

# Preparing for the ABR Diagnostic Medical Physics Oral Exam

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- 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

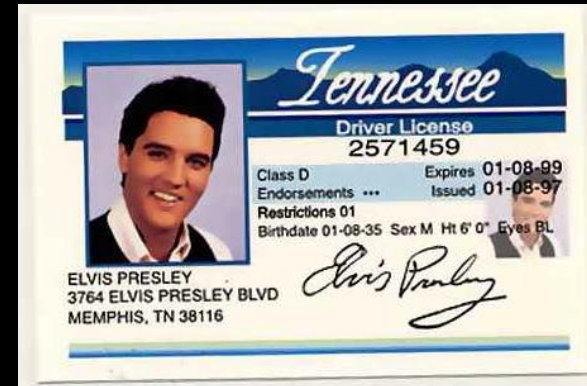
# Eligibility and Cost

- 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)

- Test your **knowledge** and **competence** as it relates to the **clinical practice** of diagnostic medical physics
- **Tip:** Draw upon your clinical experience

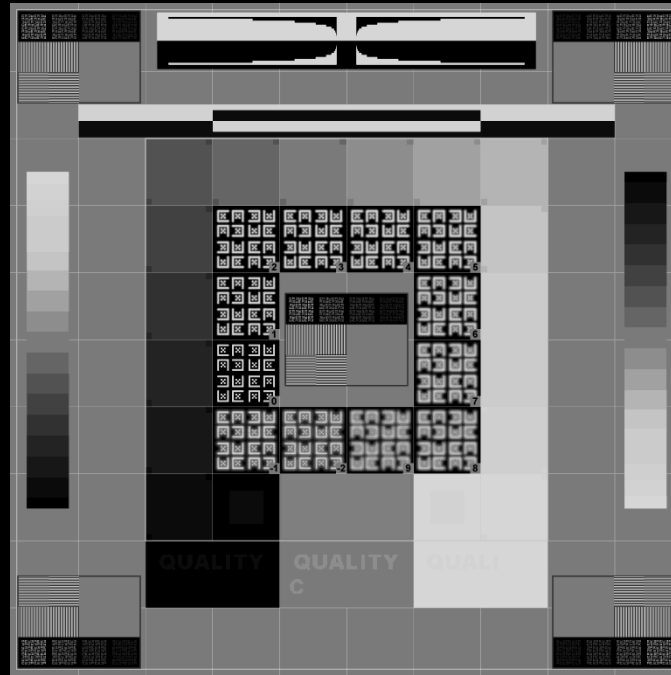


- Basic imaging principles
  - e.g. sampling criteria to avoid aliasing
- Imaging systems
  - e.g. fluoroscopic imaging chain
- Image acquisition, processing, display
  - e.g. T2 contrast in MR
- Image quality and artifacts
  - e.g. beam hardening in CT



- 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

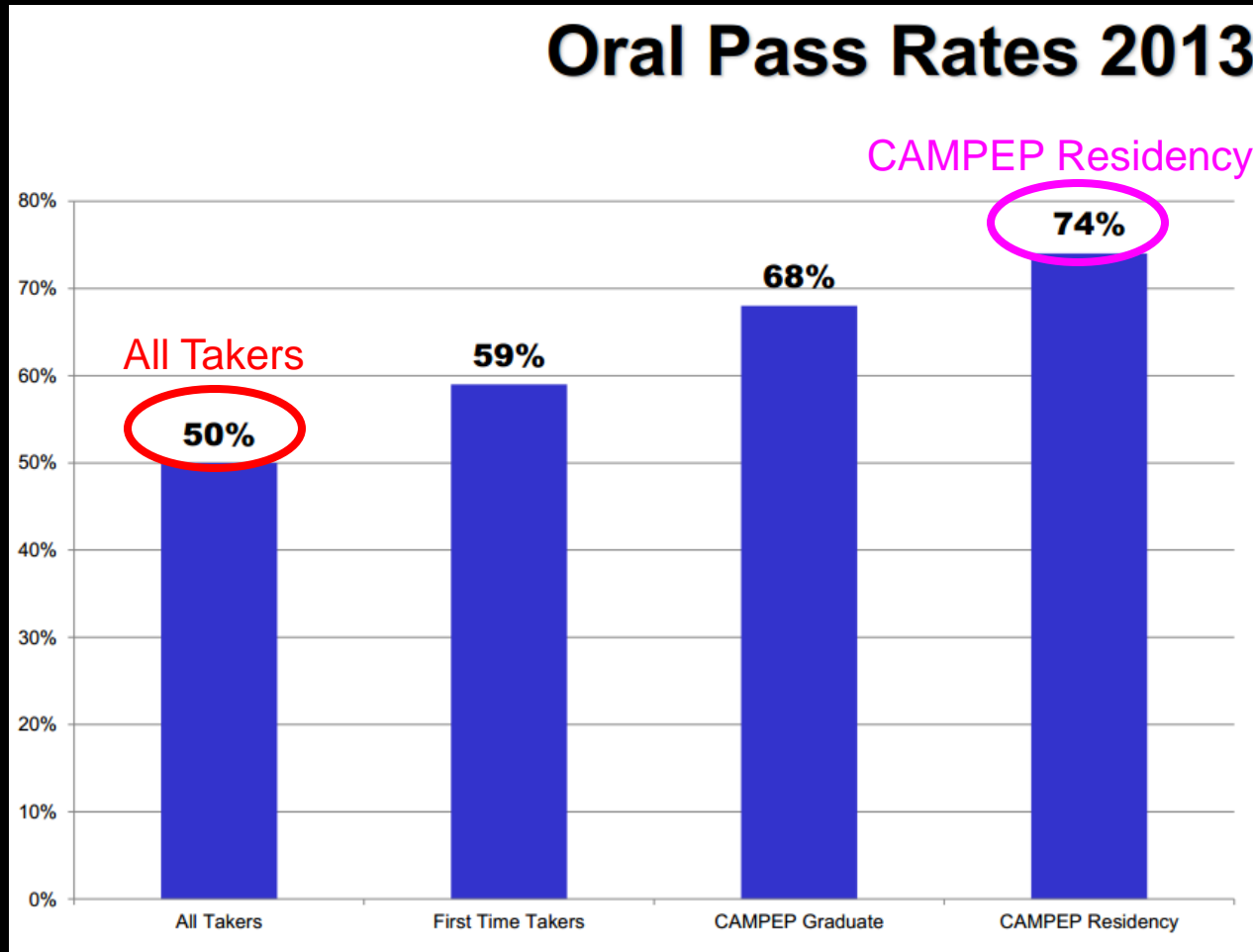
- Answer questions clearly and concisely
- Ideally, questions set stage for a broader + deeper discussion about the topic
- Follow up questions
- If you don't know the answer...
  - be honest
  - discuss what you do know about the topic
  - examiners often help steer/guide
  - there are 5 examiners!

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

## Medical Physics Oral - All Exam Takers

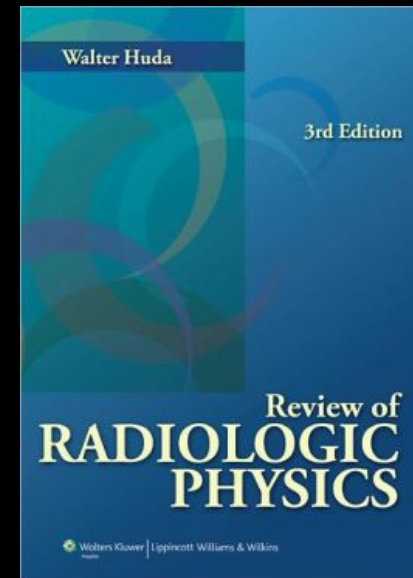
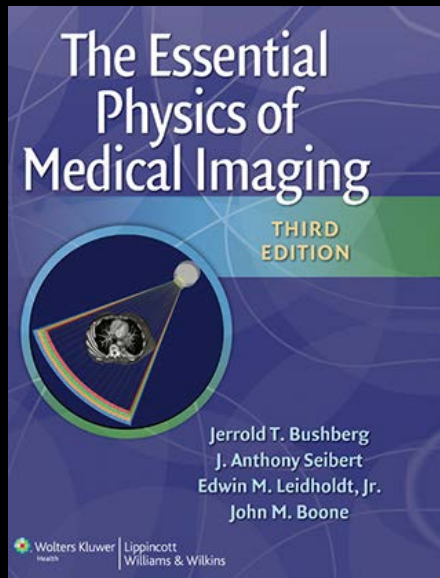
Year	Percent Passed	Number Taking
2009	55	287
2010	53	319
2011	56	363
2012	56	390
2013	50	414

- Completion of a CAMPEP imaging residency

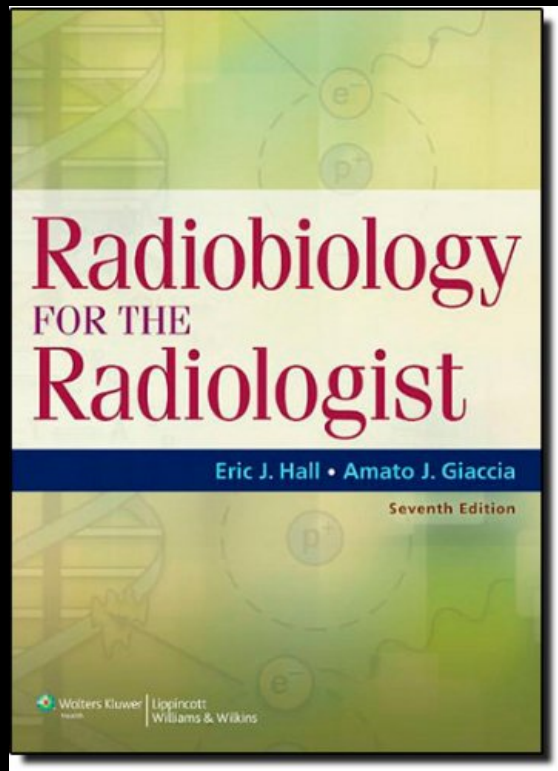


# Good Review Resources

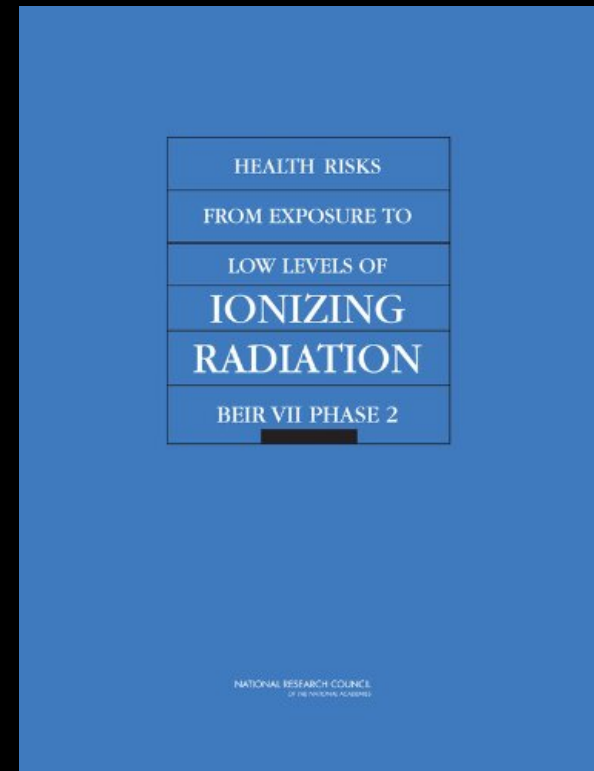
- *Essential Physics of Medical Imaging*
- by Bushberg et al.
- *Review of Radiologic Physics*
- by Huda



- *Radiobiology for the Radiologist*



- *BEIR VII Report*

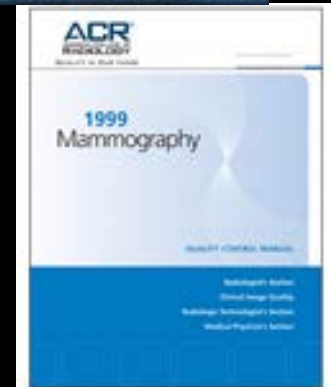
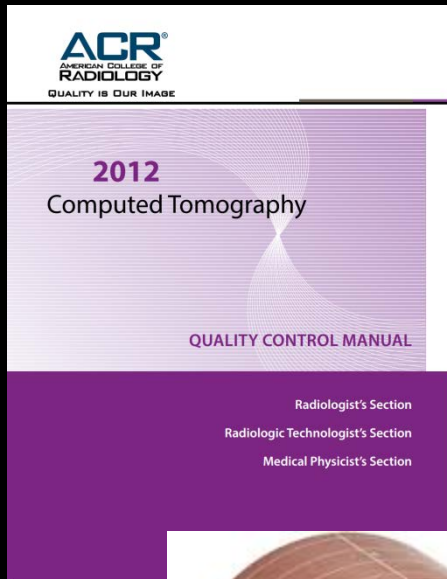




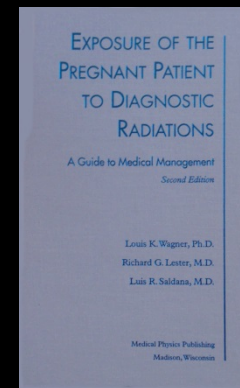
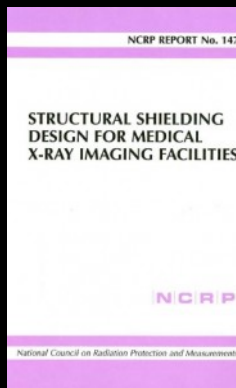
- **Display Monitors:** Online Report 03 (TG 18)
- **QC in Diagnostic Radiology:** Report 74 (TG 12)
- **Computed Radiography:** Report 93 (TG 10)
- **CT Radiation Dose:** Report 96 (TG 23)
- **MR Acceptance Testing:** Report 100 (TG 1)
- **Exposure Index:** Report 116 (TG 116)
- **SSDE in CT:** Report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

# ACR Accreditation

- ACR Quality Control Manuals and Phantom Instructions



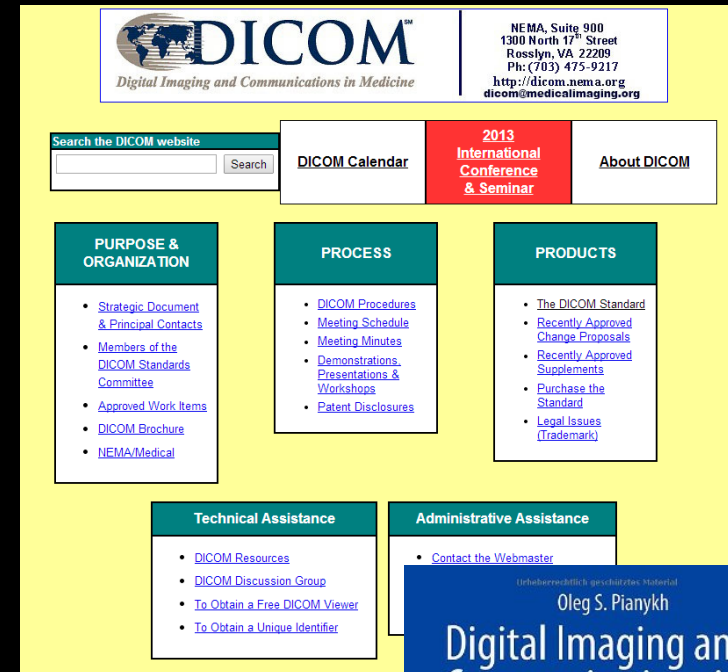
- Code of Federal Regulations
  - Performance Standards for Ionizing Radiation Emitting Products (Title 21, Part 20)
  - Standards for Protection Against Radiation (Title 10, Part 20)
- MQSA Regulations
- NCRP Report 147
- Pregnancy/Fetal Dose



# Informatics Resources

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

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



The screenshot shows the DICOM website interface. At the top, there is a header with the DICOM logo and contact information for NEMA. Below the header, there is a search bar and several navigation links: "DICOM Calendar", "2013 International Conference & Seminar", and "About DICOM". The main content area is divided into three columns: "PURPOSE & ORGANIZATION", "PROCESS", and "PRODUCTS". Each column contains a list of links related to its category. At the bottom, there are two more sections: "Technical Assistance" and "Administrative Assistance", each with a list of links.

**DICOM**  
Digital Imaging and Communications in Medicine

NEMA, Suite 900  
1300 North 17<sup>th</sup> Street  
Rosslyn, VA 22209  
Ph: (703) 475-9217  
<http://dicom.nema.org>  
[dicom@medicalimaging.org](mailto:dicom@medicalimaging.org)

Search the DICOM website

**DICOM Calendar**

**2013 International Conference & Seminar**

**About DICOM**

**PURPOSE & ORGANIZATION**

- [Strategic Document & Principal Contacts](#)
- [Members of the DICOM Standards Committee](#)
- [Approved Work Items](#)
- [DICOM Brochure](#)
- [NEMA/Medical](#)

**PROCESS**

- [DICOM Procedures](#)
- [Meeting Schedule](#)
- [Meeting Minutes](#)
- [Demonstrations, Presentations & Workshops](#)
- [Patent Disclosures](#)

**PRODUCTS**

- [The DICOM Standard](#)
- [Recently Approved Change Proposals](#)
- [Recently Approved Supplements](#)
- [Purchase the Standard](#)
- [Legal Issues \(Trademark\)](#)

**Technical Assistance**

- [DICOM Resources](#)
- [DICOM Discussion Group](#)
- [To Obtain a Free DICOM Viewer](#)
- [To Obtain a Unique Identifier](#)

**Administrative Assistance**

- [Contact the Webmaster](#)



The screenshot shows the IHE website. At the top, there is a header with the IHE logo and the text "Integrating the Healthcare Enterprise". Below the header, there is a navigation bar with links: "About IHE", "Participate", "Resources", "IHE Domains", "IHE Worldwide", "News", and "Events". The main content area features a large image of two healthcare professionals looking at a computer screen. Below the image, there is a section titled "IHE International" with the text "Enable seamless and secure access to health information whenever and wherever needed." At the bottom, there is a section titled "Integrating the Healthcare Enterprise (IHE)" with a description of the initiative and a "BECOME A MEMBER" button.

**IHE** Integrating the Healthcare Enterprise

For Developers For Users

About IHE Participate Resources IHE Domains IHE Worldwide News Events

**IHE International**  
Enable seamless and secure access to health information whenever and wherever needed.

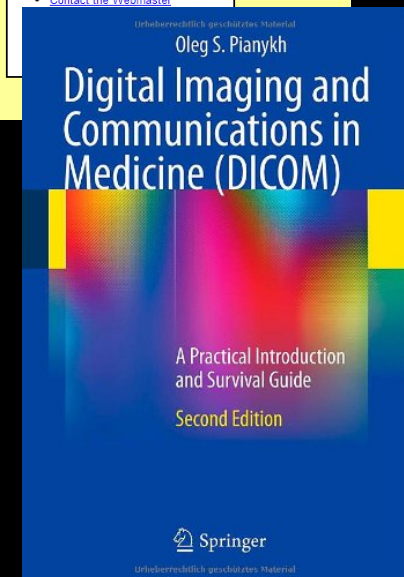
**Integrating the Healthcare Enterprise (IHE)**

IHE is an initiative by healthcare professionals and industry to improve the way computer systems in healthcare share information. IHE promotes the coordinated use of established standards such as DICOM and HL7 to address specific clinical needs in support of optimal patient care. Systems developed in accordance with IHE communicate with one another better, are easier to implement, and enable care providers to use information more effectively.

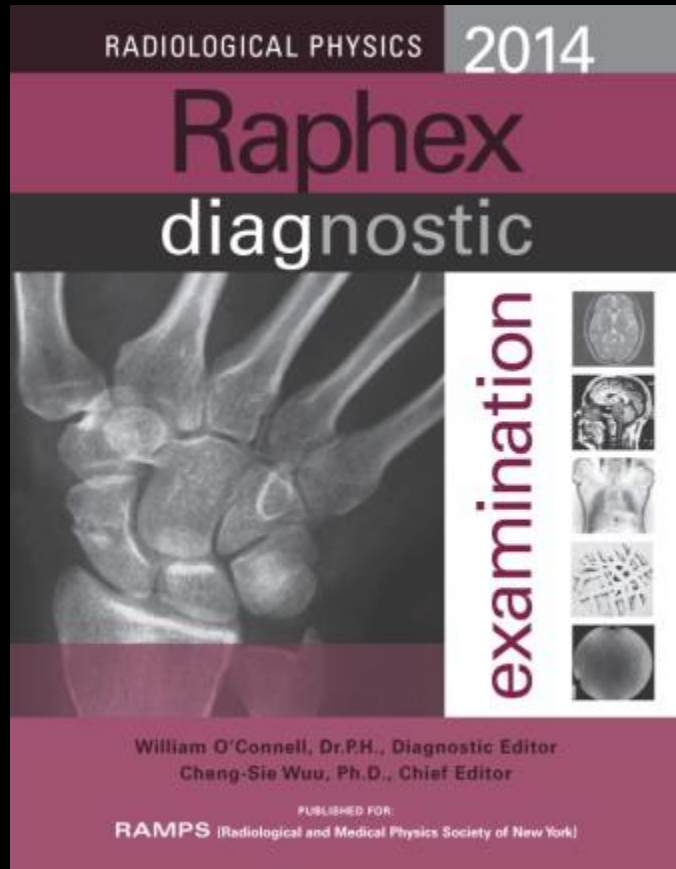
**BECOME A MEMBER**

Become an IHE member organization and improve the interoperability of healthcare information systems.

<http://www.ihe.net/>



## ■ 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



- **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

