Bridging the Gap: A perspective from a full-service private practice

Brad Lofton, MS, DABR

Colorado Associates in Medical Physics, LLC

Colorado Associates
IN MEDICAL PHYSICS

DISCLOSURES

- Managing partner and full-time medical physicist for CAMP, LLC

OBJECTIVES

- Offer our perspective on how the *increased training requirements for medical physics* have impacted the following:
  - The quality and continuity of the services we provide
  - Our ability to hire well-qualified physicists
- Offer our perspective on how we can better facilitate training future medical physicists
  - Addressing current limitations
  - Tailoring residency programs more for full-service private practice
- Generate Discussion
  - I don’t have all the answers….

BACKGROUND

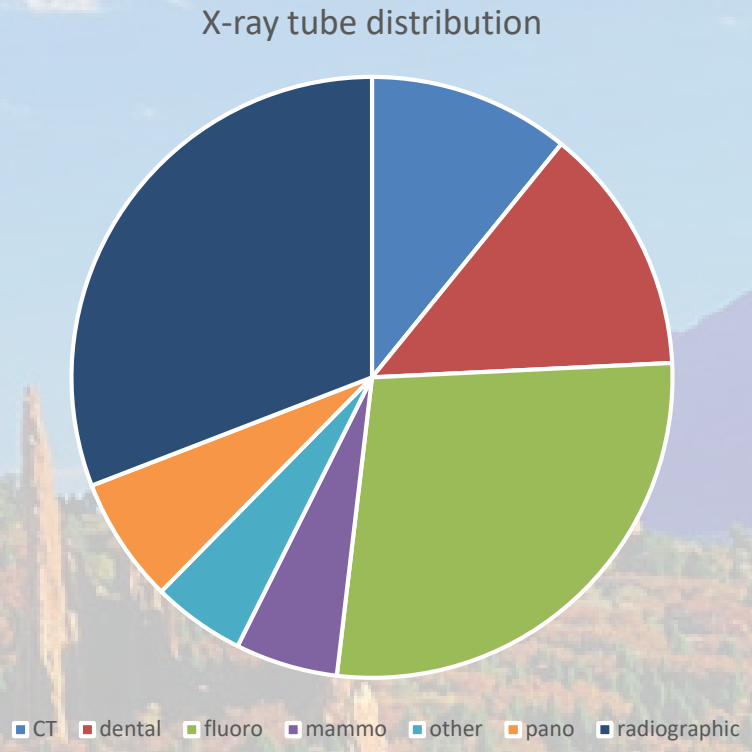
- Founded in 1988 to serve greater Colorado and Mountain West states
- Scope of Practice:
  - Therapeutic MP
  - Diagnostic MP
  - Nuclear MP
  - Radiation Safety and Health Physics

BACKGROUND

- Current Staffing
  - 18 Physicists
    - 8 ABR (TX)
    - 4 ABR (DX)
    - 4 ABR (DX, NM)
    - 1 ABR (TX, DX, NM)
    - 1 Health Physicist (in-process for CHP)
  - 5 residency graduates
    - 2 DMPs
    - 3 MS

SCOPE OF PRACTICE

- Diagnostic Imaging (7.6 FTE)
  - 5 healthcare systems
  - 50+ small to mid-size Hospitals
  - 7 outpatient imaging systems
  - ~2,400 x-ray tubes annually
  - Level 1, 2 and 3 work (TG-301)



SCOPE OF PRACTICE

- Radiation Oncology (7.9 FTE)
  - Full coverage for 3 integrated cancer centers (all ACR accredited)
    - 8 Linacs, 1 Cyberknife, 3 HDR Units
    - 100 – 140 patients/day across all centers
    - Support of special procedures programs at all centers (Stereo, HDR, IORT, TBI…)
  - Regular coverage support at one integrated cancer center (APEX accredited)
  - Vacation and short-term coverage for additional centers as needed and available

SCOPE OF PRACTICE

- Nuclear Medicine and Health Physics
  - 35+ RAM licenses
  - 5,000+ badged employees
  - Radiopharmaceutical therapies
    - Y90 microspheres
    - I-131
    - Ra-223
    - I-131 MIBG for pediatric patients
    - Lu-177 Dotatate

CONSULTANTS?

- Consulting versus “Private Practice”
  - Consulting – Implies a transient or passing relationship once a question has been answered
  - Private Practice – Implies an on-going relationship and an expectation that our presence is integrated
  - This distinction has implications for staffing expectations, as well as the expectations for physicists who are expected to integrate within a clinical environment
  - This distinction may also amplify some positives and negatives of residency programs

"IN-HOUSE" EXPECTATIONS

- In-house physicists are usually expected to demonstrate the following abilities:
  - Machine or equipment troubleshooting
  - PQI project facilitation
  - Radiation Oncologist and Radiologist Consultation
  - Capital purchasing guidance
  - System Radiation Safety oversight and active participation
  - Medical physics 3.0 integration into clinical practice
  - Active protocol or process review and revision
  - MRI safety program oversight

SUMMARY OF POSITIVE IMPACT

- Positive observations since the residency requirement:
  - Shorter time associated with training
  - Shorter time to board certification (all 5 resident hires were successful in ABR certification within a year of hire)
  - Fundamentals generally already developed
  - Demonstrated ability to perform PQI-type projects
  - Demonstrated knowledge in a variety of technologies and applications

SUMMARY OF POSITIVE IMPACT

- When programs handle training, as opposed to individuals on the job, there is less variability in the abilities and knowledge from trainee to trainee
- CAMPEP accreditation sets a minimum standard of quality for programs, thus improving the overall quality of post-residency graduates

CAVEAT…

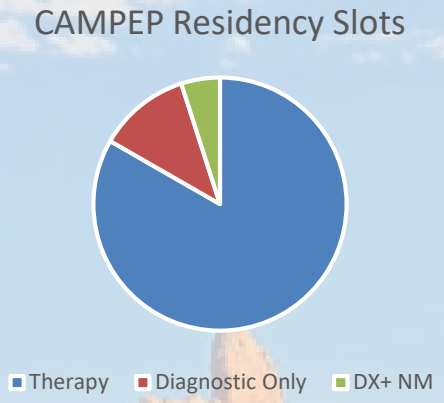
- Residencies will never be able to pre-emptively train for every conceivable nuance in departments or expectations of performance.
- Every site is indeed unique, with unique needs.
- Every resident personality is also unique.
- But our limited observation has been that new hires have a working knowledge of fundamental tasks associated with medical physicists, versus traditional modes of training.

HIRING CONSIDERATIONS

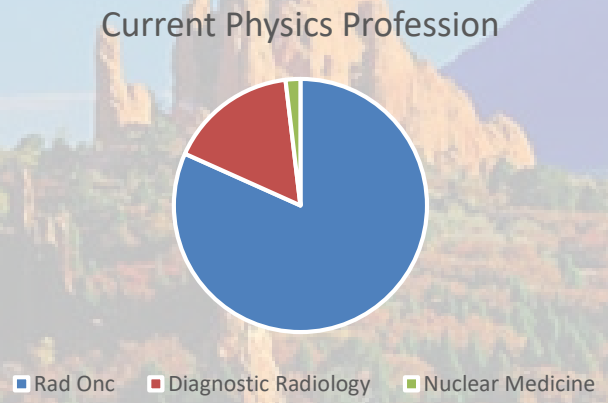
- It may be more difficult to hire physicists in the post residency requirement age, but I would argue that it's easier to find *well-qualified physicists*
- Timing of Therapy hires – not been a problem
- Timing of DX hires – has been a problem, but is this our fault?

OVERVIEW OF RESIDENCY PROGRAMS

CAMPEP Residency Distribution Between Specialties				
	Current # CAMPEP Programs	2017 Ave # Slots /year /program*	Estimated #Slots per year	Break Down
Therapy	99	1.55	153	83%
Diagnostic Only	19	1.14	22	12%
DX+ NM	8	1.14	9	5%
Total	126		184	
*Assumes the Imaging program slots/year were the same for DX and Dx+NM programs				
Source: CAMPEP Website				



Medical Physicist Distribution Between Specialties						
Primary Discipline	MS No Cert	MS Cert	PhD No Cert	PhD Cert	Total	Break Down
Radiation Oncology	123	894	115	775	1907	82%
Diagnostic Radiology	24	171	41	147	383	16%
Nuclear Medicine		9	8	27	44	2%
Source: 2017 AAPM Salary Survey						



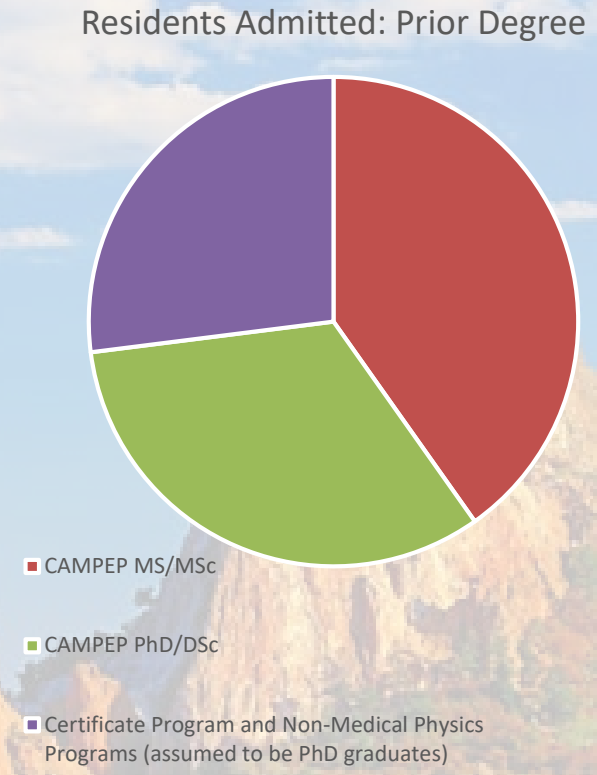
Why does it seem more difficult to hire in Diagnostic than in Therapy?

- There seems to be an equal distribution of specialties between residencies and in the field, but newer requirements may necessitate an increase in Dx need overall.

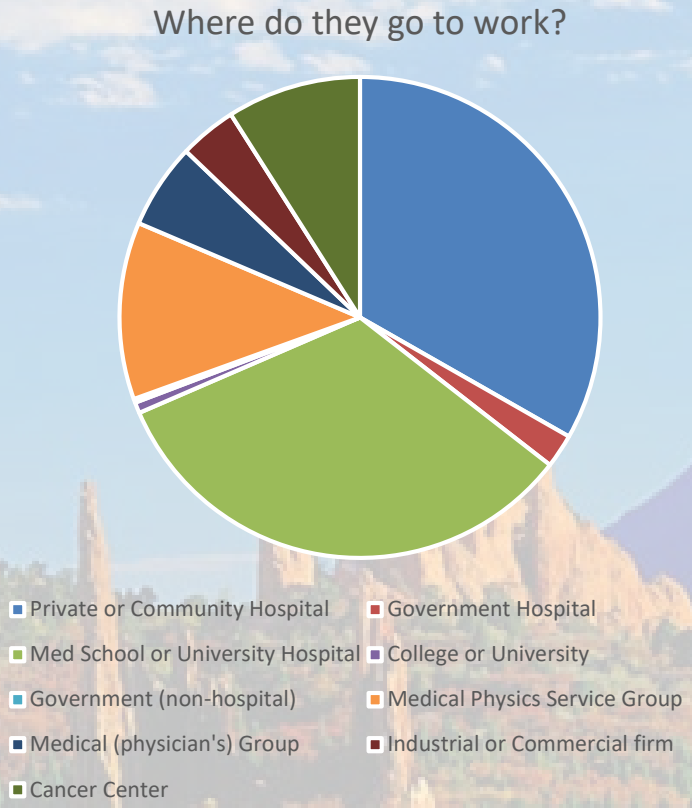
Does Nuclear Medicine get the attention it deserves?

Is there appeal for a Tx+NM Residency option? Triple Residency Option?

OVERVIEW OF RESIDENCY PROGRAMS



Reference: CAMPEP 2017 Report



Reference: 2017 AAPM Salary Survey

- About 60% of residency slots are filled by PhD's
- About 35% of the field includes positions that more commonly include research or academic components
- The remaining positions are more clinically focused.

OVERVIEW OF RESIDENCY PROGRAMS

In discussion with our five residency graduates, we learned…

- All had checklist of tasks to complete
- All residencies did include opportunities for teaching/presentations
  - E.g. - teaching physics to medical residents, teaching first year residents, journal club, etc.
- All seemed to emphasize involvement in clinical research opportunities
- Some residencies took a rotational approach, some were more self-directed
- Some actively examine at the completion of a rotation, some do not
- Few emphasized much professional time spent with physicians
  - E.g. – interacting with radiologists/rad oncs to discuss clinical topics like image quality or treatment plans
- Few residencies included significant time for Radiation Safety program oversight
- Few residencies explored “crossover” topics heavily

RESOURCES FOR RESIDENCIES

- AAPM Report No 249 (Revision of Report No 90): *Essentials and Guidelines for Clinical Medical Physics Residency Training Programs*, October 2013
- *Recommended ethics curriculum for medical physics graduate and residency programs: Report of Task Group 159*, 2010
- *CAMPEP Standards for Accreditation of Residency Educational Programs in Medical Physics*, Revised July 2018
- *ACR Guide to Professional Practice of Medical Physics*, 2018

ACR PRACTICE GUIDE TO PRACTICE OF CLINICAL MEDICAL PHYSICS - 2018

General Responsibilities:

1. Performance of Acceptance testing, calibration, and safety surveys of imaging and radiation therapy equipment.
2. Participation in the development of purchasing and acceptance specifications for imaging and radiation therapy equipment.
3. Consultation with radiologists, radiation oncologists, other physicians and medical professionals. concerning patient and fetal dose determinations
4. Participation in the clinical process of patient care in association with other medical specialists.

ACR PRACTICE GUIDE TO PRACTICE OF CLINICAL MEDICAL PHYSICS - 2018

General Responsibilities (continued):

5. Consultation with other physicians and patients regarding radiation exposure and safety.
6. Participation in department financial and personnel planning.
7. Teaching and presentation of continuing education programs for medical students, fellows, graduate students, physicians, nurses, technologists, ancillary personnel, and other staff.
8. Participation in planning for future medical facilities.

ACR PRACTICE GUIDE TO PRACTICE OF CLINICAL MEDICAL PHYSICS - 2018

General Responsibilities (continued):

9. Supervision and oversight of radiation safety program.
10. Development, implementation and supervision of quality control programs in areas related to medical physics.
11. Research and development of new devices and modalities for improved diagnostic and therapeutic uses.
12. Membership on applicable committees, such as the Safety Committee, Radiation Safety Committee, Radioactive Drug Research Committee, Continuous Quality Improvement (CQI) Committee, Disaster Committee, Cancer Care Committee, Institutional Review Board, and Sourcing and Procurement Committee.
13. Participation in clinical and basic research.

ACR PRACTICE GUIDE TO PRACTICE OF CLINICAL MEDICAL PHYSICS - 2018

Relationships:

1. Relations with Medical Physicists
2. Relations with Physicians
3. Relations with Regulatory Agencies
4. Relations with Patients
5. Relations with Public

SOME GAPS…

- Gaps between specialties
  - We've moved away from the age of triple certification
  - Nuclear Medicine: The lost specialty
  - Lack of Diagnostic and Nuclear medicine residencies
- Gaps between academic training and clinical practice
  - Troubleshooting
  - Radiation Safety/Health Physics
  - Leadership and Communication
  - Application-specific training (DECT, elastography, etc.)

POTENTIAL SOLUTIONS

- Building residencies around Medical Physics 3.0
  - Emphasis on patient care and safety
  - Emphasis on problem-solving strategies
  - Communication and Leadership
  - Identifying integrated solutions across sub-specialties
  - Building up our application specific knowledge base
- Building residencies with ACR Practice Guidelines in considerations
  - In addition to well established curriculum guidelines, provide training to cover additional clinical situations that may also arise in real world jobs
- Participate in residency offerings
  - Private practice groups offer advantages in training by covering a wide array of sites
    - Exposure to multiple vendors
    - Exposure to Cross-specialties (Tx, Dx, NM, health physics)
  - How can we make it more appealing for private practice groups to join the fray?
    - Some have already done so, more in imaging than in therapy

POTENTIAL SOLUTIONS

- More emphasis on Level 1 fundamental work in CAMPEP-grad programs
- More emphasis on Level 2 work in residency
- More intentional time spent with physicians
- More resident participation in site planning and capital purchasing
- Teaching by simulated scenarios
- Don't know your physicist in the other specialty? Get to know him/her! Work together to improve what you can offer in crossover training.

CHALLENGES OF STARTING A RESIDENCY IN A PP SETTING

- Cost
- Non-billable time
- Paperwork
- Physical Office Space
- Clients

WHY IS CROSSOVER IMPORTANT?

Some Examples…

- I-131 Project
  - Dx/NM physicists are traditionally better trained for this, but Tx physicists are often more accessible in the department
  - CAMP task group came together with 2 Dx and 2 Tx physicists to create a unified process for patient treatments across all sites
  - In our current set up, both Tx and Dx physicists cover I-131 patient procedures

WHY IS CROSSOVER IMPORTANT?

Some Examples…

- Y-90 DOSIMETRY
  - Again, Dx/NM physicists are traditionally better trained
  - Collaboration with Tx physicists allowed better patient dosimetry by utilizing Tx software, MIM.

WHY IS CROSSOVER IMPORTANT?

Some Examples…

- CT Simulators
  - Recent participation in CT Simulator purchase worked best with collaboration of Dx and Tx
- OBI QUALITY CONTROL PROGRAM
  - Tx Physicists know the use and operation of OBI, but diagnostic physicists are better trained in image quality applications.
  - Again, a collaborative approach has been useful

WHY IS CROSSOVER IMPORTANT?

Some Examples…

- STEREOTACTIC IMAGES FOR FUSION (MRI, PET)
  - Tx physicists understand applications, Dx physicists understand the imaging process
  - Example 1: Dx physicist noted a geometric problem on an MRI often used for stereotactic patient imaging but did not think to communicate to Rad Onc. Therapy physicist had noticed fusion difficulty for trigeminal cases (couldn't line both side up). Should we have application-specific tolerances?
  - Example 2: Same MRI, distortion correction factor was not always applied by MRI tech for Rad Onc patients. Collaboration efforts taught MRI techs when this is important, and taught therapy physicists where to look to determine if the correction factor is used

IN SUMMARY

- The residency requirement has been a **positive** change for our field
  - Standardization of training has helped ensure quality of new physicists
  - It is easier to hire well qualified physicists who can make an impact in a shorter amount of time
- We can still improve!
  - Find ways to encourage Private Practice groups to create more diagnostic/nuclear medicine residencies
  - Recognize the clinical training that will be helpful to residents regardless of where they take a job (ACR Guide)
    - Clinical leadership skills
    - Introduction to potential crossover areas
    - Skills they may need outside of academic practice: troubleshooting, radiation safety, independence & efficiency

References

- CAMPEP Website: www.campep.org
- AAPM Salary Survey (members only access): https://www.aapm.org/AAPMUtilities/download.asp?file=surveys/AAPM-Salary17.pdf
- ACR Guide to Professional Practice of Medical Physics 2018
- AAPM Report No 249 (Revision of Report No 90): *Essentials and Guidelines for Clinical Medical Physics Residency Training Programs*, October 2013
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