AAPM Position on Residency Training and Experience with an Academic CAMPEP Accredited Program

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Outline

- Why are We Here?
- AAPM Efforts → Consistency
- Experience in an Accredited Program

It is ALL about Patient Care

- Ultimately, the result of our work, regardless of whether we are researchers, educators or clinicians is the best possible patient care
- Providing tools and resources to improve the human condition
- We are fortunate that this is actually fun too and our services are in demand

Clinical

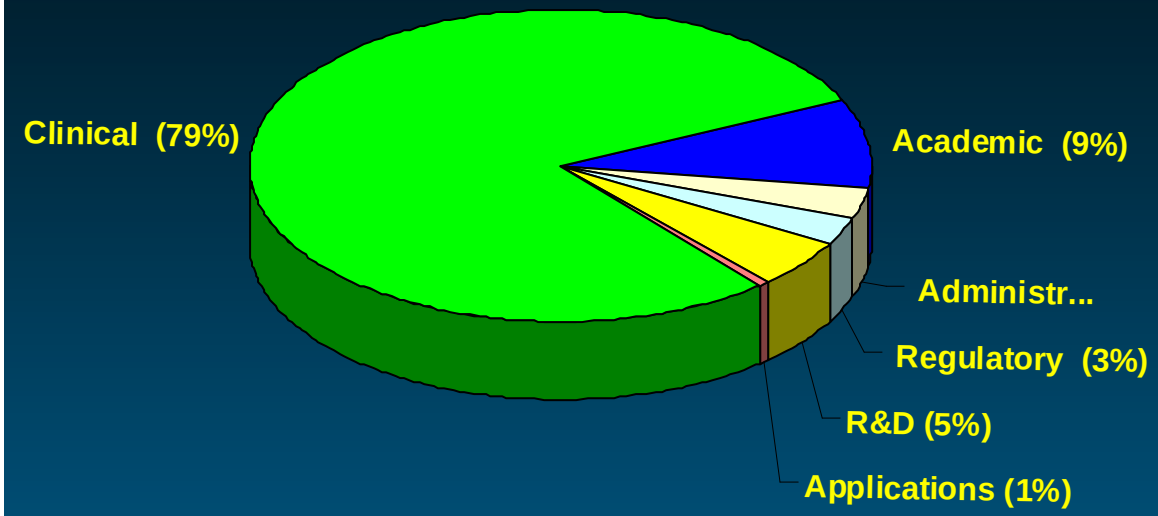
- **Definition of a Qualified Medical Physicist - AAPM**
- A Qualified Medical Physicist is an individual who is competent to practice independently one or more of the subfields of medical physics.

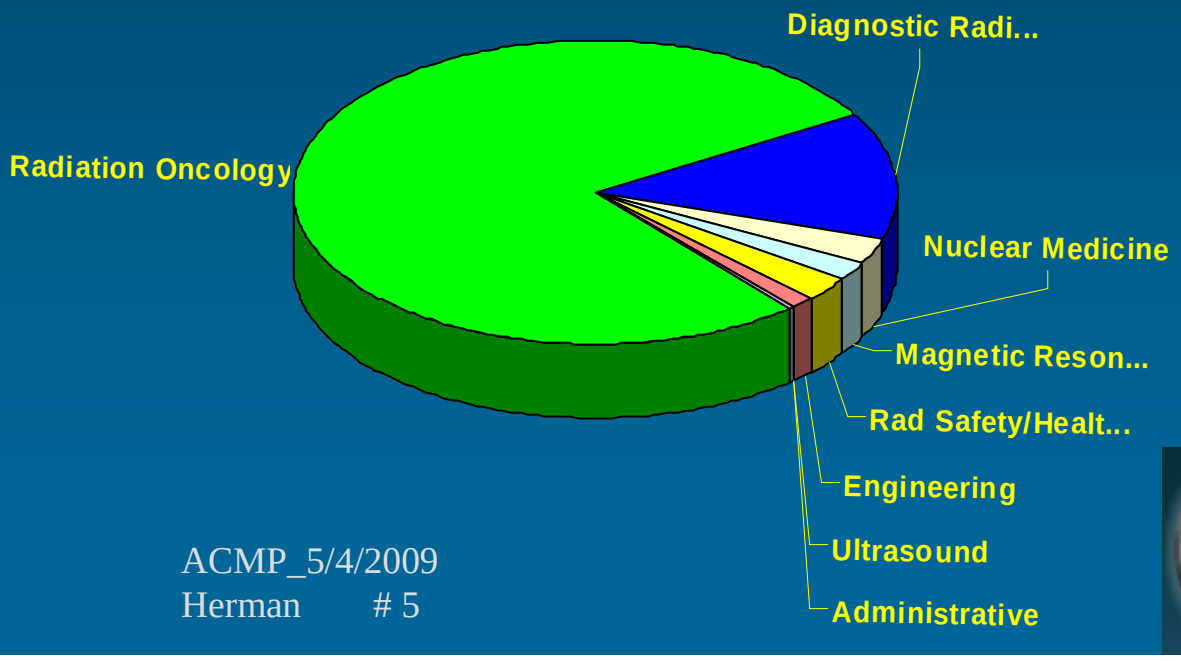
From - Scope of Practice (ACMP-AAPM)

The essential responsibility of the Qualified Medical Physicist's clinical practice is to assure the ***safe and effective delivery of radiation to achieve a diagnostic or therapeutic result as prescribed in patient care***.

AAPM 2007 Profession Survey Data

3106 Responded of 4662 surveyed of **~7000**





Quality Patient Care

- Patients and colleagues deserve to have properly trained *clinical* medical physicists participating in practice.
- Is provided by properly, thoroughly and consistently trained professionals
  - Physics fundamentals
  - Didactic Medical Physics (Report 79)
  - Clinical Medical Physics (Report 90)
  - Board Certification

Consistency

- All ABMS boards have Consistent Quality
  - premise of all certification boards: "…. certification…requires between 3 and 6 years of training in an accredited training program ….."
  - Except Medical Physics, Medical Genetics
- Accredited Clinical Training Matters
  - CAMPEP accredited residency program grads pass the ABR at a 95% rate, (2005 and Now!)
  - Overall ABR average is 53% (MedPhys 2005 PCP)

2012/2014 Initiative

- Toward Consistency in Training
- Responds to ABR requirements for education and training.
- Responding to ABMS, aligns with CARE.
- To sit for ABR:

  - in 2012 - CAMPEP-accredited degree program or residency required

  - 2014 - CAMPEP-accredited residency required
- Effort- AAPM, CAMPEP, ABR, ACR, and ACMP.

2012/2014 Considerations

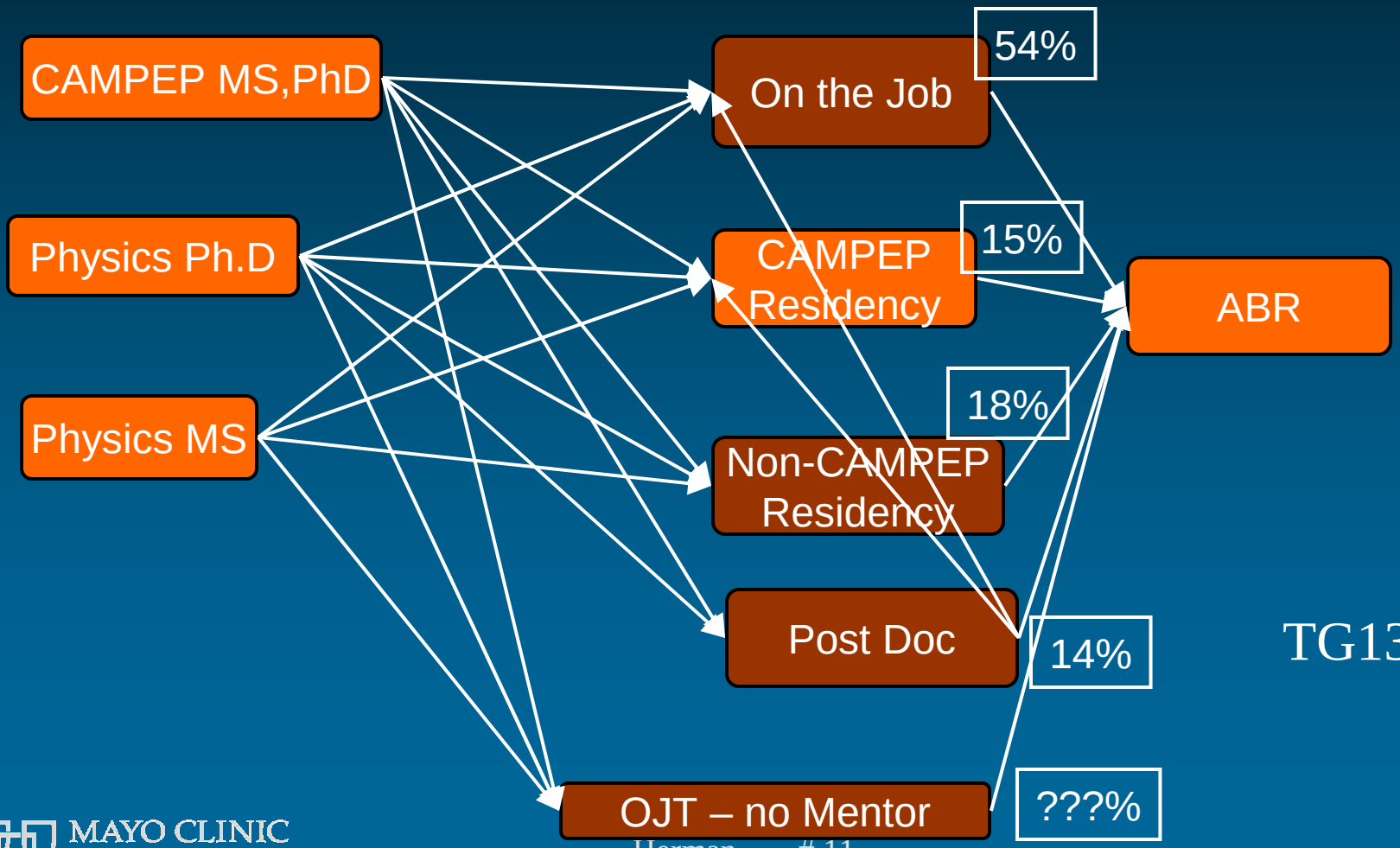
- Grad Student Production:
  - 21 CAMPEP-accredited graduate programs
  - ~ 300 per year from ALL programs 2:1 MS/PhD
  - Where do the graduates go for required residency training?
- Facilitate accreditation and growth of existing programs
  - Conventional residency
- Support development of alternative pathways
  - Develop the potential for a professional doctorate degree
    - How can it help?; What might it hurt?
  - Convert OJT/junior slots to (accredited) residency
  - Investigate combined therapy/diagnostic residencies

2012/2014 Considerations

- Alternative programs
  - Limited Affiliation
  - Dependent Affiliation
  - Practice groups with academia
  - Encourage MP graduate programs to create or affiliate with residency programs
- Support consistent national recognition programs that equate Board certification with QMP
  - Licensure, national registry
- Develop creative residency funding mechanisms
  - PDMP , Converted OJT , Grants….

The "Old" Pathway(s)

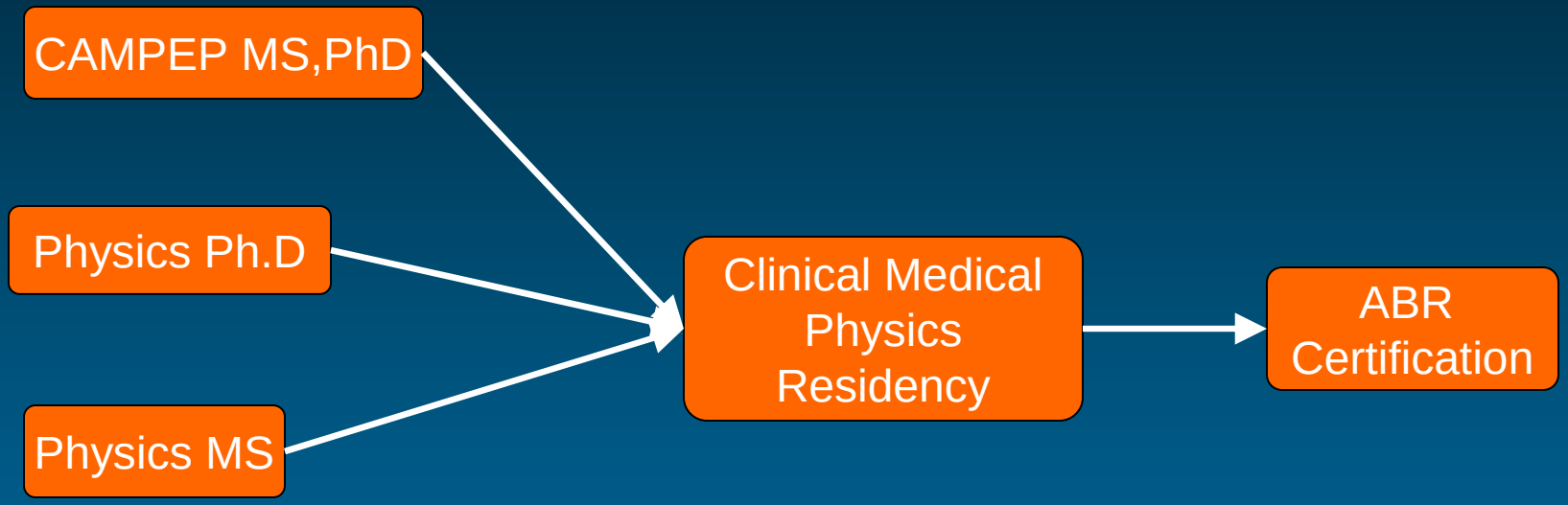
Consistent?,Equivalent?, Sufficient?, QMP? Best Patient Care?

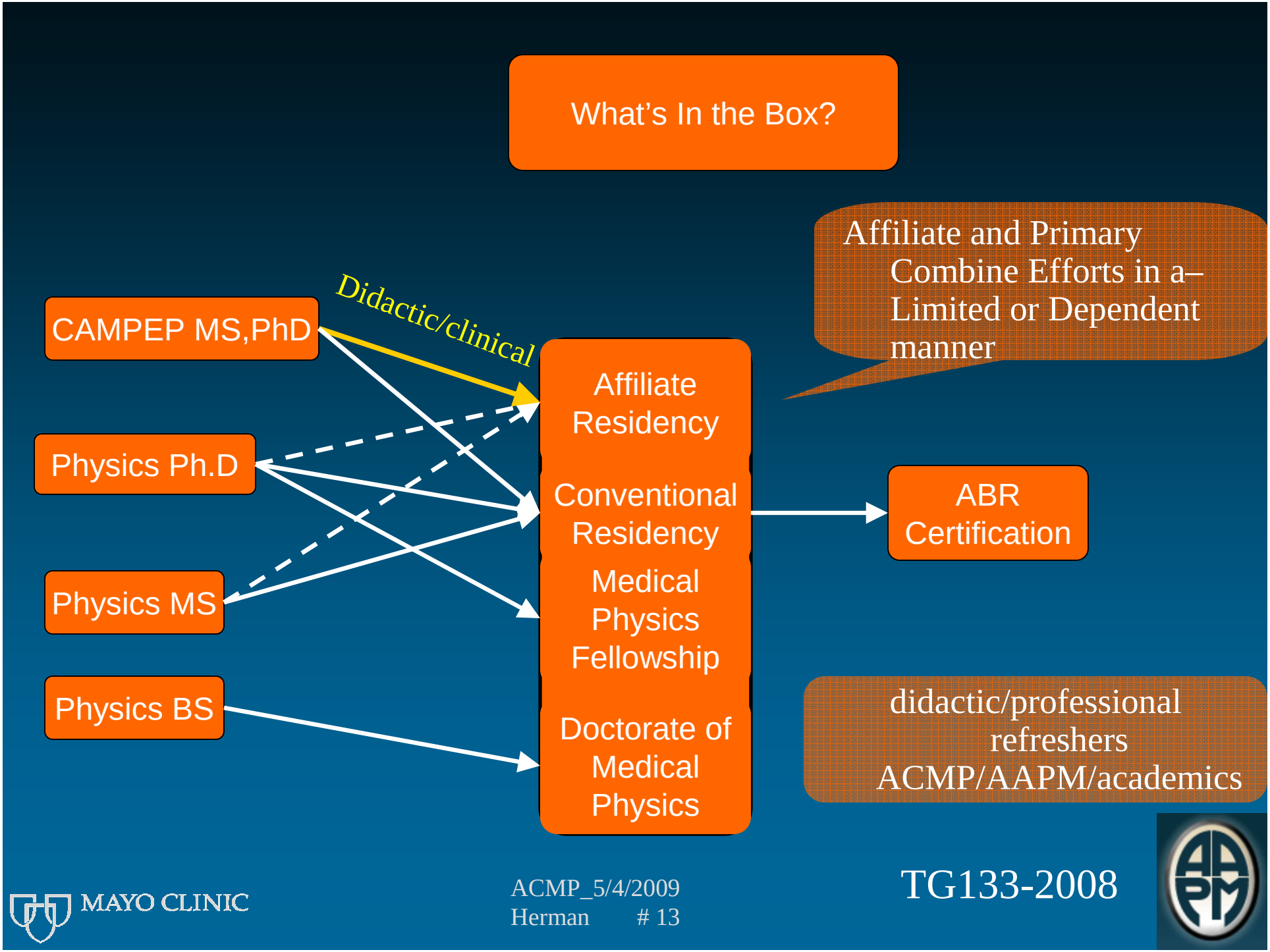


TG133-2008

THE Pathway

Equivalent!, Sufficient!, QMP!




What's In the Box?
Affiliate and Primary Combine Efforts in a– Limited or Dependent manner
CAMPEP MS,PhD
Didactic/clinical
Physics Ph.D
Physics MS
Physics BS
Affiliate Residency
Conventional Residency
Medical Physics Fellowship
Doctorate of Medical Physics
ABR Certification
didactic/professional refreshers ACMP/AAPM/academics

AAPM 2012/2014 $ Allocated/Spent

- Planned investment of $100 K for 2008,
- Feb 2009, recent 2012 Initiative Meeting ~ $20 K
- Workshops: non – CAMPEP Residency Program Directors ~ $20k
  - Help in Self Study Completion - $10 K
  - Workshop of Feb 6-7, 2009
  - 25 program directors (3 imaging), excellent program
  - second one planned for Fall of 2009
- Workshop: non-CAMPEP Academic Program Directors –
  - SDAMPP is coordinating some work – budgeted $20 K

AAPM 2012/2014 Money Cont'd

- Improving CAMPEP Process - $10K
  - AAPM HQ now taking on application processing and logistics, more to come to streamline
- Distributed Residency Demo - $10 K
  - This is happening, no money was requested
  - Mayo - KCCC/USO limited affiliation example
  - Others have recognized that they can accredit alone
  - TG133 is complete and posted on the AAPM Web
- Launching DMPs - $10 K
  - This is happening at Vanderbilt, THSC, elsewhere, funded thus far by institutions
  - program consistency? - WGDMP

We're Making Real Progress

- Therapy; we are making substantial headway
- Imaging; more work to be done
  - some traction being gained
- Anyone who is doing clinical training could/should ultimately have an accredited program - Through available mechanisms
- Probably some investment next few years
  - Budget $100k for 2009

Total Possible Residencies and Resident Positions Gerbi, 4/2009 NCCAAPM

	Therapy	Imaging
CAMPEP accredited	28	3
Programs in review	8	1
Programs represented at Feb. 2009 MPR writing workshop (Dallas, TX)	22	3
Other programs	16	-
TOTAL	74	7
Potential residents per year (at 1.2 residents/prog-yr)	89	8
DMP programs	2	1
Residents per DMP Program per yr	Vanderbilt, 5 Texas Tech, 5	-

36

4

38

PDMP – What Is It?
Coffey – Feb, 2009 Summit

- Professional Degree (PDMP) not a Research Degree (PhD)
- Combines Didactic and Clinical Training
- Four – Five Year Program
- More than a MS Degree and a Clinical Physics Residency
- PDMP May Allow Completion of Clinical Training Off Campus
  at a CAMPEP-Accredited Residency Program
- Students Pay Tuition for Duration of the Program (perhaps stipend)
- May Limit the Number of Graduates per Year (compared to MS)
- Meets Eligibility Requirements for ABR Physics Exam (Parts I and II)

- Coffey Recommendations
- Name: PDMP
- Curriculum: > MS + Residency

Society of Directors of Academic Medical Physics Programs, Inc (SDAMPP)

Dobbins – 2/2009 Summit – Spawned from AAPM SC

Objectives

- To promote better coordination between academic MP programs
- To foster establishment of educational best practices
- To monitor production of MS and PhD graduates and MP residents relative to job market
- To assist new MP programs getting started
- To serve as a voice for academic program directors
- To help medical physicists in developing countries establish educational programs

We Care

- Remember why we do what we do
- They are counting on us to do it well and make it better.
- AdHoc Training won't do!

"We should be as good as our patients think we are" – *Sister Generose to the Mayo Staff*

Mayo Clinic Accredited Residency/Fellowship - Therapy

- Began as Residency in 1997
  - Competency Based, Written report – based
  - Residency nominally 2 years
- Initiated Fellowship in 1999
  - Full residency PLUS research - integrated
- Prepared for and received Accreditation in 2003

Mayo Clinic Accredited Residency/Fellowship

- Resides within Mayo School of Graduate Medical Education
  - Large supporting infrastructure
  - Internal reviews
  - Keep up with ACGME?
- Make sure we are part of the Allied Health training reimbursement from CMS.

Mayo Clinic Accredited Residency/Fellowship

- Admissions
  - Ph.D – Medical Physics, Physics (experimental)
  - 35- 45 complete full on-line applications/year
    - Academic Record, C.V., **Personal Statement**, Transcripts, **Reference Letters**
  - Follow AAPM WGCMPR time guidelines
  - Early years – fewer applicants, none from MP

Program Objectives

- Resident is expected to become competent in all areas related to the safe and efficacious use of ionizing radiation as it relates to simulation, planning and treatment of human disease;
- Consistent → Qualified Medical Physicist

Mayo Program Rotations

- I. Dosimetric Systems, (Ion Chamber, Film, Diodes, TLD)
- II. Physicist of the Day and Plan Check
- III. External Beam QA
- IV. Shielding and Room Design
- V. Radiation Safety
- VI. Treatment Machine ATP, Survey, Commissioning
- VII. Treatment Machine Calibration
- VIII. Simulator Acceptance Testing and QA (Fluoro)
- IX. Simulator Acceptance Testing and QA (CT)
- X. External Beam Treatment Planning (3D CRT)
- XI. TPS Commissioning

Mayo Program Rotations

- XII. MU Calculation
- XIII.IMRT Planning and QA
- XIV. Special Applications (TBI, TSE, shields, dosimetry, pacemakers)
- XV. Stereotactic Radiosurgery (Gamma-knife)
- XVI.SBRT (Stereotactic Body Radiation Therapy) - New
- XVII. Intra-Operative Electron RT
- XVIII.Brachytherapy (HDR, LDR)
- XIX.Regional Practice Rotation
- XX. Particle Therapy Rotation – WIP
- XXI. IGRT - WIP

Mayo Program Rotations

Clinical Physics Rotations (in months)

TRN

Rotation	Mentor(s)	2007 Jul	Aug	Sep	Oct	Nov	Dec	2008 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2009 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Orientation	MGHe	TRN																													
Dosimetric systems acceptance testing/ commissioning/ QA	JJK		TRN		25																										
POD / Plan Check	MGHe			TRN									pl 18																		
Treatment machine QA	CRB/	TRN																20													
Shielding / room design	MGHe																												TRN		
Radiation safety	KC																									TRN					
Treatment machine ATP, survey, commissioning (see note 1)	MGHe/														TRN																
Treatment machine calibration (TG51)	MGHe/																			TRN			15								
Simulator acceptance testing and QA (Fluoro)B	RAD				TRN												15														
Simulator acceptance testing and QA (CT-sim)	DHB												TRN					19													
External beam treatment planning	J Miller				TRN		16																				TRN				
TPS commissioning (4 montsh)	RWK/JAA																TRN														
MU calculations(2 months)	MGHe					TRN		18																							
IMRT Planning (2 months and follows ExBeam Tx Planning	JJK											15	TRN																		
IMRT QA (1 month and follows IMRT planning)	JJK											15			TRN																
Special applications (777370 diodes, EPID) before POD	CRB																	###													
Stereotactic (Gamma knife / SRT, see note 2)	RWK																										TRN				
IORT	RAD																													TRN	
Brachytherapy: sources/ calibrations/ safety/ regulations	KMF																									TRN					
Regional practice rotation																		TRN					31							

(1) If a machine is not installed in this time period, then a "mock" ATP & commissioning will be done during the next annual QA in January.
(2) During rotation period, expectations include at least two complete SRT cases, gamma knife QA and annual (2 pp), and 6 patient coverage days on gamma knife.

Rotation window
Didactic instruction
complete
Observation prior to rotation/participation
Responsible window
Responsible and Teaching

Labs

Generic Template

Labs	Mentor(s)	2005 Jul	Aug	Sep	Oct	Nov	Dec	20 Jan	Feb	Mar	Apr	May	Jun
QAT (1-5)	CRB,ASA,LB	P1-4	P2	P5	P5								
QAS (1-4)	DHB,RAD	P1,3											
QAB (1-3)	KMF,KPM											P1-3	P2
POD	MGHe,DHB,JAA			P									
PlanCheck	MGHe,DHB,JAA			P									

Classroom courses	taken
Anatomy	x
Clinical Oncology	x
Dx Imaging	x
Radiologic Physics	x

Clinical Credent-ialing

hical Credentialing Documentation For:				
NAME				
Board Certification Date			MOC Date	
TASK	OK? √	Sign-offs		
		Dates	Comments	Initials
POD				
Plan Check				
Linear Accelerator			Varian C, EX, IX, 4D	
Daily QA				
Monthly QA				
Annual QA				
Acceptance/Commissioning				
Absolute Calibrations				
MLC and Ind Jaws				
EPID Operations				
OBI Operations				
Gating Operations				
Fluoroscopic Simulator			Varian Acuity	
Monthly Sim QA				
Lasers/FAD				
Annual Sim QA				
Acceptance/Commissioning				
CT Simulation			GE Advantage Sim, Lightspeed RT	
Quality Assurance				
CT Operation				
Software Applications				
Acceptance/Commissioning				
4DCT Support				
CT Simulation			Philips PQ6000, AcQSim	
Quality Assurance				
CT Operation				
Software Applications				
Acceptance/Commissioning				
Detectors/Equip				
Ion Chambers				
Film				
Solid State Detection Systems				
TLD				
Wellhofer				
External Beam Clinical Treatment Planning			Varian Eclipse	
Acceptance/Commissioning				
3D Treatment Planning				
IMRT Planning				
Data Management				
IMRT QA				
Brachytherapy 1			Planning, Procedure, QA, Full	

MAYO CLINIC

Research

- Research is integrated into the Fellowship
  - Practical and clinically meaningful
  - Hands on
  - Abstracts/publications
- IGRT, Dosimetry, Particle Therapy, Informatics

Affiliation

- Following the AAPM TG 133 (alternative Pathways) description of a limited affiliation
- Relationship with US Oncology/ Kansas City CC –
  - Residents from either program can travel to obtain training – B Wichman talk..

Mayo Program - Successes and Challenges

- Graduates 6/8 residents and 5/5 fellows with 5 currently in program
- ALL graduates that have taken ABR and have passed full exam on first attempt.
- However only 11/13 graduated
  - Place residents on probation
  - → well defined structure for discipline

Mayo Program Evolution

- Went away from written reports (Thesis)
  - Toward oral/interative rotation exams – PPT
  - Routine quarterly orals
- Converted all positions to three year Fellows
  - maintain research component
  - three years of experience
  - allow time for didactic training
- Reaccredited in 2008

Conclusion

- It is ALL about Patient Care
- Consistent, high quality clinical work comes from consistent, high quality training and experience.
- Substantial progress is being made → all training being accredited
- An accredited program must adapt/morph