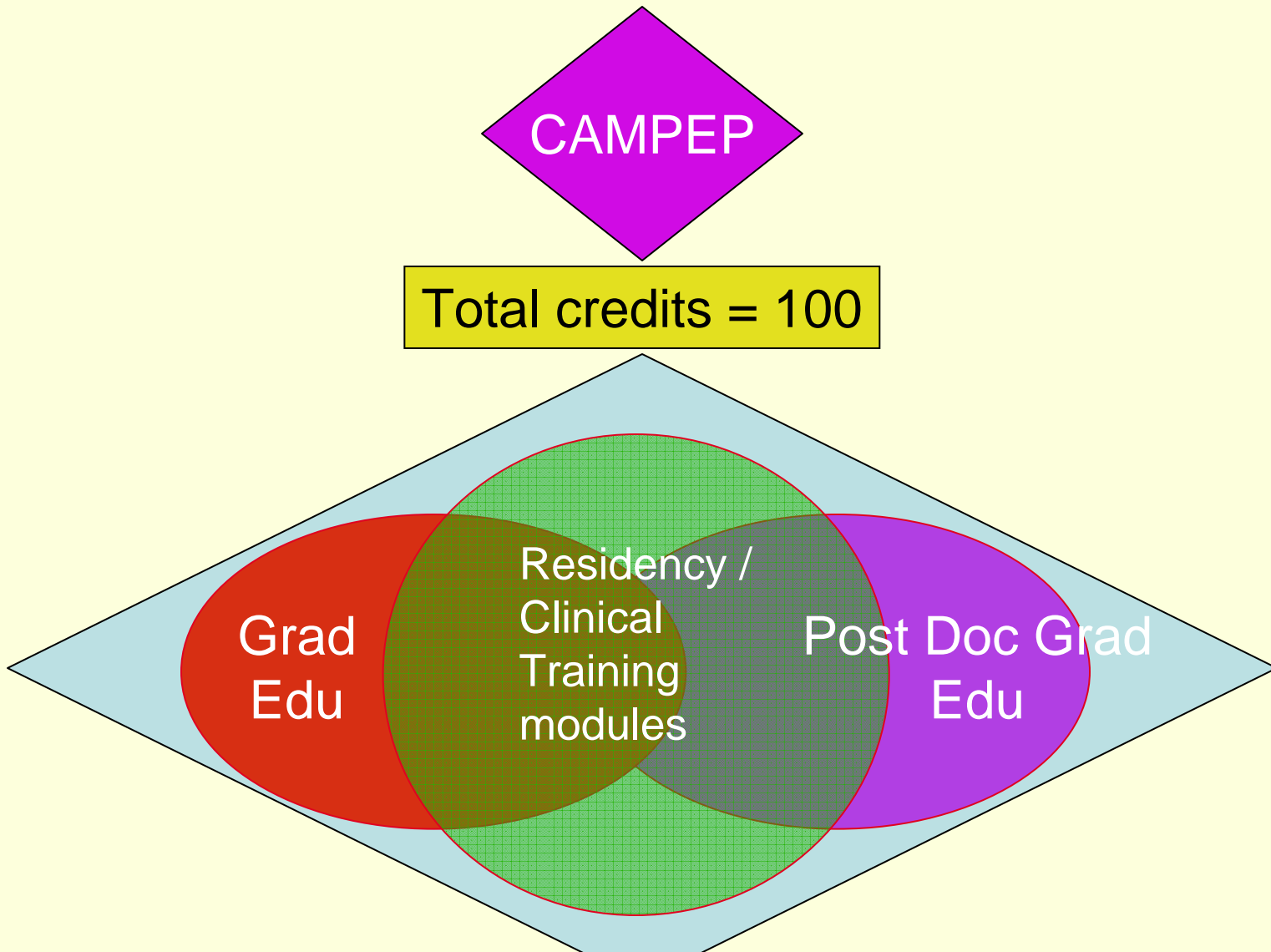


Medical Physics Education: What's Down the Line

Bruce Thomadsen
Bhudatt Paliwal

Pathway to the ABR



Education and Training Programs

- MS/PhD - Physics
- MS/PhD - CAMPEP
- MS/PhD - Physical Sciences
- Residency - CAMPEP
 - affiliated programs
- Clinical training modules

Credit System

- Didactic 100
- Clinical training 100

Total = 200

Clinical Experience Modules For Radiation Oncology

Module description	Credits/module
1. Quality Assurance (QA) [Including chart checking and machine QA]	10
2. Delivery Equipment [Including machine calibration]	10
3. Radiation Detection Instrumentation [including <i>in-vivo</i>]	5
4. Shielding/Radiation Safety/Quality Management Program/Patient Safety	5
5. Treatment Planning System (TPS) [External-beam and brachytherapy]	5
6. Brachytherapy Treatment planning and Delivery	10
7. Conventional External-beam Treatment Planning	10
8. Stereotactic Radiotherapy: Linac-based cranial SRT	5
9. Stereotactic Radiotherapy: Gamma-based cranial SRT	2
10. Stereotactic Radiotherapy: Linac-based body SRT	3
11. Intensity Modulated Radiation Therapy (IMRT) [Commissioning, planning and QA]	10
12. Imaging Equipment [Use, commissioning, QA]	10
13. Image guided External-beam Radiation Therapy (IGRT)	5
14. Attendance at tumor boards, chart rounds, clinical conferences and	10

Options for Credits

Degree/ Program	Didactic		Clinical Training				Total Cr		
			Year 1	Year 2	Year 3	Total			
PhD - CAMPEP	100	10	50	40	NA	90	200		
MS - CAMPEP	100		50	50	NA	100	200		
PhD - Med Phys (NC)	X	10	Y	Z	Y'	Z'	90-Z-Z'	100	200
MS - Med Phys (NC)	X		Y	Z	Y'	Z'	100-Z-Z'	100	200
MS/PhD Physics	0		50	50	50	100	150		

$Y = 100 - X$, if $X < 50$; else $Y = 50$. $Z = 50 - Y$, if $Y < 50$, else $Z = 0$.

$Y' = 100 - X - Y$, if $X + Y < 100$; else $Y' = 0$. $Z' = 50 - Y'$.

Credit for clinical research 

Didactic edu during clinical training 

Total credits = Didactic edu + clinical 

One Suggestion

- Create a professional doctorate in medical physics (Med.Ph.D.)
- This would be similar to Pharm.D. or Phy.Ther.D.

Program for the Med.Phys.D.

- Students would spend two years in a didactic setting.
- This would be followed by two years in a practicum.

Didactic Program: Semester 1

- Radioisotopes in Medicine, including Nuclear Medicine Physics
- Basic Radiological Physics (Interactions and radioactivity)
- Metrology and Instrumentation
- Introduction to Oncology
- Imaging 1

Didactic Program: Semester 2

- Introductory Physics of Radiotherapy
- Radiobiology
- Imaging 2
- Health Physics
- Anatomy

Didactic Program: Summer 1

- Physiology

Didactic Program: Semester 3

- Advanced External Beam Physics
- Radiotherapy Treatment Planning Systems
- Radiotherapy Lab
- Neoplasia
- Elective Lab
- Seminar

Didactic Program: Semester 4

- Brachytherapy Physics
- Biological Models in Radiotherapy
- Health Physics Lab
- Elective Lab
- Patient Safety
- Seminar

Practicum

- Two years at an affiliate institution, working under the supervision of a medical physicist.
- These affiliates would have to be able to offer a wide variety of training.
- A single affiliate need not offer *all* training; a student may travel to include all requirements.

Funding

- Students would be self funded for the first two years.
- Most students would probably receive some small stipend for the last two years.

Relation to a Ph.D.

- The Med.Phys.D. tract would not have much effect on the Ph.D. – students wishing a career in research would still take the Ph.D. route.
- The Med.Phys.D. would likely replace the Masters' program, since the ABR is planning on closing that avenue in the future.