

## INTEGRATING PHYSICS INTO CLINICAL TEACHING IN THE ERA OF THE NEW ABR EXAM

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## ABR Core Exam of the Future

- Core exam covers the entire field of radiology, case based, basic to intermediate experience level, random findings, some normals, image rich, practical, with physics included.
- Resident physics training should be clinically focused, with an emphasis on understanding image quality, artifacts, dose and patient safety for each modality/subspecialty.
- Incorporating physics educational content into the curriculum is more difficult because of time constraints and the need to tie the physics to the clinical
- However, **the physics has not changed!**

## Residency Rotations By Year

- Year 1
  - Clinical orientation – up to 1 full week
  - Physics orientation – up to 1 full week
  - Fundamentals of clinical radiology plus pre-call training
  - Physics Course: Basic Physics, Radiation Biology and Radiation Protection (12 months)
  - month 1 of 4 in clinical nuclear medicine

## Residency Rotations By Year

- Year 2
  - Build clinical fund of knowledge
  - Significant call responsibilities (fatigue)
  - Advanced physics topics & Nuclear Medicine (12 months)
  - month 1 of 3 in breast imaging (or in 1<sup>st</sup> year, but it competes with the growth of fund of knowledge and pre-call training)
  - month 2 of 4 in clinical nuclear medicine
  - AIRP (AFIP) ? - Enough clinical experience to be useful this early in their training?

## Residency Rotations By Year

- Year 3
  - Continue to build clinical fund of knowledge
  - Reduced call in second half of year
  - AIRP (AFIP) ?
  - month 2 of 3 in breast imaging
  - month 3 of 4 in clinical nuclear medicine
  - Advanced physics topics (MRI) (1<sup>st</sup> 6 months)
  - Clinical Board review course (2<sup>nd</sup> 6 months, hot seat plus clinical lectures)
  - Physics Board review course (2<sup>nd</sup> 6 months, off hours ?)
  - Attend a clinical and/or physics review course ?
  - Fellowship interviews ?
  - Take ABR Core Examination at end of year

## Residency Rotations By Year

- Year 4
  - Build clinical fund of knowledge
  - Mini-Fellowships (1-6 months each, if available)
  - Advanced physics topics (attendance depends on fellowship / rotation location)
  - month 3 of 3 in breast imaging, interpreting 240+ mammograms (so they can qualify through MQSA to interpret mammograms in the 15 months before the ABR certifying exam – last 6 months ?)
  - month 4 of 4 in clinical nuclear medicine
  - Job interviews
  - Take more call than in the past
  - Seniors will all take vacation in June
  - Have seniors mentor 1<sup>st</sup> year residents!

## New Ideas for Physics: The Short Course

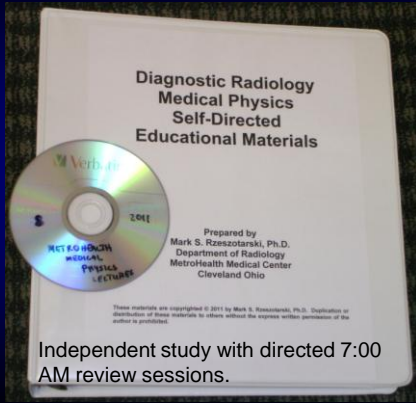
1. Incorporate physics into the existing AIRP course
2. Separate national physics course run like AIRP (use tag-team radiologist/physicist teaching?, how long?, when to take, sponsor?)
3. Dedicated physics rotation

Fits the “binge-and-purge” model loved by residents but ACGME says we must provide physics education throughout the residency

## New Ideas for Physics: Integrated Physics Approach

1. Concurrent courses like the 4 year approach shown in the previous example
2. Create a single 12, 18 or 24 month physics course and repeat it every 1, 1.5 or 2 years

## MetroHealth Approach for 2011



## Year-Round Monthly Physics Conferences

- Once per month, frequently coordinated with a radiologist lecture on the next day
- More clinical focus: safety, quality, dose
- Examples:
  - Radioiodine Therapy Procedures
  - Breast MRI Physics
  - MDCT Benefits & Risks
  - Interventional Dose & Safety
  - Image Quality

## Association of Program Directors in Radiology (APDR) April 2011 Survey Results

41. Are you planning to modify your residency physics curriculum for the new ABR core exam?

	Response Percent	Response Count
Yes	82.4%	98
No	17.6%	21
answered question		119
skipped question		21

## APDR 2011 Survey Results

42. Regarding the physics didactic curriculum, are you planning to:

	Response Percent	Response Count
Repeat the entire physics didactic curriculum annually	35.3%	42
Spread the entire physics didactic curriculum over three years (introductory, medium difficulty, advanced)	36.1%	43
Offer a "focused" physics board preparation during the months prior to the ABR exam only	7.6%	9
Offer small group discussion sessions instead of a formal didactic curriculum	1.7%	2
Other (please specify)	19.3%	23

## APDR 2011 Survey Results

44. How do you plan to integrate the RSNA/AAPM on-line physics modules into the physics curriculum?

	Response Percent	Response Count
Assign the modules to residents while on rotations (ie: complete the U.S. module while on a U.S. rotation)	31.0%	38
Assign the modules to residents based on year of training	23.3%	27
Assign the modules to residents as part of the didactic conference schedule	19.8%	23
Do not plan to integrate the modules into the physics curriculum	7.8%	9
Other (please specify)	18.1%	21

## Questions?



Mark Rzeszotarski's Home Page

- <http://rzeszotarski.com/>
- Copies of three recent articles on teaching physics
- Favorite book list
- Misc. useful links