BODY CT: Goals and Objectives

ROTATION 1 (Radiology Year 1)

ROTATION OBJECTIVE -- LEARN BASIC BODY CT, LEARN BASIC EMERGENCY CT.

MEDICAL KNOWLEDGE

At the end of the rotation, the resident should be able to:

• Identify detailed cross sectional anatomy
• Develop differential diagnosis for radiologic findings seen on CT
• Able to identify sites for Web-based learning.
• Obtain relevant history from patient to allow for safe administration of contrast media
• Understand management of contrast reactions
• Describe fundamentals of CT scan production
• Produce coherent dictations
• Begin to understand importance of protocols
• Understand important findings needed to evaluate emergency CT on call

A list of the more emergent diagnosis which will be initially taught to the resident include:

• Aortic disruption or dissection
• Pneumothorax, including tension
• Esophageal rupture
• Pulmonary embolism
• Diaphragmatic rupture
• Pulmonary atelectasis
• Pulmonary traumatic injury
• Pericardial effusion
• Pneumoperitoneum/ruptured organ
• Active arterial hemorrhage
• Aortic aneurysm with or without hemorrhage/leakage
• Bowel obstruction
• Traumatic image to organ
• Bowel ischemia
• Acute appendicitis
• Hypotension with circulatory collapse or allergic reaction
• Internal abdominal hernia or volvulus
• Pancreatitis
PRACTICE-BASED LEARNING AND IMPROVEMENT

- Demonstrate responsible work ethic
- This would include being present at the CT station at 9 A.M. and throughout the work day
- Completion of dictation of all reviewed studies in a timely manner
- Attendance at all departmental teaching conferences, and grand rounds presentations.
- Facilitate the learning of medical students, peers, other professionals participating in the CT service including technologist and nurses
- Build confidence in reading routine and STAT CT studies.

SYSTEMS BASED PRACTICE

- Review the request and all applicable clinical history and previous laboratory test and previous imaging studies to be certain that the proper test has been ordered and that the patient’s condition is such that the examination is safe and that any necessary reparation for the test has been completed before starting the examination
- If the indication for the examination is unclear contact the referring physician or another of the patient’s appropriate and knowledgeable health care providers

PATIENT CARE

- Review the request and all applicable clinical history and previous laboratory tests and previous imaging studies to be certain that the proper test has been ordered and that the patient’s condition is such that the examination is safe and that any necessary reparation for the test has been completed before starting the examination
- Perform all examinations in the appropriate way. Learn the appropriate administration of oral rectal and IV contrast
- If you have a question, ask before performing the examination
- Accurately dictate all studies in a timely fashion

INTERPERSONAL AND COMMUNICATION SKILLS

- Accurately dictate all studies
- Communicate effectively and courteously with referring clinicians:
  - Including obtaining relevant history for study interpretation
  - Regarding important findings on studies performed
  - Work as an efficient team member i.e. with medical students, peers, other professionals participating in the CT service including technologists and nurses.

PROFESSIONALISM

- Demonstrate responsible work ethic
- This would include being present at the CT station at 9 AM and throughout the work day,
- Completion of dictation of all reviewed studies in a timely manner
- Attendance at all departmental teaching conferences, and grand rounds presentations
- Facilitate the learning of medical students, peers, other professionals participating in the CT service including technologists and nurses
ASSESSMENT TOOLS UTILIZED:

- Global ratings by faculty including rotation evaluation sheet
- Conference attendance logs
- In-service examination

ROTATION 2 (Radiology Year 2):

ROTATION OBJECTIVE - CONTINUE REFINING OBJECTIVES OF ROTATION 1. LEARN BASIC ONCOLOGY CT

MEDICAL KNOWLEDGE

- The resident will know Axial CT Anatomy of the thoracic inlet to the groin
- The resident will know diagnostic criteria used for neoplasm of lung, liver, pancreas, nodal system, as well as traumatic injuries to liver, spleen, pancreas and kidneys when evaluating with CT
- The resident will be able to diagnose ascites, pleural effusion and cul de sac fluid as well mesenteric involvement with a tumor.

A general outline of types of conditions and pathologic entities that will be review (often in conferences/lectures organized by organ system) are:

- Normal anatomy and normal variants (including embryologic basis)
- Congenital Diseases
- Traumatic injuries
- Neoplasms and other masses
- Infection
- Immunologic and autoimmune conditions
- Metabolic diseases
- Cardiovascular conditions
- Toxin, burn, irradiation and other environmental injuries or diseases
- Latrogenic injuries and post surgical change

PRACTICE- BASED LEARNING AND IMPROVEMENT:

- Demonstrate responsible work ethic
  - This would include being present at the CT station at 9 AM and throughout the work day
  - Completion of dictation of all reviewed studies in a timely manner
  - Attendance at all departmental teaching conferences, and grand rounds presentations.
- Facilitate the learning of medical students, peers, other professionals participating in the CT service including technologists and nurses.
- Build confidence in reading routine and STAT CT studies
SYSTEMS BASED PRACTICE

• Review the request and all applicable clinical history and previous laboratory tests and previous imaging studies to be certain that the proper tests has been ordered and that the patient’s condition is such that the examination is safe and that any necessary preparation for the test has been completed before starting the examination.
• If the indication for the examination is unclear contact the referring physician or another of the patient’s appropriate and knowledgeable health care providers.

PATIENT CARE

• Review the request and all applicable clinical history and previous laboratory tests and previous imaging studies to be certain that the proper test has been ordered and that the patient’s condition is such that the examination is safe and that any necessary preparation for the test has been completed before starting the examination.
• Perform all examinations in the appropriate way. If you have a question, ask before performing the examination.
• Accurately dictate all studies in a timely fashion.

INTERPERSONAL AND COMMUNICATION SKILLS

• Accurately dictate all studies in a timely fashion.
• Communicate effectively and courteously with referring clinicians.
  o Including obtaining relevant history for study Interpretation.
  o Regarding important findings on studies performed.
• Facilitate the learning of medical students, peers, other professionals participating in the CT service including technologists and nurses.

PROFESSIONALISM

• Demonstrate responsible work ethic.
  o This would include being present at the CT station at 9 A.M and throughout the work day.
  o Completion of dictation of all reviewed studies in a timely manner.
  o Attendance at all departmental teaching conferences, and grand rounds presentations.
• Facilitate the learning of medical students, peers, other professionals participating in the CT service including technologists and nurses.

ASSESSMENT TOOLS UTILIZED

• Global ratings by faculty including rotation evaluation sheet.
• Conference attendance logs.
• In-service examination.
ROTATION 3: (Radiology Year 3)

ROTATION OBJECTIVE

• CONTINUED REFINING OBJECTIVES OF ROTATIONS I AND II
• LEARN BASIC PEDIATRIC CT.

MEDICAL KNOWLEDGE

• The resident will know detailed axial CT anatomy of the normal chest abdomen and pelvis as well as normal variants
• The resident will concentrate on increasing their knowledge base and differentials
• The resident should practice the “written board type” questions and practice taking cases in an ‘oralboard style’

PRACTICE-BASED LEARNING AND IMPROVEMENT

• Demonstrate responsible work ethic.
  o This would include being present at the CT station at 8 AM and throughout the work day
  o Completion of dictation of all reviewed studies in a timely manner
  o Attendance at all departmental teaching conferences and grand rounds presentations
• Facilitate the learning of medical students, peers, other professional participating in the CT service including technologist and nurses.
• Build confidence in reading routine and STAT CT studies

SYSTEMS BASED PRACTICE

• Review the request and all applicable clinical history and previous laboratory tests and previous imaging studies to be certain that the proper test has been ordered and that the patient’s condition is such that the examination is safe and that any necessary preparation for the test has been completed before starting the examination
• If the indication for the examination is unclear contact the referring physician or another of the patient’s appropriate and knowledgeable health care providers

PATIENT CARE

• Review the request and all applicable clinical history and previous laboratory test and previous imaging studies to be certain that the proper test has been ordered and that the patient’s condition is such that the examination is safe and that any necessary preparation for the test has been completed before starting the examination
• Perform all examinations in the appropriate way. If you have a question, ask before performing the examination.
• Accurately dictate all studies in a timely fashion
INTERPERSONAL AND COMMUNICATION SKILLS

• Accurately dictate all studies in a timely fashion
• Communicate effectively and courteously with referring clinicians:
  o Including obtaining relevant history for study interpretation
  o Regarding important findings on studies performed
• Facilitate the learning of medical students, peers, other professionals participating in the CT service including technologists and nurses

PROFESSIONALISM

• Demonstrate responsible work ethic
  o This would include being present at the CT station at 9 AM and throughout the work day
  o Completion of dictation of all reviewed studies in a timely manner
  o Attendance at all departmental teaching conferences and grand rounds presentations
• Facilitate the learning of medical students, peers, other professionals participating in the CT service including technologists and nurses.

ASSESSMENT TOOLS UTILIZED:

• Global ratings by faculty including rotation evaluation sheet
• Conference attendance logs
• In-service examination

ROTATION 4:

ROTATION OBJECTIVE

• LEARN ADVANCED EMERGENCY CT.
• CONTINUE REFINING OBJECTIVES OF ROTATIONS 1, 2 AND 3.

MEDICAL KNOWLEDGE

• Learn advanced analysis for trauma and malignancy diagnosis by CT with definitive correlation with MR, US, plain film and nuclear medicine review of such cases
• The resident will concentrate on increasing their knowledge base and differentials
• The resident should practice the ‘written board type’ questions and practice taking cases in an oral board style'
PRACTICE BASED LEARNING AND IMPROVEMENT

• Demonstrate responsible work ethic
  o This would include being present at the CT station at 9 AM and throughout the work day
  o Completion of dictation of all reviewed studies in a timely manner
  o Attendance at all departmental teaching conferences, and grand rounds presentations
• Facilitate the learning of medical students, peers, other professionals participating in the CT service including technologists and nurses
• Build confidence in reading routine and STAT CT studies

SYSTEMS BASED PRACTICE

• Review the request and all applicable clinical history and previous laboratory tests and previous imaging studies to be certain that the proper test has been ordered and that the patients condition is such that the examination is safe and that any necessary reparation for the test has been completed before starting the examination.
• If the indication for the examination is unclear contact the referring physician or another of the patient's appropriate and knowledgeable health care providers

PATIENT CARE

• Review the request and all applicable clinical history and previous laboratory tests and previous imaging studies to be certain that the proper test has been ordered and that the patients condition is such that the examination is safe and that any necessary reparation for the test has been completed before starting the examination.
• Perform all examinations in the appropriate way. If you have a question, ask before performing the examination.
• Accurately dictate all studies in a timely fashion

INTERPERSONAL AND COMMUNICATION SKILLS

• Accurately dictate all studies in a timely fashion
• Communicate effectively and courteously with referring clinicians
  o Including obtaining relevant history for study interpretation
  o Regarding important findings on studies performed
• Facilitate the learning of medical students, peers, other professionals participating in the CT service including technologists and nurses.

PROFESSIONALISM

• Demonstrate responsible work ethic.
  o This would include being present at the CT station at 9 AM and through the work day
  o Completion of dictation of all reviewed studies in a timely manner,
  o Attendance at all departmental teaching conferences, and grand rounds presentations.
• Facilitate the learning of medical students, peers, other professionals participating in the CT service including technologists and nurses.
ASSESSMENT TOOLS UTILIZED:

- Global ratings by faculty including rotation evaluation sheet
- Conference attendance logs
- In-service examination

ROTATION 5 (Radiology Year 5):

ROTATION OBJECTIVES

- Continued refining objectives of rotations 1, 2, 3, and 4
- Learn beginnings of 3D CT Protocols

MEDICAL KNOWLEDGE

- Learn advance analysis trauma and malignancy diagnosis by CT with definitive correlation with MR, US, plain film and nuclear medicine review of such cases.
- Learn beginnings of 3D CT protocols
- The resident will concentrate on increasing their knowledge base and differentials
- The resident should practice the “written board type” questions and practice taking cases in an ‘oral board style’

PRACTICE BASED LEARNING AND IMPROVEMENT

- Demonstrate responsible work ethic
  - This would include being present at the CT station at 9 AM and throughout the work day
  - Completion of dictation of all reviewed studies in a timely manner
  - Attendance at all departmental teaching conferences, and grand rounds presentations
- Facilitate the learning of medical students, peers, other professionals participating in the CT service including technologists and nurses.
- Build confidence in reading routine and STAT CT studies,

SYSTEMS BASED PRACTICE

- Review the request and all applicable clinical history and previous laboratory tests and previous imaging studies to be certain that the proper test has been ordered and that the patient’s condition is such that the examination is safe and that any necessary reparation for the test has been completed before starting the examination
- If the indication for the examination is unclear contact the referring physician or another of the patient’s appropriate and knowledgeable health care providers.
PATIENT CARE

- Review the request and all applicable clinical history and previous laboratory tests and previous imaging studies to be certain that the proper test has been ordered and that the patients condition is such that the examination is safe and that any necessary reparation for the test has been completed before starting the examination
- Perform all examinations in the appropriate way. If you have a question, ask before performing the examination
- Accurately dictate all studies in a timely fashion

INTERPERSONAL AND COMMUNICATION SKILLS

- Accurately dictate all studies in a timely fashion
- Communicate effectively and courteously with referring clinicians:
  - Including obtaining relevant history for study interpretation
  - Regarding important findings on studies performed
- Facilitate the learning of medical students, peers, other professionals participating in the CT service including technologists and nurses.

PROFESSIONALISM

- Demonstrate responsible work ethic.
  - This would include being present at the CT station at 9 A.M and throughout the work day
  - Completion of dictation of all reviewed studies in a timely manner
  - Attendance at all departmental teaching conferences and grand rounds presentations
- Facilitate the learning of medical students, peer, other professionals participating in the CT service including technologists and nurses

ASSESSMENT TOOLS UTILIZED

- Global ratings by faculty including rotation evaluation sheet
- Conference attendance logs
- In-service examination

RECOMMENDED READING:

Fundamentals of Diagnostic Radiology - by Brant and Helms
Fundamentals of Body CT - by Webb, Brandt, Helms
Computed Body Tomography - Lee, Sagel, Stanley
CT & MRI of the Thorax - Nodich, Zerhouni
Thoracic Imaging: Pulmonary and Cardiovascular, Webb, Higgins

In addition to above, reading review articles from peer-reviewed literature is strongly encouraged. Pictorial essays and review articles from Radiographics are particularly recommended for their clarity and thoroughness.
CORE LECTURE/PRESENTATION TOPICS (Body, CT/GI/GU FLUROSCOPY)

GASTROINTESTINAL SYSTEM:

BASIC OR GENERAL

- Abdominal Plain Radiographs: Overview
- Perforation and Obstruction of the GI Tract: Assessment by Conventional Radiology
- Principles and Pitfalls of Double Contrast Interpretation
- The Postoperative GI Tract
- Treatment of Strictures and Leaks in the GI Tract

PHARYNX AND HYPOPHARYNX

- Normal Anatomy; Structural and Functional Abnormalities; Inflammatory and Neoplastic Diseases

ESOPHAGUS

- Anatomy and Physiology
- Structural Abnormalities (varices, webs, diverticula, perforation, imprints of anomalous vessels, etc.)
- Functional Disorders (achalasia, Chaga’s, scleroderma, spasm, etc.)
- Esophagitis (reflex, Barrett’s, infectious, chemical, etc.)
- Neoplastic Diseases (benign & malignant, intrinsic & extrinsic)
- Diagnosis & Treatment of Esophageal Foreign Bodies and Food Impactions

STOMACH AND DUODENUM

- Developmental, Functional, and Structural Disorders (diverticula, webs, pyloric hypertrophy, varices, volvulus, SMA syndrome, etc.)
- Ulcers: Benign and Malignant
- Other Inflammatory Diseases
- Tumors and Tumor-Like Conditions (polyps, malignancies, extrinsic masses)

SMALL BOWEL

- Diagnosis Using Radiographic Pattern Analysis
- Developmental, Functional, and Structural Disorders
- Inflammatory Diseases
- Neoplastic Diseases (benign, malignant, extrinsic masses)
LARGE INTESTINE

- Developmental, Functional, and Structural Disorders: Rotational anomalies, Volvulus, Intussusception, Duplication, Hirschprung’s, Pseudo-obstruction, etc.
- Inflammatory Diseases of the Colon
- Colon Polyps, Polyposis Syndromes, and Colorectal Malignancies

HEPATOBILIARY SYSTEM

- Diseases of the Bile
- Diseases of the Gallbladder
- Diffuse diseases of the Liver
- Liver masses: Benign and Malignant

PANCREAS

- Embryology and Anatomy
- Inflammatory Diseases of the Pancreas
- Cystic and Solid Neoplasms of the Pancreas

GENITOURINARY SYSTEM:

- Contrast media: Indication and Safety
- Urinary Tract Infections
- Urinary Tract Obstruction and Dilatation
- Urinary Stone Disease
- Cystic Diseases of the Kidneys
- Tumors of the Renal Collecting Systems, Ureters and Bladder
- Urinary Tract Trauma
- Renal Vascular Anomalies and Abnormalities
- Diseases of the Scrotum and Testis
- Normal female pelvic anatomy and congenital anomalies
- Benign and Malignant Diseases of the Uterus
- Benign and Malignant Diseases of the Ovaries
- Disorders of the Adrenal Gland
- Differential Diagnoses: Filling Defects of the Urinary Bladder
- Differential Diagnoses: Bilateral Large and Small Kidneys
- Differential Diagnoses: Unilateral Large and Small Kidneys
- Differential Diagnoses: Displacement of the Upper and lower Urinary Tract
- Staging of Urological Malignancy: A Multimodality approach
CURRICULUM

1. Acute abdomen and abdominal plain radiographs
2. Abdominal trauma
3. Diffuse disease of liver and liver neoplasms
4. Contrast Administration and Reactions
5. Pancreas--acute pancreatitis and complications and pancreatic neoplasm
6. Adrenal imaging: Benign and malignant
7. Renal Imaging and renal neoplasms
8. Cystic renal disease
9. Upper and lower urinary tract anomalies
10. Prostate and Urethra
11. Gallbladder and Bile ducts
12. Aortic Aneurysm and complications
13. Esophagus and pathologies
14. Stomach and duodenum: Benign and Malignant
15. Small bowel disease
16. Abdominal hernias
17. Volvulus and colorectal polyposis and malignancies
18. Retroperitoneum and mesenteric disease and