GOALS & OBJECTIVES
General Vascular Surgery Residency
Loma Linda University

OBJECTIVES: The vascular residency is designed to prepare the resident to function as a qualified practitioner of vascular surgery at the high level of performance expected of a board-certified specialist. The scope of expertise gained will include proficiency in the diagnosis and treatment of diseases of the arterial, venous, and lymphatic systems (exclusive of the heart and intracranial vessels). Expertise will extend to all standard open surgical approaches to vascular diseases as well as the more frequently encountered endovascular techniques. Along with the technical expertise, a thorough study of the basic science, pathophysiology, and non-invasive diagnostic techniques will be taught. These objectives will be gained through completion of the current one-year, and future two-year vascular residency.

CONTENT: At the beginning of the rotation, each vascular resident is given a handout containing the basic science curriculum and clinical curriculum for vascular surgery developed by the Association of Program Directors in Vascular Surgery. The resident is also given handouts describing the vascular service and resident responsibilities (a.k.a. Vascular Surgery Made Ridiculously Easy), as well as an anatomy and surgical exposure chapter, an extracranial vascular disease chapter, a TcPO2 chapter, and a medical treatment of PAD and claudication article. These are required reading materials. Multiple textbooks are also available in the office of the vascular resident as well as attending staff.

MEANS OF ACHIEVING OBJECTIVES: The vascular resident has ample operative and outpatient clinic exposure in addition to a weekly lecture series and patient rounds throughout the year to develop the skills and meet the educational objectives. The focus is on education with a gradual increase in autonomy as deemed appropriate with maturity/experience.

SPECIFIC GOALS AND OBJECTIVES BY ACGME SIX GENERAL COMPETENCIES:

These goals are set for the end of the first year of training and are appropriate for both years of training once the fellowship encompasses two years.

Medical Knowledge:
Goals and Objectives:
Following the completion of training, the resident should be capable of managing all aspects of the care of the patient with vascular disease beginning with the initial evaluation, through the diagnostic and therapeutic phases. The resident should acquire sufficient knowledge to achieve board-certification and deliver comprehensive vascular care in the tertiary care environment.

- Possess adequate knowledge of the anatomy, physiology and imaging (angiographic and noninvasive) details of the arterial, venous and lymphatic systems.
- Possess a thorough understanding of the pathology of all arterial, venous and lymphatic disorders.
- Describe the pathogenesis and complications of aneurysms, atherosclerotic occlusive disease and non-atherosclerotic disease processes in the various vascular beds (aortic, carotid, peripheral, visceral).
Understand all available therapies – medical, interventional and surgical – and their relative merits and expected outcomes.

Assess and optimize risks:
- Cardiac, Pulmonary, Renal
- Understand the principles of nutritional assessment, immunologic response to illness, hematologic derangements (esp. coagulation disorders), and infection.
- Understand unique aspects of diabetes specific to vascular disease.
- Be able to assess all basic and advanced tests employed – CXR, CT scan, CTA, MRA, arteriography, PFT’s, DSE, echocardiography, Dip-Thal, etc.
- Understand all noninvasive vascular laboratory studies and their role in patient care.

Means of Teaching and Assessing:
The resident is expected to have a sound foundation of these issues following their general surgery residency. Further development of this knowledge is expected to occur through the ongoing education during the vascular surgery residency. Weekly educational conferences, including conferences presented by residents and the faculty are required. Ongoing education is provided in the clinic and hospital through direct instruction of the vascular faculty. The resident’s progress is assessed by the faculty on an ongoing basis through direct contact with the resident. Direct feedback is given to the residents on an ongoing basis. Periodic formal resident assessment is performed and documented every three months.

Patient Care and Surgical Skills:
Goals and Objectives:
- Following completion of the vascular residency the resident should demonstrate expertise in consultation for appropriate management of common and uncommon vascular disorders and be capable of integrating the preoperative evaluation, intraoperative treatment and postoperative management of patients with all types of arterial and venous diagnoses.
- Perform thorough evaluations of patients with, and at-risk for vascular disease. Become confident, and effective in vascular physical diagnosis. Understand risk factors for vascular diseases and evidence-based indications for vascular interventions.
- Correctly write and present a focused history and physical examination.
- Become proficient in the preoperative assessment of the vascular patient, decision-making process, ordering appropriate diagnostic tests, and caring for the patient in the perioperative procedure.
- The resident will acquire operative experience in major arterial & venous reconstructive surgery, including AAA & TAA repair, bypasses for UE & LE occlusive disease, carotid endarterectomy & aortic arch branch vessel reconstruction, renal/visceral arterial bypass, hemodialysis access procedures and surgery for chronic venous insufficiency. (List is not inclusive)
- The resident is expected to acquire basic techniques in endovascular surgery including, but not limited to, endovascular AAA repair, thoracic aneurysm repair, diagnostic arteriography, peripheral angioplasty and stenting, carotid stenting, embolization, IVC filter placement, thrombolysis, and other arterial and venous interventional procedures.
Understand and apply/direct all aspects of post-operative and long-term care of the vascular patient. – airway management, fluid/electrolyte/fever/infection, wound care, critical care and management of shock and trauma, acute stroke, coagulation

Specific surgical skills:
Amputation
   Above-knee
   Below-knee
   Through-knee
   Hip disarticulation
   Toe, ray, transmetatarsal
Aneurysm
   TAA, TAAA
   AAA repair
   Juxtarenal and Suprarenal AAA
   Endovascular
   RX of pelvic ischemia
Hemodialysis
   All methods of autologous and non-autologous access
   Placement of temporary and tunneled vascular access
Limb Ischemia
   Acute
   Chronic – LEOD, AIOD
   Association with diabetes and ESRD
Thromboembolecotomy
Trauma
Ultrasound
   Basic techniques of U/S-guided vascular access
   Interpretation of Carotid duplex
   Interpretation of lower extremity arterial exam
Venous disease
   Thromboembolic disease management
   Varicose vein treatment
   DVT Rx and Dx
Visceral
   Renal artery bypass
   Mesenteric

Specific Endovascular Skills
   Endovascular AAA repair
   Thoracic aneurysm repair
   Diagnostic arteriography
   Peripheral angioplasty and stenting
   Carotid stenting, embolization
   IVC filter placement
Arterial and venous thrombolysis
Other arterial and venous interventional procedures

**Means of Teaching and Assessing:**
The resident is expected to have a sound foundation of these skills following their general surgery residency. Further development of these skills knowledge is expected to occur through the ongoing education during the vascular surgery residency. Attendance at weekly educational conferences, including conferences presented by residents and the faculty are required. Ongoing education is provided in the clinic and hospital through direct instruction of the vascular faculty.

The mastery of surgical techniques is taught in the operating room. The mastery of endovascular techniques is taught in the operating room and endovascular suite. The vascular resident is allowed to participate actively in all procedures as appropriate to their level of training and ability. This graduated responsibility is determined by the faculty and assessed on an ongoing basis through direct contact with the resident. Direct feedback is given to the residents on an ongoing basis. Periodic formal resident assessment is performed and documented every three months.

**Practice-Based Learning and Improvement:**
**Goals and Objectives:**
Demonstrate the ability to evaluate the published literature, apply data to patient management, participate in academic and clinical discussions and conferences.
Apply this knowledge in the teaching of fellow physicians and trainees.
Clearly present complications in the Mortality and Morbidity conference.
Apply lessons learned from review of poor outcomes to improve overall patient care.
Continued self-assessment and self-education throughout career.

**Means of Teaching and Assessing:**
The residents are responsible for presenting periodically at the weekly Tuesday morning conferences and the Wednesday morning M&M conferences. Direct feedback is given to the residents on an ongoing basis. Periodic formal resident assessment is performed and documented every three months.

**Systems-Based Practice:**
**Goals and Objectives:**
The resident should be aware of issues of cost-effectiveness when ordering studies, etc.
The resident should be sensitive to the medico-legal and ethical aspects of the practice.
The resident should be able to work with the appropriate available technologies (computer-based charting, imaging, etc) in order to ensure high-quality patient care.

**Means of Teaching and Assessing:**
The resident’s performance in this area is continually observed in the clinic and operating room. Direct feedback is given to the residents on an ongoing basis. Periodic formal resident assessment is performed and documented every three months.
Professionalism:

Goals and Objectives:
Being present at all expected times and places.
Having a professional appearance as appropriate to duties.
Demonstrate outstanding moral and ethical behavior.
Be receptive to feedback on performance and demonstrate a desire for professional excellence.
Demonstrate sensitivity to gender, age, race, and cultural issues of patients and all persons.
Demonstrate leadership qualities and abilities.
Achieve and maintain professional competency.

Means of Teaching and Assessing:
The resident’s performance in this area is continually observed in the clinic and operating room. Direct feedback is given to the residents on an ongoing basis. Periodic formal resident assessment is performed and documented every three months.

Interpersonal and Communication Skills:

Goals and Objectives:
Demonstrate good communication skills with patients and their families in all aspects of patient care – out-patient, preoperative, postoperative, etc.
Demonstrate the ability to interact with all persons on the healthcare team including nursing staff, ancillary/support personnel, fellow residents and colleagues from other specialties.
Recognize and demonstrate the importance of whole-person care.
The resident should demonstrate the ability to request appropriate consultation from other medical specialists and interact with such consultants.
The resident should encourage a pleasant, non-threatening work environment.

Means of Teaching and Assessing:
The resident’s performance in this area is continually observed in the clinic and operating room. Direct feedback is given to the residents on an ongoing basis. Periodic formal resident assessment is performed and documented every three months.
STRUCTURE OF LOMA LINDA UNIVERSITY
GENERAL VASCULAR SURGERY RESIDENCY:

The vascular residency at LLU is currently a one-year residency allowing entry following completion of a general surgery residency program and leading to qualification for Vascular Surgery Board eligibility. The residency will become a two-year program beginning in July, 2007. The general structure of the residency will be outlined below.

ROTATIONS:

Current one-year formulation:
Resident is stationed at LLUMC except for Tuesdays when the resident rotates at the LLVA (for the primary goal of endovascular experience). The resident time at the VA will not exceed one-day per week, and is to average 5 hours per week.

Beginning in July 2008, with two residents in the program the structure will be two rotations – one at LLUMC and one at LLVA.

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July-Sept Oct-Dec Jan-March April-June
R-1   LLUMC   LLVA   LLUMC   LLVA
R-2   LLVA    LLUMC  LLVA   LLUMC
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REQUIRED CONFERENCES:

- Morbidity & Mortality: Wednesdays 8:00am - 9:00am
- General Surgery Grand Rounds: (First Wednesday of the month) 7:00am - 8:00am
- Vascular Didactic Conference (Presented by Resident) / Journal Club: Tuesdays 7:00am - 8:00am
- Vascular Surgery Interdisciplinary Conference (Presented by Faculty) / Case Presentations: Thursdays 7:00am - 8:00am

SUPERVISION: By vascular attending staff

- LLUMC:
  - J. David Killeen, MD (Division Chief)
  - Ahmed M. Abou-Zamzam, MD (Program Director, Vascular Surgery)

- Veteran’s Administration Hospital:
  - James Hopewell, MD
  - Christian Bianchi, MD
  - Theodore Teruya, MD
  - Robert Vannix, MD
RESIDENT RESPONSIBILITIES:

- **Consults:** the vascular resident is responsible for overseeing the evaluation of all new consults from 7am to 5pm, and whenever on-call. The resident may delegate initial evaluation to the junior general surgery resident, but the vascular resident is responsible for overseeing the evaluation and ensuring appropriate and timely attending involvement.
- **Clinics:** the vascular resident is expected to attend all clinics, and any absence must be approved by the attending surgeons.
- **Rounds:** daily with attendings – as a group whenever possible.
- **OR:** cases are distributed per vascular resident and all residents are expected in the OR if possible.
- **Call:** averages every second-to-third night from home for the vascular resident
- **Call for Junior general surgery resident averages every second night from home**

ORGANIZATION OF VASCULAR DIVISIONS

1). Vascular Surgery is one of six divisions within the Department of Surgery at Loma Linda University.

   a. The division chief makes administrative decisions in consultation with the Department of Surgery chairman and dean of the medical school at LLUMC. All matters of policy are subject to established medical school, hospital and departmental policies. The structure of the Division of Vascular Surgery at the VA abides by the VA bylaws.

   b. Prospective faculty and/or secretarial/support staff are selected by the division chief and current vascular faculty subject to approval as above at LLUMC. Participating faculty at the VA are determined by the program director and the designated VA coordinator.

   c. Although there are four other hospitals integrated into the Department of Surgery, Vascular Surgery utilizes primarily the parent university hospital and Veteran’s Affairs Hospital for training of the vascular resident. The time spent by the vascular residents during the course of their training is currently roughly 90% at LLUMC and 10% at LLVA. Beginning in July 2008 when there are two residents, equal time will be spent at the University Hospital and VA. The vascular resident is also able to participate in procedures performed by vascular faculty at other affiliated hospitals on a case-by-case basis. The vascular residency consists of two distinct services – the vascular surgery service at LLUMC and the vascular surgery service at the VA. Each service consists of a
vascular resident, as well as a PGY-1 general surgery resident and a PGY-3 general surgery resident.

d. The vascular resident is an integral part of the division of vascular surgery. The resident is responsible for daily inpatient and outpatient care, supervision of general surgery residents (PGY-1 and PGY-3) on the service, scheduling of cases, and maintenance of morbidity and mortality statistics and performance of the majority of cases on the service. In short, the vascular resident participates in patient care from first referral through surgical care to discharge and through follow-up.

2). Every patient on the vascular surgery service is a referral to one of the attending staff. The vascular service is to function as one “team”. Resident staff perform surgical procedures under the direct supervision of the attending staff at all times. In addition, an attending as well as resident sees all clinic patients. Attending / resident rounds are made on the service on a daily basis including weekends. The vascular and general surgery residents participate in all phases of patient care and make therapeutic / diagnostic decisions primarily in consultation with attending staff and dependent on maturity level / competence. Progressive responsibility is accorded the vascular resident as demonstrated by his / her level of expertise, with increasingly independent care of patients allowed during the course of training.

3). Vascular surgery principles are taught by the attending staff as an interrelated discipline in which relevant anatomy and physiology are utilized to explain known pathophysiology. A logical differential diagnosis is outlined and appropriate diagnostic tests are obtained to arrive at a final diagnosis. Resident staff, in consultation with attending staff, then discuss the list of potential medical/surgical/endovascular therapeutic interventions and decide upon a course of treatment. The vascular resident is taught/supervised on a daily basis in the clinic, on the wards, and during operative cases, utilizing this educational framework. Formal didactic lectures are supplemented by visiting professors and case presentations. Surgical anatomy is taught within these lectures and during vascular exposures in the operating room.
Patient care situations are also used for teaching, with residents providing decisions during all phases of care. Specific additional experience in endovascular surgery is obtained during the course of the clinical year. Experience with the non-invasive vascular laboratory and specifically duplex ultrasound is obtained by performing intraoperative studies and reading studies over the course of the year. The vascular attending will instruct the residents in the interpretation of all tests performed in the ICAVL-accredited vascular laboratory at LLUMC.

4). Vascular resident call is taken from home and averages every-other night and every-other weekend. The vascular resident workweek averages 60-80 hours. The vascular resident is assisted on the service by PGY-3 and PGY-1 general surgery residents. These three residents in addition to one or two medical students constitute the vascular team.

Approximately 20 percent of the total vascular surgery caseload is performed by general surgery residents who also participate in all phases of patient care from initial referral to post-discharge follow-up. General surgery residents at the other four integrated hospitals in the General surgery residency also perform vascular cases independent of the vascular resident. The vascular resident manages the vascular surgery service totally independent of the general surgery services, which are headed by PGY-5 general surgery residents. When the vascular resident is not on call or on vacation, a PGY-3 general surgery resident is available to assist with vascular cases. Vascular and senior general surgery residents are never in direct competition for cases.

5). The vascular resident formally evaluates the fellowship twice per year and evaluates the attending staff at the end of the training year.

6). Support services from the hospital are available 24 hours a day, seven days a week, including dialysis, radiology, laboratory, etc. as well as an on-call room for the vascular and general surgery residents and cafeteria services.
**SPECIFIC EDUCATIONAL GOALS & OBJECTIVES FOR ROTATION ON VASCULAR SURGERY AT LLUMC and LL-VA**

<table>
<thead>
<tr>
<th>RESIDENT</th>
<th>KNOWLEDGE BASE &amp; CRITICAL THINKING</th>
<th>CLINICAL DIAGNOSIS &amp; MGMT</th>
<th>OUTPT. EXPERIENCE &amp; CONTINUITY OF CARE</th>
<th>OPERATIVE EXPERIENCE</th>
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<tr>
<td><strong>GOALS FOR ALL RESIDENTS</strong></td>
<td>At the completion of this rotation, each resident should understand the pathogenesis, methods of diagnosis and principles of management of atherosclerotic occlusive disease, aneurysmal disease, and common disorders of the venous system. In particular, the resident must be knowledgeable in the diagnosis and management of peripheral vascular and carotid artery disease.</td>
<td>The resident should possess a working knowledge of vascular laboratory diagnostic procedures including: ankle/brachial indices, Doppler ultrasound and other diagnostic methodologies commonly employed by the vascular laboratory.</td>
<td>By regular attendance in the outpatient vascular clinics, the resident should develop facility in the recognition, diagnosis, evaluation and treatment of common arterial and venous disorders.</td>
<td>See Below.</td>
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<td><strong>OBJECTIVES FOR ROTATIONS</strong></td>
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<td><strong>PGY I</strong></td>
<td>SEE ABOVE</td>
<td>The resident should understand the diagnostic criteria and pathophysiology differentiating acute and chronic arterial and venous insufficiency.</td>
<td>Attend on a regular basis the outpatient clinic sessions at the FMO.</td>
<td>Perform minor and major amputations and débridements. With supervision, insert central venous lines.</td>
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<td><strong>PGY III</strong></td>
<td>SEE ABOVE</td>
<td>Demonstrate the ability to interpret vascular diagnostic procedures and provide vascular consultations. Show competence in instituting management plans. Become competent in the evaluation and treatment of patients with common vascular problems.</td>
<td>Participate on a regular basis in the outpatient clinics of vascular attending staff.</td>
<td>Achieve operative experience with dialysis access, exposure of major vessels for uncomplicated repair and/or reconstruction. Further experience with vascular anastomoses and major lower extremity amputations.</td>
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<td><strong>Vascular Resident (PGY VI, VII) (R-1 and R-2)</strong></td>
<td>Following the completion of training, the resident should be capable of managing all aspects of the care of the patient with vascular disease beginning with the initial evaluation, through the diagnostic and therapeutic phases. The resident should acquire sufficient knowledge to achieve board-certification and deliver comprehensive vascular care in the tertiary care environment.</td>
<td>Demonstrate expertise in consultation for appropriate management of common and uncommon vascular disorders. Integrate preoperative evaluation, intraoperative treatment and postoperative management of patients with all types of arterial and venous diagnoses.</td>
<td>Attend the outpatient clinics on a regular basis.</td>
<td>Acquire operative experience in major arterial &amp; venous reconstructive surgery, including AAA &amp; TAA repair, bypasses for UE &amp; LE occlusive disease, carotid endarterectomy &amp; aortic arch branch vessel reconstruction, renal/visceral arterial bypass and surgery for chronic venous insufficiency. (List is not inclusive) Acquire basic techniques in endovascular surgery including AAA repair, thoracic aneurysm repair, diagnostic arteriography, peripheral angioplasty and stenting, and carotid stenting.</td>
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