Preparing for Part I of the ABR Exam

The First Step to Board Certification

Kurt Stump, Ph.D., DABR
Program Director of Clinical Physics
Central California Region
Oncure Medical Corp.

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

General Portion Example Question 2

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

What to Expect: Clinical Portion

- 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)

Clinical Portion Example Question

- How many cervical vertebrae are there?
  a) 3
  b) 7
  c) 12
  d) 5
  e) 24

How to Prepare for Part I: General

- 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
    - Radiobiology
  - Radiochemistry (from you 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 you 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 (cGy vs mGy vs Gy) 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