One Physics

THERAPY RESIDENCY PROGRAM

One Physics – West Ohio (Program Director's Location)
One Physics – Youngstown, OH
One Physics – St. Louis, MO
One Physics – Bismarck, ND

PROGRAM DIRECTOR:
PHILIP KALLENBERG, MS, DABR, CRE

One Physics

One Physics Therapy Residency Program

INTRODUCTION

One Physics aims to be a national leader in providing high quality clinical medical physics services. Part of this commitment to clinical leadership is exemplified through training the next generation of high quality clinical medical physicists with their Medical Physics Residency programs. The Therapy Residency Program at One Physics is designed to prepare MS or PhD graduates for a career in Medical Physics in the sub-specialty of Radiation Therapy Physics. This 24-month training program is also designed to help prepare the Resident for the ABR Board Certification process.

RESIDENCY PROGRAM NETWORK

Spectrum Medical Physics, Inc was incorporated in 2000 to provide radiation oncology physics and dosimetry support Lima, OH and surrounding areas. In 2020, Spectrum Medical Physics decided to partner with the Medical Physics community to help bridge the gap between the number of graduates from CAMPEP accredited MS, DMP, and PHD programs and the number of residency positions. The Spectrum Medical Physics Residency Program Received full CAMPEP Accreditation in 2021. In 2024, Spectrum Medical Physics became a part of the Apex Physics Partners group which was renamed as One Physics shortly thereafter. The program was renamed the One Physics Therapy Residency Program with the main hub site being the One Physics – West Ohio location.

One Physics is a National Network of Medical Physics Service Practices that prides themselves on supplying excellent and comprehensive medical physics support. The One Physics Therapy Residency Program, (formerly the Spectrum Medical Physics Residency Program) received CAMPEP Accreditation in 2021. Since then it has launched Affiliate Programs in Youngstown, OH (2024), Bismarck ND (2026), and St. Louis, MO (2026).

At this time, four residents are enrolled in the program. The new affiliate sites (pending CAMPEP Approval) will operate initially with 1 resident but with the goal of eventually increasing to their capacity. Once all four sites are fully operational, it is expected that the program will admit 3-4 residents per year for a total of 6-9 residents every two years.

Location	West Ohio	Bismarck	St Louis	Youngstown
2026 Enrollment	3 Residents	0 Residents	0 Residents	1 Resident
Openings	1 – Summer 2026	1 – TBD	1 – TBD	1 – Winter 2027
Max Capacity	3 Residents	2 Residents	2 Residents	2 Residents

One Physics
809 Gleneagles Ct. Suite 100
Towson, MD 21286
https://onephysics.com/

One Physics Therapy Residency Program
803 W. Market St. Suite 100
Lima, OH 45805
https://onephysics.com/therapy-residency-program

One Physics

One Physics Therapy Residency Program

PROGRAM ENTRY REQUIREMENTS

Application Requirements

- Applicants must have graduated from a CAMPEP accredited MS, DMP, or PhD program in Medical Physics or a PostDoc CAMPEP Accredited Certificate program in Medical Physics.
    - *Applicants with a qualifying Visa will be considered.*

The specific requirements necessitate that an individual applying to this program must have a formal undergraduate education in physics or a related science, followed by advanced studies in an appropriate graduate program. To ensure the safety of our patients and the quality of the care we offer, it is essential that the knowledge and competence of individuals applying to our program be of high standards. Because our working base is in the Community Hospital setting without an affiliated academic institution to formally supplement didactic training, incoming residents must have graduated from a CAMPEP accredited MS, DMP, or PhD program in Medical Physics or a PostDoc CAMPEP Accredited Certificate program in Medical Physics. All residents must complete the curricula of the residency program regardless of prior experience.

PROGRAM PATH

Program Outline

The One Physics Residency Programs in therapeutic medical physics are each two-year programs offering a diverse range of equipment and procedures. The programs each incorporate the standards approved by the Commission on Accreditation of Medical Physics Educational Programs (CAMPEP) and the elements as described in the AAPM Report No. 249 (Essentials and Guidelines for Clinical Medical Physics Residency Training Programs). The two-year program consists of eight 3-month rotations and a simultaneous research/clinical improvement project. The research project is intentionally designed to be dissociated from a specific time-period to allow the resident flexibility in completing the project. In addition to the focus area of each rotation, the resident will be integrated into routine clinical practice with increasing levels of responsibility over the 24-month timeframe.

Each 3-month rotation has a specific focus item but also is designed to include some general medical physics responsibilities. By incorporating both a focus area and a broader scope across the clinical practice, each resident is able to meet the focus requirements while maintaining the broad range of clinical skills necessary to succeed in the Medical Physics field. While the overall responsibility of completing readings, assignments and competencies on time lies with the resident, each 3-month rotation is led by a program staff member who will meet approximately weekly with the resident to be a support to the resident.

Supervision

As a general rule, the day-to-day supervision of the Residents is performed in a team approach by all the program staff. That being said, the Program Director is responsible for the whole umbrella of resident supervision. Each Associate Program Director is responsible for Supervision at their Affiliate/Site. The Primary Rotation mentor for each resident's active rotation is also typically the primary supervisor for that resident

during that rotation time period. When the primary supervisor is on PTO or if other circumstances arise, another member of Program Staff will step in as acting supervisor.

Travel

Residents at the West Ohio Site each travel to another clinical site approximately 1 day per week. All clinical locations are located within a reasonable distance from the affiliate main clinical site (e.g. 75mi).
Residents at the Youngstown Affiliate travel to another clinical site up to 1 day per week. The four Youngstown locations are all within 20 minutes of St Elizabeth's - Youngstown.
Residents at the St Louis Affiliate travel to another clinic during their brachytherapy rotation (35mi).
The Bismarck Affiliate is self-contained within the Bismarck Cancer Center.

Travel between different Affiliates is not part of the standard scope but may be done in special circumstances. Travel to partner sites to see units and/or procedure not at the residency site is typically a consideration in the Special Procedures rotation.

Progress Meetings

Throughout the course of the residency, each resident will meet Approximately monthly with the Residency Program Director to discuss their progress through the residency, express any concerns, and create clarity and focus for the next month's work. These Progress Meetings will also be a mechanism to review Rotation Exam and Rotation Evaluation results with the resident.

Mentor Meetings

For each 3-month rotation, the resident will meet approximately weekly with that Rotation's Primary Mentor to discuss a series of topics and/or publications to help guide a focus the resident's training through the rotation. Prior to each meeting, the resident will read/study/prepare for the meeting. During the meeting the mentor will review the materials with the mentee, ask questions and provide guidance as appropriate to ensure thorough understanding of the topic.

Evaluation

Each rotation will culminate with an Evaluation based on
1. Competencies Complete
2.Prepared Material (e.g. Rotation Presentation) and
3. Rotation Exam Questions (typically Oral Exam Style)

The Program Director (either alone or with the Primary Rotation mentor) will subsequently review the Rotation Evaluation and any Remediation Plan with the Resident.

CONDUCT AND PERFORMANCE REQUIREMENTS

Hours/ Tracking of Work

In accordance with ACGME rules, a resident is not to work more than 320 duty hours[1] in any 4-week period (average of 80 per week). While One Physics Residents should not expect to routinely approach the 80 hour mark very often, they should expect to work 55-60 hours per week on average with natural fluctuations based on clinical need and program components as some rotations tend to be more time intensive than others.

The One PhysicsTherapy Program is using the online platform Typhon (typhongroup.net) for tracking the progress of each resident through the residency program. The residents must maintain an up-to-date, detailed list of all procedures in which they participate. All procedures each day must be logged into a Typhon Case Log entry. The case log will be regularly reviewed by the Program Director and/or other program staff as needed (e.g. as part of the monthly Progress Meetings between the PD and each resident). Residents are required to fulfill all requirements for each module (rotation). Additionally, each resident is given a Residency Rotation Map (Spreadsheet) for convenience of tracking their progress through the program.

Personal Conduct

All One Physics Employees are to adhere to One Physics Policies on Ethics and Code of Conduct.

All representatives of One Physics, including residents, shall act in full accordance with the rules and policies of the hospital systems in which they work. These rules and policies include a commitment to comply with all applicable laws and to conduct business in accordance with the highest ethical standards. Additionally, representatives have a legal and ethical responsibility to maintain the privacy and confidentiality of patient health care information and to protect the privacy of patients. Therefore, residents must agree to comply with the Corporate Responsibility Program Provisions of the hospital system and fully understand the requirements set forth.

The program director may discipline physics residents for failure to comply with One Physics and/or Hospital (e.g. Mercy Health) conduct policies. In addition to verbal coaching, Corrective actions include verbal warnings, written warnings or suspensions, and terminations. Typical corrective action begins at a verbal warning and progresses in a three-strike process. However, because situations that require corrective action have different levels of seriousness, we may decide that a level of action may need to be different from that which would normally apply would be more appropriate. Furthermore, certain forms of serious misconduct, policy/procedure violation or performance, may result in immediate suspension or termination without notice or prior warning. Management may skip certain disciplinary steps or repeat certain disciplinary steps depending on the particular facts of each situation.

Due Process (Overall Job performance and Evaluations)

In accordance with the policy on Due Process for resident performance, Residents not achieving satisfactory performance will be counseled and issued a written Notice of Concern. An action plan with remediation

[1] https://www.acgme.org/what-we-do/accreditation/clinical-experience-and-education-formerly-duty-hours/research-and-testimony/

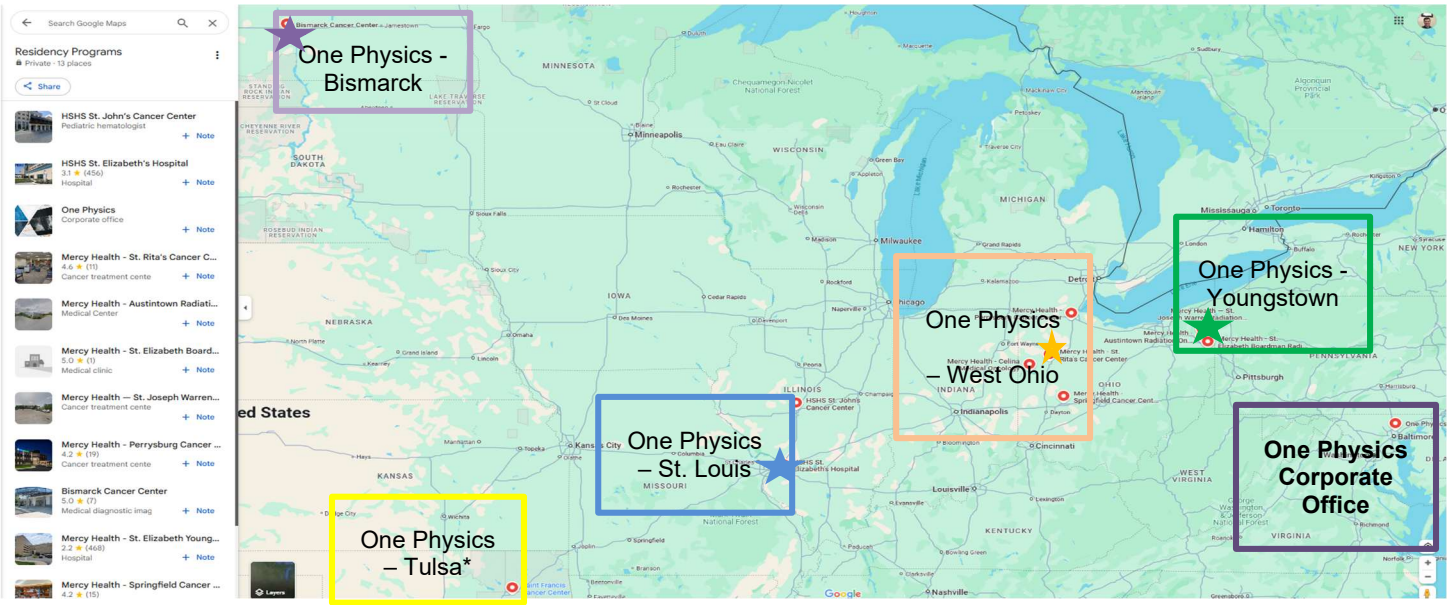
steps to a return to good standing will be presented to the Resident. The timeframe for remediation must be a minimum of 60 days. If the remediation period ends and the performance has not satisfactorily improved, the Resident will be placed in a probationary status. The duration of the probation is 30-60 days. Documented areas of substandard performance, documented failure to improve in the "Notice of Concern" areas and goals for acceptable improvement will be given to the resident. The resident may be terminated if the resident's performance has not significantly improved after the probation period.

Rotation Evaluation marks (either total Rotation Score or Rotation Exam only) of Conditional Pass and Failing will result in the initiation of Due Process and a detailed "Notice of Concern" / Remediation plan will be generated.

For first or second attempt exam Conditional Pass no repeat exam is given, but (following Due Process) an action plan for items to be completed within 60 days will be given (plus an additional 30 days for probation as per due process). Please note that failure to satisfy the conditions of rotation n prior to the completion of rotation n+1 is a cumulative excess of the Due process period and will result in the dismissal from the program.

Rotation Failure either by Exam Failure or Cumulative Rotation Score Failure bypasses the notice of concern and results in an immediate probationary status. A repeat exam/evaluation will be given upon mutual agreement between the PD and the resident. This period is typically 2-4 weeks later but may be longer if the remediation plan is extensive (probation periods not to exceed 60 days). Repeat presentations (if necessary) would be included in the action plan. A failure of the re-exam will result in dismissal from the program.

PROGRAM LOCATIONS & PROGRAM STAFF



CLINICAL LOCATIONS	Address	Affiliation	Site APD
★Mercy Health - Lima - St Rita's Cancer Center/ Allison Radiation Oncology	803 West Market St. Lima OH 45805	One Physics – West Ohio	Philip Kallenberg (PD)
Mercy Health – Springfield Regional Cancer Center (70mi SW)	148 W. North St Springfield OH 45504	One Physics – West Ohio	Ron Froehlich
Mercy Health - Perrysburg Cancer Center (70mi N) *(Brachytherapy Site)*	12623 Eckel Junction Rd. Perrysburg, OH 43551	One Physics – West Ohio	Nichole Hill
Grand Lake Regional Cancer Center (35mi SW)	900 Havemann Rd. Celina OH 45822	One Physics – West Ohio	Phil Kallenberg
Mercy Health - St. Elizabeth Youngstown Radiation Oncology (210 mi from hub)	1001 Covington St. Youngstown, OH 44510	One Physics – Youngstown	Shanna Pervola (Interim APD)
^Mercy Health - St. Elizabeth Boardman Radiation Oncology (9mi S)	8401 Market St. Boardman, OH 44512	One Physics – Youngstown	Shanna Pervola (Interim APD)
^Mercy Health — St. Joseph Warren Radiation Oncology (13mi N)	667 Eastland Ave SE. Warren, OH 44484	One Physics – Youngstown	Shanna Pervola (Interim APD)
^Mercy Health - Austintown Radiation Oncology (10mi W)	6262 Mahoning Ave, Austintown, OH 44515	One Physics – Youngstown	Shanna Pervola (Interim APD)
Cancer Care Center of O'Fallon (HSHS St. Elizabeth's -390mi from Hub)	321 Regency Park O'Fallon, IL 62269	One Physics – St. Louis	Chad Gerber
SSM St Mary's Hospital (22mi W) *(Brachytherapy Site)*	6420 Clayton Rd Richmond Heights, MO 63117	One Physics – St. Louis	Chad Gerber
SSM St. Claire Hospital – Fenton 34mi (WSW) *(Brachytherapy Site)*	1015 Bowles Ave Fenton, MO 63026	One Physics – St. Louis	Chad Gerber
Bismarck Cancer Center (1,050mi from Hub)	500 N 8th St. Bismarck, ND 58501	One Physics – Bismarck	Charles Conduah

**Note that our sister program, One Physics – Tulsa is under their own separate CAMPEP Accreditation*

One Physics

One Physics Therapy Residency Program

ONE PHYSICS - WEST OHIO PROGRAM STAFF (HUB SITE)

1. **Patrick Diltz, Ph.D. (Physicist - Program Staff)**
   B.S., Engineering Science Pennsylvania State University
   Ph.D., Biomedical Science, The Medical College of Ohio
   DABR, Therapeutic Radiologic Physics and Diagnostic Radiologic Physics

2. **Ronald Froelich, M.S., (Physicist - Associate Program Director, Program Staff)**
   B.S., Radiation Therapy Technology, Wayne State University
   M.S., Biomedical Science, The Medical College of Ohio
   DABR, Therapeutic Medical Physics

3. **Philip Kallenberg, M.S., (Physicist - Program Director, Program Staff)**
   B.S., Physics, University of Dayton
   M.S., Radiological Medical Physics, University of Kentucky
   Residency, University of Kentucky
   DABR, Therapeutic Medical Physics

4. **Kapil Mishra, M.S. (Physicist - Program Staff)**
   B.S., Cleveland State University
   M.S., Cleveland State University
   Residency, One Physics – West Ohio / Spectrum Medical Physics
   MDCB, Certified Medical Dosimetrist

5. **Nichole Hill, M.S. (Physicist - Program Staff, Brachytherapy Site)**
   B.S., Physics, University of Toledo
   M.S., Medical Physics, University of Toledo
   DABR, Therapeutic Medical Physics

6. **John Schaub (Dosimetrist - Program Staff)**
   The Ohio State University / Arthur G. James Cancer Hospital
   MDCB, Certified Medical Dosimetrist

ONE PHYSICS - YOUNGSTOWN (AFFILIATE) PROGRAM STAFF

1. **Recruiting (Physicist – Associate Program Director, Program Staff)**

2. **Shanna Pervola (Physicist – Interim Associate Program Director, Program Staff)**
   B.S., Pennsylvania State University
   M.S., University of Kentucky
   DABR, Therapeutic Medical Physics

3. **Cameron Arndt (Physicist – Program Staff)**
   B.S. Physics, University of British Columbia
   M.S. Applied Physics, University of Oregon
   M.S. Biophysics & Physiology /Medical Physics, SUNY at Buffalo
   DABR, Therapeutic Radiologic Physics

4. **Philip Kallenberg (Physicist – Program Director, Program Staff)**
   B.S., Physics, University of Dayton
   M.S., Radiological Medical Physics, University of Kentucky
   Residency, University of Kentucky
   DABR, Therapeutic Medical Physics

ONE PHYSICS – BISMARCK (AFFILIATE) PROGRAM STAFF

1. **Charles Conduah (Physicist – Associate Program Director, Program Staff)**
   B.S., Minnesota State University
   M.S., University of Minnesota
   DABR, Therapeutic Medical Physics

2. **Stephen Cassola (Physicist – Program Staff)**
   B.S., Physics, University of Minnesota
   M.S. Physics, University of North Dakota
   M.S. Medical Physics, University of Colorado Health Sciences Center
   Residency, University of Kentucky
   DABR, Therapeutic Medical Physics

3. **Luis Muñoz (Physicist – Program Staff)**
   B.S., Medical Radiation Physics, University of Wollongong
   M.S., Medical Radiation Physics, University of Wollongong
   Ph.D., Medical Radiation Physics, University of Wollongong
   ACPSEM, Clinical Radiation Medical Physics

4. **Philip Kallenberg (Physicist – Program Director only)**
   B.S., Physics, University of Dayton
   M.S., Radiological Medical Physics, University of Kentucky
   Residency, University of Kentucky
   DABR, Therapeutic Medical Physics

ONE PHYSICS – ST LOUIS (AFFILIATE) PROGRAM STAFF

1. **Chad Gerber (Physicist – Associate Program Director, Program Staff)**
   Doctor of Chiropractic - Logan University, Chesterfield, MO
   M.S., Nuclear Engineering/ Medical Physics, University of Missouri Columbia
   DABR, Therapeutic Medical Physics

2. **Kenneth Wohlt (Physicist – Program Staff)**
   B.S., Math & Physics, Lincoln University of Missouri
   M.S. Nuclear Engineering/ Medical Physics, University of Missouri Columbia
   Residency, U.S. Air Force Residency, W-P AFB Ohio
   DABR, Therapeutic Medical Physics
   DABR, Diagnostic Medical Physics

3. **Dan McKinney (Physicist – Program Staff, Brachytherapy)**
   B.S., Physics, Utah Valley University
   M.S., Medical Physics, University of Oklahoma Health Sciences Center & Southern Illinois University (Txfr)
   DABR, Therapeutic Medical Physics

4. **Michael Merrick (Physicist – Program Staff)**
   B.S. Biology (Minor Biological Physics), Creighton University
   M.S. Medical Physics, Creighton University
   Residency University of Kentucky – Alyzen Affiliate

5. **John Kostelac (Physicist – Program Staff, Brachytherapy)**
   B.S., Health Physics, Purdue University
   M.S., Nuclear Engineering /Medical Physics, University of Missouri

6. **Philip Kallenberg (Physicist – Program Director only)**
   B.S., Physics, University of Dayton
   M.S., Radiological Medical Physics, University of Kentucky
   Residency, University of Kentucky
   DABR, Therapeutic Medical Physics

CLINICAL ENVIRONMENTS – West Ohio - "Hub"

Location	Mercy Health - St Rita's Medical Center	Mercy Health – Grand Lake Regional Cancer Center	Mercy Health – Springfield Regional Cancer Center	Mercy Health – Perrysburg Cancer Center *(Brachy)*
Location	803 W Market St. Lima, OH 45805	900 Havemann Rd. Celina OH 45822	148 W. North St Springfield OH 45504	12623 Eckel Junction Rd. Perrysburg, OH 43551
Linacs	Varian TrueBeam (x2)	Varian iX	Varian TrueBeam Elekta Versa	Elekta Versa (x2)
Stereotactic	MLC-Brain & Body	MLC Lung	MLC-Brain & Body	MLC-Brain & Body
EMR	Mosaiq	Mosaiq	Mosaiq	Mosaiq
TPS	Eclipse Pinnacle MIM	Eclipse Pinnacle MIM	Eclipse Pinnacle MIM	Eclipse Pinnacle MIM
Imaging/CT Sim	Philips Big Bore	GE 580/590 Optima/Discovery	GE 580/590 Optima/Discovery	Philips Big Bore
Morning QA	SNC Daily QA3	SNC Daily QA3	SNC Daily QA3	SNC Daily QA 3
IMRT QA	Portal Dosimetry MapCheck3 SRS MapCheck	MapCheck3	Portal Dosimetry MapCheck3 SRS MapCheck	ArcCheck MapCheck2 SRS MapCheck
Beam Scanning	Iba BP2 SNC 1DS Std Img DV1D	Iba BP2 SNC 1DS	Iba BP2 SNC 1DS	PTW BeamScan SNC 1DS
2nd MU Check	MU Check ClearCalc	MU Check ClearCalc	MU CheckClearCalc	RadCalc
HDR Brachytherapy	Brachyvision	No	No	OncentraNucletron microselectron
LDR Brachytherapy	VariSeed (Practice Only)	No	No	
In-vivo Dosimetry	SNC Diodes	SNC Diodes	SNC Diodes	In-House TLD Reader

CLINICAL ENVIRONMENTS – Bismarck Affiliate

Location	Bismarck Cancer Center
Location	500 N 8th St. Bismarck, ND 58501
Linacs	Elekta Versa
Stereotactic	Aktina Cones – Brain & Body
EMR	Mosaiq
TPS	Monaco
Imaging/CT Sim	Philips Big Bore
Morning QA	PTW BeamChecker
IMRT QA	ArcCheck DosiSoft
Beam Scanning	PTW 3D Tank Iba BP2 PTW 1D Tank
2nd MU Check	Mobius
HDR Brachytherapy	Oncentra Nucletron Flexitron
LDR Brachytherapy	N/A
In-vivo Dosimetry	Mail in TLD

CLINICAL ENVIRONMENTS – Youngstown Affiliate

Location	Mercy Health St. Elizabeth Youngstown Hospital (Primary Affiliate Site)	Mercy Health – St. Joseph Warren Radiation Oncology	Mercy Health – St. Elizabeth Boardman Radiation Oncology	Mercy Health – Austintown Radiation Oncology
Location	1001 Covington St. Youngstown, OH 44510	8401 Market St. Boardman, OH 44512	667 Eastland Ave SE. Warren, OH 44484	6262 Mahoning Ave, Austintown, OH 44515
Linacs	Elekta Versa x2	Elekta Synergy	Elekta Versa	Elekta Synergy
Stereotactic	Brain and Body	No	No	No
EMR	Mosaiq	Mosaiq	Mosaiq	Mosaiq
TPS	Pinnacle (through 2026) Eclipse Monaco (SRS Module)	Pinnacle Eclipse	Pinnacle Eclipse	Pinnacle Eclipse
Imaging/CT Sim	GE Optima 580	GE Optima 580	GE Optima 580	GE Optima 580
Morning QA	SNC Daily QA3	SNC Daily QA3	SNC Daily QA3	SNC Daily QA3
IMRT QA	ArcCheck MapCheck3 SRS Mapcheck	ArcCheck	ArcCheck	ArcCheck
Beam Scanning	PTW	PTW	PTW	PTW
2nd MU Check	Rad Calc	Rad Calc	Rad Calc	Rad Calc
HDR Brachytherapy	Oncentra Elekta Flexitron	None	None	None
LDR Brachytherapy	None	None	None	None
In-vivo Dosimetry	TLD – Mail in Service	TLD – Mail in Service	TLD – Mail in Service	TLD – Mail in Service

CLINICAL ENVIRONMENTS – St Louis Affiliate

Location	HSHS St Elizabeths Hospital - Cancer Care Center of O'Fallon	SSM St Mary's	SSM St Claire
Location	321 Regency Park O'Fallon, IL 62269	6420 Clayton Rd Richmond Heights, MO 63117	1015 Bowles Ave, Fenton, MO 63026
Linacs	TrueBeam	TrueBeam	TrueBeam
Stereotactic	MLC & Cone - Brain & Body	MLC-Brain & Body	None
EMR	ARIA 16.1	Aria 15.6.8	Aria 15.6.8
TPS	Eclipse 16.1	Eclipse 15.6.8	Eclipse 15.6.8
Imaging/CT Sim	Siemens Somatom Big Bore	Philips Big Bore	Philips Big Bore
Morning QA	SNC DailyQA3	SNC DailyQA3	SNC DailyQA3
IMRT QA	Portal Dosimetry SNC Devices	Portal Dosimetry SNC Devices	Portal Dosimetry SNC Devices
Beam Scanning	SNC 1D Tank SNC Profiler SNC 3D Tank	SNC 1D Tank SNC Profiler	SNC 1D Tank SNC Profiler
2nd MU Check	Mobius and ClearCalc	RadCalc 3D	RadCalc 3D
HDR Brachytherapy	None	Oncentra Elekta Flexitron	None
LDR Brachytherapy	None	None	Prostate Seeds
In-vivo Dosimetry	GafChromic Film	MOSFETs	MOSFETs

PROGRAM OUTLINE

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Each 3-month rotation has a specific focus item but also is designed to include some general medical physics responsibilities. By incorporating both a focus area and a broader scope across the clinical practice, each resident is able to meet the focus requirements while maintaining the broad range of clinical skills necessary to succeed in the Medical Physics field. While the overall responsibility of completing readings, assignments and competencies on time lies with the resident, each 3-month rotation is led by a program staff member who will meet approximately weekly with the resident to be a support to the resident. About half of these "Mentor Meetings" (also called "Weekly Check-Ins") are specifically focused on one of the reading assignments or focus topics to give a dedicated time for the resident to ask questions and for the mentor to gauge the resident's understanding of the topic area.

Year 1 Quarter 1 – Rotation 1: Introduction, Oncology Clinical Roles, Information Technology & Introduction to Treatment Planning

An introduction to the workplace and field of radiation oncology starts with shadowing of the physician and nursing staff. Early skills needed- to be able to use physical principles to generate treatment plans- are practiced with supervision under certified dosimetry staff. The resident will start the workflow of a patient plan, from simulation to treatment and shadow the radiation therapists. Medical ethics and confidentiality are guiding principles reviewed and documented during this first rotation. There are many ancillary teams and staff who make the integration of the modern information driven radiation oncology department function; learning the landscape of how informatics drives and connects the various components is vital to long term success.
During this rotation:

A. One Physics Onboarding and Orientation will be Completed.
B. All necessary documentation for the hospital and program Human Resources will be complete.
C. The resident will become acquainted with the nursing, therapist and physician teams taking special consideration in matters of medical ethics and confidentiality.
D. The resident will become familiar with simulation, Monitor Unit calculations, 2D dosimetry methods and treatment planning systems.
E. The resident will observe and then perform the routine Quality Assurance of a medical linear

accelerator.

F. The resident will become familiar with the use of computerized hospital-based information systems needed to perform routine tasks.

Year 1 Quarter 2 – Rotation 2: Treatment Planning

Rotation 2 includes the bulk of Clinical Treatment planning training and competencies. Rotation 2 also introduces the "ongoing routine physics work" that always persists. Residents are expected to have 35 clinical plans completed prior to the Rotation 2 exam (nominally at the 6 month mark). After that, each resident will continue to complete approximately 1-2 clinical treatment plan(s) per week for an entire residency total of 100-200 total plans.

During this rotation:

A. The resident will be able to demonstrate detailed knowledge of CT based anatomy/ contouring

B. The resident will be able to demonstrate competency in Image Registration/Fusion

C. The resident should demonstrate competency in Initial Plan Check, Weekly Chart Check and End of Treatment Chart Review.

D. The Resident will perform clinical 3D and IMRT treatment plans and prepare them for treatment

E. The resident will start participating in routine patient specific Quality Assurance.

F. The resident will start participating in routine Monthly Machine QA

Year 1 Quarter 3 – Rotation 3: Machine QA

Rotation 3 is focused around Machine QA. Linear Accelerator QA including Calibration, monthly QA, Imaging System QA (IGRT) and non-imaging system QA. A sub-focus on Diagnostic imaging such as PET and MRI QA will also be done during this rotation.

aseline dosimetry of radiation machines includes specialized use of sensitive radiation detection systems, calibrated against a known standard. Information in the protocols for calibrating radionuclides will be discussed later. This rotation focuses on the calibration of electronically produced radiation from kilovoltage and megavoltage sources. The protocols and their addendums contain some background theory, but the majority of the work is centered around specific applications of cavity theory. Being able to produce a precisely known dose per setting is vital to treatment accuracy and efficacy.

During this rotation:

A. The resident will be able to demonstrate understanding of the operational principles of a megavoltage medical linear accelerator.

B. The resident will be able to show competency in participating in TG-51 output calibration.

C. The resident will be able to show ability to diagnose when QA reveals parameter is out of tolerance.

D. The resident will participate in and then perform SGRT QA, Isocenter QA, Image Quality calibrations

E. The resident will participate in an Annual review of a medical accelerator.

F.

Year 1 Quarter 4 – Rotation 4: Dosimetry Systems

Rotation 4 focused on the equipment used to detect and measure radiation, and the theory surrounding them. In this rotation, not only are measurement tools used (e.g. for Patient Specific QA and Machine QA) but the resident will explore why they are chosen for the purpose and what the pros and cons of different tools are. Most detection and calibration methods come from the use of various gas-filled detectors operating with bias across chamber of gas; other solid state and luminescent methods exist. Physical principles needed to describe multiple phenomena are found in production and detection of radiation.

During this rotation:

A. The resident will be able to demonstrate understanding of the operational principles of a megavoltage medical linear accelerator.

B. The resident will be able to compare and contrast different Patient Specific Delivery QA methods and analyze PSQA results.

C. The resident will be able to describe the operational principles and appropriate selection of gas-filled radiation detectors.

D. The resident will be able to describe the physical principles and methods for other dosimeters used, including diodes, luminescent dosimeters and film, and their calibrations.

E. The resident will be able to describe features of the electronic portal imager and its pros and cons as a QA tool.

Year 2 Quarter 1 – Rotation 5: Brachytherapy

Radionuclides are capable of providing diagnosis and therapy in radiation oncology. Therapeutic sources of radioactivity are separated as sealed and unsealed- with the sealed seeds being of primary focus here for treatment at short treatment distances of several cm from applicator. Unsealed therapeutic sources are generally handled by a general MIRD type calculation and are not considered more precisely than the standard model scaled by activity administered. Their introduction is necessary as a potential source of radiation safety concern, and demonstrations are available for completeness.

Sealed radioactive seeds are characterized by their dose rate and isodose delivery distributions. The dose rate is verified on site by the physics staff, using calibrated instrumentation and methods specific to the seed. The relative isodose distribution is handled by the manufacturer or treatment planning vendor- verified in the literature. Film methods to verify applicator and source characteristics will be explored. All steps during the process require attention to give accurate dose deposition and the ability to create predictive treatment plans. All steps have federal and state regulatory guidance that may not exist for electronic sources of radiation (in the particular state).

During this rotation:

A. The resident will become proficient in all routine QA and source exchange checks associated with the HDR Remote Afterloader.
B. The resident will be able to describe the setup considerations of a proposed HDR program, taking into consideration all applicable safety guidelines and regulations.
C. The resident will become proficient in HDR treatment planning.
D. The resident will observe and provide support for unsealed radionuclide therapy (where applicable) or review the common practices associated with radionuclide therapy and discuss the implementation of such a program.
E. The resident will review the common techniques and prescriptions associated with LDR planning of permanent prostate seed implant.

Year 2 Quarter 2 – Rotation 6: Commissioning

Full accelerator commissioning after Acceptance Testing involves numerous measurements used to create the predictive model in the treatment planning systems, as well as serving for MU calculation 2nd checks (hand calcs). The nature of these measurements and subsequent verification relies heavily on understanding the physical principles and possible limitations of each type of detector or dosimeter. During this rotation, the resident will acquire data from a linear accelerator to create a 3D treatment planning system model and a set of tables that may be used for independent checks. Once the treatment planning algorithm has populated data, verification of the model will require a thorough review. This process will take the treatment planning skills used previously and increase their use as the resident performs both a treatment planning system quality assurance and establishes baselines for future comparison.

During this rotation:

A. The resident will be able to describe the purpose and testing of an accelerator acceptance.
B. The resident will collect the initial data in commissioning needed to create a treatment planning system model of an accelerator.
C. The resident will verify their treatment planning system model for open beams, accessories and dynamic MLC based delivery.
D. The resident will demonstrate comprehension of the different types of algorithms and heterogeneity corrections.
E. The resident will perform an MPPG 5 test sequence.

Year 2 Quarter 3 – Rotation 7: Stereotactic Treatment and Reirradiation Considerations

Rotation 7 is centered around SRS, fSRT and SBRT but also includes exploration of other special procedures within the Radiation Oncology landscape. This rotation also puts a focus on BED, EQD2 and reirradiation scenarios and how to handle complex scenarios. Dose escalation and hypofractionation are now routine

parts of the clinic. Historically, the margins around target structures were designed with microscopic disease treatment unseen in mind; dose fractionation schemes were designed normal tissue side effects in mind because of the additional tissues irradiated. During the course of the 2010s, it became routine clinical practice to escalate dose to the target and decrease margins- based on the advances in imaging and target delineation. Stereotactic treatment refers to highly conformal localized treatment to maximize tumor response and minimize normal tissue complications. Typically delivered in 5 or less fractions and in smaller fields, higher doses and biologically effective doses are used. This higher dose requires additional precision in delivery and enhanced quality assurance.

During this rotation:

A. The resident will be able to perform calculations of Biologically Effective Dose for targets and normal tissues to compare treatment regimens.
B. The resident will demonstrate specific anatomical and dosimetric guidelines in comparing hypofractionated and single fraction treatment courses.
C. The resident will be able to perform and evaluate Winston-Lutz tests of mechanical and radiation isocenter agreement.
D. The resident will be able describe potential dosimetry issues in treatment plans with small fields.
E. The resident will be able to demonstrate treatment planning of highly conformal, non-coplanar strategies used in stereotactic.
F. The resident will perform QA associated with a stereotactic program and an end-to-end test of a stereotactic test plan.
G. The resident will become familiar with the guidelines of the RTOG and NRG stereotactic protocols.
H. The resident will become familiar with FMEA methodology and process analysis

Year 2 Quarter 4 – Rotation 8: Shielding in Medical Facilities

The final rotation is spent on shielding in medical facilities. One of the main concentrations of this rotation will be on review of radiation safety. This will include NRC and/or state regulations, quality management programs, and structural shielding design. There will be opportunity to review shielding for low dose rate, diagnostic energy and nuclear medicine applications. In addition to continued QA and chart checks the rotation will conclude with a sample shielding design and report, followed by a radiation protection survey of an accelerator room.

During this rotation:

A. The resident will demonstrate knowledge of applicable state and federal radiation safety guidance for workers and the general public.
B. The resident will demonstrate understanding of Quality Management in radiation oncology
C. The resident will demonstrate shielding calculations and considerations for construction of an HDR suite

D. The resident will demonstrate shielding calculations and consideration for the construction of a MV linear accelerator vault.

E. The resident will perform a shielding survey of an accelerator vault

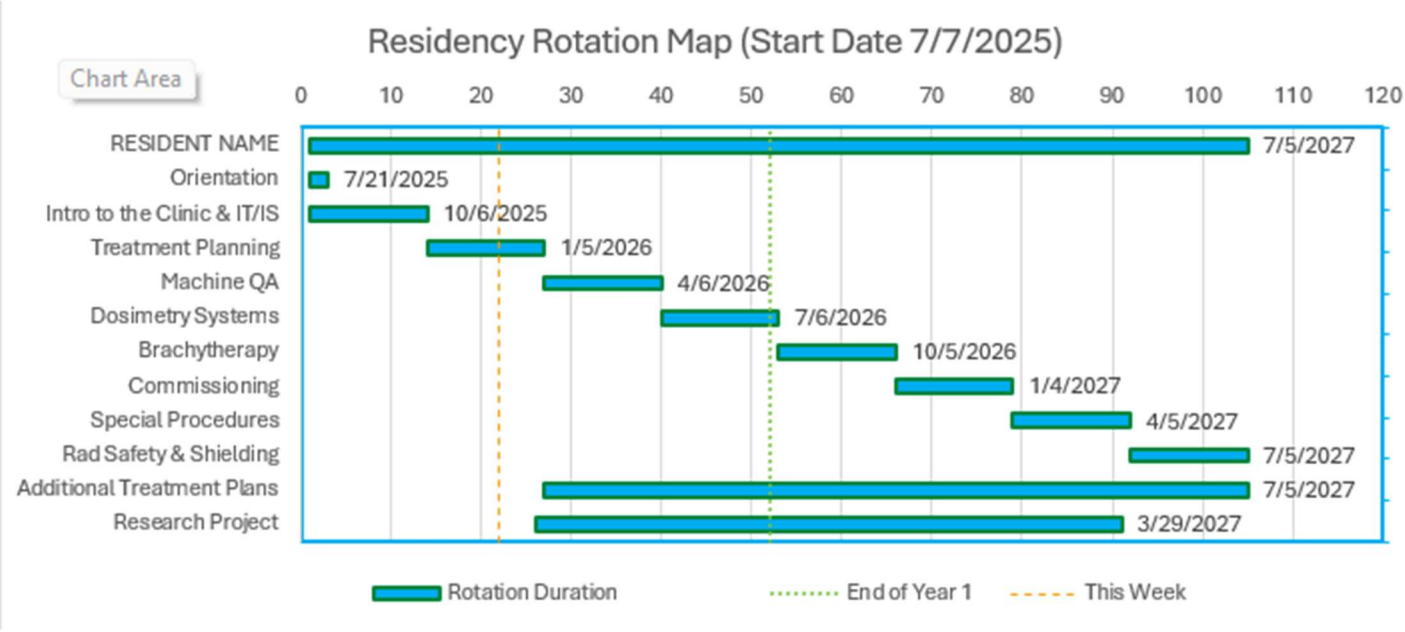
Rotation 9: Research Project

The Resident Research Project or Clinical Improvement Project is not bound to a specific timeframe but rather is done in parallel with the rotations. The typical resident has selected/begun their research project by the end of rotation 2 so as to allow enough time to be able to present their work at a meeting (Spring Clinical Meeting, AAPM Annual Meeting, ASTRO, RSS, Chapter Meeting etc.) Presenting the work is encouraged but not required for graduating.

Additional Treatment Planning

This is comprised of the 1-2 plans per week that are done to continue to sharpen the residents' treatment planning skills over the latter 18 months of the program. The expectations is that they will go from the 35 plans required at month 6 to around 100-150 plans by the end of the residency.

An Example Rotation Map:



BENEFITS

The following is intended to be a summary of some of the fringe benefits offered by One Physics. The corporation reserves the right from time to time to change or discontinue any one or more of the fringe benefits which it offers. When they differ, benefits listed here are superseded by those listed in the One Physics Employee Handbook.

Compensation

First year residents will receive annual salary of $64,000.
Beginning in year 2, residents will receive a 3% employer contribution to a 401k retirement plan.

Insurance

Health insurance benefits (Currently through Cigna) are effective the first of the month following the resident start date. Several different plan options (Gold, Silver, Bronze) with different deductible and premium levels are eligible to be selected.
Vision and dental plans are included. The Employee premium is covered by the company, but a portion of the additional premium for dependents is the responsibility of the employee.

Meetings

One Physics allows reimbursement for one meeting per year of up to $3,000. Residents will be granted permission for one meeting and may be approved for travel to a second during the 2 year residency. Permission to attend a second meeting is typically approved when the resident is presenting their work at the meeting. No travel arrangements should be made before approval by the program director.

Professional Associations / Books / Journals

In keeping with the philosophy that residents are expected to keep current in the field, all resident employees are expected to maintain membership in the American Association of Physicists in Medicine (AAPM) at the national level
Reimbursement of books and/or journals may be reimbursed based upon prior approval by the Corporation.

Paid Time Off (PTO)

PTO includes Vacation and Sick time and is accrued at a rate of 10 hours per month for a total of 15 clinical days per year. In addition to the 15 clinical PTO days, 9 holidays (New Year's Day, MLK Day, Memorial Day, Juneteenth, 4th of July, Labor Day, Thanksgiving, Day after Thanksgiving, Christmas Day) are given. If the clinic is open on one of the holidays, a "Floating holiday" is added to the resident's PTO bank. Each period of vacation is subject to approval by the Corporation depending on availability of coverage. Vacation requests must be made >3 days in advance using ADP. No vacation may be rolled into the following year and any excess vacation time at the end of a residency year will be forfeited

Extended Leave

Extended Leave, whether due to illness, injury, Maternity/Paternity shall be granted by mutual agreement

between the resident and the program. Residents would be eligible for FMLA after having worked 12 months and at least 1,250 hours. Residents in their first year would be eligible to request an unpaid personal LOA. In either case, extended leave would necessitate a residency extension equaling to the total days missed less 40. Per CAMPEP Requirements, the maximum number of days leave without extending the duration of the residency is 40 days per year of all types of leave (PTO + Holiday = 24 + all other leave = total days). If the residency duration is to be extended (whether due to exceeding the 40 day limit or upon mutual agreement between the resident and the program), the duration of the agreed upon leave will be added to the end of the current Residency year to ensure that the full 24 months of training is completed in accordance with CAMPEP Standards.

RESTRICTIVE COVANENTS (THE FINE PRINT)

Resident shall not, individually or on behalf of or in conjunction with any other individual or entity (except for or on behalf of Employer), directly or indirectly, undertake any of the following actions:

a. Non-Solicitation of Clients. Commencing on the Effective Date and continuing for a period of two (2) years after Resident's termination of employment with Employer, Resident shall not directly or indirectly, solicit or attempt to solicit any of the hospital or medical facility clients of Employer for the purpose of diverting such clients to an individual, company, or entity other than Employer.

b. Non-Solicitation of Employees. Resident shall not, directly or indirectly, solicit, hire, employ or contract with, as an employee or independent contractor, any present or future employee or future employee of Employer, for a period of two (2) years from the expiration or termination of Resident's employment hereunder.-

c. Non-Affiliation. During the Term and continuing for a period of two (2) years after Resident's termination of employment with Employer, Resident shall not, within a 50 mile radius of any location where the Resident provided Services, provide services in competition with those offered by the Employer, or provide medical services to, or manage, operate, control, be employed by, provide administrative or clinical services to (including, but not limited to, medical director services), participate in, receive substantial financial assistance from (including, but not limited to, stipends, loans or compensation for administrative services), or be connected in any manner with the provision of services for, or with the ownership, management, operation or control of, any corporation, partnership, proprietorship, joint venture, or limited liability company that is owned, controlled, managed or financed by another entity engaged in a business that is the same as or similar to all or any part of the business of the Employer or the services provided by the Employer.

d. Trade Secrets and Confidential Information*. Resident acknowledges that during the term of this Agreement he shall have access to and shall acquire confidential information relating to the business and operations of Employer, including, but not limited to, customer lists and records, policy manuals, business contracts and information, and other confidential and/or proprietary information relating to any of Employer's plans, methods of doing business and/or operations (collectively referred to herein as the "Confidential Information"). Resident acknowledges that all of the Confidential Information is solely the property of Employer and constitutes trade secrets and confidential information of it, and upon the expiration or termination of his employment with Employer for any reason, his knowledge of the Confidential Information shall enable him to compete with Employer in a manner likely to cause it irrevocable harm upon the disclosure of such matters. Resident hereby irrevocably represents, warrants, and covenants that commencing on the Effective Date and for a period of two (2) years after his employment with Employer ceases or is terminated for any reason: (i) he shall not use or disclose or allow to be used or disclosed, directly or indirectly, any of the Confidential Information to or by any individual, firm, corporation, or other entity, (ii) he shall return all of the Confidential Information in his possession to Employer within five (5) calendar days after the date he ceases to be employed by the Employer, and (iii) he shall certify to Employer that he has so complied.

* All educational material (notes, papers, presentations, study materials etc) do not qualify as Trade Secrets, Confidential Information of Intellectual Property.