Research Resident Curriculum

This applies to research residents at the PGY 3 level

Department of Surgery
Brody School of Medicine, East Carolina University
Mission Statement:

The purpose of the research year is to provide the surgical resident with a comprehensive understanding of the principles of surgical research. These principles include critical review of the literature, project design, IRB approval, data collection and management, data analysis including statistical concepts, interpretation of results, abstract writing, oral presentation skills, and manuscript production. This understanding will provide the resident with the ability to better incorporate scientific advances into the daily practice of surgery. This experience will also provide the resident with a foundation of knowledge from which he may develop future research streams in his chosen field of surgery.

Requirements to be Completed Prior to Beginning Research Year:

- A single year devoted to research is a relatively brief time. Therefore it is imperative that the resident be ready to conduct research right from the beginning. In order to facilitate this immediate transition the following will need to be completed prior to beginning the research year.

- Preliminary design of the summer research project:

  - Complete a formal three page research proposal consisting of the following elements:
    - Background information including a pertinent review of the literature.
    - Formulation of a hypothesis and research question.
    - Develop preliminary research design
    - Plan for data analysis

  - Complete the University of Miami IRB certification

  - Initiate IRB paperwork
Learning Objectives, Academics and Course Work:

The resident will be expected to achieve the following learning objectives:

Medical Literature:

- Understand how to access the medical literature utilizing standard data sources including Pubmed, Ovid, MD Consult, Cochrane Evidence Based Medical Reviews, and professional society practice management guidelines.

- Develop the ability to critically review the basic and clinical surgical literature.

- Given that advances in non-surgical fields influence surgical research the resident will need to be facile in understanding basic research concepts in all medical and occasionally non-medical fields.

Hypothesis Development:

- Using the medical literature develop a novel research question.

- Learn to develop a clinically pertinent hypothesis and understand the concept of a null hypothesis.

Study Design (to be completed prior to initiation of study):

- Develop a study design to properly address the research question.

- Understand the concepts of Power Analysis and Sample Size Justification.

- Develop methods of data collection and data management.

- Determine appropriate statistical methods to analyze data in order to answer the research question.

- Formal presentation of study design at appropriate Research Meetings and approval by department chair.
Funding and Grant Submission:
- The resident is expected to gain a basic understanding of various funding sources and opportunities.
- The resident will understand the process of grant writing and submission.
- If appropriate the resident will directly participate in the writing and submission of a grant.

The Institutional Review Board:
- Develop an understanding of the ethical principles underlying the IRB.
- Understand the elements of informed consent and the development of a consent form.
- Complete an IRB application and complete revisions as appropriate.
- The resident will attend an IRB meeting to understand the process of study approval.

Animal Care and Use Protocol:
- Understand the use of animal models in surgical research, including the development of animal care and use protocols, limitations of animal research, and principles of ethical animal treatment.

Conduct a Research Project:
- Obtain consent if appropriate.
- Develop the ability to collect data from a variety of sources including prospective sources, chart review, and local, regional, and national databases.
- Be able to tabulate data and manage a data spread sheet.
Data Analysis:

- Learn ways to clean data.
- Understand basic and advanced tests used in the determination of statistical significance.
- Determine the difference between statistical and clinical significance.

Abstract Writing:

- Learn how to write and submit an abstract that accurately describes a complete study within a limited space.

Oral Presentation Skills:

- Develop confidence and poise while public speaking.
- Learn the appropriate use of audio-visual aids and technology.
- Learn principles of slide production.
- The resident will present results at regional and national scientific meetings.

Manuscript Production:

- Develop basic medical writing skills.
- Write and submit a complete manuscript.
- In order to understand the manuscript review process the resident will assist in the review of a manuscript submitted to the Journal of Trauma or Critical Care Medicine.
- Revise the submitted manuscript.
Academics & Course Work:

- The resident has access to various workshops offered by East Carolina University including the medical writing, research career development, public speaking, and basic medical statistics.

- The resident may also participate in the Resident Research Course offered by Association of Academic Surgeons.

- The resident will also attend the annual meeting of the American College of Surgery and in particular attend the Surgical Forum.

Expectations and Requirements:

- The resident is expected to develop and complete at least one independent research project over the year. The resident is expected to take these projects from literature review and development of research questions through data collection, analysis, and ultimately submission to a national meeting and manuscript production.

- The resident is expected to submit and if selected present the results of research projects at the various regional and national meetings including:
  - North Carolina Committee on Trauma Resident Paper Competition
  - Surgical Resident Research Day
  - Surgical Forum, American College of Surgeons
  - NC Chapter, American College of Surgeons Resident Research Forum
  - Southeastern Surgical Congress
  - Or other appropriate research form

- As the majority of the research questions arise from clinical practice the trauma research resident is expected to attend Surgical Morbidity & Mortality Conference and all other educational conferences. The resident is also expected to participate in all departmental educational activities.