Core Surgical Rotation
(Surgery 720)

OREGON HEALTH & SCIENCE UNIVERSITY

MANUAL OF SURGICAL OBJECTIVES

Laszlo Kiraly, M.D.
Clerkship Director
Department of Surgery

Karen Brasel, M.D.
Program Director of Surg Ed
Department of Surgery

John G. Hunter, M.D.
Professor and Chairman
Department of Surgery

Sean Orenstein, M.D.
Assistant Clerkship Director
Department of Surgery

Karen Deveney, M.D.
Assist Program Dir of Surg Ed
Department of Surgery

Marci Jo Carlton
Medical Student Coordinator
Department of Surgery
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1.0 GASTROINTESTINAL HEMORRHAGE

Assumptions

The student has a background in anatomy and physiology and is familiar with manifestations and management of hypovolemia.

The student knows the pathology of lesions causing hemorrhage in the gastrointestinal system.

Objectives

1. Define hematemesis, hematochezia, melena, and guaiac/hemoccult positive stool; state their significance with regard to the level of the bleeding source.

2. Differentiate between acute and chronic gastrointestinal bleeding and between upper and lower GI bleeding.

3. Given a patient with gastrointestinal hemorrhage, outline according to priority, the steps of assessment and initial management, including the following:
   a. general systemic evaluation
   b. correction of hypovolemia
   c. verification of bleeding (nasogastric tube, rectal examination)
   d. management triage (prompt surgery vs. further studies)
   e. diagnostic methods sequence for upper gastrointestinal hemorrhage (endoscopy, angiography, barium studies)
   f. diagnostic methods sequence for lower gastrointestinal hemorrhage (proctosigmoidoscopy, angiography, barium studies, radionuclides)

4. In order of frequency, list the most common causes of upper and lower gastrointestinal bleeding in the adult (age 16 years and above).

5. Discuss the role of the surgeon in the management of patients with gastrointestinal hemorrhage; discuss the importance of the timing of the surgical consultation.

2.0 ESOPHAGUS

Assumption

The student knows the anatomy and physiology of the normal esophagus and esophago-gastric junction.

Objectives

1. Describe the pathophysiology predisposing to reflux esophagitis.

2. Describe the symptoms of reflux esophagitis and discuss the diagnostic procedures used for confirmation.

3. Discuss the indications for medical versus operative management of esophageal reflux; describe the most common anti-reflux operative procedure.

4. Define dysphagia and odynophagia.

5. Outline a plan for diagnostic evaluation of a patient with a suspected esophageal tumor (dysphagia).

6. Discuss the operative management and prognosis (including 5 year survival rates) of esophageal malignancies.

3.0 STOMACH AND DUODENUM

Assumption

The student knows the basic anatomy and physiology of the stomach, including the mechanisms and stimuli for
gastric and duodenal secretion.

Objectives

1. Compare and contrast the common symptoms, pathogenesis, acid secreting pattern, location, and natural history of gastric and duodenal ulcer disease.

2. Discuss the diagnostic value of upper gastrointestinal roentgenograms, endoscopy with biopsy, gastric analysis and serum gastrin levels in patients with suspected peptic ulcer disease.

3. Discuss the complications of peptic ulcer disease including clinical presentation, diagnostic workup and appropriate surgical treatment.

4. Describe common types of neoplasms that occur in the stomach and discuss appropriate diagnostic procedures, therapeutic modalities and prognosis for each.

4.0 SMALL INTESTINE AND APPENDIX

Assumptions

The student knows the anatomy and embryology of the small intestine and appendix.

The student is familiar with the physiology of the small intestine with reference to absorption of fluids and nutrients as well as exchange of electrolytes.

Objectives

4.1 Acute Appendicitis

1. Discuss the signs, symptoms, and differential diagnosis of acute appendicitis.

2. Outline the diagnostic workup of a patient with suspected appendicitis.

4.2 Obstruction of the Small Intestine

1. Describe common etiologies, signs and symptoms of small intestinal mechanical obstruction and contrast them with those of paralytic ileus.

2. Discuss the complications of small intestinal obstruction, including fluid and electrolyte shifts, vascular compromise of the small intestine, and sepsis.

3. Outline the appropriate laboratory test and x-rays to be employed in the diagnostic evaluation of a patient with a suspected small intestinal obstruction.

4. Outline a plan of treatment for a patient with small intestinal obstruction; discuss indications for operative therapy.

4.3 Crohn's Disease of the Small Intestine

1. Describe the most common clinical presentation of a patient with Crohn's disease.

2. List the complications of Crohn's disease which may require surgical therapy.

5.0 COLON AND RECTUM AND ABDOMINAL WALL

Assumptions

The student knows the normal anatomy and embryology of the colon, rectum and anus, including blood supply and lymphatic drainage.

The student understands the physiology of the colon. The student understands the composition of colonic bacterial flora.

The student has a knowledge of the anatomy of abdominal and chest wall musculature and fascial relationships.

5.1 Diverticular Disease
Objectives

1. For a patient with left lower quadrant pain, list the differential diagnosis, initial management, diagnostic studies and indications for medical versus surgical treatment.

2. Discuss the presentation, diagnosis, and appropriate surgical management of the complications of diverticular disease, including free perforation, abscess, obstruction, and colovesical or colovaginal fistula.

5.2 Carcinoma of the Colon and Rectum

Objectives

1. Identify the common symptoms and signs of carcinoma of the colon and rectum.

2. Discuss the appropriate laboratory, endoscopic and x-ray studies for the diagnosis of carcinoma of the colon and rectum.

3. Outline the treatment of carcinoma located at different levels of the colon and rectum. Include a discussion of the role of radiotherapy and chemotherapy in each.

5.3 Ulcerative Colitis and Granulomatous Colitis

Objectives

1. Differentiate ulcerative colitis and Crohn's disease of the colon in terms of history, pathology, x-ray findings, treatment and risk of cancer.

5.4 Colonic Obstruction, Volvulus, Intussusception, and Impaction

Objectives

1. List signs, symptoms, and diagnostic aids for evaluating presumed large bowel obstruction.

2. Discuss at least four causes of colonic obstruction in the adult patient including a discussion of the frequency of each cause.
3. Outline a plan for diagnostic studies, preoperative management, and treatment of volvulus; of intussusception; of impaction; of obstructing colon cancer.

5.5 Anorectal Diseases

Objectives
1. Discuss the anatomy of hemorrhoids including the four grades encountered clinically; differentiate internal and external hemorrhoids.
2. Describe the symptoms and signs of patients with external hemorrhoids; with internal hemorrhoids.
3. Outline the principles of management of patients with symptomatic external and internal hemorrhoids, including the roles of nonoperative and operative management.
4. Discuss the role of anal crypts in perianal abscess and describe the various types of perianal abscesses.
5. Outline the symptoms, physical findings, and principles of management of patients with perianal abscess.
6. Define fistula-in-ano and anal fissure and discuss clinical presentation, diagnosis, and treatment of each.

5.6 Hernias of the Groin

Objectives
1. Name at least three clinical conditions which may predispose to development of inguinal hernias.
2. Describe the anatomic and developmental differences between indirect, direct, and femoral hernias.
3. Discuss the relative frequency of indirect, direct, and femoral hernias by age and sex.
5. Describe the clinical presentation, distinctive features, and surgical treatment of femoral hernia.
6. Outline the principles of management of a patient with an incarcerated inguinal hernia.

5.7 Umbilical and Incisional Hernias

Objectives
1. Differentiate etiology, natural history, complications, and treatment of umbilical hernia in the infant and in the adult.
2. Describe four factors contributing to the development of incisional hernia.
3. Describe the surgical indications for repair of an incisional hernia and outline the risk factors for recurrence after repair.

6.0 PANCREAS

Assumption
The student is familiar with the anatomy of the pancreas and understands its relationship to the biliary tree.

The student understands the physiology of the pancreas including endocrine and exocrine function.

Objectives
1. List common etiologies of pancreatitis.
2. Describe the clinical presentation of a patient with acute pancreatitis, including a discussion of indications for surgical intervention.
3. Discuss early and late complications of acute pancreatitis.

4. Discuss the criteria used to predict the prognosis for acute pancreatitis.

5. Describe the diagnostic approach and therapy of a patient with a suspected pancreatic pseudocyst.

6. Describe the symptoms, physical signs, laboratory findings, and diagnostic workup of a pancreatic mass on the basis of the location of the tumor in the pancreas.

7. Describe the surgical treatment for a pancreatic neoplasm as well as the long-term prognosis for patients with each type of pancreatic tumor (i.e. tumors of the exocrine/endocrine pancreas).

**7.0 BILIARY TRACT**

**Assumptions**

The student knows the physiochemical characteristics of normal bile, its production and the physiologic mechanism of bile salt reabsorption.

The student knows the normal anatomy of the biliary tree and its common variations.

**Objectives**

1. Contrast the signs, symptoms, laboratory findings, and treatment plan of biliary pain (chronic cholecystitis), of acute cholecystitis, and cholangitis.

2. List the appropriate diagnostic tests used for acute cholecystitis, biliary colic, obstructive jaundice, and cholangitis, as well as the limitations and potential complications of each.

3. Contrast the liver enzyme abnormalities in obstructive jaundice and viral hepatitis, and list a differential diagnosis for obstructive jaundice.

4. Describe the symptoms and signs of choledocholithiasis; describe the management of this problem.

5. Define the following:
   A. Murphy's sign
   B. Courvoisier's sign
   C. Charcot's triad
   D. Reynold's pentad

8. Contrast carcinomas of the gallbladder, bile duct and ampulla of Vater with regard to presenting symptoms, management, and survival.

**8.0 BREAST**

**Assumptions**

The student understands the topographic and structural anatomy of the breast.

The student understands the hormonal changes which affect the breast during the menstrual cycle.

**Objectives**

1. Identify and describe the major causes of breast lumps.

2. List major risk factors for benign breast disease and breast cancers.

3. List diagnostic modalities and their sequence in the workup of a patient with a breast mass; with nipple discharge.

4. Describe the treatment for a fibroadenoma and fibrocystic change.

5. List and discuss the types of breast cancer and the clinical staging of breast cancer.
6. List and discuss the treatment options for local, regional and systemic breast cancer.

7. Describe the rationale for adjuvant chemotherapy, radiation, and hormonal therapy in the treatment of breast cancer.

8. List the current results (survival and recurrence rates) of treated breast cancer, according to clinical stage.


9.0 LIVER

Assumptions

The student has a working knowledge of the anatomy of the liver. The student understands the anatomy of portal circulation. The student also understands the signs and symptoms of liver failure.

The student also has a knowledge of the functions of the liver and understands the signs and symptoms of liver failure.

Objectives

1. Define portal hypertension and discuss its etiology.

2. Define the Child-Pugh classification of cirrhosis.

3. Describe clinical manifestations and/or complications of portal hypertension, as well as diagnostic modalities used to confirm them.

4. Outline the treatment methods available for variceal hemorrhage, both acutely and for the stable patient; include a discussion of the portosystemic shunts, sclerotherapy, TIPS, banding their advantages and disadvantages.

10.0 MELANOMA

Assumption

The student knows the anatomy of the skin and subcutaneous tissues, including the adnexal structures of the skin.

The student understands the anatomy and function of the immune system, including lymphatics, lymph nodes, spleen, liver, and reticuloendothelial system.

Objectives

1. List predisposing factors for melanoma.

2. Describe the major prognostic variables of melanoma; include a discussion of Clark's level and Breslow depth.

3. Identify the major areas of surgical controversy concerning the treatment of melanoma.

11.0 SPLEEN

Assumptions

The student understands the anatomy of the spleen. The student understands the hematologic functions of the spleen.

Objectives

1. Discuss the diagnosis and management of a patient with a ruptured spleen, including resuscitation and surgical approach.
2. Discuss the potential adverse consequences associated with splenectomy and discuss methods of reducing these risks.

3. Discuss the hematologic indications for splenectomy and their results.

12.0 FLUIDS, ELECTROLYTES AND ACID/BASE BALANCE

12.1 Fluids/Electrolytes

Assumptions

The student understands the distribution of fluids and electrolytes in the body compartments.

The student understands the role of the kidneys in regulating fluid and electrolyte balance.

The student understands the basic physiology and biochemistry of the process of respiration.

Objectives

1. Complete the following table of normal values:

<table>
<thead>
<tr>
<th></th>
<th>Na</th>
<th>K</th>
<th>HC03</th>
<th>Cl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gastric aspirate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bile</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ileostomy aspirate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perspiration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. List at least four endogenous factors that effect renal control of sodium and water excretion.

3. List at least six physical findings or symptoms of dehydration.

4. Describe the 24 hr. sensible and insensible fluid and electrolyte losses in the routine post-op patient.

5. List the composition of electrolytes in the following solutions:

<table>
<thead>
<tr>
<th></th>
<th>Gluc</th>
<th>Na</th>
<th>K</th>
<th>Cl</th>
<th>HC3</th>
<th>Ca</th>
<th>Mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Saline (.9%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ringers lactate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5% dextrose in Ringers lactate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Describe typical findings with regard to acid/base balance and fluid and electrolytes for the following clinical conditions:
   a. NG drainage without replacement
   b. Pancreatic fistula
   c. Severe diarrhea
   d. chronic renal failure with no urine output
   e. complete intestinal obstruction of several days duration with feculent vomiting

Objectives

1. List the factors that effect oxygen delivery and consumption.
2. List the differential diagnosis and describe the treatment of metabolic acidosis, metabolic alkalosis, acute hypoxia, and acute respiratory acidosis.

13.0 **ENTERAL AND PARENTERAL NUTRITION**

**Assumptions**

The student is familiar with the basic concepts of fat, protein and carbohydrate metabolism. The student is familiar with the types of vitamins and their role in human metabolism.

**Objectives**

1. List at least four parameters obtained from a patient's medical history that might indicate the presence of malnutrition.
2. Contrast the metabolic changes that occur in starvation with those that occur in patients who have sepsis or injury.
3. List indications for nutritional support and routes for supporting nutrition in the malnourished patient; contrast the risks to benefits of enteral vs parenteral nutritional support.
4. List possible complications of a TPN catheter and the metabolic complications of total parenteral nutrition. Describe appropriate treatments for each.
5. Calculate the total daily caloric and protein needs of patients requiring total parenteral nutrition.

14.0 **SHOCK**

**Assumptions**

The student knows cardiovascular physiology and understands the factors regulating blood pressure. The student understands the principles of autoregulation and blood flow within critical organs. The student understands normal sympathetic and parasympathetic nervous system anatomy and physiology.

**Objectives**

1. Define shock. List the most commonly encountered types of shock and their causes.
2. List hemodynamic features (i.e. systemic vascular resistance, cardiac output, oxygen delivery and consumption), diagnostic tests, and physical findings which differentiate each type of shock.
3. For each category of shock, outline the general principles of fluid, pharmacologic and surgical intervention.

15.0 **TRAUMA**

The educational objectives included in this material have been adapted from the Advanced Trauma Life Support Course of the American College of Surgeons and have been used with the permission of the Committee on Trauma of the ACS.

**Objectives**

1. Identify the correct sequence of priorities of emergency medical care to be followed in assessing the multiply-injured patient.
2. Outline supportive diagnostic and therapeutic actions for abdominal trauma.
3. Identify the principles of management of the patient with spine or spinal cord injury, including
appropriate immobilization techniques.

16.0 HEAD TRAUMA

Assumptions
The student has a working knowledge of the anatomy of the brain and its coverings.

Objectives
1. Discuss the epidemiology of head trauma.
2. Know the Glasgow Coma Scale and discuss its value in predicting neurologic recovery.
3. Describe the pathology of the most common kinds of head injuries and discuss their mechanisms and presentations.
4. Describe the primary, emergency management of severe head injury.
5. Describe the principles of the tertiary, neurosurgical management of severe head injury.

17.0 BURNS

Assumption
The student knows the basic anatomy and physiology of the skin and subcutaneous tissue.

Objectives
1. Differentiate first, second, third and fourth degree burns.
2. Know the rule of nines.
3. List the causes, signs and symptoms of inhalation injury.
4. Outline the fluid resuscitation of burn patients, including composition, volume and timing of fluid.
5. List the other management steps in the initial 24 hours following a burn injury, including general support, wound management and antibiotics.

18.0 SURGICAL INFECTIONS/ANTIBIOTICS

Assumptions
The student understands the basic categories of bacteria and their pathologic potential in humans.
The student understands the general classes of antibiotics, indications for use and common complications of each.

Objectives
1. Define "clean," "clean-contaminated," "contaminated," and "dirty" operative cases and the risk of infection in each.
2. List the risk factors which contribute to infection following a surgical procedure.
3. Describe the diagnostic features and treatment for common wound infections.
4. List the causes of early and late postoperative fever, and discuss the diagnostic steps for evaluation.
5. Describe the diagnostic evaluation for a suspected intra-abdominal abscess.
6. Define nosocomial infection and describe the most common causes of this in the surgical intensive care unit.
CARDIOTHORACIC SURGERY

1.0 CORONARY ARTERY DISEASE

Assumptions

The student knows the risk factors that provoke atherosclerosis and coronary artery disease.

The student knows about coronary artery anatomy and about coronary cineangiography.

The student knows brief definitions of chronic stable angina, unstable angina, postinfarction angina and complications of myocardial infarction.

1.1 The Pathology of Coronary Artery Disease

Objectives

1. Describe typical distribution of atheromatous lesions in the coronary vasculature and discuss the specific significance of left main coronary artery disease.

1.2 Coronary Artery Revascularization

1. Describe the indications for coronary artery surgery in stable angina.

2. Describe therapeutic plan for treatment of acute coronary syndrome.

3. Describe the role of percutaneous transluminal coronary angioplasty.


5. Describe late outcomes as they relate to symptoms and survival after surgery.

6. Describe the anatomy and location of the four heart valves and the diseases commonly affecting these valves.

2.0 THORACIC TUMORS

Assumption

The student knows the normal anatomy and physiology of the lung, lymphatic drainage within the mediastinum.

Objective

1. Know possible etiologies of lung cancer and the clinical presentations of this disease.

2. Describe briefly diagnostic operative and nonoperative procedures for lung cancer including bronchoscopy, thoracoscopy, mediastinoscopy and mediastinotomy.

3. Describe staging of lung cancer and determination of operability.


3.0 VALVULAR HEART DISEASE

1. Describe classic clinical features of valvular heart disease in the adult.

2. Etiology of valvular heart disease.


4. Indication for valvular heart surgery and post operative care following valvular surgery including the selection of valves.
4.0 THORACIC AORTIC DISEASE

1. Describe the diseases affecting thoracic aorta and treatment. Describe types of thoracic aortic dissection.


5.0 HEART FAILURE

Objective
Pathophysiology of heart failure.

1. Describe classic symptoms and signs of heart failure.


HEART TRANSPLANTATION, VARIOUS INDICATIONS AND COMPLICATIONS

MEDIASTINAL TUMORS

Objective
Describe the anatomy and pathology of superior, anterior, and posterior mediastinum.

1. Describe diseases and tumors involving thymus and mediastinal lymph nodes.

2. Describe various tumors in the mediastinum and their treatment.

3. Indication for surgery and multi-modality therapy in thoracic cancer, both mediastinal and lung cancer.

ORTHOPEDIC SURGERY
SEE ORTHOPEDIC SYLLABUS

PEDIATRIC SURGERY

1.0 NEONATAL SURGICAL EMERGENCIES

Objectives

1. Describe the presentation and diagnosis of neonatal surgical emergencies

   a. Esophageal atresia
   b. Diaphragmatic hernia
   c. Omphalocele/gastrochisis
d. Imperforate anus  
e. Intestinal obstruction in the newborn

2. Describe the diagnosis of Hirschsprung’s Disease

2.0 CERVICAL LYMPHADENOPATHY

Objectives

1. Describe the diagnosis and treatment of cervical lymphadenopathy

3.0 ABDOMINAL PAIN IN INFANCY AND CHILDREN

Objectives

1. Discuss the differential diagnosis of abdominal pain in infancy and children with special reference to appendicitis, intussusception, and Meckel’s diverticulum.

4.0 PYLORIC STENOSIS

Objectives

1. Discuss the diagnosis and management of pyloric stenosis.

5.0 HERNIAS, HYDROCELES AND UNDESCENDED TESTES

Objectives

1. Discuss the diagnosis and treatment of hernias, hydroceles and undescended testes.

6.0 CIRCUMCISION

Objectives

1. Discuss the indications, performance of, and complications of circumcision.

PLASTIC SURGERY

1.0 WOUNDS AND WOUND HEALING

Assumption

The student has a working knowledge of surgical treatment of problem wounds.

Objectives

1. Describe the changes that result from radiation therapy and some of the ways that a surgeon can get radiation damaged wounds to heal.

2. Define musculocutaneous flap; Afree@ (microsurgical) tissue transfer.

3. Describe clinical factors that may retard wound healing.

4. When is a skin graft indicated for an open wound? A skin Aflap@?

UROLOGY

1.0 UROLITHIASIS

Objectives
1. Describe the progression of signs and symptoms of an acute kidney stone passage through the ureter and into the bladder, and identify the three anatomic sites where renal and ureteral calculi are likely to lodge.

2. Know the various types of renal calculi and their relative radiodensities.

3. Understand the demographics of urolithiasis, and know the initial evaluation and treatment of a patient presenting acutely with a renal or ureteral calculus.

2.0 VOIDING DISORDERS

Objectives

1. Understand the meaning and usage of common terms denoting urinary tract symptoms and signs.

2. Use the basic anatomic and physiologic properties of the lower urinary tract to explain the effects of common urologic medications.

3. Describe the detrusor and bladder outlet factors contributing to common lower urinary tract disorders, including bladder outlet obstruction, female stress urinary incontinence, and basic types of neurogenic bladder dysfunction.

3.0 URINARY TRACT INFECTIONS

Objectives

1. Understand the clinical signs, symptoms, and laboratory findings which define the various types of urinary tract infections.

2. Recognize which patients with urinary tract infections require urologic evaluation and understand which diagnostic studies are commonly used for this purpose.

3. Describe the normal host defense mechanisms against urinary tract infections, and how these defenses can be compromised.

4.0 MALE GENITAL DISORDERS

Objectives

1. Understand the presenting complaints, differential diagnosis, and treatment options for male genital infections, male genital masses, and erectile dysfunction.

2. Outline the office evaluation of male urethral discharge, intrascrotal mass, and erectile dysfunction.

3. Understand the common causes, initial evaluation, and the treatment options available for male infertility.

5.0 FUNDAMENTALS OF UROLOGIC TUMOR EVALUATION

Objectives

1. Recognize the physical presentations of common urologic tumors.

2. Develop a knowledge base of the basic principles of urologic tumor management.

3. Understand the common procedures, including the technical aspects, used in the outpatient diagnosis and care of patients with urologic tumors.

VASCULAR SURGERY
The student knows the anatomy of the peripheral, arterial and venous circulation.
The student knows the physiology of the clotting mechanism.
The student knows the physiology of neural and pharmacologic control of blood vessels.

1.0 Atherosclerosis

Objectives
1. List five risk factors for atherosclerosis.
2. List at least two clinical sequelae of atherosclerosis.

2.0 Aneurysms

1. Describe the common sites and relative incidence of arterial aneurysms.
2. List the symptoms, signs, differential diagnosis, and management plans for a patient with a rupturing abdominal aortic aneurysm.

3.0 Peripheral Arterial Occlusive Disease

1. Describe the pathophysiology of intermittent claudication: differentiate this symptom from leg pain due to other causes.
2. Describe the diagnostic approach and medical management of lower extremity arterial disease, including the roles of commonly used noninvasive procedures.

4.0 Cerebrovascular Insufficiency

Objectives
1. Define and differentiate the following:
   A. Amaurosis fugax
   B. Transient ischemic attacks (TIA)
   C. Cerebrovascular accident (CVA or stroke)
2. Outline diagnostic methods and medical and surgical management of symptomatic carotid artery disease.
3. Differentiate hemispheric and vertebrobasilar symptoms.

5.0 Pulmonary Embolus, Deep Vein Thrombosis and Venous Disease

Objectives
1. List clinical risk factors which lead to an increased incidence of venous thrombosis.
2. Identify noninvasive and invasive testing procedures for diagnosing venous valvular incompetency and deep vein thrombosis.
3. Outline the differential diagnosis of acute leg edema associated with pain.
4. Describe methods for preventing the development of venous thrombosis in surgical patients.
5. Describe the methods of anticoagulant and thrombolytic administration, evaluation of adequacy of therapy and contraindication to therapy.
6. Describe the clinical syndrome of pulmonary embolus and identify the order of priorities in diagnosis and caring for an acutely ill patient with life-threatening pulmonary embolus.