DMP: Two Year Experience

Outline

- Brief History of the Vanderbilt DMP Program
- Current Status
  - Number of students
  - Didactic Curriculum
  - Research Project
  - 24 Month Residency Experience
- Lessons Learned to Date
- Future Plans of the Vanderbilt Program
- Updates/Plans from Other Institutions

History: Vanderbilt DMP Program

- Faculty Approval
- University Approval
- (State of Tennessee Council on Higher Education)
- First Students Admitted/Transferred: Fall, 2009
  - Three-Year 3 students
  - Four-Year 2 students
  - Four-Year 1 students
- CAMPEP Accreditation: July, 2010

CAMPEP Accreditation

- Self Study (Therapy and Diagnostic Tracks)
  - Graduate education
    - patterned after Vanderbilt CAMPEP-accredited MS Program (+ more)
  - Residency training
    - patterned after former Vanderbilt CAMPEP-accredited Therapy Residency
    - Diagnostic patterned after "sample" Diagnostic Programs
- Site Visit
  - Graduate Education reviewers
  - Residency Training reviewers
- Accreditation
  - Combined Program (Graduate Education and Residency Training)
Current Status

- Academic Year Student Status: 2010-2011
  a. Three-Year 4 students (all therapy track) (graduate June 20, 2011)
  b. Four-Year 3 students (all therapy track)
  c. Four-Year 2 students (all therapy track)
  d. Five-Year 1 students (4 therapy, 1 diagnostic track)

- Curriculum
- Research Project
- Two Year Residency Training

- Recruitment Efforts Fall, 2011
  Five-Year 1 students (4 therapy, 1 diagnostic track) + 2MS
  Steady State: (4 therapy + 1 diagnostic per year) = 20 students
  Total Student Numbers will be limited by Clinical Resources (Years 3 & 4)

Curriculum

- Didactic (50 credit hrs)
  Therapy
  Anatomy & Physiology 8 hrs
  Health Physics & Detectors Lab 9 hrs
  Interactions of Rad with Matter 3 hrs
  Radiation Biology 2 hrs
  Therapy Physics & Lab (g) 12 hrs
  Brady. (end of Year 1)
  Therapy I & II (Year 2)
  Lab I (Year 2) & Lab II (Year 3)

  Diagnostic Imaging & Lab 8 hrs
  Radiation Oncology 1 hr
  Seminar 3 hrs (AAPM TG Reports)
  Electives 6 hrs

  Research Project (5 credit hrs)

- Research (6 credit hrs)
  Diagnostic Imaging & Lab 8 hrs
  Radiation Oncology 1 hr
  Seminar 3 hrs (AAPM TG Reports)
  Electives 6 hrs

- Research Project (5 credit hrs)

Electives

- Therapy
  Cancer Biology
  Quantitative and Functional Imaging
  Cancer Imaging
  Biological Basis of Imaging
  Signal/Image Analysis
  Neuroimaging
  Math and Computational Methods
  Statistics
  Ethics
  Health Care Delivery Systems
  Finance and Economics

- Diagnostic

  Research

- Research Topic Subject Matter and Mentor (approved by Director)
- Literature survey, exp design of materials, equip, methodology
- Data analysis, results and conclusions
- Presented formally to Research Project Committee
- Final report in manuscript form consistent with medical physics
  literature manuscript submission is required
- Student is encouraged to submit the research subject matter in an
  abstract-form appropriate for presentation at a national scientific
  meeting or a peer-reviewed medical physics journal
- Equivalent to 4-6 months FTE
Research (continued)

- Example Projects:
  - Energy Response and Dosimetry of OSLs for Ir-192 HDR Applications*  
  - 3D Electron Compensators for Radiotherapy*  
  - Small Field Dosimetry/Beam Parameterization for Radiosurgery  
  - Retrospective Study: Potential of IGRT for Ophthalmic Brachytherapy*  
  - IMRT vs 3DCT for Left Breast Radiotherapy  
  - Predicting Table/Patient/Gantry Collisions in Radiosurgery  
  - IMRT vs RapidArc for Cranial Radiotherapy  

* AAPM Poster Presentation

Curriculum (continued)

- Clinical Medical Physics Training (Therapy)
  - Clinical Practicum (6hrs) (approximately 2-3 months FTE)
    - 1st Summer Term (brachytherapy treatment planning & QA)
    - 2nd Fall Term (Linac QA)
    - 2nd Spring Term (teletherapy treatment planning & QA)
  
- Clinical Rotations (30 hrs) (24 months FTE)
  - 3DCT, Brachy, IMRT/RapidArc, Radiosurgery, Other  
    - (10 weeks/rotation in each of Year 3 and Year 4)  
    - Fall, Spring, Summer Year 3  
    - Fall, Spring, Summer Year 4

Curriculum (continued)

- Clinical Medical Physics Training (Diagnostic)
  - Clinical Practicum (6hrs) (approximately 2-3 months FTE)
    - 1st Summer Term (Conventional Radiology)
    - 2nd Fall Term (CT, MRI, Nuc Med)
    - 2nd Spring Term (CT, MRI, Mammography)
  
- Clinical Rotations (30 hrs) (24 months FTE)
  - description of rotations  
    - Fall, Spring, Summer Year 3  
    - Fall, Spring, Summer Year 4

What We Are Learning

- Timing of Curriculum
  - Practicum at the conclusion of 1st year (Summer Term)  
    - students are now ready to observe AND participate  
    - no clinical "ramp-up" is required at the start of rotations  
  - Research begins in Summer of Year 2 and continues into Years 3 & 4  
  - Electives are preferred to be taken in Years 3 & 4; however, up to 1 course can be taken in each of Year 3 and Year 4  
  - Advanced Lab and Seminar Topics occur in 3rd and 4th Years
What We Are Learning (continued)
► Teaching and Learning Opportunities Never Cease
► Patient chart conferences
► Tumor boards
► Medical Ethics monthly conferences
► Webinars presented by equipment manufacturers
► Professional seminar Thursdays
  becoming a professional
  equipment manufacturers’ new product presentations
  regulatory issues, errors, and treatment misadministration topics
  ABR "mock" oral boards preparation/practice/Q&A
► Participation in the instruction of Medical Residents and RTT students

Lessons Learned (+)
► Integration of Didactic and Training (48 months) Continuous Learning
► Software to Account for Activities: Observe, Participate, & Competence
► Fellow Students/Collegues and Friends Are Always Available
► Slow Times Are Always Filled with Ongoing Projects/Assignments
► Awarding of "Lab Coat" Status, Summer of 2nd Year
► DMP Assistance in the Clinic is WONDERFUL
► Competence is assessed by successful completion of treatment plan
  (which then gets 2 independent physicists' checks before inclusion
  and introduction to patient treatment)
► DMP Assistance with IMRT/RapidARC QA is PRICELESS
► Convincing administration to offer Stipend in Years 3 & 4
► Other Rotation allows students to visit other depts (Radiology) and
  institutions that have different equipment and offer practices
  (community hospital/private practice) other than academic

Lessons Learned (+)
► NRC 'AMP Status' for HDR operator
► Growth Potential for Diagnostic Track
► Convince administration this is a very efficient and cost effective way
  to provide basic QA and treatment planning functions

Lessons Learned (In process)
► Busy Clinic Must be Balanced with Proper Mentoring
► Mentoring is more time consuming than thought (Student/Mentor Ratio
  is important! There is some savings with multiple students)
► End of Rotation Evaluation is more time consuming than thought
► Observation/Participation is still a toss-up call
► In all the Busyness, there are still down times
  options available, dual responsibilities
► Added workload/responsibility to an already busy clinical day...
  Making the finances work...another faculty/mentor physicist would be
  nice...
► Curriculum offerings for electives sometimes is totally dependent on
  the class schedules etc of other academic departments/units
► One dept cannot offer all 50 hrs of the curriculum
► Getting the word out/recruiting to increase size of Diagnostic Track
Future Plans

► Curriculum Offering
► (have a better listing per semester of electives)
► better coordinate intro and advanced lab concepts
► save individual mentoring effort(s) by classroom/group instruction
time
► Future of MS Program at Vanderbilt: ??
► Making the Finances Work: finding a balance of tuition charged vs.
return to dept for education costs of teaching/mentoring and facilities
► Taking Control of the Evaluation Process

Other DMP Programs

► Official/Approved
► Texas Tech (on hold)
► In Progress
► UT San Antonio Health Sciences Center
► UT MD Anderson Cancer Center

Conclusions

► DMP is > 2 + 2
► Commitment Required: Teaching/Training is a Culture….It is What
We Do...the entire TEAM must be on board...
► For Education Programs that have Sufficient Clinical Training Resources
In House with Minimal Outsourcing
► Will Result in Reduced MS Students that a Program Admits
► Should Give Edge to Graduates in this Day of Health Care Reform
1. more tools to offer the workplace
2. better experience in selection of work environment which suits the
the student
3. opportunity to negotiate professional status rather than staff status
(this is attractive to employers who want to keep their employees,
gives employers more options to pursue... the always upward
mobility and continuing higher salary maybe things of the past...
employer needs these options to keep their best employees)

So.... It Can Be Done!