

**Radiology Resident Research Block**  
**Department of Radiology, University of Illinois at Chicago**  
**Effective Date: 9/6/2020**

<b>Name of Rotation:</b>	Radiology Resident Research Rotation
<b>PGY Level:</b>	PGY4 – PGY6
<b>Supervising Attending(s):</b>	Various

**I. Competency-based goals and objectives for each trainee assignment at each educational level:**

The educational goals of this rotation reinforce the overall goals of the residency program by addressing important foundational skills and knowledge that are central to ACGME core competencies as described below. The proposed block would provide a 2- or 4-week consecutive block for a research or scholarship project to engage in a defined research or scholarship activity under the supervision of a faculty sponsor/principal investigator, with a defined expected product to be presented at institutional, local, regional, national, or international meetings (including a departmental presentation at the end of the block), and will be included in each trainee’s Learning Portfolio. Examples of non-research scholarship projects include, but are not limited to, quality improvement (QI)/educational/systematic review projects. Trainees would generally be limited to a total of 4 weeks of research block over the course of their residency (either a single 4-week block or two separate 2-week blocks). However, R4 and R5 residents may be eligible for up to an additional 4 weeks of research block (8 total) with the approval of the Program Director in coordination with the Vice Head for Research and Chief Residents, provided they are making appropriate progress in all expected residency training benchmarks.

Research activities will contribute strongly to trainees’ achievement of the ACGME core competencies at any level of educational training, as described further below:

Program Curriculum:

- IV.A.6. The curriculum must contain the following educational components: advancement in the residents’ knowledge of the basic principles of scientific inquiry, including how research is designed, conducted, evaluated, explained to patients, and applied to patient care.

Patient Care:

- IV.B.1.b).(1) Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.
- IV.B.1.b).(2) Residents must be able to perform all medical, diagnostic, and surgical procedures considered essential for the area of practice.
- Research activities in radiology typically involve performance of surgical procedures and/or the generation and interpretation of diagnostic images. Performing these activities in the process of research is directly translatable into the skills used in routine patient care.

- Research activities also have a broader aim of translating research knowledge into clinical care that is more effective and efficient.

Medical Knowledge:

- IV.B.1.c).(1).(a) The principles of medical imaging physics, including CT, dual-energy X-ray absorptiometry, fluoroscopy, gamma camera and hybrid imaging technologies, MRI, radiography, and ultrasonography.
- IV.B.1.c).(1).(b) Non-interpretive skills, including health care economics, coding and billing compliance, and the business of medicine.
- IV.B.1.c).(1).(c) Appropriate and patient-centered imaging utilization.
- IV.B.1.c).(1).(d) Quality improvement techniques.
- IV.B.1.c).(1).(e) Radiologic/pathologic correlation.
- IV.B.1.c).(1).(f) Physiology, utilization, and safety of contrast agents and pharmaceuticals.
- Depending on the research topic and frame, the research activity is likely to build on multiple of these core competencies.

Practice-based Learning and Improvement:

- IV.B.1.d).(1).(a) Identifying strengths, deficiencies, and limits in one's knowledge and expertise.
- IV.B.1.d).(1).(f) Locating, appraising, and assimilating evidence from scientific studies related to their patients' health problems.
- IV.B.1.d).(1).(g) Using information technology to optimize learning.
- Appraising the assimilating evidence of scientific studies in fundamental to research, as is using information technology to further develop the research activity.
- Through the research activity, the trainee will encounter limitations in their knowledge and expertise and develop strategies to improve their knowledge and skills, and overcome those limitations.

Interpersonal and Communication Skills:

- IV.B.1.e).(1).(a) Communicating effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds.
- IV.B.1.e).(1).(a).(i) Residents must demonstrate competence in obtaining informed consent and effectively describing imaging appropriateness, safety issues, and the results of diagnostic imaging and procedures to patients.
- IV.B.1.e).(1).(b) Communicating effectively with physicians, other health professionals, and health-related agencies.
- IV.B.1.e).(1).(c) Working effectively as a member or leader of a health care team or other professional group.
- IV.B.1.e).(1).(d) Educating patients, families, students, residents, and other health professionals.
- Through research activities the trainee may improve interpersonal and communication skills through activities including (but not limited to) informed consent, working with interdisciplinary teams as well as other health-related agencies, and education of research subjects, other trainees, and other health professionals.

Professionalism:

- IV.B.1.a).(1).(c) Respect for patient privacy and autonomy.
- IV.B.1.a).(1).(d) Accountability to patients, society, and the profession.
- IV.B.1.a).(1).(e) Respect and responsiveness to diverse patient populations, including but not limited to diversity in gender, age, culture, race, religion, disabilities, national origin, socioeconomic status, and sexual orientation.
- IV.B.1.a).(1).(g) Appropriately disclosing and addressing conflict or duality of interest.
- Research activity promotes all these components of professionalism through processes including IRB approval, following professional standards of research ethics, and following standards of research enrollment and informed consent.

Systems-based Practice:

- IV.B.1.f).(1).(c) Advocating for quality patient care and optimal patient care systems.
- IV.B.1.f).(1).(d) Working in interprofessional teams to enhance patient safety and improve patient care quality.
- IV.B.1.f).(1).(e) Participating in identifying system errors and implementing potential systems solutions.
- IV.B.1.f).(1).(f) Incorporating considerations of value, cost awareness, delivery and payment, and risk-benefit analysis in patient and/or population-based care as appropriate.
- Research activity, especially when related to quality improvement, provides the trainee with skills across all these purviews of systems-based practice.

**II. Regularly scheduled didactic educational experiences:**

During this 2- or 4-week research block, trainees will continue to attend all regularly scheduled didactic educational experiences as if they were on a regular clinical service. This includes the Tuesday morning didactic block from 8AM-12PM, noon conferences on Wednesday, Thursday, and Friday, as well as other inter-professional conferences such as tumor boards. Trainees will attend these didactics in-person or virtually via WebEx. This research block will therefore not detract from any of the regularly-scheduled didactic experiences already in place in the program.

**III. Delineation of trainee responsibilities for patient care, progressive responsibility for patient management, and supervision of trainees over the continuum of the program:**

Trainees will continue to be responsible for all normally scheduled call responsibilities assigned during the block at all sites, including short calls, weekend calls, and night float responsibilities. Trainees will also be responsible for any normally assigned interdisciplinary conferences such as tumor boards. This will allow continuation of trainee responsibilities in these areas. Supervision of trainees during these call responsibilities will be unchanged. As trainees are limited to a total of 4 weeks of research block over the course of a 4- or 5-year residency program, there will be little to no disruption in the trainee responsibilities for patient care and progressive responsibility for patient management. The skills and knowledge developed in conducting research activities supplement and strengthen those built

during every day clinical services, and can help build skills that will be required for trainees who wish to pursue further academic activities as they transition into becoming independent practitioners.

#### **IV. Support Services**

Leveraging our state-of-the-art imaging capabilities, modern laboratory and animal facilities, and multidisciplinary cross-functional team of investigators, the Department of Radiology has a solid track record for academic productivity and mentorship, and offers an enriching scholarship environment for trainees. The Department of Radiology research and clinical faculty exceed 25 total members, supporting capability for ample mentorship. The Department of Radiology also has numerous post-doctoral research associates, research associates, graduate students, and medical students to support resident physician research.

The Department of Radiology supports laboratory work in a dedicated first floor lab space in the UI Incubator Laboratory Facility (ILF) building, which supports both independent researchers across the UIC College of Medicine. The facility is home to three floors of laboratories, and laboratory floors include laboratory benches, fume hoods, sterilizers, biological safety cabinets, combination washer/dryer units, high performance ovens, ice machines, x-ray processor machines, and environmental rooms. Radiology's 2,500 square foot lab is outfitted with cell culture facilities with laminar flow hoods, carbon dioxide incubators, water baths, fume hoods, PCR thermocyclers, gel electrophoresis equipment, UV transilluminator with camera, absorbance reader, centrifuges, vacufuge, vortexes, low temperature freezers, refrigerators, liquid nitrogen storage facilities, and other essential equipment.

The Radiology research team has administrative office, work, and conference space in the state-of-the-art University of Illinois Outpatient Care Center as well as the Westside Research Office Building (WROB). Four conference rooms—housed in the Department of Radiology, in the University of Illinois Outpatient Care Center, in the ILF building, and in the WROB—are available for research group meetings.

The Department of Radiology supports resident research and scholarship seminars, including scheduled monthly seminars include Grand Rounds, "Works in Progress" talks, resident scholarship series lectures, and a resident annual presentation forum. The Department of Radiology supports national academic meeting and conference presentation by Departmental trainees and medical students involved in research and scholarly activities. The Department of Radiology supports statistical research consultation and service through the University of Illinois at Chicago Center for Clinical and Translational Science Biostatistics Core for Department of Radiology faculty members

Department of Radiology investigators have access and subsidized rates to all of the Research Resources Center (RRC) Core Facilities at UIC. Investigators may conduct animal work at the Biological Resources Laboratory. Investigators have full access to the UI Health Sciences Library in Chicago. Biostatistical services are available via the University of Illinois Center for Clinical and Translational Science, as well as the University of Illinois Cancer Center. Investigators also have access to statistical software including SPSS version 22 (SPSS Inc., Chicago IL) and SAS 9.4 (SAS Institute, Cary NC).

## V. Project Evaluation

The trainee's research or scholarship project will be evaluated after departmental presentation of the project at the end of the block. The project will be evaluated by Department Faculty member(s) including at least one of the following: Program Director, Vice Head for Research, Assistant Program Director, or Section Chief. Faculty members involved directly or indirectly in the project will be recused from formal evaluation of the project.

The following rubric will be utilized to evaluate the project on a scale of 0-100:

- Organization and clarity (maximum 40 points total)
  - Overall clarity of the project in terms of research/QI/educational question (maximum 10 points), clear and testable hypothesis/intent (maximum 10 points), design adequate to answer hypothesis/intent (maximum 10 points), and outcomes/alternative approaches (maximum 10 points)
- Scientific/educational merit (maximum 20 points total)
  - Originality and significance of the research/QI/educational project from a clinical, educational and/or basic science perspective (maximum 10 points)
  - Completed project will be publishable or suitable for presentation at a professional meeting (maximum 10 points)
- Feasibility/timeliness (maximum 20 points total)
  - Trainee's role in the research/QI/educational project were clearly defined, and tasks are at appropriate level for resident's PGY level (maximum 10 points)
  - Major goals outlined in the research/QI/educational project proposal are met or will be met within a reasonable and planned timeline (maximum 10 points)
- Educational value (maximum 10 points total)
  - Project provides a "learning experience" for the resident (maximum 10 points)

Final grading of the project will be based on the rubric scores as follows, averaging scores if there are multiple evaluators:

- **Excellent:** 90-100
- **Good:** 75-89
- **Average:** 60-74
- **Unacceptable:** <60