The vascular rotation for cardiology fellows consists of six weeks of focused vascular training. The six week period is divided into a two-week rotation that is completed by first year fellows during their second echocardiography rotation and a one month rotation at the William S. Middleton Memorial Veteran’s Hospital, which is scheduled during the second year of fellowship. This rotation is designed to give the fellow exposure to a variety of vascular procedures and interventions as well as allow for participation in reading and performing vascular studies.

During this six week experience, fellows will:

- Develop a sound knowledge of the clinical features and treatment of vascular disease.
- Demonstrate competence in obtaining the history and performing the physical examination of the arterial and venous systems.
- Become knowledgeable in the interpretation and selection of patients for non-invasive tests and peripheral angiograms.
- Demonstrate competence in the evaluation and management of arterial, venous, and lymphatic disease; atherosclerotic risk factors and hyper-coagulable states.

**Goals and Objectives**

**LEVEL I**

**Medical Knowledge**

1. Know the anatomy of the peripheral arterial and venous systems.
2. Know the causes and clinical epidemiology of atherosclerotic peripheral vascular disease, including the incidence and prevalence, sex and ethnic differences, role of genetics, and the influence of traditional risk factors and demographics on outcomes.
3. Know the pathophysiology, causes, and clinical epidemiology of aortic aneurysms.
4. Know the pathophysiology, causes, and clinical epidemiology of deep vein thrombosis and pulmonary embolism.
5. Know the cardinal symptoms and physical findings of peripheral atherosclerotic vascular diseases, including peripheral artery disease, renal and mesenteric artery disease, extracranial cerebrovascular disease, and abdominal aortic aneurysm.
6. Know the cardinal symptoms and physical findings of venous diseases including venous thromboembolism, chronic venous insufficiency, and varicose veins.
7. Know the natural history and prognosis of deep vein thrombosis and pulmonary embolism.
8. Know the indications, contraindications, risks, clinical pharmacology, and interactions of drugs used to treat thrombotic disorders.
9. Know the indications, contraindications, risks, and expected outcomes for thrombolytic therapy for venous thromboembolism (pulmonary embolism and deep vein thrombosis).
10. Know the pathophysiology of peripheral artery disease, including atherosclerosis, thrombosis, embolism, entrapment, vasculitis, and vasospasm.

11. Know the pathophysiology, causes, and clinical epidemiology of acute aortic syndromes such as dissection and intramural hematoma.

12. Know the pathophysiology, causes, and clinical epidemiology of cerebrovascular disease.

13. Know the pathophysiology, causes, and clinical epidemiology of chronic venous insufficiency and varicose veins.

14. Know the natural history and prognosis of peripheral atherosclerotic vascular diseases including peripheral artery disease, renal and mesenteric artery disease, extracranial carotid artery disease, and abdominal aortic aneurysm.

15. Know the indications for noninvasive screening for abdominal aortic aneurysm.

16. Know the indications for duplex ultrasound of the peripheral veins and carotid arteries and for duplex and physiological testing of the peripheral arteries.

17. Know the indications and contraindications for computed tomographic angiography and magnetic resonance angiography in patients with suspected vascular disease.

18. Know the appropriate indications and laboratory tests to assess for inherited and acquired thrombophilia.

19. Know the appropriate indications and laboratory tests to assess for vasculitis.

20. Know the indications, contraindications, risks, clinical pharmacology, and interactions of drugs used to treat atherosclerotic vascular diseases.

21. Know the indications and risks for surgical and endovascular treatments for acute aortic syndromes and the expected outcomes.

22. Know the indications and risks for surgical and endovascular treatments for peripheral atherosclerotic vascular diseases, including peripheral artery disease, renal and mesenteric artery disease, and extracranial cerebrovascular disease, and the expected outcomes.

### Patient Care and Procedural Skills

23. Skill to perform the comprehensive physical examination of the peripheral arteries, including palpation of the abdominal aorta and peripheral pulses and auscultation for bruits.

24. Skill to perform physical examination for suspected peripheral venous disorders, including deep vein thrombosis, varicose veins and chronic venous insufficiency.

25. Skill to perform and interpret ankle-brachial index measurement.

26. Skill to evaluate and manage aortic aneurysms including identification of patients for whom surgical or endovascular repair is indicated.

27. Skill to evaluate and manage acute aortic syndromes including identification of patients for whom surgical or endovascular therapy is indicated.

28. Skill to evaluate and manage patients with deep venous thrombosis and pulmonary embolism, including identification of patients for whom thrombolytic therapy is indicated.

### Professionalism

29. Interact respectfully with patients, families, and all members of the healthcare team, including ancillary and support staff.

### Interpersonal and Communication Skills

30. Complete all documentation within the prescribed guidelines.

31. Communicate with and educate patients and families across a broad range of cultural, ethnic, and socioeconomic backgrounds.
Resources for Vascular Rotation:

- Vascular Medicine and Intervention – Vol. 1
- Vascular Imaging – Vol. 2
  (both volumes are available in hard copy and on CVM Fellowship website)
- Cleveland Clinic Vascular Ultrasound Curriculum
  (may be checked out – see fellowship coordinator)
- UW Vascular Ultrasound Curriculum
  (available on Learn@UW)
- UWHC Vascular Imaging Library

Evaluation Methods

- 360 evaluation (NP, RN and techs)
- Faculty evaluation of fellow (MedHub)
- Direct observation (available on Ipad)
Vascular Medicine Curriculum

Introduction to Vascular Imaging and Vascular Scanning
(Presented by Carol Mitchell, Ph.D.)

Description: This course is intended to introduce the cardiovascular fellow to the physics and instrumentation for diagnostic medical ultrasound procedures typically performed in the Echocardiography/Vascular Ultrasound Laboratory. The course will focus on the following; physics and instrumentation in diagnostic medical sonography and ultrasound examinations (protocol and interpretive criteria). Specific ultrasound examinations to be presented in this course are; carotid duplex Doppler, transcranial Doppler, upper and lower extremity peripheral arterial examinations, upper and lower extremity venous examinations and abdominal Doppler examinations.

Vascular Imaging Introductory Lectures
- Ultrasound Principles and Physics
- Non-imaging peripheral arterial testing
- Peripheral arterial duplex imaging
- Carotid duplex imaging
- Visceral vascular
- Peripheral venous duplex imaging

Vascular Medicine Scanning Laboratory
- Scan labs are scheduled immediately following the above lectures.

Vascular Medicine Core Curriculum – Didactics
Perioperative Cardiovascular Risk Assessment
Peripheral Arterial Disease: Epidemiology, Presentation, and Medical Management
Venous Disease: DVT, PE, Paget Schroeder's, May-Thurner, and SVC Syndrome
Non-Invasive Vascular Imaging: ABI/PVR, Duplex, etc.
Renovascular Disease
Acute and Chronic Limb Ischemia
Vasculitides and Non-atherosclerotic Arterial Diseases
Carotid, Subclavian, and Vertebral Vascular Disease

TWO WEEK ROTATION – LEARNING EXPERIENCES
- Vascular Medicine Consults (Faculty – UW Interventional on-call)
- Vascular Imaging: Hands-on training with UWHC Vascular Technicians (minimum 8 hours) Contact person is Kim Baker: kbaker@uwhealth.org
- Vascular Ultrasound interpretation* (with MD over-read)
  Monday, Tuesday, Wednesday - Moncher
  Thursday, Friday - Gimelli
*It is the fellow's responsibility to communicate daily with the consult/reader attending of the day.

Reviewed by K. Moncher, MD 4/2016
ONE MONTH ROTATION – LEARNING EXPERIENCES

Schedule: Monday – Friday (no weekends or holidays)

Didactic Schedule; attendance at these conferences is required:
- Monday 7:00 AM Journal Club/Research G5/320
- Wednesday 4:30 PM Core Curriculum/M&M G5/320
- Thursday 5:00 PM Indications G5/320

Clinical experiences at the VA:
- Prior to first day of rotation, email the PV surgery fellow to find out where to meet, expectations, etc.
- Inpatient consults
- Observe vascular procedures in VA OR
  VA Operating Room Schedule (Observation only)
  - Monday – Dr. Acher
  - Tuesday – Dr. Hoch
  - Thursday – Dr. Tefera (except 1st Thursday of the month)
  - Friday (EO) – Dr. Schwarze

Expectation:
It is expected that you will observe a minimum of:
- 2 CEA
- 2 Bypass
- 2 Open AAA
- 2 Endoscopic AAA repair
It is also expected that you will follow these patients throughout their inpt stay.

- UW Interventional/Vascular Lab – (observation) – Tuesdays and Thursdays

Clinics
- Vascular Surgery Clinic – Wednesdays 9:00 a.m. – 4:00 pm (VA 6th floor E/F)
- Wound care (Vascular) (VA Clinic A) Monday and Tues AMs (fellow should attend this clinic if there are no surgeries to observe) with a minimum of 2 wound clinics weekly)
- Cardiology Clinic – Thursday PM at VA (every Thursday unless there is a fellow on the VA imaging service; then it will be every other Thursday)

Schedule by day of week

MONDAY:
7 AM Journal club research G5/320
Surgery/Rounding
Diana Eastridge, NP Vascular Clinic AM- Clinic A
Imaging/scanning 3rd Fl A3048/3050
Inpt consults/procedures if any

Reviewed by K. Moncher, MD 4/2016
TUESDAY:
Surgery/Rounding
Diana Eastridge, NP Vascular Clinic AM- Clinic A
Imaging/scanning 3rd Fl A3048/3050
Inpt consults/procedures if any

WEDNESDAY:
Rounding if needed
Vascular Clinic E/F 6th Fl 9am- 4 pm
If able, infectious dz/wound care clinic in PM (if done with other clinic) Clinic D 3rd Floor
Core curriculum/M&M 4:30- 6pm G5/320

THURSDAY:
Surgery/Rounding
CV clinic PM (may be every other for some fellows if there is an Imaging Fellow)-6th fl E/F clinic (same as Wed Vasc clinic)
Imaging/scanning 3rd Fl A3048/3050
Indications Conference G5/320

FRIDAY:
Surgery/Rounding
Imaging/scanning 3rd Fl A3048/3050