

**GASTROENTEROLOGY FELLOWSHIP  
RESEARCH ROTATION  
GOALS AND OBJECTIVES  
University of Toledo**

**Educational Purpose:**

The Research Service introduces the fellow to the field of gastroenterology and hepatology research. While Year I fellows discuss and plan for future research, the Research Service is primarily designed for Year II and Year III fellows and allows time for research planning, work and post-research outcomes. The Division of Gastroenterology and Hepatology has a number of faculty with diverse clinical and academic interests, ensuring that fellows have complete opportunities to investigate the gastroenterology or hepatology research project of their choice generally designed and conducted in close interaction with their mentor. The fellow will participate in increasing levels of research activities, depending on the fellow's level of experience.

**Objectives:**

Fellows will follow a complete course of research study during this rotation including research ethics, project exploration, planning, actual research activity, analysis, written outcomes and, ideally, presentation of their project at a national GI or hepatology meeting or in a peer-reviewed journal. Fellows will display the following ACGME core competencies during this rotation: medical knowledge, practice-based learning, professionalism and systems-based practice. Minimum levels of achievement in each competency are expected during each of the three years of fellowship training. The following are the goals and objectives for each competency at each level of training for the GI Research Service:

**First Year Fellow:**

**Goal:**

The first training year is a time for fellows to attend conferences, explore research project ideas, and meet with current fellows and potential faculty mentors to discuss research ideas and feasibility. Year I fellows are expected to meet with one and preferably all of the following faculty leaders related to research goals: fellowship program director, fellowship associate director and division chief. Fellows are expected to select their research project and mentor before the end of their first year. Year I fellows are expected to attend the GI Research conference sessions at which Year II and III fellows present their research plans and outcomes.

The first year fellow is required to carry out one small research project during the first twelve months of training. This could be either as a published case report or abstract. During this period of time the fellow will be exposed to different areas in the field of gastroenterology as well as working with different faculty members.

<b>First Year Fellow</b>	
<b>Patient Care</b>	<ul style="list-style-type: none"> <li>• With the help of the research mentor, the resident will hone skills in identifying an understanding of clinical research histories and exams needed to evaluate patients participating in a clinical research trial.</li> <li>• Use a logical and appropriate approach to patients participating in clinical research.</li> <li>• Know and understand the clinical research protocol to provide appropriate consent for participation in a protocol.</li> <li>• Understand the scope of established and evolving biomedical, clinical, epidemiological and social behavioral knowledge needed in the clinical research protocol and demonstrate the ability to acquire, critically interpret and apply this knowledge in clinical research.</li> </ul>

	<ul style="list-style-type: none"> <li>The fellow will apply diagnostic and screening procedures to properly care for patients participating in clinical research.</li> </ul>
<b>Medical Knowledge</b>	<ul style="list-style-type: none"> <li>Attend core conferences and teaching rounds to learn the pathophysiology, epidemiology, disease management and procedure and medicine management skills for common and uncommon inpatient gastrointestinal diseases and related basic science, translational and clinical research.</li> <li>Accumulate and begin to solve the issues that he/she encounters from other trainees, attendings and related medical professionals. Begin to apply problem solving skills to research project analysis.</li> <li>Develop a commitment to inquisitiveness and novel thinking related to research investigations. While this objective is arguably innate and can be least affected by training, it is critical for success in independent investigations.</li> </ul>
<b>Practice-Based Learning and Improvement</b>	<ul style="list-style-type: none"> <li>Become familiar with the concepts of quality improvement.</li> <li>Participate in conferences such as the GI Research conference</li> <li>Begin to review, analyze and utilize scientific evidence from the gastrointestinal literature related to the fellow's research explorations and actual project.</li> </ul>
<b>Interpersonal and Communication Skills</b>	<p>(if patient or human subject interactions are needed for Year I research project):</p> <ul style="list-style-type: none"> <li>Interview patients and family members accurately, patiently and compassionately and present information in an understandable manner.</li> <li>Practice appropriate informed consent procedures.</li> <li>Ensure appropriate patient confidentiality measures.</li> <li>Plan patient and family conferences as needed.</li> <li>Communicate effectively with research mentor, research staff, administrative staff, peers, attending gastroenterologists, referring physicians and other consultants as needed. Ensure reporting honesty and authorship fairness throughout research activities.</li> </ul>
<b>Professionalism</b>	<ul style="list-style-type: none"> <li>Learn to understand and demonstrate professional behavior in daily activities.</li> <li>Participate in professionalism-based learning activities through conferences.</li> <li>Learn to interact collegially with his/her peer group and other healthcare professionals.</li> <li>Learn about and begin to practice appropriate research organizational skills including background study, hypothesis formulation, study design, statistics, data management and data interpretation.</li> <li>Learn to practice ethical principles with relation to medical research. Important ethical issues include confidentiality, informed consent, data safety, ownership and responsibility, reporting honestly, and authorship fairness.</li> <li>Learn to practice appropriate interactions with pharmaceutical representatives.</li> <li>Learn to be sensitive to cultural, age, gender and disability issues.</li> <li>Cross-cover colleagues' services when needed and conduct this coverage carefully with appropriate feedback to responsible colleagues.</li> <li>Participate in program planning, including annual Faculty Meeting attendance, Fellow Curriculum Committee participation and Program Director meetings when requested.</li> </ul>

<b>Systems-Based Practice</b>	<ul style="list-style-type: none"> <li>• Attend conferences concerning internal system research practices, research practices elsewhere, Internal Review Board (IRB) policies, and similar programs.</li> <li>• Achieve basic understanding of healthcare systems related to gastroenterology and hepatology research, related translational gastroenterology care and overall system activities.</li> <li>• Learn proper documentation skills to practice cost-effective research activities.</li> <li>• Utilize an appropriate range of healthcare professionals to explore research opportunities.</li> <li>• Begin involvement to understand the standard operating procedures and quality improvement initiatives within the hospital.</li> <li>• Attend national gastroenterology conferences (e.g., ACG).</li> </ul>
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**Second Year Fellow:**

**Goal:** The primary research rotation blocks occur in Year II. The fellow will formulate a testable hypothesis, propose a study design and complete most of his/her investigations during Year II, and will concentrating on data acquisition and management. An understanding of statistical analysis should be achieved. Prior to their research rotation, Year II fellows will meet with the fellowship program director to ensure reasonable research goals, and Year II fellows are also expected to present their research plans at the GI Research conference. The fellow will work closely with his/her research mentor to ensure appropriate research ethics including patient privacy, complete actual research activities and begin abstract or publication materials.

<b>Patient Care</b>	<p style="text-align: center;"><b>Second Year Fellow</b></p> <ul style="list-style-type: none"> <li>• With the help of the research mentor, the resident will hone skills in identifying an understanding of clinical research histories and exams needed to evaluate patients participating in a clinical research trial.</li> <li>• Use a logical and appropriate approach to patients participating in clinical research.</li> <li>• Know and understand the clinical research protocol to provide appropriate consent for participation in a protocol.</li> <li>• Understand the scope of established and evolving biomedical, clinical, epidemiological and social behavioral knowledge needed in the clinical research protocol and demonstrate the ability to acquire, critically interpret and apply this knowledge in clinical research.</li> <li>• The fellow will apply diagnostic and screening procedures to properly care for patients participating in clinical research.</li> <li>• Demonstrate knowledge of the roles of regulatory agencies in human subjects research</li> <li>• Demonstrate knowledge of the history of regulation of human subjects research</li> <li>• Demonstrate understanding of the ethics and safety concerns surrounding basic science research</li> <li>• Demonstrate knowledge of the policies for safely handling biohazardous specimens</li> <li>• Demonstrate knowledge of the policies for safely handling specimens that</li> </ul>
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	potentially contain blood-borne pathogens
<b>Medical Knowledge</b>	<ul style="list-style-type: none"> <li>• Improve understanding of research design and methodologies.</li> <li>• The resident should review and understand all principles of the scientific method.</li> <li>• Read textbook and pertinent literature materials concerning research methodology.</li> <li>• Generate patient-centered clinical questions to drive knowledge acquisition when designing a research study.</li> <li>• Identify one's knowledge deficiencies and develop a system for generating and answering clinical questions based on patient cases.</li> <li>• Assess the type of question being asked; in order to identify the type of study that would best answer the question.</li> <li>• Identify and efficiently locate the best available information resources to address one's question in developing a research project.</li> <li>• Conduct a computerized literature search using Medline, PubMed, or an equivalent method.</li> <li>• Use methodological filters to limit searches to articles dealing with therapy, diagnosis, or prognosis.</li> <li>• Use secondary sources (Cochrane, CAT databases, ACP Journal Club, etc.) to efficiently obtain evidence.</li> <li>• Design experiments that are practical from an economic and labor standpoint.</li> <li>• Perform the experiments in a technically facile manner, interpret the results and draw conclusions supported by the data.</li> <li>• Know the indications for IRB approval including studies using patients, patient medical records, and other data specifically to patients that can compromise confidentiality.</li> <li>• Perform a statistical analysis of the results and be able to report these results in an abstract and in complete scientific paper form.</li> <li>• Describe and understand the link between clinical and basic science research.</li> <li>• The resident should teach the basic principles of his research area to other residents and faculty.</li> <li>• Continue to develop inquisitiveness and novel thinking attributes and apply these character traits to active laboratory investigations.</li> </ul>
<b>Practice-Based Learning and Improvement</b>	<ul style="list-style-type: none"> <li>• Participate in project groups, committees and hospital groups when requested.</li> <li>• Participate in programmatic reviews and conferences studying adverse events.</li> <li>• Give usable feedback to research technicians, medical students and other trainees based on observation of their performance and assess improvement.</li> <li>• Participate in problem-based quality improvement projects.</li> <li>• Review, analyze and utilize scientific evidence from the gastrointestinal and hepatology literature to enhance research productivity and outcomes.</li> <li>• Know the best practice patterns to facilitate quality research projects based on research laboratory procedures and organization.</li> </ul>
<b>Interpersonal and Communication</b>	<p>(if patient or human subject interactions are needed for Year II research project):</p> <ul style="list-style-type: none"> <li>• Interview patients and family members accurately, patiently and</li> </ul>

<b>Skills</b>	<p>compassionately and present information in an understandable manner.</p> <ul style="list-style-type: none"> <li>● Practice appropriate informed consent procedures.</li> <li>● Ensure appropriate patient confidentiality measures.</li> <li>● Plan patient and family conferences as needed.</li> <li>● Communicate effectively with research mentor, research staff, administrative staff, peers, attending gastroenterologists, referring physicians and other consultants as needed. Ensure reporting honesty and authorship fairness throughout research activities.</li> <li>● Learn to become a teacher of gastroenterology research to junior trainees, medical students and other healthcare professionals.</li> </ul>
<b>Professionalism</b>	<ul style="list-style-type: none"> <li>● Begin to mentor medical students, other trainees and Year I fellows in professional conduct.</li> <li>● Understand and demonstrate professional behavior in daily activities.</li> <li>● Participate in professionalism-based learning activities through conferences.</li> <li>● Interact collegially with his/her peer group and other healthcare professionals, including acting responsibly in the larger context of pursuing programmatic and research successes.</li> <li>● Practice appropriate research organizational skills including background study, hypothesis formulation, study design, statistics, data management and data interpretation. Present research plans and to-date research outcomes to peers through presentations and, as relevant, in publications.</li> <li>● Continue to attend to the ethical principles activities and commitment achieved in Year I. Important ethical issues include confidentiality, informed consent, data safety, ownership and responsibility, reporting honestly, and authorship fairness.</li> <li>● Practice interactions with pharmaceutical representatives and be unbiased in research investigations.</li> <li>● Interact appropriately and present all needed document to the system's Internal Review Board (IRB).</li> <li>● Practice sensitivity to cultural, age, gender and disability issues.</li> <li>● Cross-cover colleagues' services when needed and conduct this coverage carefully with appropriate feedback to responsible colleagues.</li> <li>● Participate in program planning, including annual Faculty Meeting attendance, Fellow Curriculum Committee participation and Program Director meetings, when requested.</li> </ul>
<b>Systems-Based Practice</b>	<ul style="list-style-type: none"> <li>● Attend conferences concerning all aspects of research investigation and discovery as well as healthcare system patient management and components of systems of healthcare.</li> <li>● Understand and practice proper research organization and documentation.</li> <li>● Assist other trainees in the utilization of appropriate research resources.</li> <li>● Model appropriate interactions in multidisciplinary planning, including standard operating procedures and quality improvement initiatives.</li> <li>● Attend national gastroenterology or hepatology conferences (e.g., DDW or AASLD).</li> </ul>

**Third Year Fellow:****Goal:**

The senior-level, Year III fellow should demonstrate comprehensive understanding of their area of study, study design, data acquisition and analysis. In addition, they are expected to prepare a manuscript based on their work for publication in a peer-reviewed journal. Year III fellows typically use the rotations to finalizing their research projects and writing about their research outcomes. The development of abstract and/or publication submissions of the fellows' research project should occur early during Year III. In cases where the Year III fellows has established themselves in research and has made strides toward a career as an independent researcher, this fellow could mentor a Year I fellow in conjunction with a faculty researcher. Fellows are required to present or publish their research before graduation. Year III fellows are expected to present their research outcomes and plans for project outcome submissions in national publications at the GI Research conference.

	<b>Third Year Fellow</b>
<b>Patient Care</b>	<ul style="list-style-type: none"> <li>• With the help of the research mentor, the resident will hone skills in identifying an understanding of clinical research histories and exams needed to evaluate patients participating in a clinical research trial.</li> <li>• Use a logical and appropriate approach to patients participating in clinical research.</li> <li>• Know and understand the clinical research protocol to provide appropriate consent for participation in a protocol.</li> <li>• Understand the scope of established and evolving biomedical, clinical, epidemiological and social behavioral knowledge needed in the clinical research protocol and demonstrate the ability to acquire, critically interpret and apply this knowledge in clinical research.</li> <li>• The fellow will apply diagnostic and screening procedures to properly care for patients participating in clinical research.</li> <li>• Demonstrate knowledge of the roles of regulatory agencies in human subjects research</li> <li>• Demonstrate knowledge of the history of regulation of human subjects research</li> <li>• Demonstrate understanding of the ethics and safety concerns surrounding basic science research</li> <li>• Demonstrate knowledge of the policies for safely handling biohazardous specimens</li> <li>• Demonstrate knowledge of the policies for safely handling specimens that potentially contain blood-borne pathogens</li> </ul>
<b>Medical Knowledge</b>	<ul style="list-style-type: none"> <li>• Improve understanding of research design and methodologies.</li> <li>• The resident should review and understand all principles of the scientific method.</li> <li>• Read textbook and pertinent literature materials concerning research methodology.</li> <li>• Generate patient-centered clinical questions to drive knowledge acquisition when designing a research study.</li> <li>• Identify one's knowledge deficiencies and develop a system for generating and answering clinical questions based on patient cases.</li> <li>• Assess the type of question being asked; in order to identify the type of study that would best answer the question.</li> </ul>

	<ul style="list-style-type: none"> <li>• Identify and efficiently locate the best available information resources to address one's question in developing a research project.</li> <li>• Conduct a computerized literature search using Medline, PubMed, or an equivalent method.</li> <li>• Use methodological filters to limit searches to articles dealing with therapy, diagnosis, or prognosis.</li> <li>• Use secondary sources (Cochrane, CAT databases, ACP Journal Club, etc.) to efficiently obtain evidence.</li> <li>• Design experiments that are practical from an economic and labor standpoint.</li> <li>• Perform the experiments in a technically facile manner, interpret the results and draw conclusions supported by the data.</li> <li>• Know the indications for IRB approval including studies using patients, patient medical records, and other data specifically to patients that can compromise confidentiality.</li> <li>• Perform a statistical analysis of the results and be able to report these results in an abstract and in complete scientific paper form.</li> <li>• Describe and understand the link between clinical and basic science research.</li> <li>• The resident should teach the basic principles of his research area to other residents and faculty.</li> </ul> <p>Continue to develop inquisitiveness and novel thinking attributes and apply these character traits to active laboratory investigations.</p>
<p><b>Practice-Based Learning and Improvement</b></p>	<ul style="list-style-type: none"> <li>• Demonstrate mastery of Year II fellow skills and encourage participation of colleagues related to research successes.</li> <li>• Review, analyze and utilize scientific evidence from the gastrointestinal literature related to the critical review of research publications, translational research/clinical care management of GI patients, and taking a leadership role in guiding Year I &amp; II fellows and sharing relevant literature reviews with them.</li> <li>• Know and be able to succinctly communicate the best practice patterns to facilitate gastroenterology care through research investigations.</li> <li>• Achieve acceptance of research outcome submissions in at least one of the following publication/presentation formats: <ul style="list-style-type: none"> <li>○ Publication of original research;</li> <li>○ Review article;</li> <li>○ Editorial in a peer-reviewed (indexed) journal;</li> <li>○ Funded peer-reviewed grant;</li> <li>○ Book chapter in a medical textbook;</li> <li>○ Abstracts published; and/or</li> <li>○ Abstracts presented at a national gastroenterology or hepatology meeting.</li> </ul> </li> </ul>
<p><b>Interpersonal and Communication Skills</b></p>	<ul style="list-style-type: none"> <li>• Communicate with his/her research mentor and with all relevant research staff and collaborators related to all investigative studies</li> <li>• Communicate effectively with research mentor, research staff, administrative staff, peers, attending gastroenterologists, referring physicians and other consultants as needed.</li> <li>• Practice appropriate informed consent procedures.</li> <li>• Ensure appropriate patient confidentiality measures</li> </ul>

	<ul style="list-style-type: none"> <li>• Ensure reporting honesty and authorship fairness throughout research activities.</li> <li>• Learn to become a teacher of gastroenterology research to junior trainees, medical students and other healthcare professionals.</li> </ul>
<b>Professionalism</b>	<ul style="list-style-type: none"> <li>• Demonstrate proficiency in Year II objectives.</li> <li>• Mentor medical students, other trainees and Year I fellows in professional research conduct.</li> <li>• Make a commitment to finalize the research project early in Year III, so that appropriate writing and application submissions may be made for research publications and national gastroenterology and hepatology meetings.</li> <li>• Write about research project outcomes and work with research mentor to submit project documentation, abstracts and/or articles to national meeting and peer-reviewed journal reviewers.</li> <li>• Consider the multidisciplinary implications of the fellow's research project. Learn appropriate grant writing skills. If appropriate, work with research mentor to apply for grants.</li> <li>• Assist in formal research-related teaching exercises as requested.</li> <li>• Assert leadership in program planning, including fellow participation in the annual Faculty/Fellow Meeting, Fellow Curriculum Committee and Conference Planning Committees.</li> </ul>
<b>Systems-Based Practice</b>	<ul style="list-style-type: none"> <li>• Attend conferences concerning all aspects of research investigations, healthcare system patient management and components of systems of healthcare.</li> <li>• Model appropriate interactions in multidisciplinary planning, including improvements related to standard operating procedures and quality improvement initiatives.</li> <li>• Participate in hospital and national medical association committees and multidisciplinary planning groups when requested.</li> <li>• Attend national conferences directed at research and future practice.</li> <li>• Demonstrate near-attending level utilization of overall systems of care.</li> </ul>

**Teaching Methods:**

Principles of gastroenterology and hepatology research are part of the trainees' entire fellowship experience. Fellows review other peer-reviewed research during Year I, select their own research mentor and begin planning of their own research projects during this time. Active research lab work and/or clinical investigations occur during Year II. Year III fellows finalize their research projects and prepare all outcome documentations for abstract submissions, presentations and/or publications. Fellows will have adequate clinical, laboratory and equipment resources to complete conduct and complete their research projects. Teaching of medical students, residents and other trainees as well as appropriate interactions with other research and healthcare providers are important aspects of this rotation. Participation in all required conferences is mandatory. As fellows gain experience throughout their training, skills of organization and efficiency as well as team leadership become increasingly important. The GI Research Service experience will prepare the fellow to evaluate and manage gastroenterology and hepatology research and will prepare the fellow to work on and publish outcomes related to his/her own research projects. Fellows will be prepared for a career in academic gastroenterology/hepatology and will have the opportunity to write grants for continued research when appropriate. Fellows must

communicate with his/her research mentor and with all relevant research staff and collaborators related to all investigative studies.

### **Research Format and Expectations:**

The Gastroenterology Fellowship Program is committed to a rigorous, challenging and rewarding research experience for its fellows. While most research skills may be taught and/or mentored, some critical components of research investigations related to investigator eagerness, commitment and novel thinking are instinctive and may only be encouraged and mentored via high quality teaching. Research faculty, therefore, maintain strong and valuable commitments to fellow research productivity and are committed to developing fellows' career goals related to a research/academic career. The GI Research Rotation incorporates the following targeting research training.

#### **Goals:**

- A commitment to research ethics including issues related to confidentiality, informed consent, data safety, ownership and responsibility, reporting honestly and authorship fairness.
- A commitment to the thorough and thoughtful review of relevant gastroenterology and hepatology literature, including identifying, reading and understanding this literature.
- A commitment to appropriate data acquisition and management both in the lab and among potential subjects.
- A commitment to inquisitiveness and novel thinking. This is an innate ability perhaps least affected by training but critical for success in becoming an independent investigator.
- A commitment to research organizational skills including background study, hypothesis formulations, study design, statistics, data acquisition and charting, data management and interpretation, presentations to peers and colleagues, and attention to national presentations and publications. For fellows pursuing a career in academic gastroenterology, exposure to and understanding of descriptive and analytical statistics is important.
- A commitment to the basic principles of grant writing and grant writing encouragement and instruction for those fellows following a career in academic medicine.
- A commitment to the identification of unique and talented researchers early on and the development of research mentoring skills in these young researchers.

### **Patient Characteristics:**

To the degree that patients or subjects are needed for the fellow's research project, UTMC offers a diverse mixes of socioeconomic and gender status. Teaching faculty provide an abundant supply of upper- and middle-class patients, and our contracts with medical assistance and pro bono care efforts ensure access to lower-income patients. Due to a primary care base simultaneous with the hospitals' constantly active referrals (complete with helicopter transport 24/7), patients are seen in both acute status and in diagnostic dilemma status, with both common and uncommon disorders.

### **Evaluation:**

Fellows are evaluated during the GI Research Rotation and are expected to participate in the evaluation of other fellows as well. This occurs in the following forms:

Detailed, automated evaluations using the New Innovation system are submitted for each rotation. These evaluations are reflective of the program's curriculum requirements. Attendings evaluate fellows, and the fellows evaluate the attending as well. Quarterly evaluations include:

- 360-degree (attending, nurse, nurse practitioner, staff/clerkical, etc.);
- Peer-reviewed; and

- Patient.

Evaluation summaries become part of the fellows' and attendings' promotional documents.

- The fellow also evaluates the Gastroenterology Fellowship Program annually through a confidential basis.
- Attendings evaluate the Gastroenterology Fellowship Program annually.
- A Curriculum Committee oversees major changes to the curriculum. Representative program personnel (i.e., program director, representative faculty and at least one fellow are organized to review program goals and objectives and the effectiveness with which they are achieved. This group conducts a formal documented meeting at least annually for this purpose. In the evaluation process, the group must take into consideration written comments from the faculty and the residents' confidential written evaluations. If deficiencies are found, the group will prepare an explicit plan of action, which should be approved by the faculty and documented in the minutes of the meeting.
- The Program Director meets with all fellows individually twice per year.

### **Bibliography:**

#### Resource Documents

- *Up-To-Date*
- *PubMed*
- *Textbook of Gastroenterology* – Yamada, et.al.
- *Gastrointestinal Disease: Pathophysiology Diagnosis Management* – Sleisenger & Fordtran.
- Major Gastroenterology journals online and in the program's fellow library including *Gastroenterology*, *American Journal of Gastroenterology*, *Gut*, and other major publications.

#### Curricular Design

- ACGME Outcome Project documentation (from [www.acgme.org](http://www.acgme.org)).
- Graduate Education in Internal Medicine: A Resource Guide to Curriculum Development The report of the Federated Council for Internal Medicine Task Force on the Internal Medicine Residency Curriculum, 1997.

#### Pertinent Teaching References:

- *Textbook of Gastroenterology* – Yamada, et.al.
- *Gastrointestinal Disease: Pathophysiology Diagnosis Management* – Sleisenger & Fordtran.