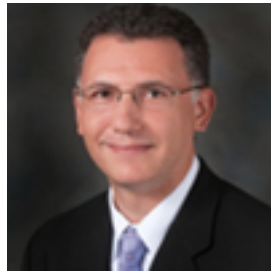




THE AMERICAN ASSOCIATION OF PHYSICISTS IN MEDICINE  
Advancing the Science, Education and Professional Practice of Medical Physics

## Hub and Spoke Webinar #2: Motivation, Economics, and Structure from the Satellite Perspective



**Firas Mourtada, PhD, FAAPM**

Christiana Care Hospital  
Newark, DE



**Michelle Verst, MS**

Cancer Care Group  
Terre Haute, IN



THE AMERICAN ASSOCIATION OF PHYSICISTS IN MEDICINE

Advancing the Science, Education and Professional Practice of Medical Physics

**The First Hub and Spoke Webinar  
entitled  
General Structure, Basics & Responsibilities from a Main Site  
Perspective**

with  
Guest Speakers:

Joseph P. Dugas, PhD, Mary Bird Perkins Cancer Center

Robert J. Pizzutiello Jr., MS, Landauer Medical Physics

can be found at

[http://www.aapm.org/meetings/webinars/  
HubSpoke2015WebinarSeriesNo1.asp](http://www.aapm.org/meetings/webinars/HubSpoke2015WebinarSeriesNo1.asp)

# **AAPM Webinar Part II: Motivation, Economics, and Structure from the Spoke Perspective**

**Firas Mourtada, MSE, PhD, DABR, FAAPM**

**Chief of Clinical Physics, Christiana Care  
Health System, Newark, DE**

**Associate Medical Physics Residency Director  
Adjunct Associate Professor  
Thomas Jefferson University, Philadelphia, PA**



# Acknowledgments

- Amy S. Harrison M.S., CMD,  
DABR Residency Program  
Director, TJUH
- Virginia Lockamy, PhD, DABR  
Associate Residency Director,  
TJUH



# Objectives

- Introduction to CCHS Radiation Oncology
- Motivation for us to be a spoke
- Basic Economics for partnership
- Residency Program Structure and Operations

# Objectives

- **Introduction to CCHS Radiation Oncology**
- Motivation for us to be a spoke
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# HFGCC Radiation Oncology Department

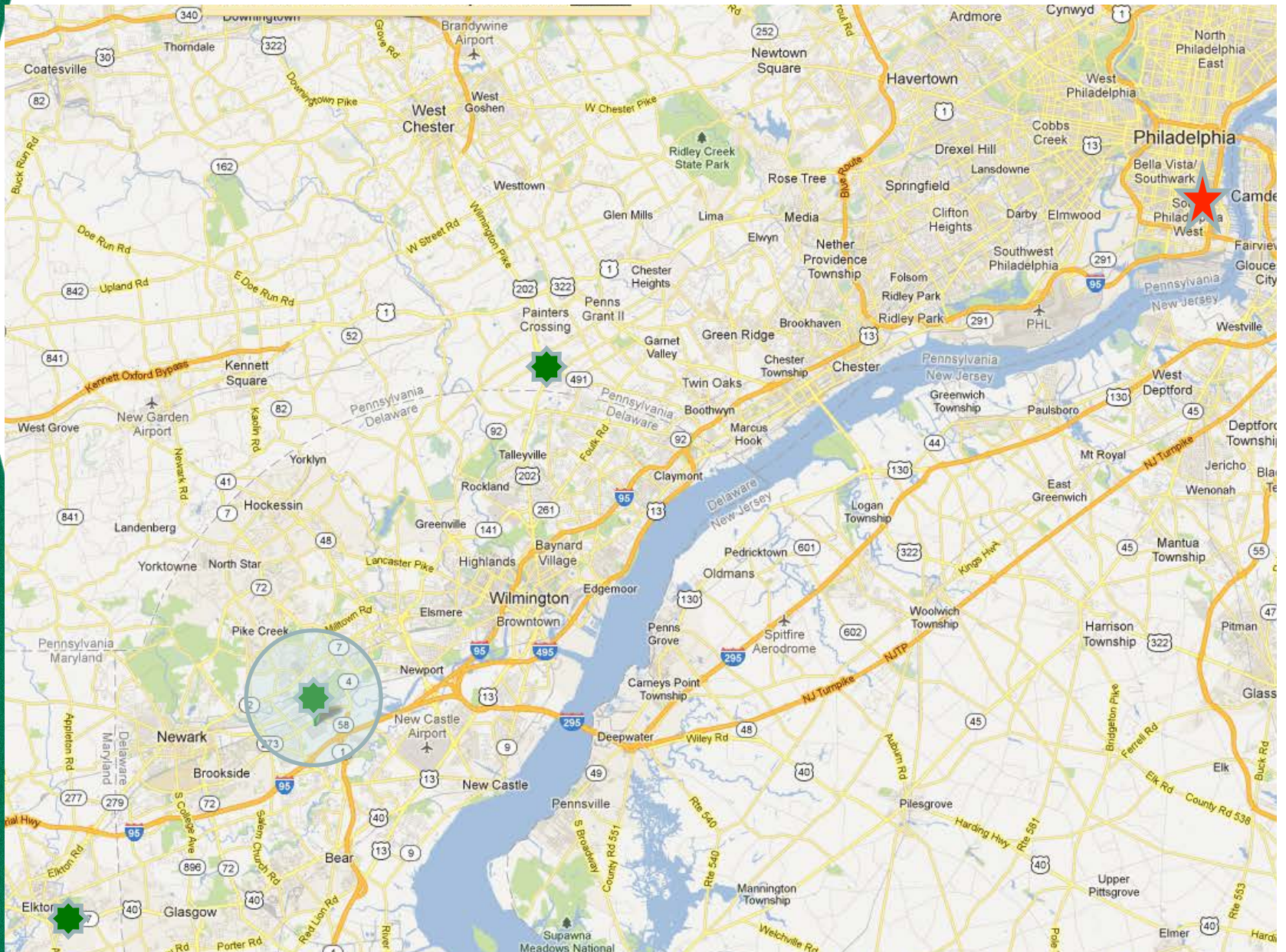




# Radiation Oncology

- Helen F. Graham Cancer Center
  - Main operations: 3 LINACs, 1 CK
  - Outpatient
- Christiana Hospital
  - Across street from HFGCC
  - In patients EBRT & HDR
- Satellite 1:
  - Union Hospital, Elkton, MD
- Satellite 2:
  - Concord Site (new, opened Jan, 2014) in Chadds Ford, PA

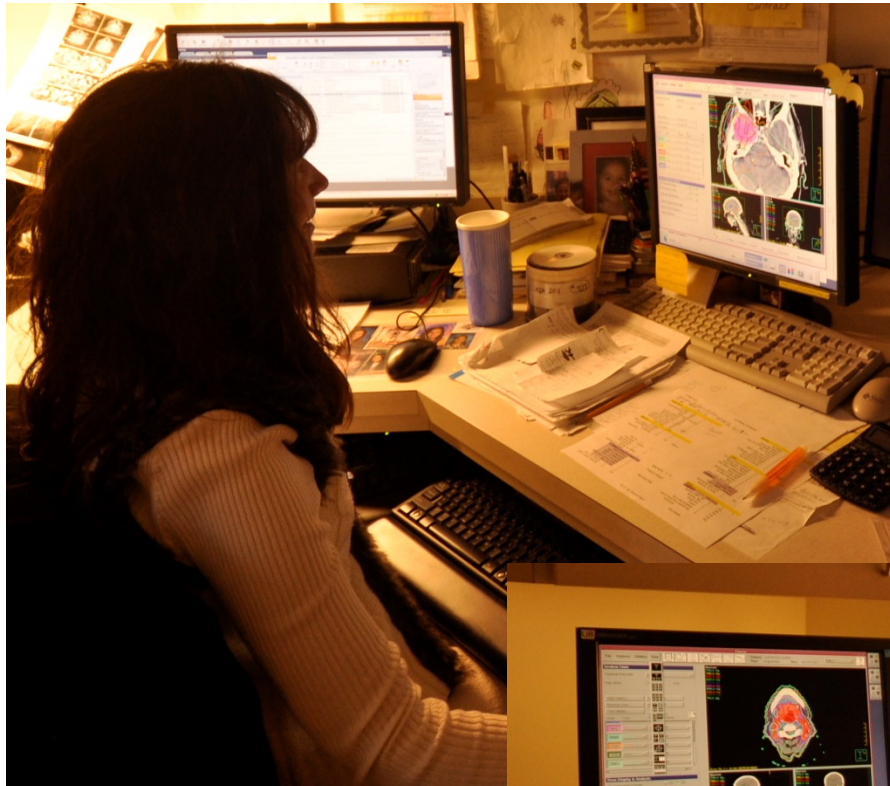






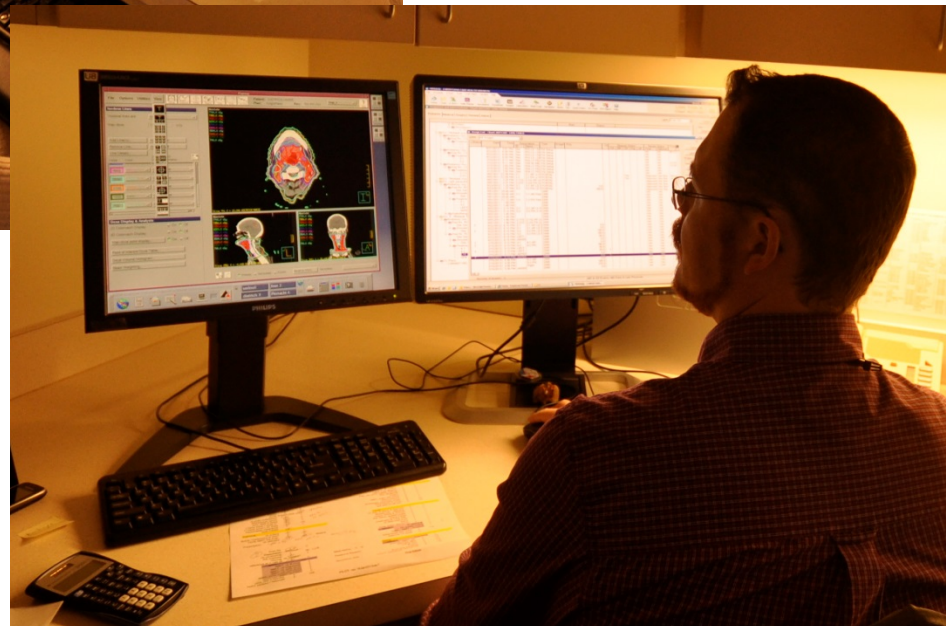
# RADIATION ONCOLOGY SERVICES

- 3 Siemens Linacs (Artiste, Oncor, Primus)
- 3 Elekta Linacs (Synergy, Infinity, Versa)
- 1 CyberKnife
- 3 Siemens CT Sim's (2 Large Bore)
- 2 Nucletron HDR Afterloaders: Breast, Gyn, Skin, Sarcoma
- Prostate Seed Implants (LDR)
  - 3 sites: Surgi Center, DOCS, Union



## Treatment Planning:

- Pinnacle TPS
- Ray Station TPS
- Oncentra TPS (HDR)
- Multiplan TPS (CK)



8 Rad. Oncs  
7 Physicists  
7 Dosimetrists



# CyberKnife Program started in 2008

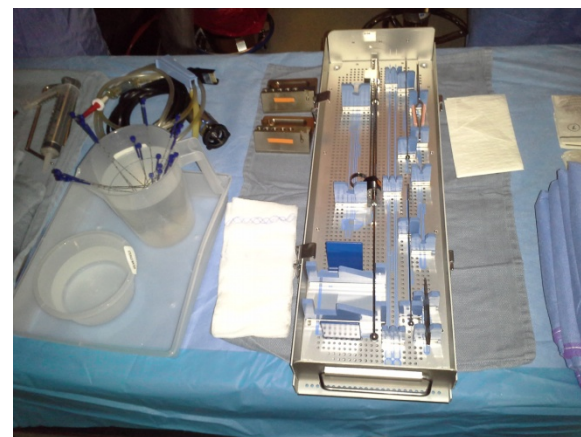
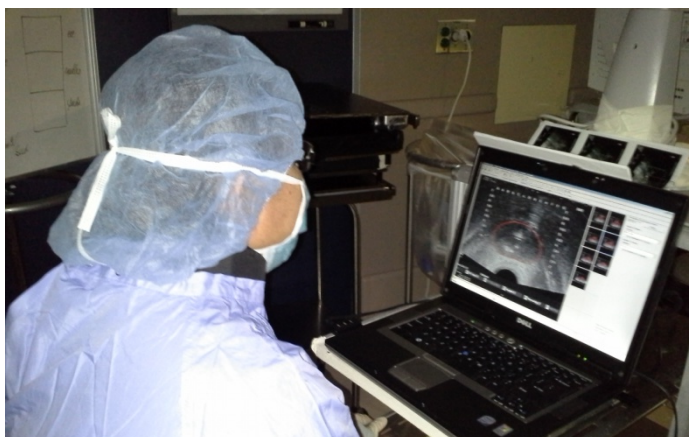


# Radiation Oncology Statistics 2014

- >32,000 EBRT fractions
- >600 SBRT (Cyberknife) fractions
- >900 HDR fractions
- >200 LDR Prostate Implants (real-time)



# US Real-time Planning for Prostate Seed Implants

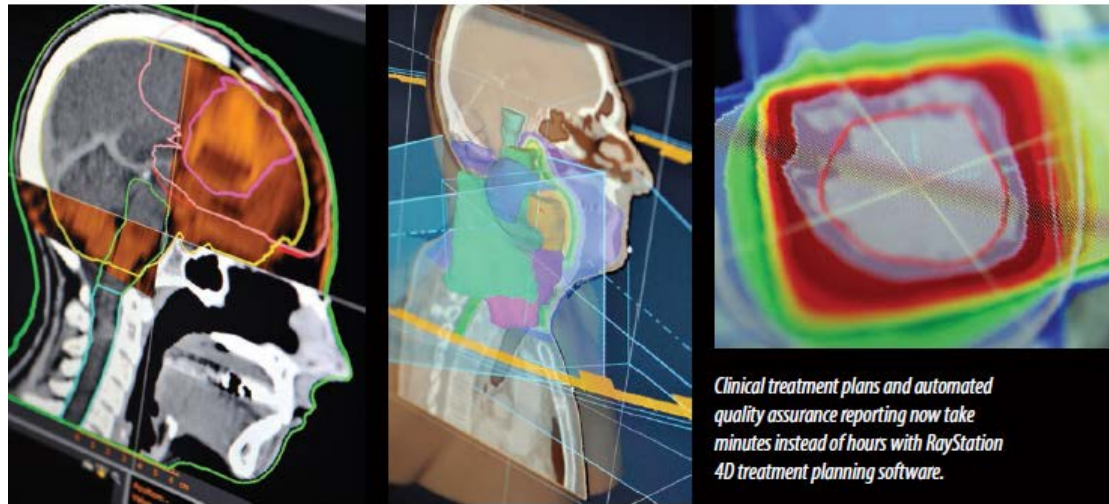


234 PSI cases in 2012: About 4-5 cases per week!



## Advanced 4D radiation treatment planning at Helen F. Graham Cancer Center

Christiana Care one of only 10 sites in U.S. with tumor-tracking software



The Helen F. Graham Cancer Center at Christiana Care is only the 10th institution in the United States to install RayStation, a 4D treatment planning software that provides precise radiation treatments for cancer patients with greater efficiency.

4D — the fourth dimension — is time. RayStation 4D software uses special adaptive techniques to adjust for anatomical changes that can occur in tumors and surrounding normal tissues during the course of treatment, allowing far greater control in tumor targeting while sparing normal tissue.

RayStation will be used to plan treatment of cancers of the head and neck, said Firas Mourtada, MSE, Ph.D., D. ABR,

chief of Clinical Physics in Radiation Oncology at Christiana Care.

“Head and neck tumors and surrounding normal organs from the original CT scans are used to create a treatment plan,” he said. “However, they move around during the course of radiotherapy, and thus might require adjustments.”

With standard systems, it can take two or three days to review the progress of a tumor and establish a plan to deliver the precise dose of radiation required to attack the cancer. RayStation condenses that process to about half a day.

Head and neck cancers account for about 3 percent of cancers in the U.S., according to the American Cancer Society. These cancers are difficult to

treat unless they are detected in their earliest stages.

Intensity-modulated radiation therapy or IMRT is so highly conformal that even minor changes in the patient’s anatomy can have profound effects on outcomes, said Adam Raben, M.D., radiation oncologist.

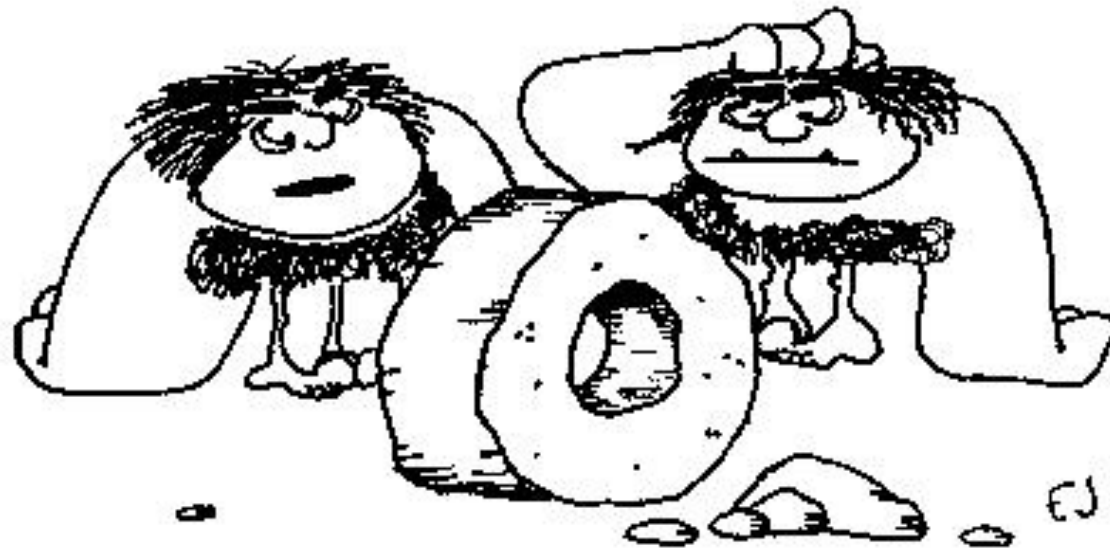
“This technology is revolutionary in that it allows rapid adaptation of our original IMRT treatment plan to re-conform to changes in the patient contour due to weight loss and tumor response,” Dr. Raben said. “Rapid adaptive IMRT is the next wave of technology that can be applied with immediate clinical benefit of additional accuracy and side-effect reduction.” ●

# Objectives

- Introduction to CCHS Radiation Oncology
- **Motivation for us to be a spoke**
- Basic Economics for partnership
- Residency Program Structure and Operations



# Motivation #1: Why Reinvent the Wheel?



How DOES IT WORK AGAIN?

# Solo vs Affiliated

- Sometimes Less is More
- Not clear how long the application process will take for CAMPEP.
- Unclear administrative resources to start and maintain a residency program.
- It was prime *time* to get residents on board at CCHS.



# Hub-and-spoke model (TG-133)

- TJU (hub) responsible for initial accreditation, curriculum development, resident performance tracking, scheduling exams, clinical training, etc.
- CCHS (spoke) responsible for clinical training







# CHRISTIANA CARE HEALTH SYSTEM

- **Founded in 1888.**
- **Delaware's largest private employer –**  
more than 10,400 employees.
- **Major Teaching Hospital –**  
more than 250 Medical-Dental Residents and Fellows.
- **More than \$2.1 billion in total patient  
revenue in FY 2011.**
- **Provided \$27.1 million in charity care.**



**Jefferson™**  
Kimmel Cancer Center  
NCI-designated

# Motivation #2: Jefferson's Reputation



- SIDNEY KIMMEL MEDICAL COLLEGE
- COLLEGE OF BIOMEDICAL SCIENCES
- JCHP
- COLLEGE OF NURSING
- COLLEGE OF PHARMACY
- COLLEGE OF POPULATION HEALTH

HOME > SIDNEY KIMMEL MEDICAL COLLEGE > DEPARTMENT OF RADIATION ONCOLOGY > RESIDENCY STATISTICS

## RADIATION ONCOLOGY HOME

- Clinical Home
- Faculty
- Education
- Divisions
- Research
- Giving to Jefferson
- Contact Us

## Residency Statistics

[Message from Chair](#) | [About TJU](#) | [About TJUH](#) | [Benefits](#) | [Life at Jeff](#) | [Education](#) | [Medical Physics Residency](#) | [Clinical Rotations](#) | [Program Overview](#) | [Residency Statistics](#) | [Current Residents](#)

## Residency Alumni

The Medical Physics Residency Program has been directed by Amy Harrison, MS since 2007. In that same year the residency program received accreditation through CAMPEP (Commission on Accreditation of Medical Physics Education Program).

### Resident Alumni - Post-CAMPEP Accreditation

Graduation Year	Number of Applicants	Number Accepted to the Program	Number of Graduates per Year	Number of Residents ABR Certified	Graduates Currently in a Clinical Position	Graduates Currently in an Academic/Clinical Position
2015	164	2	2			
2014	131	2	2		2	0
2013	149	4	2	2		2
2012	119	1	2	1	1	1
2011	85	1	1	3		1
2010	133	2	1		1	
2009	60	3	1	1	1	
2008	50 (approx.)	1	1		1	1



Letter from Yan Yu, PhD, MBA  
Director, Division of Medical Physics



Amy Harrison, MS  
Residency Program Director



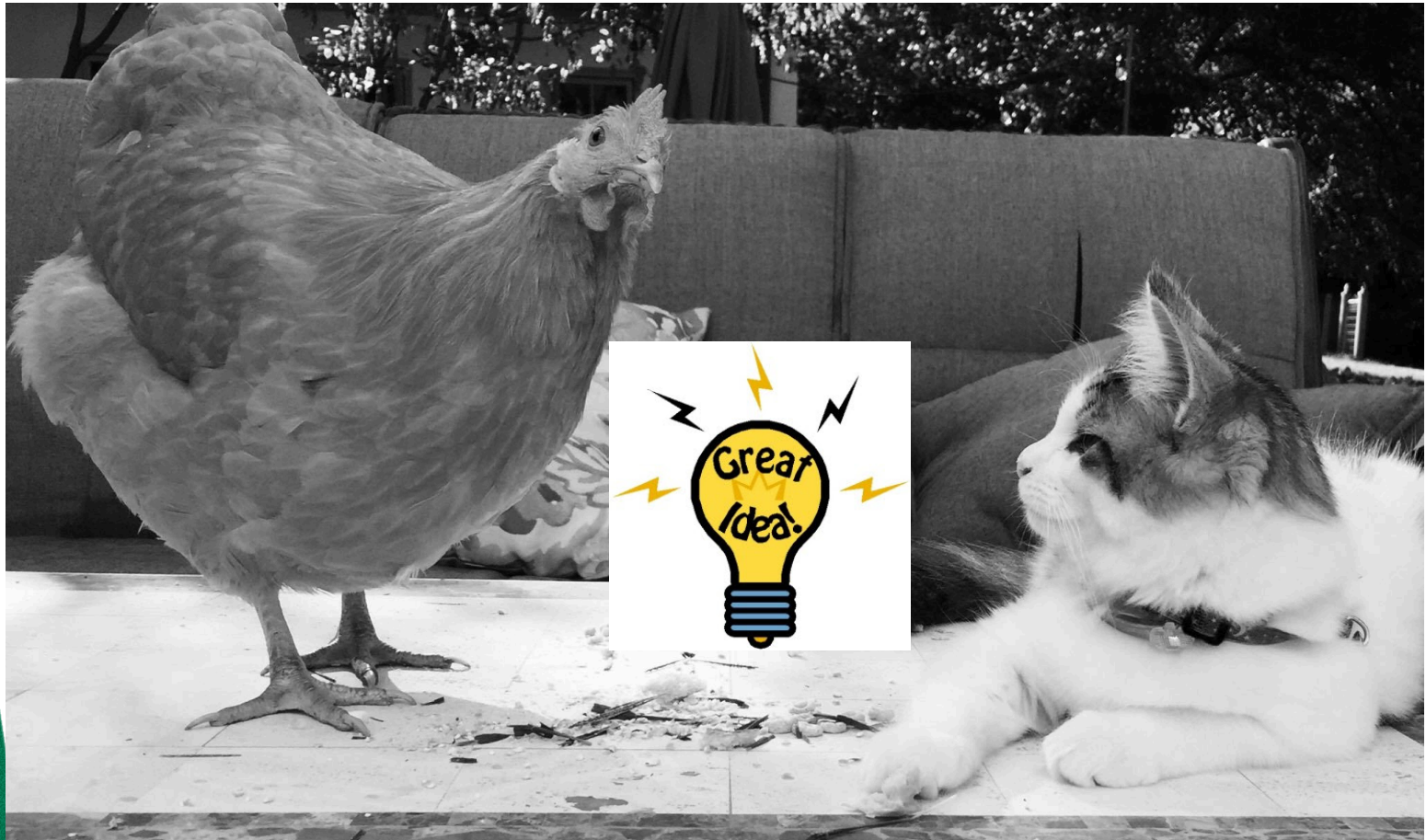
Virginia Lockamy, PhD  
Associate Residency Director



Firas Mourtada, PhD  
Associate Residency Director  
Christiana Care Health System (CCHS)



AMY HARRISON @ TJU



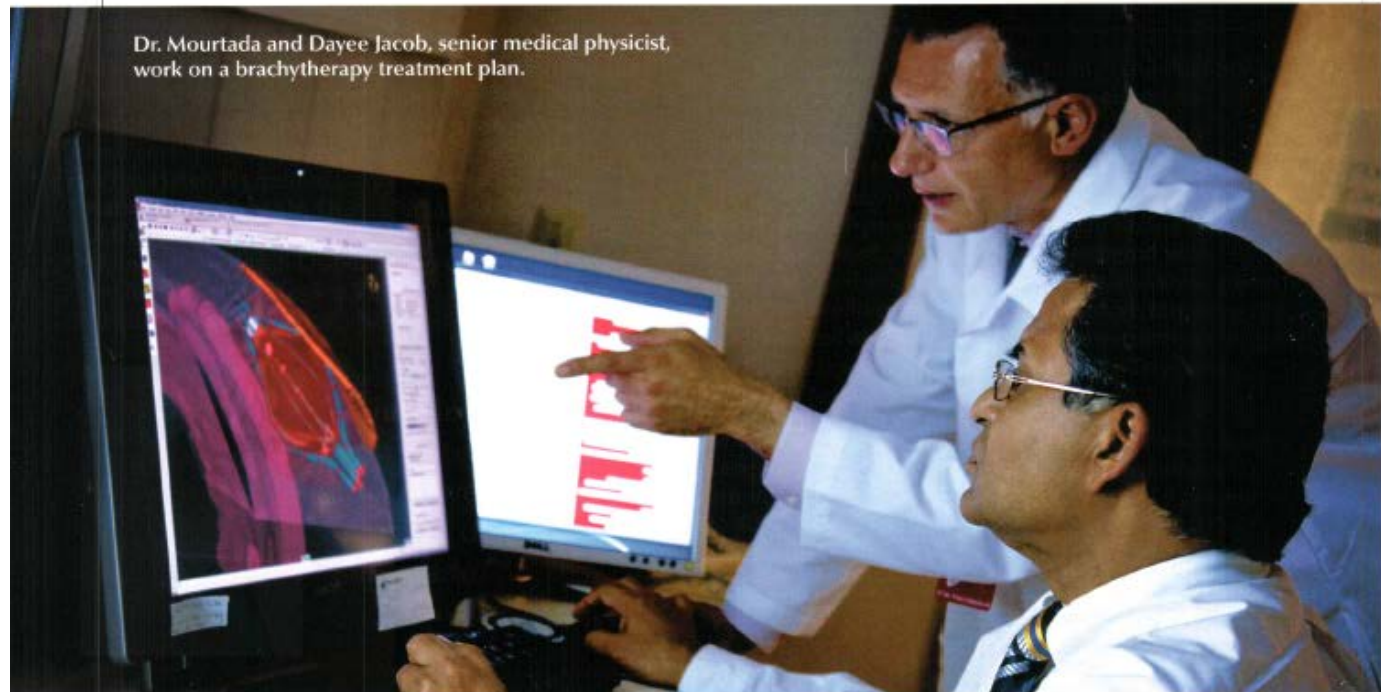
FIRAS @ CCHS

# Motivation #3: Education is part of my mission

## Radiation Oncology launches first allied health residency in medical physics

THE CHRISTIANA CARE DEPARTMENT OF RADIATION ONCOLOGY AT THE HELEN F. GRAHAM CANCER CENTER OFFERS ITS FIRST RESIDENCY PROGRAM IN MEDICAL PHYSICS. The program is in collaboration with the Thomas Jefferson University Radiation Oncology Department Division of Medical Physics at the Kimmel Cancer Center in Philadelphia.

Dr. Mourtada and Dayee Jacob, senior medical physicist, work on a brachytherapy treatment plan.





# Clinical Physics Mission

- Since my arrival to CCHS in Sept. 2011,
  - Establish a CAMPEP approved residency program, which is in line with CCHS' overall mission
- Excellent clinical environment
  - My initial assessment was positive from both equipment available, and staff willingness to have residents



# Motivation #4

## Cancer Center Mission

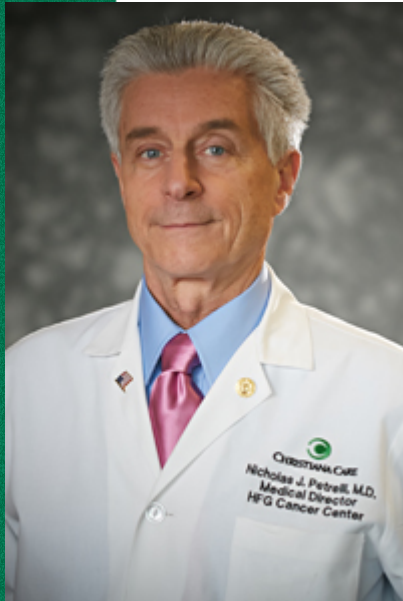
Helen F. Graham Cancer Center & Research Institute

**NATIONAL CANCER INSTITUTE**

COMMUNITY ONCOLOGY RESEARCH PROGRAM



Exceptional cancer care. Exceptionally close.



**Nicholas J. Petrelli, M.D., FACS**



**Christopher D. Koprowski, M.D.**

# Motivation #5: Need for more residency programs in the US

Journal of Applied Clinical Medical Physics, Vol 11, No 2 (2010)

---

## Future trends in the supply and demand for radiation oncology physicists

**Michael D. Mills <sup>1a</sup>, Judah Thornewill <sup>2</sup>, Robert J. Esterhay <sup>2</sup>**

*Department of Radiation Oncology, University of Louisville School of Medicine, Louisville, KY, USA, <sup>1</sup> Department of Health Management and Systems Sciences, University of Louisville School of Public Health and System Sciences, Louisville, KY, USA<sup>2</sup>*

*[Mdmill03@gwise.louisville.edu](mailto:Mdmill03@gwise.louisville.edu).*



# Objectives

- Introduction to CCHS Radiation Oncology
- Motivation for us to be a spoke
- **Basic Economics for partnership**
- Residency Program Structure and Operations

# Why we complement each other?

- TJU has
  - Has excellent track record teaching residents
  - Equipment: Gamma knife, Varian LINACS, Prostate HDR, Ra-223, TSET, Monaco, Eclips
  - Didactic courses: Radiobiology, Ethics
- CCHS has
  - Two approved residency slots
  - New RayStation TPS
  - Cyberknife and PSI LDR





# Financial Considerations

- Share CAMPEP application fees
- Determine increased administrative cost on the hub due to spoke residents
  - Interview phase
  - Tracking resident progress
- Commute expenses and faculty time should be estimated



# Webinar #3



## RESIDENT TRAINING AGREEMENT

### BETWEEN

THOMAS JEFFERSON UNIVERSITY HOSPITALS, INC.

### AND

CHRISTIANA CARE HEALTH SERVICES, INC.

This Resident Training Agreement (hereinafter "Agreement"), made effective on the 1st day of July 2013, by and between Thomas Jefferson University Hospitals, Inc. (hereinafter "JEFFERSON") and Christiana Care Health Services, Inc. (hereinafter "AFFILIATE") sets forth the parameters and administrative provisions of the rotating residency program, (hereinafter "Program") entered into mutually by the parties.

### WITNESSETH

**WHEREAS**, JEFFERSON and AFFILIATE have an interest in supporting medical physics training and in working cooperatively with other institutions dedicated to public service and medical educational endeavors; and

**WHEREAS**, JEFFERSON and AFFILIATE agree that patient care can be best achieved and facilitated when a stimulating and positive educational and clinical environment is maintained; and

**WHEREAS**, JEFFERSON and AFFILIATE desire to establish and maintain a relationship in order to provide a range of relevant clinical services and facilities as part of a radiation oncology physics residency training program; and

**WHEREAS**, JEFFERSON and AFFILIATE agree that it is in their mutual interest and to their mutual advantage to provide residents participating in the training program the opportunity to work at AFFILIATE as part of their clinical training program;

**NOW, THEREFORE**, in consideration of the mutual covenants contained herein and intending to be legally bound hereby, the parties agree as follows:



# Objectives

- Motivation for us to be a spoke
- Basic Economics for partnership
- **Residency Program Structure and Operations**

# TJU Hub & CCHS Spoke Structure

- TJU (Hub):
  - Owns program in general sense
  - Program administration
    - ◆ Advisory committees for Hub and Spoke
    - ◆ Resident evaluation and oversees compliance
  - CCHS (Spoke)
    - ◆ Interview residents w Hub
    - ◆ Directly employs residents (resident salary, benefits, PTO, funds meetings)
    - ◆ Provide resources including office space for resident



# Program Governance

- Residency Program Steering Committee (Spoke)
  - Amy Harrison, TJU
  - Virginia Lockamy, TJU
  - Firas Mourtada, CCHS
  - Henry Yu, CCHS
  - Avi Sarkar, CCHS
  - Hank Chen, CCHS
  - Kelly Andreau, CCHS
- Meets on annual basis
- I also serve on TJU residency steering committee (Hub)

# **CCHS Physics Staff Involved in Teaching Residents 3:1**

- Hank Chen, M.S., DABR
- Henry Yu, Ph.D.
- Avi Sarkar, M.S., DABR
- Dayee Jacob, M.S., DABR
- David Huang, M.S.
- Kai Yang, M.S., DABR
- Kelly Andreau, B.S., Chief Dosimetrist



## Clinical Physics Rotations (in months)

### Resident Name

Rotation	Mentor(s)	2015							2016					
		Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Orientation and Clinic Responsibilities (monthlies, IMRT/VMAT QA, OSLs, diodes, film, HDR warm up)	FM													
Treatment machine ATP, survey, commissioning	Sarkar													
Dosimetric systems acceptance testing/ commissioning/ QA	Henry													
Physics rotation/POD / Plan Check/Weeklies	Henry													
Treatment Machine QA	TBD	OE	Versa	Versa	Artiste	Artist	PA	PA	S1	S1	OncorC	Oncc	CK	CK
Treatment machine calibration (TG51) and Annuals	TBD													
Dosimetry Rotation 1: 2D, 3D, MU calculations	Hank													
Dosimetry Rotation 2: IMRT including PTI prostates	Henry													
Brachy I	FM													
Brachy II	FM													
Simulator/Sim CT acceptance testing and QA (See CT Cal)	Avi													
Shielding / room design	FM													
Stereotactic (Gamma knife / SRT, see note 2)	Hank													
TBI/TSET/IORT	Hank													

(1) If a machine is not installed in this time period, then a "mock" ATP & com

(2) During rotation period, expectations include at least two complete SRT charge days on gamma knife.

- Similar Structure between Spoke and Hub
- Only difference is equipment and staff
- This insures per CAMPEP that the CCHS residents receive clinical training comparable to TJU residents



**Jefferson™**  
Kimmel Cancer Center  
NCI-designated

**Helen F. Graham  
Cancer Center**

CHRISTIANA CARE HEALTH SYSTEM

Thomas Jefferson University Hospital

Medical Physics Residency Program

And Christiana Care Health System Affiliated TJUH Residency Program

In Radiation Oncology Physics

Self-Study Program

For

CAMPEP Re-Accreditation Review

Amy S. Harrison M.S., CMD, DABR

Residency Program Director

Virginia Lockamy, PhD, DABR

Associate Residency Director, TJUH

Firas Mourdata, PhD, DABR

Associate Residency Director, CCHS



**Thomas Jefferson University Hospital  
Medical Physics Residency Program in Radiation Oncology Physics**

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# Medical Physics Resident Manual (Spoke Specific)

- Physics Residents are CCHS Employees and as such have the benefits of staff and should read the ***Employee Handbook***
- Adheres to CCHS Mission and Core Values

The screenshot shows the 'HR Online' interface for Christiana Care Health System. The page title is 'Employee Handbook'. A search bar is located at the top right of the content area. On the left, there is a navigation menu with categories like 'Introduction', 'You and Your Job', 'Standards of Conduct and Performance', 'Your Wages and Your Paycheck', 'Your Time Off', 'Insurance Policies', 'Other Employee Benefits', 'Communications', and 'Employee Safety Handbook'. The main content area contains the following text:

**Introduction**

Christiana Care is committed to achieving and maintaining our strategic objective of being a Great Place to Work. To this end, Christiana Care has voluntarily established Human Resource policies and practices that provide guidance to managers to enable them to cultivate a work environment that encourages the recruitment, retention, and commitment of a diverse and talented work force. All policies have been established to assure equal opportunity regardless of race, color, religion, sex, national origin, sexual identity or expression, age, marital status, genetic information, sexual orientation, disability or protected veteran status.

As a condition of employment, all employees agree to abide by all Christiana Care policies and procedures including those contained in the employee handbook.

Responsibility for the day-to-day management of Christiana Care employees must rest with the Christiana Care management team. Christiana Care's human resources platform has been developed to support managers in fulfilling these responsibilities and in developing and maintaining a positive employee relations climate. Our voluntary commitment to these policies, applied through our competent management team, supports an engaged workforce that is able to support the fulfillment of our mission.

Employee and management input is regularly obtained on human resources policies and practices through various avenues including focus groups, surveys, and the Human Resources Advisory Committee.

For policy questions contact **Tasha Moore-Wright at 733-1384**.  
• [Christiana Care\\_Regulatory\\_Portal](#)

This guide highlights policies, practices, services and other benefits provided to employees in Christiana Care Health Services, Health Initiatives and Home Health and Community Services. The guide is intended to be informational and is not a contract between you and Christiana Care. Statements of policy and procedure in this guide are subject to change, and final interpretation of current policies and practices rests with Christiana Care.

# Recruitment

- Both Hub and Spoke participate in the national Med. Phys. Match
- Applicants submit a single application to TJU-CCHS Program
- TJU select top 50 applicants
- TJU and CCHS pick the top 20 to invite for interview
- TJU and CCHS interview candidates at TJU
  - Open House at Spoke, 45min drive to Newark from Philly



**CCHS/TJU 1<sup>st</sup>  
resident  
Allison Mitchell, MS  
Duke University**



Graduated in June 2015

**CCHS/TJU 2nd resident  
(PGY2)  
Melissa Lamberto, MS  
Louisiana State University**



**Our 3rd resident (PGY1)  
Nick Peterson, MS  
Louisiana State University**


# Resident Evaluations

- After each rotation (1-3months)
  - Standardized questions for both TJU & CCHS
  - Rotation faculty, Program director, and Associate director
- 2-3 oral exams to mock ABR exam
  - Program and Associate directors with invited faculty
- On-going at physics staff meetings (pop-quizzes)
  - Any faculty

# New Innovations Software

## www.new-innov.com

ADVANCED TECHNOLOGY: GAMMA KNIFE/TRUEBEAM EDGE/CYBERKNIFE



**Allison L. Mitchell**  
PRG 2  
4/1/2015 to 6/30/2015  
Advanced Technology: Gamma Knife/Truebeam edge/Cyberknife

Evaluator  
**Firas Mourtada**  
Faculty

*Instructions:*  
Select the numerical rating best matching the resident's skills and abilities with the description given for each component of clinical competence. Evaluate the resident's ability to carry out the clinical tasks and provide substantive comments for each assessment. Cite major strengths and weaknesses, including reports of critical incidents.

---

**GAMMA KNIFE TREATMENT STRATEGIES**

Understands the differences in planning and dose prescription approaches for tumors, AVM's and functional cases	1	2 = Marginal	3	4	5 = Satisfactory	6	7	8 = Superior	9	Not Observed
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments:

Remaining Characters: 5,000

---

**GAMMA KNIFE TREATMENT PLANNING**

Understands and is able to explain treatment planning steps including but not limited to: imaging, localization, shot selection, and differences between Gamma Knife and conventional 3D planning	1	2 = Marginal	3	4	5 = Satisfactory	6	7	8 = Superior	9	Not Observed
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments:

Remaining Characters: 5,000

---

**GAMMA KNIFE QA**

Understands the rationale of different QA tests and basic terminology associated with Gamma Knife	1	2 = Marginal	3	4	5 = Satisfactory	6	7	8 = Superior	9	Not Observed
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments:

Remaining Characters: 5,000

---

**GAMMA KNIFE AND THE NRC**

Understands compliance issues associated with Gamma Knife	1	2 = Marginal	3	4	5 = Satisfactory	6	7	8 = Superior	9	Not Observed
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments:

Remaining Characters: 5,000



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We specialize in integrated software solutions for medical education programs at schools, hospitals and private practices across the world.

Unify your information tasks and compliance management into a secure centralized internet database with tools specifically designed for both Graduate and Undergraduate Medical Education environments.

We are pleased to welcome Colquitt Regional Medical Center in Georgia as a member of the New Innovations' client family.

[Client Login](#)





# Requirements for program completion

- Demonstration of adequate medical physics education (equivalent to a graduate degree in medical physics).
- Demonstration of clinical competency in all clinical training rotations.
- Competency and shared responsibility of clinical physics duties: initial calculation checks, chart checks, and weekly chart checks.

# Requirements for program completion

- Demonstration of adequate medical physics education (equivalent to a graduate degree in medical physics).
- Demonstration of clinical competency in all clinical training rotations.
- Competency and shared responsibility of clinical physics duties: initial calculation checks, chart checks, and weekly chart checks.

# Requirements for program completion

- Presentation of at least one medical physics presentation during each rotation block.
- Attendance at required clinical and medical physics seminars and conferences, morning chart rounds/QA conferences.
- Satisfactory assessment of progress
  - oral examination at the end of each rotation



# Conclusions

- A hub/spoke residency program has been successfully launched with TJU and CCHS
- A hub/spoke governance should insure consistency and uniformity of resident training
- A hub/spoke model should be synergistic to provide more resources to residents from both sides

# Conclusions

- Benefit to residents
  - See academic hospital setting (TJU as Hub)
  - See community cancer center setting (CCHS as Spoke)
  - More collegial interactions; more equipment; more mentors from combined institutions



<http://christianacare.org/ncccp>

# Helen F Graham Cancer Center



**One of only 30 National Cancer Institute National  
Community Cancer Centers (NCCCP) since 2007**



# Hub and Spoke Residency Model A Spoke's Prospective

Michele Verst, MS, DABR

Chief of Medical Physics

Hux Cancer Center, Terre Haute, IN

Associate Director of Medical Physics Residency

University of Kentucky



# Objectives

- Introduction to the Hux Cancer Center
- Medical Physics Residency – Why?
- Affiliation process
- Challenges with distance learning
- CAMPEP Accreditation

# Hux Cancer Center







# Hux Cancer Center - Staffing

- 2 Physicians
- 2 Certified Physicists
- 2 Certified Dosimetrists
- 3 Oncology Nurses
- 7 Therapists
- 1 Administrative Director
- 2 Administrative Assistants
- 1 Dietician
- 1 Pastoral Counselor

1 Medical Physics Resident

# Hux Cancer Center - Equipment



2 Varian TrueBeams



Philips BigBore CT



Varian  
Ximatron

Monaco TPS and Mosaic R&V



# Hux Cancer Center - Services

- Conventional XRT ( 3D, IMRT, VMAT, 4DCT)
- MLC based SRS/SBRT (coming Jan 2016)
- LDR (prostate, GYN, interstitial)
- Radiopharmaceuticals (Xofigo, Zevalin, I-131)
  
- Treat approximately 550 patients per year, servicing Terre Haute, IN and the surrounding rural areas



# Hux Cancer Center



**AMERICAN COLLEGE OF SURGEONS**  
*Inspiring Quality: Highest Standards, Better Outcomes*





# Objectives

- Introduction to the Hux Cancer Center
- **Medical Physics Residency – Why?**
- Affiliation process
- Challenges with distance learning
- CAMPEP Accreditation



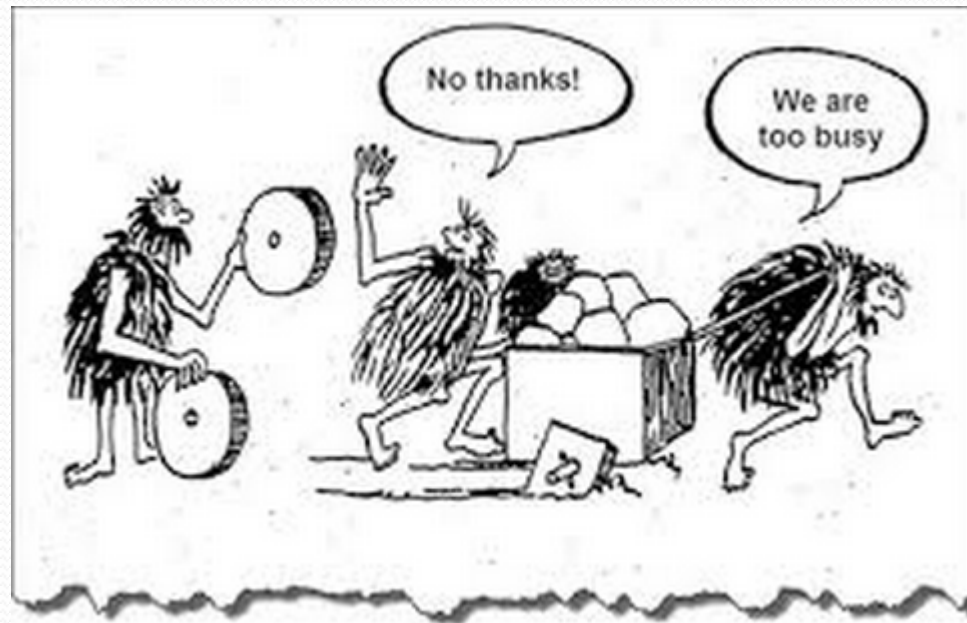
# Why a Medical Physics Residency?

- Junior Physicists (fresh from school) are no longer available
  - Hired 4 Junior Physicists in last 15 years prior to residency position
  - Mutually beneficial: lower staffing costs while providing invaluable training/experience
  - ABR requirement for CAMPEP residency eliminates staffing pool



# Why a Medical Physics Residency?

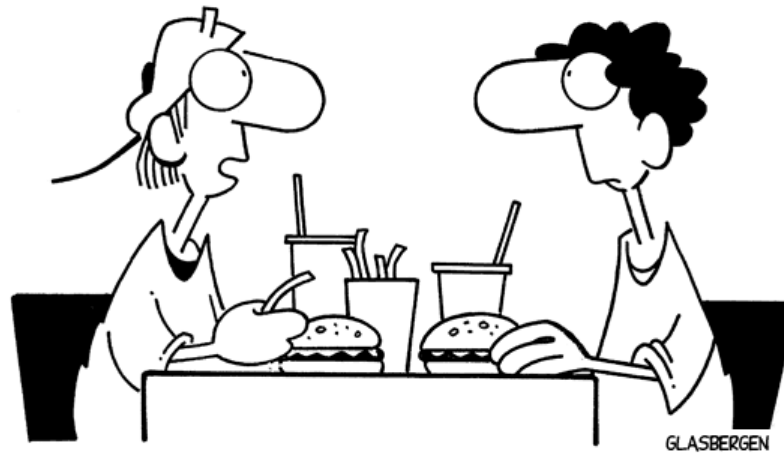
Students and Residents offer new perspectives



# Why a Medical Physics Residency?

## Proficiency Retention for Staff

Copyright 2006 by Randy Glasbergen.  
[www.glasbergen.com](http://www.glasbergen.com)



**"I forgot to make a back-up copy of my brain,  
so everything I learned last semester was lost."**



# Objectives

- Introduction to the Hux Cancer Center
- Medical Physics Residency – Why?
- **Affiliation process**
- Challenges with distance learning
- CAMPEP Accreditation



# Establishing an Affiliation

- Find the right fit for both Hub and Spoke
  - Similar philosophy to patient care
  - UK has established CAMPEP accredited Graduate and Residency Programs
    - Dedicated to MS level clinical medical physics
    - Preference given to UK graduate students
    - Need for additional residency slots through affiliated sites

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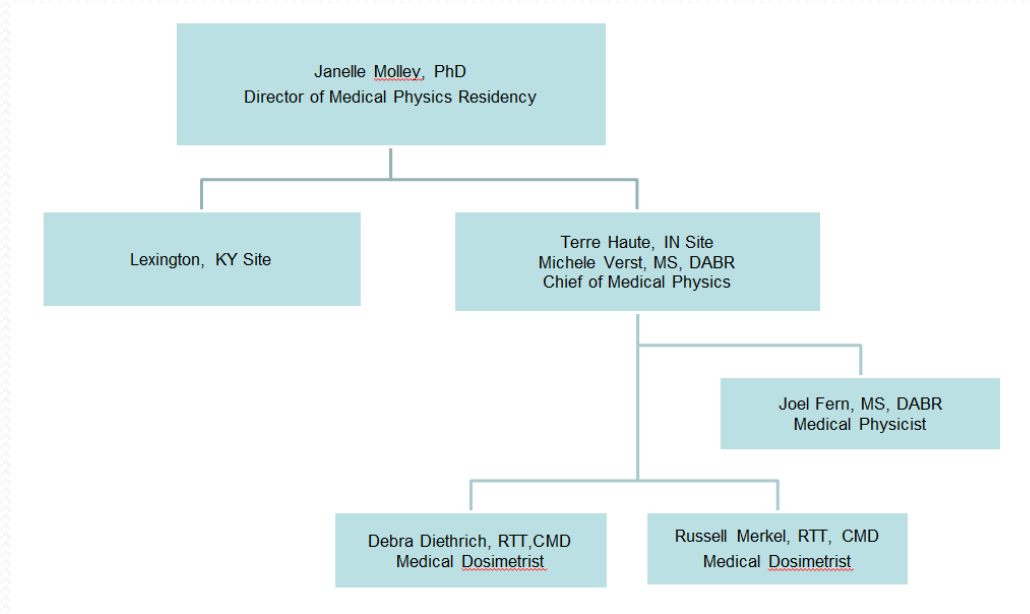
# Establishing an Affiliation

Maintaining integrity and continuity of the program

- Determine reporting structure and responsibilities
- “Equivalent” but not identical training
- Breathe of Modalities
- Teaching opportunities for Residents
- Competency tracking

# Establishing an Affiliation

## Reporting Structure





# Establishing an Affiliation - Responsibilities

- Lexington

- Employ Resident
  - Salary
  - Benefits
  - Liability
- Maintain program documentation
- Participate in Oral Exams
- CAMPEP Application

- Terre Haute

- Contract Resident
- Maintain site documentation
- Clinical experience
- Participate in Oral Exams
- Semiannual Evaluations
- Participate in Residency review board



# Establishing the Affiliation

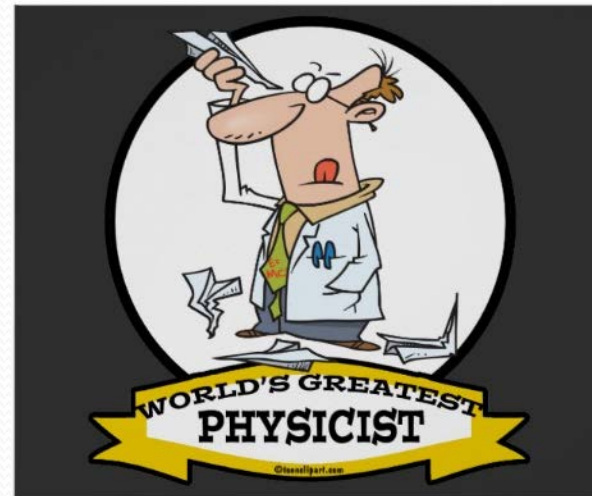
“Equivalent” but not Identical

- No two sites are the same
  - must accommodate for process differences
- Start with the basic structure of the Hub and tweak as necessary
  - Find common ground
  - Determine how to manage deficiencies
  - Determine how the Residents and Program will be evaluated

# Establishing an Affiliation

## Rotations

- Brachytherapy
- Dosimetry Systems
- Machine QA
- Radiation Safety
- Special Procedures
- Treatment Planning
- Information Management
- Clinical Research





# Establishing the Affiliation

Treatment Planning		
Mentor:	Michele Verst (HCC)	
	Paul Mason (SFH)	
Duration:	4 Months	
Conventional/3D Planning (HCC)		
DONE	MINIMUM REQUIRED	ITEM
	5	Breast
	5	Pelvis
	1	Head and Neck
	3	Lung
	1	Brain
	1	Abdomen
	1	Soft Tissue Sarcoma
	3	Total Spinal Axis
	1	Lymphoma
	5	Electron Plans
	10	Other
Stereotactic Plans (SFH)		
DONE	MINIMUM REQUIRED	ITEM
	3	SBRT
IMRT/Tomotherapy (HCC/SFH)		
DONE	MINIMUM REQUIRED	ITEM
	5	Head and Neck
	3	Prostate
	3	Brain
	1	Abdomen
	1	Lung
Fusion		
DONE	MINIMUM REQUIRED	ITEM
	2	CT/MR Fusion
	2	CT/PET Fusion
	2	CT/CT Fusion
	2	CT/CBCT Fusion
	5	Other

- Most competencies can be complete at Hux
- SRS/SBRT is not available at Hux until 2016
- Tomotherapy will not be available at Hux
- Alternatives
  - Sister hospital in Indianapolis
  - Complete in Lexington



# Establishing an Affiliation

- Resident Evaluations
  - Oral Exams
    - At the conclusion of each rotation, except Research and IMS
    - both Lexington and Terre Haute staff participate in resident oral exams for each site
  - Mentor Evaluation: Rotation Mentor(s)
  - Semiannual Evaluations: Site Director
  - 360° annual evaluations
  - Program evaluations: Residents



# Establishing an Affiliation

- Breathe of Modalities
  - Detail how each modality is offered
    - Conventional IMRT, 3D, VMAT covered at Hux
    - SRS/SBRT, Tomotherapy, HDR covered at UK or Indianapolis hospital
    - IORT, TBI, TSE, eye plaques are not available
      - Self study/practice plans
      - Alternate site – UK, another facility
      - Meeting or seminar





# Establishing an Affiliation

- Teaching Opportunities
  - Presentations: remote or on-site
    - Medical residents
    - Graduate students
  - Projects
    - Implementing new software or functionality
    - Developing process improvements
  - Daily knowledge sharing with dosimetrists/therapists

# Establishing an Affiliation

Competency  
Tracking

MedHub

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Medical Physics - Indiana

You are here: [myHome](#) » [Procedures](#) » Mentor Access to Procedures/Cases

### Mentor Access to Procedures/Cases

Procedures Requirements Certifications Continuity of Care Visits Summary Counts by Type Patient Breakdown

Group By: Procedure/Case Logs Procedure Type Diagnosis/Indications

Patient ID:	Procedure Date:	Procedure:
11	09/11/2015	TP: Conventional/3D Planning - Pelvis (1)
--	09/04/2015	TP: Mentor Meetings (1)
10	09/04/2015	TP: Conventional/3D Planning - Electron Plans - 1st 2 plans are to be reviewed by an experienced treatment planner before ph
--	09/03/2015	RS: Perform a Quarterly Brachytherapy source inventory (1)
09	08/31/2015	TP: Conventional/3D Planning - Lung - 1st plan is to be reviewed by an experienced treatment planner before ph
--	08/31/2015	TP: Mentor Meetings (1)
08	08/27/2015	TP: Conventional/3D Planning - Lung - 1st plan is to be reviewed by an experienced treatment planner before ph
06	08/25/2015	TP: IMRT/Tomotherapy Planning - Prostate - 1st plan is to be reviewed by an experienced treatment planner before ph
06	08/18/2015	TP: Conventional/3D Planning - Pelvis (1)
06	08/18/2015	TP: Conventional/3D Planning - Pelvis (1)
06	08/18/2015	TP: Conventional/3D Planning - Pelvis (1)
05	08/12/2015	TP: Conventional/3D Planning - Lung - 1st plan is to be reviewed by an experienced treatment planner before ph
05	08/12/2015	TP: IMRT/Tomotherapy Planning - Lung - 1st plan is to be reviewed by an experienced treatment planner before ph
07	08/11/2015	TP: Conventional/3D Planning - Electron Plans - 1st 2 plans are to be reviewed by an experienced treatment planner before ph
07	08/06/2015	TP: Conventional/3D Planning - Electron Plans - 1st 2 plans are to be reviewed by an experienced treatment planner before ph
07	08/06/2015	TP: Conventional/3D Planning - Electron Plans - 1st 2 plans are to be reviewed by an experienced treatment planner before ph
04	08/03/2015	TP: Conventional/3D Planning - Brain - 1st 2 plans are to be reviewed by an experienced treatment planner before ph
03	07/22/2015	TP: Conventional/3D Planning - Breast - 1st 2 plans are to be reviewed by an experienced treatment planner before ph
02	07/17/2015	TP: Conventional/3D Planning - Brain - 1st 2 plans are to be reviewed by an experienced treatment planner before ph
01	07/13/2015	TP: Conventional/3D Planning - Brain - 1st 2 plans are to be reviewed by an experienced treatment planner before ph

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# Establishing an Affiliation

- Financials
  - Salary and Benefits
    - PGY1/PGY2 designation with GME
  - Expenses
    - Travel, Meetings, Books, Exams
    - Program incidentals
  - CAMPEP fees
    - Additional fee for spoke site
  - Faculty Status
    - Provided Volunteer Faculty appointments for Hux physicists





# Establishing and Affiliation

Example: Residents, 2012-2014

Expense	Year 1	Year 2	Funding
PGY Salary	\$47,103	\$48,524	CCG through UK
PGY Benefits	\$11,442	\$11,577	CCG through UK
PGY Malpractice	?	?	UK
Books	\$500	\$500	CCG
Travel (meeting)	\$1500 (optional)	\$1800	CCG
Lab Coat	\$125	---	CCG
ABR Exam, part II	---	\$484	CCG
Mileage to Secondary Affiliate (140 miles round trip x \$0.55)	\$3080 (40 trips)	\$1540 (20 trips)	CCG
<b>Total Financial Package</b>	<b>\$63,750</b>	<b>\$64,425</b>	



# Establishing an Affiliation

- Legal
  - Liability – carried by employer
  - Letter of Intent from spoke site: documents structure and processes
  - Affiliation Contract: legal departments and administration for both entities



# Objectives

- Introduction to the Hux Cancer Center
- Medical Physics Residency – Why?
- Affiliation process
- **Challenges with distance learning**
- CAMPEP Accreditation



# Challenges for Distance Learning

- TECHNOLOGY!!!!
  - Videoconferencing with audio, video and desktop sharing
  - Two IT departments with different security rules
- Cohesive Program
  - Sharing teaching materials
  - Single message and program focus for residents
- Financials
  - Who pays for the unexpected costs





# Objectives

- Introduction to the Hux Cancer Center
- Medical Physics Residency – Why?
- Affiliation process
- Challenges with distance learning
- **CAMPEP Accreditation**



# CAMPEP Accreditation

In our experience...

- Hub and Spoke models are still a “works-in-progress” for CAMPEP accreditation
  - Submitted affiliate application in July 2014
  - Review of application took about 9 months
- Can be challenging to coordinate site visits
  - Our 1<sup>st</sup> site visit: tentatively scheduled for Nov. 2015

# Thank You



[mverst@cancercaregroup.com](mailto:mverst@cancercaregroup.com)

812-238-7504



THE AMERICAN ASSOCIATION OF PHYSICISTS IN MEDICINE  
Advancing the Science, Education and Professional Practice of Medical Physics

# **Hub and Spoke Webinar #2: Motivation, Economics, and Structure from the Satellite Perspective**

## **Question/Answer Session**

- To send questions to the speaker, please enter them into the question box in the Go-To-Meeting toolbar.





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## Hub and Spoke Webinar Series

Webinar Title	Speakers	Date/Time
<b>Webinar #2 - Motivation, Economics, and Structure from the Satellite Perspective</b>	<i>Firas Mourtada, PhD, Christiana Care Hospital</i>  <i>Michele Verst, MS Cancer Care Group</i>	Monday, Sept 21, 2015 11 – 12 pm, eastern
<b>Webinar #3 - Economics and Negotiations</b>	<i>Firas Mourtada, PhD, Christiana Care Hospital</i>  <i>Robert J. Pizzutiello Jr., MS, Landauer Medical Physics</i>	Thursday, Oct 8, 2015 12 – 1 pm, eastern
<b>Webinar #4 - CAMPEP Perspective</b>	<i>Chester Reft, PhD, University of Chicago</i>  <i>John Antolak, PhD, Mayo Clinic</i>	Thursday, Oct 15, 2015 1 – 2 pm, eastern