

# Radiology Residency Research Curriculum

The DHMC Radiology Department supports and promotes research as part of residency training. Our goal is to provide all residents with an understanding of how to analyze the medical literature and apply it to their work in imaging and patient care. In addition, we aim to provide residents with opportunities to participate in research during their training according to their interests and career goals.

The following is designed as a 4-year curriculum for all radiology residents to achieve competency in research and scholarly activity as required by the ACGME. The research curriculum consists of:

1. Didactic lectures to be given to all residents on a 2-year schedule. Additional resources will be made available to supplement education as needed by individual residents.
2. An annual Research Fair for attendings to present their ongoing research efforts and recruit residents as appropriate.
3. Annual presentation of residents' research and scholarly projects.
4. Monthly Journal Club meetings for residents to discuss and critically analyze the current medical literature.
5. Scholarly activity to be completed by each resident, as defined by the ACGME guidelines.
6. [Dedicated 4th year research elective](#), optional, for residents with a particularly strong interest in conducting primary research.

## Resident Research Committee

- Members include Lewis, Eskey, Sin, Pastel, Diflorio, resident representative
- Director is Jessica Sin
- Meetings every 2 months
- Purview includes curriculum development and oversight, review of planned and current resident research projects especially those on the research elective

## Curricular Learning Objectives

Through this curriculum residents should be able to:

1. Critically analyze current medical literature to evaluate study strengths and weaknesses and identify potential research opportunities.

2. Apply research ethics to study design, data collection, and result reporting.
3. Identify appropriate study design methodologies and their limitations for specific research questions.
4. Apply appropriate key research methodology including basic biostatistics for data analysis.
5. Outline the key components of a meritorious research grant proposal, and identify appropriate local/national pilot grant funding opportunities for new investigators.
6. Describe the components of writing a manuscript, selecting an appropriate journal for publication, and the process of peer review.
7. Effectively communicate research results via oral or poster presentations.

## Didactic Lectures

The following lectures will be given on a 2-year repeating schedule to meet the curricular learning objectives:

### Analysis of Medical Literature:

- Critical Analysis of the Medical Literature - Stephen Guerin
- Outside speakers including Robin Larson

### Ethics:

- Research Ethics - James Bernat

### Study Design:

- Design and Pitfalls of Screening Studies - William Black
- Test Performance Characteristics - William Black

### Biostatistics:

- Research Bootcamp for New Investigators - AUR  
(<https://www.youtube.com/watch?v=AuA7VNo5Q60&feature=youtu.be>)

### Grant Proposal:

- Where to look for funding and how to apply - David Pastel

### Manuscript Writing:

- Standards for Manuscript Preparation and Peer Review - Lionel Lewis

### Oral & Poster Presentations:

- Brain-Friendly Teaching - Petra Lewis
- Making A Better Research Poster - American Journal Experts  
([https://www.youtube.com/watch?v=AwMFhyH7\\_5g](https://www.youtube.com/watch?v=AwMFhyH7_5g))

## Supplementary Resources:

The Geisel Radiology Website Research Section has a useful section on the Nuts & Bolts to get started on a research project, including links to CITI training and sources of funding:

<https://geiselmed.dartmouth.edu/radiology/research/>

These additional educational materials are optional for residents to address specific areas of interests as needed for their research efforts.

- CITI training and certification (required for all residents participating in primary research)
- AUR Radiology Research Alliance Online Statistical Webinar Series (<https://www.aur.org/RAHSR-RRA-Statistical-Webinar-Series/>)
- TDI resources below

## Dedicated Training in Study Design and Biostatistics (also see TDI below)

- We are negotiating a 2-3 day mixed local and web based course for 2nd year residents in the fall run by the University of Toronto - details TBD

## Journal Club

- Monthly Journal Club - articles from the literature are presented by residents in 2nd and 3rd years, moderated by Stephen Guerin

## Scholarly Activity

Each resident is required to complete at least one scholarly activity as defined by ACGME guidelines. ([https://www.acgme.org/Portals/0/PDFs/Specialty-specific%20Requirement%20Topics/DIO-Scholarly\\_Activity\\_Resident-Fellow.pdf](https://www.acgme.org/Portals/0/PDFs/Specialty-specific%20Requirement%20Topics/DIO-Scholarly_Activity_Resident-Fellow.pdf))

Any presentations accepted for regional or national conferences should be presented to the department for feedback prior to the conference.

## Funding opportunities for residents:

### Hitchcock Foundation

[http://med.dartmouth-hitchcock.org/hitchcock\\_foundation/research\\_grants\\_and\\_deadlines.html](http://med.dartmouth-hitchcock.org/hitchcock_foundation/research_grants_and_deadlines.html)

### Radiological Society of North America

[https://www.rsna.org/Research\\_Resident\\_Grant.aspx](https://www.rsna.org/Research_Resident_Grant.aspx)

**American Roentgen Ray Society**

<http://www.arrs.org/ARRSLIVE/ResidentAwards>

**American College of Radiology**

<https://www.acr.org/Member-Resources/rfs/fellowships>

**Society of Nuclear Medicine**

<http://www.snm.org/AboutSNM/Content.aspx?ItemNumber=16526>

(see Young Investigator Award)

**American Society of Neuroradiology**

<https://foundation.asnr.org/page/awards/>

(see Trainee Research Award In Neuroradiology)

**Society of Thoracic Radiology**

<http://thoracicrad.org/?portfolio=research>

**Society of Abdominal Radiology**

<https://www.abdominalradiology.org/?ResearchGrants>

**Society of Interventional Radiology**

[https://www.sirfoundation.org/grants\\_awards/current-opportunities/radiology-resident-research-grant/](https://www.sirfoundation.org/grants_awards/current-opportunities/radiology-resident-research-grant/)

**Society of Pediatric Radiology**

<https://www.pedrad.org/Research/SPR-Research-Education-Foundation/Research-Awards#1889454-young-investigator->

(Young Investigator Award - for senior residents transitioning to faculty)

**Society of Radiologists in Ultrasound**

<https://www.sru.org/SRU-Community/Awards>

(Member-In-Training award for best original research paper.)

## TDI Opportunities:

Synergy is funded until April 2019. If grant re-submission is successful, funding will continue beyond that. Meanwhile, any residents interested in Synergy resources should take advantage before April 2019.

- 1) There is currently no funding for residents, however they are welcome to use the Core services, such as Biostatistics and Research Design etc.

- 2) Residents are welcome to attend the current sessions for Synergy research fellows and scholars: 1st and 3rd Wednesday evenings Williamson 373 4-6 pm. Review of research works in progress: good exposure to existing research methodology and mentoring of those projects.
- 3) Online didactic material - there are numerous online courses and lectures from Synergy national network institutions: (need to access from DH or server):
  - a) <https://synergy.dartmouth.edu/national-resources>
  - b) <https://geiselmed.dartmouth.edu/synergy-guides/home/career-development/take-a-course/>
- 4) Link to the Harvard Medical School Global Clinical Scholars Research Training program - advanced training in the methods and conduct of clinical research (need to access from DH or server):  
<https://hms.harvard.edu/departments/global-clinical-scholars-research-training-program>