

BASIC CRANIAL AND CERVICAL NEUROVASCULAR ANATOMY

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CRANIAL ARTERIAL NEUROVASCULAR SYSTEM ORGANIZATION

• ANTERIOR CIRCULATION

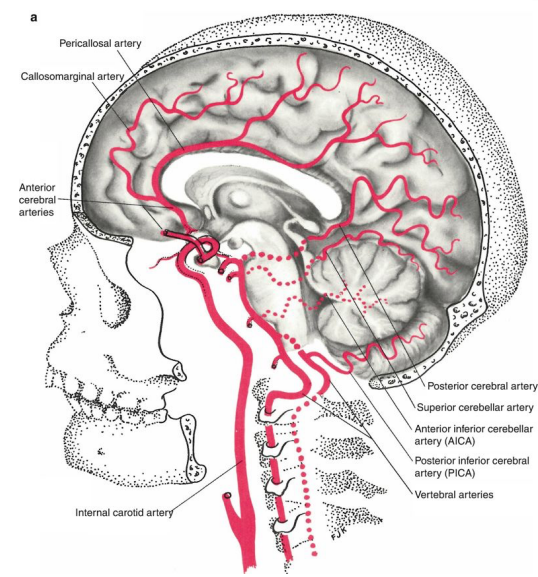
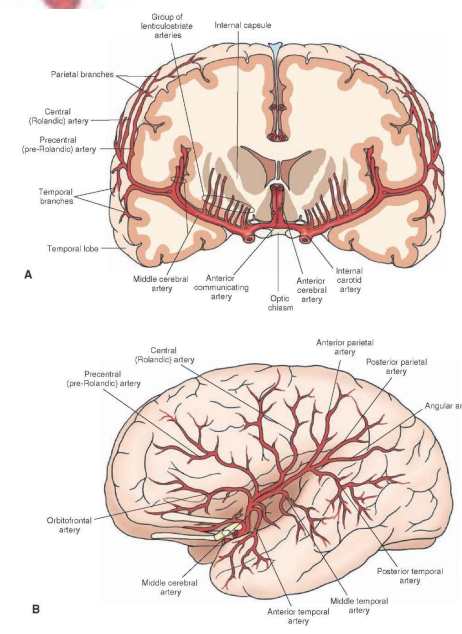
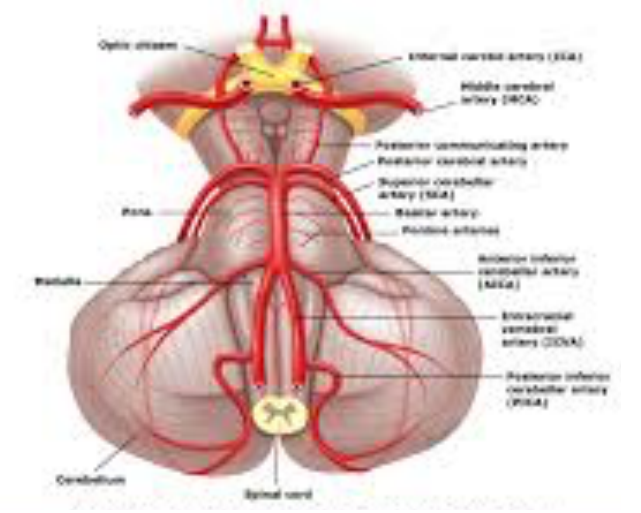
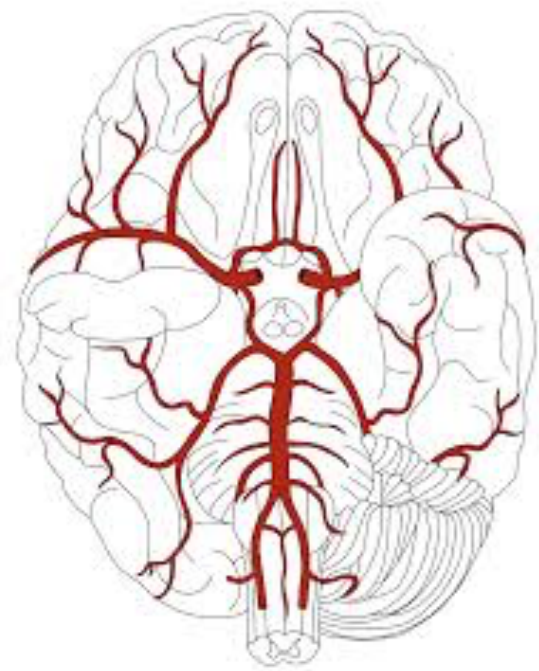
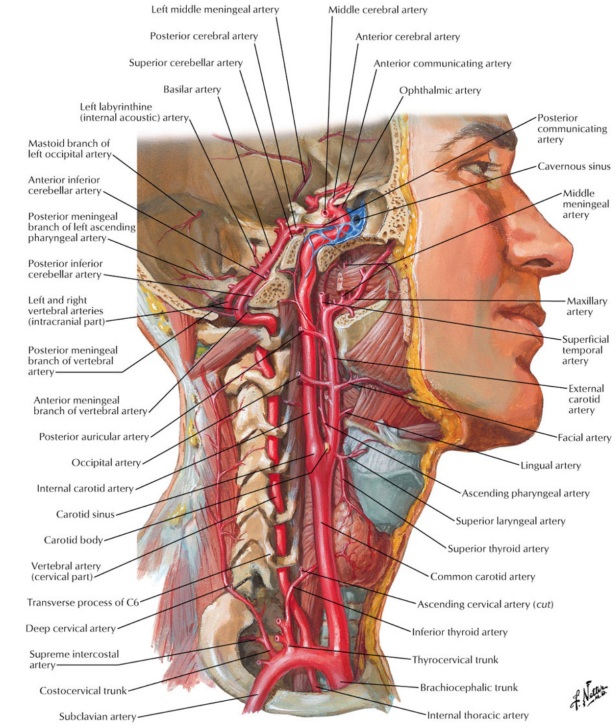
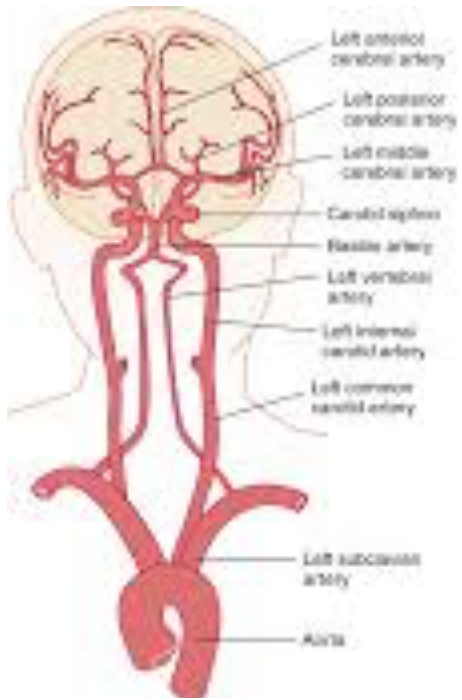
- CERVICAL SEGMENT CA
 - CCA
 - ECA + BRANCHES
 - ICA
- CRANIAL VASCULAR ANATOMY
 - EXTRADURAL ICA
 - PETROUS SEGMENT + BRANCHES
 - LACERUM SEGMENT
 - CAVERNOUS SEGMENT + BRANCHES
 - INTRADURAL ICA
 - CLINOIDAL SEGMENT + BRANCHES
 - SUPRACLINOIDAL SEGMENT + BRANCHES
 - MCA + BRANCHES
 - ACA + BRANCHES

• POSTERIOR CIRCULATION

- CERVICAL EXTRADURAL SEGMENT VA
- INTRADURAL SEGMENT VA + BRANCHES
- BA + BRANCHES
 - SCA + BRANCHES
 - PCA + BRANCHES
 - PONTINE PERFORATORS

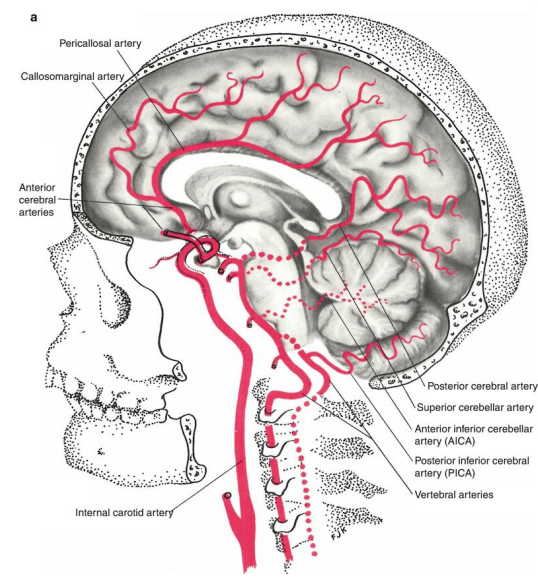
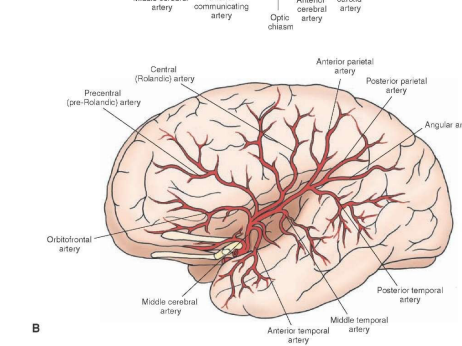
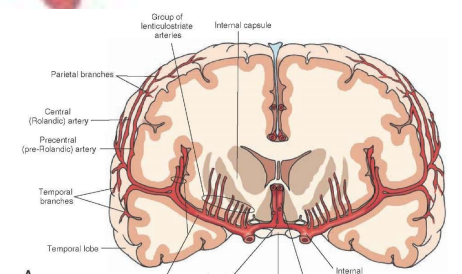
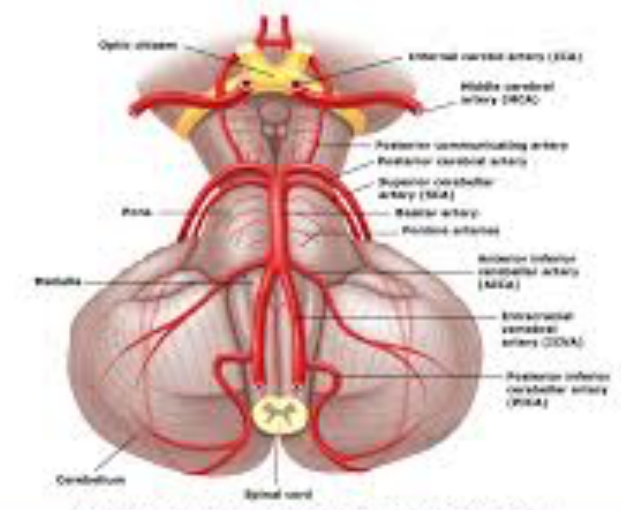
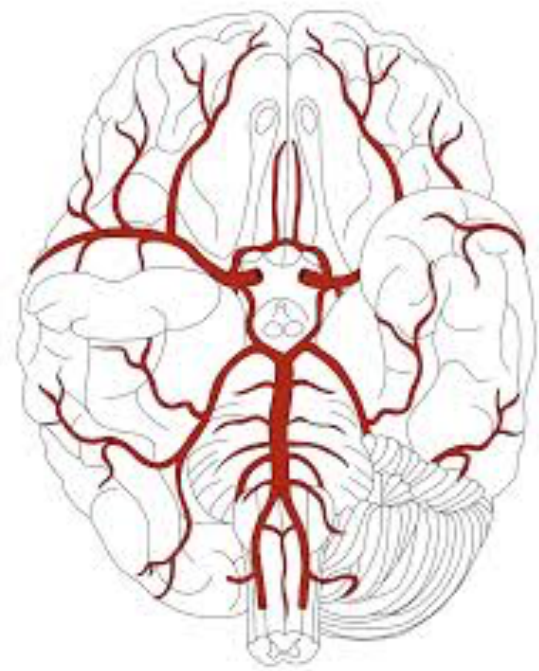
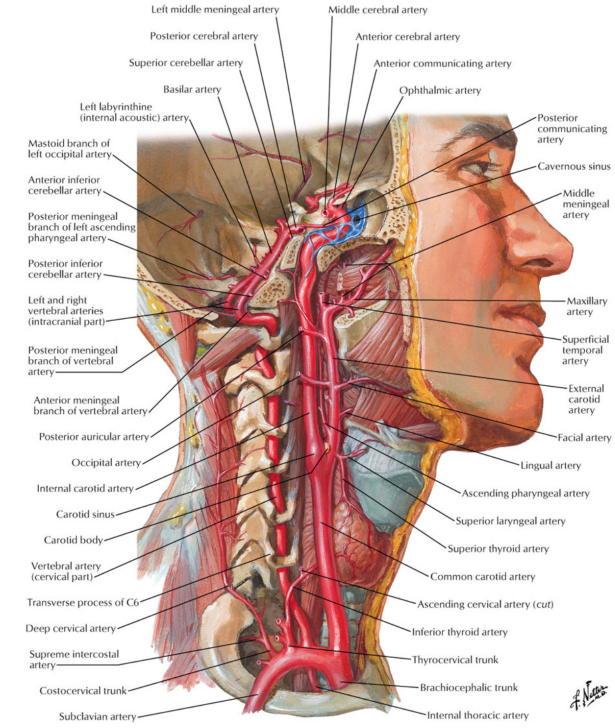
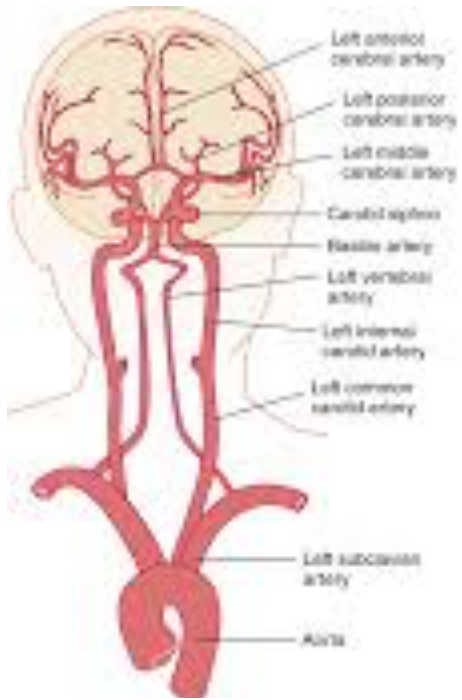
GENERAL ORGANIZATIONAL OVERVIEW

- WHEN WE DISCUSS THE CEREBRAL CIRCULATION WE DISCUSS IT IN TERMS OF THE **ANTERIOR AND POSTERIOR CIRCULATIONS**
 - THE **ANTERIOR CIRCULATION** ARISES FROM THE CAROTID ARTERIES
 - THE **POSTERIOR CIRCULATION** ARISES FROM THE VERTEBRAL ARTERIES
- WHEN WE DISCUSS THE ANTERIOR AND POSTERIOR CIRCULATIONS WE THINK OF THE **EXTRADURAL AND THE INTRADURAL SEGMENTS OF THE VESSELS**
 - **EXTRADURAL SEGMENTS** ARISE OUTSIDE AND EXTEND INSIDE THE SKULL, BUT ARE NOT NEXT TO THE BRAIN IN THE SUBARACHNOID SPACE
 - **INTRADURAL SEGMENTS** ARE IN THE SKULL AND IN THE SUBARACHNOID SPACE AND ARE THEREFORE IMMEDIATELY NEXT TO THE BRAIN



LARGE COMMON ARTERIAL ABBREVIATIONS

• COMMON CAROTID ARTERY	CCA
• EXTERNAL CAROTID ARTERY	ECA
• INTERNAL CAROTID ARTERY	ICA
• MIDDLE CEREBRAL ARTERY	MCA
• ANTERIOR CEREBRAL ARTERY	ACA
• ANTERIOR COMMUNICATING ARTERY	ACommA
• VERTEBRAL ARTERY	VA
• BASILAR ARTERY	BA
• POSTERIOR CEREBRAL ARTERY	PCA
• OPHTHALMIC ARTERY	OA
• POSTERIOR COMMUNICATING ARTERY	PCommA
• ANTERIOR CHOROIDAL ARTERY	AChA
• SUPERIOR HYPOPHYSEAL ARTERY	SupHypA
• POSTERIOR INFERIOR CEREBELLAR ARTERY	PICA
• ANTERIOR INFERIOR CEREBELLAR ARTERY	AICA
• SUPERIOR CEREBELLAR ARTERY	SCA



EXTRACRANIAL/INTRACRANIAL EXTRADURAL CIRCULATION

- **ANTERIOR CIRCULATION**

- **CCA**

- **ICA**

- CERVICAL
 - PETROUS + BR *
 - LACERUM *
 - CAVERNOUS + BR*
 - SUPERIOR HYPOPHYSEAL**

- **ECA**

- ASCENDING PHARYNGEAL
 - SUPERIOR THYROID
 - LINGUAL
 - FACIAL
 - OCCIPITAL
 - POST AURICULAR
 - INTERNAL MAXILLARY + BR
 - SUPERFICIAL TEMPORAL

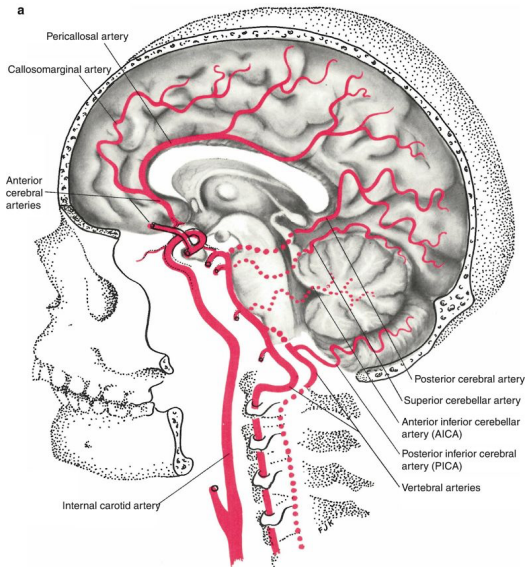
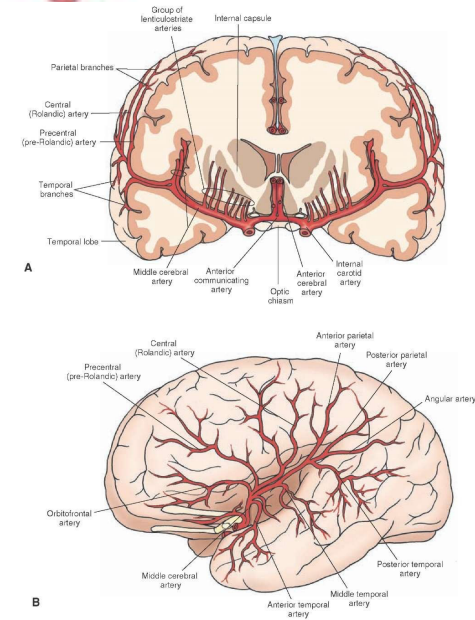
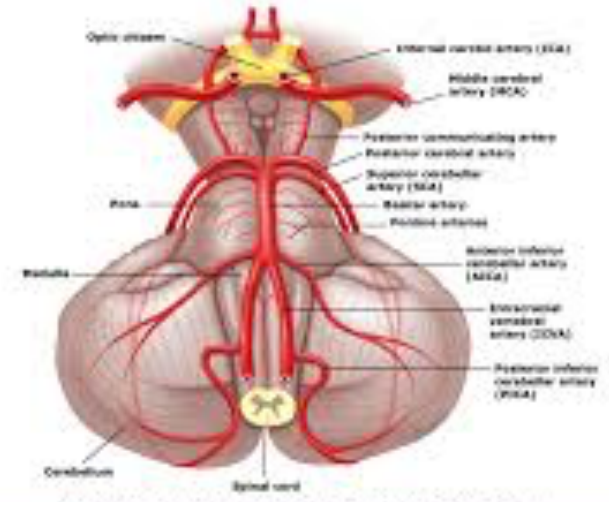
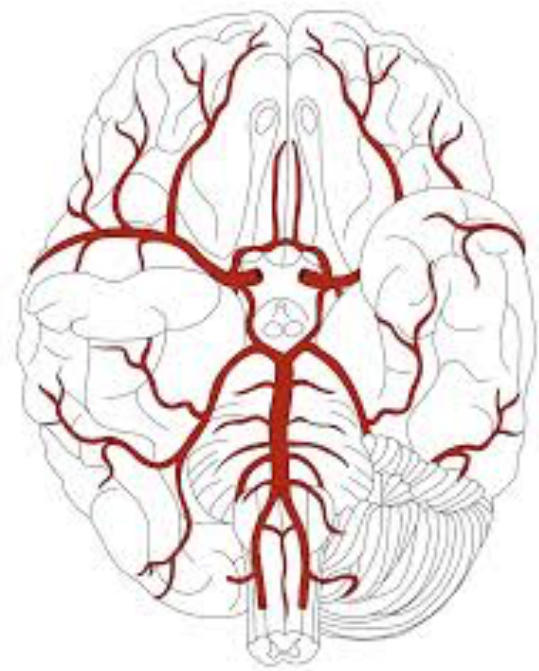
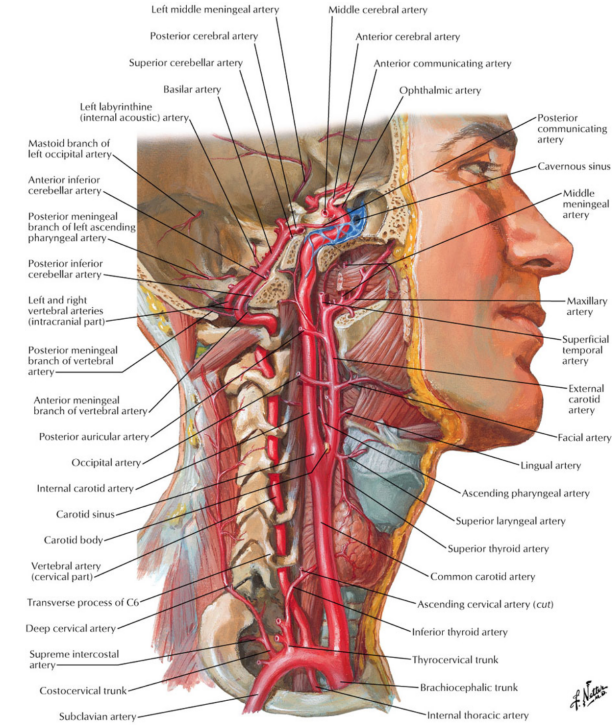
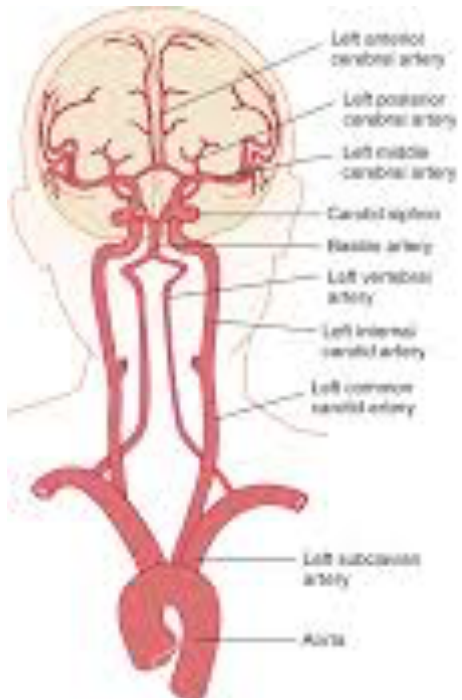
- * = INTRACRANIAL EXTRADURAL LOCATION

- ** = INTRACRANIAL AND +/- EXTRADURAL

- **POSTERIOR CIRCULATION**

- **VA**

- PRE FORAMEN TRANSVERSARIUM
 - INTRA FORAMEN TRANSVERSARIUM
 - POST FORAMEN TRANSVERSARIUM



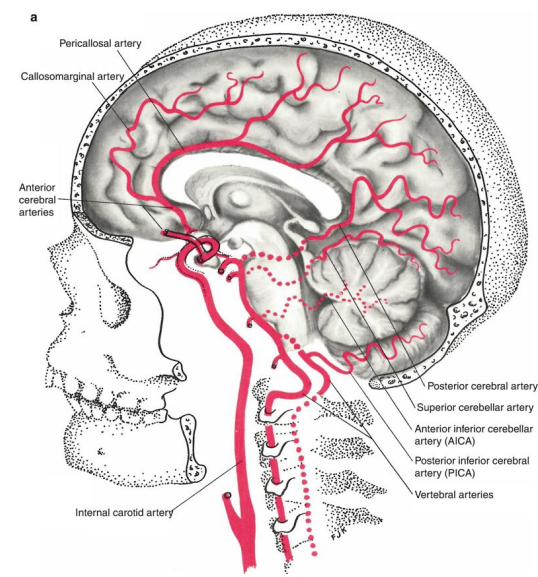
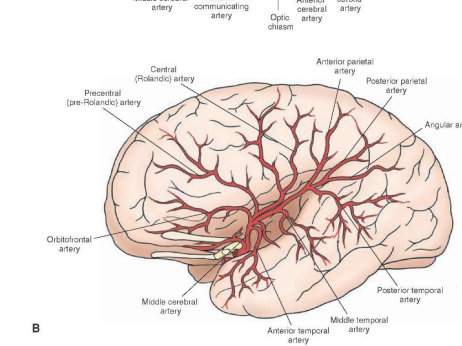
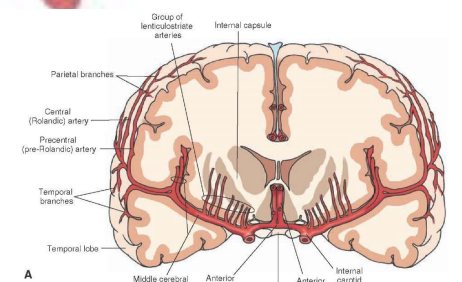
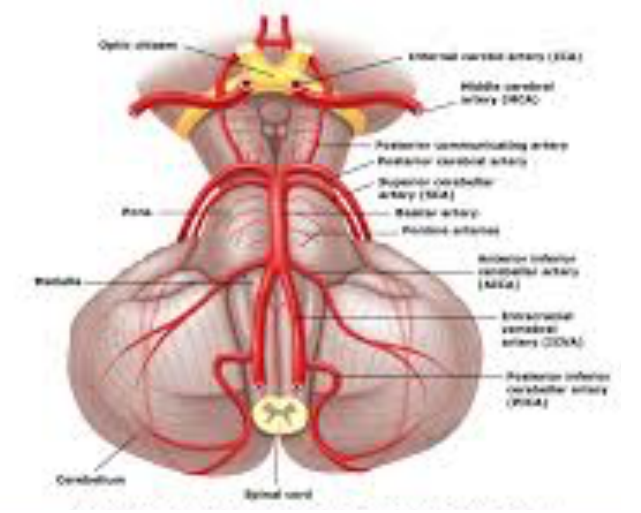
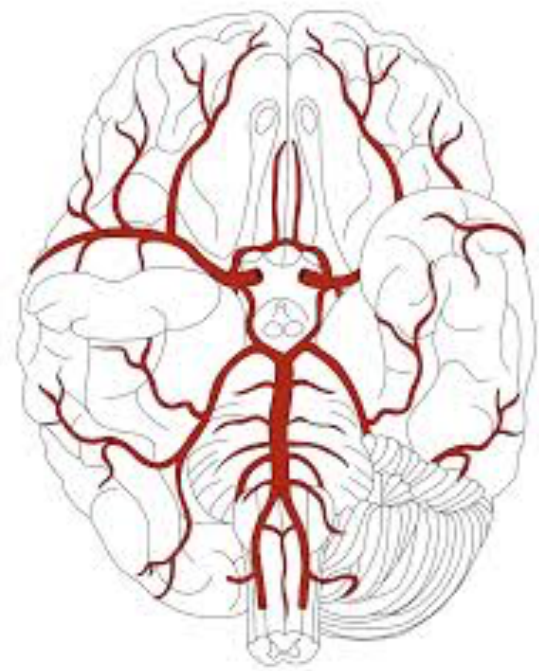
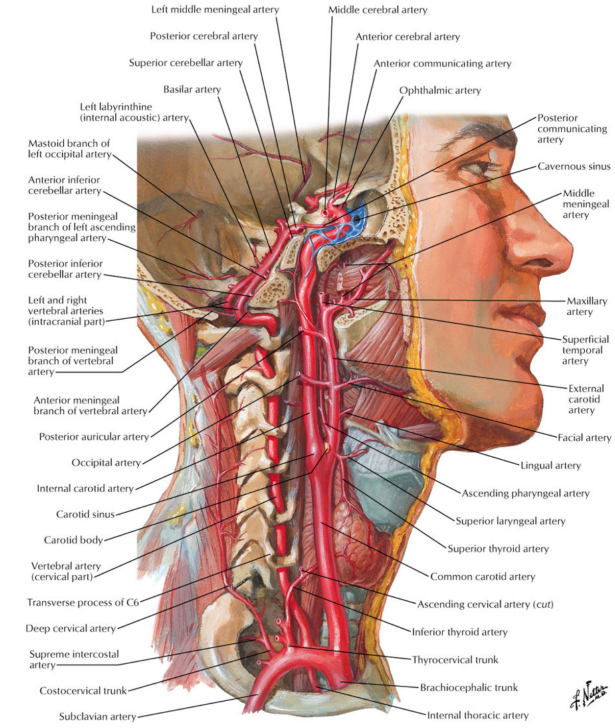
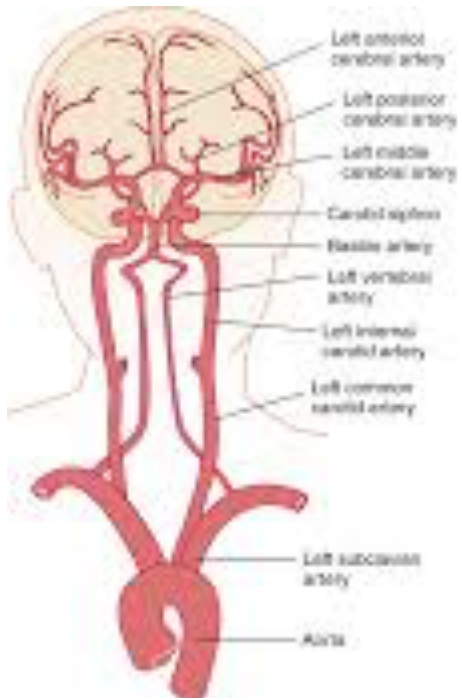
INTRACRANIAL INTRADURAL CIRCULATION

• ANTERIOR CIRCULATION

- INTERNAL CAROTID ARTERY
 - SUPRACLINOID SEGMENT
 - OPHTHALMIC A.
 - POSTERIOR COMMUNICATING A.
 - ANTERIOR THALAMIC PERFOR AA
 - ANTERIOR CHOROIDAL A
- MCA M1
 - LATERAL LENTICULOSTRIATE AA
 - ANTERIOR TEMPORAL A
- MCA M2, M3, M4, M5
- ACA A1
 - MEDIAL LENTICULOSTRIATES AA
 - ACOMM A
- ACA A2, A3, A4, A5
 - HEUBNER'S ARTERY

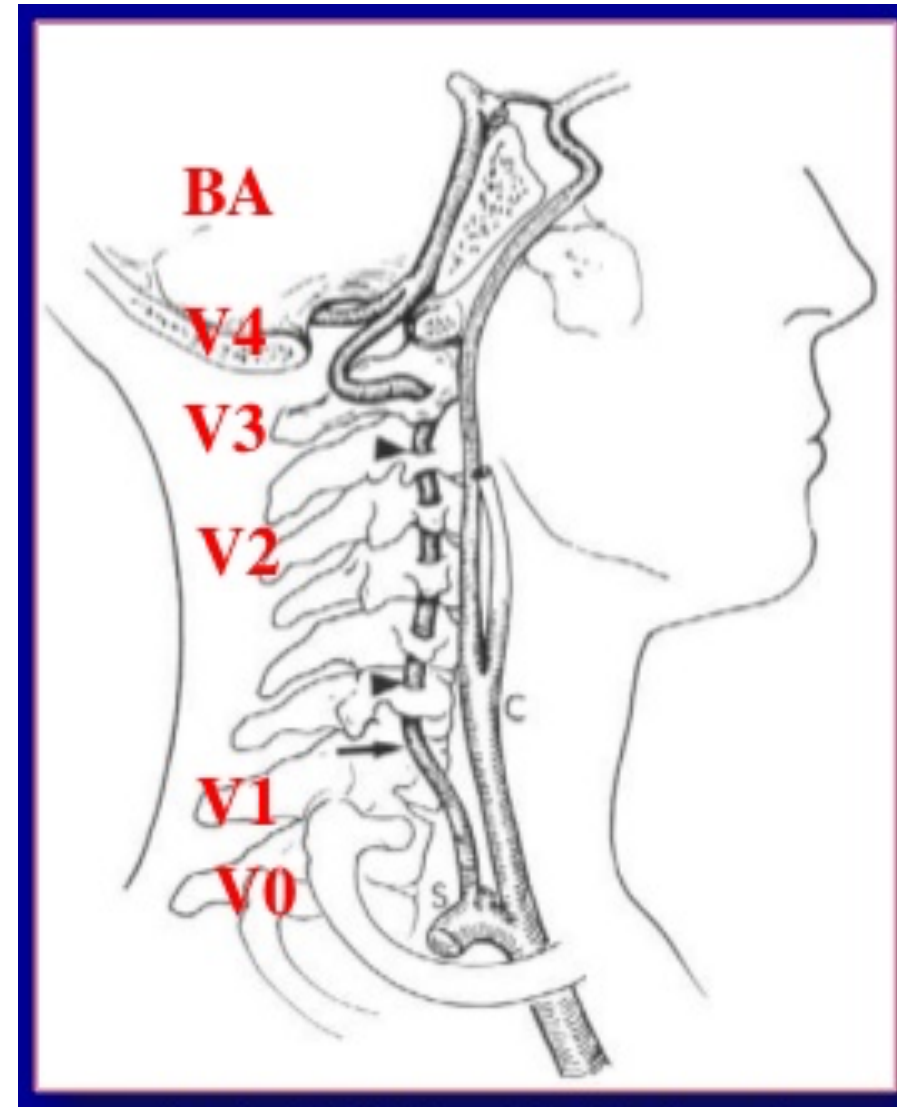
• POSTERIOR CIRCULATION

- VERTEBRAL ARTERY
 - MEDULLARY PERFORATING AA
 - POSTERIOR INFERIOR CEREBELLAR A (PICA)
- BASILAR ARTERY
 - SHORT/LONG PONTINE PERFORATING AA
 - ANTERIOR INFERIOR CEREBELLAR AA (AICA)
 - SUPERIOR CEREBELLAR AA (SCA)
- POSTERIOR CEREBRAL AA P1 (PCA)
 - POSTERIOR THALAMOPERFORATING AA
 - PCA P2, P3, P4
 - POST CHOROIDAL
 - CALCARINE
 - POSTERIOR MEDIAL TEMPORAL BRANCHES



VERTEBRAL ARTERY ANATOMIC SEGMENTS

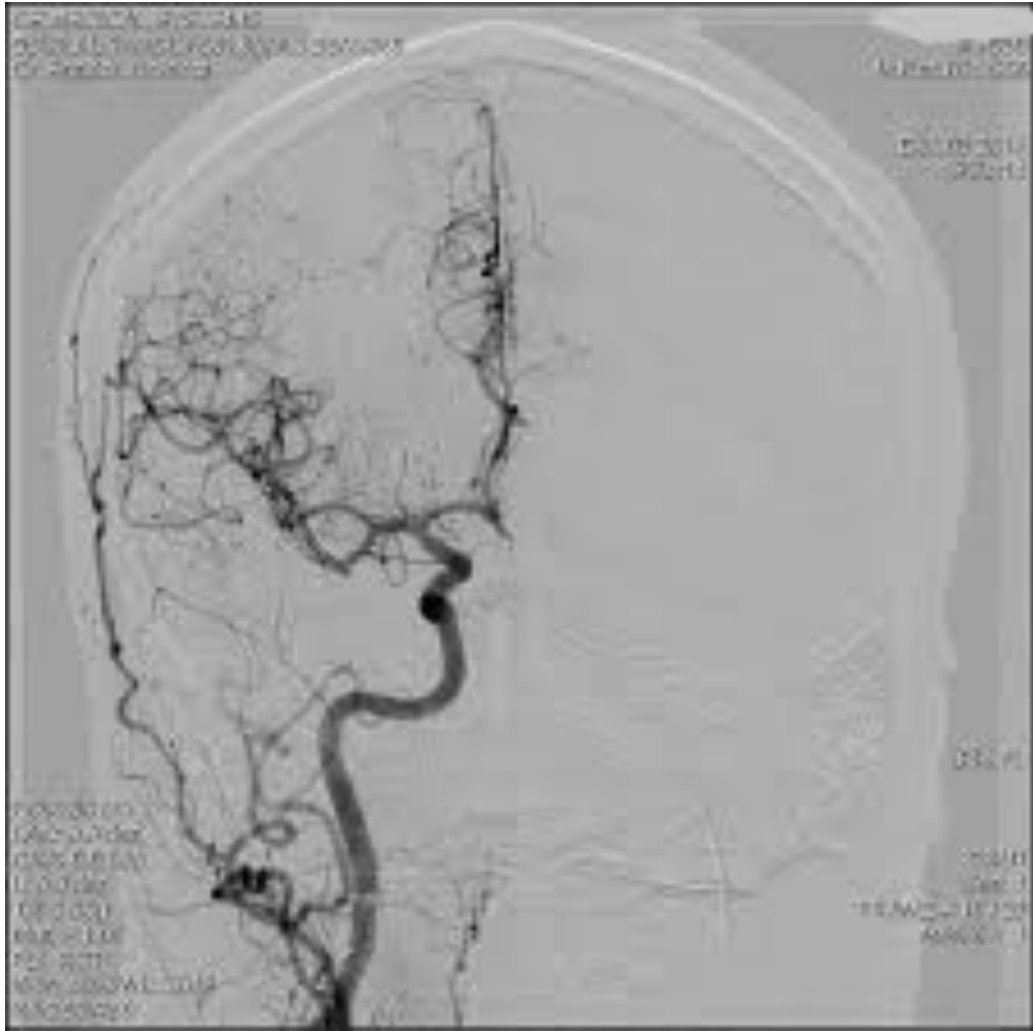
- V1: PREFORAMINAL (SUBCLAVIAN TO C6 FORAMINA)
- V2: FORAMINAL FROM C6 – C2 FORAMINA
- V3: ATLANTIC, EXTRADURAL FROM C2 TO DURAL ENTRY
- V4: FROM INTRADURAL PENETRATION TO CONFLUENCE



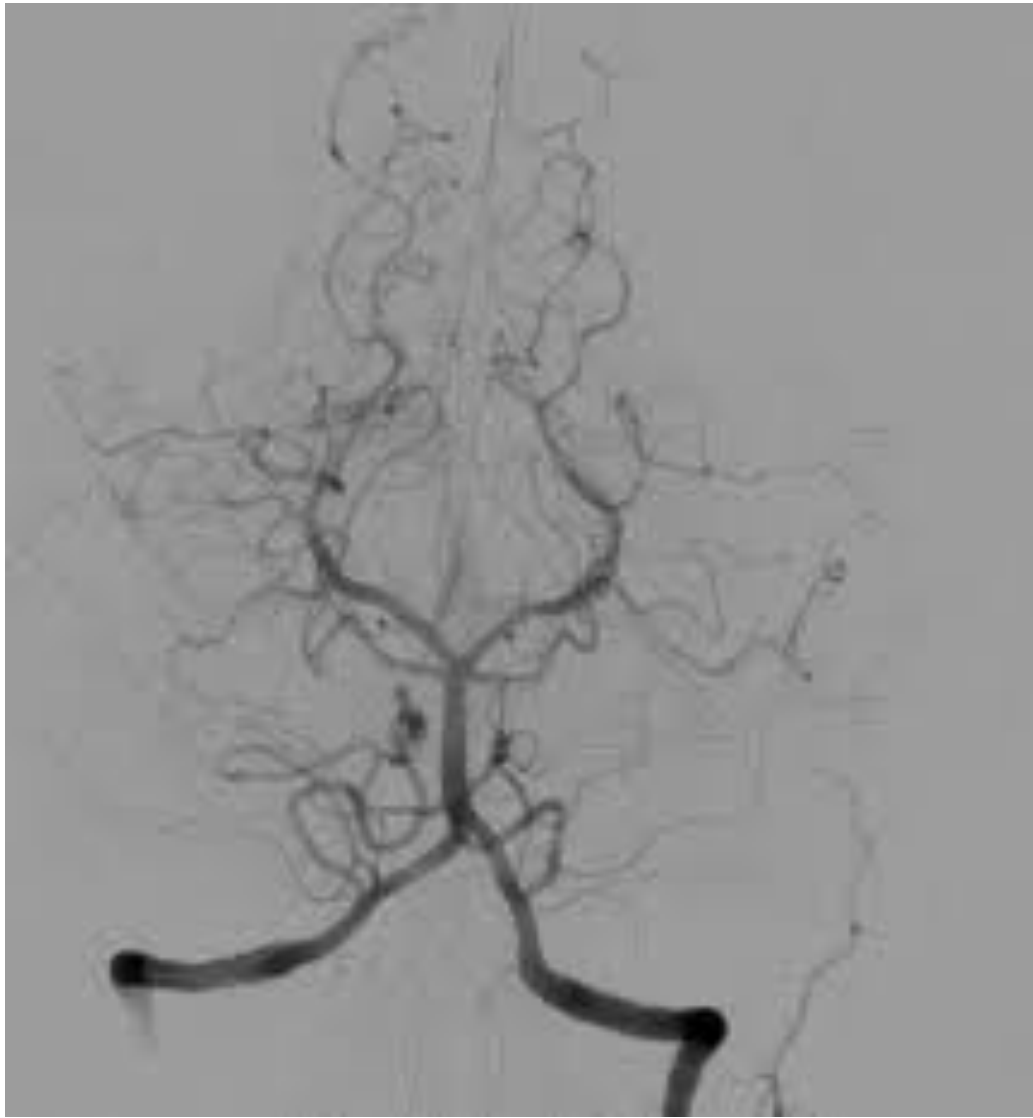
BASIC ANATOMIC CEREBROVASCULAR CONCEPTS AND TERMS

- CCA BIFURCATION: WHERE CCA DIVIDES INTO ICA AND ECA
- ICA BIFURCATION: WHERE ICA DIVIDES INTO ACA AND MCA
- VA CONFLUENCE: WHERE THE 2 VAs JOIN TO FORM THE BA
- BA APEX (AKA: BA TIP, BA BIFURCATION): WHERE THE BA DIVIDES INTO THE RT AND LT PCAs
- CAVERNOUS CAROTID ARTERY: PORTION OF THE ICA LOCATED WITHIN THE CAVERNOUS SINUS
- PARACLINOID ICA: PORTION OF ICA NEXT TO THE ANTERIOR CLINOID PROCESS
- POSTERIOR CAROTID WALL: PORTION OF ICA WHERE PCommA AND AChA ARE LOCATED
- FETAL PCOM: PCOMM THAT TRANSITIONS INTO PCA AND NO P1 SEGMENT ARISING FROM BASILAR ARTERY
- INFUNDIBULUM: TRIANGULAR DILATATION AT THE ORIGIN OF A BLOOD VESSEL WITH BLOOD VESSEL ARISING FROM THE APEX OF THE TRIANGLE
- ANEURYSM IS NAMED FOR THE BLOOD VESSEL LOCATED IMMEDIATELY BEFORE THE ANEURYSM
- ANTEROGRADE FLOW: FORWARD FLOW OF BLOOD THROUGH VESSELS
- RETROGRADE FLOW: FLOW THROUGH BLOOD VESSELS THAT IS IN THE BACKWARDS DIRECTION
- LOCATION ON A VESSEL IS DESCRIBED AS BEING VENTRAL, DORSAL, MEDIAL, LATERAL
- GENU: WHERE A VESSEL TURNS IN A NEW DIRECTION. USUALLY A MARKED CHANGE IN COURSE
- INTRADURAL: VESSEL LOCATED BETWEEN THE DURA AND BRAIN
- EXTRADURAL: VESSEL LOCATED ON SIDE OF DURA THAT IS AWAY FROM THE BRAIN
- SINUS: VENOUS BLOOD THAT MOVES BETWEEN TWO LAYERS OF DURA AND IS CONTAINED BY THE TWO LAYERS OF DURA
- DOLICHOECTASIA: A DILATED ARTERIAL SEGMENT THAT OFTEN TRAVELS ALONG A SERPIGENOUS COURSE
- CANDELABRA: THE MCA BRANCHES AS SEEN ON AN ARTERIOGRAM AS THEY EXIT THE SYLVIAN FISSURE
- SQUARE AND ROUND SHIFT: DESCRIBES DISPLACEMENT OF ARTERIES BY A MASS. THE TYPE OF SHIFT CAN HELP LOCALIZE THE MASS.

ICA ANGIOGRAM AP AND LATERAL



VERTEBRAL ARTERY ANGIOGRAM AP AND LATERAL



ANEURYSM NAMING

