Educational Goals & Objectives

The Vascular Surgery rotation will provide the resident with an understanding of vascular anatomy and physiology as well as the opportunity to diagnose and manage conditions affecting much of the body’s circulatory system. Our first year orthopedic residents will have the opportunity to evaluate and manage patients with both common and complex vascular disorders in both inpatient and outpatient settings. The goal is to familiarize them with basic mechanisms, clinical manifestations, diagnostic strategies and management of vascular disease as well as disease prevalence and prevention. Depth of exposure should be such that they can develop competency in the prevention of vascular disease, knowledge of indications for procedures, management of common disease, including basic surgical techniques; management of the acutely ill patient, and appropriate indications for referral.

Faculty will facilitate learning in the 6 core competencies as follows:

Patient Care and Procedural Skills

I. All residents must be able to provide compassionate, culturally-sensitive care for patients to prevent and treat vascular disease.
   - Residents should seek directed and appropriate medical or subspecialty surgical consultation when necessary to further patient care.
   - Residents should ensure seamless transitions of care between primary and consulting teams and between inpatient and outpatient care.

II. Residents will demonstrate the ability to take a pertinent history and perform a focused physical exam. Residents should be able to differentiate between stable and unstable symptoms and elicit the following historical details:
   - risk factors for the development of vascular disease
   - factors that increase perioperative risk, including age, comorbidities, immune status, metabolic disorders, pregnancy, and substance abuse
   - personal and family history of vascular disease, bleeding disorders, or anesthetic reaction
   - symptoms associated with vascular disease and their duration
   - complete medication history, including antiplatelet agents and anticoagulants

III. Residents should be able to recognize and characterize the following physical findings:
   - assessment of peripheral pulses
   - asymmetry of blood pressures
   - cardiac murmurs
   - jugular venous distention
   - lower extremity edema
   - signs of shock
   - signs of wound infection
   - vascular bruit
IV. Residents will understand the indications for and complications of the following procedures, and become competent in their safe and effective use:

- ACLS
- Arterial and central line placement and invasive hemodynamic monitoring
- Basic vascular dissection and anastomosis
- Diabetic foot drainage and debridement
- Dialysis access creation

In addition, residents will demonstrate knowledge of the indications, contraindications, and appropriate timing for the following procedures, and be able to counsel patients and families on their role in the treatment of vascular disease:

- Endovascular interventions, including balloon angioplasty, stents, and coils
- Surgical bypass

Medical Knowledge

I. Residents will develop an understanding of the basic pathophysiology and approach to the following vascular conditions:

- Abdominal aortic aneurysm
- Amaurosis fugax
- Arterial insufficiency of the lower extremity (claudication, rest pain, ischemic tissue loss)
- Diabetic foot, including Charcot joint, neuropathy, infection, ischemia and ulcer
- Lymphedema
- Mesenteric ischemia
- Peripheral aneurysms
- Renal artery disease
- Reynaud’s phenomenon
- Transient ischemic attack and stroke
- Vasospastic disease of the upper extremity and hand ischemia
- Venous disease, acute and chronic

II. Residents will also gain an understanding of the following issues related to the identification and treatment of vascular disease:

- Screening for asymptomatic disease
- Evidence-based algorithm for electing medical versus surgical therapy
- Timing and appropriate use of surgical intervention to treat lower extremity arterial disease
- Dialysis access creation and management
- Preoperative evaluation and assessment of risk
- Vascular anatomy

III. Residents will be able to evaluate patients and perform initial management for acute vascular conditions, including:

- Acute aortic dissection
• Acute aortic rupture
• Compartment syndrome
• Deep venous thrombosis
• Pulseless extremity
• Shock
• Trauma to major blood vessels

IV. Residents will become familiar with operating room procedures, including
• Basic patient positioning
• Induction of anesthesia
• Preparing and draping the operative field
• Sterile technique
• Basic surgical technique, including wound closure with sutures or staples
• Function and types of instruments, drains, dressings, and sutures
• Estimation of blood loss

V. Residents will become competent in basic postoperative care, including:
• Appropriate transfusion of blood products
• Knowledge of appropriate thromboembolic prophylaxis
• Recognition of facial dehiscence, hematoma, and wound infection
• Recognition of transfusion reaction
• Use of perioperative antibiotics

VI. Residents will become familiar with indications, contraindications, dosing and route for commonly used drugs in the practice of vascular surgery, including:
• Analgesics
• Anticoagulants
• Antiinflammatory agents
• Antiplatelet agents
• Cardiac medications
• Diuretics
• Laxatives
• Local anesthetics
• Narcotics
• Thrombolytics

VII. Residents will be able to understand the indications, limitations, and interpretation of the following laboratory values and procedures:
• Ankle-brachial index and toe-brachial index
• Carotid angiography
• CBC
• Chemistries, including BNP, CK, Creatinine and GFR, and Troponin
• D-dimers
• ECG
• Hand-held Doppler and Duplex scanning
• Imaging with CT, MRI, radiographs, and vascular ultrasound
• Peripheral vascular angiography

VIII. Residents should become fluent in health maintenance concerns relevant to vascular disease and be able to counsel patients appropriately on:
• Nutrition
• Cholesterol screening
• Blood pressure screening
• Smoking cessation
• Exercise prescription
• Proper foot care

Practice-Based Learning and Improvement
I. All residents should be able to access current clinical practice guidelines (e.g. Society for Vascular Surgery [www.vascularweb.org]) to apply evidence-based strategies to patient care.
II. Residents should develop skills in evaluating new studies in published literature, through Journal Club and independent study.
III. Residents should develop leadership skills to become adept at coordinating patient-centered care as part of a larger team, including the vascular surgeon, nurse, operating room team, vascular lab technicians, and primary care provider.
IV. All residents should respond with positive changes to feedback from members of the health care team.

Interpersonal and Communication Skills
I. Residents must demonstrate organized and articulate written (electronic) and verbal communication skills that build rapport with patients and families, convey information to other health care professionals, and provide timely documentation in the chart.
II. Residents must also develop interpersonal skills that facilitate collaboration with patients, their families, and other health professionals.
III. Residents should be attuned to end of life issues in patients with advanced age and/or multiple comorbidities.

Professionalism
I. All residents must demonstrate a commitment to carrying out professional responsibilities.
II. Residents should be able to communicate with patients in a manner respectful of gender, cultural, religious, economic, and educational differences.
III. Residents should be able to counsel patients and families both on diagnostic and treatment decisions and on withdrawal of care.  
IV. Residents should be able to use time efficiently in the clinic to see patients and chart information.

**Systems-Based Practice**

I. Residents must be able to articulate alternative care strategies and the cost and risks involved.  
II. Residents should be aware of current issues in the field of vascular medicine, such as the discourse on use of endovascular techniques.  
III. Residents must demonstrate an awareness of and responsiveness to established quality measures, risk management strategies, and cost of care within our system.

**Teaching Methods**

I. Supervised patient care in the inpatient and outpatient setting and in the operating room.  
   • Residents will initially be directly observed with patients to facilitate the acquisition of excellent history taking and physical exam skills.  
   • As residents become more proficient, they will interact independently with patients and present cases to faculty.  
     • Initial emphasis will be on diagnosis and basic management.  
     • When residents have mastered these skills, focus will be on medical decision-making and technical skills, and residents will work with supervising physicians to finalize a care plan.  
   • All residents will spend supervised time in the operating room, with increasing responsibility as appropriate to their skill level

II. Conferences  
   • Daily noon conference  
   • Journal club

III. Independent study  
   • Journal and Textbook reading TBD by vascular surgery attending  
   • Online educational resources  
     • Agency for Healthcare Research and Quality [www.guideline.gov](http://www.guideline.gov)  
     • Up to Date  
     • Clinical Key

**Evaluation**

I. Mini-CEX bedside evaluation tool  
II. Mid-rotation individual feedback session  
III. Attending written evaluation of resident at the end of the month based on rotation observations and chart review.
**Rotation Structure**

I. Residents should contact the attending vascular surgeon the day prior to determine start time and location.

II. Residents should divide their time between the hospital, the operating room, and the clinic as appropriate to achieve the above educational goals.

   - Residents on hospital vascular surgery rotations will have rounding responsibilities each day as specified by the attending physician. Residents on the inpatient vascular service will perform postoperative checks on the day of surgery for all patients undergoing surgery. Residents will be involved in surgical procedures as appropriate to their level of training.

   - Residents in clinic will have scheduled patients and be involved in discussion of patient presentation, differential diagnosis, decision for or against surgical intervention, and patient follow up.

   - When possible, residents should follow their patients from preoperative clinic through surgery and subsequently for postoperative care.

   - Case-based learning is most effective. Nightly reading/study should be based on cases reviewed during the day.

   - Residents may be asked to do focused literature searches or presentations during the course of the rotation.

   - When doing consults at the request of colleagues, residents should clarify the question being asked and provide a concise answer.

III. Call and weekend responsibilities TBD by the attending physician.

   - Hours worked must be consistent with ACGME requirements and are subject to approval by the Program Director.

IV. Residents have noon conferences and should be excused in a timely fashion to attend.