Preparing for the ABR Diagnostic Medical Physics Oral Exam

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Outline

I. Background Information

II. Oral Exam Content

III. Preparation: Resources and Tips

Where + When

May 2015						
Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Crown Plaza Hotel (airport)

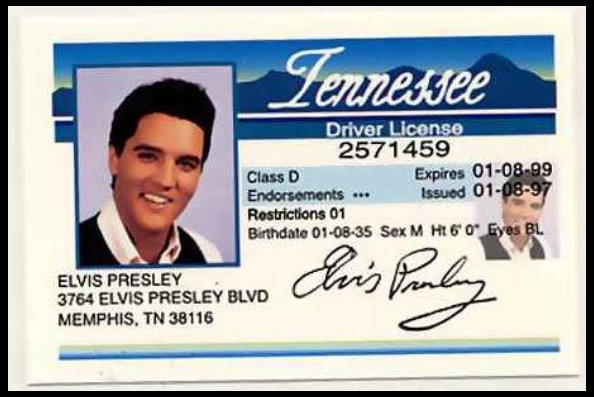
Louisville, Kentucky

Eligibility and Cost

- Eligible for diagnostic oral exam (part 3) after passing diagnostic part 2 exam
- $760, due around January 2015
  - dress accordingly
- Cancellation fees
  - $400 if > 20 days
  - $1905 if < 20 days

What to bring and not to bring?

- Bring
  - valid, legal, photo ID
  - (credit card / cash)



- Do Not Bring
  - anything else
  - cell phone!

New Oral Exam Categories for 2015

Category	Subject
1	Radiography, mammography, fluoroscopy
2	Computed tomography
3	MRI + ultrasound
4	Informatics, PACS, image processing and display
5	Radiation shielding, protection, dosimetry, and patient safety

- 5 examiners, 30 minutes each
- 5 questions per examiner, ~5 min/question
- Each examiner asks questions from **ALL** categories (not just one category)

Exam Goal

- Test your knowledge and competence as it relates to the clinical practice of diagnostic medical physics

- Tip: Draw upon your clinical experience

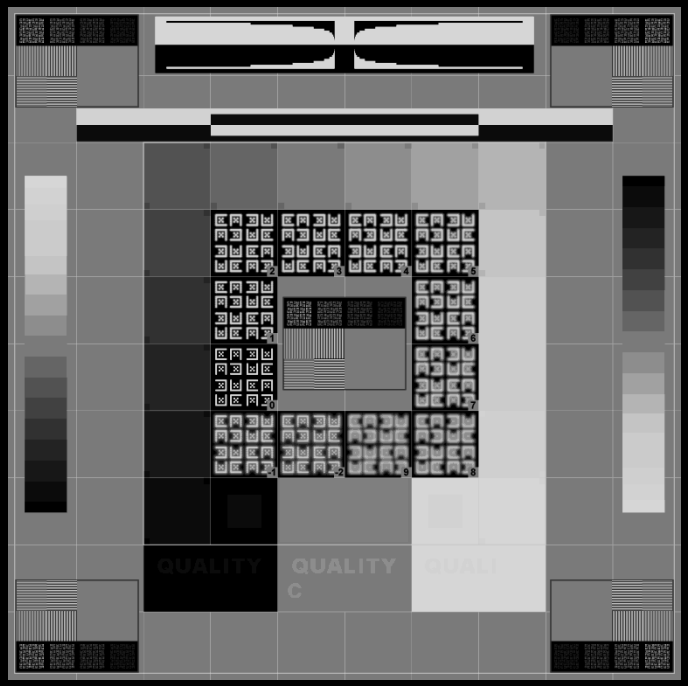
Imaging questions

- Basic imaging principles
  - e.g. sampling criteria to avoid aliasing
- Imaging systems
  - e.g. fluoroscopic imaging chain
- Image acquisition, processing, display
  - e.g. T2 contrast in MR
- Image quality and artifacts
  - e.g. beam hardening in CT

Other questions

- QA/QC testing and measurement
  - e.g. typical annual tests for mammography unit
- Safety/Shielding/Risk
  - e.g. clerical office adjacent to general rad room
- Dose metrics, calculation, reduction
  - e.g. determination of CTDIvol
- Informatics
  - e.g. relationship between IOD, SCP, SCU

Mock Exam Question



- What is the device indicated by the red arrow? What does it measure? When/how is it used?
- What is the GSDF? How is it related to the JND index?
- What is the pattern shown on the right? Describe what can be evaluated with the different regions.

During the exam

- Answer questions clearly and concisely
- Ideally, questions set stage for a broader + deeper discussion about the topic
- Follow up questions
- If you don’t know the answer…
  - be honest
  - discuss what you do know about the topic
  - examiners often help steer/guide
  - there are 5 examiners!

Pass Rates

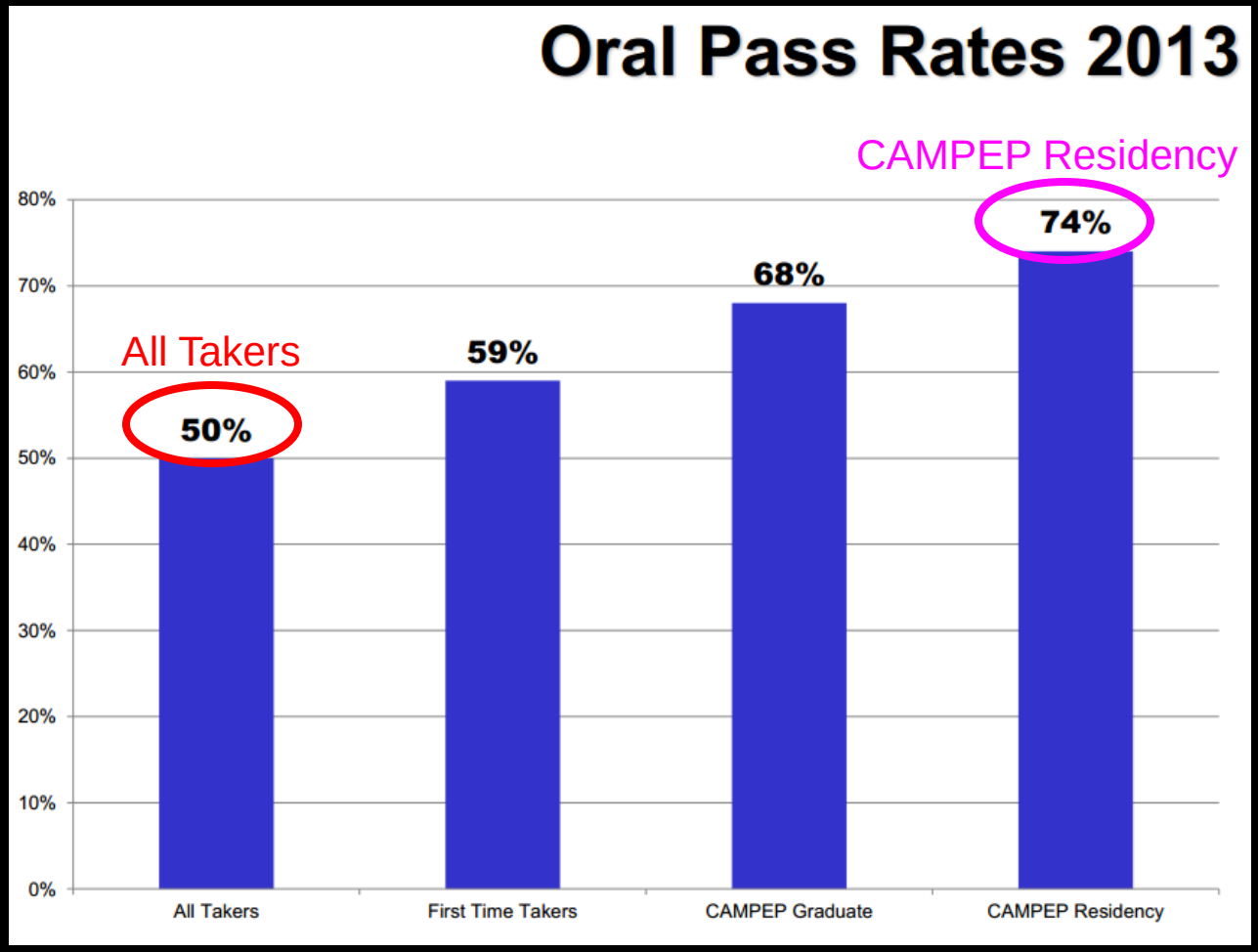
- Overall pass rate is around 50% (diagnostic, therapy and nuclear)

Medical Physics Oral - All Exam Takers

Year	Percent Passed	Number Taking
2009	55	287
2010	53	319
2011	56	363
2012	56	390
2013	50	414

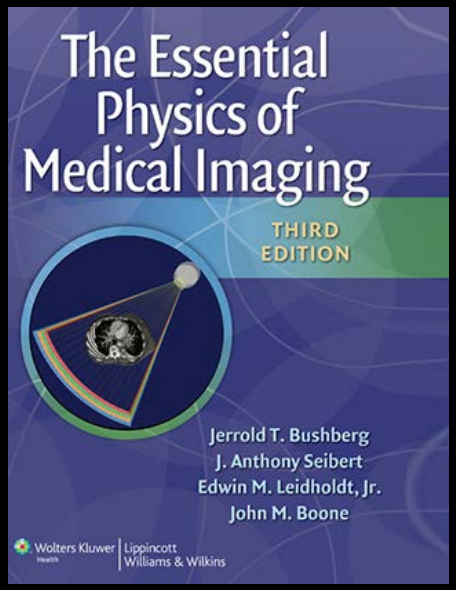
Preparation

- Completion of a CAMPEP imaging residency

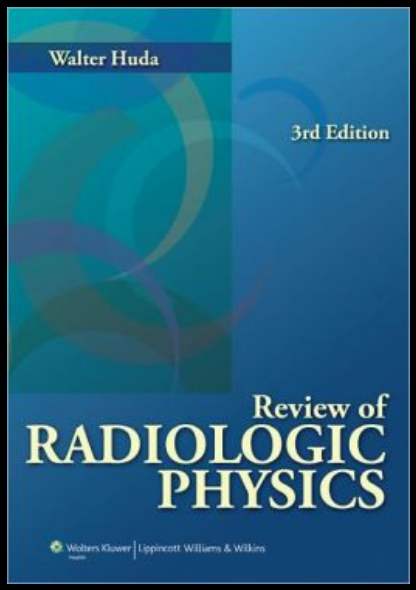


Good Review Resources

- *Essential Physics of Medical Imaging*
- by Bushberg et al.

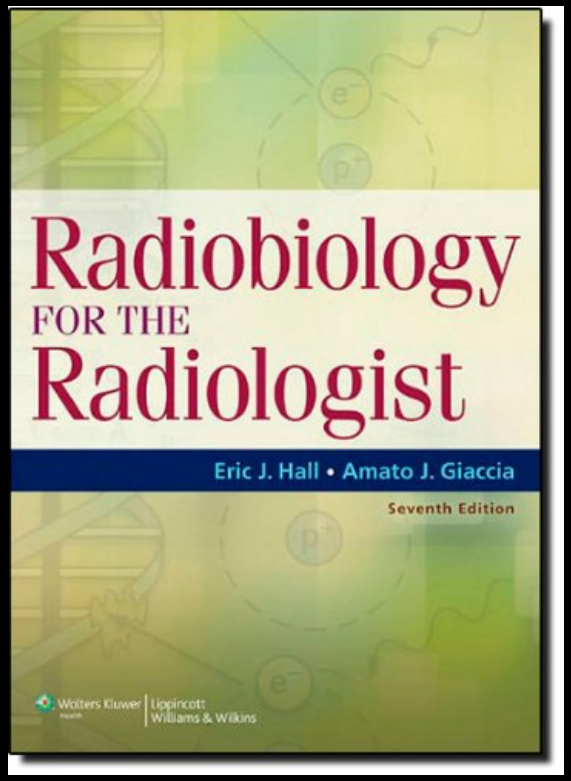


- *Review of Radiologic Physics*
- by Huda

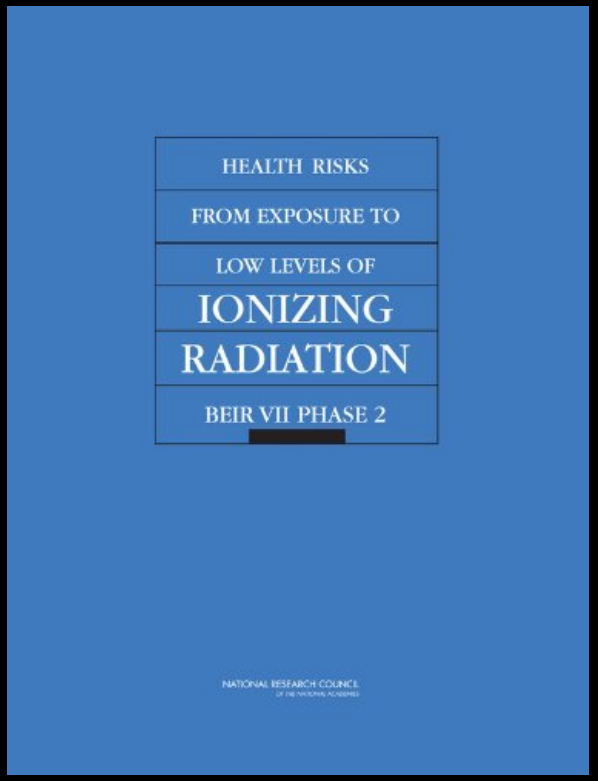


Radiobiology and Health Risks

- *Radiobiology for the Radiologist*



- *BEIR VII Report*

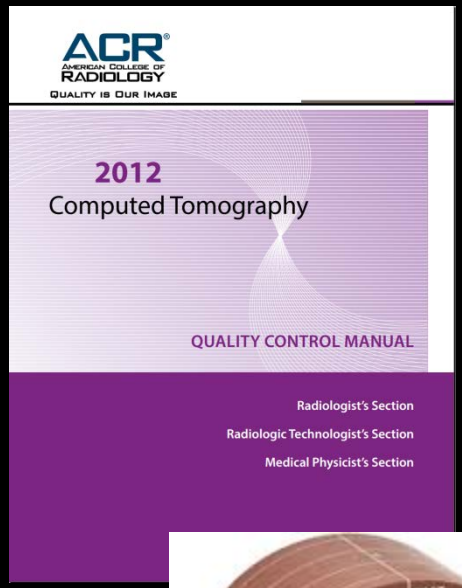


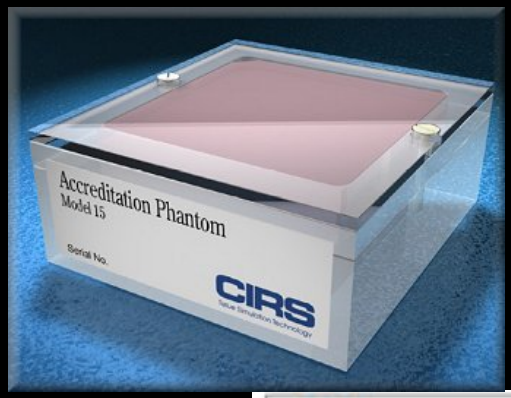
AAPM Reports

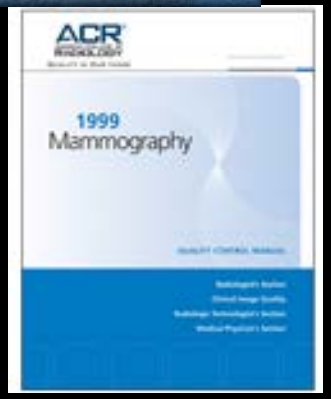
- Display Monitors: Online Report 03 (TG 18)
- QC in Diagnostic Radiology: Report 74 (TG 12)
- Computed Radiography: Report 93 (TG 10)
- CT Radiation Dose: Report 96 (TG 23)
- MR Acceptance Testing: Report 100 (TG 1)
- Exposure Index: Report 116 (TG 116)
- SSDE in CT: Report 204 (TG 204

ACR Accreditation

- ACR Quality Control Manuals and Phantom Instructions

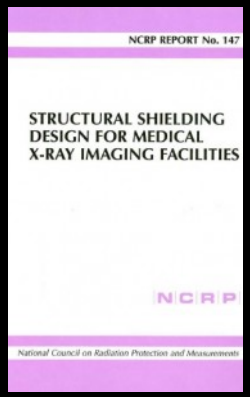




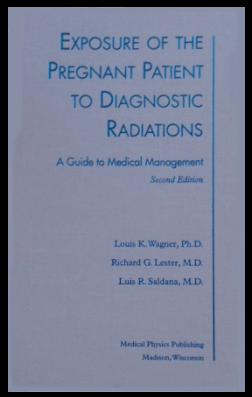


Other Resources

- Code of Federal Regulations
  - Performance Standards for Ionizing Radiation Emitting Products (Title 21, Part 20)
  - Standards for Protection Against Radiation (Title 10, Part 20)
- MQSA Regulations
- NCRP Report 147



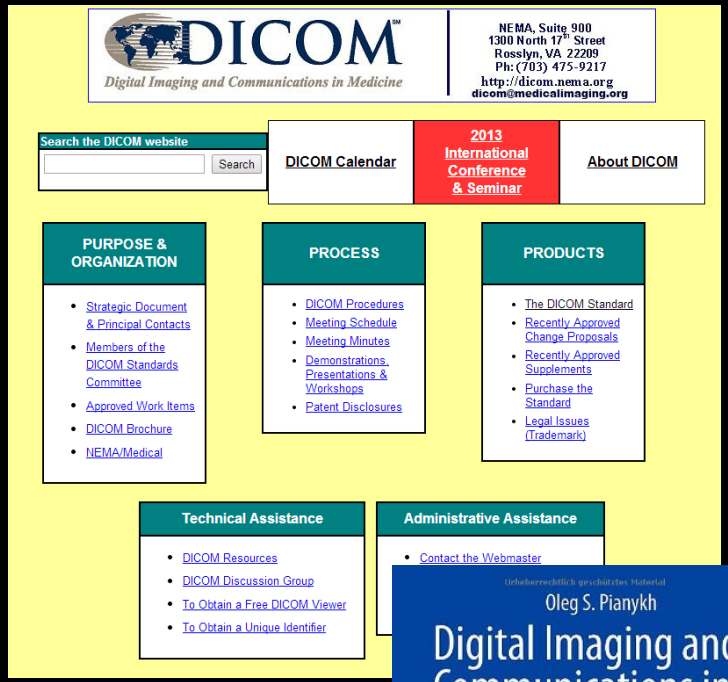
- Pregnancy/Fetal Dose



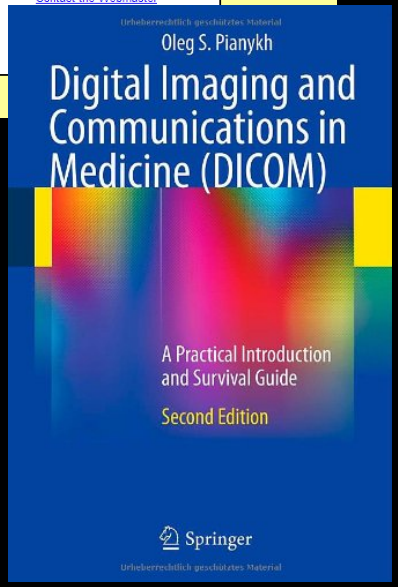
Informatics Resources

- HIS/RIS/PACS
- DICOM/HL7
- IHE

http://medical.nema.org/dicom/

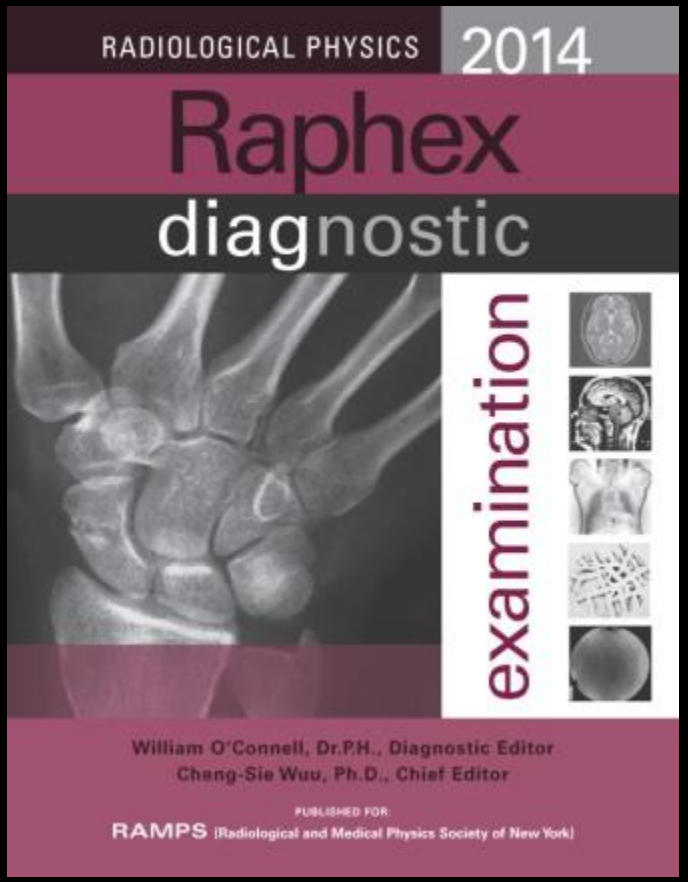


http://www.ihe.net/



Question Sources

- Raphex Exams



- AAPM/RSNA Physics Modules

Fundamentals

1. Atoms, Radiation, and Radioactivity
2. Interactions of Radiation and Tissue
3. Radiation Measurements and Units
4. X-Ray Tubes and Spectra

Basic Imaging Science and Technology

1. Image Perception and Performance Evaluation Including CAD
2. Image Display
3. Image Processing and Reconstruction
4. PACS

Radiation Biology

1. Basic Radiation Biology
2. Radiation Effects

Radiation Protection

1. Fundamentals of Radiation Protection
2. Radiation Dose and Risk
3. Radionuclide Dosimetry and Nuclear Regulations
4. Estimating Cancer Risk from Imaging Procedures

Projection X-Ray Imaging

1. Basic Concepts in Radiography
2. Digital X-Ray Imaging
3. Radiographic Image Receptors
4. Image Quality and Dose in Radiography
5. Mammography Image Quality and Dose

Fluoroscopy

1. Fluoroscopy Systems
2. Radiation Dose and Safety in Interventional Radiology

Group Study

- Pool knowledge and fill in gaps
- Divide and conquer
- Meet regularly + motivate
- Mock oral exam questions
- Meet in Louisville 1.5 days prior to exam and study as a group

Final Tips

- Goal: Demonstrate competence and working knowledge of the clinical practice of diagnostic medical physics
- Draw upon your clinical experience
- Be confident and be honest
- Good luck!

End of Module