Strategy and Influence of Medical Physics on the Changing Healthcare Environment

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## Introduction

- Medical Physicists are good at physics, not always so good at communication
- · To succeed we need to communicate with many
  - Hospital Administrators
  - University Administrators
  - Departmental Administrators

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## **Hospital Administrators**

- · Know your audience
- · Patient Safety
- · Quality of Care / Outcomes
- · Return on Investment
- · Evaluation and selection of technology
- · Role of acceptance testing

## Advancing the Science, Educate Advancing the Science, Educate Centers for Medicare & Medicaid Services **Clinical Quality Measures Basics**

Clinical quality measures, or CQMs, are tools that help measure and track the quality of health care services provided by eligible professionals, eligible hospitals and critical access hospitals (CAHs) within our health care system. These measures use data associated with providers' ability to deliver high-quality care or relate to long term goals for quality health care. COMs measure many aspects of patient care including:

- health outcomes
- · clinical processes
- patient safety · efficient use of health care resources
- care coordination
- patient engagements
- population and public health
- · adherence to clinical guidelines

http://www.cms.gov/Regulations-

and-Measuring and reporting CQMs helps to ensure that our nealing care systems delivering effective, sale, efficient,

Programs/ClinicalQualityMeasures. patient-centered, equitable, and timely care.

To participate in the Medicare and Medicard Electron and the Record (EHR) Incentive Programs and receive an incentive payment, providers are required to submit CQM data from certified EHR technology.

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Safety & Quality of care are essential and linked



			Relative	ETE Eactor	Remi	red FTF	Bermire	Total FTF
Equipment, Sources and Systems	Services - # of Units or Licenses*	No. of systems*	Physicist	Dosimetrist	Physicist	Dosimetrist	Physicist	Dosimetria
	Multi energy accelerators	4	0.25	0.05	1	0.2		
	Single energy accelerators	0	0.08	0.01	0	0		
	Tomotherapy, CyberKnife, GammaKnife	1	0.3	0.03	0.3	0.03		
	Cobalt Units, IMRT, PACS, EMR & Contouring	0	0.08	0.03	0	0		
	Orthovoltage and superficial units	0	0.02	0.01	0	0		
	Manual brachytherapy; LDR Seed Implants	1	0.2	0.03	0.2	0.03		
	HDR brachytherapy	1	0.2	0.02	0.2	0.02		
	Simulator, CT-Simulator, PET, MRI Fusion	1	0.05	0.02	0.05	0.02		
	Computer planning system (per 10 workstations)	1	0.05	0.02	0.05	0.02		
	HDR planning system	1	0.2	0.01	0.2	0.01		
						Subtotal	2.00	.033
	Annual # of Patients undergoing Procedures**	No. of patients**						
No. Patient Procedures	External Beam RT with 3D planning	500	0.0003	0.003	0.15	1.5		
	External Beam RT with conventional planning	200	0.0002	0.002	0.04	0.4		
	Sealed source Brachytherapy (LDR & HDR)	100	0.008	0.003	0.8	0.3		
	Unsealed source therapy	25	0.008	0.005	0.2	0.125		
	IMRT, IGRT, SRS, TBI, SBRT	400	0.008	0.005	3.2	2		
						Subtotal	4.39	4.33
Nonclinkal - Estimated Total FTE Effort	Estimated Total (Phys & Dosim) FTE Effort***	FTE Effort***						
	Education & Training (FTE)	0.1	0.667	0.333	0.0667	0.00333		
	Generation of Internal Reports (FTE)	0.1	0.667	0.333	0.0667	0.00333		
	Committees & Meetings; Inc. Rad. Safety (FTE)	0.1	0.667	0.333	0.0667	0.00333		
	Administration and Management (FTE)	0.5	0.667	0.333	0.0667	0.00333		
			-			Subtotal	0.53	0.27

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#### AAPM Medical Physics Practice Guideline 2.a: Commissioning and quality assurance of X-ray–based image-guided radiotherapy systems

Task Group Authors: Jonas D. Fontenot, Hassaan Alkhatib, Jeffrey A. Garrett, Andrew R Jensen, Steven P. McCullough, Arthur J. Olch, Brent C. Parker, Ching-Chong Jack Yang, Lynne A. Fairobent, AAPM Staff

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## AAPM Guidance Documents: Physicist support for IGRT

- 1. Two-dimensional MV imaging systems
  - Acceptance/Commissioning/Documentation: 18–36 hours
- Ongoing support: 25-50 hours annually
- 2. Two-dimensional kV imaging systems
- Acceptance/Commissioning/Documentation: 18–36 hours
  Ongoing support: 25–50 hours annually
- 3. Three-dimensional MV imaging systems
  - Acceptance/Commissioning/Documentation: 18–36 hours
  - Ongoing support: 100-125 hours annually
- 4. Three-dimensional kV imaging systems
  - Acceptance/Commissioning/Documentation: 18–36 hours
  - Ongoing support: 100-125 hours annually

#### Table 4.1. Scheduling and Minimum Process Time (Required for Safety)

Individual institutions should create a table like this for their process(es) and circumstances, assigning appropriate values to the minimum process times ("x"). Cases identified as emergencies and other specialized techniques will require special consideration.

Process Step	Minimum Process Time Required for Safety				
After imaging: Completion of target volumes, definition of plan intent, normal structure volumes; anatomy approved	x days				
After anatomy approval: Planning: 3-D CRT Planning: 3-D IMRT, Volumetric Modulated Arc Therapy (VMAT) Planning: 5-D SBRT Planning: SRS	x days x days x days x hours				
Plan evaluation and physician approval	x minutes (though xx hours must be allocated to schedule this time)				
IMRT QA and analysis	To be completed x hours before treatment				
Treatment preparation (transfer from treatment planning system to treatment management system before treatment start)	Allow x hours				
Final checks before treatment	x minutes or hours				
Treatment setup and delivery (based on complexity)	x minutes				

# Demonstrating the value of the QMP to administration

- · Impact on accreditation
- · Impact on patient care
- · Engagement/staff satisfaction
- Impact on reimbursement







 92 questions carefully selected from various authoritative reports and recommendations to assess performance in key, safety-critical areas

- Summary of your clinic's performance via visual pie charts
- Bar graphs allowing you to benchmark your performance against other participants
- Downloadable Quality/Safety Improvement Log to guide safety improvement initiatives
- Annotated bibliography for further guidance on best practices and standards

### Implementation of New Technologies into the Clinic

Fundamental Keys to Success

- 1) identify a project champion
- 2) multi-disciplinary approach
- 3) show clinical efficacy and return on investment  $(\mbox{ROI})$
- 4) articulate the project concisely
- 5) celebrate successful implementation

BS Teh et al. Biomed Imaging Interv J 2007; 3(3):e57

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#### Lost Opportunities for Improved Care and Revenue Generation

- Stereotactic Radiosurgery -- 12.3 k<sup>\*</sup>
- MR-guided radiation therapy -- >20k\*
- Volumetric arc radiation therapy -- 18.2 k<sup>\*</sup>
- Stereotactic Body Radiation Therapy -- 16.1 k<sup>\*</sup>

\*HOPPS National Average APC payment per case

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**University Administrators** 

## **Increased Medical Physics Faculty**

- · Enhance clinical service
  - Increase number of patients
  - Increase types of procedures
  - Increase complexity of procedures
  - Expand to services outside institution
- Expand educational programs
- · Improve scholarly works

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## Medical Physics Scholarly Activity





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## **Academic Tenure**

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## Promotion (Tenure Track)

- To associate professor
  - Developed independence
  - Effectiveness as a teacher
  - Developing an external presence
  - Evidence of ability to attain full professor
- · Should not be used as a vehicle for retention
- Early promotion should be carefully assessed as a standard is then set

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## Promotion (Tenure Track)

- To full professor
  - National and/or international reputation
  - Study sections, editorships, invited lectures
  - Ongoing research productivity
  - Clearly training the next generation completed PhDs, other trainees
  - Continued teaching effectiveness

## Promotion (Clinical Track)

- To associate professor
  - Teaching success in context of clinical service, with quantitation where possible
  - There has been evidence of progress towards professional productivity
  - Excellent clinical service

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## **Promotion** (Clinical Track)

- · To full professor
  - Needs an external presence (regional or national)
  - Exemplary Clinical service
  - continued teaching success
  - Established record of professional productivity
  - Is leading programs in the college or hospital
  - Can be granted for administrative activities

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**Departmental Administrators** 

## Vacation and Leave Time

- Clinical Requirements: 6.0 FTE
- vacation time (24 days/year)
- sick leave (18 days/year)
- academic days (25 days/year)
- clinic is open (250 days/year)
- 0.75 FTE available from each faculty member
- Would need 8 faculty members to cover the 6.0 FTE of clinical work









