



Alliance of Clinician-Educators in Radiology

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Drs. Mark Mullins and Aine Kelly at the 2016 AUR meeting in San Diego

This newsletter serves to highlight the current ACER goals and available resources and to keep members informed of ongoing projects.

Members and potential new members are encouraged to get involved in the stimulating and worthwhile activities of ACER. One way this can be achieved is through committee membership and organizational leadership, please contact Aine Kelly (ainekell@umich.edu) ACER president.

Members are also invited to send their contributions to the upcoming ACER newsletters. These contributions may be sent to Matthew Heller (hellermt@upmc.edu) or Ana Lourenco (alourenco@lifespan.org).



ACER's Mission & Goals

- Providing a formal organization and forum for clinician-educators to meet, exchange ideas, and learn new skills that promote and advance the careers of clinician-educators.
- Providing programming at the annual AUR meeting targeted towards the needs of clinician-educators.

ACER: Benefits of Membership

- Access to information and networking database for the benefit, awareness, and nurturing of clinician-educators.
- Opportunities for involvement in educational research

Membership Update

- As of December 2016, the AUR total membership stands at 1611.
- ACER has 155 members, consisting of 101 full time members and 54 junior members.
- ACER's membership is third to AMSER's (203) and RRA (195) among the AUR Affinity Groups; other Affinity Groups include RAHSR (126) and A³CR² (45).

Condition C: Radiology

By Michael Magnetta, MD, MS

“Condition C, Radiology.” These are words that no patient or radiologist wants to hear over the hospital public address system. Though rare, true anaphylactic contrast reactions are potentially deadly medication allergies. Despite the serious nature of these reactions, many radiologists feel ill prepared to administer first-response care because of the rarity of these events and lack of hands-on experience. Just as airline pilots must train repeatedly for unlikely catastrophes, radiologists, technologists and nurses must train for first-response assessment and resuscitation in the event of a contrast reaction.



Prior to 2016 at the University of Pittsburgh Medical Center (UPMC), contrast reaction training consisted of Advanced Cardiac Life Support (ACLS) certification, self-study and an occasional didactic lecture given by a faculty member to residents. That changed after one of the residents, Dr. Alisa Sumkin (class of 2018) was called to a true anaphylactic contrast reaction and felt that she could improve and standardize our training for these serious events. Under the guidance of faculty mentors, Dr. Marion Hughes and Dr. Philip Orons, Dr. Sumkin and Dr. Michael Magnetta (class of 2018) created a comprehensive online and hands-on contrast reaction and medical emergency first-response training course at the Peter M. Winter Institute for Simulation, Education and Research (WISER) Center. The curriculum aims to provide relevant and tailored multidisciplinary high-fidelity education to radiologists, residents, technologists and radiology nurses.

The course assesses baseline knowledge with an online quiz and then reviews basic first-response medical care via online modules that were co-created by WISER Director of Educational Development, Debbie Farkas, PhD. Course participants then actively participate in hands-on simulations of multiple different clinical scenarios using advanced medical mannequins. These scenarios allow participants to learn how to assemble and use medications and devices that are necessary for emergency care. Course content was reviewed and amended by residents in the Department of Internal Medicine at UPMC prior to implementation. Faculty, residents, nurses and technologists have reacted positively to the contrast reaction course and have requested that it become mandatory yearly training. Participants can receive 2.5 hours of continuing medical education credit. Furthermore, the course has spurred the development of a task-force within our department to standardize radiology emergency treatment protocols across our large, multisite health system.

This collaboration between our academic radiology department, the Department of Internal Medicine and the WISER center demonstrates how clinical radiologists can become patient safety advocates, act as stewards of multidisciplinary committees, and embrace education leadership.

Integrating Residents in Medical Student Teaching

By Maria Shiau, MD, MA

"To teach is to learn twice." - Joseph Joubert

Arguably the primary mission of a radiology residency program is training residents to become competent – radiologists, able to provide patient-centric care in a respectful and professional manner. But the mission does not end there. In addition to interpreting studies and performing procedures, residents need the skills to impart knowledge to future generations of medical students and residents. "Residents as teachers" is a LCME educational directive and ACGME core competency. The act of teaching itself is one of the most effective ways for residents to learn. Other subspecialties have banded together to devise curricula which satisfy these requirements. These efforts, however, focus on overseeing medical student history and physicals, - activities far less applicable to radiology. Our resident as teacher curriculum must address our unique speciality. -



Ways to enhance resident-student teaching at the workstation include:

1. Asking questions and giving students time to answer - Students can't tune out when they are expected to answer questions. Therefore, give them time to think things out-. This exercise also helps to gauge the student's fund of knowledge.
2. Allow students the time to review a study then ask them to describe the salient abnormality and most likely diagnosis. You can then demo your review technique and articulate how you arrive at your conclusion.
3. Ask students to review a particular topic / diagnosis and provide a 2-minute summary the following day.

What about classroom teaching? The MedU Core (Case-based Online Radiology Education) series provides a robust medical student curriculum with companion flipped classroom PowerPoints with extensive 'teacher notes'. Residents could easily adapt these teaching materials and provide classroom teaching which is both interactive and vetted. To complete the experience residents should be provided faculty and student feedback.

What about hands-on workshops? Our residents pioneered our monthly medical student hands-on ultrasound workshop. Their ability to communicate at the appropriate level and anticipate stumbling blocks is invaluable. Faculty supervision is now provided and student feedback solicited.

Lastly, we are ushering residents into the gross anatomy lab with faculty and new innovative radiology-anatomy iBooks, integrating what students learn in the lab with imaging. Again residents will be provided with both faculty and student feedback.

Residents are an important adjunct to medical student education but they should be supervised, given constructive feedback and not overly burdened.

Institution of a radiology resident teacher of the year award by medical students would acknowledge resident contributions .

Simulate PACS scrolling through CT/MR in Powerpoint

By Jeffrey Robinson, MD, MBA



As a radiologist, images are everything. When we lecture from text slides, we lose the audience. Presenting plain film findings in Powerpoint is pretty straightforward. However, I have been frustrated in trying to present CT scans in the lecture format. How can I impress on my audience, either residents, other clinicians or laypeople, the quantity of data available in cross sectional imaging studies? At a recent meeting a presenter used the following technique to simulate the PACS environment in Powerpoint. He was able to scroll forward through a set of CT images, then backward to the slice in the middle of the stack that had the finding, and back and forth at will. (disclosure: I don't remember the radiologist's name, and even though he explained how to do it, I promptly forgot everything). The following instructions are copied from the Global Radiology CME website (<http://www.globalradcme.com/single-post/2015/09/30/How-to-Add-a-Scrollable-CTor-MRI-Image-Stack-to-a-Powerpoint-Slide>)

The basic steps on Mac:

1. Export the image stack from PACS as JPEG images. If your PACS can not export as JPEG, use Osirix to convert from DICOM to JPEG. Make sure the images are de-identified either with PACS or Osirix.
2. Resize all images to 630 x 630 pixels.
3. Copy and paste the entire set of JPEG images to a single blank slide.
4. Select all and click Animate> Appear.
5. On the right side, where the list of "Play Selected" is, select all (with Ctrl-A)
6. Below under "Timing", click Start> On Click.
7. Save.
8. In presentation mode, use mouse or wheel to scroll through the images.

These are my minor modifications for Windows:

1. Export the image stack from PACS as JPEG images. If your PACS can not export as JPEG, use DICOM Converter to convert from DICOM to JPEG. Make sure the images are de-identified in PACS prior to download.
2. Resize all images to 630 x 630 pixels.
3. Copy and paste the entire set of JPEG images to a single blank slide.
4. Click animations on the tool bar, click on Custom Animation
5. Click the little triangle on Add Effect>Entrance> Appear.
6. On the right side, where the list of "Play Selected" is, select all (with Ctrl-A)
7. Above at "Start" select "On Click".
8. Save.
9. In presentation mode, use mouse or wheel to scroll through the images.

For video learners, here are two YouTube links covering the same process:

<https://www.youtube.com/watch?v=P1Wl9qlqNj0>

https://www.youtube.com/watch?v=HdfJ0pN_i4Y

Keep in mind, though, that with too many images in the stack, your computer may slow down.

How Can We Maintain our Educational Goals in an Evolving Practice Model of Academic Radiology?

By: Mai Elezaby, MD

How Can We Maintain our Educational Goals in an Evolving Practice Model of Academic Radiology?

One of the primary missions of academic radiology departments is providing high-quality training to residents. However, the changing economic environment paved the way to newer practice models with increasing expansion of academic institutions into the community [1]. These expansions often pose a difficult decision for radiology leadership: "Should the residency training experience extend to these off-campus sites?" From a radiology educator perspective, this changing practice model provides both opportunities and challenges for a residency program and its educational mission. Some of these opportunities include: (1) providing larger volumes of radiologic exams and interventional procedures for training; (2) exposure to a wider variety of pathologies and clinical scenarios; (3) introducing different models of clinical practice in comparison to large medical centers; and (4) reinforcing practice based learning, through quality assessment and practice improvement measures which are often undertaken at newly acquired sites. These variables no doubt can enhance the educational experience for trainees by better preparing them for the clinical experience after graduation. On the other hand, increasing off-campus training sites pose educational challenges which may include: (1) maintaining residents' access to the offered radiology lectures as part of their curriculum; (2) identifying feedback mechanisms to residents on their interpretations when face-to-face feedback is not possible; and (3) identifying champions of teaching at these off-campus sites that can guarantee preservation of a learning environment for residents. The good news is that information technology (IT) solutions can offset some of these challenges. These may include:



1. Web based Video conferencing software for resident lectures: these allow consistent access to lectures during off-campus rotations. Some of them also allow video capturing for later viewing [2].
2. Electronic feedback mechanisms for residents' interpretations: these allow consistent feedback to residents on their interpretations even in the setting of off-campus rotations [3].
3. Cloud-based file sharing tools: these allow a central location of educational material and clinical protocols [4]
4. Access to clinical decision support systems that integrate best practice parameters and appropriateness criteria: these can act as quick reference guides to trainees at off-campus sites and empower them in providing quality patient care [5]

In conclusion, the evolving landscape of academic radiology carries educational opportunities for residency training. However, thoughtful implementation, out-of-the box thinking and involvement of the key stakeholders guarantee the alignment of the educational and clinical goals.

References can be found on page 10.

Mentoring the Masses... How are we doing?

By Stacy Smith, MD



Throughout our medical careers we wear many hats. For those of us in education, Mentoring is a key component of what we do on a day-to-day basis, whether it be undergraduate students, residents, junior faculty or even our own peers. However, a current literature review and results of a recent departmental survey demonstrate that mentoring skills are more often than not learned on an "Ad Hoc" basis rather than acquired through formal training. As Director of the ARRS Annual Introduction to Academic Radiology Program (ITAR) and in other medical educational leadership roles, I have seen firsthand the need for structured mentoring; in particular, residents from smaller programs have little in terms of academic or research mentorship at their local sites. These residents commonly look to those in Radiology Society Leadership positions for guidance in research, education, and clinical expertise as well as career choices or work life balance. Given the critical need for mentoring, we recently implemented a formal mentoring program at our institution using the following steps and guidelines:

1. Determine Major Players: Utilize residents as teachers (RAT) as a cornerstone. We created leadership tracks for 4th year radiology residents (senior residents paired with faculty members in specific areas of expertise) harnessing trainee creativity with respect to design of new curricula/programs.

2. Gather Essential Data:

a) Surveys of residents and faculty can best gauge the current mentoring milieu of a department. Residents are eager to assist in what is most needed in their training programs. Honest input from faculty as to their mentoring background and needs are also paramount.

b) Research current mentoring support systems/educational tools and leadership in your department/institution, other institutions, and societies (ie: AUR, APDR, and ARRS currently have excellent mentoring programs)

4. Create Program Materials:

a) Mentoring toolkit: include formal mentor/mentee agreements, flipped classroom educational modules, visiting expert speakers/moderators, and conference sessions on mentoring theory.

b) Develop a "live" departmental folder/website with articles/websites for mentees/mentors. Add an area to post achievements/ outcomes of the program.

Our program utilizes residents as mentors for junior residents as well as traditional faculty mentors, according to matched criteria. Dedicated time during the work day for mentor/mentee meetings demonstrates departmental support. Mid and year-end evaluations by mentees and mentors are essential.

By initiating the mentoring process early and supporting both sides of the mentoring process, we look forward to a well honed structured mentoring system for trainees and faculty alike.

Data-Analytics: An innovative approach for healthcare challenges

By Joshua Rosenbaum, MD and
Puneet Bhargava, MD

Advanced analytics initiatives in radiology departments can help improve operational efficiency, increase revenue, optimize marketing strategies, and enhance customer satisfaction. Our department formed an industry partnership to base an analytics team locally. In a short interval we identified how these new capabilities can help us understand our challenges in ways not before possible.



Let's use the problem of why patients "No Show" or "Cancel" their radiology appointments as a prototype. We were able to search our radiology information system (RIS) from January 1, 2000 to December 31, 2015 across three university-affiliated hospitals, as part of an IRB-exempt quality improvement study.

We identified more than 8.4 million radiology exams amongst 907,250 patients over a 16-year interval. Of the 4,402,118 outpatient exams completed, we studied the many administrative data points available in our RIS.

The strongest predictors of cancellation and No Show were modality, day and time, scheduling lead-time, ordering provider, and previous failed appointments. No Show rates were highest in mammography and lowest in PET. Cancellations were highest in nuclear medicine and lowest in radiography. Missed exams were most likely on Monday and decreased until Sunday. Early morning appointments showed higher rates of cancellation and No Show while lunch-hour and late afternoon appointments were likely attended. Exams scheduled within 16 days were most likely completed while those scheduled more than 9 months in advance were more likely missed. Patients with a history of a No Show were more likely to No Show and cancel in the future. We also identified the top ten ordering providers with the most cancelled and No Show studies.

Data analytics is helping us predict which patients are more likely to miss scheduled imaging. Further work in this area has the potential to reduce inefficiency and lost revenue for our department. Availability of data analytics software is helping us approach existing problems in novel ways and guide systems redesign so we regain lost opportunities to care for these unique subset of patients.

Such approaches developed within the radiology department have the potential to be scaled up to the level of a healthcare system and change our current practices in a huge way. This is yet another way where radiologists can integrate into the full spectrum of patient care and demonstrates long-term relevance of radiology through the highest quality patient care as outlined in the ACR 3.0 initiative.

Overnight Emergency Radiology Staffing

By Jeffrey Robinson, MD, MBA



Like so many unsettled issues in resident education, on-site overnight faculty supervision of emergency radiology residents has advantages and disadvantages, with passionate advocates for each position. While I cannot say what the best solution is for your institution, let me outline our current situation and offer some insights from recent publications.

We staff a level 1 trauma center with 24 x 7 resident coverage. Dedicated Emergency Radiologists cover the service on-site every day from 7AM to 10PM and from home overnight.

From our residents' perspective, making decisions without on-site faculty oversight fosters confidence and promotes efficient practice. They feel the stress of being 'alone', but almost uniformly report that they do not want increased faculty presence at night.

From the faculty's perspective, quite frankly, there is little enthusiasm for overnight coverage. Our clinical colleagues are satisfied with the current staffing plan and know that we are available if needed.

From a patient care perspective, there is abundant literature reviewing discrepancy rates of resident and attending interpretation of overnight exams, usually showing less than 5% discrepancy. A recent report casts those studies in some doubt [1].

From an administrative perspective, overnight faculty coverage is costly (\$850,000 per year by one estimate[2]), and delivers no additional revenue.

A 2014 survey found that 48% of responding academic radiology programs had traditional resident-staffed night coverage, with faculty overreads done the following morning. There were a variety of other arrangements comprising the other 52% ranging from partial on-site coverage to outsourced commercial nighthawk services[3].

Recent published surveys find that residents felt that they received more frequent feedback and worked at a more relaxed pace with on-site attendings, but both residents and faculty felt that on-site supervision negatively affected graduating residents' interpretive efficiency[4-6].

In summary, what works best for your program will be influenced by resource availability, demands from clinical services and your current coverage model. These studies may help inform discussions when they arise.

References can be found on page 10.

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