

2010 Summer Research Internship Program



Sample 2009 Internship Project Assignments

Intern project assignments vary from year to year, but the examples below should give applicants a sense of what types of work might be involved in upcoming project assignments.

Example #1

Intern A was assigned to work primarily on a retrospective chart review on patients undergoing open carotid endarterectomy with Jo Anne Goldman, RT, RCIS, CCRC, Research Section Manager and Adnan Rizvi, MD, of the Department of Vascular and Endovascular Surgery.

The study on carotid endarterectomy at Abbott Northwestern Hospital looked at patient outcomes, based on antiplatelet or anticoagulation regimen and variations in surgical procedure. The purpose of this procedure is to remove an atheroma or arterial plaque from the interior walls of the internal carotid artery in order to prevent recurrent TIAs or prevent a serious stroke. Many patients undergoing the surgery, however, have been on antiplatelet or anticoagulation therapy that can create complications perioperatively. Data on the subject is limited, and the early outcomes from this surgery based on medication were the primary endpoints of the study.

The focus of the **project assignment** was as follows:

- Gather data on all patients undergoing open carotid endarterectomy at Abbott Northwestern Hospital from 01/00 to 05/09, including demographics, risk factors, initial imaging, surgical specifics, antiplatelet/anticoagulation treatment prior to surgery, early outcomes, and late outcomes.
- Generate statistics on the data collected in order to draw conclusions to present to surgeons.
- Begin writing an abstract on the data collected during the summer internship.

Project objectives included the following:

- To determine the incidence of complications, particularly neck hematoma, myocardial infarction, or stroke in patients under different therapies.
- To determine the incidence of complications related to the different surgical procedural variants.

Intern A achieved the following **project-related accomplishments**:

- Compiled a complete data set for 260 patients and partial data set for 100 more.
- Revised the study database to include fields designated by Dr. Rizvi to be substantive.
- Prepared and delivered a presentation to MHIF staff on the carotid endarterectomy project overall.
- Prepared and delivered a presentation to the MHI vascular surgeons at a Vascular Clinical Case Conference on the project overall.
- Created a draft abstract for submission.

As a **secondary project**, Intern A also did the following work:

- Analyzed data on a study on gene therapy angiogenesis for patients with critical limb ischemia, particularly the correlation of biomarkers (predominantly dealing with endothelial progenitor cells (EPCs) with clinical outcomes to facilitate identification of relevant EPC markers to quantify the success of angiogenesis treatments.

Example #2

Intern B was assigned to work on the OPTIMIST Program research with Dr. Tim Henry, Director of Research; Rachel Olson, RN, Section Manager; and Theresa Arndt, RN, OPTIMIST Research Coordinator.



The OPTIMIST Program at the Minneapolis Heart Institute was created as a systematic way to screen coronary artery disease patients whose angina is not controlled with medications and who cannot have coronary artery bypass or angioplasty. Patients meet with our nurses and doctors and together they decide the best treatment or research option. These options may include coronary angiogenesis research, spinal cord stimulation research, Enhanced External Counterpulsation therapy, new medications or combination therapies, i.e., surgery plus angiogenesis, surgery plus Transmyocardial Laser Revascularization.

The focus of the **project assignment** was as follows:

- Make 600+ long-term follow-up calls to OPTIMIST patients and to gather data on hospital readmission, ongoing use of prescribed medications, cardiac cath procedures, etc.
- Gather additional data on the subset of OPTIMIST Long-Term Follow-up study participants enrolled in the Roche Cardiac Biomarker Study.
- Conduct a literature review on the usefulness of cardiac troponin in predicting long-term outcomes of patients with advanced coronary artery disease, and a literature review on the emergence of a new high-sensitivity troponin T assay not yet approved in the U.S. that may reveal clinically important information in treating OPTIMIST patients
- Write an abstract on the current progress of the Roche Cardiac Biomarker Study analyzing cardiac troponin T for submission to the 2010 American College of Cardiology Conference in Atlanta, Georgia
- Begin to write the manuscript for eventual publication in a future cardiology journal reporting the prevalence of elevated cardiac troponin T levels

Project objectives included the following:

- In the Long-Term Follow-Up Study, to update and track the natural history of refractory angina from interviews with patients over the phone and ultimately assess their long-term outcomes study learn more about the refractory angina population
- In the Biomarker study, to continue enrolling new OPTIMIST patients, measure their cardiac troponin levels, and correlate these levels to the major adverse cardiac events (MACE) in one year follow-up
- In the Pre/Post Conditioning Acute Myocardial Infarction study, to report significant changes in left ventricular ejection fraction based on cardiac MRI over a 6 month period and quantify the difference between those receiving pre/post conditioning and those that did not.

Intern B achieved the following **project-related accomplishments**:

- Completed contact efforts to 600+ study participants, including written requests for records sent to 35 regional hospitals.
- Revised study database to include a field to track which study participants are currently being enrolled in the Biomarker study.
- Prepared and delivered a presentation to MHIF staff on the OPTIMIST project overall and on the focus of the research being conducted this summer.
- Completed an abstract submitted to the ACC 2010 conference

As a **secondary project**, Intern B also did the following work:

- Analyzed data and created graphical representations of Dr. Jay Traverse's acute myocardial infarction study, testing the effectiveness of pre- or post-conditioning in combination with autologous bone marrow stem cell injection. The statistical analysis, graphical representations, and verified data integrity will contribute towards a paper that will be published. The results of which demonstrate that those patient who did have stem cell therapy with a conditioning treatment had a three-fold increase in left ventricular ejection fraction in 6 months in comparison to those who just had stem cell therapy

Example #3

Intern C was assigned to work on Patent Foramen Ovale Database research with Dr. Ivan Chavez, Interventional Cardiologist; Jo Anne Goldman, Section Manager; and Holly MacDonald, Clinical Research Coordinator.

The Patent Foramen Ovale (PFO) Database is a registry of patients who have had percutaneous PFO closure since 2001 at Abbott Northwestern Hospital. Patients undergo this procedure because they have



orthodeoxia platypnea, recurrent strokes or TIAs on medical therapy, or other recurrent embolic events. Randomized trials on the success of PFO closure devices are still pending, so atrial septal defect (ASD) closure devices are used off-label for this procedure. Furthermore, the role of the PFO in embolic events is still under question. As a result, the PFO database is important for tracking closure procedure success and its usefulness in preventing recurrent embolic events.

The focus of the **project assignment** was as follows:

- Reorganize current database and update it using electronic medical records
- Contact 200+ patients in database for long-term follow-up via phone calls and/or post.
- Consent via post 26 new patients to participate in database.
- Analyze procedural and follow-up data for up to 3 years following procedure
- Begin writing a manuscript on the success of PFO closure procedure and its effectiveness in preventing recurrent embolic events.

Project objectives included the following:

- To determine the success of percutaneous PFO closure and its long-term success in preventing recurrent embolic events.
- To reorganize and update the ongoing PFO patient database.

Intern C achieved the following **project-related accomplishments**:

- Reorganized PFO Database by making new fields, combining previous two databases, creating updated and filling in missing information using electronic medical records.
- Completed initial contact efforts to all 207 participants, including 88 second contact attempts via mail.
- Analyzed patient data for closure procedure and 3-year follow-up.
- Began to write a manuscript describing experience with PFO closure procedure to describe procedural success and effectiveness of closure in preventing recurrent embolic events.
- Prepared and delivered a presentation to MHIF staff on the percutaneous PFO closure procedure overall and on the focus of the research being conducted this summer.

As a **secondary project**, Intern C also did the following work:

- Gathered additional data to expand the marathon study, which looks at the cardiac health of men who have completed at least 25 consecutive, annual marathons. A larger patient population will make the results of the study more significant.

2009 Internship Program Learning Components

The information below, from the 2009 program, is provided as a model comparable to what interns can expect in the 2010 program:

Orientation to the internship program included the following training components:

- *Software*: Excellian/Epic electronic medical record system; U.S. National Library of Medicine's PubMed/MEDLINE biomedical journal database; and RefWorks research bibliography and reference software .
- *Cardiology*: Biostatistics, cardiac anatomy; cardiology research overview; cardiovascular diagnostics; and hospital etiquette.
- *Clinical Research*: Allina Hospitals & Clinics ethics and compliance training; training on Institutional Review Board (IRB) functions, Protected Health Information (PHI) and the Health Insurance Portability and Accountability Act (HIPAA); Collaborative Institutional Training Initiative (CITI) training modules on the Protection of Human Research Subjects (research with data or laboratory specimens, good clinical practice, and health information privacy and security); and patient consent training.

Observation opportunities constituted 11 days of the 10-12 week internships:

- Shadowing nurses in the Heart Hospital units: post-surgical ICU (H4100), hemodynamically unstable ICU (H4200), telemetry (H5000), and post-interventional (H5200).
- Observations in the cardiac cath lab, the electrophysiology lab and in cardiovascular surgery.



- Shadowing a nurse practitioner, observing various testing modalities in Cardiovascular Diagnostic Services, attending a session of the Vascular Clinical Case Conference CME activity, and attending a session of the Medical Education Grand Rounds with Abbott Northwestern Hospital internal medicine residents and other staff.
- Boston Scientific hosted an industry day in Maple Grove that included tours of cardiac catheter and stent production facilities and hands-on experience in the simulation lab.

Staff presentations of 60 minutes each covered the following topics (12 hours in total):

- Kevin Harris, MD, on aortic dissection
- Jeff VanWormer, MS, on the Heart of New Ulm community health intervention project
- Dave Hurrell, MD, on stress testing
- Alan Hirsch, MD, on peripheral artery disease
- John Lesser, MD, on advanced cardiac imaging
- Bill Katsiyiannis, MD, on electrophysiology
- Tim Henry, MD, on coronary artery disease and the Level One treatment protocols
- Tim Henry, MD, on cardiac stem cell therapies and the OPTIMIST program
- Bonnie LeRoy, MS, CGC, from the University of Minnesota's Institute of Human Genetics on ethical considerations in genetic testing
- Shalini Bobra, MD, on careers for women in cardiology
- Wobo Bekwelem, MD, a master's candidate from the University of Minnesota's School of Public Health, on international volunteer opportunities for physicians,
- Jeff Dusek, PhD, on integrative therapies research programs at Abbott Northwestern Hospital

2009 Internship Program Participants

The list below includes the 2009 interns (name, school, year, major):

Ahmed Uddin, University of MN – Twin Cities, Senior, Chemistry
 Andrew Rosenbaum, Northwestern University, Graduate, Biology
 Allison Hickey, University of Notre Dame, Graduate, Biology
 Arthur Sillah, Macalester College, Senior, Chemistry with Biochemistry Emphasis
 Azra Thakur, University of Minnesota, College of Liberal Arts, Graduate, English
 Craig Tschautscher, Minnesota State University – Mankato, Masters, Biology
 Dih-Dih Huang, Johns Hopkins University, Graduate, Chemical and Biomolecular Engineering
 Kurt Bowen, Minot State University, Graduate, Chemistry
 Mathew Thomas, University of Minnesota, Senior, Microbiology, Physiology, and Finance
 Renetta Kalis, North Dakota State University, Graduate, Emergency Management
 Svetlana Melamed, University of Pennsylvania, Senior, Biology
 Vikrant Jagadeesan, University of Illinois at Chicago, Senior, Bioengineering

Feedback from Former Research Interns

(Each quote below comes from a different intern.)

“Successful premed students generally shadow physicians during college, but I think something that makes MHIF unique is that many students go further than this and have **working relationships with doctors**. The physicians I've worked with have been great with giving me their time and enthusiasm, responding to my questions and discussing my ideas for how to go forward in projects. At the very least, I got a much better sense for physician culture. Overall, I think MHIF has been one of my most valuable career experiences.”

“I would recommend this internship hands down to any pre-medical student. I have really **solidified my career goal** of being committed to the forefront of research and clinic. I desire to be at an institute or academic environment where, in addition to patient care, colleagues have an overall commitment to furthering knowledge of medicine and teaching residents, fellows, and students.”



"This is an **exceptional program** that I would recommend to any student who is considering a career in the health professions. Without this internship, it would have been virtually impossible to have exposure in the cardiovascular clinical setting. I got to work on an entire project which yielded valuable information that is **publishable**. I'll definitely rate this program a five star."

"During the summer all the shadowing opportunities, the research work, the lunch presentations, and the **networking I was able to engage in with staff and fellow interns** was a truly invaluable experience. I enjoyed my time here greatly and I am so very thankful for the wonderful opportunity I was given to work on and learn the things I did."

"I would absolutely recommend this program to others. I doubt there is a program like it where the pre-medical students get such **incredible access to the physicians** of a hospital and get to observe all the things that go on in the **cardiovascular diagnostics and inpatient areas**. The learning is incredible, but one of the other great things is the sense of how research is conducted that you can take from the experience. As a student entering medical school, I found that the internship will have prepared me well for my future learning in the field."

"This internship has been a great experience and I would strongly recommend it to others. Through my employment at MHI, I have **learned so much about cardiology, clinical research, and the medical profession** in general. Throughout this summer I have been able to meet numerous individuals with a variety of backgrounds. I feel this experience has expanded my horizons and has given me deeper perspective on the most pressing **issues effecting health care today**. I cannot imagine a better experience than the one I received as a summer intern at MHI."

What did you like best about the research internship program?

I was able to gain a level of exposure to cardiology that exceeded what I thought was possible at this stage in my career path.

The introduction to clinical research was very valuable, as were the opportunities to tag along on interesting cases. Spending one morning a week in the clinic was a great way to get a feel for the everyday duties of a cardiologist.

For me, I was able to work in close intellectual collaboration with a research cardiologist. This learning relationship itself was very valuable. Also, working on research problems was very challenging and intellectually stimulating. I also really enjoyed and learned from the procedures I was able to watch, especially surgical procedures.

I enjoyed getting to work in a hospital environment with other students that are interested in medicine, as well as the direct interaction with physicians and learning what their lives are like as doctors. I also learned a lot in my specific research assignments.

I liked the parts of the program geared towards intern education the best: Lunch and learn presentations, observations, and simply getting to be in the environment of patient practice and research. Everyone involved in the program is positive and willing to help. I felt that the people involved in the program cared that I had a great experience, which made every aspect of the experience better.

I can't say enough good things about my experience. The opportunity to be involved in research of the magnitude done at MHI is hard to come by. Everybody was helpful and supportive.



Would you recommend this internship to other students?

Yes, it was a wonderful mix between clinical observations and clinical research. It allowed observation of both the researcher and the cardiologist, which is not available through many other programs. Additionally, the facilities were extraordinary, and the other interns I worked with were very social and fun people.

I would recommend this internship to other students. The medical professionals and staff members were excellent and had great ideas and understanding of the health topics being addressed. In the end, great project ideas were generated, and a good amount of work was given to me. I learned to use programs that I have only heard of before. In addition, the shadowing opportunities provided were varied and interesting.

I would recommend this internship to other students because of the great opportunities that come along with it. I felt that my experience was rewarding and has helped me understand some of the difficulties of clinical research and the day to day life of working in a hospital. This is unique experience and I believe that it was a great privilege to have been part of this program.

I thought the program did an excellent job providing us with a variety of observational opportunities, in addition to research-related projects for students contemplating entering the healthcare profession. It provided generous insight to the different opportunities that are available.

Like any program, there is room for improvement, but last summer was beyond what I had hoped for. If premed students were asked to visualize and design the perfect paid summer internship, complete with research, shadowing, and mentoring components, this vision would be very similar to what the MHIF research internship actually is in real life.

