



CURRICULUM OUTLINE
FOR
VASCULAR SURGERY

NOVEMBER 2018

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INTRODUCTION

EXPLANATION OF THE CURRICULUM OUTLINE

The **SCORE Curriculum Outline for Vascular Surgery (VSCORE)** is a list of vascular and core surgery patient care topics to be covered in a vascular surgery training program. The curriculum includes vascular surgical diseases/conditions and operations/procedures and core surgical medical knowledge topics essential to the care of the vascular patient, as well as the Accreditation Council for Graduate Medical Education (ACGME) required topics on professionalism, interpersonal and communication skills, practice-based learning and improvement, and systems-based practice. It is designed to be relevant to five-year integrated training programs, as well as two-year fellowship programs.

The outline has been created with input from the Vascular Surgery Board of the American Board of Surgery, the Association of Program Directors in Vascular Surgery, the Society for Vascular Surgery and the Review Committee for Surgery (ACGME).

The Vascular Surgical Council on Resident Education (VSCORE®) is a nonprofit consortium with the mission of improving the education of residents in vascular surgery. VSCORE Member Organizations include the American Board of Surgery-Vascular Surgery Board, the Association of Program Directors in Vascular Surgery, the Society for Vascular Surgery, and the Review Committee for Surgery (ACGME).

Please note: The topics below may not directly match the [modules](#) currently listed on the SCORE Portal (www.surgicalcore.org). This document is forward-looking, reflecting the latest updates. There has also been an effort to consolidate topics wherever possible, which will be reflected on the portal as the development and updating of modules continues.

Category 1: Atherosclerotic Cerebrovascular Disease

Diseases/Conditions

- [Carotid Artery, Atherosclerotic – Asymptomatic](#)
- [Carotid Artery, Atherosclerotic – Symptomatic](#)
- Innominate, Common Carotid, Subclavian Disease
- [Vertebral Artery Disease – Atherosclerotic, FMD, Dissection](#)

Operations/Procedures

- [Carotid Artery Endarterectomy – Patch and Eversion](#)
- [Carotid Artery Stenting](#)
- Great Vessel – Endovascular
- Great Vessel – Open
- Vertebral Artery Procedures – Open and Endovascular

Category 2: Non-Atherosclerotic Cerebrovascular Disease

Diseases/Conditions

- [Carotid Artery Dissection](#)
- Takayasu's and Giant Cell Arteritis

- [Uncommon Carotid Conditions – FMD, Aneurysm, Carotid Body Tumor](#)

Category 3: Thoracic Aortic Disease

Diseases/Conditions

- [Aortic Dissection – Including Variants of Penetrating Ulcer and Intramural Hematoma](#)
- Atherosclerotic Thoracic Aortic Disease – Coral Reef/Shaggy Aorta
- [Thoracic Aortic Aneurysm](#)
- Thoracoabdominal Aneurysm

Operations/Procedures

- [Suprarenal Aortic Aneurysm Repair – Open](#)
- Thoracic Aortic Aneurysm – Open and Endovascular
- Thoracic Aortic Dissection Repair – Open and Endovascular
- Thoracoabdominal Aneurysm Repair – Open and Endovascular

Category 4: Aorto-Iliac Aneurysms

Diseases/Conditions

- Abdominal Aortic Aneurysm – Infrarenal and Juxtarenal
- [Aortic Aneurysm – Ruptured](#)
- Genetic Aortic Diseases
- [Mycotic Aneurysms](#)

Operations/Procedures

- [Abdominal Aortic Aneurysm \(Infrarenal and Juxtarenal\) Repair – Open](#)
- Endovascular Abdominal Aortic Aneurysm Repair (EVAR) – Elective
- Endovascular Abdominal Aortic Aneurysm Repair (EVAR) – Rupture

Category 5: Other Aneurysms

Diseases/Conditions

- Celiac, Hepatic and Mesenteric Artery Aneurysm
- [Femoral and Popliteal Artery Aneurysm](#)
- [Renal Artery Aneurysm](#)
- Splenic Artery Aneurysm

Operations/Procedures

- Femoral Artery Aneurysm Repair
- [Popliteal Artery Aneurysm Repair – Open and Endovascular](#)
- Renal Artery Aneurysm Repair – Open and Endovascular

Category 6: Visceral Artery and Venous Disease

Diseases/Conditions

- Celiac Compression Syndrome
- Mesenteric and Portal Vein Thrombosis
- [Mesenteric Ischemia, Acute – Embolus, Thrombosis, NOMI](#)
- [Mesenteric Ischemia, Chronic](#)
- Superior Mesenteric Artery Dissection

Operations/Procedures

- Mesenteric Bypass/Endarterectomy
- SMA Stenting
- SMA Thrombectomy

Category 7: Renovascular Diseases

Diseases/Conditions

- Atherosclerotic Renal Artery Disease
- Non-Atherosclerotic Renal Artery Disease
- [Pediatric Renovascular and Abdominal Aortic Developmental Disorders](#)
- Renal Vein Compression Syndrome
- Renovascular Hypertension

Operations/Procedures

- Renal Artery Bypass – Aortorenal, Splenorenal, Hepatorenal

Category 8: Atherosclerotic Lower Extremity Disease

Diseases/Conditions

- [Acute Lower Extremity Ischemia, Including Blue Toe Syndrome](#)
- [Chronic Limb-Threatening Ischemia– Rest Pain, Ulcer and Gangrene](#)
- [Claudication](#)

Operations/Procedures

- [Aortobifemoral Bypass](#)
- Axillobifemoral Bypass
- Common/Profunda Femoral Endarterectomy
- [Femoral BK Popliteal/Tibial Bypass with Prosthetic/Vein](#)
- [Femoral Popliteal Artery Embolectomy](#)
- Femoral Popliteal Tibial Artery PTA/Stenting
- [Iliac Artery Stenting](#)
- [Popliteal-tibial and Pedal Bypasses](#)
- Tibial PTA/Stenting
- Thrombolytic Therapy

Category 9: Non-Atherosclerotic Lower Extremity Disease

Diseases/Conditions

- Buerger's Disease
- Compartment Syndrome
- [Diabetic Foot Ulcers and Infections](#)
- Popliteal Entrapment and Adventitial Cystic Disease

Operations/Procedures

- Amputations – Foot (Toe, Ray, TMA, Chopart, Lisfranc, Symes)
- Amputations – Lower Extremity (AKA, Through the Knee, BKA)

Category 10: Thoracic Outlet Syndromes & Upper Extremity Disease

Diseases/Conditions

- Thoracic Outlet Syndrome – Neurogenic, Arterial, Venous
- Upper Extremity Occlusive Disease – Claudication, Rest Pain, Tissue Loss

Operations/Procedures

- [Carotid-Subclavian Artery Bypass](#)
- [First Rib Resection – Infraclavicular](#)
- [First Rib Resection – Transaxillary](#)

Category 11: Vascular Trauma

Diseases/Conditions

- [Posterior Knee Dislocation – Popliteal Injury](#)
- Vascular Injury – Neck
- Vascular Injury – Chest
- Vascular Injury – Abdomen
- Vascular Injury – Extremities

Operations/Procedures

- Abdominal Vascular Exposures
- [Thoracic Aortic Injury \(Blunt\) Repair – Endovascular](#)

Category 12: Hemodialysis Access

Diseases/Conditions

- Access Infection
- [Access-Related Ischemic Steal Syndrome](#)
- Failing or Thrombosed Access
- New Hemodialysis Access
- Non-Maturing Autogenous Arteriovenous Fistula
- Non-Thrombotic Access Complications

Operations/Procedures

- Failing/Thrombosed Access – AVF and AVG Management
- [Hemodialysis Access Catheter](#)
- Non-Thrombotic Access Complications
- Peritoneal Dialysis Catheter Placement

Category 13: Venous Insufficiency, Lymphatic Diseases & Malformations

Diseases/Conditions

- [Chronic Venous Insufficiency, Including Venous Leg Ulcer](#)
- Lymphedema/Lymphangitis – Primary and Secondary
- Pelvic Congestion Syndrome
- Superior Vena Cava Syndrome
- [Varicose Vein Disease](#)
- Venous Malformations

Operations/Procedures

- Sclerotherapy
- Varicose Vein Procedures

Category 14: Venous Thrombosis

Diseases/Conditions

- Acute Iliofemoral Deep Venous Thrombosis
- Lower Extremity Deep Venous Thrombosis
- Pulmonary Embolus
- Superficial Thrombophlebitis
- Vena Caval Obstruction/Tumors

Operations/Procedures

- DVT (Acute) Treatments
- Vena Caval Filter Insertion and Removal
- Venous Obstructive Disorders Treatments

Category 15: Complications

Diseases/Conditions

- Abdominal Compartment Syndrome after Aortic Operation
- [Aortic Graft Infections](#)
- [Aortocaval Fistula](#)
- Chylous Ascites/Chylothorax
- Colonic Ischemia after Aortoiliac Operation
- [Endovascular Complications: Contrast-Induced Nephropathy](#)
- [Endovascular Complications: Specific Complications of Endovascular Therapy](#)

- Percutaneous Arterial Access Complications
- Peripheral Arterial Graft Infections
- Post-revascularization Leg Ischemia
- Post-surgical Groin Complications
- Spinal Cord Ischemia after Aortic Procedure
- Stroke after Carotid Intervention

Operations/Procedures

- Anastomotic Aneurysm Repair
- Aortic Graft-Enteric Fistula/Erosion Removal –Extra-Anatomic vs In Situ Replacement
- [Neo-Aortoiliac System Procedure](#)
- Pseudoaneurysm Repair, Iatrogenic – Open vs. Injection

Category 16: Imaging/Vascular Laboratory

Vascular Laboratory (Registered Physician in Vascular Interpretation)

- Abdominal Vascular, Aortic Aneurysm and Post-EVAR Assessment
- Abdominal Vascular, Renal and Mesenteric
- Cerebrovascular, Carotid
- Cerebrovascular, Intracranial (TCD)
- Cerebrovascular, Intraoperative
- Peripheral Arterial, Duplex Evaluation of Occlusive Disease
- Peripheral Arterial, Physiologic Testing
- Venous, Evaluation of Upper and Lower Extremity DVT
- Venous, Evaluation of Venous Insufficiency

Other Imaging

- CT/CTA
- MRA

Fluoroscopy

- [Fluoroscopy, Radiation, and Radiation Safety](#)

CORE SURGICAL CURRICULUM (SCORE)

Category 17: Core Surgical Patient Care

Diseases/Conditions

Abdomen – General

- [Abdominal Pain – Acute and Chronic](#)

Abdomen – Hernia

- [Ventral Hernia](#)

Abdomen – Spleen

- [Postsplenectomy Sepsis](#)

Alimentary Tract – Stomach

- [Gastrointestinal Bleeding – Upper](#)

Alimentary Tract – Small Intestine

- [Paralytic Ileus](#)
- [Pneumatosis](#)
- [Small Intestinal Obstruction](#)

Alimentary Tract – Large Intestine

- [C. difficile Colitis](#)
- [Colitis – Ischemic](#)
- [Colonic Volvulus and Obstruction](#)
- [Gastrointestinal Bleeding – Lower](#)

Endocrine

- [Pheochromocytoma](#)

Skin and Soft Tissue

- [Cellulitis](#)
- [Decubitus Ulcer](#)
- [Necrotizing Soft Tissue Infections](#)
- [Soft Tissue Masses – Evaluation](#)
- [Surgical Site Infection](#)

Surgical Critical Care

- [Abdominal Compartment Syndrome](#)
- [Anaphylaxis](#)
- [Acute Respiratory Distress Syndrome \(ARDS\)](#)
- [Brain Death](#)
- [Cardiac Arrhythmias - Common](#)
- [Cardiac Failure](#)
- [Cardiogenic Shock](#)

- [Derangements of Electrolytes and Acid-Base Balance](#)
- [Endocrine Dysfunction](#)
- [Hepatic Failure and Hepatorenal Syndrome](#)
- [Hypovolemic Shock](#)
- [Neurogenic Shock](#)
- [Neurologic Dysfunction](#)
- [Postoperative Delirium](#)
- [Renal Failure](#)
- [Respiratory Failure](#)
- [Sepsis and Septic Shock](#)

Trauma

- [Cardiac Tamponade](#)
- [Frostbite and Hypothermia](#)
- [Geriatric Trauma](#)
- [Hemothorax and Pneumothorax](#)
- [Hepatic Injury](#)
- [Initial Assessment and Management of Trauma](#)
- [Renal Injury](#)
- [Retroperitoneal Hematoma](#)
- [Rib and Sternal Fractures](#)
- [Small Intestinal Injury](#)
- [Splenic Injury](#)
- [Ureteral Injury](#)
- [Brachial Plexus Injury](#)

Thoracic Surgery

- [Pleural Effusion/Empyema](#)
- [Pneumothorax and Pleurodesis](#)
- [Chylothorax](#)
- [Superior Vena cava Syndrome](#)

Plastic Surgery

- [Complex Wound Closure](#)
- [Skin Grafting](#)

Operations/Procedures

Abdomen – Spleen

- [Splenectomy](#)

Alimentary Tract – Small Intestine

- [Adhesiolysis](#)

Skin and Soft Tissue

- [Skin/Soft Tissue Lesions - Excisional and Incisional Biopsy](#)
- [Soft Tissue Infections - Incision, Drainage, Debridement](#)

Surgical Critical Care

- [Abdominal Exploration for Trauma](#)
- [Airway Management/Ventilator Management](#)
- [Arterial Catheter Placement](#)
- [Central Venous Catheter Placement](#)
- [Defibrillation and Cardioversion](#)
- [Endotracheal Intubation](#)
- [Invasive Hemodynamic Monitoring](#)
- [Pulmonary Artery Catheter Placement](#)
- [Ultrasound Use for Intravascular Access](#)

Trauma

- [Focused Assessment with Sonography for Trauma \(FAST\)](#)

Thoracic Surgery

- [Tube Thoracostomy and Thoracentesis](#)

Nervous System

- [Nerve Block - Digital](#)
- [Nerve Block\(s\) – Peripheral other than Digital](#)

Category 18: Core Medical Knowledge

Anesthesia

- [Anesthesia, General - Agents and Techniques](#)
- [Anesthesia, Regional and Local - Agents and Techniques](#)
- [Choice of Anesthesia](#)
- [Conscious Sedation - Agents and Techniques](#)
- [Intraoperative Monitoring and Common Intraoperative Problems](#)
- [Pain, Acute - Management](#)
- [Pain, Chronic - Management](#)

Biostatistics and Evaluation of Evidence

- [Clinical Trials](#)
- [Evaluating the Quality and Applicability of a Study](#)
- [How Data is Expressed and Summarized](#)
- [Levels of Evidence](#)
- [Outcomes](#)
- [Research Design](#)
- [Surveys and Qualitative Research](#)
- [Tests of Significance](#)

Fluids, Electrolytes, and Acid-Base Balance

- [Hypokalemia and Hyperkalemia](#)
- [Hyponatremia and Hypernatremia](#)

Geriatric Surgery and End-of-Life Care

- [Advance Directives, DNR Orders, and Power of Attorney](#)
- [Frailty](#)
- [Goal Setting with Elderly Patients and Families](#)
- [Palliative and Hospice Care](#)
- [Perioperative Management of Geriatric Patients](#)

Immunology

- [Components of the Immune System](#)
- [Immune Response to Injury and Infection](#)
- [Surgery and Surgical Conditions in Immunocompromised Hosts](#)

Infection and Antimicrobial Therapy

- [Antimicrobial Stewardship](#)
- [Diagnostic Approach to Infection](#)
- [Infections – Hospital-Acquired](#)
- [Infections – Opportunistic](#)
- [Intra-abdominal Abscess](#)
- [Intra-abdominal Infections](#)
- [Preoperative Assessment and Management of Coexisting Infection](#)

Nutrition and Metabolism

- [Effect of Surgery, Illness, and Injury on Nutritional Requirements](#)
- [Nutritional Requirements](#)

Preoperative Evaluation and Perioperative Care

- Hypertension (VSCORE)
- Diabetes Mellitus (VSCORE)
- Hyperlipidemia Assessment and Management (VSCORE)
- Tobacco Use/Smoking Cessation Management (VSCORE)
- [Evaluation of Surgical Risk](#)
- [Management of Perioperative Risk](#)
- Antithrombotic agents (VSCORE)
- [Prophylaxis of Venous Thromboembolism](#)
- [Postoperative Pain Management](#)
- [Common Postoperative Problems](#)

Transfusion and Disorders of Coagulation

- [Evaluation of Ongoing Bleeding and Laboratory Assessment of Coagulation](#)
- [Inherited and Acquired Disorders of Coagulation](#)
- [Normal Mechanisms of Hemostasis and Coagulation](#)
- [Transfusion - Indications, Risks, Type and Crossmatch, and Component Therapy](#)

Wound Healing

- [Wound Closure and Postoperative Care](#)
- [Wound Healing](#)

Category 19: Professionalism

Ethical Issues in Clinical Surgery: Competition of Interests

- [Accepting Gifts from Vendors](#)
- [Clinical Research - Case 1](#)
- [Clinical Research - Case 2](#)
- [Clinical Research - Case 3](#)
- [Confronting Problem Behavior](#)
- [Non-Patient Care Obligations](#)
- [Personal Investments](#)
- [Refusal to Care for Patients](#)
- [Reimbursement Incentives - Case 1](#)
- [Reimbursement Incentives - Case 2](#)
- [Reimbursement Incentives - Case 3](#)

Ethical Issues in Clinical Surgery: Truth Telling

- [Dealing with Complications and Poor Outcomes](#)
- [Informed Consent](#)
- [Listening and the Surgeon-Patient Relationship](#)
- [Respecting Cultural Diversity and Individual Sensitivities](#)
- [Truth Telling and the Surgeon–Patient Relationship](#)
- [Use of the Internet and E-mail for Communication - Case 1](#)
- [Use of the Internet and E-mail for Communication - Case 2](#)

Ethical Issues in Clinical Surgery: Confidentiality

- [Concern for the Safety of Identifiable Others](#)
- [Conversations about Patients in Public](#)
- [Duty to Report Patients to Public Authorities](#)
- [Relaying Genetic Test Results to Family Members](#)
- [Revealing Confidential Information](#)
- [Surgeons Infected with Blood-Borne Diseases](#)

Ethical Issues in Clinical Surgery: Professional Obligations

- [Obligations to Other Professionals](#)
- [Obligations to Patients: Commitment](#)
- [Obligations to Patients: Competence](#)
- [Obligations to Society: Allocation of Resources](#)
- [Obligations to Society: Teaching and Learning Surgery](#)

Ethical Issues in Clinical Surgery: End-of-Life Issues

- [Advance Directives and the Surgical Patient](#)
- [DNR Orders in the Operating Room](#)
- [Euthanasia and Physician-assisted Suicide](#)
- [Futility](#)
- [Maintaining Contact](#)
- [Palliative Care](#)
- [Talking About Death](#)
- [Withdrawing and Withholding Treatment](#)

Ethical Issues in Clinical Surgery: Substitute Decision Making

- [By What Criteria Should Substitute Decision Makers Decide?](#)
- [Substitute Decision Makers and DNR Orders](#)
- [Substitute Decisions for Children](#)
- [Unclear Competence and Decision-Making Capacity](#)
- [Who Decides When the Patient Cannot?](#)

Category 20: Interpersonal and Communication Skills

Non-Technical Skills for Surgeons (NOTSS)

- [Cognitive Skills \(Situation Awareness and Decision Making\)](#)
- [Social Skills \(Communication, Teamwork and Leadership\)](#)

Surgical Professionalism and Interpersonal Communication Education (SPICE)

- [Admitting Mistakes - Ethical Choices and Reasoning](#)
- [Advanced Communication Skills for Surgical Practice](#)
- [Cultural Diversity - Working Through the Barriers of Language and Differing Customs](#)
- [Delivering Bad News - Your Chance to Become a Master Surgeon](#)
- [Giving and Getting Feedback](#)
- [Managing Your Career - Making the Professional and Personal Choices that will Define You](#)
- [Medical Errors and Apology](#)
- [Safe Handoff of Patient Care Duties](#)
- [The Stress of Surgical Practice - The Signs of Stress, Depression, and Suicide in You and Your Surgical Colleagues](#)
- [Working with Professionals Around You – Team Communication and Respect](#)

Category 21: Practice Based Learning and Improvement

Quality Improvement

- [Inspiring a Healthy Culture for Patient Care](#)
- [Local Engagement in Quality Improvement](#)
- [Problem-Based Quality Improvement](#)
- [Understanding the Data and Methods to Evaluate Performance](#)

Category 22: Systems Based Practice

Systems-Based Practice

- [Advocating for Quality Patient Care](#)
- [Coordinating Patient Care](#)
- [Cost Awareness and Risk-Benefit Analysis](#)
- [Identifying Systems Errors – Root Cause Analysis](#)
- [Working Effectively in Various Healthcare Delivery Settings and Systems](#)
- [Working in Interprofessional Teams](#)