demonstrated: 1) no significant change in peak VO2; 2) 10% in-crease in exercise duration, 8% increase in peak ventilation, 8% increase in LVAD flow rate; and 3) 3% decrease in submaximal heart rate and 6% decrease in systolic blood pressure. VO2 at the ventilatory threshold (VO2VT) and VO2VT as a percentage of peak VO2 were significantly greater after ET (10.6+1 to 12.8+2 ml/kg/min; p=0.02 and 66+8 to 74+7%; p=0.04, respectively).

Discussion This study suggest that HF patients with LVAD elicit modest training effect, but are limited at maximal capacity due most likely to mechanical restraints from the LVAD.

Limitations of Project Issues that impacted the implementation of the project e.g. subject availability, institutional limitations, time constraints.

Dissemination of Results The results of the study
were presented by me e.g. during an in-service within the institution, state meeting, national meeting, published in a journal.

Changes to Practice Changes to Practice Changes that occurred in practice as a result of the study were e.g. departmental changes, institutional changes, changes in policies and procedures, or why changes in practice did not occur.

Example 3:

Description of Applicant’s role:

I participated in a study of the effect of aerobic exercise and weight training on the bone density of young women. My participation entailed recommending several testing tools and procedures to assess aerobic capacity (e.g., VO2max) and peak torque generated by selected muscle groups. I was also responsible for conducting and interpreting those tests finally selected by the principal investigator.

Abstract of project:

Introduction It has been widely suggested that physical activity has a beneficial effect on bone mineral density in women. The purpose of this two-year, randomized, intervention trial was to investigate the effect of aerobic exercise and weight training on peak bone mass in young women.

Methods One hundred twenty-seven females (ages 20 to 35) were randomly assigned to either an aerobic exercise, weight training and stretching program (exercise group), or to a stretching program (non-exercise group). Sixty-three females (32 exercise, 31 non-exercise) completed the study. Spinal bone mineral density (spinal trabecular and spinal integral) was determined using quantitative computed tomography and dual x-ray absorptiometry. Aerobic capacity (VO2max) was assessed by expired gas analysis in accordance with the recommendations of the American College of Sports Medicine using the Bruce treadmill protocol. Muscle performance (knee flexion/extension and trunk flexion/extension peak torque) was assessed with commercially available isokinetic equipment.

Results The exercise group demonstrated a significant gain in bone mineral density of the spinal integral (1.3+2.8%, p<0.02) as compared with the non-exercise group. There were significant between-group differences (p<0.05) in spinal trabecular bone mineral density changes due to a 3% loss in the non-exercise group. The exercise group exhibited significant gains (p<0.05) in VO2max (2.3+5.2 gain vs. 1.8+6.0 mL/kg/min loss) and knee flexion (4.6+4.7 vs. 2.1+4.9 ft. lbs), knee extension (4.8+6.4 vs. 0.8+5.8 ft. lbs), and trunk extension peak torques (11.7+12.9 vs. 4.4+12.1 ft. lbs) as compared to the non-exercise group.

Discussion This study suggests that over a 2-year period, a program of aerobic exercise, weight training and stretching has beneficial effects on bone mineral density, aerobic capacity, and muscle performance in young women.

Limitations of Project Issues that impacted the implementation of the project e.g. subject availability, institutional limitations, time constraints.

Dissemination of Results The results of the study were by me e.g. during an in-service within the institution, state meeting, national meeting, published in a journal.

Changes to Practice Changes that occurred in practice as a result of the study were e.g. departmental changes, institutional changes, changes in policies and procedures, or why changes in practice did not occur.

Example 4:

Description of Applicant’s role:

I participated in a study examining the impact of frailty on exercise capacity in the pre-lung transplant population. Several pulmonary diagnosis with varying degrees of severity were included. My role included direct measure of frailty measures with participants in addition to co-writing/editing the paper submitted for publication.

Abstract of project:

Introduction Frail lung transplant candidates are almost twice as likely to die without receiving a transplant or be delisted. Frailty can be defined by using the FFP, a 0-5 scale with 5 being the frailest, that uses measures of muscle strength, daily activity levels and fatigue. Frailty may represent an objective measure of fitness for surgery, but its relationship to maximal exercise capacity remains unknown. Independent of disease severity, frailty may also capture information that impacts exercise capacity which would have implications for transplant candidacy decisions. The purpose of this study was to determine whether frailty in lung transplant candidates would be associated with reduced exercise capacity, independent of disease severity.

Methods Sixty-eight lung transplant candidates (51% women, Mean +/- SD age was 57 +/- 11 years) underwent a frailty assessment using Fried’s Frailty Phenotype (FFP) and cardiopulmonary exercise testing (CPET). Primary outcomes were peak workload and peak aerobic capacity (VO2).

Results 57% of participants had interstitial lung disease, 32% had chronic obstructive pulmonary disease, 11% had cystic fibrosis. Mean lung allocation score was 40.2 (19.2-94.5). Adjusting for age, gender, diagnosis and LAS, per 1 unit increment in FFP (ie the more frail a patient is), peak workload decreased by 10W (95% CI 4.7 to 14.6) and peak VO2 decreased by 1.8 mL/kg/min (95% CI 0.6 to 2.9). After adjustment, frail participants had exercise tolerance that was 38W lower (95% CI 18.4-58.1) and peak VO2 that was 8.5 mL/kg/min lower (95% CI 3.3 to 13.7) than non-frail participants.

Discussion The study found that frailty was statistically and clinically associated with reduced maximal exercise capacity among a cohort of lung transplant candidates at Columbia University Medical Center independent of respiratory disease severity and diagnosis.

Limitations of Project Patients were excluded if the CPET was not performed within three months of the frailty assessment. In this study, only 68 of 172 patients met this inclusion criteria. In addition, these findings may not be generalizable to those with lung disease not yet
severe enough to merit referral to lung transplantation, those at transplant centers other than our own, or those who are not eligible for lung transplantation for a myriad of reasons (such as history of non-compliance, substance abuse, severe co-morbidities and advanced age).

Dissemination of Results The results of the single center cross-sectional study were published in Respiratory Medicine 131 (2017) 70-76

Changes to Practice Frailty phenotype captures potentially clinically important information about physical fitness above and beyond that available from resting measures of disease severity alone in adults with advanced lung disease. It is possible that targeting frailty using preventative or therapeutic interventions might preserve or even improve exercise capacity and even outcomes after lung transplantation.

12. CARDIOVASCULAR AND PULMONARY SPECIALTY APPLICATION DATA ANALYSIS

DO’S AND DON’TS

Do:
1. Clearly define your role in the project
   - What activities did you do?
   - What was your part of the team?
2. Prepare your presentation as an abstract that you would submit for publication. It should be clear and concise in regards to:
   - Description of Applicant’s Role—what was your participation in the project? Were you the primary investigator, performed data collection, developed the tool used in the project, etc.
   - Introduction—what is the impact that this project have on the field of cardiovascular and pulmonary PT? What is the question you are attempting to answer?
   - Methods—please give some detail here in your explanation of your intervention
   - Results—proper statistical analysis
   - Discussion—include the outcomes of the results of the intervention and statistical analysis. How will the results of your project affect the field of cardiovascular and pulmonary PT in regards to other therapists, medical disciplines, intervention and statistical analysis. How will the results of your project affect the field of cardiovascular and pulmonary PT in regards to other therapists, medical disciplines, patients, etc?
   - Limitations—what difficulties were present for the project? This can include the limited number of participants, lack of time to complete the project, constraints placed by the institution, etc.
   - Dissemination—how did you get this information out those that it will benefit? Did you give an inservice at your place of work, present the information at a meeting (i.e. district PT meeting, state or national conference), or was it published in a peer-reviewed journal?
   - Changes to practice—how did this project change the practice of cardiovascular and pulmonary PT at your institution/ regionally/nationally, etc., or why your findings show no change in practice

3. Be concise in your writing

4. Clearly differentiate the sections of your presentation

Don’t:
1. Cut and paste an entire article that you may have submitted for publication to a journal
2. Add information that does not directly address your project
3. Present your project as one thing when it is really something else
   - A case study/series that is being presented as a research project. This can be determined by the lack of data collection or statistical analysis, lack of inclusion/exclusion criteria, etc., as an example
4. Submit a project that has a conclusion date in the future
   - We would need to know that the project has been completed. regardless of your role
5. If you and another PT have both worked on the same project do not submit the exam same material.
   - Even if you both had the same roles (i.e. data collection and analysis) you will need to submit in your own words what your role was and how you addressed your duties in the project
13. CASE REPORT SCORING RUBRIC

<table>
<thead>
<tr>
<th>Case Report Criteria</th>
<th>Pass</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Title</td>
<td>Yes</td>
</tr>
<tr>
<td>A descriptive and succinct title that describes the phenomenon of greatest interest (symptom, diagnostic test, diagnosis, intervention, outcome). Ends with “: a case report”. Clearly and concisely describe the case topic.</td>
<td>No</td>
</tr>
<tr>
<td>2. Abstract</td>
<td>Yes</td>
</tr>
<tr>
<td>Briefly summarize the relevant information in 250 words or less without citations. Information should include the following elements: (1) Introduction/Background, (2) Case Description/Key points from the case; and (3) Outcomes (4) Discussion: Main lessons to be learned from this case report.</td>
<td>No</td>
</tr>
<tr>
<td>3. Key words</td>
<td>Yes</td>
</tr>
<tr>
<td>Provides 2 to 5 key words that will identify important topics covered by this case report.</td>
<td>No</td>
</tr>
<tr>
<td>4. Introduction</td>
<td>Yes</td>
</tr>
<tr>
<td>The introduction should briefly summarize why this case report is important and provide the conceptual foundation for the report. Please provide an adequate background to support the subsequent content. Use American Medical Association (AMA) formatting to cite one of the CARE articles (e.g., Gagnier JJ, Kienle G, Altman DG, Moher D, Sox H, Riley D, et al. The CARE Guidelines: Consensus-Based Clinical Case Reporting Guideline Development. Glob Adv Health Med. 2013 Sep; 2 (5): 38 - 43)</td>
<td>No</td>
</tr>
<tr>
<td>5. Timeline of Episode of Care</td>
<td>Yes</td>
</tr>
<tr>
<td>Provides a timeline as a chronological summary of an episode of care as a figure or table. This should begin with antecedents and past medical history through the outcome. Should be a graphic representing the case report as a visual summary (see examples of timelines that follow the CARE Guidelines).</td>
<td>No</td>
</tr>
<tr>
<td>6. Case Rationale/ Purpose</td>
<td>Yes</td>
</tr>
<tr>
<td>• The applicant presented a rationale for the case, e.g., diagnosis within those seen most often by an cardiovascular and pulmonary practitioner or whose treatment is different than that for a general patient, co-morbidities, presence of “red flags”.&lt;br&gt;• The applicant provided insight regarding his/her perspective of specialist practice.&lt;br&gt;• The case selected is representative of cardiovascular and pulmonary specialty practice.&lt;br&gt;• The specialist provided rationale for the case clearly outlining the indicators that make it reflective of cardiovascular and pulmonary specialty practice.</td>
<td>No</td>
</tr>
<tr>
<td>7. Narrative of Case</td>
<td>Yes</td>
</tr>
<tr>
<td>• The presenting concerns (chief complaints) and relevant demographic information.&lt;br&gt;• Clinical findings describe the relevant past medical history, pertinent co-morbidities, and important physical examination (PE) findings.&lt;br&gt;Specialist must describe decision making and rationale for the following:&lt;br&gt;• Examination: Systems Review/Tests &amp; Measures (Diagnostic assessments) discuss diagnostic testing and results.&lt;br&gt;• Evaluation/Diagnosis demonstrates the synthesis of all the examination findings from the history, systems review, and tests and measures and applies a differential diagnosis process to establish the diagnosis, prognosis, and plan of care as supported by current practice/literature.&lt;br&gt;• Prognosis/Plan of Care:&lt;br&gt;  o The prognosis includes a predicted optimal level of improvement in function and the amount of time needed to reach that level.&lt;br&gt;  o The specialist reflects on:&lt;br&gt;    ▪ Favorable and unfavorable prognostic indicators&lt;br&gt;    ▪ Patient’s perceptions (i.e., cognitive/affective status)&lt;br&gt;    ▪ Possible contributing factors&lt;br&gt;  o The plan of care demonstrates the use of interventions to produce changes in the condition that are consistent with the diagnosis/prognosis.&lt;br&gt;• Interventions describe the types of intervention (pharmacologic, surgical, preventive, lifestyle) and how the interventions were administered (dosage, strength, duration and frequency). Tables or figures may be used.&lt;br&gt;• Follow-up and Outcomes describes the clinical course of the episode of care during follow-up visits including:&lt;br&gt;  o Intervention modification, interruption, or discontinuation&lt;br&gt;  o Intervention adherence and how this was assessed&lt;br&gt;  o Adverse effects or unanticipated events</td>
<td>No</td>
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<tr>
<td>8. Discussion/Post-Case Reflections</td>
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<tr>
<td></td>
<td>Describes case management, including strengths and limitations with scientific references.</td>
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<tr>
<td>9. Conclusion</td>
<td></td>
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<tr>
<td></td>
<td>Offers the most important findings from the case and suggestions for future directions</td>
</tr>
<tr>
<td>10. References</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Appropriately chosen references from peer-reviewed scientific literature. All citations should be &lt;10 years since publication unless the article is considered a seminal study. References are to be provided throughout ALL sections of the case reflection using American Medical Association (AMA) formatting supporting all clinical decision making and intervention techniques. Course manuals are not accepted as supporting references.</td>
</tr>
<tr>
<td>11. Acknowledgements</td>
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<td>(A short acknowledgement section should mention funding support or conflicts of interest, if applicable).</td>
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<tr>
<td>12. Informed Consent</td>
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<td></td>
<td>(Option 1 provides the opportunity for de-identified information without consent). The patient should provide informed consent and the author should provide this information if requested. Rarely, additional approval may be needed.</td>
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<td>13. Format</td>
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<td>The case represents specialist practice and is professional in appearance, using correct grammar, spelling and punctuation.</td>
</tr>
</tbody>
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14. RESOURCE GUIDE INFORMATION

Resource guides are compiled by APTA sections and board-certified specialists to reflect current literature in the specialty area. They are provided for your information only. Neither the ABPTS nor the specialty councils has reviewed or endorsed the content of these lists. In addition, reviewing these resources does not guarantee that a candidate will receive a passing score on the specialist certification examination.

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