

Challenges and Opportunities in Restructuring Radiology Residencies: The APDR Residency Restructuring Committee Report

Lori Deitte, MD^a, Jocelyn D. Chertoff, MD, MS^b, Martha B. Mainiero, MD^c, Janet L. Strife, MD^d, Kristen K. DeStigter, MD^e

Changes to the ABR certification process are imminent, with a core examination after 36 months of training and a certifying examination 15 months after the completion of training replacing the current examination structure for residents entering training in July 2010 and beyond. The Residency Restructuring Committee of the Association of Program Directors in Radiology was developed to analyze the challenges and opportunities of these upcoming changes and provide recommendations to programs. The guidelines included in this article represent a summary of the work of this committee to date.

Key Words: Diagnostic radiology training program, Association of Program Directors in Radiology, ABR, radiology residency curriculum, radiology residency restructuring, core examination, certifying examination

J Am Coll Radiol 2010;7:507-511. Copyright © 2010 American College of Radiology

BACKGROUND

Major changes to the ABR certification process have occurred over the past decade. Before 2002, lifetime certificates were issued to radiology residents who passed all required components of the board certifying examinations. Starting in 2002, 10-year time-limited certificates were introduced, requiring newly certified radiologists to participate in the Maintenance of Certification process.

These new requirements were followed by discussions on ways to increase subspecialization training during radiology residency to reflect trends in clinical practice and

to maximize the value of radiologists [1]. Changes to the content and timing of the certifying examination were proposed to mirror practice and to bring radiology in line with other specialties. In October 2007, the ABR announced that the following examinations would replace the current physics, written, and oral board examinations, effective for residents entering diagnostic radiology training in July 2010 and beyond:

- Residents will be eligible to take the core examination after completing 36 months of radiology residency training. This will be a comprehensive, computer-based, “image-rich” examination encompassing all of diagnostic radiology and radiologic physics. Categories include organ systems, imaging methods, and fundamental radiologic concepts. This examination will replace the current written diagnostic and physics examinations.
- The certifying examination will now be taken 15 months after the completion of the 4-year radiology residency training program. This will be a computer-based, image-rich examination consisting of 5 modules, including non-interpretive skills, essentials of radiology, and 3 additional modules selected by candidates [2,3]. This examination will replace the current oral board examination.

^aDepartment of Radiology, University of Florida College of Medicine, Gainesville, Florida.

^bDepartment of Diagnostic Radiology, Dartmouth-Hitchcock Medical Center, Lebanon, New Hampshire.

^cDepartment of Diagnostic Imaging, Warren Alpert Medical School of Brown University, Rhode Island Hospital, Providence, Rhode Island.

^dChildren’s Hospital Medical Center, Cincinnati, Ohio.

^eDepartment of Radiology, University of Vermont/Fletcher Allen Health Care, Burlington, Vermont.

Corresponding author and reprints: Kristen K. DeStigter, MD, University of Vermont/Fletcher Allen Health Care, Department of Radiology, 111 Colchester Avenue, Burlington, VT 05401; e-mail: kristen.destigter@vtmednet.org.

ACGME REQUIREMENTS

With the ABR announcement that it would change the timing, content, and structure of the board examinations, it became evident that radiology training programs would need to ensure that all residents receive adequate training in all specialty areas to prepare them for the new comprehensive, 36-month, image-rich core examination [4].

In response, the Diagnostic Radiology Residency Review Committee of the ACGME revised the program requirements for radiology training programs. The revised program requirements for graduate medical education in diagnostic radiology, effective July 1, 2010, include the following [5]:

- “Residents entering diagnostic radiology training on July 1, 2010 or thereafter must be provided appropriate clinical rotations and formal instruction in all subspecialties of diagnostic radiology and in the core subjects pertaining to diagnostic radiology (eg, medical physics, physiology of contrast media, etc.) before taking the ABR Core Examination (given after 36 months of diagnostic radiology training at the end of PGY 4). During the final year of diagnostic training (PGY 5), these residents should be allowed, within program resources, to select and participate in rotations, including ‘general radiology,’ that will reflect their desired areas of concentration as they enter practice.”
- “Participation in on-call activities is essential for the development of radiologists who are expected to practice independently upon completion of training, and should occur throughout the second, third, and final years of diagnostic residency. Program directors may exercise discretion in granting relief from call responsibilities for short periods before the oral board exam for residents entering diagnostic radiology training before July 1, 2010 and before the ‘Core’ board exam for residents entering diagnostic radiology training on July 1, 2010 or thereafter.”

ASSOCIATION OF PROGRAM DIRECTORS IN RADIOLOGY RESPONSE

In response to the new ABR and ACGME changes, the Association of Program Directors in Radiology (APDR) created the Residency Restructuring Committee. Program directors from both large and small programs from around the country, as well as representatives from the ABR and the Diagnostic Radiology Residency Review Committee, are members of this committee.¹ The com-

mittee’s mission and focus is to examine and evaluate the upcoming changes, solve potential challenges, and communicate recommendations that will help all programs adapt to the changing circumstances.

The initial goals set forth by the committee included analyzing the upcoming changes and the developing options for schedule and curricular adjustments for the residency core curriculum (R1-R3) and the fourth year (R4). To anticipate what changes the new examinations and program requirements might have on residency training, separate surveys were developed and sent to the APDR membership and to current radiology residents. The survey results are summarized below.

The APDR program director survey summary yielded the following findings [6]:

- One hundred six members of the APDR responded to the survey.
- Survey respondents agreed that the length of time in a given area of “focused training” for fourth-year residents will be mainly determined by program resources.
- There was a consensus that fourth-year residents are likely to take more call.
- Program directors concurred that the changes will better position fourth-year residents to serve as leaders and educators on their services.
- The majority of program directors stated that they plan to allow fourth-year residents to use some of their focused training time for research if they so desire.
- Concern was expressed that the fourth-year focused training may have a negative educational impact on the training of core residents (R1-R3) and fellows.

The APDR resident survey summary yielded the following findings [7]:

- One thousand ninety-eight radiology residents responded to the survey.
- Residents generally preferred smaller blocks (eg, 12 weeks) of focused training in different subspecialty areas to a larger block (eg, 36 weeks) in a single subspecialty during the fourth year.
- The subspecialty areas of greatest interest for focused training were neuroradiology, musculoskeletal radiology, and MRI, followed by abdominal imaging.
- Thirty percent of resident respondents stated that they would be highly or moderately interested in pursuing research during the fourth year.

Lawrence P. Davis, MD, Lori A. Deitte, MD, Spencer B. Gay, MD, Darel E. Heitkamp, MD, Charles F. Lanzieri, MD, Martha B. Mainiero, MD, Duane G. Mezwa, MD, Mark D. Murphey, MD, Melissa Myers, MD, Charles S. Resnik, MD, Ali Shirkhoda, MD, Eric M. Spickler, MD, Janet L. Strife, MD, Anoop S. Wattamwar, MD (American Alliance of Academic Chief Residents in Radiology representative), and Mark S. Rzeszutarski, PhD (guest contributor).

¹ The members of the APDR Residency Restructuring Committee are Kristen DeStigter, MD (chair), Janet E. Bailey, MD, Jocelyn D. Chertoff, MD,

- Current residents predicted that 85% of future residents will undergo fellowship training after residency graduation and before taking the ABR certifying examination 15 months later.

It is evident that program directors are faced with challenges and opportunities in developing schedule and curriculum changes for the core curriculum and for the fourth year. During the core curriculum, radiology training programs are required to teach their residents the fundamentals of diagnostic radiology, safety, and radiologic physics. Challenges include managing the integration of physics education during all 4 years of training, scheduling the Armed Forces Institute of Pathology (AFIP) away rotation, determining how scholarly activity and research fit in, and satisfying US FDA and Mammography Quality Standards Act training requirements and the Nuclear Regulatory Commission's radioactive materials training requirements. The 36-month ABR core examination will encompass anatomy, physiology, safety, and clinically relevant physics. What modifications to the current curriculum will be necessary to prepare our residents for this examination? How will physics be integrated into the curriculum? Will the AFIP rotation need to be scheduled in the second and fourth years to accommodate board preparation in the spring of the third year? Will residents have time to pursue research and scholarly activities during the core training years? Program directors will need to examine the strengths and weaknesses of their own programs and make schedule and curricular adjustments within the constraints of their own program resources [7].

The APDR Residency Restructuring Committee proposes the following guidelines for program directors to consider for the core curriculum (R1-R3) [5]:

- Structured scheduling with required core rotations is proposed for the first through third years of radiology residency (R1-R3). It is unlikely that programs will be able to offer electives during these years.
- Proposed guidelines for the core curriculum (R1-R3) include 3 rotations in each of the core subspecialties (or equivalent, depending on the unique features of each training program): neuroradiology, vascular and interventional radiology, musculoskeletal radiology, cardiothoracic radiology, abdominal radiology, pediatric radiology, ultrasonography (including obstetric and vascular ultrasonography), and nuclear radiology (including PET and nuclear cardiology). The R1-R3 curriculum should also include 2 rotations of breast radiology with the third required breast rotation scheduled during the R4 year.
- Some programs might provide limited (pending individual program resources) relief from in-house call for third-year residents 3 to 4 months before the 36-month core examination.
- Residents may prefer to be scheduled for AFIP rotations from January through June of the second year (R2), July through December of the third year (R3), or during the fourth year (the rationale being that the physics curriculum is likely to become more focused during the 6 months leading up to the core examination).
- Adjustments should be made to the physics curriculum to transition into an integrated, clinically relevant curriculum with clinical case scenarios supplemented with online resources.
- The general radiology curriculum should be revised to increase the focus on anatomy, physiology, and medical management. Because the future radiology core curriculum will consist of 3 years rather than 4 years, programs might consider repeating the core curriculum lecture series every 18 months instead of every 24 months.
- In the future, the specialty societies may need to help define the "core rotations."
- The documentation of the ACGME case logs will be required only for the R1 to R3 years.

The APDR Residency Restructuring Committee proposes the following guidelines for program directors to consider for the fourth year (R4):

- Structure the schedule to include one rotation each in mammography (the Mammography Quality Standards Act's minimum residency training requirement is 12 weeks) and nuclear medicine (the US Nuclear Regulatory Commission's minimum residency training requirement is 16 weeks) during the fourth year.
- Include a requirement that fourth-year residents take in-house call. This helps provide call relief for the R3 residents and is integral to the professional development and maturity of our future leaders.
- Consider offering 2-month to 3-month blocks of focused training during the fourth year. Many programs prefer this option.
- Some programs may offer 6 to 9 months of focused training within the constraints of program resources. The fourth-year educational experience will need to be adjusted so that it does not have a negative educational impact on the training of core residents.

On the APDR resident survey, residents agreed that they generally prefer smaller blocks of focused training in different subspecialty areas to a larger block of time in a single subspecialty area. This model should be a more attractive option for programs with limited resources. For some small programs, a fourth year with more diverse

training that resembles the R1 to R3 years will be the norm.

For programs that will offer larger blocks of focused training, the discussion with individual residents regarding desired areas of concentration will likely take place during the latter part of the second year or early in the third year, and the fourth-year schedule will be adjusted accordingly. It is important to keep in mind that the new July 2010 radiology program requirements purposely allow for flexibility in scheduling the fourth-year rotations "within program resources" to include "general radiology" [5]. Maintaining flexibility will be a key factor in optimizing the transition from the current curriculum and schedule to the new curriculum and schedule within a training program. It is important to remember that the actual delegation of specific rotations during the fourth year falls under the jurisdiction of the program directors and depends not only on resident interests but on the needs of the clinical services and the availability of program resources.

THE ABR EXAMINATIONS

The ABR initially planned to schedule both the last ABR oral examination for fourth-year residents and the first core examination for third-year residents at the end of the academic year in 2013. Early on, the APDR Residency Restructuring Committee identified this timing as a tremendous challenge for programs and petitioned the ABR to move the first core examination to the fall of 2013. At this time, the ABR has agreed to move the date of the first core examination to accommodate the unique challenges of 2013.

The American Association of Physicists in Medicine (AAPM) and the Radiological Society of North America (RSNA) are developing Web-based physics resources designed to supplement radiologic physics education in residency programs. These resources include a revised physics curriculum syllabus and online modules. The recently approved curriculum in medical physics for diagnostic radiology residents can be accessed via a link on the APDR's Web site [8] or directly on the AAPM's Web site [9]. The initial set of 16 physics Web modules was released at the RSNA's 2009 annual meeting and is available to any RSNA or AAPM member. Additional modules are nearing completion, and a second phase of module development is planned for 2010. Approximately 40 to 45 total modules are anticipated. These modules are image rich and were written by teams of radiologists and physicists to help bridge the gap between physics and clinical radiology. These modules will also enhance educational opportunities for programs lacking physicist expertise in one or more areas of study. In addition, the modules can be assigned during clinical rotations so that

the physics training is concurrent with the clinical training. Posttests are provided with each module and can be used by program directors to document successful completion of the modules. It is hoped that additional radiology resources will become available to aid programs and trainees in preparing for the computerized image-rich core and certifying ABR examinations of the future.

Residents who apply to sit for the ABR certifying examination may have missed no more than 120 days from the total 4 years of residency training. This policy will remain after the new examination structure is in effect. It is the current understanding of this committee, after discussion with the ABR, that activities in the fourth year of training that are part of the training curriculum or are electives that promote the educational experience of the resident in the program will not count against the 120-day requirement.

CONSEQUENCES: INTENDED AND UNINTENDED

One of the most challenging aspects of these changes will be to provide both core teaching and focused subspecialty experiences within existing department resources without compromising the learning experiences of residents or fellows and while maintaining the positive aspects of residency culture. Some programs have proposed a competitive approach to the assignment of the most highly sought focused rotations in the fourth year. A program that chooses this approach will have to define the selection process and criteria and monitor the outcome of this approach. Unintended consequences could include a devaluing of the less desired rotations and a competitive rather than cooperative attitude among the residency group, possibly leading to less collegiality (eg, less willingness to trade calls or to help one another).

The suggested timing of AFIP from January to June of the R2 year and July to December of the R3 year may become another source of stress among the residents because they are likely to perceive AFIP to be a critical rotation in the R3 year before the core examination. Programs may need to manage this scheduling by lottery or competition. Programs could begin adjusting their AFIP schedule now in preparation for 2012 to 2013 (before the last oral examination and the first core examination), when there is expected to be significant competition for these slots. In addition, it has been suggested by members of this committee that AFIP consider integrating physics into its curriculum, creating a modern model of radiology education that can be replicated at the program level.

The flexibility of the fourth year introduces the possibility of truly different and exciting opportunities. A research elective of several months' duration would have

the potential for accommodating basic science research as well as clinical research. Academic institutions may be able to take advantage of the educational resources within their systems and facilitate projects with their departments or in associated graduate programs of engineering, business, law, sociology, and health policy. Some programs may choose to offer electives focused in teaching, leadership, quality improvement, informatics, or international outreach. For nonclinical or off-site electives, there will be reimbursement challenges, and residents may need to look at other funding sources for innovative programs. Certainly, the upcoming changes will provide ample opportunity for programs to be creative and innovative as we mold our future leaders.

CONCLUSIONS

The field of radiology is in a period of intense scrutiny. Now is the time for us to determine how to educate our residents to take leadership roles in creating the new paradigm. As we prepare for the changes that will occur in our diagnostic radiology training programs brought forth by the new ABR examination process, we have the opportunity to manage these changes in a way that maximizes the benefit to our profession. The APDR Residency Restructuring Committee has attempted to identify and address the challenges and opportunities that will result from these changes. Our recommendations will likely be modified as the requirements put forth by the regulatory, accreditation and certification bodies continue to evolve. This committee will continue to assess

outcomes of the restructuring process, communicating ideas and best practices as we go forward.

REFERENCES

1. Amis ES Jr, Dunnick NR; American Board of Radiology; Diagnostic Radiology Residency Review Committee. Improvement in radiology education: joint efforts of the American Board of Radiology and the Diagnostic Residency Review Committee. *J Am Coll Radiol* 2009;6:103-5.
2. Amis ES Jr, Baker SR, Becker GJ, et al. Panel discussions in radiology: changes in radiology training and new examination format. *AJR Am J Roentgenol* 2008;191:W217-30.
3. American Board of Radiology. ABR exam of the future: update RSNA 2008. Available at: http://www.theabr.org/present/eof_update_dec08.pdf. Accessed October 31, 2009.
4. Pressman BD, Hoffman TR. ACR white paper: Task Force on Timing of Oral Boards in Diagnostic Radiology. *J Am Coll Radiol* 2008;5:1112-7.
5. Accreditation Council for Graduate Medical Education. ACGME program requirements for graduate medical education in diagnostic radiology. Available at: http://acgme.org/acWebsite/downloads/RRC_progReq/420_diagnostic_radiology_07012010_TCC.pdf. Accessed October 19, 2009.
6. Deitte LA, Dravid VS, Heitkamp DE, Shirkhoda A. The new 4th year: challenges and opportunities. 2009 annual AUR meeting presentation. Available at: http://www.apdr.org/documents/2009_meeting_materials.cfm. Accessed October 19, 2009.
7. Deitte LA, DeStigter KK, Heitkamp DE. Update from the APDR Residency Restructuring Committee: options for program directors. 2009 annual AUR meeting presentation. Available at: http://www.apdr.org/documents/2009_meeting_materials.cfm. Accessed October 19, 2009.
8. Association of Program Directors in Radiology. Residency curriculum/ goals and objectives. Available at: <http://www.apdr.org/directors/curriculum.cfm>. Accessed November 7, 2009.
9. American Association of Physicists in Medicine. Curricula and teaching aids. Available at: <http://www.aapm.org/education/teachingaids.asp>. Accessed November 7, 2009.