

**The Ohio State University
Wexner Medical Center
James Cancer Hospital
Department of Radiation Oncology**

Medical Physics Residency Training Program Handbook

July 2020-June 2022

<https://cancer.osu.edu/for-cancer-researchers/education-and-training/for-postdoc-residents-and-fellows/clinical-programs/radiation-oncology-residency-for-physicists>

Contents

INTRODUCTION	4
PROGRAM EVOLUTION AND HISTORY	4
1. PROGRAM STRUCTURE AND GOVERNANCE	5
1.1. PROGRAM STRUCTURE	5
1.2. ADMISSIONS.....	7
1.3. MEDICAL PHYSICS RESIDENCY EDUCATION COMMITTEE (MPREC)	9
1.4. PROGRAM POLICIES & ADVERSE ACTIONS	10
1.5. CURRICULUM DEVELOPMENT AND REVIEW.....	10
1.6. EVALUATION OF RESIDENT PROGRESS.....	11
1.7. PROGRAM LOCATION, DURATION, AND PROGRAM INFORMATION	12
2. PROGRAM DIRECTOR	13
2.1. STRUCTURE WITHIN THE HOSPITAL OR MEDICAL CENTER.....	13
2.2. ROLE OF THE PROGRAM DIRECTOR	13
2.3. COMMITTEES AND MEETINGS	14
2.4. RECORDS AVAILABLE FOR REVIEW.....	14
2.5. MEETINGS WITH THE MPRP DIRECTOR	14
3. PROGRAM STAFF	15
4. INSTITUTIONAL SUPPORT	15
4.1. INSTITUTIONAL SUPPORT AND FINANCES	15
4.2. NEW RESIDENT ORIENTATION.....	16
4.3. SAFETY	16
5. EDUCATIONAL ENVIRONMENT	16
5.1. CLINICAL EQUIPMENT.....	17
5.2. RESIDENT OFFICES	19
5.3. LIBRARIES	19
5.4. EVALUATION OF THE CURRICULUM	19
5.5. EVALUATION OF THE CURRICULUM BY THE FACULTY	19
6. SCHOLARLY ACTIVITIES	20
6.1. RESEARCH PROJECTS	20
6.2. CLINICAL PROBLEM SOLVING	20
6.3. COMMISSIONING EXPERIENCE.....	21
7. RESIDENCY CURRICULUM	21
7.1. RESIDENT PERFORMANCE AND EXPECTATIONS	21
7.2. NEW RESIDENT ORIENTATION.....	21
7.3. SAFETY	21
7.4. SAMPLE TRAINING PLAN	22
7.5. EVALUATION OF RESIDENT PROGRESS.....	26
7.6. SUCCESSFUL PROGRAM COMPLETION.....	27
8. MEDICAL PHYSICS RESIDENT EXPECTATIONS	30

8.1.	MEDICAL PHYSICS SENIOR RESIDENT EXPECTATIONS	32
8.2.	CHIEF MEDICAL PHYSICS RESIDENT	33
8.3.	RESIDENT SIGNOFF	33
8.4.	PRIMARY PRECEPTOR/SECONDARY PRECEPTOR GUIDELINES	35
9.	ROTATION DESCRIPTIONS	36
9.1.	MEDICAL PHYSICS ROTATION DESCRIPTION-ORIENTATION	36
9.2.	MEDICAL PHYSICS ROTATION DESCRIPTION – DOSIMETRY A.....	38
9.3.	MEDICAL PHYSICS ROTATION DESCRIPTION-DOSIMETRY B	40
9.4.	MEDICAL PHYSICS ROTATION DESCRIPTION-EXTERNAL BEAM A	42
9.5.	MEDICAL PHYSICS ROTATION DESCRIPTION-EXTERNAL BEAM B	44
9.6.	MEDICAL PHYSICS ROTATION DESCRIPTION-BRACHYTHERAPY A	46
9.7.	MEDICAL PHYSICS ROTATION DESCRIPTION-BRACHYTHERAPY B	48
9.8.	MEDICAL PHYSICS ROTATION DESCRIPTION-SRS/SRT/SBRT A	50
9.9.	MEDICAL PHYSICS ROTATION DESCRIPTION- SRS/SRT/SBRT B	52
9.10.	MEDICAL PHYSICS ROTATION DESCRIPTION-COMMISSIONING ROTATION	54
9.11.	MEDICAL PHYSICS ROTATION DESCRIPTION-SHIELDING ROTATION	55
9.12.	MEDICAL PHYSICS ROTATION DESCRIPTION-ELECTIVE ROTATION	56
9.13.	MEDICAL PHYSICS ROTATION DESCRIPTION-ADMINISTRATIVE AND PROFESSIONAL ROTATION	57
9.14.	MEDICAL PHYSICS ROTATION DESCRIPTION-JOURNAL CLUB.....	60
9.15.	MEDICAL PHYSICS ROTATION DESCRIPTION-CLINICAL SERVICE ROTATION	62
10.	SAMPLE CHECKLIST FORMS	63
11.	GME POLICIES AND ADVERSE ACTIONS.....	67
12.	LIMITED STAFF BENEFITS.....	74

Introduction

Program Evolution and History

A formalized medical physics residency program started at The Ohio State University Medical Center's James Cancer Hospital in 2003. The program has since successfully trained and placed eleven medical physicists. However, the program's roots started in 1990, when interested graduate students in related fields starting spending two to three days per week in the clinic.

Prior to 2005, radiation oncology at the James Cancer Hospital was a division of the Department of Radiology. At that time, the physics group in the division consisted of four radiation physics faculty and three dosimetrists. The division also had five attending radiation oncologists, four radiation oncology residents and approximately 18 FTE radiation therapists. In 2005, the division of radiation oncology was converted to an academic department within The Ohio State University, as the Department of Radiation Oncology. Since then, the department has grown considerably. The physics group currently consists of five faculty physicists, eleven staff physicists, four physics residents and thirteen medical dosimetrists. The department also has nineteen attending radiation oncologists, ten radiation oncology residents, 8 research faculty, four support IT staff and over 40 radiation therapists, including four brachytherapy therapists.

More than 3,000 new patients per year are seen in consultation within the Department of Radiation Oncology. This provides exposure to a wide variety of pathologies, both adult and pediatric, as well as therapeutic modalities. The James Cancer Hospital is one of 45 NCI-designated Comprehensive Cancer Centers in the United States, drawing challenging cases from multiple states and advancing standards of care. The National Cancer Institute (NCI) has awarded the OSUCCC – James a perfect score of 10 and the institute's highest descriptor, "exceptional," following a 2015 site review that has resulted in Ohio State's re-designation as a comprehensive cancer center—a designation the university has maintained since 1976).

In December 2014 the Department of Radiation Oncology moved in to the new James Cancer Hospital facility. This 100,000 sq. ft. department offers state of the art equipment and facilities and is described in detail later. The first expansion site for OSU Radiation Oncology, The Stephanie Spielman Comprehensive Breast Center opened in summer 2011. In the past year two other affiliates have been added to the network of Radiation Oncology centers, with several more being planned. The above mentioned growth continues to provide exceptional opportunities for current and future medical physics residents in the department.

Since its inception in 2003, our Medical Physics Residency Program (MPRP) has shown a strong track record of changes and improvements based on feedback received. The program was transitioned from a hospital based program to a University based program under the purview of The Ohio State University Graduate Medical Education (GME) Office in 2011. This is further discussed in **Program Structure and Governance**. The program received five year accreditation in 2012 from the CAMPEP, and 5 year reaccreditation status in 2016. The MPRP is currently funded for four physics resident positions, two first year and two second year. In 2015 the GME signed an agreement with the US Armed Forces to expand the current agreement to host Medical Residents to include Medical Physics Residents from the Armed Services. We do not currently have an Armed Services resident in the MPRP.

Program Objective and Goals

The Department of Radiation Oncology at the Arthur G. James Cancer Hospital & Richard J. Solove Research Institute, The Ohio State University, offers a two-year residency program in radiation oncology medical physics. The residency program is designed for individuals with an M.S. or Ph.D. (D.Sc.) degree who seek training in clinical radiation oncology physics in preparation for a clinically oriented career. The program's objective is to provide clinical training and educational activities in radiation oncology physics that will prepare the graduate for board certification and a professional career in radiation oncology.

The residency program is designed to expose residents to the clinical training outlined in the American Association of Physicists in Medicine's (AAPM) Report #249, "Essentials and Guidelines for Clinical Medical Physics Residency Training Programs." Resident training satisfies all of the minimum requirements of Report #249 as well as most recommendations. Training involves full participation of the physics resident in clinical rotations under the supervision of experienced radiation oncology physicists. Comprehensive training and experience is provided in the areas of clinical dosimetry, treatment planning, treatment aid design and fabrication, radiosurgery, brachytherapy, radiation safety, radiation machine calibration and commissioning, quality assurance, shielding and professional and ethical conduct. During an elective rotation, the resident proposes, performs and presents a clinical project. These projects typically involve implementation or analysis of a new clinical technology. In addition to teaching the resident how to use the technology present, the supervising physicists also show the resident how to function as a physicist in a busy clinical environment, effectively interacting and communicating with other members of the department and solving problems. This is demonstrated by the resident during their final clinical rotation.

The residency program also offers a didactic component that is designed to supplement the resident's graduate school education in medical physics. It is expected that all future residents will have graduated from a Commission on Accreditation of Medical Physics Education Programs (CAMPEP) or equivalent graduate program. The didactic component of the residency program will build upon this base as well as provide practical clinical instruction. Training from this program will prepare the graduate for certification in the specialty of Therapeutic Radiological Physics by the American Board of Radiology. Graduates of the program will have received sufficient clinical training to work independently as radiation oncology physicists.

1. Program Structure and Governance

The radiation oncology MPRP is a program within the Arthur G. James Cancer Hospital & Richard J. Solove Research Institute's Department of Radiation Oncology, and is governed and overseen by the Graduate Medical Education Committee within the Office of Graduate Medical Education (GME) at The Ohio State University, College of Medicine. The Arthur G. James Cancer Hospital & Richard J. Solove Research Institute is part of a Comprehensive Cancer Center located on the campus of The Ohio State University (OSU). The hospital and university work together to provide the highest quality of patient care, research, and excellence in education. The James Cancer Hospital is accredited by The Joint Commission.

1.1. Program Structure

The MPRP faculty consists of physics and physician faculty within the Department of Radiation Oncology in the College of Medicine and the radiation oncology technical staff of the Arthur G. James Cancer Hospital. The position of the MPRP within the organizational structure of The Ohio State University Medical Center (OSUMC) as well as its position within the university itself is shown in Figures 1-3.

The Ohio State University Medical Center GME Committee Reporting Structure

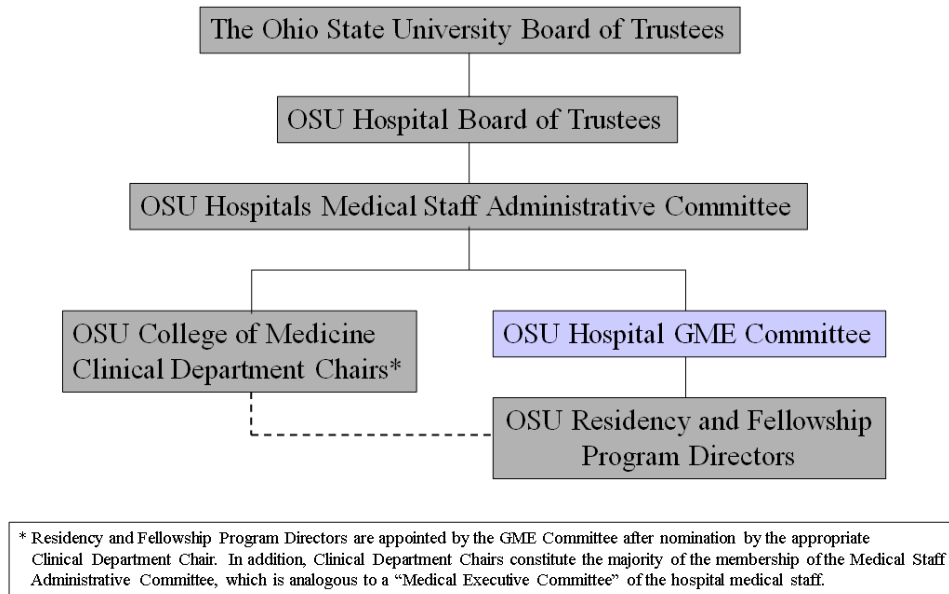


Figure 1. The Graduate Medical Education (GME) Committee reporting structure

The Ohio State University Medical Center Business Unit Organizational Structure

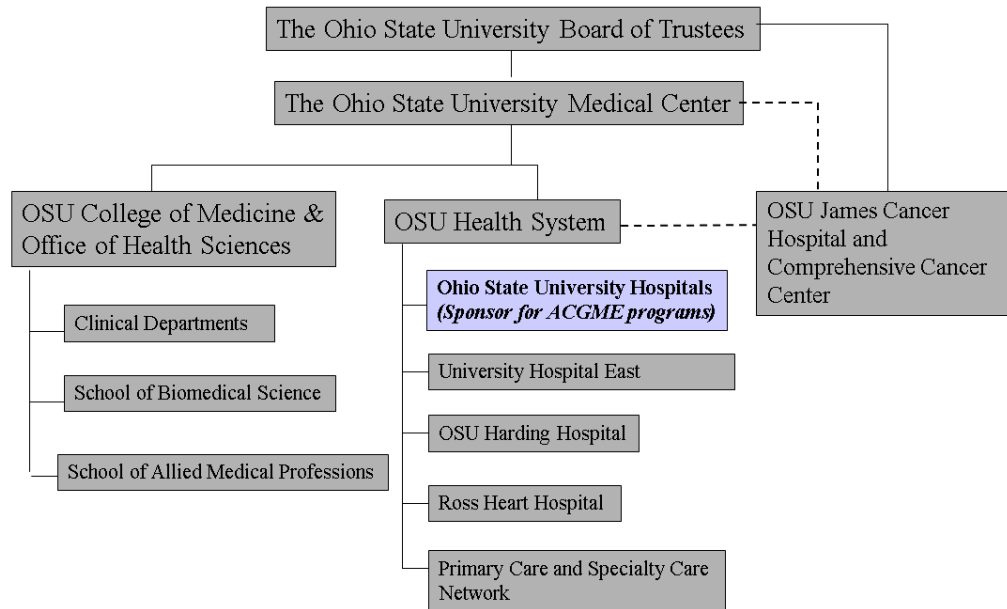


Figure 2. The business unit organizational structure at the Ohio State University Medical Center (OSUMC)

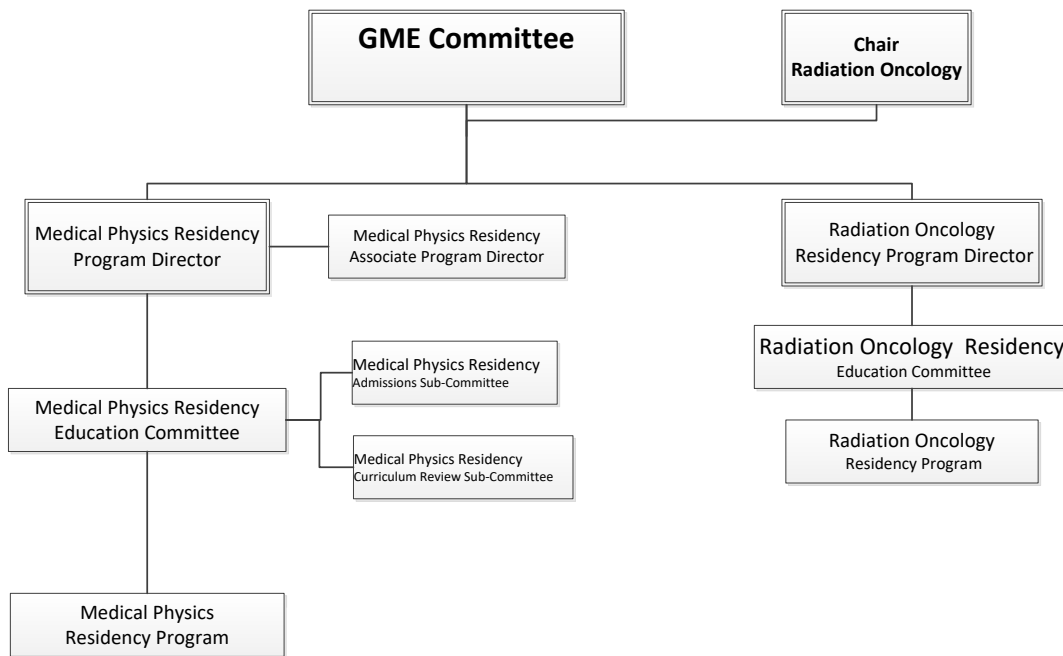


Figure 3. The Medical Physics Residency Program (MPRP) reporting structure

Figure 1 shows the GME committee reporting structure. Figure 2 shows the business unit organizational structure at the OSUWMC. The MPRP is a non-ACGME accredited graduate training program under the auspices of The Ohio State University Office of Graduate Medical Education (GME). The institutional administration of GME takes place under the auspices of the Offices of Graduate Medical Education (OGME), which is a division of the Office of the Medical Director. The Office of Graduate Medical Education is led by the Designated Institutional Official, who also serves as Associate Dean for the Graduate Medical Education Office, for the OSU College of Medicine, and a Director of Graduate Medical Education. The Graduate Medical Education Committee (GMEC) is charged with developing institutional policies and procedures pertaining to GME and overseeing the implementation of ACGME requirements and guidelines by the institution and by each program. Further details can be found in GME policy titled: ‘Statement of Institutional Commitment Policy’ and ‘Charge of the Graduate Medical Education Committee Policy’.

Figure 3 presents a more focused view of the MPRP reporting structure, and is discussed in details in the Medical Physics Residency Education Committee section below.

The Department of Radiation Oncology also offers an accredited radiation oncology residency program for radiation oncologists as well as an accredited radiation therapy training program, which is an undergraduate degree program under the School of Health and Rehabilitation Sciences. The medical physics residency program is integrated with these programs in many of the supplementary didactic areas. Conferences, lectures, journal clubs and courses are shared between the three programs, based on the didactic background and interest of the residents and students.

1.2. Admissions

All residents entering the Medical Physics Residency Program (MPRP) are required to have acquired a strong foundation in basic physics as documented by a master's or doctoral degree from a CAMPEP accredited graduate program. Since Non-CAMPEP accredited program graduates are not accepted, no formal evaluation of didactic deficiencies of core courses are formally conducted for incoming residents any longer.

The application process is handled using the Medical Physics Residency Application Program (MP-RAP) administered through the AAPM (www.aapm.org/CAP/). The announcement of the open residency position is typically made in October of the year prior to the start of the residency.

The MPRP application currently requires, per MP-RAP:

- Personal information (name, address, contact information)
- ABR certification status
- Disclosure of criminal behavior, academic violations, and/or licensure actions
- Employment history
- Military service history (if applicable)
- Education (undergraduate and graduate)
- Three references (including one from current advisor or department head)
- Personal statement (max 3000 characters) indicating why you want to go into medical physics, and anything else you want to communicate to the applications reviewers (this is instead of a cover letter).
- Uploaded CV (should include awards, publications and presentations)
- Transcripts and a copy of TOEFL results (if applicable)
 - Can be uploaded, or
 - Official copies can be mailed to Clinical Medical Physics Residency Application, One Physics Ellipse, College Park, MD 20740

Completed applications are typically due by mid-December.

The recruitment of Medical Physics Residents is the function of the Admissions Sub-committee of the Medical Physics Residency Education Committee (MPREC). The applications and related material are reviewed by the Medical Physics Admissions Subcommittee. The MPRP application review is a three step process. In Phase I of the review process the applicant pool is ranked in the top half vs bottom half by the Admissions Sub-committee members, based on a review of applicant CV's. The applications of the top half of the applicants are then reviewed in Phase II, where their applications are scored using a scoring sheet. The Admissions Sub-committee meets to review the tallied scores of all committee members and determines a score cut-off to use to invite candidates for an on-site interview. The top ranked candidates are then contacted to initiate the interview process (Phase III). Candidates are invited to visit the facility for a formal interview by the members of the MPREC. In addition, references are contacted by phone to supplement the recommendation letters, if needed. Interviews are typically conducted in January and February. After completion of all interviews, the Admissions Sub-committee meets to review the interview results and any other pertinent information regarding the applicants. The committee then internally ranks interviewees to come up with the Rank List for the Medical Physics Match.

The Ohio State University MPRP currently participates in Medphys Match (<http://natmatch.com/medphys/>) – the medical physics residency-matching program for graduate students and postgraduate trainees. The internally ranked candidates are entered into the Medphys Match by the published deadline for submitting the Rank List. Upon completion of the Match process, offer letters are sent to successful candidates as required by Medphys Match. The interview and offer process is performed in accordance with the equal opportunity standards of both The Ohio State University and the Arthur G. James Cancer Hospital & Richard J. Solove Research Institute.

All incoming residents must sign a "Limited Staff Agreement" document. This document is provided on an annual basis to all residents and fellows within the graduate medical education training programs sponsored by The Ohio State University Hospital. Residents and fellows are appointed to the medical staff of The Ohio State University Hospitals in the limited staff category. In addition, residents and fellows are appointed to the faculty of The Ohio State University College of Medicine with the special faculty title of Clinical Instructor – House Staff. The renewal of this agreement is contingent upon successful completion of the first year of the residency and a recommendation for promotion given by the program director. The contract is updated annually, approved by the Graduate Medical Education Committee, and distributed each spring to all renewing and incoming trainees for their signature. A signed copy of this agreement is kept on file.

1.3. Medical Physics Residency Education Committee (MPREC)

Resident education is supervised and monitored by the Medical Physics Residency Education Committee (MPREC). Responsibilities of the MPREC include; resident recruitment, admission recommendations, developing and maintaining a new resident orientation program, monitoring the resident's progress through the residency program, developing and maintaining training curriculum, performing regular program review, granting of completion certificates and review of adverse actions. Specific details on each of these topics are provided in other sections of this self-study document. In brief, all current members of the MPREC are full time employees within the Department of Radiation Oncology and interact regularly with medical physics residents. During regular committee meetings, curriculum is developed and reviewed to ensure that residents receive the knowledge required for a professional career as intended by AAPM's Report # 249, "Essentials and Guidelines for Clinical Medical Physics Residency Training Programs." Committee consensus is used to evaluate and select new residents as well as to evaluate resident progress and determine successful completion of training. The committee may assign subcommittees to handle certain tasks and report back to the committee.

Figure 3 presents a more focused view of the MPRP reporting structure. Direct oversight of the MPRP is the responsibility of the MPREC. This includes providing policies and procedures for MPRP activities in accordance with guidance provided by the GMEC. The MPREC is comprised of all faculty/staff physicists, the chief dosimetrist, the MPRP coordinator, the senior physics resident/s, the radiation oncology residency program director and the Radiation Oncology clinical director. The MPRP Director is the ex-officio chair of the MPREC and is appointed by the department chair. The MPRP Director currently serves as the chief of physics and has dual academic and clinical faculty appointments. The MPRP Associate Director is the ex-officio vice chair of the MPREC and is also appointed by the department chair.

a. Resident Recruitment and Program Review by MPREC

The MPREC currently monitors residency recruitment and residency program review utilizing a subcommittee structure. The sub-committees are appointed ad hoc by the Program Director. Additional details are provided below. The subcommittee activities are summarized and presented to the MPREC during the meetings of the committee.

b. Admissions Sub-committee

The new resident recruitment function of the MPREC is handled by the Admissions Sub-committee. This sub-committee is appointed by the Program Director from the MPREC membership, and the typical membership, charge and frequency of meetings are listed below.

Meeting Frequency: Ad-hoc during Residency Recruitment process

Membership: Residency Director
Associate Director
At least 2 additional ad-hoc MPREC members
Senior Residents
MPRP Program coordinator

Charge: 1. Monitor and run Resident recruitment/selection process per program guidelines
2. Make admission recommendations

c. Curriculum Sub-committee

The annual program review function of the MPREC is handled by the Curriculum Sub-committee. This sub-committee is appointed by the Program Director from the MPREC membership, and the typical membership, charge and frequency of meetings are listed below.

Meeting Frequency: Meet annually - as many times as needed to complete annual program review

Membership: Residency Director
Associate Director
All MPRP Primary Preceptors
One or more additional ad-hoc MPREC members
MPRP Program coordinator
Senior Residents

Charge: 1. Developing and maintaining a new resident orientation program
2. Developing and maintaining training curriculum
3. Review Yearly program evaluations by Residents & Faculty and recommend changes
4. Performing regular program review

1.4. Program Policies & Adverse Actions

As noted earlier, the Ohio State University Graduate Medical Education Committee (GMEC) is charged with developing institutional policies and procedures pertaining to GME and overseeing the implementation of ACGME requirements and guidelines by the institution and by each program. As a non-ACGME Accredited Training Program under the GMEC the MPRP follows GME Policies. These and other GME policies are available in the GME intranet website to all faculty/staff/residents of the MPRP.

a. Adverse Actions

The resident progress evaluation process is described in later sections. If a resident receives an “Unsatisfactory/Fail” score for their overall grade for a rotation, the preceptor, MPRP director, and the resident in question will meet to discuss the progress of the resident in that rotation. Failure of a rotation, unprofessional or unethical behavior, participation in illegal activities, or overall unsatisfactory progress in the residency are possible conditions for disciplinary action or termination. The “Academic and Administrative Adverse Action Policy” and the “Resident Due Process Policy” as outlined by The Ohio State Medical Center GME policies and procedures govern how unsatisfactory performance of a resident is addressed.

b. Resident Due Process

The “Resident Due Process Policy” document details the rules for handling any disciplinary actions. These include general guidelines, challenges to a performance/rotation evaluation, and appeals to adverse action. Specifics on adverse action can be found in the “Academic and Adverse Actions Policy.” Possible adverse actions include focused-review, probation, suspension, non-promotion, non-renewal and termination.

1.5. Curriculum Development and Review

As described above, the curriculum development and review is the function of the Curriculum sub-committee of the MPREC. The program handbook has a clearly spelled out “Rotation Description” section, that spells out the Rotation duration, name of primary preceptor, Rotation Overview, Clinical Objectives, Didactic Readings, Competency Lists, and Expectations for successful completion of rotation. The program currently uses a single primary preceptor model for each rotation, i.e. the primary preceptor for each rotation is pre-determined and published in the program handbook. This allows ownership for each rotation curriculum to be the responsibility of that primary preceptor. Primary preceptors are all members of the curriculum sub-committee, allowing for a streamlined process for curriculum review. The curriculum sub-committee collects curriculum change recommendations from both residents and faculty using an annual survey described below. Additionally, during each rotation, residents and primary preceptors identify any rotation curriculum changes that they may feel would need to be considered and have an opportunity to propose such changes for consideration during annual program review.

a. Evaluation of the Curriculum/Program by the Resident

A program evaluation form is completed annually by each resident. The form allows the resident to anonymously evaluate each clinical rotation they have completed as well as the overall program. The form is completed online via the AHST system.

In addition to the program/curriculum evaluation, at the end of each rotation, the resident also evaluates the performance of their preceptor. This evaluation is performed on-line using the AHST system.

b. Evaluation of the Curriculum by the Faculty

The MPREC will meet annually to evaluate and discuss training objectives. An annual program evaluation survey is completed by all faculty and by each resident. During these meetings, input from members will be sought to improve the MPRP and all survey results are reviewed. Possible program modifications will be discussed and the impact of the proposed changes on the requirements listed in AAPM's Report #249 will be assessed. A majority vote of the MPREC is required to ratify changes to the MPRP, should a change be approved, residents will be notified in writing of the alterations prior to its implementation. Minutes from these meetings will be available for review.

In order to provide a stable environment for the residents, major modifications of the program will take effect July 1 of the calendar year. Changes in evaluations for resident progress will only take place July 1 and will only be applied to new residents. Minor program changes will only be implemented in between rotations.

1.6. Evaluation of Resident Progress

a. Evaluation of Resident Progress

Currently the MPRP is using the Allied Health Student Tracking (AHST) system to track and evaluate the resident's progress through the program using consistent and well defined metrics. The software facilitates the evaluation of the resident's strengths and areas for improvement, as well as keeps track of the resident's accomplishments.

Performance requirements and institutional disciplinary procedures are discussed with the resident at their initial meeting with the MPRP Director. Written documentation detailing these expectations and procedures are also provided to the resident at this time as part of the resident handbook. Evaluation of the resident's progress through the MPRP is performed via rotational evaluations, meetings with the MPRP Director and annual testing. Each of these components is discussed in detail in the sections that follow.

b. Rotation Evaluations

During each clinical rotation, primary preceptors are assigned and available to the resident. The primary preceptors monitor the resident's progress and provide guidance throughout the rotation. In order to monitor the resident's progress, the residents submit weekly progress reports to their primary preceptor. These reports list the clinical, didactic and professional activities that the resident has observed or performed that week. Weekly progress (case log) reports are completed via the AHST System. The primary preceptor coordinates the activities of the resident on any rotation with secondary preceptors who are on clinical coverage for the rotation area, and are responsible for ensuring that the resident gets an opportunity to complete all the required competencies during their rotation.

At the end of each rotation, the preceptor evaluates the performance of the resident during the rotation against the expectations and competencies required for that rotation. The evaluation takes place based on both a scheduled end of rotation oral exam (if required), conducted with the MPRP Program Director/Associate Director, the primary preceptor, and one of more secondary preceptors from the rotation and the overall performance during the rotation. The evaluation is prepared through a survey via the AHST system. The resident is evaluated on learning and development, clinical knowledge and application, communication skills and work habits, based on the rotation as well as the exam. The overall rotation performance of the resident is then graded on a four point scale, categorizing the resident's performance as either "Excellent", "Satisfactory", "Needs Improvement" or "Unsatisfactory/Fail".

If the resident receives an "Unsatisfactory/Fail" score for their overall grade for a rotation, the preceptor, MPRP director, and the resident in question will meet to discuss the progress of the resident in that rotation. Possible conditions for disciplinary action or termination include: failure of a rotation, unprofessional or unethical behavior, participation in illegal activities, or overall unsatisfactory progress in the residency. The "Academic and Administrative Adverse Action Policy" and the "Resident Due Process Policy" as outlined by The Ohio State Medical Center GME policies and procedures govern how unsatisfactory performance of a resident is addressed.

The "Resident Due Process Policy" document details the rules for handling any disciplinary actions. These include general guidelines, challenges to a performance/rotation evaluation, and appeals to adverse action. Specifics on adverse action can be found in the "Academic and Adverse Actions Policy." Possible adverse actions include focused-review, probation, suspension, non-promotion, non-renewal and termination.

c. Annual Testing

In addition to end of rotation oral exams, the resident is required to take two exams during their residency. At the end of the first year of their residency, the residents are required to take a written examination. Typically, the Raphex Therapy Examination is used for this purpose. An oral exam will be required near the completion of the second year of the MPRP. In order to provide valuable oral exam experience to the resident, the oral exam is structured similar to the oral exam given by the ABR. While it is expected that the resident will perform well on these exams, results will primarily be used to identify the strengths and weaknesses of the resident's knowledge of medical physics are discussed with the resident during one of their meetings with the MPRP Director. If required, modifications to the resident's training plan are made.

1.7. Program Location, Duration, and Program Information

The MPRP is currently designed around the Residents being at the main department and at the Breast Center satellite. There are currently no affiliate centers or "spoke" sites that are in place or being considered at this time.

The duration of the MPRP at The Ohio State University is two years. During this period, the residents rotate through several clinical rotations. The details of the rotations and a sample rotation plan are discussed later.

Information regarding our program is disseminated using the Department of Radiation Oncology website at www.radiationoncology.osu.edu. Information regarding the MPRP is available within the "Residency" portion of the website. The MPRP information on the website consists of general program information, information on our curriculum, our application process, information on our current residents and program admission and graduation statistics. A copy of our current handbook is also posted for interested applicants to review.

2. Program Director

2.1. Structure within the Hospital or Medical Center

As described earlier, the MPRP is a program wholly based within the Arthur G. James Cancer Hospital & Richard J. Solove Research Institute's Department of Radiation Oncology. The MPRP is under the direct supervision of the MPREC. The MPRP Director is the ex-officio chair of the committee and is appointed by the department chair. The MPRP is a non-ACGME accredited graduate training program under the auspices of The Ohio State University Office of Graduate Medical Education (GME). Additional information on the structure of the program can be found in **Program Structure and Governance**.

2.2. Role of the Program Director

The MPRP Director is responsible for advising and evaluating residents as well as overall program administration. Program administration tasks include, but are not limited to, the following:

- Correspondence with prospective trainees
- Scheduling of prospective residents visits
- Recruiting new residents
- Evaluating and ensuring that each incoming resident satisfies the CAMPEP prerequisites for residency education in medical physics (currently ensured by accepting only graduates from CAMPEP accredited graduate programs).
- Advising residents
- Scheduling of classrooms for faculty lectures
- Scheduling of MPREC meetings
- Scheduling of faculty/staff meetings
- Preparation of agenda & minutes of MPREC and faculty/staff meetings
- Preparation for resident orientation
- Administrative support for residents
- Program correspondence
- Preparation of clinical rotation schedule
- Preparation of didactic lecture schedule
- Initiation of physics residency program review
- Promoting the residency program
- Report all student statistics, annual reports, and other information required by CAMPEP in a timely fashion

The MPRP Director is appointed by the Chair of the Department of Radiation Oncology. The MPRP Director is a board certified medical physicist who holds both academic and clinical appointments in the Department of Radiation Oncology and The Ohio State University Medical Center. The MPRP Director is assisted by the MPRP Associate Director, the Residency Coordinator and the physics/dosimetry staff. The role of the MPRP Director in various aspects of the MPRP has been discussed in several sections of this document

2.3. Committees and Meetings

The MPRP Director sits on all educational committees held within the department, which includes the radiation therapy program advisory committee and the medical radiation oncology residency education and admissions committee. The MPRP Director also sits on the MPREC.

The MPREC has previously been discussed in **Program Structure and Governance**. Responsibilities of the MPREC include; resident recruitment, admission recommendations, developing and maintaining a new resident orientation program, monitoring the resident's progress through the residency program, developing and maintaining training curriculum, performing regular program review, granting of completion certificates and review of adverse actions.

The MPREC will meet a minimum of two times each year. Minutes of each meeting will be recorded and retained in accordance with The Ohio State University records retention policies.

2.4. Records Available for Review

- Committee meeting minutes (administrative, applicant selection and oral exams)
 - Located with residency coordinator
 - Stored on file
 - 24 hour access time
 - After 3 years transferred to university archives
- Resident applications (application forms, transcripts, candidate interview evaluations)
 - Located with residency coordinator or stored off-site based on age
 - Stored on file or in fireproof storage
 - 24 hour access time
 - Kept for 3 years
- Resident files (training schedules, rotation evaluations, examination results)
 - Stored through AHST system and onsite
 - 24 hour access time
 - Kept for 5 years after completion/termination

2.5. Meetings with the MPRP Director

The MPRP Director will meet with each resident at least once per year to discuss the overall progress of the resident through the MPRP. Prior to the meeting, the MPRP Director will review the rotation evaluations for the resident and will provide the resident with a list of performance observations based on these evaluations. The resident reviews these observations and prepares a formal written response. The observations and resident's responses are then discussed at a meeting between the MPRP Director and the resident. They further discuss and document any changes that may be required in the resident's training plan. The document is then signed by both the resident and the director and is kept on file.

The MPRP Director and/or Associate Director and primary preceptor are present during each end-of-rotation meeting with the resident and feedback is provided.

3. Program Staff

The Department of Radiation Oncology has three training programs that have been in place for many years. These include a radiation therapist undergraduate training program (currently ten students per year), a radiation oncology residency program (currently eleven residents) and a therapeutic medical physics residency program (currently five residents). The Arthur G. James Cancer Hospital has committed to increased staffing to meet the teaching obligations to all these programs. This includes a framework of didactic courses, teaching conferences, journal clubs, and individualized mentoring. Throughout their training, a resident will interact with many staff members, and they will specifically work with all physicists, dosimetrists, and physicians. Our current physicist to resident ratio is 4:1. This ratio is expected to increase as additional faculty and staff physicists are added to the department.

The current physics staff consists of fourteen medical physicists, five clinical faculty and nine clinical staff physicists. Ten members have already achieved ABR board certification in therapeutic radiological physics, while the other members are in the ABR board certification process. Residents will rotate with all staff members during the course of the program. For each rotation, clinical staff members will provide daily education, guidance, and supervision of the resident. Faculty/Staff preceptors will be responsible for guiding the resident through the rotation and for performing a rotational evaluation as outlined in "Evaluation of Resident Progress."

The process for appointment of program staff is as follows:

- Program Director – Appointed by the Department Chairman
- Program Associate Director – Appointed by the Department Chairman
- Program Coordinator – Hired into Program Coordinator position by the Department Chair, Administrator, Radiation Oncology Residency Director, and Medical Physics Residency Program Director
- Primary Preceptors – Proposed by Program Director and Curriculum Subcommittee, and ratified by the MPREC
- All other program staff/faculty – all other program faculty and staff are based on their employment expectations (job descriptions) to be part of the education mission of the department.

Program Administration

Nilendu Gupta, PhD	Chief Medical Physicist and Director of the Medical Physics Residency Program
Jeffrey Woollard, PhD	Associate Director of the Medical Physics Residency Program
Meg Decker	Residency Programs Coordinator
Arnab Chakravarti, MD	Chair of the Department of Radiation Oncology
Raju Raval, MD, DPhil	Program Director, Radiation Oncology Residency Program
Douglas Martin, MD	Clinical Director, Department of Radiation Oncology

4. Institutional Support

4.1. Institutional Support and Finances

The Department of Radiation Oncology supports the MPRP directly and through its broader education mission. Administrative support is available through the residency coordinator and the office associates in the medical physics group that help the MPRP Director and Associate Director and the residents with planning and execution of program activities. There are adequate clinical and educational resources available to the Medical Physics Residents, as well as adequate office space, conference rooms, and other support facilities further discussed in **Educational Environment**. The institutional commitment to the long term support of the MPRP is expressed through the letters from the GME and the department.

Medical physics residents are appointed through the GME office and have titles of Housestaff. The funding for the program comes through the Department of Radiation Oncology. In addition to direct compensation, physics residents are afforded benefits consistent with those of OSU's medical residents, including medical and dental insurance, paid vacation and holiday benefits, sick pay benefits, life insurance, and disability insurance. The expense of these benefits varies and is shared between the physics resident and the Arthur G. James Cancer Hospital. Listed below are salaries and benefits as of 2016.

Salary:	Set by the GME First year residents receive PGY-2 stipends. Second year residents receive PGY-3 stipends.
Benefits:	See "Limited Staff Benefits"
Travel to a national meeting:	Departmental funds support resident attendance at one National Conference at the end of their first year. They are also allotted funds in order to attend 2 additional local chapter meetings each year.
Book allowance:	\$500 for length of program.
Academic expenses:	Tuition for any credit coursework is reimbursable at 100% under OSU employee benefits policy upon successful completion of course.

4.2. New Resident Orientation

The orientation rotation is further discussed in **Residency Curriculum**.

4.3. Safety

In order to make incoming residents sufficiently aware of hazards present in the hospital environment, they are required to take and pass a series of Computer Based Learning (CBL) modules. Among other topics, these modules cover chemical/bio hazardous material handling and safety, fire safety and radiation safety. In addition to CBLs, The Ohio State University's Office of Radiation Safety provides a radiation safety short course which all staff and residents are required to attend. All first year residents are issued a radiation monitor by OSU as part of their new employee procedure.

The resident will be instructed on the safe operation of equipment specific to the Department of Radiation Oncology during their orientation rotation or first clinical rotation in that specific area.

5. Educational Environment

In addition to the Medical Physics Residency Program, the Department of Radiation Oncology also offers an accredited medical residency program for radiation oncologists as well as an accredited radiation therapy training program, which is an undergraduate degree program under the School of Health and Rehabilitation Sciences. The medical physics residency program is integrated with these programs in many of the supplementary didactic areas. Conferences, lectures, journal clubs and courses are shared between the three programs. A complete list of conferences and meetings available to the physics resident is presented in **Residency Curriculum**. Physics residents are also provided with many teaching opportunities, including presenting physics lectures to both the medical residents and the therapy students, as well as at weekly physics education conferences.

A list of the clinical equipment and description of the facilities available to physics residents in the MPRP is provided in the sections that follow.

5.1. Clinical Equipment

a. External Beam Treatment Machines:

- Varian TrueBeam Linear Accelerator (2.5MV, 6MV, 10MV, 15MV, 5 Electron Energies, SD MLC, with static and dynamic IMRT and RapidArc, MV and kV imaging, including kV CBCT, Gating and the Calypso Tracking System)
- Varian TrueBeam Linear Accelerator (2.5MV, 6MV, 10MV, 15MV, 5 Electron Energies, SD MLC, with static and dynamic IMRT and RapidArc, MV and kV imaging, including kV CBCT, Gating, OSMS and the Calypso Tracking System)
- Varian TrueBeam Linear Accelerator (2.5MV, 6MV, 10MV, 15MV, 5 Electron Energies, including TSE mode, SD MLC, with static and dynamic IMRT and RapidArc, MV and kV imaging, including kV CBCT and Gating)
- Varian TrueBeam Edge Linear Accelerator (2.5MV, 6MV, 6FFF, 10FFF, HD MLC, with static and dynamic IMRT and RapidArc, MV and kV imaging, including kV CBCT, Gating, OSMS and the Calypso Tracking System, 6 DoF Couch)
- Varian TrueBeam STx Linear Accelerator (2.5MV, 6MV, 6FFF, 10FFF, HD MLC, with static and dynamic IMRT and RapidArc, MV and kV imaging, including kV CBCT, Gating and the OSMS Tracking System, 6 DoF Couch)
- Varian TrueBeam Linear Accelerator (2.5MV, 6MV, 10MV, 15MV, 5 Electron Energies, including TSE mode, SD MLC, with static and dynamic IMRT and RapidArc, MV and kV imaging, including kV CBCT, Gating and the OSMS Tracking System)
- Varian TrueBeam Edge Linear Accelerator (2.5MV, 6MV, 6FFF, 10FFF, HD MLC, with static and dynamic IMRT and RapidArc, MV and kV imaging, including kV CBCT, Gating and the OSMS Tracking System, 6 DoF Couch)
- Varian TrueBeam Linear Accelerator (6MV, 6FFF, 15MV, 5 Electron Energies, SD MLC, with static and dynamic IMRT and RapidArc, MV and kV imaging, including kV CBCT, Gating and the VisionRT Tracking System) (SSCBC)
- Varian TrueBeam Linear Accelerator (2.5MV, 6MV, 15MV, 3 Electron Energies, SD MLC, with static and dynamic IMRT and RapidArc, MV and kV imaging, including kV CBCT, Gating and the VisionRT Tracking System, 6 DoF Couch) (SSCBC)
- Non-clinical Linear Accelerator dedicated to Training and R&D efforts.
- Mobetron Intraoperative Radiotherapy Electron Linear Accelerator (3 Electron Energies) located in a shielded operating room.
- Elekta Gamma Knife Icon
- Xstrahl Small Animal Radiation Research Platform (SARRP)

b. Simulators:

- Samsung BodyTom mobile CT
- Siemens Sensation Open 4D CT Simulator
- 2 GE Large Bore 4DCT with RPM Gating (James)
- GE Large Bore 4DCT with RPM Gating (SSCBC)
- GE MRI

c. Treatment Planning Systems

- Varian Eclipse (version 13.6) Treatment Planning System
- Varian BrachyVision (LDR/HDR) CT-based Brachytherapy Planning System
- Variseed Real-Time Prostate Implant Dose Planning System
- Leksell Gammaplan Gamma Knife Stereotactic Radiosurgery Planning System
- RaySearch RayStation Treatment Planning System

d. Brachytherapy

- Varian GammaMed Plus HDR Remote Afterloading Unit

- Ultrasound guided interstitial implant system
- Eye plaques (I-125 seeds)
- Yttrium-90 microspheres

e. R&V/PACS

- Varian ARIA (version 13.6) EMR Software
- Velocity
- Agfa- hospital wide diagnostic PACS system.
- Fuji- Computed Radiography system for Portal Imaging
- EPIC-enterprise EMR

f. Dosimetry Resources

- NIST-traceable calibrated ion chamber and electrometer dosimetry systems
- Farmer type ion chamber and Electrometer systems
- Various small volume ion chambers
- Parallel-plate ion chambers (Marcus)
- Multiple well ionization chambers for assaying brachytherapy sources.
- Scanditronix-Wellhoffer Blue Phantom 2 scanning system
- Sun Nuclear 3DS scanning system
- Landauer OSL dosimetry system
- Diode based in-vivo dosimetry system for photons and electrons with computerized data collection.
- RIT and Scanditronix-Wellhoffer film scanning and densitometry systems with Epson 10000XL scanner.
- Radiochromic densitometer
- Sensitometry equipment
- Multiple solid water phantoms
- IMRT QA phantoms
- Alderson-Rando anthropomorphic phantom
- Barometers, thermometers, etc
- Ion-chamber based morning output check devices for each linear accelerator (SNC DQA3)
- Multiple radiation survey meters
- Modus Medical Pentaguide IGRT QA Phantom
- IBA Compass & Matrixx Treatment Plan Verification System
- Nuclear Associates CT Density Phantom
- CIRS Dynamic Thorax Respiratory Gating Phantom
- Sun Nuclear Profiler 2 and MapCheck2
- DoseLab QA Software
- Standard Imaging W/L Device
- BrainLab W/L Device
- SNC Arccheck Cylindrical Diode Array
- SNC 3DVH Plan QA Software
- Varian Portal Dosimetry

One of the linacs listed above is located in our training facility. This facility is used by Varian to provide service engineer training courses and will be used by OSU, in conjunction with Varian, to provide linac commissioning, QA and in-room imaging training courses. When this facility is not being used for training, it is available for use by the residents for various QA activities or beam measurements (i.e. for the commissioning rotation).

Residents access the department using their hospital ID and have a departmental key, which provides access to physics equipment. As part of orientation, each resident goes through a safety and equipment handling review. During this time, residents are instructed in the proper use of the equipment as well as how to leave equipment for the next user. Clinical equipment is available when not in use for patient treatment, and its use requires supervision by a medical physicist until satisfactory knowledge of the use of a particular piece of equipment has been demonstrated. Residents also have access to a machine shop. Residents submit work orders to the machine shop as required and are not allowed to personally use the machines.

In addition to having access to a wide variety of clinical facilities and equipment, the residents will also be exposed to a wide variety of specific patient procedures. Core special procedures performed in the Department of Radiation Oncology include, photon and electron external beam treatments, intracavitary and interstitial brachytherapy (both HDR and LDR), total body irradiation, total skin electron treatment, IMRT, VMAT, SRS (both Gamma Knife and linac-based), SBRT, IORT, radiopharmaceutical therapy and interstitial seed implant procedures.

5.2. Resident Offices

The Physics Residency Program provides office space for each resident in the program. The Resident Office is currently located in the Physics area in the Department of Radiation Oncology in the James Cancer Hospital. This room is in the same area as the Program Director's office and the other medical physicists' offices. Residents are provided a desk, file cabinet, bookshelves, computer connected to a LAN, telephone access, and standard office supplies. Residents have access to departmental copying equipment. Resident space is approximately 40 sq. ft. per resident.

Conference or classrooms available for resident teaching

Ample space is available for resident advisory meetings, didactic lectures, exams, seminars, and oral examinations. Didactic lectures are presented in our modern conference room, which is equipped with the latest multimedia equipment and on-line links to information sources.

5.3. Libraries

There are many libraries available to the residents on the OSU campus. The main library of interest to residents is the Prior Health Sciences Library, which is located within the Medical Center complex, and can request books from all other University libraries. The residents have access from their desktop computer to the University's subscription to all electronic journals and research databases. Additionally, residents are given access to reference management software.

5.4. Evaluation of the Curriculum

Evaluation of the Curriculum/Program by the Resident

A program evaluation form is completed annually by each resident (both current and graduating residents). The form allows the resident to anonymously evaluate each clinical rotation they have completed as well as the overall program. The form is completed online via the AHST system.

In addition to the program/curriculum evaluation, at the end of each rotation, the resident also evaluates the performance of their preceptors. This evaluation is performed on-line using the AHST system.

5.5. Evaluation of the Curriculum by the Faculty

The MPREC will meet annually to evaluate and discuss training objectives. During these meetings, input from members will be sought to improve the MPRP. Program evaluation forms, completed by each resident (and discussed in the previous section), will also be reviewed. Possible program modifications will be discussed and the impact of the proposed changes on the requirements listed in AAPM's Report #249 will be assessed. A majority vote of the MPREC is required to ratify changes to the MPRP. Should a change be approved, residents will be notified in writing of the alterations prior to its implementation. Minutes from these meetings are available for review.

In order to provide a stable environment for the residents, major modifications of the program will take effect July 1 of the calendar year. Changes in evaluations for resident progress will only take place July 1 and will only be applied to new residents. Minor program changes will only be implemented in between rotations.

As part of the resident evaluation of program, the senior (graduating) residents have the opportunity to provide feedback regarding their residency experience and recommend program changes.

6. Scholarly Activities

Medical Physics Residents are provided various opportunities to engage in scholarly activities, some of which are required elements of the program. The residents are supported to attend the national AAPM conference closest to their transition from PGY2 to PGY3. The residents are also given the opportunity to attend the two AAPM Ohio River Valley chapter meeting held per year. One of these meetings is geared towards student presentations for all students/residents in our chapter. Residents are strongly encouraged to partake in clinical and other research projects that would lead to them presenting at the National AAPM and chapter meetings during their residency. Some of the required elements of scholarly and other activities within the curriculum are listed below.

6.1. Research Projects

The residents are required to go through a one month elective project rotation. The requirements of the elective project are spelled out in detail in the training plan. Briefly, the residents are required to identify a clinically oriented research project ahead of time that they would like to spend a month of focused study on, leading to a required report and an oral presentation in the Medical Physics Education Conference, as well as identify a preceptor for their elective rotation. The expected rigor of work is supposed to be at a level that would result in a submitted report that they can use towards an abstract for the AAPM annual conference and/or prepare a paper for publication in a journal.

In order to provide ideas to residents for their research projects and give them some areas to choose from, we hold periodic research meetings that review current areas of clinical development and projects that would enhance our ability to deliver better quality patient care, or provide a systematic process of learning a topic, and also identify physicists that would be able to mentor such projects. This list is discussed as a group with our physicists and physics residents so that they can get a good sense of which projects they may be interested in. Most of our recent resident elective projects, as well as additional projects they have been involved with, have come out of such discussions within our group.

6.2. Clinical Problem Solving

The Medical Physics Residents get ample opportunities to get involved in clinical problem solving, both for situations related to patient care as well as linac trouble shooting during the clinical day through some involvements integrated into their curriculum. Firstly, during our External Beam rotation, our residents are required to carry and respond to the “physicist of the day” phone for certain durations, with adequate supervision and help from primary/secondary preceptors. This experience allows the residents to be directly involved in clinical and linac problem solving situations. This is a new process we have started recently and has received great feedback from the residents as providing them with great opportunities to learn how to deal with such situations and problems. Similarly, during our SBRT/SRS/SRT rotations, the resident on the rotation in their second year are allowed to cover a case independently, after they have demonstrated competence and knowledge. This allows the second year residents to gain more confidence, knowing that if they have any questions, they can still call a physicist.

The residents use the AHST system to log any significant clinical troubleshooting activities and their coverage of SBRT/SRS/SRT cases as part of their External Beam and SRS/SBRT rotations so that they have a log of such activities. The Clinical Service rotation also provides opportunity to develop clinical problem solving skills.

6.3. Commissioning Experience

The Medical Physics Residents get ample opportunities to partake in commissioning of new equipment and technologies. In order to provide our residents with a structured opportunity to commission a linac and a treatment beam in a treatment planning system, the residents have a 2 month concurrent commissioning/shielding rotation. During that rotation they are required to independently collect beam data based on the beam modelling needs in Eclipse, and complete modelling and commissioning their beam model. The residents are required to submit a satisfactory commissioning report as part of the completion of this rotation. Recently the department has acquired a non-clinical training linear accelerator and a non-clinical installation of Eclipse. These resources allow our residents a very unique opportunity to perform commissioning during working hours and collect uninterrupted beam data or perform other measurements for commissioning activities.

Besides linac and treatment planning commissioning, the residents are involved routinely in commissioning projects for new treatment modalities and other equipment. These opportunities are ad hoc based on what changes or new equipment is being brought into the clinics.

7. Residency Curriculum

The MPRP is delineated through rotational focus on medical physics topics and is designed to expose residents to the clinical training outlined in AAPM's Report #249, "Essentials and Guidelines for Clinical Medical Physics Residency Training Programs." The design of the program satisfies all of the minimum requirements of Report #249 as well as most recommendations. In addition, technical advances since the publication of Report #249 are incorporated into rotational content to provide residents with the sufficient clinical training to work independently at advanced facilities after graduation. A detailed description of the MPRP curriculum, including a sample training plan, is provided in the sections that follow.

7.1. Resident Performance and Expectations

The MPRP Director meets with each resident during the first week of their residency experience to clearly define the training schedule for the resident. During this meeting, the clinical, didactic and behavioral expectations of the resident are discussed. A schedule of clinical rotations, containing actual dates for the rotations, is provided to the resident. Additionally, the resident is provided with documentation detailing the clinical objectives, areas of competency, additional didactic requirements and expectations of performance for successful completion for each rotation. A sample training plan, including a sample schedule is discussed below.

7.2. New Resident Orientation

At the beginning of their training, new physics residents attend the day long new housestaff orientation that is given by the College of Medicine. They are then provided a one-day orientation lecture series followed by a four-week clinical orientation rotation in the clinic and dosimetry areas. In addition, the Program Director meets with each new resident at that time to ensure that the incoming resident clearly understands the program's requirements, resident administrative procedures, and any other expectations. At this meeting, the resident is made aware of staff and program resources, including treatment machines, treatment planning facilities, laboratories and libraries.

7.3. Safety

- The Ohio State University Radiation Safety Office provides a Radiation Safety Short Course which all staff and residents are required to attend.
- All first year residents are issued a radiation monitor by OSU as part of their new employee procedure.
- All residents attend orientation lectures on treatment machine operation and introductory training in the dangers of high voltage.

- During the course of the first year, Physics Residents complete training as described under **Institutional Support (Safety)**.

7.4. Sample Training Plan

a. First Year Training Plan

The residency is sectioned into rotations, each of which is two months in duration, with the exception of dosimetry, which is 3 months, and the orientation, elective, professional and clinical rotations which are one month each. The first year starts with an orientation rotation, in which the resident spends time throughout the various functional areas of the department. This enables the resident to become more familiar with patient workflow, staff and equipment, as well as the physicist's role in the clinic. By the end of their orientation rotation, the resident is expected to have achieved good communication and rapport with the staff they are in direct contact with.

After the Orientation rotation, the resident will begin the focused clinical rotations. Below is a sample clinical rotation schedule. Each resident's rotation schedule is customized in order to minimize rotation overlap with other physics residents. A detailed summary of each rotation, including the duration of each rotation, rotation objectives, didactic educational objectives, required competencies and requirements for successful rotation completion is provided in this document.

**The Ohio State University Medical Center
Medical Physics Residency Program
Clinical Rotation Schedule**

+ Clinical Rotation Schedule for _____

Year 1		
Month#	Rotation	Duration
1	Orientation	1 month
2-4	Dosimetry A	3 months
5-6	External A	2 months
7-8	Brachytherapy A	2 months
9-10	Radiosurgery A	2 months
11-12	External B	2 months
Year 2		
13-14	Brachytherapy B	2 months
15-16	Radiosurgery B	2 months
17-18	Shielding and Commissioning	2 months
19-21	Dosimetry B	3 months
22	Elective	1 month
23	Admin and Professional	1 month
24	Clinical Coverage	1 month

Documentation detailing the clinical objectives, areas of competency, additional didactic requirements and expectations of performance for successful completion for each rotation are provided in each clinical rotation description. The above rotation is a typical schedule, and may be changed as needed.

Resident Signature _____ Date _____

MPRP Director Signature _____ Date _____

Throughout the first year, in all rotations except for the orientation and dosimetry rotation, the resident is expected to observe and assist in all cases. The common expectation is that in the first rotation of each section of external, brachytherapy and radiosurgery, the resident will mainly review literature, observe and assist with procedures. For each

rotation, the resident is assigned a primary preceptor. The primary preceptor will guide and track the resident's progress through the rotation. While the resident will work closely with their primary preceptor, they will also work with the other clinical physicists who are responsible for clinical coverage for that functional area (i.e. external, brachytherapy, etc.). Since our clinical physicists' services are not specialized to any particular function, and clinical physics coverage rotates among the clinical physicists, the resident will be exposed to the practice patterns of many physicists, uniform within the guidelines of the department, but individually different enough to provide a real world experience. The dosimetry rotation will be precepted by the dosimetry staff in addition to a physicist preceptor, and will focus on treatment simulation, planning, setup and delivery. For all other rotations, the resident will be under the supervision of a physicist preceptor.

At the end of each rotation, the resident will be evaluated by their primary preceptor. Resident evaluation and testing is discussed previously in **Evaluation of Resident Progress**. If the resident has not performed satisfactorily, the program director may counsel, advise, and/or test the resident. The program director may then declare the rotation as not satisfactorily completed after due discussion with the primary preceptor involved and other physics staff. This action may result in additional training requirements which may delay the resident's admission to the board examination. The program director meets with each resident to discuss progress as previously described in **Meetings with the MPRP Director**.

Physics residents also participate in all department conferences in which the physics staff is expected to attend. The resident is expected to attend meetings, conferences, and seminars.

b. Second Year Training Plan

The second year of the residency will continue with rotations in dosimetry, external, brachytherapy and radiosurgery, with some additional rotations, one focusing on administrative and professional duties of a medical physicist, one elective rotation, a shielding and commissioning rotation and a final rotation providing clinical coverage. As noted earlier, in order to minimize overlaps or due to specific needs of a resident, the sequence of rotations may need to be changed for individual residents.

The second year is similar to the first year of the residency, except that the resident is expected to have achieved both skill and competency in the duties of a medical physicist, and should be able to perform most duties with minimal supervision. By the end of the second rotations in external, brachytherapy and radiosurgery, the resident is expected to have a strong understanding of the process, clinical rationale, and background of all procedures that happen in a standard radiation oncology department. The second dosimetry rotation entails the resident learning more complicated treatment simulation, planning, setup and delivery. The administrative rotation is designed to expose the resident to the various professional and administrative duties that a career in medical physics presents.

Year 2 rotations will utilize the same primary preceptor structure as year 1 (as described in the previous section). At the end of each rotation, the Resident will be evaluated by their primary preceptor. Resident evaluation and testing is discussed previously in **Evaluation of Resident Progress**. If the resident has not performed satisfactorily, the program director may counsel, advise, and/or test the Resident. The program director may then declare the rotation as not satisfactorily completed after due discussion with the physicist involved and other physics staff. This action may require additional training and may delay the candidate's admission to the Board examination. The program director meets with each resident to discuss progress as previously described in **Meetings with the MPRP Director**.

During year 2, physics residents continue to participate in all department conferences in which the physics staff is expected to attend. The resident is expected to attend meetings, conferences and seminars discussed in **Meeting, Conference and Seminar Schedule and Attendance**.

c. Administrative and Professional Rotation

The content of the Administrative and Professional rotation, along with the rotation checklist used, is described in detail later in this document and can be found in section **9.13. Medical Physics Rotation Description-Administrative and Professional Rotation**. Coverage of specific topics required by the self-study guidelines are detailed in the table below.

Professionalism and Ethics	How covered	Comments
Professionalism		
<ul style="list-style-type: none"> ▪ Definition of a profession and professionalism ▪ Elements of a profession ▪ Definition of a professional ▪ Elements of professionalism ▪ How is professionalism judged? ▪ Do's and don'ts of professionalism ▪ Physician's charter and applicability to physicists 	ABR/ACR/RSNA/AAPM/ASTRO/ARR/ARS Online Modules on Ethics and Professionalism	
Leadership		
	Four readings and two discussion sessions. Readings are listed below	
<ul style="list-style-type: none"> ▪ Leadership Theories 	Downloaded from Mindtools Website	
<ul style="list-style-type: none"> ▪ Leadership Styles 	Journal Article	<i>International Journal of Management Reviews, Vol. 19, 76–96 (2017)</i> DOI: 10.1111/ijmr.12082
<ul style="list-style-type: none"> ▪ Ethical Leadership 	Downloaded from Mindtools Website	
<ul style="list-style-type: none"> ▪ Authentic Leadership 	Downloaded from Mindtools Website	
Ethics		
<ul style="list-style-type: none"> ▪ Ethics of a profession ▪ Ethics of an individual ▪ Interactions with colleagues and co-workers ▪ Interactions with patients and the public ▪ Confidentiality ▪ Peer review ▪ Negotiation skills ▪ Relationships with employers ▪ Conflicts of interest ▪ Ethics in research ▪ Use of animals in research ▪ Use of humans in research ▪ Relationships with vendors ▪ Publication ethics ▪ Ethics in graduate and resident education ▪ Selected case studies 	ABR/ACR/RSNA/AAPM/ASTRO/ARR/ARS Online Modules on Ethics and Professionalism and OSUWMC Computer Based Learning modules	

7.5. Evaluation of Resident Progress

a. Progress through Rotations

Residents are monitored through each rotation by the primary preceptor. For each rotation, the primary preceptor will meet with the resident at the start of the rotation to review the rotation objectives, required didactic readings, clinical competencies and requirements for successful completion of the rotation. During the rotation the primary preceptor will periodically meet with the resident (typically weekly) to review the residents' progress. The primary preceptor also meets with the resident at the end of the rotation to discuss the residents' performance. At the end of the Dosimetry, External Beam, Brachytherapy and SRS/SRT rotations the resident also takes an oral exam. While it is expected that the resident will perform well on the exams, the exam results will primarily be used to identify strengths and weaknesses in the resident's knowledge of medical physics in that area. Successful completion of the clinical rotations is based on evaluations performed by the primary preceptor at the end of each rotation and are discussed in **Evaluation of Resident Progress**.

b. Progress through the Program

The residents' progress through the program is monitored by the Program Director and the MPREC. Periodic meetings between the physics resident and the Program Director are held to discuss problems related to resident training.

Currently the medical physics residency program is using the AHST (<http://www.typhongroup.net/osu>) to track and evaluate the resident competencies and progress through the program. It facilitates the evaluation of the resident's strengths and areas for improvements, as well as keeping track of the resident's accomplishments for their own records.

c. Criteria for Successful Completion

Successful Rotation Completion

The requirements for successful completion of a particular rotation are spelled out in the rotation description. At the end of a rotation, the primary preceptor determines if all completion requirements have been met and then evaluates the performance of the resident during their rotation. This evaluation is based on meetings with the resident during the rotation, discussion with the clinical physicists working with the resident and the oral exam results. This evaluation is documented in AHST. In each of these evaluations there is an overall rotation evaluation. It consists of a four-point scale, categorizing the residents' abilities as either 'Excellent', 'Satisfactory', 'Needs Improvement' or 'Unsatisfactory/Fail'.

If the resident receives an "Unsatisfactory/Fail" score for their overall grade for a rotation, the primary preceptor, Program Director and the resident in question will meet to discuss the progress of the resident in that rotation. Possible conditions for disciplinary action or termination include (but are not limited to): Failure of a rotation, unprofessional or unethical behavior, participation in illegal activities, or overall unsatisfactory progress in the residency. The "Academic and Adverse Action Policy" and the "Due Process Policy" as outlined by The Ohio State Medical Center GME Policy and Procedure govern how unsatisfactory performance of a resident is addressed.

The Resident Due Process Policy details the rules for handling any disciplinary actions. These include general guidelines, challenges to a performance/rotation evaluation, and appeals to adverse action. Specifics on adverse action can be found in the Academic and Adverse Actions Policy.

7.6. Successful Program Completion

The progress of each resident is reviewed by the MPRP Director and the MPREC regularly. Rotation evaluation criteria, as well as procedures to be followed if a resident does not meet the expected level of performance, have been described in the previous sections. Near the end of the resident's residency tenure, the MPREC meets to evaluate the resident's overall performance, both clinical and didactic, to determine if the resident has successfully completed the program.

a. Meetings with the MPRP Director

The MPRP Director will meet with each resident at the start of Orientation, and at the end of the first and second years of residency, to discuss the progress of the resident through the MPRP. Additionally, the MPRP Director or Associate Director are part of each end-of-rotation exam, and review and provide feedback to the resident on their progress and areas to improve for each rotation.

Prior to the end-of-year meetings, the MPRP Director will review the rotation evaluations for the resident and will provide the resident with a list of performance observations based on these evaluations. The resident reviews these observations and prepares a formal written response. The observations and resident's responses are then discussed at a meeting between the MPRP Director and the resident. They further discuss and document any changes that may be required in the resident's training plan. The document is then signed by both the resident and the director and is kept on file.

b. Annual Testing

In addition to end of rotation oral exams, the resident is required to take two exams during their residency. At the end of the first year of their residency, the residents are required to take a written examination. Typically, the Raphex Therapy Examination is used for this purpose. An oral exam will be required near the completion of the second year of the MPRP. In order to provide valuable oral exam experience to the resident, the oral exam is structured similar to the oral exam given by the ABR. While it is expected that the resident will perform well on these exams, results will primarily be used to identify the strengths and weaknesses of the resident's knowledge of medical physics are discussed with the resident during one of their meetings with the MPRP Director. If required, modifications to the resident's training plan are made.

c. Teaching

Teaching formal coursework is not a requirement of the MPRP. However, physics residents may be asked to assist in the training of other departmental personnel through one-on-one interaction and division/departmental meetings. It is also expected that the senior residents will provide guidance to the junior residents for proper equipment operation and departmental policies as well as assist with the radiation therapy classes as needed.

d. Research

While in the program, the resident may choose to become involved in a research project. Given the resources and the wide variety of radiation therapy modalities implemented in the department, ample research opportunities exist for the resident. While not a requirement, participation in a research project allows the resident to benefit from faculty scholarly experience and to learn the principles of scientific inquiry and critical analysis.

e. Meeting, Conference and Seminar Schedule and Attendance

In order to provide professional exposure, it is anticipated that the resident will attend local and an annual AAPM meeting during the course of the residency. Residents are expected to be present for weekly physics meetings, departmental seminars, vendor demonstrations for relevant products, journal reviews, in-service training sessions, guest lectures, mortality/morbidity meeting, and other educational presentations. Physics residents participate in all departmental conferences in which the physics staff is expected to attend. Resident attendance requirements for meetings, conferences and seminars are shown in the table below. Some events, such as annual in-service training sessions, are mandatory. Failure of the resident to meet this attendance criterion will be addressed during evaluation of the resident.

Conference	Frequency	Required Attendance %
Chart Rounds	Three per week	20%
Mortality and Morbidity Conference	Once per month	25%
Physics Educational Conference	Two per month	80%
Physics Morning Conference	Once per week	80%
Resident Teaching Conference	Once per month	*see below
Journal Club	Once per month	25%
In-service training for radioactive materials	Annually	100%
AAPM regional meetings	Two meetings/year	**see below
AAPM national meetings	Once/year	**see below
Other meetings and seminars available to the resident		
Dosimetry meeting	Once per week	Attendance optional
Unit council meeting	One per month	Attendance optional
Vendor demonstrations	As available	Attendance optional
Vendor training/webinars	As available	Attendance optional
Guest lecturers	As available	Attendance optional

* must attend all body sites within 2 years or attend physician resident disease site specific didactic series

** Residents are strongly encouraged to attend these meetings, but attendance is not required

f. Modification of Curriculum

The MPREC will meet annually to evaluate and discuss training objectives. During these meetings, input from members will be sought to improve the MPRP. Program evaluation forms, completed by each resident (discussed previously), as well as those from staff members, will also be reviewed. Possible program modifications will be discussed and the impact of the proposed changes on the requirements listed in AAPM’s Report #249 will be assessed. A majority vote of the MPREC is required to ratify changes to the MPRP. Should a change be approved, residents will be notified in writing of the alterations prior to its implementation. Minutes from these meetings are available for review.

In order to provide a stable environment for the residents, major modifications of the program will take effect July 1 of the calendar year. Changes in evaluations for resident progress will only take place July 1 and will only be applied to new residents. Minor program changes will only be implemented in between rotations.

g. Facilities available to Residents

A description of facilities available to the resident has been provided under **Clinical Equipment**. All clinical facilities, with the exception of the training linac, are located within our department in the James Cancer Hospital. Clinical equipment is available when not in use for patient treatment and its use require supervision by a medical physicist until satisfactory knowledge of the use of a particular piece of equipment has been demonstrated. The training linac is located in our training facility (in a building adjacent to the James Cancer hospital), and when this facility is not being used for training, it is available for use by the residents for various QA activities or beam measurements (i.e. for the commissioning rotation).

8. Medical Physics Resident Expectations

1. The resident is responsible for being proactive regarding their rotation obligations. This includes:
 - a. Independently review and monitor clinical schedules for clinical area of rotation
 - b. Shadowing physicist during clinical activities
 - c. Be the primary point of contact for clinical issues during your rotation
*While the physicists/clinical staff try their best to include and update the residents on clinical occurrences, it is also up to the resident to proactively inquire and follow-up on any clinical activities they are interested in or should see for their rotation. If the resident has trouble doing so, they should speak with their primary preceptor on how to proceed.

2. The competency list in each rotation description is meant to be a guide for what a resident needs to complete during their rotation. It is expected that a resident will complete each competency multiple times as they encounter clinical cases and improve their level of knowledge. The level of completion will be verified by discussion/questions by the preceptor and if the primary preceptor feels that the level of completion documented is not appropriate, they may ask the resident to change the report accordingly.
 - a. Rotation Meetings Expectations:

The resident is expected to work with the Program Manager and Primary preceptor to pre-schedule the following meetings for each rotation:

 - i. Initial Rotation Meeting (within the first couple of days of the beginning of rotation) with completion of initial rotation form.
 - ii. Weekly meetings with Primary Preceptor (to be discussed at initial meeting)
 - iii. Mid-rotation meeting with completion of mid-rotation form.
 - iv. End of Rotation exam within a week of completion of rotation.
 - b. Documentation Expectations for Competencies
 - i. Weekly progress reports turned in on Monday following the week of the reporting period (AHST System will no longer allow logging competencies after 1 week).
 - ii. Competency report filled in the AHST System need to include:
 1. The correct competency completed consistent with activity performed
 2. The appropriate level of completion (to be verified by primary preceptor discussion/questions)
 3. The comments section populated for each competency report including:
 - a. Physicist performed with
 - b. Any relevant notes pertaining to the competency
 - c. Preparation for rotations
 - i. Meet reading requirements as outlined in the Handbook
 - ii. Ask questions to help bridge any gaps between your assigned readings and the clinical competencies that are performed.
 - iii. While on a rotation, requests for participation in other clinical activities by any faculty member need to be coordinated through the rotation primary preceptor. (participation in developmental projects are discussed below)

3. QA Involvement expectation:

Orientation	Year 1 (in addition to Orientation)	Year 2 (in addition to Year 1)
IMRT QA	Full Monthly Linac QA	Weekly Chart Checks
Linac Daily QA	Ancillary Monthly QA	Plan 2 nd Checks (Ex. Beam B)
Monthly Linac QA w/physicists	Annual QA	Brachy Planning (Brachy B)
Mobetron QA w/physicists		SRS/SRT Checklist (SRS/SRT B)
Trajectory log analysis		Full Annual QA

- a. Daily QA: ideally the daily linac results are reviewed before start of treatment, however this often is before the resident is expected to be in the clinic, and thus the resident is expected to complete daily QA first thing in the morning. If the resident cannot complete within a reasonable time (before 9am or first stereotactic), they are expected to communicate and obtain coverage from fellow residents.
- b. Monthly QA: participate/attend with physicist until end of first calendar year (December), or until comfortable to continue independently with appropriate sign off from physicist. Resident shall not tweak absolute dose calibrations on any linear accelerator throughout the residency unless under the supervision of a physicist.
- c. Annual QA: Attend/participate every possible annual QA, and in their 2nd year be comfortable to independently perform Annual QA
- d. IMRT QA: must complete all IMRT QA scheduled on the resident's assigned day. QA on the schedule should not be moved by the resident unless discussed with relevant clinical staff. For any QA moved, the resident is expected to follow-up or communicate with the next resident on the schedule. The resident is responsible for any portal dosimetry or Mapcheck work that needs to be done or re-done after patient treatment hours on their day
- e. Trajectory log: analysis should be completed on the resident's assigned IMRT QA day. Timeline for completion of this task is consistent with Daily QA review. If the resident is unable to complete this on their day, communicate with the next resident on the schedule. Any apparent issues with the trajectory log should be reported

*Note: the resident is responsible for fully understanding the QA requirements and procedures before accepting independent work. If the resident needs further clarification or does not feel ready to perform any of the above independently then they are expected to communicate with the senior residents or the physicists to become fully comfortable with the tasks

4. Attendance:

- a. The resident needs to meet meeting/conference/seminar attendance requirements as outlined in the Handbook
 - i. Meetings must not interfere with rotation activities and should be cleared with the preceptor

5. Participation and preparation for Development Projects:

- a. Elective Rotation Projects
 - i. For elective rotation projects, it is expected that each Resident will initiate a development project with a faculty member of their choosing (with approval from the Residency Director) well before their Elective rotation, and get the rotation proposal approved as articulated in the Elective Rotation documentation.
 - ii. The project needs to be developed with appropriate scientific rigor with a one page idea proposal to be approved by the residency director.

- iii. The resident is expected to see the project as stated in the elective proposal through its completion
 - 1. A report of completion/progress is due at the end of the elective rotation month.
 - 2. Additional project activities beyond the elective month must not interfere with other rotations
- iv. The development project results will be presented by the resident at an education conference, or
- v. The resident is encouraged to submit the project results to the AAPM national conference.
- b. Other developmental projects:
 - i. If approached by faculty members to participate in additional development projects, the residents are encouraged to consider these based on their interest and time, but with the following stipulations:
 - 1. The participation in additional projects should not interfere with other rotation obligations for the resident
 - 2. Participation and time commitments during any other rotation during clinic hours shall be coordinated through the primary preceptors

If a resident commits to a project, they are expected to see the project through completion or appropriately hand it off to the faculty member

8.1. Medical Physics Senior Resident Expectations

The Senior Medical Physics Resident(s) (referred to as Senior Resident in the rest of the document) is a leadership role with the primary goal of being a liaison between the Medical Physics Residents and the Residency Director/Associate Director, and other Faculty members. This also serves as a way for Medical Physics Residents to develop administrative and leadership skills that they need for their future careers. Due to the 2 year duration of the Medical Physics Residency Program (MPRP), the senior resident(s) transition to the role as Senior Resident for the second academic year beginning July 1st and ending June 30th.

1. Senior Resident(s)'s primary responsibility is to ensure that the resident component of the clinical operation of Medical Physics and the educational activities of the residency are optimized and effective on a daily basis.
2. Senior Resident(s) is responsible to and will meet regularly with the Director and Associate Director of the MPRP.
3. Senior Resident(s) will serve Medical Physics committees including but not limited to:
 - a. Medical Physics Residency Education Committee
 - b. Medical Physics Curriculum Subcommittee
 - c. Medical Physics Residency Admissions Subcommittee
 - d. Any other ad hoc committee as appointed by the MPRP Director
4. Senior Resident(s) will assist the Director/Associate Director of MPRP, core faculty, and Residency Coordinator in:
 - a. Coordinate resident participation in new resident recruitment activities
 - b. Curriculum development and evaluation for residents.
 - c. Assisting in creating and maintaining the Physics Education Conference schedule, identify topics of presentation, and ensuring that the Physics Education Conferences are held as planned.
 - d. Designing and implementing an educational program for the upcoming calendar year.
 - e. Orientation of the incoming Residents into the Medical Physics Residency Program, and help them during their orientation rotation month.
 - f. Host visiting students, potential applicants, and other visitors. Prepare and coordinate schedules for such visitors.
 - g. Create and maintain clinical schedules, specifically:

- i. IMRT QA schedule
 - ii. Linac Daily QA review schedules
 - iii. Resident coverage of Monthly QA's
5. Senior Resident(s) will schedule and coordinate attendance in shared educational activities including, but not restricted to:
 - a. Weekly Chart Rounds
 - b. M&M conference
 - c. Radiation Oncology Resident Teaching Conference
 - d. Radiation Oncology Clinical Didactic Conferences
 - e. Radiation Oncology Radiobiology Didactic Course
 - f. Radiation Oncology Physics & Dosimetry Didactic Course
 - g. Journal club
 - h. Radiation Safety & Other In-service presentations
6. Senior Resident(s) will alert the Residency Director to any potential issues regarding resident or faculty performance and will assist the Residency Director (or his/her designee) in individual counseling sessions as necessary.
7. The Senior Resident(s) will serve as the resident advocate, and when needed, act as intermediary between resident and faculty, voicing residents' questions, concerns, suggestions and complaints to faculty and vice versa.
8. Senior Resident(s) will facilitate team spirit and cohesiveness.
9. Senior Resident(s) will hold resident meetings as needed when issues/concerns arise.
10. Senior Resident(s) will participate in the training of his/her successor(s).
11. Senior Resident(s) will seek to enhance his/her credentials through additional training, committee work continuing medical education, self-study, and participation in professional development seminars.
12. Senior Resident(s) will be responsible for other duties as assigned by the Director of Medical Physics Residency (or his/her designee).

8.2. Chief Medical Physics Resident

- A Senior Resident may be nominated as Chief Medical Physics Resident by the MPREC.
- If there are two senior residents, both may be nominated as Chief Residents.
- The title will be an honorary award to recognize an exceptional resident that has demonstrated clinical excellence, and leadership throughout their residency.
- The decision for Chief Resident will be made by the MPREC.

8.3. Resident Signoff

The following items may be signed/approved/billed by the resident once they have demonstrated a level of competency to the primary preceptor within the noted rotation.

- Weekly Chart Checks – Year 2
- Physics Plan Second Checks – External Beam B
- Brachytherapy Plans – Brachy B (Note: AMP check and signoff required)
- External Beam Plans – Dosimetry B (Note: Dosimetry/Physics check and signoff required)

- SRS/SRT/SBRT Checklist and standing for procedure – SRS/SRT/SBRT B
- IMRT QA – With a clear pass

8.4. Primary Preceptor/Secondary Preceptor Guidelines

a. Preceptor Model

- Each rotation will have a fixed primary preceptor irrespective of which physicist is on service
- Physicists on clinical service will be designated as secondary preceptors
- Monitoring resident progress during a rotation is the role of the primary preceptor
- Primary preceptor coordinates:
 - Beginning of Rotation Meeting
 - Weekly progress meetings & mid-rotation meeting (to monitor competency and reading completion to meet requirements)
 - Final Oral Exam
 - Complete all forms and paperwork for the rotation.
- Primary preceptor will coordinate resident progress by:
 - Assigning residents to shadow secondary preceptors for specific competencies as needed
 - Get feedback from the secondary preceptors regarding resident progress
 - Select secondary preceptors for meetings and exams as appropriate.
 - Receive and discuss competency reports from residents to determine the level of completion before signing off
- Secondary preceptors shall:
 - Work with the residents for assigned clinical activities
 - Report back to the Primary preceptor regarding resident progress for assigned activities
 - Be present in various rotation meetings as requested by the Primary Preceptor

b. Roles/Responsibilities:

1. Orient the Medical Physics Resident to the work environment for the rotation including safety information and Radiation Safety specifically applicable to the Rotation.
2. Review the expectations of the Resident's role for the rotation and what constitutes completion of different competencies for the rotation. Preceptor needs to complete with the Resident the "Beginning of Rotation Form" and use the Rotation Descriptions as a reference.
3. Provide hands-on learning under direct supervision. It is expected that residents participate in all aspects of clinical physics responsibilities.
4. Facilitate the resident's learning of your specialty by questioning the resident and providing feedback. Challenge the resident to identify areas of insufficient knowledge and to use this as an impetus for additional learning.
5. Share resources with our residents (books, journal articles, etc.) and provide opportunities to enhance professional development.

c. General Policies:

1. We ask that if you are not available at any time you are scheduled to precept to let us know immediately so we can reassign the resident(s) to another preceptor.
2. The program should not rely primarily on other residents for didactic or clinical instruction.
3. Residents must not substitute for clinical or administrative staff during supervised clinical practical experiences.

9. Rotation Descriptions

9.1. Medical Physics Rotation Description-Orientation

Rotation: Orientation

Timeframe: 1 Month

Preceptor: Nilendu Gupta

Overview

In this rotation residents are introduced to staff, resources, and procedures at the Department of Radiation Oncology. During this rotation, the resident will meet with the MPRP Director to develop a clinical/didactic training plan, perform all required hospital orientation training and spend time observing clinical activities at each of the clinical areas in the department. In addition, several didactic readings are also required. Each week daily records from the AHST system will be provided to the preceptor. At the end of this rotation, residents will be evaluated by the preceptor and the results documented in the AHST system.

Clinical Objectives

- Develop a specific training plan - The resident will meet with the MPRP Director to develop a clinical rotation schedule. The MPRP Director will also discuss what is expected of the resident during their time in the program.
- Perform Hospital orientation training - The resident will complete all required hospital orientation training. This includes attending resident orientation and the radiation safety short course, as well as completing any assigned Computer Based Learning (CBL) modules through BuckeyeLearn.
- Complete an introductory training module on the Allied Health Student Tracking (AHST) System by the Typhon Group.
- Rotation through Department - Residents will spend time at each treatment and simulation unit to gain an appreciation of departmental organization and procedures. Time will also be spent with dosimetry, radiation safety, and block room to introduce the resident to staff.
- Aria and Eclipse Training – A training course will be offered at the Radiation Oncology Training Center for Aria and Eclipse Training. All incoming residents are required to attend this as part of their orientation/onboarding.
- Daily Linac QA Review - The resident will observe the daily Linac QA checks performed by the therapists. After observing/assisting the physics staff, the resident will become responsible for reviewing that the daily Linac QA was performed and documented and that the results are acceptable.
- Perform IMRT QA and electron cutout measurements- After observing/assisting the physics staff with several IMRT QAs and electron cutout measurements, the resident will become responsible for performing these measurements. All measurement results will be reviewed by the preceptor.

Didactic Readings

- AAPM TG249: Essentials and Guidelines for Hospital-Based Medical Physics Residency Training Programs
- ASTRO QA Whitepaper “Safety is no Accident”
- Review relevant Departmental Policies in Department Sharepoint Site
- Review QA Procedures for the Department in Medical Physics Sharepoint Site
- AAPM Medical Physics Practice Guideline 3: Levels of supervision for medical physicists in clinical training
- Medical Physics Practice Guideline 4: Development, implementation, use and maintenance of safety checklists
- AAPM Medical Physics Practice Guideline 10: Scope of practice for clinical medical physics

Competency List

- Attend MU Calculations Class
 - Calculations
 - Electron Calculations

- Electron Calculations Extended SSD
- Photon Calculations SSD
- Photon Calculations Extended SSD
- Photon Calculations SSD Off Axis
- Photon Calculations SAD
- Photon Calculations SAD Off Axis
- Manual Calculations of Computer Plans
- Complete: Review of Electrical, Ozone, Cerrobend Hazards
- Observe: Custom Cerrobend Block / Cutout (optional)
- Complete: Typhon Group Overview
- Complete: Expectations with Residency Director
- Complete: CT sim/PET Introduction
- Complete: Linac V1 Introduction
- Complete: Linac V2 Introduction
- Complete: Linac V3 Introduction
- Complete: Linac V4 Introduction
- Complete: Linac V5 Introduction
- Complete: Linac V6 Introduction
- Complete: Linac V7 Introduction
- Complete: TrueB1/TrueB2 Introduction
- Complete: Dosimetry Introduction
- Complete: Brachy Introduction
- Complete: Gamma Knife SRS/SRT Introduction
- Complete: Aria and Eclipse Training
- Observe/Assist: QA with MapCheck
- Observe/Assist: QA with Portal Dosimetry
- Observe/Assist: Electron Cutout Measurements
- Perform: Daily Linac Checks
- Complete: Faculty Preceptor Evaluation

Expectations for Successful Completion of Rotation

1. At the end of the rotation the resident will submit a short report to the MPRP Director. The report should address the following topics:
 - Describe the simulation process and immobilization devices used by the department for each disease site.
 - Describe the treatment techniques and field arrangements used in the department to treat different disease sites.
 - Describe the different brachytherapy and SRS/SRT/SBRT procedures used in the department
2. Completion of a minimum of 80% of required competencies and approval by preceptor.

9.2. Medical Physics Rotation Description – Dosimetry A

Rotation: Dosimetry A

Timeframe: 3 Months

Preceptor: Dominic DiCostanzo, Danny Eiler, and Doug Boyle

Overview

In this rotation, residents are introduced to dosimetry. The rotation is three months in length and includes familiarization with patient immobilization/set-up, 3D planning, inverse planning and related quality assurance tasks. In addition to assigned patient planning, didactic readings are also required. Each week daily records from the AHST system will be provided to the preceptor. At the midpoint of the rotation, as well as at the end of the rotation, residents will be evaluated by the preceptor and results documented in the AHST system.

Clinical Objectives

- Planning Techniques - Residents will be provided with an education on treatment planning techniques that will cover a range from 3D conformal, IMRT, and VMAT planning.
- Patient setup/immobilization- Residents will gain an understanding of the range of available immobilization equipment and the impact on reproducible patient setup. Residents will also contribute in the planning of immobilization for patient treatments.
- Image Fusion/Contouring- Residents will observe, assist, and perform image fusion and contouring of normal tissues.
- 3D planning- Residents will observe, assist, and perform patient planning for a variety of 3D plans.
- IMRT/VMAT planning- Residents will observe, assist, and perform patient planning for a variety of IMRT plans.
- Record and Verify system- The transfer of plan information to the record and verify system will be observed and performed by the resident.
- Quality Assurance for Treatment Planning System- Residents will observe/assist and then perform monthly quality assurance for the external beam treatment planning system.

Didactic Readings

Reading list provided by dosimetry staff

- AAPM TG65: Tissue Inhomogeneity Corrections for Megavoltage Beams
- AAPM TG263: Standardizing Nomenclatures in Radiation Oncology
- ICRU 50/62: Prescribing, Recording and Reporting Photon Beam Therapy
- Quantec Report
- A recent scientific publication of your choice related to dosimetry/patient simulation
- Radiation Therapy Planning by Gunilla Bentel pps. 383-414
- Eclipse Algorithm Reference Guide

Competency List

Initial Eclipse Training

- Complete: Eclipse Training during orientation

3D Planning

- Complete: 3D Plan Whole Brain
- Complete: 3D Cranial Spinal
- Complete: 3D Plan Abdomen
- Complete: 3D Plan AP/PA
- Complete: 3D Lung
- Complete: 3D Plan Oblique
- Complete: 3D Plan Pelvis 4 Field

- Complete: 3D Plan Pelvis Prone
- Complete: 3D Plan Spine Single Field

Breast

- Complete: Supine Conformal
- Complete: Prone Breast
- Complete: Prone Breast and Low Axilla
- Complete: Electron Planning
- Complete: Chest Wall & Nodes

Algorithms

- Observe/Assist/Complete: IMRT Beam Arrangements, Optimization Algorithms
- Observe/Assist/Complete: VMAT Optimization Algorithm and Basic Beam Limitations
- Observe/Assist/Complete: Final Dose Calculation Algorithms

IMRT/VMAT

- Complete: IMRT/VMAT Brain
- Complete: IMRT/VMAT Prostate
- Complete: IMRT/VMAT Abdomen
- Complete: IMRT/VMAT Prostate and Nodes
- Complete: IMRT/VMAT Rectum

Craniospinal Radiation

- Observe/Assist/Complete: CSI-3D
- Observe/Assist/Complete: CSI-IMRT

Other Competencies

- Complete: Faculty Preceptor Evaluation

Expectations for Successful Completion of Rotation

1. Completion of a minimum of 80% of required competencies and approval by preceptor.
2. An overall passing grade on the end of rotation preceptor evaluation.

9.3. Medical Physics Rotation Description-Dosimetry B

Rotation: Dosimetry B

Timeframe: 3 Months

Preceptor: Dominic DiCostanzo, Danny Eiler, and Doug Boyle

Overview

In this rotation, residents are introduced to more complicated aspects of dosimetry. This rotation is three months in length and includes familiarization with complex patient immobilization/set-up, inverse planning for intensity modulated techniques, inverse planning for stereotactic techniques and related quality assurance tasks. In addition to assigned patient planning, didactic readings are also required. Each week daily records from the AHST system will be provided to the preceptor. At the midpoint of the rotation, as well as at the end of the rotation, residents will be evaluated by the preceptor and results documented in the AHST system.

Clinical Objectives

- Planning Techniques - Residents will be provided with an education on treatment planning techniques for various disease sites.
- Patient setup/immobilization- Residents will contribute in the planning of immobilization for patient treatments.
- Image fusion/Contouring- Residents will perform image fusion and contouring of normal tissues.
- IMRT/VMAT planning- Residents will observe, assist, and perform patient planning for IMRT and VMAT cases.
- Record and Verify system - The transfer of plan information to the record and verify system will be performed by the resident.
- Second MU checks - The resident will transfer plans to second MU check dosimetry software and perform second MU checks for approved plans.

Didactic Readings

- Task Group 53: Quality assurance for clinical radiotherapy treatment planning
- AAPM Report No. 166: The use and QA of biologically related models for treatment planning
- A recent scientific publication of your choice related to dosimetry/patient simulation

Competency List

Pelvis

- Complete: IMRT/VMAT Prostate (and Nodes)
- Complete: SBRT Prostate
- Complete: IMRT/VMAT Gyn

Abdomen

- Complete: SBRT Liver

Thorax

- Complete: IMRT/VMAT Lung
- Complete: SBRT Lung
- Complete: IMRT/VMAT Chest

Head & Neck

- Complete: IMRT/VMAT SIB Head/Neck

Brain

- Complete: IMRT/VMAT Brain
- Complete: SRS/SRT Brain

Spine

- SBRT Spine

R&V System

- Complete: Export Treatment Plan to Record and Verify System

Other Competencies

- Complete: Faculty Preceptor Evaluation
- Observe: Re-Simulation (x5)

Optional Competencies

- Timmerman SBRT technique
- 2D Breast
- 4 Field Breast

Expectations for Successful Completion of Rotation

1. Completion of a minimum of 80% of required competencies and approval by preceptor.
2. An overall passing grade on the end of rotation preceptor evaluation.

9.4. Medical Physics Rotation Description-External Beam A

Rotation: External Beam, Rotation A

Timeframe: 2 Months

Preceptor: Jeff Woollard

Overview

In this rotation, residents are introduced to, and assist with, the various physics tasks associated with external beam treatment delivery. The external beam rotation includes quality assurance procedures for both equipment and patient charts, as well as special procedures. In addition to clinical training, didactic readings are also required. Unique opportunities, such as commissioning of new equipment, may also be required but will not be burdensome to the completion of rotational clinical objectives. Each week daily records from the AHST system will be provided to the preceptor. At the end of the rotation, residents will be evaluated by the preceptor and the results documented in the AHST system.

Clinical Objectives

- Linear accelerator quality assurance- Machine specification and testing/calibration will be covered with consideration of proper equipment operation and task group reports. The resident will observe/assist with all linear accelerator quality assurance activities.
- Intraoperative linear accelerator quality assurance- Machine specification and testing/calibration will be covered with consideration of proper equipment operation and task group reports. The resident will observe/assist with all intraoperative linear accelerator quality assurance activities.
- CT Simulator quality assurance- Machine specification and testing/calibration will be covered with consideration of proper equipment operation and task group reports. The resident will observe/assist with all CT Simulator quality assurance activities.
- Special Procedures – The resident will observe/assist with setup, calculation and delivery of special procedures. Special procedures include total body irradiation, total skin electron treatment.
- Patient chart checks- Residents will observe and assist in the proper procedure to ensure that patients are receiving the correct daily dose and that this is properly documented.

Didactic Readings

- AAPM TG142: Quality Assurance of Medical Accelerators
- AAPM TG40: Comprehensive QA for Radiation Oncology
- AAPM TG66: Quality assurance for computed-tomography simulators and the computed tomography-simulation process
- AAPM TG51: Protocol for Clinical Dosimetry of High-Energy Photon and Electron Beams
- AAPM TG72: Intraoperative Radiation Therapy Using Mobile Electron Linear Accelerators
- AAPM TG29: The Physical Aspects of Total and Half Body Photon Irradiation
- Karzmark Primer- Advances in linear accelerator design
- AAPM TG71: Monitor Unit Calculations for External Photon and Electron Beams
- A recent scientific publication of your choice related to external beam radiotherapy
- AAPM Medical Physics Practice Guideline 2: Commissioning and quality assurance of X-ray–based image-guided radiotherapy systems
- AAPM Medical Physics Practice Guideline 8: Linear accelerator performance tests

Competency List

Linear Accelerator QA

- Observe/Assist: Linac Daily QA
- Observe/Assist: Linac Monthly QA
- Observe/Assist: Linac Annual QA

- Complete: Linac Operation & Safety
- Observe/Assist: Linac Troubleshooting
- Observe/Assist: Constancy Checks Monthly QA for IC's
- Complete: Ion Chamber/Electrometer Operations & Safety
- Observe/Assist: TG-51 Electron Calibration
- Observe/Assist: TG-51 Photon Calibration
- Observe/Assist: Film Handling, Processing, Scanning & Software
- Observe/Assist: Dosimetry Software Operation
- Observe/Assist: Dosimetry Equipment Troubleshooting

Intraoperative Linear Accelerator QA

- Observe/Assist: Intra-Op Linac Weekly QA
- Observe/Assist: Intra-Op Linac Annual QA

CT Simulator QA

- Observe/Assist: CT Simulator Daily QA
- Observe/Assist: CT Simulator Monthly QA
- Observe/Assist: CT Simulator Annual QA
- Complete: CT Simulator Operation & Safety
- Observe/Assist: CT Simulator Troubleshooting

Special Procedures

- Observe/Assist: TBI Photon Diode Calibration
- Observe/Assist: TBI Treatment
- Observe/Assist: TSE Electron Diode Calibration
- Observe/Assist: TSE Treatment
- Observe/Assist: In Vivo Patient Dosimetry
- Observe/Assist: Pacemaker Dosimetric Calculations

Patient Chart Checks

- Observe/Assist: Weekly Chart Check
- Observe/Assist: Plan 2nd Checks

Other Competencies

- Complete: Review Reporting Procedure for Medical Events
- Complete: Faculty Preceptor Evaluation
- Observe/Assist/Complete: Calculating Dose for Incorrect Treatment

Expectations for Successful Completion of Rotation

1. Completion of a minimum of 80% of required competencies and approval by preceptor.
2. An overall passing grade on the end of rotation preceptor evaluation.

9.5. Medical Physics Rotation Description-External Beam B

Rotation: External Beam, Rotation B

Timeframe: 2 Months

Preceptor: Jeff Woollard

Overview

In this rotation, residents assist with and perform the various physics tasks associated with external beam treatment delivery. The external beam rotation includes quality assurance procedures for both equipment and patient charts as well as special procedures. In addition to clinical training, didactic readings are also required. Unique opportunities, such as commissioning new equipment, may also be required but will not be burdensome to the completion of rotational clinical objectives. Each week daily records from the AHST system will be provided to the preceptor. At the end of the rotation, residents will be evaluated by the preceptor and the results documented in the AHST system.

Clinical Objectives

- Linear accelerator quality assurance- The resident will assist with/perform all linear accelerator quality assurance activities.
- Intraoperative accelerator quality assurance- The resident will assist with/perform all intraoperative linear accelerator quality assurance activities.
- CT Simulator quality assurance- The resident will assist with/perform all CT simulator quality assurance activities.
- Special Procedures – The resident will assist with/perform setup, calculation and delivery of special procedures. Special procedures include total body irradiation, total skin electron treatment, and in-vivo dosimetric measurements.
- Patient chart checks- Residents will perform chart checks to ensure that patients are receiving the correct daily dose and that this is properly documented.

Didactic Readings

- AAPM TG36: Fetal Dose from Radiotherapy with Photon Beams
- AAPM TG62: Diode in Vivo Dosimetry for Patients Receiving External Beam Radiation Therapy
- AAPM TG148: QA for Helical Tomotherapy
- AAPM TG58: Clinical use of Electronic Portal Imaging
- AAPM TG55: Radiochromic Film Dosimetry
- AAPM TG50: Basic Applications of Multileaf Collimators
- TG-119 IMRT Commissioning Tests Instructions for Planning, Measurement, and Analysis
- A recent scientific publication of your choice related to external beam radiotherapy
- AAPM TG25: Clinical Electron Beam Dosimetry
- AAPM TG70: Recommendations for Clinical Electron Beam Dosimetry Supplement to the Recommendations of Task Group 25

Competency List

Linear Accelerator QA

- Assist/Complete: Linac Daily QA
- Assist/Complete: Linac Monthly QA
- Assist/Complete: Linac Annual QA
- Assist/Complete: Linac Troubleshooting
- Complete: Linac Selection/Performance Specifications
- Assist/Complete Constancy Checks Monthly QA for IC's
- Assist/Complete: TG-51 Electron Calibration
- Assist/Complete: TG-51 Photon Calibration
- Assist/Complete: Film Handling, Processing, Scanning & Software
- Assist/Complete: Dosimetry Software Operation
- Assist/Complete: Dosimetry Equipment Troubleshooting

Intraoperative Linear Accelerator QA

- Assist/Complete: Intra-Op Linac Weekly QA
- Assist/Complete: Intra-Op Linac Annual QA
- Complete: Intra-Op Linac Selection/Performance Specifications

CT Simulator QA

- Assist/Complete: CT Simulator Daily QA
- Assist/Complete: CT Simulator Monthly QA
- Assist/Complete: CT Simulator Annual QA
- Assist/Complete: CT Simulator Troubleshooting

Special Procedures

- Assist/Complete: TBI Photon Diode Calibration
- Assist/Complete: TBI Treatment
- Assist/Complete: TSE Electron Diode Calibration
- Assist/Complete: TSE Treatment
- Assist/Complete: In Vivo Patient Dosimetry
- Assist/Complete: Pacemaker Dosimetric Calculations

Patient Chart Checks

- Assist/Complete: Weekly Chart Check
- Assist/Complete: Plan 2nd Checks

Other Competencies

- Complete: Faculty Preceptor Evaluation
- Observe: QA procedures with Diagnostic Physics (CT, PET/CT, etc.)

Expectations for Successful Completion of Rotation

1. Completion of a minimum of 80% of required competencies and approval by preceptor.
2. An overall passing grade on the end of rotation preceptor evaluation.

9.6. Medical Physics Rotation Description-Brachytherapy A

Rotation: Brachytherapy, Rotation A

Timeframe: 2 Months

Preceptor: Jeff Woollard

Overview

In this rotation, residents are introduced to, and assist with, the various physics tasks associated with brachytherapy. The brachytherapy rotation includes quality assurance procedures for both equipment and patient charts, brachytherapy treatment planning, and brachytherapy delivery. In addition to clinical training, didactic readings are also required. Unique opportunities, such as commissioning of new equipment, may also be required but will not be burdensome to the completion of rotational clinical objectives. Each week daily records from the AHST system will be provided to the preceptor. At the end of the rotation, residents will be evaluated by the preceptor and the results documented in the AHST system.

Clinical Objectives

- HDR treatment planning and delivery- Residents will observe and assist with treatment planning and delivery for the majority of patients who receive HDR treatments.
- LDR treatment planning and delivery- Residents will observe and assist with treatment planning and delivery for the majority of patients who receive LDR treatments.
- HDR quality assurance- Machine specification and testing/calibration will be covered with consideration of proper equipment operation and task group reports. The resident will observe/assist with daily, monthly and quarterly HDR quality assurance activities.
- LDR quality assurance- Source handling and testing/calibration will be covered with consideration of radiation safety procedures and task group reports. The resident will observe/assist with LDR quality assurance activities.
- Patient chart audits- Residents will observe proper procedure to ensure that brachytherapy patients are receiving the correct daily dose and assist in proper documentation.

Didactic Readings

- AAPM TG43: A Revised AAPM Protocol for Brachytherapy Dose Calculation
- AAPM TG56: Code of Practice for Brachytherapy Physics
- AAPM TG59: High Dose-Rate Brachytherapy Treatment Delivery
- The American Brachytherapy Society Recommendations for High-Dose-Rate Brachytherapy for Carcinoma of the Cervix
- The American Brachytherapy Society Recommendations for High-Dose-Rate Brachytherapy for Carcinoma of the Endometrium
- AAPM TG64: Permanent Prostate Seed Implant Brachytherapy
- AAPM TG128: Quality Assurance Tests for Prostate Brachytherapy Ultrasound Systems
- AAPM TG129: Dosimetry of 125I and 103Pd COMS eye plaques for intraocular tumors: Report of Task Group 129 by the AAPM and ABS
- A recent scientific publication of your choice related to brachytherapy

Competency List

HDR Treatment Planning and Delivery

- Observe/Assist: HDR Bronchial Tx Plan
- Observe/Assist: HDR Interstitial Tx Plan
- Observe/Assist: HDR Intra-Op Tx Plan
- Observe/Assist: HDR Ring & Tandem
- Observe/Assist: HDR Tandem and Ovoids
- Observe/Assist: HDR Vaginal Cylinder

- Observe/Assist: HDR 'Y' Tandem
- Observe/Assist: HDR Hand Calculation
- Complete: HDR Emergency Training

LDR Treatment Planning and Delivery

- Observe/Assist: LDR Eye PlaqueTx Plan
- Observe/Assist: LDR Prostate Pre-Plan
- Observe/Assist: LDR Prostate Intra-Op
- Observe/Assist: LDR Prostate Post Plan
- Observe/Assist: LDR Y-90 Calculation
- Observe/Assist: Ordering Radioactive Seeds
- Observe/Assist: Release Calc with Radioactive Patient
- Observe/Assist: Returning Radioactive Seeds

HDR QA

- Observe/Assist: HDR Daily QA
- Observe/Assist: HDR Monthly QA
- Observe/Assist: HDR Source Exchange

LDR QA

- Observe/Assist: Well Chamber Constancy QA
- Observe/Assist: Source Handling
- Observe/Assist: Assay of Radioactive Seeds
- Observe/Assist: Source Leak Check with Radiation Safety
- Observe/Assist: LDR Source Inventory
- Observe/Assist: Hot Lab Survey

Other Competencies

- Observe/Assist: Intra-Op Electron Tx Calculation
- Observe/Assist: Intra-Op Linac Setup
- Observe/Assist/Complete: BrachVision Monthly QA
- Observe/Assist/Complete: VariSeed Monthly QA
- Complete: Review of Brachytherapy Protocols
- Complete: Review of HDR/LDR Applicators
- Observe/Assist: Brachytherapy Planning System Operations
- Complete: Faculty Preceptor Evaluation

Expectations for Successful Completion of Rotation

1. Completion of a minimum of 80% of required competencies and approval by preceptor.
2. An overall passing grade on the end of rotation preceptor evaluation.

9.7. Medical Physics Rotation Description-Brachytherapy B

Rotation: Brachytherapy, Rotation B

Timeframe: 2 Months

Preceptor: Jeff Woollard

Overview

In this rotation, residents assist with and perform the various physics tasks associated with brachytherapy. The brachytherapy rotation includes quality assurance procedures for both equipment and patient charts, brachytherapy treatment planning and brachytherapy delivery. In addition to clinical training, didactic readings are also required. Unique opportunities, such as commissioning of new equipment, may also be required but will not be burdensome to the completion of rotational clinical objectives. Each week daily records from the AHST system will be provided to the preceptor. At the end of the rotation, residents will be evaluated by the preceptor and the results documented in the AHST system.

Clinical Objectives

- HDR treatment planning and delivery- Residents will assist and perform treatment planning and delivery for the majority of patients who receive HDR treatments.
- LDR treatment planning and delivery- Residents will assist and perform treatment planning and delivery for the majority of patients who receive LDR treatments.
- HDR quality assurance- The resident will assist with/perform daily, monthly, and quarterly HDR quality assurance activities.
- LDR quality assurance- The resident will assist with/perform LDR quality assurance activities.
- Patient chart checks/audits- Residents will perform brachytherapy chart checks and audits to ensure that brachytherapy patients are receiving the correct daily dose and that this is properly documented.

Didactic Readings

- AAPM TG186: Report of the Task Group 186 on model-based dose calculation methods in brachytherapy beyond the TG-43 formalism: Current status and recommendations for clinical implementation
- AAPM TG137: AAPM Recommendations on Dose Prescription and Reporting Methods for Permanent Interstitial Brachytherapy for Prostate Cancer
- AAPM TG144: Recommendations of the American Association of Physicists in Medicine on dosimetry, imaging, and quality assurance procedures for 90Y microsphere brachytherapy in the treatment of hepatic malignancies
- ACR–AAPM Technical Standard for the Performance of Low-Dose-Rate Brachytherapy Physics
- ACR–AAPM Technical Standard for the Performance of High-Dose-Rate Brachytherapy Physics
- ESTRO TG-167: Clinical recommendations for innovative brachytherapy devices and applications
- A recent scientific publication of your choice related to brachytherapy

Competency List

HDR Treatment Planning and Delivery

- Assist/Complete: HDR Bronchial Tx Plan
- Assist/Complete: HDR Interstitial Tx Plan
- Assist/Complete: HDR Intra-Op Tx Plan
- Assist/Complete: HDR Ring & Tandem
- Assist/Complete: HDR Tandem and Ovoids
- Assist/Complete: HDR Vaginal Cylinder
- Assist/Complete: HDR 'Y' Tandem
- Assist/Complete: HDR Hand Calculation

LDR Treatment Planning and Delivery

- Assist/Complete: LDR Eye PlaqueTx Plan
- Assist/Complete: LDR Prostate Pre-Plan
- Assist/Complete: LDR Prostate Intra-Op Plan
- Assist/Complete: LDR Prostate Post Plan
- Assist/Complete: LDR Y-90 Calculation
- Assist/Complete: Ordering Radioactive Seeds
- Assist/Complete: Returning Radioactive Seeds
- Assist/Complete: Release Calc with Radioactive Patients

HDR QA

- Assist/Complete: HDR Daily QA
- Assist/Complete: HDR Monthly QA
- Assist/Complete: HDR Source Exchange

LDR QA

- Assist/Complete: Well Chamber Constancy QA
- Assist/Complete: Source Handling
- Assist/Complete: Assay of Radioactive Seeds
- Assist/Complete: Source Leak Check with Radiation Safety
- Assist/Complete: LDR Source Inventory
- Assist/Complete: Hot Lab Survey

Other Competencies

- Observe: Cases with Radiation Safety (posting, release instructions, etc.)
- Assist/Complete: Intra-Op Electron Tx Calculation
- Assist/Complete: Intra-Op Linac Setup
- Assist/Complete: BrachVision Monthly QA
- Assist/Complete: VariSeed Monthly QA
- Complete: Review of Materials License and Radiation Safety
- Complete: Faculty Preceptor Evaluation

Expectations for Successful Completion of Rotation

1. Completion of a minimum of 80% of required competencies and approval by preceptor.
2. An overall passing grade on the end of rotation preceptor evaluation.

9.8. Medical Physics Rotation Description-SRS/SRT/SBRT A

Rotation: Stereotactic Radiosurgery and Radiotherapy, Rotation A

Timeframe: 2 Months

Preceptor: Ahmet Ayan

Overview

In this rotation, residents are introduced to, and assist with, the various physics tasks associated with stereotactic radiosurgery and radiotherapy. This rotation includes quality assurance procedures for image guidance and delivery systems (both Linac and gamma knife), treatment planning/delivery of stereotactic treatments, and checks of stereotactic patient charts. In addition to clinical training, didactic readings are also required. Unique opportunities, such as commissioning of new equipment, may also be required but will not be burdensome to the completion of rotational clinical objectives. Each week daily records from the AHST system will be provided to the preceptor. At the end of the rotation, residents will be evaluated by the preceptor and the results documented in the AHSTsystem.

Clinical Objectives

- Gamma Knife quality assurance- Machine specification and testing/calibration will be covered with consideration of proper equipment operation and task group reports. The resident will observe/assist with all Gamma Knife quality assurance procedures.
- Linac-based SRS/SRT quality assurance- Machine specification and testing/calibration will be covered with consideration of proper equipment operation and task group reports. The resident will observe/assist with all Linac-based SRS/SRT quality assurance procedures.
- Patient management quality assurance- QA for image guidance systems, gating systems, and similar devices will be reviewed. The resident will observe/assist with all quality assurance procedures associated with this equipment.
- Gamma Knife treatment and planning and delivery – Patient planning, as well as proper immobilization and setup, for various stereotactic procedures will be covered. The resident will observe/assist with Gamma Knife treatment planning and delivery.
- Linac-based SRS/SRT/SBRT setup and delivery- Patient immobilization, setup and delivery for various stereotactic procedures will be covered. The resident will observe/assist with linac-based SRS/SRT/SBRT setup and delivery.
- Patient chart checks- Residents will observe proper procedure to ensure that patients are receiving the correct daily dose and that this is properly documented.

Didactic Readings

- “Modern Technology of Radiation Oncology”: Chapter 16: Stereotactic Irradiation
- AAPM TG104: The Role of In-Room kV X-Ray Imaging for Patient Setup and Target Localization
- AAPM TG42: Stereotactic Radiosurgery
- AAPM TG101: Stereotactic Body Radiation Therapy
- AAPM TG76: The Management of Respiratory Motion in Radiation Oncology
- AAPM Medical Physics Practice Guideline: Commissioning and quality assurance of X-ray–based image-guided radiotherapy systems
- Quality and Safety Considerations in Stereotactic Radiosurgery and Stereotactic Body Radiation Therapy (ASTRO white paper)
- AAPM-RSS Medical Physics Practice Guideline 9 for SRS-SBRT
- A recent scientific publication of your choice related to stereotactic radiotherapy
- IAEA TRS-398: CODE OF PRACTICE FOR COBALT-60 GAMMA RAY BEAMS

Competency List

Gamma Knife QA

- Observe/Assist: Gamma Knife Daily QA
- Observe/Assist: Gamma Knife Monthly QA
- Observe/Assist: Gamma Knife Annual QA
- Complete: Gamma Knife Operation & Safety
- Observe/Assist: Gamma Knife Troubleshooting
- Observe/Assist: TG-21 Photon Calibration

Linac-based SRS/SRT QA

- Observe/Assist: Linac based SRS/SRT Daily QA
- Observe/Assist: Linac based SRS/SRT Monthly QA
- Observe/Assist: Linac based SRS/SRT Annual QA
- Observe/Assist: Linac based SRS/SRT Troubleshooting

Patient Management QA

- Observe/Assist: Gating Daily QA
- Observe/Assist: Gating Monthly QA
- Observe/Assist: Gating Annual QA
- Complete: Gating Operation & Safety
- Observe/Assist: Gating Troubleshooting
- Observe/Assist: In-Room Imaging Daily QA
- Observe/Assist: In-Room Imaging Monthly QA
- Observe/Assist: In-Room Imaging Annual QA
- Complete: In-Room Imaging Operation & Safety
- Observe/Assist: In-Room Imaging Troubleshooting

Gamma Knife Treatment Planning and Delivery

- Observe/Assist: GK Trigeminal Neuralgia Plan and Delivery
- Observe/Assist: GK Brain Metastasis Plan and Delivery
- Observe/Assist: GK Arteriovenous Malformation Plan and Delivery
- Observe/Assist: GK Other Plan and Delivery if Applicable

Linac-Based SRS/SRT/SBRT Treatment Setup and Delivery

- Observe/Assist: Complex Immobilization
- Observe/Assist: Respiratory Gating
- Observe/Assist/Complete: Gating – 4D Contouring/Planning

SRS/SRT Intracranial Treatment Setup and Delivery

- Observe/Assist: SBRT Lung Treatment Setup and Delivery
- Observe/Assist: SRS/SRT Other Plan and Delivery if applicable
- Observe/Assist: SBRT Spine Treatment Setup and Delivery
- Observe/Assist: SBRT Liver Treatment Setup and Delivery
- Observe/Assist: SBRT Other Treatment Setup and Delivery

Patient Chart Checks

- Observe/Assist: Audit of Gamma Knife Charts

Other Competencies

- Complete: Faculty Preceptor Evaluation

Expectations for Successful Completion of Rotation

1. Completion of a minimum of 80% of required competencies and approval by preceptor.
2. An overall passing grade on the end of rotation preceptor evaluation.

9.9. Medical Physics Rotation Description- SRS/SRT/SBRT B

Rotation: Stereotactic Radiosurgery and Radiotherapy, Rotation B

Timeframe: 2 Months

Preceptor: Ahmet Ayan

Overview

In this rotation, residents assist with and perform the various physics tasks associated with stereotactic radiosurgery and radiotherapy. This rotation includes quality assurance procedures for image guidance and delivery systems (both Linac and gamma knife), treatment planning/delivery of stereotactic treatments, and checks of stereotactic patient charts. In addition to clinical training, didactic readings are also required. Unique opportunities, such as commissioning of new equipment, may also be required but will not be burdensome to the completion of rotational objectives. Each week daily records from the AHST system will be provided to the preceptor. At the end of the rotation, residents will be evaluated by the preceptor and the results documented in the AHST system.

Clinical Objectives

- Gamma Knife quality assurance- The resident will assist with/perform all Gamma Knife quality assurance procedures.
- Linac-based SRS/SRT quality assurance- The resident will assist with/perform all Linac-based SRS/SRT quality assurance procedures.
- Patient management quality assurance- The resident will assist with/perform all quality assurance procedures associated with this equipment.
- Gamma Knife treatment planning/delivery- Patient planning, as well as proper immobilization and setup, for various stereotactic procedures will be covered. The resident will assist with/perform SRS/SRT treatment planning and delivery.
- Linac-based SRS/SRT/SBRT setup and delivery – Patient immobilization, setup and delivery for various stereotactic procedures will be covered. The resident will assist with/perform linac-based SRS/SRT/SBRT setup and delivery.
- Patient chart checks- Residents will check patient's charts to ensure that patients are receiving the correct dose and that this is properly documented.

Didactic Readings

- AAPM TG21: A protocol for the determination of absorbed dose from high energy photon and electron beams
- AAPM TG75: The Management of Imaging Dose During Image-Guided Radiotherapy
- AAPM TG132: Use of image registration and fusion algorithms and techniques in radiotherapy: Report of the AAPM Radiation Therapy Committee Task Group No. 132
- ICRU REPORT 91 Prescribing, Recording, and Reporting of Stereotactic Treatments with Small Photon Beams
- TRS483: Dosimetry of Small Static Fields Used in External Beam Radiotherapy
- A recent scientific publication of your choice related to stereotactic radiotherapy

Competency List

Gamma Knife QA

- Assist/Complete: Gamma Knife Daily QA
- Assist/Complete: Gamma Knife Monthly QA
- Assist/Complete: Gamma Knife Annual QA
- Assist/Complete: Gamma Knife Troubleshooting
- Complete: Gamma Knife Performance Specification
- Assist/Complete: TG-21 Photon Calibration

Linac-based SRS/SRT QA

- Assist/Complete: Linac based SRS/SRT Daily QA
- Assist/Complete: Linac based SRS/SRT Monthly QA
- Assist/Complete: Linac based SRS/SRT Annual QA
- Assist/Complete: Linac based SRS/SRT Troubleshooting
- Complete: Linac based SRS/SRT Selection/Performance Specification

Patient Management QA

- Assist/Complete: Gating Daily QA
- Assist/Complete: Gating Monthly QA
- Assist/Complete: Gating Annual QA
- Assist/Complete: Gating Troubleshooting
- Assist/Complete: In-Room Imaging Daily QA
- Assist/Complete: In-Room Imaging Monthly QA
- Assist/Complete: In-Room Imaging Annual QA
- Assist/Complete: In-Room Imaging Troubleshooting
- Complete: In-Room Imaging Performance Specification

SRS/SRT Treatment Planning and Delivery

- Assist/Complete: GK Trigeminal Neuralgia Plan and Delivery
- Assist/Complete: GK Brain Metastasis Plan and Delivery
- Assist/Complete: GK Arteriovenous Malformation Plan and Delivery
- Assist/Complete: GK Other Plan and Delivery if applicable

Linac-Based SRS/SRT/SBRT Treatment Setup and Delivery

- Assist/Complete: Complex Immobilization
- Assist/Complete: Respiratory Gating
- SRS/SRT Intracranial Treatment Setup and Delivery
- Assist/Complete: SBRT Lung Setup and Delivery
- Assist/Complete: SBRT Spine Setup and Delivery
- Assist/Complete: SBRT Liver Setup and Delivery
- Assist/Complete: SBRT Other Setup and Delivery

Patient Chart Checks

- Assist/Complete: Audit of Gamma Knife Charts

Other Competencies

- Complete: Faculty Preceptor Evaluation

Expectations for Successful Completion of Rotation

1. Completion of a minimum of 80% of required competencies and approval by preceptor.
2. An overall passing grade on the end of rotation preceptor evaluation.

9.10. Medical Physics Rotation Description-Commissioning Rotation

Rotation: Commissioning

Timeframe: 2 Months concurrent with Shielding

Preceptor: Dominic DiCostanzo

Overview

In this rotation, residents are introduced to linear accelerator acceptance testing, beam commissioning, and treatment planning system calculation algorithms. In addition to clinical objectives, didactic readings are also required. Each week daily records from the AHST system will be provided to the preceptor. At the end of the rotation, residents will be evaluated by the preceptor and the results documented in the AHST system.

Clinical Objectives

Linear accelerator acceptance procedures - Residents will participate in, or review, linear accelerator acceptance testing procedures.

- Beam commissioning - Residents will be given the opportunity to commission a linac beam in a treatment planning system.
- Calculation Algorithms – The resident will become familiar with the calculation algorithms used in various treatment planning systems.
- Knowledge of commissioning software of the treatment planning system not related to dose calculation algorithm.

Didactic Readings

- TG106: Accelerator Beam Data Commissioning Equipment and Procedures
- TG53: Quality Assurance for Treatment Planning Systems/TRS 430: Quality Assurance for Treatment Planning Systems
- AAPM Medical Physics Practice Guideline 5: Commissioning and QA of Treatment Planning Dose Calculations — Megavoltage Photon and Electron Beams
- Photon Beam Dose Computations, Mackie et al, AAPM Summer School Proceedings
- Electron Beam Dose Computation, Hogstrom et al, AAPM Summer School Proceedings

Expectations for Successful Completion of Rotation

1. Completion of a project related to commissioning. The topic and content of the project will be mutually agreed upon by the resident and the preceptor at the start of the rotation. The project will be presented at the Physics Education Conference.
2. Modeling of one photon beam in treatment planning system of choice and at minimum development of validation plan for the model developed.
3. Commissioning Report
4. An overall passing grade on the end of rotation preceptor evaluation.

9.11. Medical Physics Rotation Description-Shielding Rotation

Rotation: Shielding

Timeframe: 2 Months concurrent with Commissioning

Preceptor: Dominic DiCostanzo

Overview

In this rotation, residents are introduced to shielding techniques. In addition to clinical objectives, didactic readings are also required. Each week daily records from the AHST system will be provided to the preceptor. At the end of the rotation, residents will be evaluated by the preceptor and the results documented in the AHST system.

Clinical Objectives

- Shielding Techniques – The resident will review current shielding documents
- Shielding Evaluations – The resident will independently perform a limited shielding evaluation for an existing linac unit.

Didactic Readings

- NCRP151 Structural Shielding Design and Evaluation from Megavoltage X- and Gamma Ray Radiotherapy Facilities
- Shielding Techniques for Radiation Oncology Facilities, by Patton H. McGinley

Expectations for Successful Completion of Rotation

1. Shielding Report including calculation, measurements, and evaluation report.
2. An overall passing grade on the end of rotation preceptor evaluation.

9.12. Medical Physics Rotation Description-Elective Rotation

Rotation: Elective

Timeframe: 1 Month

Preceptor: Resident Selects

Overview

In this rotation, residents are given the opportunity to get introduced to a variety of topics, based on the specific interests of the resident. Possible topics include Radiation Physics, Clinical Radiation Oncology, Radiation Safety, Nuclear Medicine, Imaging, or other related Radiation Oncology topics. Each resident is expected to decide on the topic of their Elective Rotation, the preceptor who they wish to work with, and write up a one page proposal regarding their chosen topic, along with completion milestones and metrics of successful completion of the rotation. This elective proposal is presented to the Preceptor, Residency Program Director, and Associate Director a month before the elective rotation is to start, and a signed approval from all is needed. The resident is expected to discuss their proposed topic and choice of preceptor with the residency director well before their assigned rotation month. This will allow the residency director to approve the concept prior to engaging a preceptor and writing the rotation proposal.

The rotation proposal should address the following:

- Elective Rotation Overview
- Clinical and other Learning Objectives
- Didactic Readings
- Competencies that will be completed
- Rotation completion milestones
- Expectations for successful completion and evaluation metrics proposed
- Format of Elective Report and presentation of findings in Education Conference or other approved venue

Clinical Objectives

As defined in Rotation Proposal.

Didactic Readings

As defined in Rotation Proposal.

Competency List

No defined competencies, but Rotation Proposal is expected to propose any competencies that are relevant.

Expectations for Successful Completion of Rotation

1. Evaluation metrics defined in rotation proposal
2. An overall passing grade on the end of rotation preceptor evaluation

9.13. Medical Physics Rotation Description-Administrative and Professional Rotation

Rotation: Professional

Timeframe: 1 Month

Preceptor: Nilendu Gupta

Overview

In this rotation residents are introduced to the professional and administrative aspects of a medical physicist's job. This rotation also allows time for the resident to learn about the job search process, medical physics workforce and staffing models, become familiar with professional publications/societies, and study for the ABR exam, which is viewed as a professional activity. In addition to clinical training, didactic readings are also required. During this rotation, residents are also required to acquire some understanding of Radiation Oncology Incident Learning processes. Each week daily records from AHST system will be provided to the preceptor. At the end of the rotation, residents will be evaluated by the preceptor and the results documented in AHST system.

Clinical Objectives

- Residents will become familiar with various professional and administrative aspects of the medical physics profession.
- Residents may use this time to perform or learn about the job search process.
- Residents may use this time to study for the American Board of Radiology certification exam.

Didactic Readings

- Complete the AAPM/ABR Online Modules on Ethics and Professionalism (available on the AAPM website)
- AAPM Report 109: Code of Ethics for the American Association of Physicists in Medicine
- AAPM Report 80: The Solo Practice of Medical Physics in Radiation Oncology
- AAPM TG160: Radiation Safety Officer Qualifications for Medical Facilities
- The ABT Study of Medical Physicist Work Values for Radiation Oncology Physics Services
- ACR Accreditation Requirements 2015
- ASTRO Safety is no Accident Report
- Review Departmental QMP Program Policies and relevant NRC Regulations and ODH Administrative Code
- Point/Counterpoint: Medical Physicists Should Position Themselves as Institutional Resources in Expanding Areas such as Healthcare Informatics and Information Networking
- Point/Counterpoint: Medical Physicists Need Professional Malpractice Insurance
- Point/Counterpoint: The Future Will Not Need Clinical Therapy Physicists
- AAPM's most recent "Medicare Hospital Outpatient Final Rule Summary" (available on the AAPM website)
- RO-ILS: Radiation Oncology Incident Learning System: A report from the first year of experience, Practical Radiation Oncology (2015) 5, 312-318.
- Complete [AAPM Incident Learning Workshop Virtual Library Modules](#) (other than Hands-on session)
- Four modules on Leadership Development from MindTools website:
 - Introduction to Leadership
 - General Leadership
 - Becoming a Leader
 - Young and Future Leaders

Competency List

- Complete: Billing Procedures
- Complete: Job Search and contract negotiations
- Complete: Malpractice and Legal Issues
- Complete: Professional Organizations, Certification and Licensure
- Complete: Publishing in Scientific and Clinical Journals if applicable
- Complete: Review of Planning Workstations
- Complete: Workforce and the Future of Medical Physics – Staffing Calculations
- Complete: Oncology Information System Operation
- Complete: Review of Radiation Safety Regulations/Regulations
- Complete: FDA Clearance/510(k) Process
- Complete: RSNA/AAPM Ethics Modules
- Complete: Leadership Training Modules
- Complete: Review of Budgeting process for Medical Physics
- Complete: Review of Equipment Acquisition Process
- Complete: AAPM Incident Learning Workshop Modules
- Complete: Faculty Preceptor Evaluation

Expectations for Successful Completion of Rotation

1. Completion of a minimum of 80% of required competencies and approval by preceptor.
2. Provide documentation of completion of all AAMP/RSNA modules assigned.
3. Medical Physics Staffing Report – Recommended staffing for assumptions provided during rotation
4. An overall passing grade on the end of rotation preceptor evaluation.

Administrative and Professional Rotation Topic Checklist and completion method:

Competency	Method of Covering
Billing Procedures and Rules	Overview lecture by Technical Director
FDA Clearance/510(k) Process	Review Presentations on FDA 510K process: us-fda-510k-webinar-slides.pdf and 2013_05_07_FDA-CDRH_Hunter_NCI-SBIR-FRAC.pdf, followed by a review by primary preceptor
Job Search including contract negotiations	AAPM/RSNA Module, one on one discussion on Career Services and placement with Matthew Meineke
Malpractice and Legal Issues	Review AAPM Prof Insurance write-ups Virtual Presentation Session
Oncology Information System Operation	Aria Administration overview discussion with Dominic DiCostanzo
Professional Organizations and Certification	Review MOC and certification process with Matthew Meineke
Review of Planning Workstations	Eclipse Admin and Machine setup discussion with Dominic DiCostanzo
Review of Radiation Safety Regulations/Regulations	Quality Management Program Review and setup for External Beam and Radioactive Materials with primary preceptor
PROFESSIONALISM & ETHICS	
Professionalism in Everyday Practice: A Physician Charter (2018)	<p>ABR/ACR/RSNA/AAPM/ASTRO/ARR/ARS Online Modules on Ethics and Professionalism And OSUWMC Computer Based Learning modules</p> <p><i>Self-Study & provide proof of completion as part of your end or rotation report.</i></p>
Historical Evolution and Principles of Medical Professionalism (2018)	
Relationships with Vendors (2018)	
Physician-Physician and Physician-Patient Interactions (2018)	
Ethics in Graduate and Resident Education (2018)	
Vertebrate Animal Research (2018)	
Personal Behavior, Peer Review, and Negotiations with Employers (2018)	
Conflict of Interest (2018)	
Ethics of Research (2018)	
Human Subjects Research (2018)	
Publication Ethics (2018)	
AAPM Code of Ethics	Report No. 109 - Code of Ethics for the American Association of Physicists in Medicine (Revised): Report of Task Group 109 (2019) – Review of report and schedule a follow-up discussion session with Primary Preceptor
LEADERSHIP	
	Review “Leadership Skills” modules from the MindTools Website. Use Buckeye Learn MindTools pass-through login. Review all modules if time permits, but at the minimum Complete the 4 areas listed below:
Introduction to Leadership	MindTools “Leadership Skills” modules – completed “Start Here” module set
General Leadership	MindTools “Leadership Skills” modules – completed “General Leadership” module set
Becoming a Leader	MindTools “Leadership Skills” modules – completed “Becoming a Leader” module set
Young and Future Leaders	MindTools “Leadership Skills” modules – completed “Young and Future Leaders” module set
Incident Learning	Selected modules from the AAPM Incident Learning Virtual Library presentations from 2015. http://www.aapm.org/education/VL/?t=byE&e=ILS&y=2015
Equipment Selection, etc.	Review Equipment Acquisition Process with Primary Preceptor
Annual budget preparation	Capital and Operating Budget preparation with Primary Preceptor
Workforce and the Future of Medical Physics	Abt Report and ASTRO Safety is no accident Whitepaper, ACR staffing guidelines Resident to develop staffing spreadsheet and propose staffing plan for our department. Two to three review sessions through the rotation with Primary Preceptor to review reports and develop better understanding.
Faculty Preceptor Evaluation	Complete Faculty/Preceptor Evaluation

9.14. Medical Physics Rotation Description-Journal Club

Rotation: Journal Club, competencies stored in Administration

Timeframe: Over the course of the residency (longitudinal)

Preceptor: Ashley Cetnar

Overview

The goal of medical physics journal club is to allow the resident to gain scientific literacy by selecting a manuscript to read, digest, interact with, and present to a group. After participating in journal club you will be able to read a technical document, think about it critically, and share technical information to colleagues in a formal setting.

In order to help gain the literacy skills that you will need as a medical physicist, you will complete four different projects over the course of the residency.

1. Review a research article using an outline for key aspects
2. Learn how to search for and select a good journal article
3. Compare and contrast a strong and weak article on the same topic
4. Research and defend one side of an argument in a point/counterpoint

The resident will lead the topic for the paper in the one hour time slot of the Physics Education Conference (PEC) involving presentation and discussion. The other residents are expected to read and understand the paper. There will be a set schedule where you can plan in advance the article and when you will be presenting. The selected article will be sent out at the beginning of the month to the physicists and physics residents. At least one week prior to the presentation, a small group discussion will take place between the resident and preceptor for the content and understanding of the article and answer/discuss questions.

Over the course of the residency, records from the AHST system will be provided to the preceptor. At the end of the rotation, residents will be evaluated by the preceptor and the results documented in the AHST system.

Clinical Objectives

- **Review a research article using an outline for key aspects.** The resident will complete assigned readings reviewing journal club and review video on writing good scientific papers. The resident will identify a topic of interest and mentors will help identify a good paper on the topic. The resident will fill out a worksheet to help guide the understanding of the structure and purpose of the article. Schedule meeting with preceptor for review and date for presentation.
- **Learn how to search for and select a good journal article.** The resident will be introduced to scientific journals within medical physics and radiation oncology by reviewing videos on differences between journals in medical physics. They will be introduced to impact factor and the process of publication and review. The resident will also be exposed to citation management software and select one for download. The resident will select a topic of interest and propose three articles within a topic of interest. One final article will be selected after discussion with mentors for presentation to the group during the journal club meeting.
- **Compare and contrast a strong and weak article on the same topics.** The resident will review videos on what journal article reviewers are looking for in a manuscript. The resident will select a topic of interest and review several articles within a topic of interest. The resident will rank the articles and select an example of a strong article and weak article and defend why they believe so. The resident will schedule a meeting with mentors to review and justify. The two final articles will be compared and contrasted for presentation to the group during journal club meeting.
- **Research and defend one side of an argument in a point/counterpoint.** Resident will coordinate with another co-resident to select a topic for a point/counterpoint discussion that will be held during the journal club. Any topic of interest may be selected, but topics are encouraged from the AAPM list of past articles which can be found in either of the two volumes of "Controversies in Medical Physics: a Compendium of Point/Counterpoint Debates."

Didactic Readings

- A Problem-Based Journal Club. Bahman Joorabchi. *Journal of Medical Education*. 1984. Vol. 59. Pg. 755.
- Journal Club for Faculty or Residents: A Model for Lifelong Learning and Maintenance of Certification. Michele T. Pato, Robert T. Cobb, Shari I. Lusskin, and Connie Schardt. *International Review of Psychiatry*. 2013; 25(3), 276-283.
- A Journal Club Workshop that Teaches Undergraduates a Systematic Method for Reading, Interpreting, and Presenting Primary Literature. Katerine Roberson. *Journal of College Science Teaching*. 2012. 41(6), 25-31.
- A New Approach to Teaching and Learning in Journal Club. Khalid S. Khan and Harry Gee. 1999. *Medical Teacher*. 21(3), 289-292.

Competency List

Meeting to review readings/assignments

- Complete - Part 1
- Complete - Part 2
- Complete - Part 3
- Complete - Part 4

Meeting to review selected article(s) and outline for presentation

- Complete - Part 1
- Complete - Part 2
- Complete - Part 3
- Complete - Part 4

Presentation during Journal Club

- Complete - Part 1
- Complete - Part 2
- Complete - Part 3
- Complete - Part 4

Expectations for Successful Completion of Rotation

1. Completion of a 100% of required competencies and approval by preceptor.
2. An overall passing grade on the end of rotation preceptor evaluation.

9.15. Medical Physics Rotation Description-Clinical Service Rotation

Rotation: Clinical Service

Timeframe: 1 Month

Preceptor: Nilendu Gupta

Overview

In this rotation (designed to be the last rotation before graduation) the resident is expected to function as a clinical medical physicist and cover all services within the radiation oncology clinic. The resident will work with a rotation preceptor and create a clinic coverage schedule for the month and make it available to the residency director. This rotation also allows a physics resident to complete any competencies from any other rotation that remained incomplete or needed additional work or repeating for any reason.

At the end of the rotation, residents will be evaluated by the preceptor and the results documented in AHST system.

Clinical Objectives

- Residents will become proficient in providing clinical coverage to different clinical areas within the department.
- Residents may use this time to perform a job search.
- Residents may use this time to study for the American Board of Radiology certification exam.

Didactic Readings

- No Assigned Didactic Readings

Competency List

- No assigned competency
- Any competency from other rotations that are completed during this time need to be completed and signed by the preceptor

Expectations for Successful Completion of Rotation

1. End-of-Year/Residency Evaluation with Program Director(s).

10. Sample Checklist Forms

**The Ohio State University Medical Center
Medical Physics Residency Program
Initial Rotation Checklist**

Rotation _____ Date _____

Resident _____ Preceptor _____

1. Clinical objectives for this rotation were reviewed and discussed.

Comments: _____

2. Didactic readings required for this rotation were reviewed and discussed.

Comments: _____

3. Clinical competencies were explained and discussed. It is clear what is expected for observe, assist and done levels of completion for each competency.

Comments: _____

4. Overall clinical preparation and participation expectations were explained and discussed. The resident understands the level and type of participation required for successful completion of this rotation.

Comments: _____

Resident Signature _____ Date _____

Preceptor Signature _____ Date _____

**The Ohio State University Medical Center
Medical Physics Residency Program
Mid-Rotation Evaluation Checklist**

Rotation _____ Date _____

Resident _____ Preceptors _____

1. Approximate completion status of rotation competencies _____

2. Approximate completion status of didactic reading _____

3. Additional items discussed: _____

4. Proposed plan for completion of competencies and required reading: _____

Resident Signature _____ Date _____

Preceptor Signature _____ Date _____

**The Ohio State University Medical Center
Medical Physics Residency Program
Final Rotation Checklist**

Rotation _____ Date _____

Resident _____ Preceptor _____

1. Oral Exam

Examiners: _____

1a Notes: _____

1b Notes: _____

2 Notes: _____

3a Notes: _____

3b Notes: _____

3c Notes: _____

4a Notes: _____

4b Notes: _____

5a Notes: _____

5b Notes: _____

6 Notes: _____

2. Exam performance was reviewed and discussed. _____

Comments: _____

3. Rotation performance was reviewed and discussed.
Rotation Competencies completion _____ %
Didactic reading completion _____
Clinical preparation and participation _____

Comments: _____

4. Reviews scheduled:		Sent
Resident review of Primary Preceptor	_____	_____
Resident review of Secondary Preceptor	_____	_____
Primary Preceptor review of Resident (rotation & exam)	_____	_____
Secondary Preceptor review of Resident (rotation only)	_____	_____
Examiner review of Resident (exam only)	_____	_____

please include competency report with checklist submission

11. GME Policies and Adverse Actions

The Ohio State University Medical Center

GRADUATE MEDICAL EDUCATION POLICY AND PROCEDURE

Policy: ACADEMIC AND ADMINISTRATIVE ADVERSE ACTIONS

Effective: 4/13/89

Revised: 6/28/06, 12/19/01, 3/28/01, 11/15/00, 10/11/99, 10/23/96

In this policy, the term "resident" refers to all interns, residents, and fellows in Graduate Medical Education programs.

Procedure:

1. Program Directors have the primary responsibility to monitor resident progress and to take appropriate academic and administrative adverse actions based on the resident's performance and behavior
2. Program Directors have a responsibility to remove from clinical responsibilities any resident whose actions may place patients, peers, or others at risk.
3. Concerns regarding a resident's performance or behavior that may lead to an adverse action may be raised by a peer, any faculty member, any Program Director or department chair, another member of the hospital staff, an administrator, a patient, risk management, or any other person familiar with the resident's performance and activities.
4. Residents may be subject to adverse actions for failure to fulfill general academic, clinical, ethical, or administrative requirements and expectations of the program or institution as outlined in various program policies, institutional policies, hospital Medical Staff Bylaws and Rules and Regulations, Health System policies, College of Medicine policies, University policies, or the Limited Staff Agreement.
5. The Program Director, after consultation with the Chief Medical Officer or Associate Dean for GME, may proceed under this policy or the Medical Staff Bylaws to address deficiencies in resident performance. This policy is typically used to address situations involving deficiencies related to medical knowledge, academic performance, and administrative issues that are not covered under the Medical Staff Bylaws. The Medical Staff Bylaws process is typically reserved for significant clinical issues that relate to quality of care and/or patient safety, significant issues of ethics and professionalism, or non-compliance with state or federal law.
6. Levels of adverse actions include the following: (described more fully below)

Page 1 of 5

- a. The specific adverse action that is proposed
- b. The specific deficiencies in knowledge, performance, or behavior leading to the adverse action
- c. The documentation that describes the deficiencies (e.g., performance evaluations, patient complaints, student complaints).

The committee may provide a recommendation to the Program Director. If the housestaff competency committee makes a recommendation, the resident may use the recommendation during an appeal of an adverse action.

2. The Program Director must provide an opportunity for residents to
 - a. Appear before the committee to discuss the action and provide information to the committee, or
 - b. Submit a written comment to the committee regarding the adverse action.
3. The Program Director, after consultation with the program education committee or housestaff competency committee, will make the decision on what if any adverse action should be taken against a resident.
4. When taking an adverse action, the Program Director must notify, in writing, the resident, the Chair of the Clinical Department, and the Associate Dean for GME /DIO/Chair of the Graduate Medical Education Committee.
5. In the written notification, the Program Director will document the following items:
 - a. The specific adverse action being taken (see item 6 above under Policy section).
 - b. An outline of the deficiencies leading to the adverse action.
 - c. When applicable, a review of any previous formal communication or meetings with the resident regarding the deficiencies.
 - d. If applicable, an outline of the steps the resident can take to remedy the deficiencies.
 - e. When appropriate, the behavior or performance expectations after the deficiencies are remedied.
 - f. The time period during which the adverse action will be effective and the time at which there will be a reconsideration of the resident's performance in relation to the deficiencies.
 - g. When appropriate, a faculty mentor with whom the resident can work to remedy the deficiencies. This may be the resident's advisor and typically should not be the Program Director or the Department Chair.
 - h. When appropriate, a statement regarding potential future adverse actions that may be taken if the deficiencies are not remedied under this adverse action.
 - i. A statement outlining the appeal and due process rights for the resident as outlined in the Resident Due Process policy.
 - 1) With the exception of focused review that does not extend the length of the training program, all other adverse actions under this policy are eligible for appeal.
 - 2) Adverse actions taken under the Medical Staff Bylaws follow a separate process that is outlined in the Medical Staff Bylaws.

Page 3 of 5

- a. Focused-review
- b. Probation
- c. Suspension
- d. Non-promotion
- e. Non-renewal
- f. Termination

7. Specific adverse actions should be determined on a case-by-case basis taking into account:
 - a. the specific facts of the case
 - b. the quantity and quality of the documentation (e.g., evaluations, event reports, outcomes data, or other information) related to the deficiencies leading to the adverse action
 - c. any past adverse actions taken against the resident
 - d. the resident's overall performance in the program up to that point
 - e. the improvement of the resident's performance after previous feedback related to these or other similar deficiencies
 - f. the ability of the resident to remedy the specific deficiencies found in a reasonable timeframe
 - g. the predicted future ability of the resident to successfully complete the training program and to practice competently and independently in their chosen specialty given the deficiencies noted
8. Program Directors are not required to use a stepwise approach for determining specific adverse actions. For example, a Program Director is not required to place a resident on focused review prior to probation or probation prior to suspension.
9. With regard to non-promotion, residents will be notified of intent not to promote them to a subsequent PGY-level no later than four (4) months prior to the end of the resident's current PGY-level. This date would typically be March 1st of any academic year for appointments beginning July 1st. If the primary reason(s) for non-promotion occur(s) within the four months prior to the end of the PGY-year, the Program Director must provide the resident with written notice of intent not to promote the resident in as timely a manner as the circumstances will reasonably allow.
10. With regard to non-renewal, residents will be notified of intent not to renew their appointment no later than four (4) months prior to the end of the resident's current term of appointment. This date would typically be March 1st of any academic year for appointments beginning July 1st. If the primary reason(s) for non-renewal occur(s) within the four months prior to the end of the term of appointment, the Program Director must provide the resident with written notice of intent not to renew in as timely a manner as the circumstances will reasonably allow, prior to the end of the term of appointment.

Procedures:

1. The Program Director must consult with the program's education committee or housestaff competency committee prior to taking adverse actions against a resident. The Program Director should present the following information to the committee:

Page 2 of 5

6. The Associate Dean for GME and Hospital Legal Services are available for consultation regarding the content of the written notification of the adverse action. The final adverse action will be implemented only after all rights to appeal have been exhausted and the decision becomes final.

Definitions for Administrative and Academic Disciplinary Actions:

1. Focused Review:

- a. Focused review is typically used as a preventive measure to formally notify the resident regarding minor deficiencies in their knowledge, performance, or behaviors and to provide them with an opportunity to remedy those deficiencies.
- b. If the deficiencies are not satisfactorily corrected, typically a more serious adverse action will follow.
- c. The resident's schedule and activities may be modified during the period of focused review in order to allow the resident an opportunity to remedy the deficiencies and/or to ensure that the resident is fully prepared to move forward to the next stage of training.
- d. Time spent on focused review may or may not be used for credit toward the completion of the training program at the Program Director's discretion. The decision to grant credit for the time on focused review must be made at the beginning of the period of focused review. Focused review that does not extend the period of training is not eligible for appeal. (See Resident Due Process policy.)

2. Probation:

- a. Probation is used when ongoing and/or significant deficiencies in a resident's performance or behavior are noted.
- b. Probation allows the resident to continue active participation in the program while addressing the concerns and deficiencies identified in the written notice of probation.
- c. Time spent on probation may or may not be used for credit toward the completion of the training program at the Program Director's discretion. The decision to grant credit for the time on probation may be made at the end of the probationary period based on the resident's performance while on probation.
- d. The resident's schedule and activities may be modified during the period of probation in order to allow the resident an opportunity to remedy the deficiencies or to ensure that the resident is fully prepared to move forward to the next stage of training.
- e. If the deficiencies are not satisfactorily corrected during the probationary period, further disciplinary action will follow.

3. Suspension:

- a. Suspension involves the removal of a resident from training activities for a specified period of time. Although some of the reasons for probation and suspension are the same, the severity of the resident's deficiencies and any potential direct or indirect threat to patients, colleagues or other staff may determine which adverse action should be taken.
- b. Suspension may be with or without pay as appropriate depending upon the circumstances and at the discretion of the Program Director.

Page 4 of 5

- c. When returning from suspension, the resident may be placed on probation for a specified period of time in order to determine whether the specific deficiencies that caused the suspension have been adequately addressed.
4. **Non-promotion:**
- a. Non-promotion means that the resident will not be promoted to the subsequent PGY-year at the completion of their current year of training. Non-promotion should be used when a resident has not been able to clearly demonstrate the knowledge, skills, or behaviors required to advance to the next level of training and responsibility.
 - b. Non-promotion is appropriate when the Program Director believes that the resident will be able to successfully complete the PGY-year and eventually the training program after the period of additional training.
 - c. The notification timeline regarding non-promotion are noted in item 9 in the "Policy" section above.
 - d. When non-promotion is decided upon, the resident has the option of resigning from the program at the completion of the academic year in lieu of not being promoted.
 - e. When non-promotion is decided upon and the resident chooses to transfer to another institution in the same or in a different specialty, the resident will not receive credit for successfully completing the current year of training.
5. **Non-renewal:**
- a. Non-renewal means that the resident will be terminated as a trainee within the training program at the end of their current appointment.
 - b. The resident will receive credit for successfully completing training up to the end of the current contract year.
 - c. The notification timeline regarding non-promotion are noted in item 9 in the "Policy" section above.
6. **Termination:**
- a. Termination involves the immediate and permanent removal of a resident from the training program and is the most serious of all adverse actions. Termination should be used only in the case of a resident with serious deficiencies in knowledge, performance, or behavior. In addition, under the Hospital Medical Staff Bylaws, a resident may be terminated if they are no longer eligible to practice medicine under state or federal law.
 - b. As stated in the Limited Staff Agreement, Hospital Medical Staff Bylaws, and University HR policies, termination from the training program will also result in immediate termination of the resident's stipend and benefits, faculty position, access to medical records, and clinical credentials as a member of the Limited Staff.
 - c. Termination is typically preceded by sufficient notice to the resident that there are significant deficiencies in the knowledge, performance, or behaviors and potentially by previous adverse actions. However, there is no requirement that there be any preceding adverse action prior to a resident being terminated.

The Ohio State University Medical Center

GRADUATE MEDICAL EDUCATION POLICY AND PROCEDURE

Policy: CHARGE OF THE GRADUATE MEDICAL EDUCATION COMMITTEE

Effective: 3/14/88

Revised: 5/23/07, 9/28/00, 9/25/99

Procedure:

The institutional administration of Graduate Medical Education at The Ohio State University Medical Center takes place under the auspices of the Office of Graduate Medical Education (OGME), which is a division of the Office of the Medical Director. One of the responsibilities in Graduate Medical Education is to have an institutional oversight committee to assure that each program meets requirements set forth by the Accreditation Council for Graduate Medical Education (ACGME) for Resident Review Committee (RRC) approval and the institution's overarching educational objectives. This Committee will be the designated institutional entity responsible for monitoring and advising on all aspects of residency education.

In order to provide a broad base of input into on-going discussions the institutional Graduate Medical Education Committee (GMEC) is convened. Voting membership of this Committee is composed of all core residency program directors, selected subspecialty residency program directors, the designated institutional official, hospital administrators, and residents nominated by their peers. The Committee will meet on a monthly basis and minutes will be kept in the Office of Graduate Medical Education.

The GMEC has oversight authority and responsibility for all aspects of GME including:

1. To establish and implement institutional policies and procedures regarding the quality of education and the work environment for residents in all programs.
2. To ensure that communication mechanisms exist between the GMEC and all program directors within the institution. To ensure that program directors maintain effective communication mechanisms with the responsible individual at each participating institution for their respective program to ensure proper oversight at all clinical sites.
3. To develop, implement, and oversee an internal review process.
4. To make recommendations regarding stipends, benefits, and funding for resident positions.
5. To develop and implement policies and procedures regarding resident duty hours.
6. To monitor programs' supervision of residents and ensure that supervision provides safe and effective patient care; meets educational needs; and well being of residents, and provides progress responsibility appropriate to residents' education, competency, and experience.

7. To communicate with leadership of the medical staff regarding the safety and quality of patient care.
8. To ensure that programs provide a curriculum and an evaluation system to ensure that residents demonstrate achievement of the ACGME general competencies.
9. To ensure that programs select, evaluate, promote, transfer, discipline, and/or dismiss residents in compliance with the institutional policies and the ACGME institutional and common program requirements.
10. To review all ACGME program and institutional accreditation letters of notification and monitor action plans for correction of citations and areas of noncompliance.
11. To review all program changes prior to submission to the ACGME in accordance with the ACGME institutional and common program requirements. Program changes include:
 - a. All applications for ACGME accreditation of new programs;
 - b. Changes in resident complement;
 - c. Major changes in program structure or length of training;
 - d. Additions and deletions of participating institutions;
 - e. Appointments of new program directors;
 - f. Progress reports requested by any Review Committee;
 - g. Responses to all proposed adverse actions;
 - h. Requests for exceptions of resident duty hours;
 - i. Voluntary withdrawal of program accreditation;
 - j. Requests for an appeal of an adverse action;
 - k. Appeal presentations to a Board of Appeal or the ACGME.
12. To provide oversight of all processes related to reductions and/or closures of individual programs, major participating institutions, and/or sponsoring institution.
13. To ensure sponsoring institution has a policy regarding resident and training program interactions with vendor representatives.
14. To ensure the development of an institution-wide policy for programs to continue the education of all residents in the event of a disaster.

The Ohio State University Medical Center

GRADUATE MEDICAL EDUCATION POLICY AND PROCEDURE

Policy: RESIDENT DUE PROCESS POLICY

Effective: 11/28/01

Revised: 6/28/06, 12/17/03

In this policy, the term "resident" includes all interns, residents and fellows in GME training programs.

Procedure:

The purpose of the policy is to describe the Graduate Medical Education due process and to establish appeals/grievance procedures consistent with the principles of due process related to both evaluations and academic/administrative adverse actions. These procedures provide guidance for the fair resolution of disputes regarding the resident's performance and conduct.

I. General Guidelines:

- A. Promotion and re-appointment of a resident as well as completion of a training program is contingent upon the resident's satisfactory performance in meeting knowledge, performance and behavior standards and expectations as set by the institution and program within various program, institutional and University policies, and the annual Limited Staff Agreement.
- B. If a resident does not satisfactorily meet the standards and expectations, the resident may be subject to a variety of adverse actions as outlined in the policy entitled "Academic and Administrative Adverse Actions."

II. Challenging a Performance Evaluation:

- A. The resident has the right to challenge the accuracy of a written or electronic evaluation of his/her performance.
- B. As a first step, the resident should meet with the Program Director to discuss the evaluation. The resident should present their concerns with the evaluation in as objective a manner as possible. For example, a concern may be that the faculty member did not have sufficient exposure to the resident during the evaluation period to form an objective opinion or complete an evaluation.

Page 1 of 4

Program Director regarding the adverse action is final and adverse action will be implemented.

- D. If a Resident or Fellow is enrolled in the combined program for Internal Medicine/Pediatrics, the due process and appeals procedures for academic-related adverse actions will be those delineated in the guidelines, handbook or policies of the training program that take into account the oversight of the faculty from both OSU and Children's. This will ensure that appropriate due process occurs and will ensure that there is not duplication of processes in both institutions.
- E. If an appeal is made, an appeal committee will be appointed by the Associate Dean for GME. The composition of the appeal committee will be as follows:
 - 1) The Associate Dean for GME will function as the chair of the appeal committee.
 - 2) Three program directors not from the clinical department of the program in question (preferably members of the GME Committee).
 - 3) One resident not from the clinical department of the program in question (preferably a member of the Residents Advisory Council).
 - 4) Individuals selected to be on the appeal committee should not have first-hand knowledge of the resident's performance (e.g., appeal committee members should not have directly supervised or been supervised by the resident in the past).
- F. The basis of the resident's appeal may include, but not be limited to, one of the following concerns:
 - 1) The Program Director did not follow appropriate procedures in the consideration of the original adverse action decision.
- G. The appeal committee will function using the following procedures:
 - 1) The appeal committee will meet within fourteen days of the receipt of the written appeal.
 - 2) The appeal committee meeting will be scheduled to provide sufficient time for the committee members to receive the information necessary to make a final decision regarding the appeal. If a majority of committee members feel that additional time is necessary to either gather additional information or to deliberate, an additional meeting will be scheduled by the chair.
 - 3) A complete copy of the resident's evaluation file and the written notification of the adverse action should be supplied to the appeal committee in advance of the committee meeting.
 - 4) The recommendation of the program education committee or housestaff competency committee to the Program Director regarding the original adverse action shall be presented to the appeal committee.
 - 5) During an appeal hearing, the Resident may submit written or oral evidence in support of an appeal, may call others with substantive knowledge of the case to present evidence, and may choose to be represented by a member of the teaching faculty acting as an advocate for the Resident.

Page 3 of 4

- C. As a result of that conversation, the Program Director may decide:
 1. to uphold the evaluation and include it in the resident's record
 2. may decide to not act on the evaluation at that time but to keep it in the resident's record for future reference
 3. may decide to not act on the evaluation and to purge it from the resident's record.
- D. The Program Director should document the date of the meeting, the stated reasons that the resident is challenging the evaluation, and their final decision regarding the disposition of the complaint in a memo in the resident's file for future reference.
- E. If the resident's concerns about the evaluation are not satisfactorily resolved after talking with the Program Director, the resident may choose to meet with the program education committee and/or housestaff competency committee to present rebuttal evidence.
 1. The committee shall hear the resident's concerns and provide direction back to the Program Director regarding the disposition of the evaluation.
 2. After receiving the input of the committee, the Program Director will make a final decision on the disposition of the evaluation.
 3. This final decision should be documented in the resident's file.

III. Appealing an Adverse Action:

- A. The appeals process for adverse academic and administrative actions taken under the policy entitled "Academic and Administrative Adverse Actions" are dealt with in this policy. The appeals process for adverse actions taken under the Medical Staff Bylaws is defined in the Medical Staff Bylaws.
- B. Academic adverse actions are defined in the "Academic and Administrative Adverse Actions" policy to include the following:
 - 1) Focused review that does not extend the length of the training. This action is not eligible for appeal under any circumstances.
 - 2) Focused review that does extend the length of training.
 - 3) Probation
 - 4) Suspension
 - 5) Non-promotion
 - 6) Non-renewal
 - 7) Termination
- C. An appeal of an adverse action must be made in writing by the Resident to the Program Director within fourteen days after receipt of the written notice of the adverse action. If the Resident does not make a timely appeal, the decision of the

Page 2 of 4

- 6) The Program Director may also submit additional written or oral evidence beyond items (3) and (4) above and may call others with substantive knowledge of the case to present evidence in support of the adverse action.
- 7) The hearing is not controlled by legal rules of evidence nor procedure. No formal transcript of appeal committee meeting is required. Neither party may be represented by legal counsel at the hearing.
- 8) While the resident is presenting his/her case, the Program Director shall not be in the room. While the Program Director is presenting his/her case, the Resident shall not be in the room. After their respective presentations, the appeal committee may ask both the Resident and the Program Director to be present for further clarification of any facts.
- 9) At the conclusion of the presentations by the Resident and the Program Director, the members of the appeal committee will deliberate on the final disposition of the appeal with neither the Resident nor the Program Director in the room.
- 10) At the conclusion of the appeal committee's deliberations, the committee chair will call for a vote to uphold, modify or reverse the original adverse action.
- 11) If additional meetings are required after the initial committee meeting as described in G above, a final determination by the appeal committee must be made within fourteen days of the first hearing committee meeting.
- 12) The chair of the appeal committee will notify both the Resident and the Program Director in writing regarding the committee's decision within seven days of the decision.
- 13) The decision of the committee is final and may not be further appealed.
- 14) The final appeal committee decision must be properly documented in the resident's file.

Page 4 of 4

The Ohio State University Medical Center

GRADUATE MEDICAL EDUCATION POLICY AND PROCEDURE

Policy: PROGRAM EDUCATION COMMITTEE AND
HOUSESTAFF COMPETENCY COMMITTEE

Effective: 6/28/06

Revised: 7/25/07

For the purposes of this policy, "resident" means all interns, residents, and fellows in GME training programs.

Procedures:

1. Each GME training program must have an established "education committee." The training program may use a different title for the committee but its membership, responsibilities, and functions must be consistent with this policy.
2. A department may choose to have one education committee that oversees multiple GME training programs. However, each training program must fall under the jurisdiction of an education committee.
3. Committee membership. The committee must include at least the following individuals:
 - a. The Program Director.
 - b. At least three other faculty members from the training program who are full-time university faculty members.
 - c. At least one resident from the program. The resident should be peer-selected to serve on the committee.
 - d. The applicable Division Director or Department Chair should serve as an ex-officio member of the committee.
 - e. Although not required, it is recommended that at least one faculty member from each major non-OSU participating institution for the program be included on the committee.
 - f. On an annual basis, the program must forward a list of education committee members to the GME Office.
4. Committee logistics.
 - a. The education committee must meet at least twice per year.
 - b. Meeting minutes should document the date of meetings, the list of members and guests in attendance, and a review of the substantive issues that were discussed on the agenda.

Page 1 of 3

c. Committee meeting minutes will be reviewed at the time of the program internal review.

5. Committee responsibilities. The education committee will have the following roles and responsibilities:
 - a. At least twice per year, the committee should review the program's compliance with ACGME and institutional duty hour policies.
 - b. At least once annually, the education committee must complete a self-assessment that evaluates the educational effectiveness of the overall program using a systematic process. The program director should prepare the self-assessment and present it to the committee. The self-assessment includes but is not limited to the following topics:
 - 1.) The program's written curriculum and rotation-specific competency-based goals and objectives.
 - 2.) All resident, faculty and program evaluation forms used in the training program.
 - 3.) The educational value and effectiveness of rotations at each participating institution.
 - 4.) The aggregate competency-based resident performance evaluations.
 - 5.) The scholarly activity and research participation of the residents.
 - 6.) Resident performance on in-service training exams (if applicable) and board certification exams.
 - 7.) The resident's aggregate evaluations of the teaching faculty with special attention paid to their teaching ability, commitment to the educational program, clinical expertise, and scholarly activity.
 - 8.) The faculty's participation in faculty development programs.
 - 9.) An aggregate summary of the individual resident and faculty evaluations of the overall program and provide feedback to the program.
 - c. Quality Improvement Plan.
 - 1.) Based on the program's annual self-assessment, the program director will develop a written quality improvement action plan to be presented to the program education committee. The approval of this plan should be recorded in the committee minutes.
 - 2.) The quality improvement action plan must be forwarded to the GME office by September 30th of each year.
6. Evaluation Activities
Each program should designate a "housestaff competency committee" to address academic and administrative adverse actions, and individual evaluations of housestaff.
 - a. The committee:
 - 1.) may be the program education committee, minus the housestaff members of the program education committee.
 - 2.) may be a sub committee of the program education committee, or
 - 3.) may be a separate, independent committee,
 - 4.) housestaff should not participate in the review of evaluations for individual trainees or the review of adverse action.

Page 2 of 3

- b. The committee will provide review and feedback to the Program Director with regard to any academic or administrative adverse action to be taken against any resident in the program.
 - 1.) All committee discussions and minutes regarding potential adverse actions shall remain confidential.
 - 2.) The committee may provide the Program Director with a recommendation regarding the proposed adverse action. The recommendation should be documented in the minutes of the committee meeting.
 - 3.) The Program Director is responsible for making the final determination on whether or not to take an adverse action as defined in the academic and administrative adverse actions policy.

Page 3 of 3

The Ohio State University Medical Center

GRADUATE MEDICAL EDUCATION POLICY AND PROCEDURE

Policy: INTERNAL REVIEW POLICY FOR NON ACGME
ACCREDITED TRAINING PROGRAMS

Effective: 8/24/05

Approved/Revised: 8/24/05

Purpose:

Consistent with the institutional mission to educate physicians for leadership in clinical and academic medicine, internal reviews are regularly conducted by members of the Graduate Medical Education Committee (GMEC) and/or its designees. The internal review is designed to assess whether each program has defined the specific knowledge, skills, and attitudes required and assess whether the program provides educational experiences for the residents and fellows to demonstrate competency in the following general competency areas: patient care skills, medical knowledge, interpersonal and communication skills, professionalism, practice-based learning, and systems-based practice. Also included in the review is an assessment of each program's effectiveness in preparing physicians for leadership roles in clinical and academic medicine, and an assessment of the institution's effectiveness in providing the support, oversight and resources necessary to meet our educational mission.

An internal review is required periodically for our accredited programs under the policy entitled "Residency Training Program Internal Review Policy for Accredited Programs". This policy applies to non-accredited training programs. The GME Committee believes that non-accredited programs should also be periodically reviewed to ensure the quality of education and training provided as well as compliance with institutional policies.

Guidelines:

1. Internal review of the training program will be carried out under the auspices of the GME Committee and administration of the Office of Graduate Medical Education.
2. Internal reviews will take place once every four years. An off cycle internal review can also be initiated at the request of the Program Director, Department Chair, Medical Director, or Chair of the GME Committee.

Page 1 of 3

achieving the educational goals, resident working environment (including on-call duty hours), faculty participation, institutional support, etc.

- g. Procedures for monitoring resident stress, including mental or emotional conditions inhibiting performance or learning, and drug or alcohol dysfunction
- h. List of facilities and equipment available to trainees (e.g. call rooms, lounges, libraries)
- i. The program should have available all written program-specific policies and procedures, and the resident handbook.

7. After reviewing the submitted documents, the reviewers shall:

- a. Interview the Program Director to review program requirements for the training program;
 - b. Interview selected faculty to assess faculty evaluation of and commitment to the program. The selected faculty should not include the chair of the department. If the chair would like time with the committee, a separate interview will be conducted;
 - c. Interview selected trainees (one from each PGY level) to assess their perception and evaluation of the program, curriculum, and assessment processes. Only current trainees are included in the interview;
 - d. Prepare a report to be submitted to the GME Committee;
 - e. Send the completed report, both electronically and on paper, and all supporting documents to the Office of Graduate Medical Education no later than one week prior to the presentation date.
8. A summary of the report highlighting the program strengths and areas of concern will be formally presented to the GME committee for approval and/or monitoring and appropriate action.

3. When a new training program is approved, a review will be conducted within six months of the completion of the initial year of training program activity.
4. Internal reviews will be conducted by the GMEC, or a body designated by the GMEC, which must include faculty, residents, and administrators, from within the institution but from programs/departments other than the one being reviewed.
5. The review shall appraise the following:
 - a. The educational objectives of the program;
 - b. The adequacy of available educational, clinical and financial resources to meet these objectives;
 - c. The effectiveness of each program in meeting its objectives;
 - d. Adequacy of the participating institution's resources for training of physicians (i.e., medical records, security, facilities, ancillary support, etc.);
 - e. Evidence of the program's use of evaluation tools to ensure that the residents demonstrate competence and use of dependable measures to assess residents' competence.
6. The program director and Office of Graduate Medical Education are responsible for providing the review team with the following documents. Some documents that are too large to duplicate, such as curriculum guides, may be made available for the review team during the interviews.
 - a. Program Description (brief description of the program including brief history, type of program, number of trainees, general goals and learning objectives of training program, duration of program, training sites, pre-requisites, etc.)
 - b. Educational Program Curriculum for clinical rotations as well as the didactic component of the training program. For research based programs, include the research educational objectives.
 - c. Roster of faculty, their involvement and time committed to the training program
 - d. Procedures for faculty evaluation by the residents (please include written procedures and form(s) used)
 - e. Procedure for resident evaluation (please include written procedure and form(s) used)
 - f. Procedure for continuous overall evaluation of the training programs including effectiveness of program, quality of curriculum, the extent to which residents are

Page 2 of 3

This will replace "Statement of Commitment to Graduate Medical Education" and "Statement of Institutional and Departmental support and responsibilities"

The Ohio State University Medical Center

GRADUATE MEDICAL EDUCATION POLICY AND PROCEDURE

Policy: STATEMENT OF INSTITUTIONAL COMMITMENT TO GRADUATE MEDICAL EDUCATION

Effective: 2/24/99

Revised: 5/23/07, 9/28/00, 9/25/99

The Ohio State University Medical Center has a long tradition of commitment to medical education at the undergraduate, graduate, and continuing education levels. The Ohio State University Health System and its affiliated physician practice sites are the primary sites for Graduate Medical Education (GME) training. Within the Health System, The Ohio State University Hospital serves as the official sponsoring institution for all ACGME accredited programs.

The mission of The Ohio State University Medical Center is to improve people's lives through innovation in research, education and patient care. The Medical Center is committed to the effective administration and operation of its graduate medical education programs that are designed to offer physicians in training the opportunity for professional and personal development consistent with the ACGME general competencies under careful supervision and guidance of the faculty and medical staff. The Medical Center is also committed to providing a scholarly educational environment essential to the development of future leaders in the art and science of medicine. When appropriate, the Medical Center will take advantage of opportunities to cooperate with other institutions to achieve these goals in a variety of clinical settings serving unique and diverse patient populations.

The institutional administration of Graduate Medical Education takes place under the auspices of the Offices of Graduate Medical Education (OGME), which is a division of the Office of the Medical Director. The Office of Graduate Medical Education is led by the Designated Institutional Official (DIO), who also serves as Associate Dean for Graduate Medical Education for the OSU College of Medicine, and a Director of Graduate Medical Education. The Graduate Medical Education Committee (GMEC) is charged with developing institutional policies and procedures pertaining to GME and overseeing the implementation of ACGME requirements and guidelines by the institution and by each program.

The OSU Medical Center, through the OSU Health System and specifically The Ohio State University Hospital, is committed to providing its graduate medical education

This will replace "Statement of Commitment to Graduate Medical Education" and "Statement of Institutional and Departmental support and responsibilities"

programs with the necessary educational, financial, and human resources to maintain compliance with the ACGME Institutional Requirements, Common Program Requirements, and specialty-specific Program Requirements.

David P. Lauer
Chair, University Hospitals Board
Date

Fred Sanfilippo, MD, PhD
Senior Vice President and Executive
Dean for Health Sciences
CEO, OSU Medical Center
Date

Wiley W. Souba, MD, ScD, MBA
Dean, College of Medicine
Date

Peter Geier
Chief Executive Officer, The OSU Health System
Vice President for Health Services
Date

Larry Anstine
Executive Director
University Hospital/Ross Heart Hospital
Date

Hagop S. Mekhjian, MD
Chief Medical Officer
Associate Vice President for Health Services
Date

Andrew M. Thomas, MD, MBA
Associate Dean for Graduate Medical Education
DIO/Chair Graduate Medical Education Committee
Associate Medical Director, University Hospital
Date

12. Limited Staff Benefits

Limited Staff Benefits Information	
<p>Medical physics residents are entitled to the same benefits as Limited Medical Staff, which includes all residents and clinical fellows. For Limited Medical Staff, The Ohio State University routinely provides the following benefits. A Limited Medical Staff Agreement is provided for residents and fellows each academic year. The below is concurrent as of 2018-2019.</p>	
Health Care:	Limited medical staff are eligible for enrollment in one of several University-sponsored health insurance plans including single and dependent coverage. Prescription drug coverage is included in all plans. Coverage, deductibles, and co-payments vary by plan.
Dental:	Dental coverage for residents and dependents is available upon employment.
Vision:	Vision benefits for residents and dependents are available upon employment.
Worker's Compensation:	Worker's Compensation is prepaid providing 100% of all medical expenses and for a percentage of wage-loss, which results from job-related injuries or occupational diseases.
Disability Insurance:	Limited medical staff receives prepaid long term disability income insurance with benefits of \$2000 per month in case of total and/or residual disability lasting beyond 90 days. The contract has portability features upon completion of training.
Life Insurance:	Limited medical staff are automatically entitled to prepaid term life insurance in the amount of 22 times their annual stipend, plus accidental death and dismemberment benefits. Dependents are eligible for enrollment in optional dependent group life plans. A variety of plans with varying premiums and limits of coverage are available.
Malpractice Insurance:	The University administers a self-indemnification insurance program. All residents are covered for their activities within the scope of the duties and responsibilities for the training program. It is an occurrence policy. Coverage is at least \$1 million per occurrence and \$3 million annual aggregate.
Electronic Device Reimbursement:	Residents in their first year at OSU will receive \$200 reimbursement for the purchase of an electronic device to use for work purposes. Approve list is housed in GME office, and device must be accepting of OSU software.
Maternity/ Paternity Leave:	<p>For the birth of a child, birth mothers are provided with 6 weeks (240 hours) of maternity leave to be paid prior to use of accumulated sick leave and/or accumulated vacation. Birth fathers or domestic partners (as defined in University Policies) are provided with three weeks (120 hours) of paternity leave to be paid prior to use of accumulated sick leave and/or accumulated vacation. For the adoption or foster care placement of a child, adoptive mothers, fathers, and domestic partners (as defined in University Policies) are provided with three weeks (120 hours) of paid leave to be paid prior to use of accumulated sick leave and/or accumulated vacation. Paid parental leave is available for one year from birth or adoption of a child. It runs concurrently with FML (but not limited by this). Leave may be used one continuous time or intermittently prior to and during the first 12 weeks following birth or adoption, and intermittently with advanced notice and departmental approval.</p> <p>Notice of pregnancy should occur in the first trimester to ensure proper scheduling and receipt of benefits. Because the length of the maternity leave may affect the amount of time allowed away from a training program by a certifying board, the program director may use vacation, sick leave, personal days, or conference leave to accomplish completion of the training requirements within the standard training period. No moonlighting is permitted during maternity leave. Additional information regarding paid leave programs can be found on OSU HR website, Paid Parental Leave Policy 02-44</p>
Vacation:	Limited medical staff receives up to two weeks (10 working days) paid vacation time per academic year. A maximum of one week (5 working days) vacation may be taken per rotation.
Job Interview Leave:	Residents in their second year of residency are given an additional 5 days in order to travel to/attend job interviews. Additional days in excess of this may be granted at the Program Directors discretion.
Sick Leave:	Limited medical staff begins accruing sick leave benefit hours upon employment. This benefit gives the resident full pay for up to the total number of hours accrued. Full-time employees accrue 10 hours per month of service. Appointments of less than 100% accrue at a pro-rated amount according to the time actually worked.

Retirement Benefits:	Retirement benefits are provided through the State of Ohio Teachers Retirement System (STRS) or through one of the Alternative Retirement Program (ARP) plans available. Contribution rates can vary from year to year based on program policies. For more information on the STRS and/or the Alternative Retirement Program, contact Human Resources at (614) 292-1050 to speak to a benefits consultant. Information is also available at www.hr.osu.edu under OSU faculty and staff.
Lab Coats & Laundry:	Two white lab coats with the OSU insignia (or one lab coat and one gray fleece) per year and scrubs are provided free of charge by the Medical Center. There is free laundry service for all work-related clothing.
Notary Service:	Free notary service is provided through the GME office. Educational loan deferment documents are processed through the GME office.
Parking:	Limited Staff have the right to purchase faculty "A" parking permits. Some departments may purchase parking passes for their housestaff.
Recreation:	Discounted fitness club memberships are available through the OSU Center for Wellness and Prevention. In addition, many athletic facilities and individual, team, and tournament sports are available on campus. Also, many other activities and cultural events are available at the University and throughout the city and the central Ohio area.
Resident Fund:	Residents are eligible to receive reimbursement for books and exam review materials up to \$500 total over the course of their 2-year residency.
Meetings:	Residents are afforded the opportunity of going to national meetings at departmental expense. The Medical Director's office supports attendance at national meetings for those residents who demonstrate significant involvement in institutionally-based efforts. This benefit is designed to train/educate residents and enhance their participation.
Library & Learning Resources:	The Prior Health Sciences Library is located next to the Hospital. Overall, the Ohio State University has 27 libraries. The Medical Center houses a learning center for residents with PCs, laser printers, and free access to the Internet and online journals.
Counseling & Support:	The OSU Medical Center provides opportunities for counseling and consultation referral related to personal problems arising out of the trainee's participation in the program. As a benefits-eligible Ohio State faculty or staff member, trainees have access to the Ohio State Employee Assistance Program (EAP) that offers tools and resources to help address complex issues that can be affecting mental and emotional well-being. EAP services are also available to benefits-eligible faculty and staff's immediate families, members of their household and parents and parents-in-law. The Employee Assistance Program provides a confidential avenue for the discussion and resolution of personal problems. Further information can be found by visiting the EAP at https://hr.osu.edu/benefits/eap/