UNIT 21. DISSECTION: CRANIAL CAVITY

STRUCTURES TO IDENTIFY:

- Cranial nerves (on the brain & on the skull)
- Telencephalon (forebrain)
- Diencephalon (forebrain)
- Mesencephalon (midbrain)
- Metencephalon (hindbrain)
- Myelencephalon (medulla)
- Dura
- Arachnoid granulations and villa
- Falx cerebri
- Falx cerebelli
- Tentorium cerebelli
- Diaphragma sellae
- Middle meningeal artery
- Superior sagittal sinus
- Inferior sagittal sinus
- Straight sinus
- Occipital sinus
- Transverse sinus
- Sigmoid sinus
- Superior petrosal sinus
- Inferior petrosal sinus
- Intercavernous sinus
- Cavernous sinus
- Internal carotid artery
- Ophthalmic artery
- Circle of Willis
- Anterior cerebral artery
- Anterior communicating artery
- Middle cerebral artery
- Posterior communicating artery
- Posterior cerebral arteries
- Vertebral artery
- Posterior inferior cerebellar artery
- Basilar artery
- Pontine branches
- Anterior inferior cerebellar artery
- Superior cerebellar artery

DISSECTION INSTRUCTIONS:

1. Make a sagittal incision through the entire scalp from the glabella to the external occipital protuberance. Make another incision from ear to ear over the top of the head (coronal incision). Reflect the four flaps thus formed downward to expose the entire calvaria. The calvaria is to be removed without damage to the dura mater, which is attached to the inner surface of the calvaria. Cut through the outer table of bone all the way around the skull, staying ¼ inch above the orbits and the external occipital protuberance. Remember that the skull is very thin in the temporal region. Using your chisel and mallet break through the inner table of bone until the calvaria is attached only by the dura mater. Using your chisel to pry up the calvaria, push the dura mater away from the bone. Work all the way around the cut, then continue to separate the dura and bone upward until the calvaria is removed.

2. Examine the dura. (N. plate 100; G. plate 7.19) Open the sagittal sinus and clean it out so that the arachnoid granulations can be inspected (N. plates 100, 102; G. plate 7.19). Using your scissors, make two incisions in the dura; the first is parallel to the midline, ½ inch lateral to it from anterior to posterior. From the top of the head make the second incision through the dura to the ears and reflect the four flaps of dura
downward. Carefully separate the cerebral hemispheres and study the falx cerebri (N. plate 103; G. plates 7.20A, 7.21A). Cut it from its attachment to the crista galli.

3. Carefully elevate the frontal lobes of the cerebral hemispheres enough to see the olfactory tracts and bulbs. The olfactory bulbs should lie on the cribiform plates on each side of the crista galli. With a probe, loosen them from the cribiform plate if they are still attached. Elevate the cerebral hemispheres enough to see the optic nerves medial to the anterior clinoid processes; cut both optic nerves. Immediately posterior to the optic nerves are the internal carotid arteries; cut them. In the midline, the stalk of the pituitary gland may be seen, it is usually black because of the blood it contains. Immediately posterior to the internal carotid arteries are the oculomotor nerves. Cut the pituitary stalk and the oculomotor nerves.

4. Without breaking the brainstem, elevate the frontal and temporal lobes of the cerebral hemispheres until the attachment of the tentorium cerebelli to the apex of the petrous portion of the temporal bone can be seen. With the tip of the scalpel blade, carefully cut through the attachment of the tentorium cerebelli to the petrous bone as close to the bone as possible. This cut must extend all the way to the lateral wall of the cranial cavity. Immediately inferior to the tentorium cerebelli is the trigeminal nerves as they leave the lateral side of the pons to enter the middle cranial fossa; cut these nerves. Look into the posterior cranial fossa along its anterior wall. The abducens nerves leave the pontomedullary junction to enter the dura covering the clivus; cut them. Lateral to the abducens nerves are the facial and vestibulocochlear nerves. They also leave the pontomedullary junction, but enter the internal acoustic meatus on each side; cut them. Inferior to the latter two nerves you can see the glossopharyngeal, vagus, and spinal accessory nerves entering the jugular foramina. Do not break the brainstem when trying to see these nerves. You need to see the surface of the clivus. Look also for the vertebral arteries, which enter the cranial cavity through the foramen magnum. Place the scalpel parallel on the clivus. Insert it through the foramen magnum as far as possible. Now cut the spinal cord and vertebral arteries, keeping the scalpel blade against the clivus. When the spinal cord and the vertebral arteries are cut, the brain should be free and can be removed from the head. Remember that the dura mater must be kept moist or it will dry out quickly.

5. Identify the cranial nerves as they leave the brain (N. plates 139 – 141, 143; G. plates 7.22 – 7.27). Identify the arteries that make up the Circle of Willis (N. plates 139 – 141; G. plates 7.28, p. 647, 7.30).

6. Attempt to restore the dura (N. plates 103, 104; G. plate 7.22), including the falx cerebri and tentorium cerebelli, to their original positions within the cranial cavity before the brain was removed.

7. Identify the sinuses (N. plates 102 - 104, 109; G. plates 7.21, 7.22, 7.24B).

8. Identify all of the cranial nerves in the cranial cavity and note their relationship to the dura (N. plate 98; G plates 7.25, 7.26A, 7.27A). While the nerves are being cleaned, also open one of the cavernous sinuses and identify the internal carotid artery and the abducens nerve, which are in the sinus (N. plate 104; G. plates 7.26, 7.27).