Medical Knowledge and Patient Care:

Residents must demonstrate knowledge and application of the pathophysiology and epidemiology of the diseases listed below for this rotation, with the pertinent clinical and laboratory findings, differential diagnosis and therapeutic options including preventive measures, and procedural knowledge. They must show that they are able to gather accurate and relevant information using medical interviewing, physical examination, appropriate diagnostic workup, and use of information technology. They must be able to synthesize and apply information in the clinical setting to make informed recommendations about preventive, diagnostic and therapeutic options, based on clinical judgement, scientific evidence, and patient preferences. They should be able to prescribe, perform, and interpret surgical procedures listed below for this rotation.

Disease based learning objectives:

PGY1:

- Demonstrate effective patient history taking and physical examination.
- Clearly present patient information on rounds and in conferences.
- Demonstrate responsibility for the care of inpatients (exclusive of intensive care patients) on the vascular service, with faculty and senior resident supervision.
- Demonstrate appropriate initial evaluation of outpatients with vascular disease including plans for initial diagnostic evaluation.

Atherosclerotic disease with gangrene/ulcer/pain: Demonstrate the ability to perform a thorough pulse exam and appropriate non invasive assessment of arterial circulation including Ankle Brachial Index, Pulse Volume Recordings, and selection of appropriate imaging study. Acquire technical skills to perform amputations.

Leg swelling: Demonstrate the ability to evaluate limb swelling including generalized edema, deep vein thrombosis, and lymphadema. Residents will reveal knowledge of exam findings representative of each and appropriate imaging to confirm diagnosis. House staff will select appropriate treatment of each entity.

Vericose Veins: Demonstrate the knowledge to varicose veins and superficial thromboplebitis. Perform varicose vein excision.
PGY2:
• Demonstrate expertise with procedures learned during the previous year.
• Demonstrate responsibility for the care of vascular patients in the intensive care units.
• Demonstrate appropriate evaluation of outpatients with vascular disease, including plans for diagnostic evaluation and initial therapeutic planning.

   **Vascular Access**-Demonstrate proficiency in placing percutaneous arterial catheters for both diagnostic imaging as well as pressure monitoring. Also have the ability to obtain central venous access and place catheters (including tunneled) for fluid, nutrition, medication pressure monitoring as well as dialysis access.

   **Renal Failure/Dialysis Access**-Demonstrate the ability to evaluate the need for dialysis access. Demonstrate skills to perform operations including arteriovenous fistula creation or av-graft placement. Be able to diagnose complications resulting from dialysis access catheters fistulas and grafts. Select appropriate treatment modalities for each of these entities.

   Atherosclerotic disease with lower extremity gangrene/ulcer/pain-Assist in components of aorto iliac and lower extremity revascularization procedures including assistance on abdominal vascular procedures, Greater Saphenous vein harvest, approaches to exposure of donor and target vessels for bypass, graft and vein anastomosis.

   Atherosclerotic extracranial cerebrovascular disease. Demonstrate the ability to identify history and exam findings associated with cerebral vascular events. Select appropriate diagnostic tests. Observe procedures for carotid and vertebral artery exposure, endarterectomy and bypass. Manage post procedure hemodynamic changes and hyperperfusion syndrome.

PGY3:
• Demonstrate expertise with procedures learned during the previous year.
• Perform under supervision inpatient consultations for other services.
• Demonstrate thorough evaluation of outpatients with vascular disease, including diagnostic and therapeutic planning.

   **Aortic Aneurysms**- Evaluate patients with aortic aneurysms with the ability to differentiate symptomatic from asymptomatic as well as rupture from non rupture. Manage and expedite the preoperative preparation of patients with complications of aortic pathologies such as aneurysms, dissections, penetrating ulcers and acute aortic syndrome. Assist with open and endovascular treatment of all of these disease processes. Exposure of the abdominal aorta through trans- and retroperitoneal exposure, and endovascular aortic and iliac artery aneurysm repair.

   **Atherosclerotic disease with lower extremity gangrene/ulcer/pain**-Perform under supervision lower extremity revascularization procedures including assistance on abdominal vascular procedures.

PGY4
• Demonstrate expertise with procedures learned during the previous year.
• Take chief resident responsibility for supervising junior residents in the management of patients on the inpatient vascular service.
• Demonstrate complete evaluation of outpatients with vascular disease, including diagnostic and therapeutic planning with minimal faculty supervision.

• Aortic Aneurysms- Evaluate patients with aortic aneurysms (rupture and non rupture). Distinguish and manage pathologies such as aneurysms, dissections, penetrating ulcers and acute aortic syndrome. Perform open and endovascular repair of abdominal aortic and iliac aneurysms.

Atherosclerotic disease with upper and lower extremity gangrene/ulcer/pain-Perform upper and lower extremity revascularization procedures including cervical brachiocephalic reconstructions, lower extremity revascularizations and thoracoabdominal aneurysms.


PGY5:
• Achieve skills required to perform all major fundamental and complex vascular procedures, including endovascular as well as traditional surgery.
• Apply clinical and basic science knowledge to pre-intra- and post-operative decisions independently.
• Assist with complex vascular operations including thoracoabdominal aneurysm repair, aortic enteric fistulas, excision and replacement of infected bypass grafts, redo carotid endarterectomy, mesenteric bypasses for acute and chronic mesenteric ischemia, carotid body tumor excision, renal artery bypass and redo abdominal aortic surgery
• Supervise residents in the management of all patients on the inpatient vascular service.
• Instruct junior residents in basic open operations.
• Oversee the safe and competent post-operative care of vascular patients. With ability to recognize and treat of complications.
• Independently manage complex vascular patients with minimal faculty supervision in both the outpatient and inpatient setting

Operations by level:

PGY1:
• Learn basic concepts concerning occlusive and aneurysmal disease of the arterial system. Learn basic concepts concerning venous thrombosis and insufficiency.
PGY2:
- Develop a foundation of basic and clinical knowledge and apply this to the care of vascular surgery patients
- Achieve a more detailed understanding of occlusive and aneurysmal disease of the arterial system as well as venous thrombosis and insufficiency.

PGY3:
- Acquire more in-depth knowledge of arterial, venous and lymphatic disease processes, with an inclusion of the less common disease entities such as the vasculities, and malformations.
- Demonstrate an up to date knowledge of basic and clinical science in the literature and its application to clinical vascular surgery.

PGY4:
- Demonstrate capacity to diagnose and treat basic knowledge concerning less common arterial, venous and lymphatic disease processes, including diagnosis and treatment options.

PGY5:
- Demonstrate detailed knowledge concerning all arterial, venous and lymphatic disease processes, including diagnosis and treatment options, using interventional, open and medical management techniques.
- Be knowledgeable about the educational and scholarly activities of vascular surgery by having assumed responsibility for teaching and supervising surgical residents and medical students.

**Practice Based Learning:**

**Objectives:**
Residents must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices. Residents are expected to develop skills and habits to be able to:
- Identify strengths, deficiencies and limits in one’s knowledge and expertise
- Set learning and improvement goals
- Incorporate formative evaluation feedback into daily practice
- Use information technology to optimize learning
- Systematically analyze practice, using quality improvement methods, and implement changes with the goal of practice improvement
- Locate, appraise, and assimilate evidence from scientific studies related to their patients’ health problems
- Participate in the education of patients, families, students, residents and other health professionals, as documented by evaluations of resident’s teaching abilities by faculty and/or learners
**Teaching Methods:**
Residents are encouraged to develop an individualized learning plan and are assigned a mentor to determine if those goals are being achieved. The mentor, along with program director/assistant program directors at the semi-annual review, guides residents to incorporate self-assessment and feedback of others as part of their learning portfolio. Residents also get departmental lectures on quality improvement methodology as well as online research tools available at the medical library. A monthly journal club is used to teach and promote use of evidence-based medicine principles. They also receive a departmental lecture on research methodology, and are encouraged to apply the principles of research methodology and statistical analysis to their own research projects. Case presentations by residents at Morbidity and Mortality conferences allow them to analyze practice, using evidence based medicine and quality improvement methods. Participation in an animal lab on a semi-annual basis, where residents practice and teach to junior residents, basic and advanced laparoscopic surgery in animal models, allows overall practice improvement.

**Assessment:**
Monthly core-competency based evaluations are used by faculty to evaluate residents. Also collective faculty feedback is given semi-annually where all the attendings collectively discuss individual resident strengths and weaknesses, and ways for improvement.

**Systems Based Practice:**

**Objectives:**
Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. Residents are expected to:
- Work effectively in various health care delivery settings and systems, including private offices of surgeons
- Coordinate patient care within the health care system
- Incorporate considerations of cost awareness and risk-benefit analysis in patient care
- Use system resources to advocate for quality patient care and optimal patient care systems
- Work in interprofessional teams to enhance patient safety and improve patient care quality
- Participate in identifying systems errors and in implementing potential systems solutions

**Teaching Methods:**
Residents get departmental lectures of health care finance and cost-effective resource allocation, as well as on different health care delivery systems to help understand the financial underpinnings of various insurance models. They also participate in discussion of medical errors or “near-miss” events at general surgical conferences. There is a lecture on patient safety and medical liability for residents to better understand provision of quality patient care.
Assessment:
Monthly core-competency based evaluations are used by faculty to evaluate residents. Also collective faculty feedback is given semi-annually where all the attendings collectively discuss individual resident strengths and weaknesses, and ways for improvement.

Professionalism:

Objectives:
Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.
They must demonstrate:
- Compassion, integrity and respect for others, including accountability to patients and society, and professional commitment to excellence.
- Adherence to ethical principles by practicing patient-centered care that encompasses confidentiality, respect and autonomy via appropriate informed consent and shared decision making
- Cultural competence, by being sensitive and responsive to a diverse patient population as well as colleagues, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Teaching Methods:
Professionalism is taught
- primarily during clinical experiences where residents observe and adopt the behavior of senior residents and faculty
- by assigning mentors who are positive role-models
- using departmental lectures at the Monday morning conferences (Schwartz lecture series) by a member of the hospital Ethics committee and risk management team
- giving an institutional lecture to the incoming intern class on cultural sensitivity and diversity.

Assessment:
A global 360 degree multi-rater evaluation is used to assess resident performance with respect to professionalism and interpersonal and communication skills. These are filled out anonymously by health care professionals, including nurses, and by their colleagues. The residents are also assessed at semiannual meetings, where they get collective faculty assessment and feedback about professionalism and interpersonal and communication skills, in addition to other competencies.
Interpersonal and Communication Skills:

Objectives:
Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families and professional associates. They must demonstrate that they can:

- Communicate effectively with patients and families across a broad range of socioeconomic and cultural backgrounds
- Communicate effectively with physicians, other health professionals, and health related agencies
- Work effectively as a member or leader of a health care team
- Maintain comprehensive, timely and legible medical records

Teaching Methods:
Interpersonal and communication skills are taught primarily during clinical experiences where residents observe the faculty and senior residents, and participate in, delivering bad news, holding family meetings to discuss ongoing care, educating patients and their families, and resolving conflict. Also daily meetings of the junior residents with social workers and case managers, as well as conversations with consultants, refine the skill of communication with other health care professionals to provide better patient care. Communication with colleagues is encouraged by having a standardized method of hand-off between junior and senior residents to help reduce medical errors and promote continuity of care. The junior residents receive ongoing lectures from the chief residents to develop and refine the skill of seamless hand-off of patient care. The residents also get a lecture at the Schwartz lecture series about case management and documentation. Scholarly communication is taught by having residents present cases and literature search at Morbidity and Mortality conferences, as well as General and Vascular Surgery conferences on Thursday and Friday mornings. These conferences help develop effective lecture and teaching skills, as they communicate effectively to their colleagues by presenting cases, associated complications and data, as well as teach the medical students. The residents are also given a talk on research methodology and opportunities, and are encouraged to present their scholarly work via presentations, abstracts, or publications.

Assessment:
A global 360 degree multi-rater evaluation is used to assess resident performance with respect to professionalism and interpersonal and communication skills. These are filled out anonymously by health care professionals, including nurses, and by their colleagues. The residents are also assessed at semiannual meetings, where they get collective faculty assessment and feedback about professionalism and interpersonal and communication skills, in addition to other competencies.