ABR Diagnostic Physics Exam: How to prepare for Part 1 in One week



Online: goo.gl/bGjS86

2

Outline

- <u>Exam Overview</u>
 - ABR website
 - Important dates
 - Results

Hints & Strategies

- Exam format
- Exam resources
- Exam content

Resources

Slides available here: <u>http://www.aapm.org/</u> <u>meetings/2016AM/PRAbs.asp?</u> <u>mid=115&aid=32226</u>



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3

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and here

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ABR Website





4

ABR Eligibility Requirements



← → C	← → C 🗋 www.theabr.org/ic-rp-landing				
	☆ Contact Us		mvABR Login		1
	Volunteering for the ABR Sitemap	Time-limited certificates are valid contingent upon meeting the requirements of Maintenance of Certification (MOC).Throughout the period for which you hold a time-limited certificate, you are expected to continue learning and improving by ury skills in a personalized program 	Medical Physics InfoCAMPEP RequirementCredentials Evaluation OrgsInternational MP GraduatesMP Random Audit of ApplicationsMedical Physics FAQsNuclear Regulatory Commission (NRC)ReapplicationsRequirements		
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Part 1 Eligibility



4. When am I eligible to apply for certification?

You can apply to take Part 1 of the computer-based examination anytime after you are officially enrolled in a CAMPEP-accredited medical physics graduate program, DMP program, certificate program, or residency. Enrolled means that you have been accepted into the program and have begun coursework or residency duties. Please see the website: http://www.theabr.org/ic-rp-process#part1, for application process and dates.

http://www.theabr.org/ic-mp-faq

CAMPEP Eligibility





Graduate Education Programs

Residency Education Programs

Professional Doctorate in Medical Physics (DMP) Degree Programs

Certificate Programs Continuing Education The **Mission** of the Commission on Accreditat consistent quality education of medical physic Doctorate in Medical Physics (DMP), Certificat established by CAMPEP in collaboration with it

CAMPEP is a nonprofit organization, independence accreditation of educational programs in medi

Accreditation is a voluntary, non-governmer

http://www.campep.org/

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More eligibility requirements here!

Exam Content Children's National 🕂 IC MP Landing | The Amer 🗙 www.theabr.org/ic-rp-landing C myABR Login Contact Us Ĥ • • • Exam Information Time Limitation for Attaining Initial Certification ("Board Eligibility") Calculators and Constants maining eligible to be List Candidates have specific time limits for initially certified by the ABR and to ma their status as board Conditions and eligible. For medical physics. "comple ining" is defined Reregistration program or ion. Exam registration & Exam Registration Process d belo content information Fees, Dates, Locations Sample Questions Before January 1, 2011: December 31 January 1, 2011, or later: six full calen ears from the end of Scoring and Results residency training or Part 2 approval, ichever comes first. Study Guide After the period of eligibility ends, candidates failing to successfully completentine mitig control at the mitig control at the mitig control at the second sec

cation of eligibility:

Important Dates & Fees

- Exam Registration window: 9/1-10/31
- Notification of eligibility: 11/30
- Location Registration:
 Months leading up to exam
- Exam: Early August

Tips

• Your application may be audited

Fees

- Schedule location at the earliest possible time
- It is possible to change exam location

Registration: \$505

Cancellation: \$300





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Content

PART 1: General

The nature and sources of radiation Radioactivity

Ultrasound

Nuclear magnetic resonance

Interactions of radiation with matter

Spatial distribution and transmission of radiation

Concepts of dosimetry

Instrumentation and measurement techniques Principles of safety

Methods of quality control and quality assurance

Radiobiology

Radiation protection

Basic atomic and nuclear physics

Mathematics relevant to medical physics Statistics

PART 1: Clinical

Physiology Anatomy Biochemistry Radiation effects Medical uses of radiation sources Radiochemistry Medical terminology Ethical principles



Format



General Questions

- 237 minutes for 80 questions
 - 27 Complex [3 pts ea]
 - 53 Simple [1 pt ea]
- * 30 min Break (optional)*

Clinical Questions

• 90 minutes for 75 questions

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Pearson VUE

- Computer-based exam
- Cubicles
- Headphones
- Wet-erase laminated sheets
 - no erase option
 - need to request more







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First Time Takers Enrolled in a CAMPEP Program









 Pass both parts – Eligible for Part 2 upon completion of residency

- Pass general Repeat clinical
- Pass clinical Retake the exam
- Fail both parts Retake the exam

Complex vs. Simple Questions



<u>Simple</u>: (1) Zero calculational steps or (2) relatively minor arithmetic

<u>Complex</u>: Requires some advanced reasoning and 2+ calculational steps.

Example: Simple Question



From the ABR:

Beyond the depth of maximum dose, what is the relative behavior of dose and kerma?

- A. Dose and kerma fall off equally.
- B. Kerma falls off faster than dose.
- C. Dose falls off faster than kerma.
- D. Dose falls while kerma rises.
- E. Dose rises while kerma falls.

Example: Simple Question



Another example:

The HVL of shielding material is 1 mm. What thickness will attenuate the beam by 90%?

A. 1.1 mm B. 2.2 mm C. 3.3 mm D. 4 .4 mm E. 5.5 mm

Example: Complex Question



From the ABR:

The mass attenuation coefficient of bone (density of 1.8 g/cm3) is 0.2 cm2/g for an 80-keV gamma ray. What percentage of 80-keV photons is attenuated by a slab of bone 4 cm thick under conditions of narrow beam geometry?

- A. 36%
- B. 45%

C. 55%

D. 64%

E. 76%

$$I = I_0 e^{-\left[\frac{\mu}{\rho}\right]\rho x}$$

Example: Complex Question

Another Example: We collected some data, what is the standard error? A. 18.3 B. 34 $\frac{1}{N}\sum_{i=1}^{N}\left(x_{i}-\mu\right)^{2}$ C. 5.9 SEM D. 1.5 E. 4.8



Children's National

Example: Clinical Question



From the ABR:

A fetus receives a dose of 2 Gy during weeks 20 to 39 of pregnancy. After birth, the child has an increased risk for what condition?

- A. Trisomy 21
- B. Leukemia
- C. Microcephaly
- D. Neonatal death

Example: Arcane Clinical Question

<u>Another Example:</u> What is a physiological element is contained within organ #17?

- A. Bowman's Capsule
- B. Hepatocytes
- C. Red pulp
- D. Ampulla of Vater



The TI-30XS Calculator

- Practice before exam
 Stop using excel or any other calculator TODAY
- Use unit analysisBall-park solutions





Exponential Decay



Accounts for ~ 30% of the math

- Other options
 - Base 2

$$A = A_0 2^{-\frac{t}{T_{1/2}}}$$

$$A = A_0 e^{-\frac{0.693t}{T_{1/2}}}$$

• Taylor series

$$e^{-ax} = 1 - ax + \frac{(ax)^2}{2} - \frac{(ax)^3}{3!}$$

Study Material: General



General

- Essential Physics of Medical Imaging
- The Physics of Radiation Therapy
- Physics in Nuclear Medicine
- Review of Radiologic Physics



Study Material: General



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Tips

- I. Do all example problems
- 2. Review all figures
- 3. Read cover-to-cover

Study Material: Clinical



Clinical

- Radiobiology for the Radiologist
- Anatomy for Dummies
- Imaging Atlas of Anatomy
- Online anatomy quizzes
 - http://www.free-anatomyquiz.com



Additional Resources



ABR Medical Physics: http://www.theabr.org/ic-rp-landing

- Registration timeline: http://www.theabr.org/ic-rp-process
- Pearson VUE: http://www.pearsonvue.com/ABR/
- Tutorial: http://www.pearsonvue.com/athena/athena.asp
- Calculator & Constants: http://www.theabr.org/ic-rp-calc
- Exam length and question types: http://www.theabr.org/ic-rpreq
- Test categories: http://www.theabr.org/ic-mp-study-guide
- Sample questions: http://www.theabr.org/ic-rp-sample

"Well, tests ain't fair. Those that study have an unfair advantage." — Allan Dare Pearce, Paris in April

29



 Medical Physics: An Update of the ABR Requirements and Processes [https://www.aapm.org/meetings/ webinars/ ABRUpdateWebinar2015.pdf]

Part 1 General Enrollment





Medical Physics: An Update of the ABR Requirements and Processes https://www.aapm.org/meetings/webinars/ABRUpdateWebinar2015.pdf Online: goo.gl/bGjS86

Where is the bottle neck?



