Preparing for Part I of the ABR Exam

The First Step to Board Certification

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Background

- Ph.D. University of Wisconsin 2005
- Worked at Oncure for 6 years
- Became board-certified in 2008
- Currently the Program Director of Clinical Physics for 9 centers

Presentation Goals

- Gain an understanding of Part I of the ABR Certification Exam for Radiologic Physics
  - Eligibility requirements
  - Exam structure
  - Likely exam content
- Get some preparation tips
  - What to study
  - General test taking strategies for multiple choice examinations

Why Become Board Certified?

- Board certification is a long process, why bother?
- Currently can get a job without it
  - Unless you do a residency or post-doc, you have too
- Many reasons for board certification
  - Job opportunities
  - Advancement
  - Higher salary
  - Promoting excellence in Medical Physics
Part I of Radiological Physics

ABR Certification

- Computer-based written examination
- Used to have to travel to ABR testing facility
- Can now be taken locally at third-party testing center
- Same examination for all Medical Physics specialties
- Consists of two parts
  - Basic medical physics principles
  - Clinical medical physics (in general)
- This exam must be passed in order to be eligible to sit Part II

Part I Eligibility Requirements

- If you are taking Part I prior to 2012
  - Enrolled in or graduated from a regionally-accredited medical physics, radiologic physics, or physics program, with sufficient medical physics education
- If you are taking Part I for the first time in 2012 or 2013
  - Enrolled in or graduated from a CAMPEP-accredited program (graduate or residency)
- If you are taking Part I in 2014 or later
  - Must also have completed a CAMPEP-accredited residency before being eligible to take Part II

What to Expect: General Portion

- The general portion of the exam will test how well you understand the basics of medical physics
  - Think about your general courses taken in the first year of graduate school
    - Radiation interactions
    - Radioactivity
    - Radiation metrology
    - Imaging
    - Basic Dosimetry
    - Radiation Safety
  - Also think about basic physics principles
    - Atomic and nuclear physics
    - Some modern physics
    - Calculus
    - Statistic
  - Don’t be surprised to see some basic computer science questions
    - Image storage
    - Data transmission

General Portion Example Question

Which is the dominant interaction with water for a 6MV photon beam?

a) Pair Production
b) Compton Effect
c) Photo-nuclear interaction
d) Photoelectric Effect
e) CSDA
In pair production, _____.

- the electrons and positrons are emitted at 180° to each other
- positrons and antineutrinos are produced when the interactions occur
- photons with energies greater than 2.04 MeV are necessary for the interactions to occur
- the annihilation of the positron produces two photons that travel in approximately opposite directions
- the total energy of the incident photon is evenly divided between the kinetic energy of the pair of particles

How many cervical vertebrae are there?

- a) 3
- b) 7
- c) 12
- d) 5
- e) 24

Medical physics is a special branch of physics
- Requires special knowledge that is unique to the field

The clinical portion tests your understanding of basic clinical medical principles
- Basic Anatomy & Physiology
- Medical terminology
- Biochemistry
- Medical use of radiation and radioactivity
- Basic pathology (focused on oncology)

The General Medical Physics portion will be general
- Look to the introductory courses for the major aspects of Medical Physics
  - Diagnostic Imaging
  - Radiation Oncology
  - Nuclear Medicine
  - Radiation Protection
- Understand the Major topics of each specialty
- Look for concepts that tie the disciplines together
  - Radioactivity
  - Radiation Interactions with matter
- Don't forget the basics
  - Go back to some undergrad texts on modern physics
  - Basic atomic, nuclear, and quantum physics
- Remember when you had to do math?
  - Brush up on elemental calculus and statistics

Remember: The ABR isn't trying to trip you up. They want to see that you know the basics and are ready to proceed to Part II
Preparing for Part I: Clinical

- This is the stuff that makes a physicist a medical physicist
- Focus on brushing up on larger aspects of biological fields
  - Major systems in Anatomy and Physiology
  - Oncologic pathology
  - Biochemistry
- Put it in the context of Radiological Physics
  - Study radiological aspects of biology
  - Radiochemistry (from your nuke med courses)
- Don’t forget medical terminology
  - Probably haven’t had a specific medical terminology course
  - Learn key radiological terms
  - Learn the root names of major organs (i.e., Greek word hepat for liver, thus hepatic means something to do with liver)
  - Learn roots and suffixes of words (i.e., -itis means inflammation)
  - Put it together hepatitis is the inflammation of the liver.

Tips on Taking the Exam

- Start Early
  - Not another test to cram for to get a grade
  - View this as a chance to solidify your understanding of the basic principles of your profession
- Use your colleagues
  - Get advice from people who have taken the exam
  - Form a study group
- Have a system
  - By now you should know how you learn best, use your strengths
  - Create a schedule of topics to study
- Study smarter—not harder
  - Study for an understanding of principles and basic competency
    (that is what the exam is trying to determine)
  - Not just memorizing answers
  - It'll pay off later for Parts II and III

General Multiple-Choice Test Strategies

- Read the entire question first
- Take your time—no extra credit for finishing first
- Look for key words like “all”, “except”, “not”
- Eliminate unlikely choices
- Reread the question
- Try to answer the question before looking at the choices
  - Read all choices before selecting your answer, even if you think you know the answer
  - Be sure before choosing “all of the above” or “none of the above”
  - Always think about units (Gy vs mGy vs cGy) does the unit of the answer make sense?
  - Always try to go back to underlying principles and see if your answer makes sense
- Read the question again

Summary

- Board certification is an important element in a professional medical physics career
  - Helps to promote excellence in our field
  - Establishes a core level of competency among medical physics practitioners
  - Increases employability and salary
- Part I is the first step in obtaining board certification
- Eligibility requirements are changing, so know your timeline
- Exam is designed to determine candidates’ understanding principles related to the practice of radiological physics
  - Both clinical medical and general scientific principles
- Is a computer-based, multiple choice exam
- Successful completion is a requirement to advance to Part II