University of California – San Diego
VASCULAR & ENDOVASCULAR SURGERY
Fellowship HANDBOOK
2017

Dennis Bandyk, MD, FACS
Program Director, UC San Diego
dbandyk@ucsd.edu

John Lane III MD, FACS
Chief, Division of Vascular & Endovascular Surgery and Professor of Surgery, UC San Diego

Associate Program Directors
David Frankel MD FACS – Chief, Vascular Surgery; Scripps Green Clinic
Kelley Hodgkiss-Harlow MD, FACS – Chief, Vascular Surgery,
Kaiser Foundation Medical Center

Residency Program Administrator
Lupita Nuño
619-471-3859 ph | 619-543-3017 fax | 619-787-5481 cell |
gnuno@ucsd.edu

UC San Diego – Sulpizio Cardiovascular Center
Vascular Surgery Faculty

UC San Diego – Sulpizio Cardiovascular Center
Dennis Bandyk, MD, FACS – Professor of Surgery in Residence
John Lane III MD, FACS – Professor of Surgery
Andrew Barleben, MD – Acting Assistant Professor of Surgery
Erik Owens, MD, FACS – Professor of Surgery
Chief – VAMC Surgical Service

Scripps Clinic/Green
Ankur Chandra MD FACS - Clinical Assistant Professor of Surgery
David Frankel, MD – Clinical Assistant Professor of Surgery

Kaiser Foundation Medical Center
Katherine Chang MD, FACS – Clinical Assistant Professor of Surgery
Tim Canty, MD, FACS - Clinical Assistant Professor of Surgery
Kelley Hodgkiss-Harlow MD – Clinical Assistant Professor of Surgery
Robert McGinn, MD, FACS - Clinical Assistant Professor of Surgery
Edward Plecha, MD, FACS - Clinical Associate Professor of Surgery
Elena Rakhlin, MD - Clinical Assistant Professor of Surgery

CLINICAL COMPETENCY COMMITTEE
John Lane III, MD
David Frankel, MD
Kelley Hodgkiss-Harlow MD
2nd year vascular surgery fellow

RESIDENCY (Program Evaluation) ADVISORY COMMITTEE
Dennis Bandyk, MD
Katherine Chang, MD
Andrew Barleben, MD
1st year – vascular surgery fellow

UC San Diego - Division of Vascular & Endovascular of Surgery
Practicing and teaching surgical excellence while Advancing the field of vascular surgery
UC San Diego Vascular Surgery Faculty

Dennis Bandyk, MD - Chief of Vascular Surgery
• University of Michigan School of Medicine 1975
• Residency University of Washington, 1975-1980
• Clinical Interests: Vascular lab interpretation, carotid surgery, thoracic outlet syndrome, graft infection, critical limb ischemia;

Andrew Barleben, MD
• New York Medical College, 2005
• Residency: University of Cal - Irvine, 2005-2011
• Fellow in Vascular Surgery, UCLA, 2011-2013
• Clinical Interests: Complex aneurysm repair, fenestrated endografts; venous endosurgery

John S. Lane, MD
• UCLA School of Medicine, 1993
• Residency: UCLA School of Medicine 1993-2000
• Fellow in Vascular & Endovascular Surgery, UCLA, 2000-2001
• Clinical Interests: Carotid surgery, TEVAR, CLI, IVC filter removal, complex EVAR and TEVAR
GENERAL GOALS OF THE PROGRAM

A. The primary goal of this 2-year independent ACGME approved vascular surgery fellowship training program is train a general surgeon to become a specialist and leader in the discipline of vascular surgery. Our program is structured to instill knowledge, skills, clinical judgment, and professional attitudes for our graduates to excel as vascular surgeons.

To accomplish these objectives, the program combines fundamental education in the education of vascular disease with a diverse exposure to clinical patient care and vascular interventions. The cognitive and technical skills required for vascular surgery practice are fostered, while residents are encouraged to develop clinical maturity and evidence-based surgical judgment in caring for the vascular patient.

B. Two fundamental philosophies apply to vascular surgery training at UC San Diego and the participating institutions:

1. Graded responsibilities in clinical vascular & endovascular surgery both in and out of the operating/hybrid room or angiography suite.

2. A daily discipline in the pursuit of self-directed study and faculty-mentored scholarship to advance vascular care for our patients. There is as strong emphasis on continuity of care during clinical rotations, including in participation at all levels of pre, intra-, and post-interventional care of patients with vascular disease.

C. The vascular surgery fellow, relative to their level of training, are expected to demonstrate the skills, knowledge, and attitudes to sufficiently meet the requirements of the following general competencies:

1. Patient Care
2. Medical Knowledge
3. Practice-Based Learning and Improvement
4. Interpersonal and Communication Skills
5. Professionalism
6. System-Based Practice

The vascular surgery fellow is expected to maintain a "learning portfolio". This self-completed assessment is a means by which you can demonstrate evidence of learning and competence. The portfolio is a collection of resident work packaged and organized for easy review and evaluation, and it will provide a framework for presenting it as evidence of your progress in achievement of the Six Competencies required by the ACGME.

Following is the minimum items that should be in your portfolio:
- CV
- Scholarly Activity (during your resident training)
- Publications (manuscripts, scientific publications, book chapters)
- Abstracts
- Presentations at regional and national meetings
- IRB research project submissions
- Your resident clinical research project

- Presentations at Monday - Vascular Conference
  - Vascular curriculum review topics
  - Journal club – including article(s) reviewed
  - M&M presentations – including literature article review

- Quality Improvement project
  - A focused patient QI project
  - A written root-cause analysis of a M&M patient event
  - Use of the Vascular Quality Initiative (VQI) database to research and analyze a QI outcome.

- Learning Activity project
  - An activity you completed to identify strengths, deficiencies, and limits in your knowledge and expertise (self-reflection and self-assessment) of a vascular surgery condition or procedure; you set learning and improvement goals; identify and perform appropriate learning activities to achieve self-identified goals (life-long learning).

- Log of Clinical Experience (procedures, interventions, hands-on ultrasound imaging)
  - Open procedures
  - Endovascular interventions, including ultrasound-guided procedures
  - Diagnostic arterial and venous imaging studies

- Log of Vascular Laboratory interpretations
- Log of general surgery residents and medical students mentored
- Faculty evaluations

The portfolio will be used by the Program Director and Program Evaluation Committee (PEC), along with other information, to evaluate your evolving competence as a vascular surgeon. The portfolio will be reviewed by the Clinical Competency Committee as part of your semi-annual review. It will be scored according to the following criteria:

**Beginning:** partial demonstration of required and non-required exhibits

**Advancing:** substantial demonstration of required and non-required exhibits

**Competent:** satisfactory demonstration of required and non-required exhibits

**Above Competence:** outstanding demonstration of required and non-required exhibits

The faculty recognize that vascular surgery education and experience will continue beyond these two training years. We therefore will emphasize the importance of self-directed study habits with special attention to the history and evolution of vascular surgery as a specialty, and promotion of vascular surgeons as experts in vascular disease evaluation and management. This program values each individual’s needs, abilities, and career desires. Research in clinical outcomes and on-going vascular research studies are encouraged.
D. The fellowship program consists of two structured clinical years devoted to the evaluation and management of vascular disease. Clinical rotations are 2 or 4 months in duration and designed to provide step-graded advancement to the ultimate goal of independent practice in vascular surgery with all of its technical, judgmental, and ethical responsibilities. Each fellow will be provided a balanced “on-call” experience for continuity of patient care, opportunities to attend professional vascular surgery meetings, and “off-call: time for independent study and recreation.

E. At the conclusion of vascular surgery training, our residents will:

1. Compete favorably for the most coveted academic and community practice vascular surgeon positions

2. Successfully pass the qualifying (written) and certifying (oral) examinations of the Vascular Surgery Board of the American Board of Surgery, obtaining certification from the ABS-Vascular Surgery Board.

3. Contribute as vascular specialists and leaders in academic vascular surgery, or in the community practice of vascular surgery.

I. VASCULAR SURGERY RESIDENCY TRAINING GOALS

A. Core Knowledge and Skills

1. Our vascular surgery fellowship is designed to give the trainee broad clinical experience in arterial, venous, and lymphatic disorders in all patient age groups. On completion of the program, the vascular surgery fellows are expected to be clinically proficient in these areas as well as knowledgeable in performance and interpretation of vascular laboratory diagnostic testing, usage of endovascular devices, and open vascular repair.

2. Although operative and endovascular procedures constitute the most important aspects of the program, our fellowship includes the opportunity to correlate diagnostic imaging and pathologic aspects of vascular disorders. At the completion of training, the fellow will be skilled in important diagnostic procedures (duplex ultrasound, intravascular ultrasound, arteriography, venography), able to interpret physiologic/ultrasound vascular laboratory testing and other appropriate vascular imaging studies (CT angiograms, MRI/MRA).

In addition to open and endovascular intervention, the vascular surgery fellow has the opportunity under supervision to:

a. Provide pre-intervention management, including patient counseling, selection and timing of the procedure, and selection of appropriate procedures.

b. Provide and be responsible for post-intervention patient care, including ICU care.
c. Provide and be responsible for the critical care of patients with vascular disorders, including trauma patients, whether or not intervention was required.

d. Participate in clinical research.

B. In Training Vascular Surgeons, We Recognize Important Factors For Development

1. **Knowledge** in vascular surgery is defined by a clinical and basic curriculum developed by the Association of Program Directors in Vascular Surgery (APDVS). In addition, knowledge is acquired through didactic lectures, textbooks, scientific journals, the internet, and information provided by faculty and other medical practitioners. Assessment of knowledge is obtained formally (annual in-training VSITE examination), and by faculty evaluation of the resident’s fund of knowledge.

2. **Skill** in vascular surgery is defined as the ability to accomplish a procedure (open or endovascular) with precision and confidence, which requires knowledge, dexterity, and expertise. Both manual and intellectual skills are required. Skills are acquired by graded supervision in the operating room or angiography suite for each vascular surgery procedure.

3. **Clinical judgment** in vascular surgery is defined as the ability to evaluate a patient, formulate a differential diagnosis, consider alternative modes of treatment, and then determine and implement an appropriate treatment plan. Clinical judgment is an attribute of the “expert” surgeon, is difficult to acquire, but can be developed in the resident through experience and dialog with the supervising faculty.

4. **Behaviors and Attitudes** appropriate to vascular surgery are defined as the abilities to establish and maintain professional relationships with patients, colleagues, staff, and faculty. This subject encompasses the ability of the resident to treat patients with compassion, respect, integrity, in an ethical fashion, and the ability to seek consultation with colleagues within and outside the specialty. The ability of the resident to incorporate constructive criticism into the learning process is key to the formation of appropriate professional attitudes.

Our vascular surgery fellows work with the faculty at four hospitals: UCSD Sulpizio Cardiovascular Center, San Diego VA Medical Center (VAMC), The Scripps Green Hospital, and the Zion Kaiser Foundation Medical Center.

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<th></th>
<th>July- Aug</th>
<th>Sept-Oct</th>
<th>Nov-Dec</th>
<th>Jan-Feb</th>
<th>Mar-April</th>
<th>May-June</th>
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<tbody>
<tr>
<td>Year 1</td>
<td>UCSD*</td>
<td>Scripps</td>
<td>UCSD*</td>
<td></td>
<td>Kaiser</td>
<td>UCSD*</td>
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<td>Year 2</td>
<td>Scripps</td>
<td>UCSD*</td>
<td>Kaiser</td>
<td>UCSD*</td>
<td>UCSD*</td>
<td>UCSD/Scripps</td>
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*UCSD – Sulpizio CVC, HillCrest, and VAMC
During each (2 or 4 mo.) rotation, the fellow experience varies by providing an exposure to both community and academic vascular surgery practice. The fellows will receive endovascular intervention training from the UC San Diego vascular surgery faculty and during the Kaiser and Scripps rotations work with community vascular surgeons. At the Sulpizio Cardiovascular Center, the San Diego VA, and Scripps Green, fellows will perform routine and complex endovascular intervention in state-or-art hybrid operating rooms. During the 24 months of training, the fellow will be exposed to the full complement of vascular disease and its management, including vascular trauma, spine exposure, thoracic outlet compression syndromes, and pediatric vascular conditions.

III. PROGRAM GOALS AND ORGANIZATION

The clinical curriculum of this 2-yr ACGME-accredited vascular surgery fellowship training program has been developed by the clinical faculty in conjunction with Association of Program Directors in Vascular Surgery - www.vascularweb.org/APDVS/. The clinical curriculum is reviewed and modified each year based on resident and faculty input and results of the VSITE examination. Furthermore, the institution’s Graduate Medical Education Committee (GMEC) has as its primary goal the surveillance of UCSD resident education programs. Our program’s last GMEC review was in November 2013, and our last RRC-ACGME site visit was in February 2013.

A. Educational Goals

1. The fellow must acquire a fundamental knowledge base in the basic sciences applicable to vascular surgery, including arterial and venous physiology, vascular anatomy, ultrasound physics, and radiation physics and safety.

2. The fellow must acquire a sound knowledge base in the clinical science of vascular surgery.

3. The fellow must develop, through simulation training and clinical experience, the competence to execute the operative, endovascular, and non-operative procedures intrinsic to the practice of vascular surgery.

4. The fellow must develop the skills of clinical decision-making to become a safe and effective practitioner of vascular surgery.

5. The fellow must develop the desire and ability to care for the vascular patient in a competent, responsible, compassionate, and ethical manner while serving society by demonstrating professional integrity, intellectual honesty, and social responsibility.
6. The fellow must learn to appraise and assimilate scientific evidence, evidence-based outcome data, and attempt to continuously improve patient care by continuous self-evaluation and lifelong learning.

7. The fellow must develop an understanding of systems-based practice and use this knowledge to improve quality of patient care and make the hospital environment safer for patients.

B. Vascular Surgery Fellow Responsibilities

1. Participate in effective and compassionate vascular patient care under supervision commensurate with level of ability and training. Develop a personal program of self-study and professional growth with guidance from the vascular surgery faculty and the Assn. of Program Directors in Vascular Surgery.

2. Participate in the education and scholarly activities of the program, including the teaching of medical students and general surgery residents, and the development of quality care initiative.

3. Adhere to the established practices, procedures, and policies of the institution.

4. Participate in divisional and institutional committees, especially those that relate to patient care review activities.

5. Participate in the evaluation of the vascular surgery training program including clinical curriculum review and assessment of faculty teaching.

6. Develop an understanding of ethical, socioeconomic, and medical/legal issues that affect graduate medical education, vascular surgeons, and how to apply cost containment measures in patient care.

7. Complete medical records in an accurate and timely fashion.

8. Accurately and timely log work-hours in New Innovations.

9. Log diagnostic imaging interpretation experience, operative procedures, and endovascular interventions in ACGME case log system.

II. VASCULAR SURGERY FELLOW COMPETENCIES

The independent 5+2 training track in vascular surgery consists of 24 months of clinical experience for graduates of ACGME-RRC accredited general surgery programs. Both years are
intended as a “senior” level experience in vascular surgery to develop independent skills in managing vascular disease; with the 2nd year being designated as the “Chief Resident” year. The vascular fellow is expected to be knowledgeable with the workup and care of vascular patients, become competent in evaluating vascular complaints, performing physical examination of the vascular system, prescribing and interpreting appropriate diagnostic tests, and recommending management as indicated. The vascular surgery fellow should become very well versed in the pre- and post-operative management of patients with vascular disease as well as the principles of both open and endovascular treatment. Competency in the use of noninvasive vascular testing, diagnostic angiography, interventional procedures, including interpretation of all vascular imaging studies is required. In addition, the vascular surgery fellow should become familiar with open procedures, their proper indications and prove competence in the performance of vascular reconstructions with minimal assistance. The two training years are designed to provide a progressive learning experience leaning to independent operator experience in vascular surgery.

The first year will provide a senior experience on the vascular services of the San Diego VAMC, community hospitals (Scripps Green, Zion Kaiser) with an excellent spectrum of vascular conditions primarily in the elective setting. Early rotations will provide dedicated experience in vascular laboratory test interpretation, diagnostic angiography (VAMC, CVC) to sharpen the skills in diagnostic and therapeutic endovascular procedures. The fellow during this year should become competent in the management of routine vascular problems (dialysis access, lower limb angioplasty/bypass grafting, carotid endarterectomy, endovascular AAA repair, IVC filter placement, venous surgery) as well as the performance of emergent vascular trauma procedures, both open and endovascular. Rotation on the vascular surgery service at the Sulpizio Cardiovascular Center will provide exposure to more complex vascular conditions, including thoracoabdominal aneurysm repair, and thoracic aorta endografting.

The second year is designed to provide experience at the senior level in the more complex types of vascular problems, both elective, redo, and emergency. This year will be spent at the Sulpizio Cardiovascular Center, and the two sponsoring Kaiser and Scripps institutions, where tertiary care is provided in addition to common advanced vascular procedures (thoracic outlet procedures, catheter-directed thrombolysis). During this year, the vascular surgery fellow will perform complex endovascular procedures, carotid artery stent angioplasty, and implantation of fenestrated stent-grafts for juxta and pararenal abdominal aortic aneurysm.

At the completion of training, the graduate is expected to have the skills necessary to diagnose and define abnormalities of the vascular system, formulate a treatment plan based on available medical and surgical therapeutic options and perform all various surgical and endovascular reconstructive procedures deemed necessary. The graduating vascular surgeon will also have an in-depth understanding of the pathophysiology of vascular disease, especially in areas of hemodynamics, predisposing factors for atherosclerotic disease and knowledge of the pharmacokinetics of drugs used in the treatment of vascular pathology.

A. MEDICAL KNOWLEDGE AND PATIENT CARE
By the end of training, the successful graduate should possess all the necessary skills required to be proficient in the diagnosis and treatment of diseases of the peripheral arterial, venous and lymphatic systems. The aim of the last two years of the program is to prepare fellows to become proficient in the diagnosis, management and proper planning of the appropriate interventions as well as the performance of such interventions with minimal assistance, for the following categories of vascular problems:

1. Aneurysmal disease: Infrarenal, thoracoabdominal, visceral, peripheral
2. Extracranial cerebrovascular disease: Carotid bifurcation, aortic arch, subclavian steal
3. Peripheral obstructive disease: Aorto-iliac, infrainguinal, upper extremities
4. Hemodialysis access: arteriovenous fistulas, cuffed catheter intravenous dialysis access
5. Venous disease: Reflux and varicose veins, Deep venous thrombosis, vena cava filter placement and retrieval.
6. Thoracic outlet obstruction (neurogenic, arterial, venous)
7. Traumatic injuries: arterial, venous
8. Wound healing strategies: diabetic foot infection
9. Congenital malformations
10. Inflammatory vascular diseases
11. Reflex sympathetic dystrophy and vasospasm

The trainee will be expected to be able to conduct efficiently the spectrum of common vascular procedures outlined below.

<table>
<thead>
<tr>
<th>Open Surgical Procedures and Techniques</th>
<th>Endovascular Reconstructive Procedures and Techniques</th>
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<tr>
<td>• Vascular Exposure and Control</td>
<td>• Diagnostic angiography</td>
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<tr>
<td>• Vascular Access Construction</td>
<td>• Carotid artery stenting</td>
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<td>• Thromboembolectomy</td>
<td>• Endovascular Aneurysm Repair</td>
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<td>• Varicose Vein Excision</td>
<td>• Thoracic Endovascular Grafting</td>
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<td>• Extra-anatomic bypasses</td>
<td>• Peripheral Artery Bypass</td>
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<tr>
<td>• Vascular clamps and Instruments</td>
<td>• Aortic Aneurysm Repair</td>
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<td>• Vascular surgical retractors</td>
<td>• Visceral Artery Bypass</td>
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<tr>
<td>• Prosthetic and autogenous conduits</td>
<td>• Carotid Endarterectomy</td>
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<tr>
<td>• Measurement of stent-grafts for AAA repair</td>
<td>• Peripheral endarterectomy</td>
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<tr>
<td>• Central Line placement</td>
<td>• Venous ablation procedures</td>
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<tr>
<td>• Magnifying and lighting instruments</td>
<td>• Removal of Infected grafts</td>
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<tr>
<td>• Thoracic Outlet Decompression</td>
<td>• Sympathectomy</td>
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<tr>
<td>• Peripheral Arterial Bypass</td>
<td>• Endovenous techniques</td>
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<tr>
<td>• Peripheral aneurysm repair</td>
<td>• Percutaneous Thrombectomy</td>
</tr>
<tr>
<td>• Visceral Artery Bypass</td>
<td>• 0.014 to 0.035 platform sizes</td>
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In addition, the trainee will be expected to acquire the necessary knowledge and skills in the proper use of noninvasive vascular lab testing, including hands-on experience for intraoperative arterial repair assessment and venous mapping. Thorough understanding of the physics of flow and of ultrasound measurements is essential. The fellows are expected to demonstrate a complete understanding of the accuracy and limitations of non-invasive ultrasound and hemodynamic testing as well as alternative diagnostic modalities appropriate for the clinical situation. Familiarity with actual hands on testing is expected for most common procedures such as carotid ultrasound as well as venous testing. The successful graduate is finally expected to have a thorough of diagnostic criteria for test interpretation of tests for the following:

- Hemodynamic indirect physiologic testing: Upper and lower extremities
- Dialysis access evaluation and surveillance
- Duplex scans: Carotids, abdominal aortic and visceral, graft surveillance

Vascular Lab Training is integrated throughout the patient care process from outpatient to inpatient care during the two year training period. The vascular resident is expected to become certified by the ADRMS as a registered physician in vascular interpretation (RPVI) in the Spring of the 2nd year of training (requires interpretation of >500 vascular tests).

The diagnostic skills and use of specialized radiographic imaging by the vascular fellow are expected to be sharpened significantly during the senior years. The fellow is expected to demonstrate advanced expertise in the proper use and interpretation of vascular structures on CT and MR angiography. They are expected to perform and interpret diagnostic angiography of all vascular beds in the scope of diseases mentioned before. A clear understanding of radiation physics and safety is also expected before completion of the training program.

**PATIENT CARE:**

**PGY-6 – 1st year Vascular Fellow**

1. To understand radiation safety issues for the patient and operator
2. To understand arterial and venous radiographic anatomy.
3. To develop proficiency with percutaneous arterial and venous cannulation of the upper and lower extremity.
4. To become familiar with and be able to name and use all basic guidewires, catheters and other devices used for diagnostic and therapeutic interventional procedures.
5. To become proficient using the Mentis simulator for interventional procedures.
6. To perform under supervision diagnostic arteriography and venography of the abdomen and lower extremities.
7. To learn the indications for, the performance of, and the interpretation of arterial physiologic testing and venous duplex scanning for DVT.
8. To demonstrate expertise with percutaneous puncture and with diagnostic arteriography of the abdomen and lower extremity.
9. To use the vascular simulator to practice interventional techniques.
10. To perform under supervision diagnostic arteriography of the renal and brachiocephalic arteries.
11. To perform under supervision balloon angioplasty and stenting of the iliac and lower extremity arteries.
12. To perform under supervision vena cava filter placement.
13. To use percutaneous closure techniques after arterial catheterization.
14. To learn the indications for, the performance of, and the interpretation of peripheral arterial duplex scanning and duplex scanning for venous valvular incompetence.
15. To perform under supervision catheter directed thrombolysis procedures.
16. To perform under supervision of balloon angioplasty and stenting of renal and mesenteric arteries.
17. To perform under supervision thrombin injection of femoral pseudoaneurysms.

PGY-7 – 2nd year Vascular Fellow
1. To use embolic protection devices during carotid, renal and mesenteric stenting.
2. To learn the indications for, the performance of, and the interpretation of carotid artery duplex, abdominal arterial duplex, and upper extremity venous duplex scanning. To perform under supervision carotid artery stenting.
3. To perform under supervision selective catheterization of branch arteries for coil embolization.
4. To perform under supervision sub-intimal angioplasty and laser treatment of leg arteries.
5. To use mechanical thrombolytic devices.
6. To interpret >500 noninvasive vascular laboratory studies under faculty supervision.
7. To independently manage complex interventional procedures with minimal faculty supervision.
8. To demonstrate appropriate rescue techniques for complications of interventional procedures.

Assessments of Resident Knowledge and Patient Care:
- Informal faculty assessment on a day-to-day basis
- Faculty assessment in New Innovations after each rotation
- Bi-annual meetings with the Program Director
- Direct feedback from physician extenders (PA, ARNP), nurses, other physicians, and ancillary staff
- Bi-yearly 360 degree evaluations from operating room, clinic, and office staff.
- Faculty feedback from biweekly M&M conferences
- Yearly VSITE in-service examination conducted each March.
B. Practice-based Learning and Improvement

The fellows must demonstrate the ability to research and evaluate the care of their patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on outcome analysis, self-evaluation, and life-long learning. The vascular fellow will be expected to participate actively in the Mortality and Morbidity conferences helping in analysis of complications and errors as well as implementing corrective actions reached at these conferences. They must demonstrate an understanding of quality control and continuous improvement processes for vascular care. They are also expected to develop critical skills in basic and clinic research in vascular diseases. During their training, beginning in the 1st year, the vascular fellow is expected to become familiar with the methodology used for both retrospective and prospective investigations, statistical analysis of data, methods of funding research and writing of abstracts and manuscripts. The fellow is also expected during this phase of training to learn the basics of laboratory investigation, endovascular skill simulation, and clinical trials. They should show an understanding of the concepts being investigated in the division and assist in appropriate patient enrollment in on-going, IRB-approved clinical studies. It is expected that each trainee will be able to complete and publish at least one peer review research project during this residency period.

Fellows will be assessed on their ability to accomplish the following goals:
- Identify strengths, deficiencies, and limits of one’s knowledge in vascular surgery
- Set yearly learning, research, and improvement goals
- Analyze patient outcomes using quality improvement methods and implement changes in patient care
- Actively participate in educational conferences and make revision in the clinical curriculum.
- Apply appropriately journal article reviews and textbook learning to vascular patient care practices
- Obtain IRB approval for a patient outcome research study
- Log cases in Quality Vascular Initiative to improve patient care and follow-up

Assessments:
- Informal faculty assessment based on prior procedure experience
- Faculty assessment in New Innovations after each rotation
- Bi-annual meetings with the Program Director
- Publication of a peer-reviewed scientific article
- Direct feedback from physician extenders (PA, ARNP), nurses, other physicians, and ancillary staff
- Bi-yearly 360 degree evaluations from operating room, clinic, and office staff.
- Faculty feedback from biweekly M&M conferences.
- Presentation of annual quality improvement program results.
C. Interpersonal and Communication Skills

Fellows must demonstrate communication skills that result in the effective exchange of information and collaboration with patients, their families, health professionals, and the faculty. It is also expected the vascular surgery resident will present at the Southern California Vascular Surgery Society meeting annually, and also be able to present regionally (Western Vascular) or nationally (Society for Vascular Surgery, Peripheral Vascular Surgical Society) at least once during the two years of the residency. The vascular residents are expected to lead the service and coordinate flow of information from the more junior residents to the attending staff level effectively. This attribute will be confirmed by:

- Observation of effective communication with patients, families, and referring physicians.
- Counseling patient on open and endovascular interventions for vascular disease
- Act effectively as a consultative vascular surgeon
- Writing relative and comprehensive consults and daily notes.
- Demonstrate empathy and good listening skills.
- Presentations at weekly conferences and regional/national vascular meetings.

Assessments:
- Informal faculty assessment based on outpatient clinic interactions with patient and their families.
- Faculty assessment in New Innovations after each rotation
- Bi-annual meetings with the Program Director
- Direct feedback from physician extenders (PA, ARNP), nurses, other physicians, and ancillary staff
- Bi-yearly 360 degree evaluations from operating room, clinic, and office staff.
- Monitoring of timeliness and content of operative notes and discharge summaries

D. Professionalism

The fellow must demonstrate a commitment to the profession of vascular surgery and an adherence to ethical principles. This characteristic will be determined by:
- Continuously showing respect, compassion, humility, and integrity in the care of their patients
- Demonstrate responsiveness to patient care that supersedes self-interest
- Uphold the professional standards on every rotation with regard to work hours, patient confidentiality, and informed consent.
- Routinely demonstrate sensitivity to and respect differences in a diverse patient population without regard to gender, age, culture, race, sexual orientation, disability, or educational level.
- Demonstrate continuity of care from the pre-operative evaluation thru the interventional procedure, and during post-procedural care.
Assessments:
- Direct daily faculty assessment of resident work habits and attitudes.
- Faculty assessment in New Innovations after each rotation
- Bi-annual meetings with the Program Director
- Direct feedback from physician extenders (PA, ARNP), nurses, other physicians, and ancillary staff.
- Completion of UCSD Resident Physician Online Learning Modules encompassing relevant topics.
- Completion of annual online training on Sexual Harassment.
- Bi-yearly 360-degree evaluations from operating room, clinic, and office staff.
- Monitoring of timeliness and content of operative notes and discharge summaries.

E. Systems-based Practice

Fellows must demonstrate an awareness of and responsiveness to the health care system and the delivery of quality vascular surgery care. The fellow must know how to call in additional resources in order to provide optimal vascular care. The fellows will be expected to lead the team in planning treatment, admissions, transfers and discharges teaching junior members the proper procedures for functioning appropriately within the established system of care. They must be expert at all the electronic resources for patient care. A thorough understanding of insurance guidelines, billings and patient responsibilities and financial burden are expected. The fellows should also achieve an understanding of risk benefit ratios for various interventions both in terms of complications, expected benefits, quality of life and financial costs to the health care system, the patient and society.

This trait will be demonstrated by:
- Work effectively at the Sulpizio Cardiovascular Center and other participating institutions with the faculty, referring physicians, and consultants in the care of the vascular patient.
- Efficiently coordinate patient care at each institution.
- Understand the team concept of patient care.
- Demonstrate sensitivity and awareness of healthcare costs.
- Work with quality initiative to enhance patient safety and improve patient quality care.

Assessments:
- Direct daily faculty assessment of fellow work habits and attitudes.
- Faculty assessment in New Innovations after each rotation
- Bi-annual meetings with the Program Director
- Direct feedback from physician extenders (PA, ARNP), nurses, other physicians, and ancillary staff.
- Presentations on quality initiatives project to improve patient care.
- Completion of annual online training on Sexual Harassment.
- Bi-yearly 360 degree evaluations from operating room, clinic, and office staff.
I. ORGANIZATIONAL STRUCTURE AND INSTITUTIONS

The UC San Diego vascular surgery training program consists of two years of clinical experience involving one parent institution and three integrated institutions. The education content and expected goals of each rotation are listed in the following institution descriptions.

A. UC San Diego - Parent Institution:

The Sulpizio Cardiovascular Center (CVC) adjacent to the “new” Jacobs Medical Center (245 beds) is a state of the art tertiary referral center devoted to the care of vascular, cardiac, and thoracic conditions.
The fellow is involved in both inpatient care and outpatient evaluations. There is collaborative work environment with Cardiothoracic Surgery and Cardiology. This rotation includes exposure to all aspects of adult vascular surgery, including open arterial reconstruction, minimally invasive surgery, venous surgery, and endovascular interventions in a specialized hybrid operating suite for aortic stent-grafting and complex perioperative interventions.

![ hybrid operating suite ]

There are approximately 150 beds allotted to the CVC, including 75 med-surg beds, 50 progressive care beds, and 25 ICU beds. The annual vascular surgery caseload is approximately >500 procedures.

B. Integrated participating institutions.

The Veterans Affairs Medical Center (VAMC) is one-half mile from the UC San Diego Sulpizio Cardiovascular Center.

![ VAMC building ]

This medical center has a 250 total bed capacity and has a busy vascular (Gold Surgery) and cardiothoracic surgery program. The annual vascular surgery caseload is approximately 350 procedures.

The Scripps Green Hospital and Clinics is located three miles from the CVC; on the Torrey Pines bluffs overlooking the Pacific Ocean.
This is a 173-bed teaching hospital rated in the top 100 hospitals in America. The vascular laboratory is supervised by vascular surgery and vascular neurology. Has a busy, referral vascular surgery service staffed by two board-certified vascular surgeons and two interventional vascular radiologists. The annual vascular surgery caseload is approximately 350 cases per year.

The Zion Kaiser Foundation Medical Center is located approx. 12 miles from the CVC.

This 368-bed facility has an accredited vascular laboratory and a busy vascular surgery service staffed by 6 board-certified vascular surgeons and physician assistant. Annual vascular surgery caseload ranges from 1100-1200 procedures, including >100 EVARs.

The vascular surgery rotations have been scheduled to provide the resident with interventional experience in both an academic and community hospital practice.

**Rotation specific goals and objectives**

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<tr>
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<th>July- Aug</th>
<th>Sept-Oct</th>
<th>Nov-Dec</th>
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<th>Mar-April</th>
<th>May-June</th>
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<tbody>
<tr>
<td>Year 1</td>
<td>UCSD*</td>
<td>Scripps</td>
<td>UCSD*</td>
<td></td>
<td>Kaiser</td>
<td>UCSD*</td>
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<tr>
<td>Year 2</td>
<td>Scripps</td>
<td>UCSD*</td>
<td>Kaiser</td>
<td>UCSD*</td>
<td>UCSD*</td>
<td>UCSD/Scripps</td>
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*UCSD: Sulpizio Cardiovascular Center – VAMC

**Year One:**
The 1st year vascular surgery fellow rotations will emphasize education in evaluation of the vascular patient, vascular laboratory test interpretation, vascular imaging including diagnostic arteriography, and the basics of endovascular therapy. During each rotation, the vascular resident will be expected to
participate in endovascular procedure cases, and interpret vascular lab studies at the Sulpizio Cardiovascular Center. During this year, the vascular surgery resident should become competent in the management of routine vascular problems (dialysis access, lower limb angioplasty/bypass grafting, carotid endarterectomy, endovascular AAA repair, IVC filter placement, venous surgery) as well as the performance of emergent vascular trauma procedures, both open and endovascular.

Goals:

- Obtain hands-on experience with multiple endovascular devices for EVAR/TAG, carotid stenting, as well as atherectomy/laser/thrombolysis devices.
- Be trained to plan the device selection for endovascular aneurysm cases through the use of regular CT scans and M2S 3-D AAA reconstructions.
- Spend the 1st two months performing vascular lab education as a foundation for reading, interpreting, and performing of non-invasive testing in the areas of cerebrovascular, peripheral arterial, peripheral venous, and visceral vascular. The resident should become proficient in intra-operative duplex ultrasound imaging and intravascular imaging.
- Attend one clinic session per week at each participating institution, as per ACGME requirements.
- Participant in outpatient office-based vascular procedures including endovenous closure and surgery for varicose veins, and foam sclerotherapy.
- Organize and participate in the Monday morning vascular conference, including being responsible for bi-weekly M&M conference, and monthly Journal club.
- Attend regional and national vascular surgery scientific mtgs (all expenses paid) throughout the year, including the Moore Course in Los Angeles, Western Vascular Society mtg, The Vascular and Endovascular Surgery Society (VESS) mtg, the SVS National Meeting, and the Southern Cal Vascular Surgical Society meeting. The UCSD Division of Surgery will reimburse for other meetings where a fellow's research is accepted for presentation.

Rotation Specific Objectives:

UC San Diego (4 months) – During two 2-month rotations, the vascular fellow with complete vascular laboratory interpretation curriculum, including hands-on experience with duplex scanning for arterial and venous access, and mentored review of vascular studies. Perform diagnostic angiographic studies at the VAMC (Tuesday AM) and at the Sulpizio Cardiovascular Center. Acquire basic skills in endovascular procedure access, guidewire manipulation, balloon/stent angioplasty, and endovascular AAA repair. The vascular fellow training occurs in an academic vascular surgery practice with tertiary patient referrals with complex vascular conditions, including vascular trauma, thoracoabdominal AA, graft infection, and pediatric vascular lesions. The vascular fellow is begin directed vascular research. By the end of the 1st year, the vascular resident is expected to proficient in vascular lab test interpretation. The vascular fellow will obtain experience in varicose vein surgery, including endovenous saphenous and perforator vein ablation and foam sclerotherapy.

Medical knowledge:

APDVS clinical & basic science curriculum, Vascular Laboratory textbook:

*Noninvasive Vascular Diagnosis* - a practical guide to therapy
**Patient Care:** Attend clinics and participate in patient care at the Sulpizio Cardiovascular Center, including supervision of general surgery resident in-patient care. Participate in care of veterans at the San Diego VAMC, including endovascular procedures and complex open arterial reconstructions.

Specific patient care goals during PGY-6 year

18. To understand radiation safety issues for the patient and operator
19. To understand arterial and venous radiographic anatomy.
20. To develop proficiency with percutaneous arterial and venous cannulation of the upper and lower extremity.
21. To become familiar with and be able to name and use all basic guidewires, catheters and other devices used for diagnostic and therapeutic interventional procedures.
22. To become proficient using the Mentis simulator for interventional procedures.
23. To perform under supervision diagnostic arteriography and venography of the abdomen and lower extremities.
24. To learn the indications for, the performance of, and the interpretation of arterial physiologic testing and venous duplex scanning for DVT.
25. To demonstrate expertise with percutaneous puncture and with diagnostic arteriography of the abdomen and lower extremity.
26. To use the vascular simulator to practice interventional techniques.
27. To perform under supervision diagnostic arteriography of the renal and brachiocephalic arteries.
28. To perform under supervision balloon angioplasty and stenting of the iliac and lower extremity arteries.
29. To perform under supervision vena cava filter placement.
30. To use percutaneous closure techniques after arterial catheterization.
31. To learn the indications for, the performance of, and the interpretation of peripheral arterial duplex scanning and duplex scanning for venous valvular incompetence.
32. To perform under supervision catheter directed thrombolysis procedures.
33. To perform under supervision of balloon angioplasty and stenting of renal and mesenteric arteries.
34. To perform under supervision thrombin injection of femoral pseudoaneurysms.

**Technical Skills:** Acquire hand-on skills in duplex ultrasound scanning. Acquire basic skills in endovascular procedure access, guidewire manipulation, balloon/stent angioplasty, and endovascular AAA repair. Perform endovenous saphenous vein closure procedures

**Communication Skills:** Provide counseling to patient on the treatment of claudication, asymptomatic carotid stenosis, endovascular AAA repair, and varicose vein surgery using patient educational materials as prompters

**Professionalism:** Present topics from the clinical curriculum to colleagues. Present at M&M conference. Practice ethical surgery at the multiple UCSD institutions covered on this rotation which involves vascular care to a diverse population varying age from children to the elderly.
**Systems-based Practice:** Become familiar with enrollment of patient procedures in vascular quality initiative (VQI)

**Scripps (4 months)** – During a 4 month block rotation, the vascular resident will work both vascular surgeons and interventional radiologists in a busy, community-based health care system. On a weekly basis, the vascular resident will participate in both open and endovascular interventions. Experience in thoracic outlet decompression and spine exposure procedures will be obtained.

**Medical knowledge:** APDVS clinical & basic science curriculum. Review basics of endovascular therapy- Textbook: Endovascular Skills (Peter Schneider)
   Textbook: Endovascular therapy (Ahn and Moore)

**Patient Care:** Attend clinics and participate in patient care with the 2 faculty vascular surgeons. Work with interventional radiologists performing endovascular interventions and diagnostic arteriography. Achieve patient care goals cited above.

**Technical Skills:** Acquire hand-on skills endovascular procedure access, guidewire manipulation, balloon/stent angioplasty, and venous/artery thrombolysis. Learn basics of spine exposure procedures

**Communication Skills:** Provide counseling to patient on the treatment of claudication, asymptomatic carotid stenosis, endovascular AAA repair, and thoracic outlet compression syndromes.

**Professionalism:** Present topic from the clinical curriculum to colleagues. Present at M&M conference. Learn to avoid inadvertently disclosing private health information using an electronic medical record (EPIC).

**Systems-based Practice:** Become familiar with NSQUIP database and outcome of vascular procedures, including the concept of root cause analysis for medical failures and adverse events.

**Kaiser (4 months)** – During a 4-month block rotation, the vascular resident will work with six vascular surgeons in a HMO-based vascular surgery practice. Experience in dialysis access, open and endovascular interventions, and hands-on exposure to foam sclerotherapy for symptomatic varicose veins will be obtained. This is a busy clinical vascular surgery practice that allows the vascular resident to be involved in both common and complex “open” arterial repairs.

**Medical knowledge:** APDVS clinical & basic science curriculum. Review management of dialysis access management – open and endovascular interventions:

**Patient Care:** Attend clinics and participate in patient care with the 5 faculty vascular surgeons. Achieve PGY-6 patient care goals.

**Technical Skills:** Acquire hand-on skills in foam sclerotherapy for symptomatic varicose veins, and catheter thrombolysis for dialysis graft/fistula thrombosis
**Communication Skills**: Provide counseling to patients on the treatment of varicose veins using foam sclerotherapy. Learn how vascular surgery care is provided in a large HMO-based medical practice serving a large (>500,000) population.

**Professionalism**: Present topic from the clinical curriculum to colleagues. Present at M&M conference.

**Systems-based Practice**: Demonstrate ability to provide effective vascular care in a population–based health care system which incorporates cost awareness and risk-benefit analysis in vascular care decisions.

**Year Two:**

The 2nd year vascular surgery fellow rotations will emphasize education in complex “open” and endovascular interventions including thoracoabdominal aortic aneurysm repair, fenestrated endovascular grafting, and redo arterial reconstruction.

**Goals:**

- Assume independent decision-making in patient evaluation and intervention planning.
- Participate in complex endovascular cases, such as fenestrated aortic stent-grafting, endoleak repair after EVAR, difficult carotid stents, and visceral stent-angioplasty.
- Demonstrate mastering of basic and technically challenging lower extremity bypass procedures for limb salvage.
- Obtain experience with complicated open aneurysm repairs (abdominal, thoraco-abdominal, and thoracic), including hybrid procedures with visceral and thoracic debranching.
- Be proficient in vascular lab testing interpretation with sufficient case log experience to take the ARDMS-PVI certification examination.
- Attend one clinic session per week.
- Attend (all expenses paid) vascular surgery meetings throughout the year, including the Veith Symposium in NYC, the SVS National Meeting, the Western Vascular Surgery mtg, and the Southern Cal Vascular Surgery Society mtg. The division also pays for all other meetings where a fellow's research is accepted for presentation.

**Specific Patient Care Goals for PGY-7 (all rotations)**

1. To use embolic protection devices during carotid, renal and mesenteric stenting.
2. To learn the indications for, the performance of, and the interpretation of carotid artery duplex, abdominal arterial duplex, and upper extremity venous duplex scanning.
   1. To perform under supervision carotid artery stenting.
   2. To perform under supervision selective catheterization of branch arteries for coil embolization.
   3. To perform under supervision subintimal angioplasty and laser treatment of leg arteries.
   4. To use mechanical thrombolytic devices.
   5. To read >400 noninvasive vascular laboratory studies and perform interpretations under faculty supervision.
1. To independently manage complex interventional procedures with minimal faculty supervision.
2. To demonstrate appropriate rescue techniques for complications of interventional procedures.
3. To read sufficient noninvasive vascular laboratory studies and perform interpretations under faculty supervision to qualify for the Registered Vascular Technology examination.

Rotation Specific Objectives:

UC San Diego (4 months) – During two 2-month rotations, the vascular fellow with interpret vascular laboratory testing studies to be ability to take the ARDMS PVI certification examination. Perform complex endovascular interventions at the VAMC (Tuesday AM) and at the Sulpizio Cardiovascular Center. Acquire advanced skills in endovascular procedures including carotid stent-angioplasty, and fenestrated stent graft repair of aortic aneurysms. The vascular fellowship occurs in an academic vascular surgery practice with tertiary patient referrals with complex vascular conditions, including vascular trauma, thoracoabdominal AA, graft infection, and pediatric vascular lesions. The vascular fellow will complete directed vascular research including outcomes based research from VQI initiative.

Medical knowledge:
APDVS clinical & basic science curriculum, Rutherford Vascular Surgery textbook – complete review for taking vascular surgery boards

Patient Care: Attend clinics and participate in patient care at the Sulpizio Cardiovascular Center, including supervision of general surgery resident in-patient care. Participate in care of veterans at the San Diego VAMC, including endovascular procedures and complex open arterial reconstructions.


Communication Skills: Provide counseling to patient on the treatment of complex vascular conditions including ruptured AAA, mycotic aneurysm, graft infection, visceral ischemia, and dialysis access induced hand ischemia. Learn how to communicate with ER physicians and vascular surgeons wishes to transfer/referral of a patient with a complex vascular condition.

Professionalism: Present topics from the clinical curriculum to colleagues. Present at M&M conference. Practice ethical surgery at the multiple UCSD institutions covered on this rotation which involves vascular care to a diverse population varying age from children to the elderly.

Systems-based Practice: Report an outcomes based project based on the vascular quality initiative (VQI) database.

Kaiser (2 months) – During a 2-month block rotation, the vascular fellow will work with six vascular surgeons in a HMO-based vascular surgery practice. Experience in redo dialysis access, endovascular
interventions performed in both the OR and angio suite will be acquired. Return to this busy clinical vascular surgery practice will allow the vascular resident to be more involved in the decision-making of vascular care and procedure planning, including complex “open” arterial repairs.

**Medical knowledge:** APDVS clinical & basic science curriculum. Review management of dialysis access management – open and endovascular interventions.:

**Patient Care:** Attend clinics and participate in patient care with the 5 faculty vascular surgeons.

**Technical Skills:** Acquire experience in thoracic aorta endografting and arterial repair for mesenteric ischemia. Gain additional experience in foam sclerotherapy of varicose veins, and catheter thrombolysis for dialysis graft/fistula thrombosis.

**Communication Skills:** Provide counseling to patients on the spectrum of vascular conditions presenting to the clinic and ER. Learn how vascular surgery care in provide in a large HMO-based medical practice serving a large (>500,000) population.

**Professionalism:** Present topics from the clinical curriculum to colleagues. Present at M&M conference.

**Systems-based Practice:** Demonstrate ability to provide effective vascular care in a population –based health care system which incorporates cost awareness and risk-benefit analysis in vascular care decisions.

**Scripps (6 months)** – During a 2-mo and a 4-mo block rotation, the vascular fellow will complete their vascular surgery training by working with vascular surgeons and interventional radiologists in a community-based health care system. On a weekly basis, the vascular fellow will participate in both open and endovascular interventions. The fellow will have specific training from Interventional Radiology in arterial and venous endovenous therapy. Experience in all aspects of vascular surgery will be obtained with mentorships from senior vascular surgeons and vascular radiologists.

**Medical knowledge:** Complete APDVS clinical & basic science curriculum.

**Patient Care:** Attend clinics and participate in patient care with the 2 faculty vascular surgeons. Work with interventional radiologists performing endovascular interventions and diagnostic arteriography.

**Technical Skills:** Acquire independent experience in performing open and endovascular arterial interventions, including case planning and stent-graft sizing. Acquire experience from IR in carotid stent angioplasty.

**Communication Skills:** Provide counseling to patients on the treatment of claudication, asymptomatic carotid stenosis, endovascular AAA repair, and thoracic outlet compression syndromes.
**Professionalism:** Present topic from the clinical curriculum to colleagues. Present at M&M conference.

**Systems-based Practice:** Become familiar with VQI and NSQUIP database and outcome of vascular procedures, including the concept of root cause analysis for medical failures and adverse events.
Vascular Surgery 5+2 Fellowship Fact Sheet:

Surgical Case Logs –
Total majors – approx. 600 (60th percentile)
  >1100 EVAR/TEVAR
  >60 carotid interventions
Total cases - approx. 900 (68th percentile)

Work Hours – logged in New Innovations weekly
There is no “in-house” call for the vascular surgery fellows. Vascular surgery fellows work approximately 10 hours/day (7 AM to 5 PM). There is a maximum of 80 duty hours per week averaged over a 4-week period. The fellows have every other week-end off. 10-hour rest periods are allotted to vascular surgery fellows between all duty periods. Should the fellows be called in from home at night or on week-ends, the following day they will be relieved of duty after 4 hours.

The fellows are on-call from home 1 night in 3.
No moonlighting is allowed.

Salary:

<table>
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<th>Resident Physician 6</th>
<th>$5,418/mo</th>
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<tr>
<td>Resident Physician 7</td>
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<td>$67,167</td>
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Educational Stipend
An educational and housing stipend of $4,800 is given to all residents by the UC San Diego House Staff Association.

Licensing Fees
All Medical Board Licensing Fees and USMLE Step III application fees are paid for by the UC San Diego House Staff Association.

Vacation
Four weeks of paid vacation are offered per year. Additional leave for illness, family medical emergencies, or maternity/paternity may be taken according to written policy in the UCSD House Officer Policy and Procedure Document (HOPPD).

Insurance Coverage
Health insurance with Blue Cross and disability plans are available to resident physicians and their dependents, as well as dental and vision coverage, provided as an employment benefit with NO COST to the resident or his/her dependents.

Life Insurance
There is a $40,000 life insurance plan for the resident physician, which includes a double indemnity clause of
$80,000, and is provided by the University at no cost to the resident. Malpractice insurance is also provided by the University.

**Uniforms**
Three lab coats with embroidery are provided yearly. Laundering services are provided by the Linen's department.

**On-Call Meals**
On-Call meal points are provided at the VA Hospital based on the number of call nights. At UC San Diego Thornton and Hillcrest a preset amount of money is provided for the year.

**Library Resources**
Residents have full access to UC San Diego and VA libraries. This includes access to all libraries on the UC San Diego campus with full offsite access. There is also full off-site access available via the internet.

**Parking**
The VA Hospital, Kaiser Permanente, offer free parking. Scripps Green offers reimbursed parking. UC San Diego Medical Center offers a 50% reduction in the cost of parking.