ABR Update 2014

First Core Exam
Certifying Exam (yet to come)

Duane Mezwa MD
Trustee, ABR
Disclosures

I am an ABR Trustee
I am a member of the Radiology RRC
Past Program Director of many years

I have nothing further to disclose
Disclaimer

All information true on April 2 2014 but could be SUBJECT TO CHANGE based on future Board deliberations and decisions.
Thanks

Kay Vydareny, Associate Executive Director

Dennis Balfe, Assistant Executive Director
2013 Totals

- Initial Certification Exams – 32
- Maintenance of Certification Exams – 15
  TOTAL = 47 exams

- Initial Certification Examinees – 6,570
- Maintenance of Certification Examinees – 1,092
  TOTAL = 7,662 examinees
How many individual responses were scored in the first Core exam?
Overview

Core Exam 2013
  Exam goals
  Statistics and results

Certifying Exam 2015
  Current timeline
  Progress of item-writing committees
Core exam - Timing

Residents expected to take in 36th month of DR training

If off-cycle, must wait until have 36 months of DR

Exception – research residents with >9 months research in first 3 years can delay

Few other exceptions to delay have been granted

Few exceptions to take “early” have been granted (eg military)
2x year – June + October – in testing centers in Tucson and Chicago

Oral exams to fade away...last one Nov 2014

2015 dates published as June 18-19 and 22-23

Some concerns raised about extending into 4th week of June

Should they be moved earlier June by a week?
Core Exam: Structure

Covers all of diagnostic radiology
Comprehensive, categorical exam
Candidate must pass all categories
Core Structure

18 categories, each must be passed

Organ system: MSK, Cardiac, Thoracic, Gastrointestinal, Urinary, Repro/Endo, Neuro, Pediatric, Breast, Vascular

Modality: Ultrasound, Interventional, Nuclear Radiology/Molecular Imaging, CT, MRI, Rad/Fluoro

Fundamental concepts: Quality and safety, physics

Items presented in random order although all receive same content each day
Core Exam: Structure

How many questions?

Input from psychometricians

High-stakes exams demand high reliability

Can be achieved, but requires a minimum of 60 questions/category

To be scored:

- Examination as a whole
- 18 individual categories
- 1 item affects both organ system and modality
Core exam, structure

Image-rich, practice related

Exam is 2 days – 7.5 hours the first, 6 the second

Will assess knowledge and comprehension (40%) and application, analysis, synthesis, and evaluation (60%)

Combination of current physics, clinical, and oral exams

Level of expertise expected for the exam is basic to intermediate

Mostly MCQ’s, few other item types (hot spot, labeling, extended matching)
### Sample grid

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<th>Cardiac</th>
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<th>MSK</th>
<th>Neuro</th>
<th>Peds</th>
<th>Thorax</th>
<th>Repro / Endo</th>
<th>Urinary</th>
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</table>

**Specific example: Form 1 of 2013 Core exam**
Core Exam: Content

Combines old written and oral content

~40% require fact retrieval

~60% require higher-order analysis
  - Development of differential diagnosis
  - Recognition of management methods

Majority of items linked with an image (effort made to emulate workstation to some degree)

What is the most likely diagnosis?

Most physics items *practical*
  - What is this artifact, and how would you fix it?
  - How would you reduce dose?

Additional physics content: radionuclide safety
Example: Extended Matching

For each patient whose clinical and imaging information is shown, select the most appropriate diagnosis from the list below. Each option may be used once, more than once, or not at all.

<table>
<thead>
<tr>
<th>A. Focal nodular hyperplasia</th>
<th>B. Liver cell adenoma</th>
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</thead>
<tbody>
<tr>
<td>C. Cavernous hemangioma</td>
<td>D. Inflammatory pseudotumor</td>
</tr>
<tr>
<td>E. Pyogenic abscess</td>
<td>F. Fungal abscess</td>
</tr>
<tr>
<td>G. Nodular focal fat</td>
<td>H. Biliary cystadenoma</td>
</tr>
<tr>
<td>I. Lymphoma</td>
<td>J. Solitary metastasis</td>
</tr>
<tr>
<td>K. Intrahepatic cholangiocarcinoma</td>
<td>L. Hepatocellular carcinoma</td>
</tr>
<tr>
<td>M. Fibrolamellar carcinoma</td>
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</tbody>
</table>
A 35 year old woman underwent sonographic evaluation for mild abdominal discomfort. She was referred for MR imaging to characterize a solitary liver mass seen on that ultrasound. Images are obtained 30 seconds (A), 70 seconds (B) and 1 hour (C) after administration of gadobenate intravenously.

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</tbody>
</table>
A 60 year old man with abdominal pain. Ultrasound showed a liver mass, and he is referred for CT imaging to characterize it. Images are obtained before (A), 20 seconds after (B), 50 seconds after (C), and 5 minutes after (D) intravenous administration of iodinated contrast material.

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</table>
A coronal CT image obtained in a patient with ascites is shown. Label the following structures:

a) Left subphrenic space  
b) Lesser sac, inferior recess  
c) Lesser sac, superior recess  
d) Transverse mesocolon  
e) Gastrohepatic ligament  
f) Morison’s pouch  
g) Left paracolic gutter  
h) Root of intestinal mesentery
First Core Exam

Given 9/30-10/4 (two different forms, identical blueprints)

Two half-day exams

1206 candidates
   980 (79%) in Chicago
   226 (21%) in Tucson

Post-examination survey sent to all
647 (54%) responded
Candidate Experience

657 items in 13.5 hours, but
No time trouble for vast majority
Persistent complaint about (some) images:
Too small, became pixelated when enlarged
  Sonography, especially cine loops
  Cardiac CT and MR
  Chest radiographs
How Did We Score It?

Two stage scoring process

Step 1: Must achieve overall score above the Angoff standard.
  Yes? Move to step 2
  No? FAIL

Step 2: Must achieve passing standard for each category (all 18). In 2013, passing standard for Physics was higher than other categories
  Yes? PASS
  No? if < 5 categories, CONDITION. If > 5, FAIL
Scoring the Core

Scoring goal: to make valid and reliable pass/fail/condition decisions about each candidate
Norm-Referenced Standard

Compares a candidate’s performance to other candidates

Goal is to rank the group of candidates so that decisions (i.e. college entrance) can be made
Criterion-Referenced Standard

Compared a candidate’s performance to a pre-defined standard

Goal is to determine whether or not the candidate has demonstrated mastery of a set of skills (i.e. certification)

All ABR exams are criterion-referenced
Angoff Standard Setting

Failing Candidates  
Low Performers

Cut Score

High Performers  
Passing Candidates

*Angoff target group (CERTIFIED DR Diplomates & Subspecialists)

*How would he or she respond to each question?

*WOULD the candidate answer the question correctly? (NOT should)
How is this exam scored?

Criterion (not norm) referenced

Measures what a candidate does relative to standard vs. how he/she does relative to others

Passing score determined by “Angoff committees” who ask “Would just-competent candidate answer this question correctly?”

100% could theoretically pass exam

No predetermined pass/fail rate or curve
ABR Examinations: The Why, What, and How

The American Board of Radiology (ABR) has provided certification for diagnostic radiologists and other specialists and subspecialists for more than 75 years. The Board certification process is a tangible expression of the social contract between the profession and the public by which the profession enjoys the privilege of self-regulation and the public is assured that it can expect medical professionals to put patients’ interests first, guarantee the competence of practitioners, and guard the public health. A primary tool used by the ABR in fulfilling this responsibility is the secure proctored examination. This article sets forth seven standards based on authoritative sources in the field of psychometrics (the science of mental measurements), and explains in each case how the ABR implements that standard. Readers are encouraged to understand that, despite the multiple opinions that may be held, these standards developed over decades by experts using the scientific method should be the central feature in any discussion or critique of examinations given for the privilege of professional practice and for safeguarding the public well-being.

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Gary J. Becker, MD
Jennifer L. Bosnia, PhD
Milton J. Gelberleau, MD
Anthony M. Gerdeman, PhD
Donald P. Frush, MD
James P. Borgstede, MD
For the Board of Trustees of the American Board of Radiology
What were the results of 2013 exam?

87% PASS
11.5% FAIL (n=146)
1.5% CONDITON (n=16) - all in Physics

This is similar to combined results of prior physics, clinical and oral exams
Rumors about changing scoring model
2014 scoring model will be the same 2 step model used in 2013
Upcoming Core Exam 2014

Will be given in June
Test assembly meeting held, and three new forms made from identical blueprints
Based on history of written/oral exams in past, ABR expects (minor) variations in pass rates
No changes will be made in scoring model
No changes will be made in content layout
Program Directors Report

American Board of Radiology
Diagnostic Radiology
Program Report
October 2013 Core Exam

Report Overview
This report is provided to Diagnostic Radiology training programs by the American Board of Radiology and contains specific information pertaining to the performance of residents in your training program compared to the overall performance of all residents taking the 2013 Core exam. This report can be used by the program to evaluate their resident training in each of the individual categories. For more information about how the core exam was scored, please refer to the explanation on the website: http://www.theabr.org/ic-dr-score

The report contains the following information:
- Exam level information for the total group and your program’s residents
  - n value – the total number of residents taking the exam for the first time
  - Mean Scaled Score - A scaled score is a conversion of a number-correct score on an exam to a common scale to allow meaningful comparisons across all exam takers and versions of the exam. In this case, the range of the scale was defined to be 200 to 800.
  - Standard Deviation – A standard measure of the degree of dispersion of exam scores around the mean.
- Category level information for the total group and your program’s residents
  The exam is comprised of categories in three subareas: Organ Systems, Modalities and Fundamentals. For more information about the content in each category, please refer to the exam blueprint: http://www.theabr.org/core-and-cert-exam-overview
  - For each category, your program’s mean scaled scores are compared to the national mean scaled score.
  - For each category, the report includes the number of residents from your program who fell into each performance quartile. Quartile 1 (Q1) represents the 25% of residents with the lowest scores. Quartile 4 (Q4) represents the 25% of residents with the highest scores.

Angoff Standard Setting Process
The ABR employs a standard psychometric process known as Angoff standard setting. In this process a group of experts evaluates each question on the exam to determine whether a resident just above the competency threshold would be expected to select the correct response. You can read more about the ABR’s use of this process in the following article: http://pubs.rsna.org/doi/abs/10.1148/radiol.13130384?queryID=11%2F386620.
Exam Level Information

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Category Level Information

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<td>Repro/Endo</td>
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<tr>
<td>Thoracic</td>
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Results Reports

Residents who failed received detailed reports similar to PDs

For 2014 the residents will get quartile reports...... A WIP

And comparison of scores in each category to the Angoff and the passing scaled scores.
How do I prepare for the Core?

- Website
- Study Guides
- Blueprints
- On Line Core Practice Exam
- Core Exam topic list
- Review sessions in Program
- Physics modules
General Information

ABR Online Tools

ABR Exam Information
The ABR has published an overview of what happens on the days leading up to and including the exam day for various ABR examinations. Examinees may refer to the appropriate section as they prepare to take an exam.

The ABR administers exams for each of its specialties and subspecialties. Locations include Pearson VUE Test Centers, the ABR Tucson Exam Center, the ABR Chicago Exam Center, and the Crowne Plaza Hotel, Louisville Airport, for oral exams. For further information, please click on the appropriate links below.

- Exam Dates and Locations
  - For all ABR exams

- Exam Center Information
  - Pearson VUE Test Centers
  - Chicago Exam Center
  - Tucson Exam Center

- Exam Day Schedule
  - ABR Exam Centers (Tucson and Chicago)
    - Initial Certification
      - Diagnostic Radiology Core and Certifying Exams
      - Diagnostic Radiology Subspecialty Exams
    - Maintenance of Certification - Diagnostic Radiology
  - Pearson VUE Test Centers
    - Initial Certification
      - Radiation Oncology (Clinical, Biology, and Physics)
      - Radiation Oncology (Physics and Biology Combined)
      - Medical Physics, Part 1 (Clinical) and Part 1 (General)
      - Medical Physics, Part 1 (Clinical and General Combined)
      - Medical Physics, Part 2 (All Disciplines)
    - Maintenance of Certification
      - Radiation Oncology
      - Medical Physics

- Study Guides
  - Diagnostic Radiology
    - Initial Certification
    - Core Exam
    - Certifying Exam (study guide to come)
  - Maintenance of Certification Exam
In This Issue

New Date Set for Public Reporting/ Core Practice Exam on the Way

From the Editor

Quick Links

ABR Website
ABR Exam Calendar
Personal Database (PD)
ABR Video
ABR Foundation
Focus on Residents

The Core Exam: Tools for Residents
by Duane G. Menes, MD, ABR Trustee

As the Exam of the Future (EOF) now becomes the Exam of Today, the Core Exam becomes a reality. Current PGY-3 residents are anxiously preparing for the inaugural examinations. We have received many questions from residents, as well as program directors, regarding what to expect and, more importantly, how to prepare for this test. The Core Exam is basically divided into two main areas. Items that are of a factual nature and make up a knowledge base will compose about 40 percent of the exam. This will be similar to the current “written” (computerized) exam. Sixty percent of the Core Exam will test higher levels of knowledge, centering around image analysis and differential diagnosis as well as patient management. This section is more in keeping with the current Oral Exam.

With all that in mind, many tools are available, as are just as many offers of advice. On its website, the ABR has posted a study guide outlining all material that could be expected to be seen on the Core Exam and covering all of its aspects. In addition to the ABR’s study guide, several new study modules for medical physics have been assembled on the RSNA website. The ABR has also prepared a set of blueprints that can be used as a study guide. We have published each category’s blueprint for exam composition on our website. Read more.

2013 Core Pilot Exam Information

All third-year residents who are eligible to take the first Core Exam in October 2013 will also be eligible to take the Core Pilot Exam in June 2013. To accommodate all residents who wish to take the pilot, the ABR will offer two administrations—one on June 20-21, 2013, and the other on June 24-25, 2013. Each exam will be administered in two sessions: one the afternoon of the first day, and another the morning of the second day. This duplicates the length of the Core Examination as it will be administered in October 2013.
Study Guides

Comprehensive listing- 172 pages

In general, the Core Examination is based on material in this study guide.

However, not all material in the study guide is included on every form of the examination.

Items that are not included in this study guide may appear on the examination.

Another WIP and we will be asking writers to re visit value
Breast Imaging

1) Regulatory/Standards of Care
   a) Components and desired goals of the medical audit for breast cancer detection
   b) Appropriate application of the Breast Imaging Reporting and Data System (BI-RADS) terminology and assessment categories
   c) Mammography Quality Standards Act (MQSA) requirements
   d) Quality determinants of mammography, breast ultrasound, and breast MR, including positioning, image processing, artifacts, optimal technique, and equipment

2) Screening
   a) Indications
   b) Normal anatomy (mammography, ultrasound, MR)
   c) Lesion detection and localization
   d) Computer-aided detection
   e) Breast cancer risk factors, including the identification and management of women at high risk for breast cancer

3) Diagnostic Breast Imaging
   a) Appropriate mammographic views for work-up of a breast lesion
   b) Evaluate and manage women and men with breast symptoms
      i) Palpable masses
      ii) Breast thickening
Safety

1) ACGME - Core Competencies
The American Board of Radiology has adopted the framework established by the Accreditation Council for Graduate Medical Education. Residents should have a basic understanding of each of the six Core Competency categories and the requirements for Maintenance of Certification.

a) Patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.

i) Gather essential and accurate clinical and radiologic information about patients relevant to the interpretation of the examination.

ii) Understand the importance of the patient-physician interaction during all encounters.

iii) Communicate effectively and demonstrate caring, respectful behavior when interacting with patients and their families, answering their questions and helping them to understand the examination or procedure, including its clinical significance.

iv) Use information technology to support patient care decisions.

v) Understand the bioeffects and safety issues involved with the examination or procedure that the patient is undergoing.
Core Exam Blueprints

Estimated breakdown of the content from each category that will be included on each administration of the examination.

Blueprints provide the relative percent distribution of content that will be tested across the domain.
GASTROINTESTINAL

1. Pharynx/esophagus (1-5%)
   a. Technique of examination
   b. Normal anatomy, variations and function
   c. Benign diseases
   d. Diverticuli
   e. Foreign bodies
   f. Trauma
   g. Motility disorders
   h. Esophagitis
   i. Rings, webs, strictures
   j. Varices
   k. Benign tumors and tumor-like conditions
   l. Extrinsic processes affecting the esophagus
   m. Hiatal hernia
   n. Malignant tumors
   o. The postoperative esophagus

2. Stomach (5-10%)
   a. Techniques of examination
   b. Normal anatomy, variations and function
   c. Benign disease
   d. Malignant disease, primary and metastatic
   e. The postoperative stomach, expected appearance and complications

3. Duodenum/small bowel (5-10%)
   a. Techniques of examination
   b. Normal anatomy, variations and function
   c. Benign diseases
   d. Malignant diseases

4. Colon, appendix (10-15%)
   a. Techniques of examination
   b. Normal anatomy, variations and function
   c. Benign disease
   d. Malignant disease

5. Pancreas (5-10%)
   a. Techniques of examination
   b. Normal anatomy, variations and function
   c. Pancreatitis
Assembled a sample for each organ-system-based Core Examination category, to foster an understanding of the type of material which, when assembled collectively, forms a single Core Examination

A sample of the Domain
Core Exam Topics

- Complications of transcatheter therapy to liver tumors
- Options for treatment of ascites in portal hypertension
- Indications/contraindications to TIPS
- Blood supply to the colon
- Causes of gallbladder wall thickening
- Sonographic features of luminal masses in the common bile duct
- Features of pancreatic neoplasms
- Sonographic features of liver masses
- Sonographic features of the gallbladder wall
- MR features of solitary liver masses
- Appropriateness of imaging abdominal pain in pregnancy
- Features of right lower quadrant inflammation
- Anatomy of the peritoneum
- Complications of bariatric procedures
- Technical details of draining peritoneal collections
- Causes of biliary obstruction
- Scintigraphic features of peritoneal inflammation
- Scintigraphic features of gastrointestinal bleeding
- Appearance of the small intestine on PET-CT
- Features of solitary liver masses on PET-CT
- Differential diagnosis of right lower quadrant inflammation
- CT features of gastrointestinal bleeding
- MR features of biliary dilatation
- Differential diagnosis of dilated pancreatic duct
- Causes of colonic wall thickening
- Differential diagnosis of peritoneal nodules
- Technical details and features of evaluating esophageal perforation
- Differential diagnosis of focal masses in the stomach
- Dose reduction in fluoroscopy
- Artifacts in image-intensified fluoroscopy
- Improving fluoroscopic contrast
- Artifact recognition in MR of the liver
- Dose reduction in abdominal CT
- Differential diagnosis of hyperenhancement of the intestine on CT
- Differential diagnosis of dilated intestine
- Options for diagnosis and therapy of visceral vascular stenosis
- Therapeutic considerations in patients with biliary obstruction
- Contraindications to percutaneous gastrostomy
- Technical details of fluoroscopic evaluation of the colon
- Hazards of MR imaging
- Features of focal hepatic lesions
- Analysis of error reduction
- Biologic effects of fluoroscopic radiation
Practice Exam

90 minutes -- to simulate the real exam
Subset of exam (110 cases) with answers
Available to anyone with “myABR”
Illustrates software interface, typical exam questions
A myelogram is performed for a man with chronic L5 radiculopathy and previous surgery. Based on the images, what is the most likely diagnosis?

A. Arachnoiditis  
B. Epidural injection  
C. Drop metastasis  
D. Epidermoid
A 51-year-old woman presents with a pea-sized palpable lump in her left breast. Based on the images, what is the most appropriate management?

A. No further evaluation  
B. Cyst aspiration for diagnosis  
C. Needle core biopsy  
D. Antibiotic therapy
In CT imaging, spatial resolution improves when which of the following increases?

A. Field of view  
B. Matrix size  
C. Focal spot  
D. Detector size
Certifying Exam: Goals

To certify that candidate has mastered the material germane to his/her clinical practice area

Level: Basic to moderately advanced

Domain: Clinical practice areas (self-chosen)
  Organ system (Abdomen, neuro, etc.)
  Modality (Nuclear, interventional)

Also contains material to certify candidate has acquired and maintained knowledge of

Non-interpretive skills (professionalism, safety)

Essentials (things every radiologist should know)
Certifying Exam: Goals

To confirm candidate has acquired and maintained necessary skills to practice independently in chosen area

Dual role

Final ABR Certification Exam
First exam of practice-based learning (like MOC)
Certifying Exam

Will be first administered in October, 2015
Contains five parts (but questions will appear in random order)

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<th>Non interpretive skills</th>
<th>Things every physician should know</th>
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<td>Essentials</td>
<td>Things every diagnostic radiologist should know</td>
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<td>Clinical Practice Areas</td>
<td>Things this specific radiologist should know</td>
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<td>(3 self-selected CPAs)</td>
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Certifying Exam: Categories

Twelve categories

Organ system: MSK, Cardiac, Thoracic, GI, Urinary, Neuro, Peds, Breast
Technology: US, VIR, Nuclear Radiology
General
ABR establishing guidelines for addition of CPAs

Candidates can choose any combination of CPAs

Items will vary in both difficulty and scope

Level 1: fundamental
Level 2: advanced

Candidates selecting a CPA more than once will receive a higher proportion of level 2 items
Certifying Exam: Content

Emulates clinical practice
  Will include normals and variants
  Will include important findings outside chosen area
  Appropriateness, clinical vignettes, management decisions

Item types
  Familiar: MCQs, extended matching
  Unfamiliar*: Structured reporting, script concordance testing

*Examples posted on ABR Website >1 year before use
Certifying Exam: Specifics

~300 items
5 hours (half-day)
Exam centers in Chicago and Tucson
Will be offered in October and Spring

Scoring:
Pass/Fail for exam: 3 scoring decisions—Pass NIS, Essentials and CPA’s as a group
Single Angoff-derived standard
Certifying Exam: Resources

Non-interpretive skills and Essentials
  Syllabus for NIS posted 1/13
  Similar outline for Essentials in progress

Clinical practice areas
  Study guide posted on Website
  CME/SAMs
  Practice-based learning
  Society-produced educational modules
RISE (RadioIsotope Safety Exam) for AU-E

Embedded in Core and Certifying exams

Rationale: radioisotope safety is important for all DR not just for AU’s

50-60 scorable units in Core exam
  25-30 already in NM, Safety, Physics
  25-30 additional radioisotope safety items

Additional items in Certifying exam per NRC

Scored after certifying exam
FAQ’S AND MISCONCEPTIONS ABOUT EXAM
Who writes these questions?

Item writer committees in each category
   Composed of diverse group of ABR certified volunteers, all of whom must be in MOC
   APDR plays a big role in offering volunteers
   Academic, private practice, geographical distribution; core committees generally faculty in residency programs
   Include physicist

Questions vetted, edited by entire committee
Test Assembly meeting – each question vetted by all attendees. Many discarded.
Why do I have to pass all 18 categories?

Last comprehensive exam taken by candidate

Trustees think it is important that all have knowledge in each category which meets a minimum standard
Why didn’t anyone condition any section other than physics?

Passing standard for physics was higher than other categories

If weak in multiple categories, failed exam
Why doesn’t the ABR just write a new exam each time?

Validity and reliability of exams is increased when some exam questions (with good performance statistics) are re-used, and when versions of the exam are “equated” to maintain a constant level for the passing standard.

If we did not reuse questions then these benefits are not obtainable.
What can I study for Quality and Safety?

NIS syllabus on ABR website has been updated to include material on Core exam.

Dedicated syllabus for Core exam will be posted soon.
Does it matter to the ABR what we (the candidates) think about the process?

Complaint: no breaks
   Time added (30 minutes) to each day to accommodate breaks tho few took entire exam period

Complaint: there was nothing I liked/could eat in the snacks you provided
   Candidates can bring own snacks. ABR will provide water
Complaint: the hotel breakfasts were way too expensive, room service was way too slow, and internet was way too costly.

Internet and breakfast now included in price of hotel room at Renaissance.
Why can’t I just go to a PearsonVUE center to take this test?

Modular content difficult for PV

PV can’t handle case structure on their software

PV monitors aren’t calibrated, can’t control lighting

Aim: to have distributed exam. We are working on system to implement
Life isn't about waiting for the storm to pass... it's learning to dance in the rain.
Questions?

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