



SERVICE: Vascular Surgery – Boca Raton Regional Hospital, PGY 2 & 4

General description:
<p>The FAU surgical residents will rotate in the Division of Vascular Surgery at Boca Raton Regional Hospital (“BRRH”) during their 2nd and 4th clinical year. The duration of this rotation during the 2nd year is 4 weeks and during the 4th year is 6 weeks.</p> <p>The resident will be a fully integrated member of the Vascular Surgery Service, under the supervision of experienced Vascular Surgery clinical faculty and office staff.</p> <p>The resident will participate in all aspects of care rendered to the inpatient census of the Vascular Surgery service at BRRH: admission, diagnostic workup, operations, post-operative care and discharge. In addition, the resident will participate in the outpatient management of Vascular Surgery patients at the offices of Vascular Surgery /BocaCare.</p> <p>During office hours and in designated diagnostic areas, the resident will be exposed to the evaluation and interpretation of non-invasive vascular studies.</p> <p>This rotation is designed to complement and intensify the exposure to Vascular Surgery that each resident receives throughout his/her training at the various participating sites, by providing a focused rotation with a high-level, high-volume Vascular Surgery practice.</p> <p>During the rotation, the resident will participate in the following educational activities:</p> <p>Surgery Core/Specialty Curriculum Resident Lectures - 2 hours/week Surgery M&M - 1 hour/week</p> <p>Vascular Surgery Faculty Office Hours – 1 four- to six-hour block/week Preoperative Vascular Surgery Case Conference – 1 hour/week</p> <p>In addition, the Vascular Surgery clinical faculty will provide lectures on the major topics in Vascular Surgery throughout the General Surgery Core Curriculum, as assigned.</p>

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Competencies:	Goals and Objectives:
<p>Patient Care:</p>	<p><u>Goals:</u> During this rotation, the resident should learn and practice to:</p> <ul style="list-style-type: none"> ▪ Demonstrate caring and respectful behaviors when interacting with patients and their families; demonstrate sensitivity to gender, age, ethnicity, religion, value systems and other potential differences of patients and their families; practice according to the clinical standards of Boca Raton Regional Hospital and the affiliated outside institutions

- Gather patient and case specific essential, **comprehensive multi-source and accurate information** about their patients for initial or peri-operative work-up and patient follow-up in the inpatient and outpatient setting
- Using all available resources, under the guidance of the Vascular Surgery clinical faculty and other designated staff, to make **informed decisions about diagnostic and therapeutic interventions** based on patient information, up-to-date scientific evidence and clinical judgment; Evaluate and implement priorities in patient care and incorporate preventive measures
- Under the guidance of the Vascular Surgery clinical faculty, develop and **carry out patient management plans**
- Under the guidance of Vascular surgery clinical faculty and other designated staff, **monitor** closely the patient's clinical progress, review and react to variances in patient progress or response to therapeutic interventions; **communicate** the details and changes of patient care, progress, and complications to the Vascular clinical faculty in a timely manner
- Under close supervision of the Vascular Surgery clinical faculty, **counsel and educate patients** and their families on the state of the patient's disease, necessary diagnostic tests, operative procedures and medical management
- Use information technology (hospital computer system) to support patient care decisions and patient education (electronic patient record, electronic radiology studies, online educational resources, including literature research)
- **Work closely with other healthcare professionals**, including those from other disciplines (Nephrology, Cardiology, Medicine, Radiology, mid-level providers, nurses, Vascular Surgery office staff, etc.), to provide patient-focused and optimum outcome driven care
- Assure that the **needs of the patient and team supersede individual preferences** when managing patient care; incorporate evidence-based medicine into patient care whenever possible; comply with changes in clinical practice and standards given by the Vascular Surgery clinical faculty

Objectives:

During the rotation, the resident should:

- Under the supervision of the Vascular Surgery clinical faculty, **perform competently and/or assist in procedures considered essential for the area of practice**, including:
 - a. Vascular access (AV graft and fistulas) and peritoneal dialysis , both operative and percutaneous
 - b. Operations on the upper and lower extremity arterial vasculature for occlusive, aneurysmal, thromboembolic disease and trauma

	<p>c. Operations on the aorta and iliac vessels for aneurysmal and occlusive disease, as well as dissections and trauma</p> <p>d. Operations on the celiac and mesenteric vasculature for occlusive disease, thromboembolic disease, trauma</p> <p>e. Operations on the carotid artery</p> <p>f. Endovascular procedures on the aorta, extremity vessels and the carotid artery</p> <p>g. Operations for venous insufficiency</p> <p>h. Angiography</p> <p>These operations will include anatomic and extra-anatomic bypasses, use of autogenous and prosthetic graft materials, thoracic, abdominal, retroperitoneal and various extremity exposures, and will be performed in the emergent and elective settings.</p> <ul style="list-style-type: none"> ▪ Participate in the pre- and post-operative surgical management of patients before and after Vascular Surgery; attend Vascular Surgery clinic at least once a week; participate in daily inpatient rounds with the Vascular Surgery clinical faculty. ▪ Manage post-operative surgical and long-term vascular complications, including wound and graft infections, non-healing wounds, anastomotic stenosis and leaks, lymphocele formation, recurrent or persistent vascular insufficiency, etc.
<p>Medical Knowledge:</p>	<p><u>Goals and objectives:</u></p> <ul style="list-style-type: none"> ▪ Develop a fundamental knowledge of the vascular anatomy (arterial and venous) and of common variations; understand the pathophysiology of the arterial and venous system: <ul style="list-style-type: none"> - Describe the relationship of the following disorders/practices to atherosclerotic vascular disease: diabetes mellitus, hypertension, congestive heart failure, hypercholesterolemia/dyslipidemia, (morbid) obesity, renal failure, smoking - Analyze the role of the endothelium in atherosclerosis, thrombosis and thrombolysis - Discuss clotting factors and how they interact (coagulation cascade), and natural factors of thrombolysis: <ul style="list-style-type: none"> - Factors I – XIII, intrinsic and extrinsic pathway, alternate modes of activation - Protein C, S, antithrombin III, plasminogen - Complement system and inflammatory mediators <p>Endothelial cell, platelets</p> <ul style="list-style-type: none"> - Understand the tissue and cellular metabolic changes with acute and chronic arterial insufficiency or occlusion, and acute and chronic venous insufficiency or occlusion:

- Aerobic vs. anaerobic metabolism, acute cell death
- Local paracrine and inflammatory mediator response
- Tissue edema (acute and chronic) and its effects on oxygen delivery and trophic changes
- Concept of **re-perfusion injury** and re-perfusion shock, and strategies to minimize these complications
- Discuss the **physiologic and organic manifestations** of acute and chronic arterial and venous vascular disease, in particular regarding the brain, heart, kidneys, gut, skin
- Assess patients' vascular systems using appropriate skills in **history-taking, clinical examination and bedside diagnostic tests** (Doppler)
 - Understand that vascular disease in most cases is a **systemic phenomenon**; discuss evaluation of all potentially involved organ systems (CNS, heart, kidney, gut, etc.)
 - Describe the hemodynamics and pathophysiology of the following **concepts**:
 - Claudication, rest pain, tissue loss
 - Transient ischemic attack (TIA) vs. stroke
 - Mesenteric angina, acute mesenteric infarct, mesenteric venous thrombosis
 - Angina pectoris vs. myocardial infarction ([sub-] endocardial, transmural)
 - Reno-vascular hypertension
 - Arterio-venous (AV) fistula
 - Explain the concept of **critical arterial stenosis**; describe life- and limb-threatening signs of vascular disease and indicate when immediate intervention is required
 - Describe how clinically **“silent” disease** may pose a significant threat to patients
- Discuss the **diagnostic tools** available for assessing vascular disease and explain the indications, relative contribution and limitations of each:
 - Angiography (contrast, CO₂, digital subtraction techniques)
 - Computed axial tomography (CT), CT angiography
 - Magnetic resonance imaging (MRI), magnetic resonance angiography (MRA)
 - Ultrasonography: B-mode, color-flow duplex scanning
 - Discuss the **complications associated with the use of intra-vascular contrast dye** and strategies to minimize adverse effects (non-ionic [isotonic] contrast, volume hydration, alkalinization, N-acetyl cysteine, etc.)
- Discuss mechanisms of action and therapeutic roles of these **pharmacologic agents**:
 - Vasopressors/catecholamines/adrenergic blocking agents
 - Vasodilators (calcium antagonists, α -blockers, “direct” vasodilators, nitrates, etc.)
 - Anticoagulants (heparinoids, warfarin, anti-platelet agents, etc.)

	<ul style="list-style-type: none"> - Thrombolytics (e.g. tPa) - Dyslipidemia and cholesterol lowering drugs ▪ Discuss the various approaches for operative exposure and vascular techniques for: <ul style="list-style-type: none"> - Aorta: thoracic, supra-celiac, juxta- and infra-renal - Iliac arteries: left vs. right - Celiac, superior and inferior mesenteric arteries - Subclavian arteries: left vs. right - Axillary and brachial arteries, radial and ulnar arteries to the wrist - Femoral (common, superficial, profunda), popliteal, tibial and peroneal arteries - Handling of vascular tissues; types of sutures used; principles of vascular bypass grafting, including major types of grafts, advantages and limitations; principles of endarterectomy, patch and eversion technique; endovascular techniques, including types of stents ▪ Understand the principles of peri-operative risk assessment and optimization of patients with (cardio-) vascular disease: <ul style="list-style-type: none"> - Morbidity and mortality risk from cerebro-vascular accidents (stroke, bleed), myocardial ischemia and arrhythmia - Preexisting cardiopulmonary, renal and other organ dysfunction - Impact of amputations/requirement for rehabilitation - Nutritional assessment and support ▪ Understand the fundamental principles in diagnosis and management of vascular trauma: <ul style="list-style-type: none"> - Penetrating vs. blunt trauma; partial (adventitial/intimal) vs. complete injury: <ul style="list-style-type: none"> - Concept of proximity injury in penetrating injury - Concept of crush injury, and injury to vasculature with certain orthopedic injuries - Concept of deceleration trauma to vasculature - Hard and soft signs of vascular injury - Non-invasive and invasive diagnosis of vascular injury - Importance of systematic multi-specialty approach to the injured patient <ul style="list-style-type: none"> - Concept of shunting and orthopedic damage control fixation before definitive vascular repair - Special risks of anticoagulation and anti-platelet drugs in traumatized patients - Concept of grafting outside of the zone of injury - Minimal vascular trauma – iatrogenic injuries related to vascular access and diagnostic procedures: management of persistent bleeding, pseudo-aneurysm, intimal dissection, etc.
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At the end of the Vascular Surgery rotation, the resident should be able to understand, discuss and develop a comprehensive plan for:

- **Obstructive arterial disease (arteriosclerosis/atherosclerosis)**, including its risk factors, common distribution, natural history, and clinical signs and symptoms and differences regarding:
 - **Diabetic vasculopathy, Hypertensive vasculopathy and arteriosclerosis related to smoking, hypercholesterolemia and dyslipidemia**
- **Aneurysmal arterial disease**, including its risk factors/major etiologies, natural history in various anatomic locations, and clinical signs and symptoms
- **Thromboembolic disease**, arterial and venous:
 - **Arterial thromboembolism:** common sources of thrombus, common distribution of emboli (cerebral, intestinal, extremities), clinical signs and symptoms and acute (non-)operative interventions
 - Indications for, and risks of systemic anticoagulation
 - Interventional radiology; suction thromboembolectomy, catheter thrombolysis, stenting, etc.
 - Operative thromboembolectomy
 - **Venous thromboembolic disease:**
 - Virchow's triad of **deep vein thrombosis (DVT)**, common risk factors/patients at high risk of venous thrombosis
 - DVT prophylaxis, including heparinoids, compression devices, anti-platelet agents and their risks and relative protection in different patient populations (GYN, cancer, orthopedic, surgery patients)
 - Clinical signs and symptoms for:
 - Lower and upper extremity DVT, phlegmasia (cerulea dolens/albans)
 - Pulmonary embolism ([sub-] segmental, lobar, saddle)
 - Paradoxical systemic embolus (PFO)
 - Diagnosis of DVT (sonography, venography)
 - Therapy of active DVT, including removal of IV catheters, timing, duration and risks of systemic anticoagulation; indications, types and common problems of IVC filters; "older" forms of therapy, including vena cava clip and ligation; differences in the therapy for upper and lower extremity DVT
 - Clinical diagnosis of **pulmonary embolism (PE)**: respiratory, cardiovascular, EKG, IV contrast CT vs. Radionuclide studies and/or pulmonary angiography; diagnostic accuracy and limitation of the diagnostic studies

- Therapy of PE, including systemic anticoagulation, indications and risks for pulmonary angiography/catheter suction thrombectomy and catheter thrombolysis vs. operative pulmonary thrombectomy
- **Thrombophlebitis:** clinical signs and symptoms, common causes, medical and operative therapy
- **Chronic venous insufficiency and lymphatic disease**
 - Normal (extremity) venous anatomy, deep and superficial system, valves, muscle pump, perforators
 - Grades of venous insufficiency (**varicose veins**) and associated therapy (compression devices, injection sclerotherapy, vein-stripping, vein ligation, etc)
 - Chronic **venous stasis ulcers** – options for therapy
 - Normal lymphatic anatomy and physiology
 - Common causes of **lymphatic insufficiency** (infection, radiation, cancer, operation, congenital, etc.) and therapy of chronic lymphedema.
- **Intestinal ischemia**
 - Clinical signs and symptoms from intestinal angina to frank gangrene
 - Differentiate arterial occlusive disease, arteriospasm, arterial thromboembolism global hypo-perfusion, mesenteric venous thrombosis and outline appropriate (emergency) work-up, medical and operative strategies:
 - CT, angiography, duplex ultrasound
 - Anticoagulation, anti-platelet agents
 - Endovascular therapy (angioplasty, stenting, thrombolysis, vasodilator therapy)
 - Operation (bowel resection, arterial bypass)
- **Lower extremity ischemia**, from claudication to tissue loss:
 - Differentiate **anatomic level and severity of disease** through history and clinical exam, non-invasive and invasive diagnostic tests
 - Exam of skin and pulses, sensory/motor status
 - Bedside and formal arterial Doppler, (CT, MR, conventional) angiography
 - Understand the **importance of conservative therapy** in all stages of the disease
 - Physical therapy and exercise programs
 - Smoking cessation, diabetes control, management of hypertension, obesity and hypercholesterolemia
 - Anticoagulation and anti-platelet therapy
 - Care of the ischemic limb
 - Discuss the **operative therapeutic options** based on anatomic level and severity of the disease:

- Angioplasty (vein vs. graft patch) vs. balloon dilatation and/or stenting
- Anatomic vs. non-anatomic bypass
- Use of graft (Dacron, ePTFE) vs. vein (reversed, in situ) and combined bypass
- Management of multi-level disease and the 'poor' outflow patient
- Understand the most important **post-operative considerations**:
 - Cardio-vascular support, nutritional support, analgesia, etc.
 - Anticoagulation, dextrans, anti-platelet therapy
 - Prevention, recognition and therapy of compartment syndromes
 - Physical therapy and rehabilitation
- Discuss **special diseases / situations** and their management
 - Popliteal aneurysm, congenital vascular abnormalities
 - Diffuse small vessel disease
- Role of exercise, risk factor modification, and drug therapy in the management of claudication; their mechanism of action and their limitations; Rest pain and the risk of amputation if untreated; Different presentation of the **elderly patient** with single and multilevel arterial disease

▪ **Upper extremity ischemia**

- Differentiate **anatomic level and severity of disease** through history and clinical exam, non-invasive and invasive diagnostic tests
 - Exam of skin and pulses, sensory/motor status
 - Bedside and formal arterial Doppler, (CT, MR, conventional) angiography
- Discuss **special diseases/situations** and their management
 - Thoracic outlet syndrome, arteria lusoria, carotid steal syndrome, and other congenital vascular abnormalities of the aortic arch / subclavian and proximal upper extremity vasculature
- Discuss the **operative therapeutic options** based on anatomic level and severity of the disease:
 - Angioplasty (vein vs. graft patch) vs. balloon dilatation and/or stenting
 - Anatomic vs. non-anatomic bypass
 - Use of graft (Dacron, ePTFE) vs. vein (reversed, in situ) and combined bypass
 - Management of multi-level disease and the 'poor' outflow patient
- Understand the most important **post-operative considerations**:
 - Cardio-vascular support, nutritional support, analgesia, etc.
 - Anticoagulation, dextrans, anti-platelet therapy

	<ul style="list-style-type: none">- Prevention, recognition and therapy of compartment syndromes- Physical therapy and rehabilitation▪ Aortic disease<ul style="list-style-type: none">- Aorto-iliac aneurysm<ul style="list-style-type: none">- Understand the anatomic classification(s) / types of aorto-iliac aneurysm disease and implications for potential complications and management outcomes- Discuss the signs and symptoms of aorto-iliac aneurysmal disease: chronic vs. acute pain vs. silent disease- Discuss the differences in management of inflammatory aneurysms- Understand the natural progression of aneurysmal disease, signs and symptoms of (impending / contained / frank) rupture and indications for operative management<ul style="list-style-type: none">- Management of the incidentally diagnosed aneurysm- Discuss the various operative approaches and considerations<ul style="list-style-type: none">- Trans-abdominal, retroperitoneal, thoraco-abdominal, based on extent of the disease- Tube-graft vs. aorto-iliac or aorto-femoral bifurcated graft- Indications for cardiovascular bypass vs. clamp-and-sew techniques- Role and options for spinal protection (spinal pressure monitoring/drainage, blood pressure elevation, etc.)- Discuss the indications, various options, potential complications and (long-term) results of endografting for aorto-iliac aneurysmal disease- Understand the options when there is involvement of major end-organ arterial supply (arch, celiac, renal, mesenteric) – individual re-anastomosis vs. arterial patch, vs. bypass, vs. ligation, etc.- Understand the most important post-operative considerations:<ul style="list-style-type: none">- Cardiovascular support, nutritional support, analgesia, etc.- Anticoagulation, dextranes, anti-platelet therapy- Prevention, recognition and therapy of compartment syndromes- Physical therapy and rehabilitation- Aorto-iliac occlusive disease<ul style="list-style-type: none">- Understand the role of surgical vs. endovascular vs. hybrid (combined) treatments- Knowledge of the classifications for disease severity (e.g. TASC) and guidelines for choice of type of therapy- Understand the respective advantages and disadvantages of two therapies in terms of early and late patency, functional recovery, and perioperative and late complications
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- Understand the indications, advantages and disadvantages of anatomic and extra-anatomic vascular reconstructions
- **Aortic dissection**
 - Understand the classification systems (e.g. DeBakey, Stanford), **pathophysiology** of aortic and major vessel dissection, including hypertension, iatrogenic, relation to genetic disorders like Marfan's and Ehlers Danlos syndrome; understand the **concept of false lumen** perfusion and occlusion of spinal cord, abdominal organs and lower extremities; discuss the natural progression of the disease
 - Discuss the **signs and symptoms of dissection**
 - Understand the **importance of medical management** of acute aortic dissection:
 - Heart rate and blood pressure control
 - Management of pain
 - Management of end-organ ischemia
 - Discuss the indications for emergent, urgent or elective **intervention** for acute and chronic dissections
- **Management of concomitant intra-abdominal pathology** (such as cholelithiasis, colonic cancer, renal tumors and prostatic disease) in aortic surgery
- Importance of preserving pelvic circulation through reperfusion of at least one hypogastric artery, the significance of previous colectomy, and the indications for re-implantation of the inferior mesenteric artery
- Demonstrate knowledge of the pathophysiology of **abdominal aortic aneurysm (AAA) in the elderly patient** with respect to: incidence in patients > 65 years old; natural history of untreated AAA in the elderly; incidence of rupture and risk factors associated with increased incidence of rupture; morbidity and mortality rates of elective AAA replacement in elderly patients with and without other organ dysfunction; concept of chronological age vs. physiological age; preservation of the quality of life following AAA replacement in elderly patients
- **Carotid disease**
 - Understand the **pathophysiology, natural progression and clinical (warning) signs and symptoms** of carotid artery disease (TIA, stroke)
 - Understand the importance of a **coordinated systems approach** to the patient with ischemic CNS symptoms to improve outcomes (stroke team, rapid diagnosis and appropriate management with blood pressure control, anticoagulation and/or anti-platelet agents, interventional radiology or operative vascular therapy)
 - Understand the findings of the **landmark articles** for the management of carotid disease (annualized complication rates with or without operative intervention, indications for operative intervention):

- Risk factors for stroke development and changes in stroke incidence with every decade of life; contribution of carotid disease to the incidence of stroke and significance of stroke as cause of mortality and disability in elderly patients; proven measures for stroke prevention
- Significance of carotid bruit in elderly patients; advantages and disadvantages of diagnostic methods (duplex ultrasonography, angiography, MRA, intracranial doppler and CT scan)
- Natural history of asymptomatic vs. symptomatic carotid disease; benefits of carotid endarterectomy in symptomatic patients; benefits of carotid endarterectomy in asymptomatic patients
- Causes and management of stroke during CEA; risk of stroke or death following CEA in asymptomatic patients, patients with TIA, and patients with prior stroke;
- Effect of ulceration, degree of stenosis and presenting symptoms on the risk of stroke in patients with symptomatic carotid disease managed medically without CEA; effect of life expectancy and female gender on the benefits of CEA in asymptomatic patients
- Understanding the etiology of recurrent carotid disease and the indications for intervention
- Role of carotid stenting in the management of carotid disease
- Discuss the various **operative approaches** and considerations:
 - Carotid endarterectomy - vein vs. graft patch – eversion technique
 - Carotid stenting
 - Indications for intra-operative shunting
- **Intra-operative neurologic monitoring:**
 - Operation on the awake patient (task performance monitoring), evoked potentials, etc.
- Understand the most important **post-operative considerations:**
 - Importance of post-operative neurologic monitoring and prevention of secondary CNS injury (hypoxia, hypotension, etc.)
 - Management of neck hematoma with or without respiratory compromise
 - Cardiovascular support, nutritional support, analgesia, etc.
 - Anticoagulation, dextrans, anti-platelet therapy
 - Physical therapy and rehabilitation
- **Reno-vascular disease**
 - Understand the **pathophysiology, natural progression, and signs and symptoms** of renal atherosclerotic disease, fibro-muscular disease, involvement in aneurysmal disease and dissection

- Discuss the concepts of **reno-vascular hypertension** (renin, angiotensin)
- Understand the concept of **(individual) renal function assessment**:
 - Blood and urine laboratory data, including creatinine clearance
 - Renal (artery) duplex ultrasound and angiography
 - Radionuclide studies
- Discuss the various **operative approaches** and considerations
 - Trans-abdominal vs. retroperitoneal approach to the renal artery
 - Renal artery balloon angioplasty and stenting
 - Patch angioplasty vs. bypass
 - Nephrectomy
- Understand the most important **post-operative considerations**:
 - Importance of post-operative renal function monitoring and avoidance of secondary injury (hypovolemia, hypotension, contrast, nephrotoxic drugs, etc.)
 - Cardio-vascular support, nutritional support, analgesia, etc.
 - Anticoagulation, dextrans, anti-platelet therapy
 - Management of acute and chronic renal failure
- **Visceral ischemic syndromes**
 - Understand the **pathophysiology, natural progression and clinical (warning) signs and symptoms** of intestinal ischemia
 - Differentiate **anatomic level, severity and type of the disease** through history and clinical exam, non-invasive and invasive diagnostic tests:
 - Chronic) intestinal angina vs. acute occlusion or embolus
 - Differential diagnosis in acute abdomen
 - Discuss the various **operative approaches** and considerations:
 - Balloon angioplasty and stenting vs. operative bypass
 - Bowel resection: anastomosis vs. ostomy
 - Intra-operative assessment of bowel viability (inspection, Doppler, fluorescein)
 - Concept of second look operation
 - Understand the most important **post-operative considerations**:
 - Cardiovascular support, nutritional support, analgesia, etc.
 - Anticoagulation, dextrans, anti-platelet therapy
 - Management of infection/sepsis
- **Arterio-venous fistulas or malformations**
 - Understand the difference between acquired and congenital arteriovenous fistulas.
 - Know the anatomy and pathophysiology of fistulas and malformations, and clinical differences in presentations

	<ul style="list-style-type: none"> - Know the potential treatment options (both percutaneous and surgical) ▪ Vascular access surgery for the management of chronic renal failure (percutaneous, operative AV fistula and graft), including complications and management thereof ▪ Infections in peripheral vascular disease <ul style="list-style-type: none"> - Management of diabetic foot infections - Management of infected gangrene - Management of wound and graft infection after vascular surgery, including options for re-operation (alternate route and/or graft material) ▪ Amputations <ul style="list-style-type: none"> - Anatomic options and considerations for amputations (toe, TMA, BKA, AKA, hip disarticulation) - Physiologic consequences of amputation: mobility and energy expenditure, contracture formation - Psychological consequences – body image - Physical therapy and rehabilitation; prosthetic devices - Predicting healing of an amputation based on noninvasive testing - Morbidity, mortality and ambulation rates after a major amputation in elderly patients, Accepted indications for primary amputation in elderly patients ▪ Categorize the prevention and management of operative and post-operative complications, including wound and graft infections, ischemic bowel, graft thrombosis, CNS and myocardial infarctions, bleeding, compartment syndromes, and recurrent or persistent extremity ischemia ▪ Outline the manifestation of failing peripheral vascular grafts, contrasting management with angioplasty, thrombectomy, reconstruction and amputation <p><u>Objectives – General:</u></p> <ul style="list-style-type: none"> ▪ Complete the reading assignment (see literature list) ▪ Attend all (≥ 85%) conferences, M&M conferences, Grand Rounds/other educational activities of the Division of Vascular Surgery during the rotation ▪ Take a post-rotation self-assessment test with at least 75% correct answers [if offered]
<p>Practice-based Learning and Improvement:</p>	<p><u>Goals and Objectives:</u></p> <p>Residents must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices. Residents are expected to:</p>

	<ul style="list-style-type: none">▪ <u>Self-assessment</u>: Analyze practice experience during the rotation, as well as own performance-based on interaction with Vascular Surgery clinical faculty and other Vascular staff; accept and use constructive criticism to improve performance in the six core competencies▪ <u>Medical knowledge</u>: Self-directed and under mentorship of Vascular Surgery clinical faculty, locate, appraise and assimilate evidence from scientific studies related to their patients' health problems; use evidence-based medicine approach to patient care whenever possible; apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness; Use information technology to manage information, access online medical information and support their own education; facilitate the learning of students and other healthcare professionals on the Vascular Surgery service by sharing pre-existing and newly acquired knowledge (general and case-based) on rounds and during formal educational activities. Residents are encouraged to ask/question the Vascular Surgery clinical faculty and/or staff for clarification of unclear concepts/practices at any time▪ Participate in the <u>peri-operative management of Vascular Surgery</u> as outlined in patient care competency; during the rotation, the resident should become familiar / proficient with:<ul style="list-style-type: none">a. Different forms of vascular disease (atherosclerosis, thrombosis, embolism, aneurysmal disease and vascular trauma) and their various manifestations related to different etiologiesb. Organ dysfunction related to vascular disease, individual and combined, definitions, etiologies and managementc. Clinical evaluation and diagnostic procedure in vascular patientsd. Vascular exposure and operative techniques as outlined in the patient care competency and medical knowledge competencye. Management of complex multi-morbid patientsf. Management of common post-operative problems (see Medical Knowledge competency)▪ Perform/participate in <u>Vascular Surgery service related operations</u> as outlined in patient care competency; during the rotation the resident should become familiar / proficient with: vascular exposure and handling, graft choices and handling
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<p>Interpersonal and Communication Skills:</p>	<p><u>Goals and Objectives:</u></p> <p>Residents must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their patient’s families and professional associates. Residents are expected to:</p> <ul style="list-style-type: none"> ▪ Develop interpersonal skills necessary to communicate effectively with patients, patient families, nursing staff, mid-level healthcare providers, ancillary staff, medical students, fellow residents and attending staff in the complex multi-specialty environment that constitutes Vascular Surgery ▪ Contribute to creating an atmosphere of collegiality and mutual respect with all providers involved in the care of patients ▪ Develop effective listening, questioning and documentation skills ▪ Demonstrate ability to work effectively as a member of a team ▪ Demonstrate ethically sound behavior (see also Professionalism) ▪ Share personal knowledge with other members of the team to foster an environment of learning
<p>Professionalism:</p>	<p><u>Goals and Objectives:</u></p> <p>Residents must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles and sensitivity to a diverse patient population. Residents are expected to:</p> <ul style="list-style-type: none"> ▪ Demonstrate adherence to institutional and departmental standards and policies ▪ Demonstrate respect, compassion, integrity and ethical behavior consistent with the values of the department and institution; develop and sustain sensitivity toward differences of age, gender, culture, religion, ethnicity or other diversities in both co-workers and patients ▪ Demonstrate ability to appropriately take on, share and delegate responsibilities with regard to patient care; balance own rights and privileges appropriately with responsibilities and accountability resulting from being a member of a team dedicated to patient care ▪ Demonstrate commitment to excellence and on-going professional development ▪ Under faculty and other Vascular Surgery staff guidance, develop skills to resolve potential problems and conflicts that occur in a complex corporate environment using the appropriate channels and methods of communication to maximize patient care and surgical service performance ▪ Evaluate and formulate a response to ethical questions, including:

	<ul style="list-style-type: none"> a. Vascular reconstruction in multi-morbid/bedridden patients vs. amputations b. Management of patients that refuse amputation, body image considerations c. The high risk aneurysm patient that refuses operation d. Management of the high-potential operative mortality aneurysm patient e. Ethical implications of endo-grafting: lack of long-term outcome data
<p>Systems-based Practice:</p>	<p><u>Goals and Objectives:</u></p> <p>Residents must demonstrate an awareness of and responsiveness to the larger context and system of healthcare and the ability to effectively call on system resources to provide care that is of optimal value. Residents are expected to:</p> <ul style="list-style-type: none"> ▪ Understand how choices in patient care and other professional practices affect other health care professionals, the healthcare organization and the larger society and how these elements of the system affect their own practice: <ul style="list-style-type: none"> a. The relevance and components of clinical pathways and how to deal with deviation b. The cost/benefit of prevention and (pre-operative) conservative therapy vs. revascularization operation in peripheral vascular disease c. The costs involved in amputation (rehabilitation, loss of functionality, prosthesis, complications, etc.) ▪ Practice cost-effective healthcare and resource allocation that does not compromise quality of care ▪ Know how to partner with healthcare managers (Social Work, Case Management, PT/OT and Rehabilitation medicine, etc.) and other healthcare providers (PMD, specialty providers in and out of the hospital) to assess, coordinate and improve healthcare for the individual patient and cohorts of patients.

Appendix: S.C.O.R.E. Curriculum

<p>Surgical Council on Resident Education</p> <p>The SCORE® Curriculum Outline for General Surgery is a list of topics to be covered in a five year general surgery residency program. Graduating residents are expected to be competent in six areas: patient care; medical knowledge; professionalism; interpersonal and communication skills; practice-based learning; and systems-based practice.</p>	<p>Vascular - Arterial Disease Diseases/Conditions</p> <p><i>Core</i></p> <ul style="list-style-type: none"> • Acute Arterial Thrombosis • Acute Limb Ischemia • Aortic Thrombosis • Aortoiliac Disease • Cerebrovascular Disease • Compartment Syndromes • Diabetic Foot Infections • Peripheral Arterial Emboli • Peripheral Vascular Disease and Claudication
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The **SCORE Portal** (www.surgicalcore.org) has been created to provide educational content and assessment in support of the curriculum to general surgery residency programs. Learning “modules” are available on the portal for nearly all of the topics listed in this booklet

Patient Care Classification System

The patient care curriculum topics are organized into 28 organ-based categories. Within each category, the topics are further separated into Diseases/Conditions and Operations/Procedures. With this edition, the topics are then stratified into two levels using the same classifications:

- **CORE** – Diseases and procedures encountered in general surgery for which a graduate of training will possess significant knowledge and be able to provide comprehensive care, including procedural competency.
- **ADVANCED** – Diseases and procedures that are not consistently part of general surgery practice for which a graduate of training should have sufficient knowledge to make a diagnosis and provide initial management. In some instances, graduates will have sufficient knowledge and experience to provide comprehensive care.

Advanced

- Aortic Dissection
- Arterial Aneurysms - Aortic
- Arterial Aneurysms - Peripheral
- Arterial Aneurysms - Visceral
- Chronic Visceral Disease
- Hypercoagulable Syndromes
- Nonatherosclerotic Occlusive Diseases
- Renal Artery Disease
- Thoracic Outlet Syndrome
- Vascular Graft Infections

Operations/Procedures

Core

- Abdominal Aortic Aneurysm - Endovascular/Open Repair
- Amputations - Lower Extremity
- Aortofemoral Bypass
- Embolectomy/Thrombectomy - Arterial
- Extra-anatomic Bypass
- Femoral-popliteal Bypass
- Infrapopliteal Bypass

Advanced

- Arterial Occlusive Disease - Endarterectomy
- Carotid Endarterectomy
- Endovascular - Therapeutic, Including Thrombolysis
- Femoral Aneurysm - Repair
- Graft-enteric Fistula - Management
- Infrarenal and Aortoiliac Aneurysm - Repair
- Popliteal Aneurysm - Repair
- Pseudoaneurysm - Repair
- Suprarenal Abdominal Aortic Aneurysm - Repair
- Ultrasound in Diagnosis of Vascular Diseases
- Visceral Occlusive Disease – Operation

Vascular - Venous Diseases/Conditions

Core

- Thrombophlebitis - Acute and Suppurative
- Varicose Veins
- Venous Stasis/Chronic Venous Insufficiency
- Venous Thrombosis/Pulmonary Embolism

Operations/Procedures

Core

- Sclerotherapy - Peripheral Vein
- Vena Caval Filter - Insertion
- Venous Insufficiency/Varicose Veins – Operation

**Vascular - Access
Diseases/Conditions**

Core

- Vascular Access for Dialysis
- Venous Access for Long-Term Therapy

Operations/Procedures

Core

- Arteriovenous Graft/Fistula
- Percutaneous Vascular Access
- Venous Access Devices – Insertion