Internal Carotid Artery

Internal Carotid Artery Segments		*Branches* *(7 segments in Bouthillier Angiographic classification)*
C1	Cervical	None
C2	Petrous (horizontal)	Vidian, Caroticotympanic
C3	Lacerum	None
C4	Cavernous	Meningeohypophyseal, capsular, inferolateral trunk
C5	Clinoid	None
C6	Ophthalmic (supraclimoid)	Ophthalmic, superior hypophyseal
C7	Communicating (terminal)	Posterior communicating, anterior choroidal
Mnemonics	Segments (CPL CCST)	Branches (VIP's COM): Vidian, inferolateral trunk, PCOM, superior hypophyseal, Caroticotympanic, ophthalmic, Meningeohypophyseal

ICA is divided into 4 anatomical segments (cervical, petrous, cavernous & cerebral) and 7 angiographic segments as detailed above.

Internal Carotid artery branches			*Clinical significance*
C2	Caroticotympanic	enters middle ear	anastomose with inferior tympanic branch of ECA (enlarges in cases of aberrant ICA 'absent C1 segment')
C2	Vidian	pterygopalatine fossa	anastomose with vidian branch of internal maxillary of ECA
C4	Meningeohypophyseal		>> Marginal tentorial: tentorial dura >> Clival: clival dura >> inferior hypophyseal: pituitary
C4	Inferolateral Trunk	Runs in inferolateral direction in the cavernous sinus	>>anterior branch: through superior orbital fissure, anastomose with recurrent meningeal branch of ophthalmic artery >>posterior branch: along abducent to supply tentorial dura >>third branch: anastomose with accessory meningeal artery >>fourth branch: supply V2 division of trigeminal nerve (maxillary)
C6	Ophthalmic	Runs in optic canal	>>Orbital branches: lacrimal, supraorbital, supratrochlear, ethmoidal >>Ocular branches: central retinal, anterior ciliary, posterior ciliary
C6	Superior Hypophyseal		Supplies optic nerve, chiasm, pituitary gland

C7	PCOM		Supplies posterior part of optic nerve, chaism, hypothalamus, mammillary bodies >>anterior thalamoperforating (premamillary a.)
C7	Anterior Choroidal	-Chroidal fissure segment -Intraventricular segment	Supplies optic tract, LGB, lateral thalamus, posterior limb of internal capsule, lateral midbrain Supplies choroid plexus in temporal horn

Occluded artery	*Occlusion syndrome*
Ophthalmic Artery *Central retinal artery*	Loss of vision with no cherry red spot (worse than CRAO) **CRAO**: sudden, acute, and painless loss of vision in one eye. Fundus with cherry red spot (pale retina) Prognosis: 65% will lose vision (worse than 20/400) – only 15% will regain their vision (better than 20/40)
Posterior Ciliary	**AION**: ischemia of optic nerve head due to decrease blood flow in circle of Zinn (made by medial & lateral post ciliary arteries around optic nerve head). Manifests as altitudinal field defect (commonly inferior). GCA is a major cause of AION (median age 72, more in women, 50% of patients have PMR).
Anterior Ciliary	Multiple small arteries, rarely to manifest clinically.
Posterior Communicating	Uncommon
Anterior Thalamoperforating	Personality changes, apathy, abulia
Anterior Choroidal Artery	Hemiparesis, hemihypothesia, hemianopia and neglect. Sometimes mutism which is considered a form of neglect

External Carotid Artery Branches	Intracranial Supply
Superior thyroid	None
Ascending Pharyngeal	Neuromeningeal branch → dura and lower cranial nerves
Lingual	
Facial	Angular branch → anastomosis with ophthalmic artery branches
Occipital	Anastomosis with vertebral artery segmental branches
Superficial temporal	
Internal Maxillary	Middle meningeal artery → supplies dura through foramen spinosum

Middle Cerebral Artery Segments	Location	Branches
M1	Main trunk	Lenticulostriate – deep penetrating vessels
M2	In Sylvian fissure where it divides	Superior and inferior divisions
M3	Cortical segment	Cortical branches
M4	Over Cortical surface	Cortical branches

Posterior Cerebral Artery Segment	Location	Branches
P1	From basilar to PCOM origin, in interpeduncular cistern	PCOM → anterior thalamoperforator Posterior thalamoperforator
P2	From PCOM origin P2A: while in the crural cistern P2P: after bridging to ambient cistern	Middle posterior choroidal artery Lateral posterior choroidal artery Thalamogeniculate
P3	Quadrigeminal cistern	
P4	Cortical branches	Anterior & posterior temporal arteries Lateral occipital artery Medial occipital artery → calcarine & parieto-occipital Splenial artery

Basilar Artery Branches	
Paramedian	Supplies medial third of pons, midbrain
Short circumferential	Supplies lateral 2/3 of pons, midbrain
Long Circumferential	AICA & SCA (superior cerebellar artery)
Interpeduncular	Supplies high midbrain and subthalamic