CAMPEP and the Future of Education for Medical Physicists

Geoffrey D. Clarke, Ph.D.

CAMPEP Board Member
• What CAMPEP is and what it does
• Profile of CAMPEP Accredited Graduate Programs and Residency Programs
• CAMPEP Accreditation Process
• Implications of 2012 / 2014 Policy
• Alternatives to Traditional Clinical Education Programs
• Challenges to CAMPEP in the next 10 years
CAMPEP is a nonprofit organization whose objectives are the review and accreditation of educational programs in medical physics.

Accreditation is a voluntary, non-governmental process of peer review, to ensure a program or institution has met a defined standard.

- CAMPEP accreditation serves as public recognition that a program provides a quality service or education.

Scope: CAMPEP offers specialized accreditation of medical physics educational programs such as:

- degree-granting programs
- clinical residencies
- continuing education and short courses.
• CAMPEP is an umbrella organization with two representatives each from each sponsoring organization:
  – American Association of Physicists in Medicine
  – American College of Medical Physics
  – American College of Radiology
  – Canadian College of Physicists in Medicine

• Criteria for membership requires “a purpose (in whole or in part) of promoting medical physics”.
The mission of CAMPEP is to promote consistent, high quality education and training of medical physicists from graduate school through professional practice by accrediting graduate, residency and continuing education programs that meet defined standards.
Organization

• **Officers:**
  - President and Board Chair – John Hazle (ACMP)
  - Vice President – Peter Dunscombe (CCPM)
  - Secretary/Treasurer – Marlene McKetty (AAPM)

• **Members:**
  Geoff Clarke (ACR), Bill Hendee (AAPM), Rich Maughan (ACR), Ervin Podgorsak (CCPM), Tim Solberg (ACMP)

• **Standing Committees:**
  - Graduate Education Program Review Committee (Jackson)
  - Residency Education Program Review Committee (Gerbi)
  - Continuing Education Review Committee (Thomadsen)

• **Task Groups:**
  - Professional degree accreditation requirements (Clarke)
• The standards for practice should primarily be determined by the collective bodies of medical physicists involved in the delivery of clinical services.
  – AAPM
  – ACR
  – ACMP
  – Others

• Success is judged by results of testing by recognized Boards.
  – ABR
  – ABMP

-- CCPM
-- ISMRM
-- SNM
-- ABSNM
CAMPEP’s Role

• To develop educational standards that meet practice expectations defined by appropriate professional societies.

• To verify that these standards are being adhered to by those organizations participating in the educational process.

• Our success should be measured by the Board pass rates and professional successes of those educated in CAMPEP programs.
CAMPEP-Approved Graduate Programs*

- U. Alberta: Cross Cancer Institute
- U British Columbia
- U Calgary: Tom Baker Cancer Center
- U California – Los Angeles
- U Manitoba: CancerCare Manitoba
- U Chicago
- E Carolina University
- U Florida

~300 active students
~125 graduates/year

- U Kentucky
- Louisiana State U
- McGill U
- U Oklahoma
- U Texas HSC – Houston
- U Texas HSC – San Antonio
- Vanderbilt U
- Wayne State U
- U Wisconsin

at least 11 active non-accredited graduate Med Phys programs

*as of January 31, 2008
## How is SW-AAPM Doing?

<table>
<thead>
<tr>
<th>Region</th>
<th>Population</th>
<th># CAMPEP Grad Programs</th>
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<tbody>
<tr>
<td>Canada</td>
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<td>Texas</td>
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<td>Oklahoma</td>
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<td>Rest of USA</td>
<td>236,375,043</td>
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</table>
Conventional CAMPEP Residency

- 2 year program
- Didactic knowledge requirements
- Responsible program director
- Adequate staff, equipment & facilities
- Training evaluation
- Institutional support
- Educational environment including regular conferences
<table>
<thead>
<tr>
<th>University/Center</th>
<th>Year</th>
<th>No./Yr</th>
<th>University/Center</th>
<th>Year</th>
<th>No./Yr</th>
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<tbody>
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<td>Washington U</td>
<td>1997</td>
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<td>U Texas MD Anderson</td>
<td>2006</td>
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<td>2000</td>
<td>1</td>
<td>Stanford U</td>
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<tr>
<td>McGill U</td>
<td>2000</td>
<td>1</td>
<td>U Iowa</td>
<td>2007</td>
<td>1</td>
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<tr>
<td>U Florida</td>
<td>2000</td>
<td>1</td>
<td>Virginia Commonwealth U</td>
<td></td>
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<tr>
<td>Mayo Clinic</td>
<td>2000</td>
<td>1-2</td>
<td></td>
<td>2007</td>
<td>1</td>
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<tr>
<td>U Louisville</td>
<td>2000</td>
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<td>U California – Irvine</td>
<td>2008</td>
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<tr>
<td>U Chicago</td>
<td>2004</td>
<td>1</td>
<td>U Nebraska</td>
<td>2008</td>
<td>1</td>
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<tr>
<td>U Wisconsin</td>
<td>2004</td>
<td>1</td>
<td>U Toronto</td>
<td>2008</td>
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<tr>
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<tr>
<td>Cross Cancer Cntr.</td>
<td>2005</td>
<td>1</td>
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<tr>
<td>Tom Baker Cancer Cntr</td>
<td>2005</td>
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<td>London Reg. Cancer Cntr</td>
<td>2006</td>
<td>1</td>
<td></td>
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<tr>
<td>Ottawa Hospital Cancer Cntr</td>
<td>2006</td>
<td>1</td>
<td></td>
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</table>

20 Programs:  
~ 23 residents / year  
2 more programs in progress; maybe 10 under development
The M.D. Anderson Cancer Center  2002
Cross Cancer Center – U Alberta  2005

*No other programs currently in the accreditation process

Funding options limited

Not much recognition in AAPM Education Council  TG Reports that Imaging Physicists and Nuclear Medicine Physicists have significantly different job responsibilities
Expectations

• Programs are to be run by QMP’s with some participation of Radiologists, Radiation Oncologists, Radiation Biologists, others …

• As a minimum:
  – Graduate Programs should comply with recommendations of AAPM Task Group Report #79
  – Residency Programs should comply with recommendations of AAPM Task Group Report #90

• Also program must be self-structured - must include self-evaluation procedures – show financial stability, etc.
CAMPEP accreditation process

• Initial application
  – Accreditation must be requested by responsible administrator
  – For graduate programs, the institution must be recognized by a national accrediting body (i.e., CHEA)
  – Program completes a self-study with details of students, alumni, faculty, courses, etc.
  – Submit application fee ($5,000)

• Initial application materials are reviewed by the appropriate CAMPEP committee (GEPRC or REPRC)
• Any questions are presented to the program director

• Once all major issues from the review are addressed a site visit is scheduled
  – The application fee must be received before the site visit will be scheduled

• A site visit is performed by 2-3 members of the respective committee

• A physician is included on all residency review visits
• At the end of the site visit an exit interview is performed to convey the general findings of the visit to the director

• A written report is prepared by the site visit team for the appropriate committee

• The committee votes and a recommendation is forwarded to the Board
• The Board votes on the committee recommendation
  – Accept for full accreditation (5 years)
  – Accept for partial accreditation (3 year with interim report on deficiency remediation); may require annual report
  – Deny accreditation

• The results of the Board vote are communicated to the program director and a certificate is issued
• In 2000, the ABR indicated that it wishes to implement a requirement by 2012 that individuals complete a CAMPEP accredited program to sit for the ABR exam.

• In March, 2007 the AAPM Board of Directors passed Professional Policy #19 suggesting that a CAMPEP accredited residency be required to sit for the ABR exam by 2014.

• Adopted by ABR Board of Trustees – October 13, 2007.
What Does This Mean For Medical Physics Education?
Workforce Projections (Guesses)

• 120 new clinical jobs per year

• 30 retired Qualified Medical Physicists

• Suggests demand for 150 (σ≈ 127.3) new Qualified Medical Physicists/year*
  – Approximately 125 in therapy physics
  – Approximately 25 in imaging physics

• Also ~ 15-20 new research and industrial jobs per year

*George Sherouse - 2008
• Probably enough graduate programs (need to get all existing programs accredited)
• Need ~ 4x the number of residencies in existence or planned
• Number of residents fundamentally limited by number of mentors available
• Need to examine new models for residency programs
Education Pathways - Current Reality

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

CAMPEP MS, PhD

Physics Ph.D

Physics MS

On the Job 54%

CAMPEP Residency 15%

Non-CAMPEP Residency 18%

Post Doc 14%

OJT – no Mentor ???%

ABR

Michael Herman PhD – Mayo Clinic
• Graduate degree from a CAMPEP accredited program and 3 years experience.
• Graduate degree, 2 year CAMPEP residency program and 1 year of additional experience.
• Professional degree in Medical Physics from CAMPEP accredited program (5 years).
• Graduate degree and 2 years residency from CAMPEP accredited programs (for consideration).
Requirements for clinical residency training:

- A formal 2 year residency program at an academic center offering a complete range of treatment techniques and with many, often specialized, qualified medical physicists (QMP).
- Limited slots available due to requirement of 1-2 QMP’s to supervise each resident.
- A formal 2 year residency may be offered at a center with more limited resources but affiliated with a CAMPEP accredited center.
1. Conventional academic CAMPEP accredited residency
2. Structured mentorship affiliated with primary CAMPEP accredited residency
3. Professional doctoral degree
4. Enhanced MS or PhD program providing some of the necessary accredited clinical training
• Could provide some or all of the necessary accredited clinical training
• Clinical training should be documented
• Include parts of AAPM Report #90 on Residency Training requirements in graduate curriculum
• Also all components of didactic training listed in AAPM Report #79
• Papanikolaou’s “Practicum” Approach
• “Dependent affiliate” as part of and managed by a primary program

• “Limited Affiliate” – independent but requires programmatic assistance

• Up to the two institutions to decide whether this constitutes one or two accreditation applications
• Degree criteria are being developed by AAPM Task Group #133.
• A CAMPEP Task Group is considering accreditation issues.
• First pass expectations are M.S. equivalent didactic work and full residency.
• Approximately a 4-5 year program.
• Ideally, graduates would be qualified to immediately sit for the Boards, similar to dentists and veterinarians.
• Task Force Report on Professional Doctorates (PD’s)
• Areas of Consensus:
  – A PD is different from the PhD, although the specifics of the differences are not always clear.
  – Should prepare leaders in the profession in a similar manner to how PhD programs are aimed at preparing leaders in science.
  – The concept of the PD’s needs better definition, clarification of core characteristics and reasonable ranges of variation.
  – There need to be explicit criteria for accreditation and review of PD’s, including national standards.
  – Accreditation and review must be paired with institutional review.
  – Standards of excellence cannot be mechanically defined (e.g. numbers of credit hours).
  – May include a “capstone project”
• 5 year program
  – 1st year of medical school
  – Two years of medical physics class work
  – Two years of medical physics clinical training

• Intend to sit for ABR written during 5th year & ABR orals upon graduation

• Students go through interview process and meet requirements for entry to School of Medicine

• Approved by THECB in July 2007
  – First class (Fall 2007) has 5 students

William Kubricht
CAMPEP Education Pathways - Future

Commission on Accreditation of Medical Physics Educational Programs, Inc.

CAMPEP MS, PhD
- Didactic/clinical

Physics PhD

Physics MS

Physics BS

Affiliate Residency

Conventional Residency

Medical Physics Fellowship

Doctorate of Medical Physics

ABR Certification

Affiliate and Primary Combine Efforts in a Limited or Dependent manner

didactic/professional refreshers ACMP/AAPM/academics
• Accreditation of “satellite” residency programs (including single mentor situations).
  – Moving to affiliated program model.
  – Fee/workload structure

• Accreditation of professional degree programs (i.e., Doctor of Medical Physics).
  – Continues to be an issue.
  – One program in progress at Texas Tech and several other programs are exploring developing professional doctoral programs.
• There are currently 17 CAMPEP accredited graduate programs in North America.
  – 12 in the U.S.
  – 5 in Canada

• These programs produce about 100-125 graduates per year.

• Programs are accredited to provide “general” medical physics education (therapy, diagnostic and nuclear medicine fundamentals).

• Essentials for training are in AAPM TG #79.

• Potential for 5-10 new programs in next 5 years.
• There are currently 20 CAMPEP accredited graduate programs in North America.
  – 14 in the U.S.
  – 6 in Canada

• These programs produce about 20-25 graduates per year.

• Programs are accredited to provide specialized medical physics education (radiation therapy physics, diagnostic imaging physics and nuclear medicine physics).

• There are only 2 diagnostic imaging physics residencies.

• There are no nuclear medicine physics residencies.

• Potential for 10-12 new programs in next five years
• CAMPEP is actively involved in discussions about educational activities related to the 2012 and 2014 deadlines.
• CAMPEP philosophy is to be flexible with accreditation requirements (i.e., alternate pathways) *while maintaining quality*. 
• There are no CAMPEP imposed barriers to implementing the 2012 and 2014 deadlines.