Training and Evaluation of Residents in a Distributed ("Hub and Spoke") Residency

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### Mary Bird Perkins Cancer Center



## Medical Physics Program

Mary Bird Perkins Cancer Center - LSU Medical Physics Dept





### **Residency Program Description**

**Hub and Spoke Program Motivation** 

 LSU-MBPCC Medical Physics program graduates ~6 students per year, most with MS degrees

Question: Will these graduates be able to find a residency position after 2014?

- MBPCC goal to accommodate 6 new residents per year in time for the 2014 requirement
- Problem: There are not enough faculty to support these numbers. AAPM Report 90 recommended physicist-toresident ratio of 2:1
  - 14 MBPCC physicists → 7 total residents maximum
  - 3-4 new residents per year (2-year program) MARY BIRD PERKINS
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# Residency Program Description

Introduction

How do we accommodate the other 3 needed positions per year?

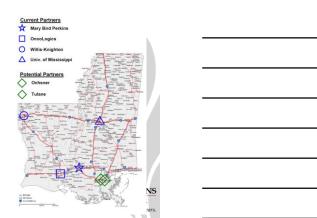
- Solution was to develop partnerships with regional medical physics groups to provide clinical residency training
- Hub-and-spoke model (TG-133)
  - MBPCC responsible for accreditation, curriculum development, resident performance tracking, scheduling exams, etc.
  - Partner sites responsible for clinical training











### Resident Recruitment

### Residency Placement

- LSU Medical Physics students/Post docs receive first priority
   Residency position not guaranteed, only the opportunity
- Student assigned ~mid-January to training site based on internal match system using National Resident Matching Program (NRMP) algorithm
- Unfilled positions opened to outside applicants.



### **MBPCC** Resident Timeline



### **Residency Program Description**

Strategic Plan for Resident Enrollment

Total Actual Residents
Total

# Residency Program Description Program Status

 10 residents have completed program. 10 residents currently in program (5 at MBPCC, 5 at affiliate sites)



### **Resident Training**

Individual Resident Rotation/Project Schedule

Thomas Brown, Ph.D. Clinical Rotation and Project Schedule: July 2012 – June 2014						
YEAR	MONTH	CLINICAL ROTATION	PROJECT	PROJECT MENTOR		
	July	Orientation (CT & Accelerators)	Orientation	Gibbons		
	August	Dosimetry	IGRT commissioning	Fontenot		
2012	September	BR Clinic, IMRT	CT / PET acceptance and commissioning	Dugas		
2012	October	BR Initial Checks	MU Check commissioning	Moldovan		
	November	Tomotherapy, BR LDR	Dosimetric Systems	Dugas		
	December	BR HDR Planning	Gantry-Static IMRT: Commissiong & QA	Gibbons		
2013	January	SRS = Novalis + BR Initials	Daily / IMRT QA Device Commissioning	Perrin		
	February	LDR = Seed implants + Tomo + BR Closeouts	LDR Program & TPS Commissioning	Chu		
	March	HDR = HDR + BR Clinic + BR IMRT	HDR Program & TPS Commissioning	Guidry		

### **Resident Training**

MBPCC Training & Responsibilities

- At MBPCC, residents credentialed after 1<sup>st</sup> year
  - Must demonstrate competency in areas of credentialing
  - Credentialed for duties of non-ABR physicist
- Two purposes:
  - More cost effective as resident is assigned ½ clinical rotation FTE
  - Resident becomes comfortable with independent work



#	Project	#	Project	
1	Orientation	13	Gantry Static-IMRT: Acceptance, Commissioning and QA	
2	CT/PET-Simulators: Acceptance and Commissioning	14	Intraoperative Therapy commissioning	<b>├</b>
3	IGRT: Acceptance and Commissioning	15	TPS: Commissionning of photons and electrons in Pinnacle	
4	Dosimetric Systems: Acceptance, Commissioning and QA	16	MU Check: Commissioning of MU Check for photons and electrons	
5	HDR program and TPS commissioning	17	Linac room design and shielding / Radiation area survey	Done at
6	LDR program and TPS commissioning	18	Survey meters	Partner site
7	SRS program and TPS commissioning	19	HDR, CT & PET shielding and surveys	
8	Daily QA / IMRT QA: Acceptance, Commissioning of Daily QA and IMRT QA	20	TomoTherapy Commissioning	
9	4DCT and gating: Acceptance, Commissioning and QA	21	Total Body Irradiation Commissioning	
10	Total Skin Electron commissioning	22	Radiopharmaceuticals	
11	LINAC: Acceptance and Commissioning	23	Personnel monitoring program / Sealed Source leak testing and inventory	
12	Gantry Dynamic IMRT: Acceptance and Commissioning for VMAT	24	State and federal radiation safety regulations	RY BIRD PERKIN

# Resident Training MBPCC Resident Project Schedule



# Resident Evaluation Typhon Software

- Web-based Student Tracking Software
- EASI: Evaluation and Survey Instrument:
  - Used to create surveys for resident/faculty evaluations
- AHST: Allied Health Student Tracking:
  - Used to track resident progress through competencies, project reports, etc.



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Date (II)	Catnoory Description	
7/15/2013	Project Reports [Dodrnyb's Systems]	
7/24/2013	Project Reports [Mil Check Commissioning Project]	
7/31/2013	Project Reports (Centry-Static SHIT: Commissioning and QA)	
8/14/2013	Project Reports (Daily / IMRT QA Device Commissioning)	
8/14/2013	Project Reports [Esec Trec Annual QA] December Laboration 3/14/2013 6 (60-27 And CT	
8/14/2013	Project Reports [SRT Commissioning]	200
8/30/2013	Project Reports [HCR Program and TPS Commissioning]	MARY BIRD PERKINS
9/30/2013	Project Reports [Total Stin Electron Commissioning]	CANCER CENTER
12/30/2013	Project Reports (LEE Program and TES Communicated)	Fighting Cancer For Over 40 Years

### Resident Evaluation

Individual Resident Oral Exams

- Residents given oral exams every four months
- Minimum of four faculty administer:
  - Two from Resident's home site
  - Two from another Consortium site
- Exams cover clinical rotations, and all projects

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Time: Resident:	10:00 – 12:00 am Jeffrey Kemp (MBPC)	<b>;</b> )					
Topics:	Dosimetry (Apollo) IMRT QA/TLDs (Dugas CT/PET-Simulator Com IGRT Commissioning (I	missioning (Dugas)					
Faculty:	MBPCC: John Gibbons Joe Dugas	UMMC: Claus Yang	Willis-Knighton: Terry Wu				

# Skype Oral Exams RD PERKINS CANCER CENTER

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### Flex Maps Oral Exam



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### **Resident Evaluation** Oral Exam Evaluation Form

Topic: IMAT RA/TUS

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### **Resident Evaluation**

Oral Exams - Summary Report RESIDENCY ORAL EXAM EVALUATION NOVEMBER 28, 2012

- IMRT OA/TLDs (Score\*: 4.6):

  1. Should know the shape of the glow curve before fading.
  2. should know the Gamma equation and paper by Dan Low (Med. Phys. 25(5), 656-661 (1998)).
  3. Review dose difference and DTA concepts.
  4. Should know that EDR is preferred over XV for IMRT QA.
  5. Should know thatis expects of TL, XV and EDR2 film, along with approximate doses necessary to get OD=1 and where films saturate.
  5. Very good knowledge of TLD thory and use demonstrated.
  7. Understood very well IMRT QA—Calibration check and Setup check.
  8. Good answer for clinical judgment if you have trouble with IMRT QA comparisons.

- CT/PET Simulator Commissioning (Score: 4.4):

  1. Should know typical doses from CT.

  2. Should know why is used for density conversion over pc, and why.

  3. Should be familiar with TG111 protocol (non-CTD1 formalism for CT dose measurement)

  4. Review CT # to density graph.

  5. Seemed to understand well the tests for acceptance.

  6. Great job explaining CTD1 measurements.

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- A hub-and-spoke model residency program has been successfully established with MBPCC and three affiliate sites in Louisiana and Mississippi.
- The hub and spoke model offers more opportunities for resident training, with more residents, faculty and procedures than available at a single site.
- Resident performance is tracked by their written reports and their performance on periodical oral exams, such as.

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