INTRODUCTION

A radiologic technologist practicing in any field of radiology must understand basic human anatomy and physiology in order to perform his or her duties. Those working in CT or MRI must also be able to identify normal anatomic structures on cross-sectional images. This requires an adaptation in thinking; special attention must be paid to the relationships among structures. There are many excellent resources available that provide comprehensive images from the entire head and body, allowing readers to learn, identify, and recall anatomic structures in cross section. Some of these resources are listed here.

The aim of this section is to provide an introduction to cross-sectional anatomy by presenting just a few representative slices from some of the most common examinations performed in the CT department. Each cross-sectional image is accompanied by a drawing, in shades of gray, to help identify structures. All the drawings have been done according to the same gray scale. Regardless of where they are found in the body, air is depicted as black; bone is white. Within these extremes, shading varies for tissues, organs, and abnormalities. Each cross-sectional image is also accompanied by a reference image to help the reader imagine its location in the body.
Because only representative slices are included, the slices displayed are not adjacent. Compared with an actual CT examination that includes contiguous slices, the reader is at a considerable disadvantage in accurately identifying specific structures from a single image. (Note: questions contained in the certification examination for CT asking the examinee to identify anatomic structures most often provide only a single cross-sectional image. Therefore, this format, although not reflecting actual practice, does mirror that commonly used for the CT examination.) In actual practice, whenever there is doubt the viewer should analyze adjacent superior and inferior images and compare the structures in question.

Resources:
Chapter 15

NEURO ANATOMY

HEAD

Brain
Routine scans of the brain usually begin at the base of the skull and continue superiorly. Depending on the clinical indication, the scans may be done without IV contrast enhancement, with IV contrast enhancement, or without and with IV contrast enhancement. The images included below include IV contrast enhancement.

1. Nasal bones
2. Eye, lens
3. Maxillary sinus
4. Vomer
5. Sphenoid bone
6. Medulla oblongata
7. Occipital bone
8. Vertebral artery
9. Mastoid air cells
10. Zygoma
11. Eye, globe
12. Ethmoid sinus
1. Medial rectus m. 7. Sigmoid sinus
2. Globe of eye 8. Pons
3. Optic n. 9. Cerebellum
4. Sphenoid bone, greater wing of
5. Mandibular condyle
6. Mastoid air cells in left temporal bone
10. Internal auditory canal
11. Auricle
12. External auditory meatus
13. Lateral rectus m.
14. Zygoma
1. Frontal sinus
2. Pituitary
3. Sphenoid bone
4. Middle cerebral a.
5. Temporal lobe
6. Mastoid air cells in left temporal bone
7. Sigmoid sinus
8. Occipital bone
9. Cerebellar peduncles
10. Cerebellum
11. Right lamboid suture
12. Fourth ventricle
14. Sella turcica
15. Temporalis m.
16. Frontal bone, orbital roof
1. Frontal bone 7. Cerebellum, tentorium
2. Falx cerebri 8. Internal occipital protuberance
3. Anterior cerebral a. 9. Fourth ventricle
6. Parietal bone 12. Temporal bone
1. Superior sagittal sinus  
2. Frontal bone  
3. Lateral ventricle, anterior horn  
4. Caudate nucleus, head  
5. Putamen/Globus pallidus  
6. Third ventricle  
7. Choroid plexus  
8. Parietal bone  
9. Internal occipital protuberence  
10. Cerebellar vermis  
11. Pineal body  
12. Thalamus  
13. Internal capsule  
14. Temporal bone
1. Falx cerebri 7. Occipital lobe
2. Frontal bone 8. Choroid plexus
3. Corpus callosum 9. Lateral ventricle, body
4. Caudate nucleus, body 10. Temporal bone
5. Parietal bone 11. Corona radiata
6. Confluence of sinuses (torcula) 12. Straight sinus
1. Frontal lobe
2. Superior sagittal sinus
3. Precentral gyrus
4. Central suicus
5. Falx cerebri
6. Parietal lobe
7. Parietal bone
8. Temporal bone
9. Scalp
10. Frontal bone
Sinuses
Sinus screening is intended as an inexpensive, accurate, and low radiation dose method for confirming the presence of inflammatory sinonasal disease. If confirmed and the patient will then have endoscopic sinus surgery, the coronal images provide a “roadmap” for the surgeon. When the clinical indication is recurrent or chronic sinusitis, the study is done without IV contrast enhancement and scanning is done in the coronal plane. Other clinical indications may require the administration of IV contrast or additional scans in the axial plane.

Sinuses (Coronal)

1. Sphenoid bone
2. Sphenoid sinus
3. Sella tursica, floor
4. Zygoma
5. Medial pterygoid m.
6. Masseter m.
7. Mandible
8. Aryepiglottic fold
9. Pharynx
10. Hyoid bone
11. Lateral pterygoid m.
12. Pharyngeal constrictor
1. Frontal lobe  
2. Medial rectus m.  
3. Superior rectus m.  
4. Infraorbital fissure  
5. Nasal conchae  
6. Maxillary sinus  
7. Zygoma  
8. Maxillary bone  
9. Hard palate  
10. Mandible  
11. Tooth  
12. Nasal bone (nasal septum)  
13. Inferior rectus m.  
14. Lateral rectus m.  
15. Optic nerve/canal  
16. Sphenoid sinus  
17. Tongue  
18. Oral vestibule  
19. Masseter m.
1. Crista galli
2. Ethmoid sinus
3. Medial rectus m.
4. Frontal bone
5. Inferior rectus m.
6. Middle nasal turbinate
7. Maxillary sinus
8. Inferior nasal turbinate
9. Mandible
10. Maxillary bone, hard palate
11. Dental filling (spray artifact)
12. Lacrimal gland
13. Superior rectus m.
14. Superior oblique m.
15. Eye, globe
1. Frontal lobe  
2. Eye, globe  
3. Lacrimal gland  
4. Inferior rectus m.  
5. Maxillary sinus  
6. Maxillary bone  
7. Tooth  
8. Tongue  
9. Oral vestibule  
10. Mandible  
11. Inferior nasal chonchae  
12. Nasal bone (nasal septum)  
13. Middle nasal chonchae  
14. Ethmoid sinus
Temporal Bones
The organs of hearing and balance are located in the petrous ridge of the temporal bone. Because these organs are tiny, thin slices are used. Once the scan data are acquired, the two petrosal bones are reconstructed separately so that the display field of view can be reduced to ensure optimal resolution. Most protocols include scans in both the coronal and axial planes; the use of IV contrast varies according to the clinical indication.

Temporal Bones (Coronal)

1. Epitympanum
2. Malleus
3. Facial canal
4. Cochlea
5. Internal auditory canal
6. Tympanic cavity
7. Mastoid air cells
8. Temporal bone
9. Semicircular canals
10. Hypoglossal canal
11. Occipital condyle
12. Jugular fossa
1. Internal auditory canal
2. Superior semicircular canal
3. Lateral semicircular canal
4. Epitympanum
5. Incus
6. External auditory canal
7. Styloid process
8. Tympanic cavity
9. Oval window
Temporal Bones (Axial)

1. Mandible, condyle
2. Sphenoid sinus
3. Clivus
4. Carotid canal
5. Sigmoid sinus
6. Mastoid air cells
7. External auditory canal
8. Jugular foramen
9. Auditory ossicle: malleus
10. Auditory ossicle: incus
11. Carotid canal
12. Internal auditory canal
13. Vestibule
14. Semicircular canal
15. Cochlea
1. Temporal lobe
2. Superior semicircular canal
3. Mastoid antrum
4. Posterior semicircular canal
5. Sigmoid sinus
6. Temporal bone
7. Occipital bone
NECK

Unless contraindicated, CT examinations of the neck are done with the IV administration of contrast media. Artifacts caused by dental work often obscure surrounding structures at some levels. Some facilities split the data acquisition into two groups so that the gantry can be angled to reduce artifact. However, many MDCT systems do not allow the gantry to be angled in the helical mode, so this is not always possible.

1. Maxillary bone
2. Oral vestibule
3. Masseter m.
4. Mandible, ramus
5. Atlas, anterior arch
6. Dens
7. Spinal cord
8. Internal jugular v.
9. Mastoid tip
10. Parotid gland
11. Retromandibular v.
12. Internal carotid a.
13. Pharynx
14. Genioglossus
15. Vertebral a.
16. Vertebra, spinous process
17. Longus colli muscles
18. Rectus/oblique capitus m.
19. Splenius capitus m.
20. Pterygoid m.
1. Genioglossus m. 7. Left internal carotid a.
2. Tongue 8. Vertebral body
4. Pharynx 10. Sternocleidomastoid m.
5. Left external carotid a. 11. Submandibular gland
6. Internal jugular vv.
1. Sternohyoid/Sternothyroid mm.
2. Thyroid cartilage
3. Cricoid cartilage
4. Sternocleidomastoid m.
5. Jugular vv.
6. Thyroid gland
7. Esophagus
8. Vertebral body
9. Erector spinae m.
10. Trapezius m.
11. Right vertebral a.
12. Right common carotid a.
13. Pharynx
CT of the spine is most often performed without IV contrast media administration. However, scans of the spine are often obtained after intrathecal contrast material is given for a myelography study.

1. Aorta
2. Psoas m.
3. Dural sac
4. Pedicle
5. Lumbar vertebra 2
6. Articular facet
7. Ligamenta flava
8. L1, spinous process
9. L2, transverse process
10. Erector spinae m.
11. Kidneys
12. Jejunum/ileum
1. Inferior vena cava  
2. Aorta  
3. L2, vertebral body  
4. Psoas m.  
5. Dural sac  
6. L2, lamina  
7. L2, spinous process  
8. Multifidus m.  
9. Erector spinae m.  
10. Cauda equina (in dural sac)  
11. Right kidney  
12. Nerve root (exiting)  
13. Posterior longitudinal lig.
1. Inferior vena cava
2. Aorta
3. Anulus fibrosus
4. Intervertebral disk L2/L3
5. Articular processes
6. L2, spinous process
7. Erector spinae m.
8. Psoas m.
9. Right kidney
10. Ligamenta flava
11. Dural sac
12. Quadratus lumbrum m.