DEPARTMENT OF SURGERY

SECTION OF VASCULAR SURGERY

VA VASCULAR SURGERY

ANN ARBOR VETERANS AFFAIRS MEDICAL CENTER

House Officer I
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Curriculum/Rotation Goals and Objectives for
Surgery Residents

VA VASCULAR SURGERY

House Officer I

Goal: The goal of HO I VA Vascular Surgery rotation is to begin to build the residents' overall vascular surgical knowledge and operative experience. House officers will be expected to care for patients with vascular disease in the pre-operative and post-operative phases. House officers will evaluate patients with vascular disease in the outpatient clinic and help formulate treatment plans. As a member of the surgical team, house officers will be able to work through and manage common post-operative issues related to patients undergoing all vascular and general surgical procedures such as hypotension, low urine output, electrolyte imbalances, post-operative fever, and surgical site infections. In addition, house officers will respond to consultations for patients with vascular disease and formulate plans as part of the surgical team.

Learning Objectives:

Patient Care: By the end of the VA Vascular rotation, the HO I resident will be able to:
1. Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families
2. Gather essential and accurate information about their patients, especially regarding arterial and venous diseases, diabetic foot disease and vascular access/renal failure
3. Suggest diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment
4. Counsel and educate patients and their families, under the guidance and direction of senior residents and faculty
5. Use information technology effectively to support patient care decisions and patient education
6. Assist and perform portions of basic vascular procedures including amputations, vascular access procedures and venous surgery (phlebectomy). In addition, assist with exposure of vein conduit and closure of large wounds in multiple layers
7. Collaborate with health care professionals, including those from other disciplines, to provide patient-focused care, with a particular attention to common comorbid diseases, including cardiac disease and diabetic disease

Medical Knowledge: By the end of the VA Vascular Surgery rotation, the HO I resident will be able to:
1. Peripheral arterial occlusive disease
a. Explain the anatomy of the aorta and lower extremity vasculature, including all major branches to the level of the pedal arteries b. Explain the incidence and risk factors for the development of peripheral arterial occlusive disease c. Describe the pathophysiology of peripheral arterial occlusive disease and the complications of these diseases d. Describe the common workup and imaging for patients with peripheral arterial occlusive disease, including Ankle-Brachial Indices, Arterial Duplex and Lower Extremity Angiography e. List the common treatment options for patients with aorto-iliac occlusive disease, infra-inguinal occlusive disease and distal diabetic vascular disease, including both endovascular and open surgical interventions

f. Describe the intra-operative risks of aorto-femoral bypass, lower extremity bypass, femoral endarterectomy, and lower extremity angioplasty/stenting
g. Demonstrate safe and effective post-operative management of patients following endovascular lower extremity interventions, aorto-femoral bypass and infra-inguinal bypass/endarterectomy
h. Delineate post-operative complications, both short and long term for endovascular lower extremity interventions, aorto-femoral bypass and infra-inguinal bypass/endarterectomy
i. Demonstrate safe and effective management of post-operative complications, including hematoma, graft thrombosis, compartment syndrome, myocardial infarction, surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation

2. Acute limb ischemia

a. Explain the incidence and risk factors for the development of acute limb ischemia
b. Describe the pathophysiology of acute limb ischemia
c. Describe the common workup and imaging for patients with suspected acute limb ischemia
d. List the common treatment options for patients with acute limb ischemia, including embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
e. Describe the intra-operative risks of embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
f. Demonstrate safe and effective post-operative management of patients following embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
g. Delineate post-operative complications, both short and long term for embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
h. Demonstrate safe and effective management of post-operative complications, including hematoma, intracranial bleeding, compartment syndrome, myocardial infarction, surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation

3. Aneurysmal disease

a. Explain the anatomy of the aorta and major arterial branches
b. Explain the risk factors for the development of abdominal aortic aneurysms and other common aneurysms, including popliteal aneurysms and visceral aneurysms
c. Describe the pathophysiology of abdominal aortic aneurysms, popliteal artery aneurysms and the complications of these diseases
d. Describe the common workup and imaging for patients with suspected aneurysmal disease
e. List the common treatment options for AAA, including open and endovascular abdominal aortic aneurysm repair
f. Explain the anatomy and technique relevant exposure of the abdominal aorta
g. Delineate the intra-operative risks of both open and endovascular abdominal aortic aneurysm repair
h. Demonstrate safe and effective post-operative management of open and endovascular abdominal aortic aneurysm repair
i. Summarize post-operative complications, both short and long term for open and endovascular abdominal aortic aneurysm repair
j. Demonstrate safe and effective management of post-operative complications, including renal failure, myocardial infarction, colon ischemia and acute limb ischemia, and surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

4. Cerebrovascular occlusive disease

a. Explain the anatomy of the cerebral vasculature
b. Explain the incidence and risk factors for cerebrovascular occlusive disease
c. Describe the pathophysiology of cerebrovascular occlusive disease
d. Describe the common workup and imaging for patients with suspected cerebrovascular occlusive disease
e. List the indications for the treatment of both asymptomatic and symptomatic cerebrovascular occlusive disease, with particular attention to the ACAS, NASCET and CREST trials
f. List the common treatment options for cerebrovascular occlusive disease, including carotid endarterectomy, carotid stenting, and carotid-subclavian bypass
g. Describe the technique for carotid endarterectomy
h. List the intra-operative risks of carotid endarterectomy and stenting
i. Demonstrate safe and effective post-operative management of cerebrovascular occlusive disease patients
j. Explain post-operative complications of carotid surgery, both short and long term
k. Demonstrate safe and effective management of post-operative complications, including stroke, myocardial infarction, neck hematoma, hypertension, reperfusion syndrome, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

5. Venous disease

a. Explain the anatomy of the lower extremity venous system, including the superficial and deep venous system
b. Explain the incidence and risk factors for the development of symptomatic venous insufficiency
c. Describe the pathophysiology and complications of venous insufficiency
d. Describe the classification of venous insufficiency, including the CEAP classification of venous disease
e. Describe the common workup and imaging for patients with venous disease
f. List the indications for the treatment of symptomatic venous insufficiency and varicose veins
g. List the common treatment options for the treatment of venous insufficiency, including stab phlebectomy, sapheno-femoral disconnection, and endovenous ablation.
h. Describe the technique for stab phlebectomy
i. Demonstrate safe and effective post-operative management of venous surgical patients
j. Explain post-operative complications of venous surgery, both short and long term
k. Demonstrate safe and effective management of post-operative complications, including hematoma, bleeding, neuropathy, recurrence, and surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

6. Venous Thromboembolic disease

a. Explain the incidence and risk factors for the development of deep venous thrombosis and pulmonary embolism
b. Describe the pathophysiology of deep venous thrombosis and pulmonary embolism
c. Describe the prevention strategies for venous thromboembolism
d. Describe the common workup and imaging for patients with suspected venous thromboembolism
e. List the indication for treatment of venous thromboembolism, referencing the CHEST guidelines, available from the American College of Chest Physicians
f. Describe the common treatment options for venous thromboembolism, including anticoagulation, compression of affected limbs, thrombolysis and vena cava filter placement
g. Explain complications of treating venous thromboembolism, both short and long term

7. Vascular Access

a. Explain the incidence of renal failure and risk factors for renal failure
b. Describe the potential access options for patients on hemodialysis, including, temporary catheters, tunneled catheters, AV-grafts and AV fistulae
c. Describe the workup of a patient in preparation for a AV- fistula formation
d. Describe the technique of a radiocephalic/brachiocephalic fistula formation
e. Demonstrate safe and effective management of patients following dialysis access surgery

f. Describe the common complications of dialysis access surgery
g. Demonstrate safe and effective management of post-operative complications, including, failure to mature, arterial steal syndrome, ischemic monomelic neuropathy, graft infection and pseudoaneurysm, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

Systems-Based Practice: By the end of the VA Vascular Surgery rotation, the HO I resident will be able to:
1. Explain the role of systems in delivering optimal health care, including how "system problems" contribute to quality problems
2. Explain how their patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice
3. Explain how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources
4. Practice cost-effective health care and resource allocation that does not compromise quality of care
5. Advocate for quality patient care and assist patients in dealing with system complexities
6. Collaborate with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance

Practice-Based Learning and Improvement: By the end of the VA Vascular Surgery rotation, the HO I resident will be able to:
1. Analyze patient care experience and perform practice-based improvement activities using a systematic methodology (discussed in QI curriculum)
2. Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems
3. Conduct an effective literature search about a given vascular surgery topic
4. Describe/design a systematic approach to evaluate the results of one's own practice
5. Use information technology to manage information, access on-line medical information; and support their own education
6. Outline the main differences of the Veteran's Administration Health System and other health systems familiar to the resident

Professionalism: By the end of the VA Vascular Surgery rotation, the HO I resident will be able to:
1. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and on-going professional development
2. Demonstrate appropriate sensitivity to the veteran patient population, and understand how their needs may be different from other patients (including psychological, financial and social needs)
3. Recognize the importance of timely record keeping and its impact on the quality of surgery care
4. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices
5. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities

Interpersonal and Communication Skills: By the end of the VA Vascular Surgery rotation, the HO I resident will be able to:
1. Create and sustain a therapeutic and ethically sound relationship with patients
2. Demonstrate and employ effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills
3. Work effectively with others as a member of a health care team
4. Demonstrate the ability to interview and evaluate patients suffering from vascular disease

VA Vascular Surgery Service

House Officer II

Goal: The goal of the HO II VA Vascular Surgery rotation is to continue to build on the residents' overall vascular surgical knowledge and operative experience. House officers will be expected to care for patients with vascular disease in the pre-operative and post-operative phases. House officers will evaluate patients with vascular disease in the outpatient clinic and help formulate treatment plans. As a member of the surgical team, house officers will be able to work through and manage common post-operative issues related to patients undergoing all vascular and general surgical procedures such as hypotension, low urine output, electrolyte imbalances, post-operative fever, and surgical site infections. In addition, house officers will respond to consultations for patients with vascular disease and formulate plans as part of the surgical team.

Learning Objectives:

Patient Care: By the end of the VA Vascular rotation, the HO II resident will be able to:
1. Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families
2. Gather essential and accurate information about their patients, especially regarding arterial and venous diseases, diabetic foot disease and vascular access/renal failure
3. Suggest diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment
4. Counsel and educate patients and their families, under the guidance and direction of senior residents and faculty
5. Use information technology effectively to support patient care decisions and patient education
6. Assist and perform basic vascular procedures including amputations, vascular access procedures and venous surgery (phlebectomy). In addition, assist with exposure of vein conduit and closure of large wounds in multiple layers
7. Collaborate with health care professionals, including those from other disciplines, to provide patient-focused care, with a particular attention to common comorbid diseases, including cardiac disease and diabetic disease

Medical Knowledge: By the end of the VA Vascular Surgery rotation, the HO II resident will be able to:
1. Peripheral arterial occlusive disease
a. Explain the anatomy of the aorta and lower extremity vasculature, including all major branches to the level of the pedal arteries b. Explain the incidence and risk factors for the development of peripheral arterial occlusive disease c. Describe the pathophysiology of peripheral arterial occlusive disease and the complications of these diseases d. Describe the common workup and imaging for patients with peripheral arterial occlusive disease, including Ankle-Brachial Indices, Arterial Duplex and Lower Extremity Angiography e. List the common treatment options for patients with aorto-iliac occlusive disease, infra-inguinal occlusive disease and distal diabetic vascular disease, including both endovascular and open surgical interventions

f. Describe the basic tenets of vascular procedures, including proximal and distal control of blood vessels, intra-operative clamping and assessment of arterial disease based upon imaging
g. Describe the intra-operative risks of aorto-femoral bypass, lower extremity bypass, femoral endarterectomy, and lower extremity angioplasty/stenting
h. Demonstrate safe and effective post-operative management of patients following endovascular lower extremity interventions, aorto-femoral bypass and infra-inguinal bypass/endarterectomy
i. Delineate post-operative complications, both short and long term for endovascular lower extremity interventions, aorto-femoral bypass and infra-inguinal bypass/endarterectomy
j. Demonstrate safe and effective management of post-operative complications, including hematoma, graft thrombosis, compartment syndrome, myocardial infarction, surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation

2. Acute limb ischemia

a. Explain the incidence and risk factors for the development of acute limb ischemia
b. Describe the pathophysiology of acute limb ischemia
c. Describe the common workup and imaging for patients with suspected acute limb ischemia
d. List the common treatment options for patients with acute limb ischemia, including embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
e. Describe the technique of lower extremity 4-compartment fasciotomies
f. Describe the intra-operative risks of embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
g. Demonstrate safe and effective post-operative management of patients following embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
h. Delineate post-operative complications, both short and long term for embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
i. Demonstrate safe and effective management of post-operative complications, including hematoma, intracranial bleeding, compartment syndrome, myocardial infarction, surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation

3. Aneurysmal disease

a. Explain the anatomy of the aorta and major arterial branches
b. Explain the risk factors for the development of abdominal aortic aneurysms and other common aneurysms, including popliteal aneurysms and visceral aneurysms
c. Describe the pathophysiology of abdominal aortic aneurysms, popliteal artery aneurysms and the complications of these diseases
d. Describe the common workup and imaging for patients with suspected aneurysmal disease
e. List the common treatment options for AAA, including open and endovascular abdominal aortic aneurysm repair
f. Explain the anatomy and technique relevant exposure of the abdominal aorta
g. Delineate the intra-operative risks of both open and endovascular abdominal aortic aneurysm repair
h. Demonstrate safe and effective post-operative management of open and endovascular abdominal aortic aneurysm repair
i. Summarize post-operative complications, both short and long term for open and endovascular abdominal aortic aneurysm repair
j. Demonstrate safe and effective management of post-operative complications, including renal failure, myocardial infarction, colon ischemia and acute limb ischemia, and surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

4. Cerebrovascular occlusive disease

a. Explain the anatomy of the cerebral vasculature
b. Explain the incidence and risk factors for cerebrovascular occlusive disease
c. Describe the pathophysiology of cerebrovascular occlusive disease
d. Describe the common workup and imaging for patients with suspected cerebrovascular occlusive disease
e. List the indications for the treatment of both asymptomatic and symptomatic cerebrovascular occlusive disease, with particular attention to the ACAS, NASCET and CREST trials
f. List the common treatment options for cerebrovascular occlusive disease, including carotid endarterectomy, carotid stenting, and carotid-subclavian bypass
g. Explain a rationale for selecting carotid endarterectomy versus stenting
h. Describe the technique for carotid endarterectomy
i. List the intra-operative risks of carotid endarterectomy and stenting
j. Demonstrate safe and effective post-operative management of cerebrovascular occlusive disease patients
k. Explain post-operative complications of carotid surgery, both short and long term
l. Demonstrate safe and effective management of post-operative complications, including stroke, myocardial infarction, neck hematoma, hypertension, reperfusion syndrome, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

5. Venous disease

a. Explain the anatomy of the lower extremity venous system, including the superficial and deep venous system
b. Explain the incidence and risk factors for the development of symptomatic venous insufficiency
c. Describe the pathophysiology and complications of venous insufficiency
d. Describe the classification of venous insufficiency, including the CEAP classification of venous disease
e. Describe the common workup and imaging for patients with venous disease
f. List the indications for the treatment of symptomatic venous insufficiency and varicose veins
g. List the common treatment options for the treatment of venous insufficiency, including stab phlebectomy, sapheno-femoral disconnection, and endovenous ablation
h. Describe the technique for stab phlebectomy and sapheno-femoral disconnect
i. Demonstrate safe and effective post-operative management of venous surgical patients
j. Explain post-operative complications of venous surgery, both short and long term
k. Demonstrate safe and effective management of post-operative complications, including hematoma, bleeding, neuropathy, recurrence, and surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

6. Venous Thromboembolic disease

a. Explain the incidence and risk factors for the development of deep venous thrombosis and pulmonary embolism
b. Describe the pathophysiology of deep venous thrombosis and pulmonary embolism
c. Describe the prevention strategies for venous thromboembolism
d. Describe the common workup and imaging for patients with suspected venous thromboembolism
e. List the indication for treatment of venous thromboembolism, referencing the CHEST guidelines, available from the American College of Chest Physicians
f. Describe the common treatment options for venous thromboembolism, including anticoagulation, compression of affected limbs, thrombolysis and vena cava filter placement
g. Explain complications of treating venous thromboembolism, both short and long term

7. Vascular Access

a. Explain the incidence of renal failure and risk factors for renal failure
b. Describe the potential access options for patients on hemodialysis, including, temporary catheters, tunneled catheters, AV-grafts and AV fistulae
c. Describe the workup of a patient in preparation for a AV- fistula formation
d. Describe how to assess for adequate vein conduit for AV-fistula formation

e. Describe the technique of a radiocephalic/brachiocephalic fistula formation
f. Demonstrate safe and effective management of patients following dialysis access surgery
g. Describe the common complications of dialysis access surgery
h. Demonstrate safe and effective management of post-operative complications, including, failure to mature, arterial steal syndrome, ischemic monomelic neuropathy, graft infection and pseudoaneurysm, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

Systems-Based Practice: By the end of the VA Vascular Surgery rotation, the HO II resident will be able to:
1. Explain the role of systems in delivering optimal health care, including how "system problems" contribute to quality problems
2. Explain how their patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice
3. Explain how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources
4. Practice cost-effective health care and resource allocation that does not compromise quality of care
5. Advocate for quality patient care and assist patients in dealing with system complexities
6. Collaborate with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance
7. Outline the main differences of the Veteran's Administration Health System and other health systems familiar to the resident

Practice-Based Learning and Improvement: By the end of the VA Vascular Surgery rotation, the HO II resident will be able to:
1. Analyze patient care experience and perform practice-based improvement activities using a systematic methodology (discussed in QI curriculum)
2. Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems
3. Conduct an effective literature search about a given vascular surgery topic
4. Describe/design a systematic approach to evaluate the results of one's own practice
5. Use information technology to manage information, access on-line medical information; and support their own education

Professionalism: By the end of the VA Vascular Surgery rotation, the HO II resident will be able to:
1. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and on-going professional development
2. Demonstrate appropriate sensitivity to the veteran patient population, and understand how their needs may be different from other patients (including psychological, financial and social needs)
3. Recognize the importance of timely record keeping and its impact on the quality of surgery care
4. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices
5. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities

Interpersonal and Communication Skills: By the end of the VA Vascular Surgery rotation, the HO II resident will be able to:
1. Create and sustain a therapeutic and ethically sound relationship with patients
2. Demonstrate and employ effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills
3. Work effectively with others as a member of a health care team
4. Interview and evaluate patients suffering from vascular disease

VA Vascular Surgery Service

House Officer III

Goal: The goal of the HO III VA Vascular Surgery rotation is to continue to build upon the resident's overall vascular surgical knowledge and operative experience. An increasing emphasis will be placed upon operative experience. House officers will be expected to care for patients with vascular disease in the pre-operative and post-operative phases. House officers will evaluate patients with vascular disease in the outpatient clinic and help formulate treatment plans. As a member of the surgical team, House officers will be able to work through and manage common post-operative issues related to patients undergoing all vascular and general surgical procedures such as hypotension, low urine output, electrolyte imbalances, post-operative fever, and surgical site infections. In addition, house officers will respond to consultations and help the junior residents analyze and synthesize plans for patients with vascular disease.

Learning Objectives:

Patient Care: By the end of the VA Vascular rotation, the HO III resident will be able to:
1. Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families
2. Gather essential and accurate information about their patients, especially regarding arterial and venous diseases, diabetic foot disease and vascular access/renal failure
3. Suggest diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment
4. Counsel and educate patients and their families, under the guidance and direction of senior residents and faculty
5. Use information technology effectively to support patient care decisions and patient education
6. Perform basic vascular procedures including amputations, vascular access procedures and venous surgery (phlebectomy). In addition, house officers will assist and perform more complex vascular procedures including carotid endarterectomy, lower-extremity revascularization and abdominal aortic aneurysm repair
7. Help to lead the team on rounds and coordinate the care of patients with vascular disease
8. Collaborate with health care professionals, including those from other disciplines, to provide patient-focused care, with a particular attention to common comorbid diseases, including cardiac disease and diabetic disease

Medical Knowledge: By the end of the VA Vascular Surgery rotation, the HO III resident will be able to:
1. Peripheral arterial occlusive disease
a. Explain the anatomy of the aorta and lower extremity vasculature, including all major branches to the level of the pedal arteries b. Explain the incidence and risk factors for the development of peripheral arterial occlusive disease c. Describe the pathophysiology of peripheral arterial occlusive disease and the complications of these diseases d. Describe the common workup and imaging for patients with peripheral arterial occlusive

disease, including Ankle-Brachial Indices, Arterial Duplex and Lower Extremity Angiography
e. List the common treatment options for patients with aorto-iliac occlusive disease, infra-inguinal occlusive disease and distal diabetic vascular disease, including both endovascular and open surgical interventions
f. Describe the steps of lower extremity bypass, including selecting inflow and outflow, assessing vein conduit adequacy, exposure of the common femoral artery and below-knee popliteal artery
g. Describe the intra-operative risks of aorto-femoral bypass, lower extremity bypass, femoral endarterectomy, and lower extremity angioplasty/stenting
h. Demonstrate safe and effective post-operative management of patients following endovascular lower extremity interventions, aorto-femoral bypass and infra-inguinal bypass/endarterectomy
i. Delineate post-operative complications, both short and long term for endovascular lower extremity interventions, aorto-femoral bypass and infra-inguinal bypass/endarterectomy
j. Demonstrate safe and effective management of post-operative complications, including hematoma, graft thrombosis, compartment syndrome, myocardial infarction, surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation

2. Acute limb ischemia

a. Explain the incidence and risk factors for the development of acute limb ischemia
b. Describe the pathophysiology of acute limb ischemia
c. Describe the common workup and imaging for patients with suspected acute limb ischemia
d. List the common treatment options for patients with acute limb ischemia, including embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
e. Describe the technique of lower extremity 4-compartment fasciotomies and embolectomy
f. Describe the intra-operative risks of embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
g. Demonstrate safe and effective post-operative management of patients following embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
h. Delineate post-operative complications, both short and long term for embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
i. Demonstrate safe and effective management of post-operative complications, including hematoma, intracranial bleeding, compartment syndrome, myocardial infarction, surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation

3. Aneurysmal disease

a. Explain the anatomy of the aorta and major arterial branches
b. Explain the risk factors for the development of abdominal aortic aneurysms and other common aneurysms, including popliteal aneurysms and visceral aneurysms
c. Describe the pathophysiology of abdominal aortic aneurysms, popliteal artery aneurysms and the complications of these diseases
d. Describe the common workup and imaging for patients with suspected aneurysmal disease
e. List the common treatment options for AAA, including open and endovascular abdominal aortic aneurysm repair
f. Describe the steps to an open trans-abdominal repair of an infrarenal AAA
g. Delineate the intra-operative risks of both open and endovascular abdominal aortic aneurysm repair
h. Demonstrate safe and effective post-operative management of open and endovascular abdominal aortic aneurysm repair
i. Summarize post-operative complications, both short and long term for open and endovascular abdominal aortic aneurysm repair
j. Demonstrate safe and effective management of post-operative complications, including renal failure, myocardial infarction, colon ischemia and acute limb ischemia, and surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

4. Cerebrovascular occlusive disease

a. Explain the anatomy of the cerebral vasculature
b. Explain the incidence and risk factors for cerebrovascular occlusive disease
c. Describe the pathophysiology of cerebrovascular occlusive disease
d. Describe the common workup and imaging for patients with suspected cerebrovascular occlusive disease
e. List the indications for the treatment of both asymptomatic and symptomatic cerebrovascular occlusive disease, with particular attention to the ACAS, NASCET and CREST trials
f. List the common treatment options for cerebrovascular occlusive disease, including carotid endarterectomy, carotid stenting, and carotid-subclavian bypass
g. Explain a rationale for selecting carotid endarterectomy versus stenting
h. Describe the technique for carotid endarterectomy and intra-operative shunting
i. List the intra-operative risks of carotid endarterectomy and stenting
j. Demonstrate safe and effective post-operative management of cerebrovascular occlusive disease patients
k. Explain post-operative complications of carotid surgery, both short and long term
l. Demonstrate safe and effective management of post-operative complications, including stroke, myocardial infarction, neck hematoma, hypertension, reperfusion syndrome, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

5. Venous disease

a. Explain the anatomy of the lower extremity venous system, including the superficial and deep venous system
b. Explain the incidence and risk factors for the development of symptomatic venous insufficiency
c. Describe the pathophysiology and complications of venous insufficiency
d. Describe the classification of venous insufficiency, including the CEAP classification of venous disease
e. Describe the common workup and imaging for patients with venous disease
f. List the indications for the treatment of symptomatic venous insufficiency and varicose veins
g. List the common treatment options for the treatment of venous insufficiency, including stab phlebectomy, sapheno-femoral disconnection, and endovenous ablation
h. Describe the technique for stab phlebectomy and sapheno-femoral disconnect
i. Demonstrate safe and effective post-operative management of venous surgical patients
j. Explain post-operative complications of venous surgery, both short and long term
k. Demonstrate safe and effective management of post-operative complications, including hematoma, bleeding, neuropathy, recurrence, and surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

6. Venous Thromboembolic disease

a. Explain the incidence and risk factors for the development of deep venous thrombosis and pulmonary embolism
b. Describe the pathophysiology of deep venous thrombosis and pulmonary embolism
c. Describe the prevention strategies for venous thromboembolism
d. Describe the common workup and imaging for patients with suspected venous thromboembolism
e. List the indication for treatment of venous thromboembolism, referencing the CHEST guidelines, available from the American College of Chest Physicians
f. Describe the common treatment options for venous thromboembolism, including anticoagulation, compression of affected limbs, thrombolysis and vena cava filter placement
g. Explain complications of treating venous thromboembolism, both short and long term

7. Vascular Access

a. Explain the incidence of renal failure and risk factors for renal failure
b. Describe the potential access options for patients on hemodialysis, including, temporary catheters, tunneled catheters, AV-grafts and AV fistulae
c. Describe the workup of a patient in preparation for a AV- fistula formation
d. Describe how to assess for adequate vein conduit for AV-fistula formation

e. Describe the technique of a radiocephalic/brachiocephalic fistula formation
f. Demonstrate safe and effective management of patients following dialysis access surgery
g. Describe the common complications of dialysis access surgery
h. Demonstrate safe and effective management of post-operative complications, including, failure to mature, arterial steal syndrome, ischemic monomelic neuropathy, graft infection and pseudoaneurysm, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

Systems-Based Practice: By the end of the VA Vascular Surgery rotation, the HO III resident will be able to:
1. Explain the role of systems in delivering optimal health care, including how "system problems" contribute to quality problems
2. Explain how their patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice
3. Explain how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources
4. Practice cost-effective health care and resource allocation that does not compromise quality of care
5. Advocate for quality patient care and assist patients in dealing with system complexities
6. Collaborate with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance
7. Outline the main differences of the Veteran's Administration Health System and other health systems familiar to the resident

Practice-Based Learning and Improvement: By the end of the VA Vascular Surgery rotation, the HO III resident will be able to:
1. Analyze patient care experience and perform practice-based improvement activities using a systematic methodology (discussed in QI curriculum)
2. Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems
3. Conduct an effective literature search about a given vascular surgery topic
4. Describe/design a systematic approach to evaluate the results of one's own practice
5. Use information technology to manage information, access on-line medical information; and support their own education

Professionalism: By the end of the VA Vascular Surgery rotation, the HO III resident will be able to:
1. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and on-going professional development
2. Demonstrate appropriate sensitivity to the veteran patient population, and understand how their needs may be different from other patients (including psychological, financial and social needs)
3. Recognize the importance of timely record keeping and its impact on the quality of surgery care
4. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices
5. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities

Interpersonal and Communication Skills: By the end of the VA Vascular Surgery rotation, the HO III resident will be able to:
1. Create and sustain a therapeutic and ethically sound relationship with patients
2. Demonstrate and employ effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills
3. Work effectively with others as a member of a health care team
4. Begin to lead the healthcare team and delegate responsibilities to junior residents
5. Interview and evaluate patients suffering from vascular disease

VA Vascular Surgery Service

House Officer IV

Goal: The goal of the HO IV VA Vascular Surgery rotation is to continue to build upon the resident's overall vascular surgical knowledge and operative experience. As a senior resident, an increasing emphasis will be placed upon operative experience. House officers will be expected to direct the care for patients with vascular disease in the pre-operative and post-operative phases. House officers will evaluate patients with vascular disease in the outpatient clinic and help formulate treatment plans. As a member of the surgical team, house officers will be able to help junior residents work through and manage common post-operative issues related to patients undergoing all vascular and general surgical procedures such as hypotension, low urine output, electrolyte imbalances, post-operative fever, and surgical site infections. In addition, house officers will respond to consultations and help the junior residents analyze and synthesize plans for patients with vascular disease.

Learning Objectives:

Patient Care: By the end of the VA Vascular rotation, the HO IV resident will be able to:
1. Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families
2. Gather essential and accurate information about their patients, especially regarding arterial and venous diseases, diabetic foot disease and vascular access/renal failure
3. Suggest diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment
4. Counsel and educate patients and their families, under the guidance and direction of senior residents and faculty
5. Use information technology effectively to support patient care decisions and patient education
6. Assist junior residents with the performance of basic vascular procedures including amputations, and venous surgery (phlebectomy). In addition, house officers will perform more complex vascular procedures including carotid endarterectomy, lower-extremity revascularization and abdominal aortic aneurysm repair
7. Help to lead the team on rounds and coordinate the care of patients with vascular disease
8. Collaborate with health care professionals, including those from other disciplines, to provide patient-focused care, with a particular attention to common comorbid diseases, including cardiac disease and diabetic disease

Medical Knowledge: By the end of the VA Vascular Surgery rotation, the HO IV resident will be able to:
1. Peripheral arterial occlusive disease
a. Explain the anatomy of the aorta and lower extremity vasculature, including all major branches to the level of the pedal arteries b. Explain the incidence and risk factors for the development of peripheral arterial occlusive disease c. Describe the pathophysiology of peripheral arterial occlusive disease and the complications of these diseases

d. Describe the common workup and imaging for patients with peripheral arterial occlusive disease, including Ankle-Brachial Indices, Arterial Duplex and Lower Extremity Angiography
e. List the common treatment options for patients with aorto-iliac occlusive disease, infra-inguinal occlusive disease and distal diabetic vascular disease, including both endovascular and open surgical interventions
f. Describe the steps of lower extremity bypass, including selecting inflow and outflow, assessing vein conduit adequacy, exposure of the common femoral artery and below-knee popliteal artery
g. Describe the intra-operative risks of aorto-femoral bypass, lower extremity bypass, femoral endarterectomy, and lower extremity angioplasty/stenting
h. Demonstrate safe and effective post-operative management of patients following endovascular lower extremity interventions, aorto-femoral bypass and infra-inguinal bypass/endarterectomy
i. Delineate post-operative complications, both short and long term for endovascular lower extremity interventions, aorto-femoral bypass and infra-inguinal bypass/endarterectomy
j. Demonstrate safe and effective management of post-operative complications, including hematoma, graft thrombosis, compartment syndrome, myocardial infarction, surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation

2. Acute limb ischemia

a. Explain the incidence and risk factors for the development of acute limb ischemia
b. Describe the pathophysiology of acute limb ischemia
c. Describe the common workup and imaging for patients with suspected acute limb ischemia
d. List the common treatment options for patients with acute limb ischemia, including embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
e. Describe the technique of lower extremity 4-compartment fasciotomies and embolectomy
f. Describe the intra-operative risks of embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
g. Demonstrate safe and effective post-operative management of patients following embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
h. Delineate post-operative complications, both short and long term for embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
i. Demonstrate safe and effective management of post-operative complications, including hematoma, intracranial bleeding, compartment syndrome, myocardial infarction, surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation

3. Aneurysmal disease

a. Explain the anatomy of the aorta and major arterial branches
b. Explain the risk factors for the development of abdominal aortic aneurysms and other common aneurysms, including popliteal aneurysms and visceral aneurysms
c. Describe the pathophysiology of abdominal aortic aneurysms, popliteal artery aneurysms and the complications of these diseases
d. Describe the common workup and imaging for patients with suspected aneurysmal disease
e. List the common treatment options for AAA, including open and endovascular abdominal aortic aneurysm repair
f. Describe the steps to an open trans-abdominal repair of an infrarenal AAA
g. Describe the steps of an Endovascular abdominal aortic aneurysm repair
h. Delineate the intra-operative risks of both open and endovascular abdominal aortic aneurysm repair
i. Demonstrate safe and effective post-operative management of open and endovascular abdominal aortic aneurysm repair
j. Summarize post-operative complications, both short and long term for open and endovascular abdominal aortic aneurysm repair
k. Demonstrate safe and effective management of post-operative complications, including renal failure, myocardial infarction, colon ischemia and acute limb ischemia, and surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

4. Cerebrovascular occlusive disease

a. Explain the anatomy of the cerebral vasculature
b. Explain the incidence and risk factors for cerebrovascular occlusive disease
c. Describe the pathophysiology of cerebrovascular occlusive disease
d. Describe the common workup and imaging for patients with suspected cerebrovascular occlusive disease
e. List the indications for the treatment of both asymptomatic and symptomatic cerebrovascular occlusive disease, with particular attention to the ACAS, NASCET and CREST trials
f. List the common treatment options for cerebrovascular occlusive disease, including carotid endarterectomy, carotid stenting, and carotid-subclavian bypass
g. Explain a rationale for selecting carotid endarterectomy versus stenting
h. Describe the technique for carotid endarterectomy and intra-operative shunting
i. List the intra-operative risks of carotid endarterectomy and stenting
j. Demonstrate safe and effective post-operative management of cerebrovascular occlusive disease patients
k. Explain post-operative complications of carotid surgery, both short and long term
l. Demonstrate safe and effective management of post-operative complications, including stroke, myocardial infarction, neck hematoma, hypertension, reperfusion syndrome, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

5. Venous disease

a. Explain the anatomy of the lower extremity venous system, including the superficial and deep venous system
b. Explain the incidence and risk factors for the development of symptomatic venous insufficiency
c. Describe the pathophysiology and complications of venous insufficiency
d. Describe the classification of venous insufficiency, including the CEAP classification of venous disease
e. Describe the common workup and imaging for patients with venous disease
f. List the indications for the treatment of symptomatic venous insufficiency and varicose veins
g. List the common treatment options for the treatment of venous insufficiency, including stab phlebectomy, sapheno-femoral disconnection, and endovenous ablation
h. Describe the technique for stab phlebectomy and sapheno-femoral disconnect
i. Demonstrate safe and effective post-operative management of venous surgical patients
j. Explain post-operative complications of venous surgery, both short and long term
k. Demonstrate safe and effective management of post-operative complications, including hematoma, bleeding, neuropathy, recurrence, and surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

6. Venous Thromboembolic disease

a. Explain the incidence and risk factors for the development of deep venous thrombosis and pulmonary embolism
b. Describe the pathophysiology of deep venous thrombosis and pulmonary embolism
c. Describe the prevention strategies for venous thromboembolism
d. Describe the common workup and imaging for patients with suspected venous thromboembolism
e. List the indication for treatment of venous thromboembolism, referencing the CHEST guidelines, available from the American College of Chest Physicians
f. Describe the common treatment options for venous thromboembolism, including anticoagulation, compression of affected limbs, thrombolysis and vena cava filter placement
g. Explain complications of treating venous thromboembolism, both short and long term

7. Vascular Access

a. Explain the incidence of renal failure and risk factors for renal failure
b. Describe the potential access options for patients on hemodialysis, including, temporary catheters, tunneled catheters, AV-grafts and AV fistulae
c. Describe the workup of a patient in preparation for a AV- fistula formation

d. Describe how to assess for adequate vein conduit for AV-fistula formation
e. Describe the technique of a radiocephalic/brachiocephalic fistula formation
f. Demonstrate safe and effective management of patients following dialysis access surgery
g. Describe the common complications of dialysis access surgery
h. Demonstrate safe and effective management of post-operative complications, including, failure to mature, arterial steal syndrome, ischemic monomelic neuropathy, graft infection and pseudoaneurysm, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

Systems-Based Practice: By the end of the VA Vascular Surgery rotation, the HO IV resident will be able to:
1. Explain the role of systems in delivering optimal health care, including how "system problems" contribute to quality problems
2. Explain how their patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice
3. Explain how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources
4. Practice cost-effective health care and resource allocation that does not compromise quality of care
5. Advocate for quality patient care and assist patients in dealing with system complexities
6. Collaborate with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance
7. Outline the main differences of the Veteran's Administration Health System and other health systems familiar to the resident

Practice-Based Learning and Improvement: By the end of the VA Vascular Surgery rotation, the HO IV resident will be able to:
1. Analyze patient care experience and perform practice-based improvement activities using a systematic methodology (discussed in QI curriculum)
2. Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems
3. Conduct an effective literature search about a given vascular surgery topic
4. Describe/design a systematic approach to evaluate the results of one's own practice
5. Use information technology to manage information, access on-line medical information; and support their own education

Professionalism: By the end of the VA Vascular Surgery rotation, the HO IV resident will be able to:
1. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and on-going professional development
2. Demonstrate appropriate sensitivity to the veteran patient population, and understand how their needs may be different from other patients (including psychological, financial and social needs)
3. Recognize the importance of timely record keeping and its impact on the quality of surgery care
4. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices
5. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities

Interpersonal and Communication Skills: By the end of the VA Vascular Surgery rotation, the HO IV resident will be able to:
1. Create and sustain a therapeutic and ethically sound relationship with patients
2. Demonstrate and employ effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills
3. Work effectively with others as a member of a health care team
4. Lead the healthcare team and delegate responsibilities to junior residents
5. Interview and evaluate patients suffering from vascular disease

VA Vascular Surgery Service

House Officer V

Goal: The goal of the HO V VA Vascular Surgery rotation is to provide the chief resident with a comprehensive experience on the vascular service. As a chief resident, the house officer will direct the surgical team and perform complex vascular surgery procedures. House officers will be expected to direct the care for patients with vascular disease in the pre-operative and post-operative phases. House officers will evaluate patients with vascular disease in the outpatient clinic and help formulate treatment plans. As a member of the surgical team, house officers will be able to help junior residents work through and manage common post-operative issues related to patients undergoing all vascular and general surgical procedures such as hypotension, low urine output, electrolyte imbalances, post-operative fever, and surgical site infections. In addition, house officers will respond to consultations and help the junior residents analyze and synthesize plans for patients with vascular disease.

Learning Objectives:

Patient Care: By the end of the VA Vascular rotation, the HO V resident will be able to:
1. Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families
2. Gather essential and accurate information about their patients, especially regarding arterial and venous diseases, diabetic foot disease and vascular access/renal failure
3. Suggest diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment
4. Counsel and educate patients and their families, under the guidance and direction of senior residents and faculty
5. Use information technology effectively to support patient care decisions and patient education
6. Assist junior residents with the performance of basic vascular procedures including amputations, and venous surgery (phlebectomy)
7. Perform complex vascular procedures including carotid endarterectomy, lower-extremity revascularization and abdominal aortic aneurysm repair
8. Lead the team on rounds and coordinate the care of patients with vascular disease
9. Collaborate with health care professionals, including those from other disciplines, to provide patient-focused care, with a particular attention to common comorbid diseases, including cardiac disease and diabetic disease

Medical Knowledge: By the end of the VA Vascular Surgery rotation, the HO V resident will be able to:
1. Peripheral arterial occlusive disease
a. Explain the anatomy of the aorta and lower extremity vasculature, including all major branches to the level of the pedal arteries b. Explain the incidence and risk factors for the development of peripheral arterial occlusive disease c. Describe the pathophysiology of peripheral arterial occlusive disease and the complications of these diseases

d. Describe the common workup and imaging for patients with peripheral arterial occlusive disease, including Ankle-Brachial Indices, Arterial Duplex and Lower Extremity Angiography
e. List the common treatment options for patients with aorto-iliac occlusive disease, infra-inguinal occlusive disease and distal diabetic vascular disease, including both endovascular and open surgical interventions
f. Describe the steps of lower extremity bypass, including selecting inflow and outflow, assessing vein conduit adequacy, exposure of the common femoral artery and below-knee popliteal artery
g. Describe the intra-operative risks of aorto-femoral bypass, lower extremity bypass, femoral endarterectomy, and lower extremity angioplasty/stenting
h. Demonstrate safe and effective post-operative management of patients following endovascular lower extremity interventions, aorto-femoral bypass and infra-inguinal bypass/endarterectomy
i. Delineate post-operative complications, both short and long term for endovascular lower extremity interventions, aorto-femoral bypass and infra-inguinal bypass/endarterectomy
j. Demonstrate safe and effective management of post-operative complications, including hematoma, graft thrombosis, compartment syndrome, myocardial infarction, surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation

2. Acute limb ischemia

a. Explain the incidence and risk factors for the development of acute limb ischemia
b. Describe the pathophysiology of acute limb ischemia
c. Describe the common workup and imaging for patients with suspected acute limb ischemia
d. List the common treatment options for patients with acute limb ischemia, including embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
e. Describe the technique of lower extremity 4-compartment fasciotomies and embolectomy.
f. Describe the intra-operative risks of embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
g. Demonstrate safe and effective post-operative management of patients following embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
h. Delineate post-operative complications, both short and long term for embolectomy (femoral/popliteal/tibial), fasciotomies and catheter-directed thrombolysis
i. Demonstrate safe and effective management of post-operative complications, including hematoma, intracranial bleeding, compartment syndrome, myocardial infarction, surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation

3. Aneurysmal disease

a. Explain the anatomy of the aorta and major arterial branches
b. Explain the risk factors for the development of abdominal aortic aneurysms and other common aneurysms, including popliteal aneurysms and visceral aneurysms
c. Describe the pathophysiology of abdominal aortic aneurysms, popliteal artery aneurysms and the complications of these diseases
d. Describe the common workup and imaging for patients with suspected aneurysmal disease
e. List the common treatment options for AAA, including open and endovascular abdominal aortic aneurysm repair
f. Describe the steps to an open trans-abdominal repair of an infrarenal AAA
g. Describe the steps of an Endovascular abdominal aortic aneurysm repair
h. Delineate the intra-operative risks of both open and endovascular abdominal aortic aneurysm repair
i. Demonstrate safe and effective post-operative management of open and endovascular abdominal aortic aneurysm repair
j. Summarize post-operative complications, both short and long term for open and endovascular abdominal aortic aneurysm repair
k. Demonstrate safe and effective management of post-operative complications, including renal failure, myocardial infarction, colon ischemia and acute limb ischemia, and surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

4. Cerebrovascular occlusive disease

a. Explain the anatomy of the cerebral vasculature
b. Explain the incidence and risk factors for cerebrovascular occlusive disease
c. Describe the pathophysiology of cerebrovascular occlusive disease
d. Describe the common workup and imaging for patients with suspected cerebrovascular occlusive disease
e. List the indications for the treatment of both asymptomatic and symptomatic cerebrovascular occlusive disease, with particular attention to the ACAS, NASCET and CREST trials
f. List the common treatment options for cerebrovascular occlusive disease, including carotid endarterectomy, carotid stenting, and carotid-subclavian bypass
g. Explain a rationale for selecting carotid endarterectomy versus stenting
h. Describe the technique for carotid endarterectomy and intra-operative shunting
i. List the intra-operative risks of carotid endarterectomy and stenting
j. Demonstrate safe and effective post-operative management of cerebrovascular occlusive disease patients
k. Explain post-operative complications of carotid surgery, both short and long term
l. Demonstrate safe and effective management of post-operative complications, including stroke, myocardial infarction, neck hematoma, hypertension, reperfusion syndrome, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

5. Venous disease

a. Explain the anatomy of the lower extremity venous system, including the superficial and deep venous system
b. Explain the incidence and risk factors for the development of symptomatic venous insufficiency
c. Describe the pathophysiology and complications of venous insufficiency
d. Describe the classification of venous insufficiency, including the CEAP classification of venous disease
e. Describe the common workup and imaging for patients with venous disease
f. List the indications for the treatment of symptomatic venous insufficiency and varicose veins
g. List the common treatment options for the treatment of venous insufficiency, including stab phlebectomy, sapheno-femoral disconnection, and endovenous ablation
h. Describe the technique for stab phlebectomy and sapheno-femoral disconnect
i. Demonstrate safe and effective post-operative management of venous surgical patients
j. Explain post-operative complications of venous surgery, both short and long term
k. Demonstrate safe and effective management of post-operative complications, including hematoma, bleeding, neuropathy, recurrence, and surgical site infection, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

6. Venous Thromboembolic disease

a. Explain the incidence and risk factors for the development of deep venous thrombosis and pulmonary embolism
b. Describe the pathophysiology of deep venous thrombosis and pulmonary embolism
c. Describe the prevention strategies for venous thromboembolism
d. Describe the common workup and imaging for patients with suspected venous thromboembolism
e. List the indication for treatment of venous thromboembolism, referencing the CHEST guidelines, available from the American College of Chest Physicians
f. Describe the common treatment options for venous thromboembolism, including anticoagulation, compression of affected limbs, thrombolysis and vena cava filter placement
g. Explain complications of treating venous thromboembolism, both short and long term

7. Vascular Access

a. Explain the incidence of renal failure and risk factors for renal failure
b. Describe the potential access options for patients on hemodialysis, including, temporary catheters, tunneled catheters, AV-grafts and AV fistulae
c. Describe the workup of a patient in preparation for a AV- fistula formation

d. Describe how to assess for adequate vein conduit for AV-fistula formation
e. Describe the technique of a radiocephalic/brachiocephalic fistula formation
f. Demonstrate safe and effective management of patients following dialysis access surgery
g. Describe the common complications of dialysis access surgery
h. Demonstrate safe and effective management of post-operative complications, including, failure to mature, arterial steal syndrome, ischemic monomelic neuropathy, graft infection and pseudoaneurysm, including "red flags" for notifying senior residents or faculty regarding potential need for reoperation/evaluation

Systems-Based Practice: By the end of the VA Vascular Surgery rotation, the HO V resident will be able to:
1. Explain the role of systems in delivering optimal health care, including how "system problems" contribute to quality problems
2. Explain how their patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice
3. Explain how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources
4. Practice cost-effective health care and resource allocation that does not compromise quality of care
5. Advocate for quality patient care and assist patients in dealing with system complexities
6. Collaborate with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance
7. Outline the main differences of the Veteran's Administration Health System and other health systems familiar to the resident

Practice-Based Learning and Improvement: By the end of the VA Vascular Surgery rotation, the HO V resident will be able to:
1. Analyze patient care experience and perform practice-based improvement activities using a systematic methodology (discussed in QI curriculum)
2. Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems
3. Conduct an effective literature search about a given vascular surgery topic
4. Describe/design a systematic approach to evaluate the results of one's own practice
5. Use information technology to manage information, access on-line medical information; and support their own education

Professionalism: By the end of the VA Vascular Surgery rotation, the HO V resident will be able to:
1. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and on-going professional development
2. Demonstrate appropriate sensitivity to the veteran patient population, and understand how their needs may be different from other patients (including psychological, financial and social needs)
3. Recognize the importance of timely record keeping and its impact on the quality of surgery care
4. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices
5. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities

Interpersonal and Communication Skills: By the end of the VA Vascular Surgery rotation, the HO V resident will be able to:
1. Create and sustain a therapeutic and ethically sound relationship with patients
2. Demonstrate and employ effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills
3. Work effectively with others as a member of a health care team
4. Teach and mentor medical students on service
5. Lead the healthcare team and delegate responsibilities to junior residents
6. Interview and evaluate patients suffering from vascular disease
7. Develop a comprehensive treatment plan for patients with vascular disease