

Nuclear Groups Present in Medulla

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① Gracile & Cuneate		② Cerebellar Relay Nuclei "CRAVO"				
		Accessory cuneate	Inferior Olivary Nucleus	Reticular formation	Arcuate nucleus	Vestibular nuclei
Site		Lateral to cuneate nucleus.	Inferior, medial & dorsal	Midbrain, Pons, Medulla	Ventral to the pyramid	
Input	<ul style="list-style-type: none"> - Gracile & cuneate tracts. - Sensory nuclei receives: <ol style="list-style-type: none"> 1) Kinesthesia "proprioception" 💡 2) Discriminative touch 3) Vibration <p style="text-align: center;">↓</p> <p>From the same side of the body.</p>	<p>Proprioceptive information from the upper limb</p>	<ul style="list-style-type: none"> - Sensory data from spinal cord via spino-olivary tract. - Motor data from cerebral cortex via corico-spinal tract. - Motor data from basal ganglia & red nucleus via central tegmental tract. 💡 	<ul style="list-style-type: none"> - Motor data from the motor areas of the cerebral cortex. - Sensory data from the spinal cord and special sense organs. 	<ul style="list-style-type: none"> - Fibers from the cerebral cortex via pyramidal tract. 	
Output	<ul style="list-style-type: none"> - Contain 2nd order neuron - Their axons form the internal arcuate fibers which cross to the opposite side in the sensory decussation which form the medial lemniscus. 💡 - Then to thalamus. 	<p>Axons form Cuneo-cerebellar tract 💡 (dorsal external arcuate fibers)</p>	<p>Axons form olivocerebellar tract which cross to opposite side</p>	---	<ul style="list-style-type: none"> - The axons form arcuate-cerebellar fibers, reach the cerebellum through the ICP by 2 routes: A. Ventral external arcuate fibers: to the cerebellum from the same side. B. Stria medullaris of the 4th ventricle: to the cerebellum from the opposite side. 💡 	<ul style="list-style-type: none"> - They project Vestibulo-cerebellar fibers by 2 routes: A. Direct: from vestibular N B. Indirect: from vestibular nuclei
Enter the cerebellum through the inferior cerebellar peduncle						
Function	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <p>Cuneate → upper limb Gracile → lower limb</p> </div>	Coordination of movement	Cerebellar control of movement	<ul style="list-style-type: none"> - Reticular Activating System "RAS": responsible for the electrical activity of the cerebral cortex. It is important for alertness & arousal from sleep. - Motor Function: influences muscle tone. The medullary and pontine reticulospinal tracts facilitate the flexor & extensor muscles, respectively. - Autonomic Function: contains respiratory & cardiovascular centers. 	---	---
Lesion	---	---	Cerebellar ataxia	---	---	---

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③ Cranial Nerve Nuclei "HAV ² TS ² "															
2 Sensory		2 Motor			2 Parasympathetic		2 Vestibular								
Spinal Nucleus of Trigeminal 5, 7, 9, 10		Nucleus Solitaries 7, 9, 10		Nucleus Ambiguous 9, 10, 11	Hypoglossal Nucleus 12	Inferior Salivatory Nucleus 9	Dorsal Motor Nucleus of Vagus	Medial and Inferior Vestibular nuclei							
Site	In medulla Ascends to pons Descends to C3 of spinal cord.			Upper part CN 9	middle part CN 10	Lower part CN 11	Floor of the 4 th ventricle. 	Floor of the 4 th ventricle. 							
Input	- It mediates : 1) pain 2) temperature 3) light touch ↓ from the same side of the face, oral cavity and external ear via CN 5, 7, 9, 10	Upper 1/3	Receives taste sensation from the tongue via (7th, 9th & CN 10).	Describe motor nuclei of cranial nerve in medulla???			Describe parasympathetic nuclei of cranial nerve in medulla???		<table border="1"> <tr> <td>Pons</td> <td>Sup</td> <td>Lat</td> </tr> <tr> <td>Medulla</td> <td>Inf</td> <td>Med</td> </tr> </table>	Pons	Sup	Lat	Medulla	Inf	Med
Pons	Sup	Lat													
Medulla	Inf	Med													
Lower 2/3	Receive a general sensation from viscera supplied by CN 9, 10														
Output	Axons cross to the opposite side and form trigeminal lemniscus which end in the VPMN of thalamus.	Axons cross the opposite side & terminate in the thalamus													
Function	Describe sensory nuclei of cranial nerve in medulla???			Supply all muscles of pharynx, larynx, palate EXCEPT tensor palatai muscle	supply all muscles of the tongue EXCEPT palatoglossus muscle	Supplies the parotid gland through the 9 th cranial "PI"	Supplies the glands, smooth muscles and blood vessels of the thoracic & abdominal viscera via 10th cranial nerve	Maintain balance & equilibrium							

Nice to know الغي يعم

	Medial Medullary Syndrome	Lateral Medullary (Wallenberg Syndrome)																						
Synonymous	Anterior spinal artery syndrome	Posterior Inferior Cerebellar Artery [PICA] Syndrome																						
Cause	obstruction of anterior spinal artery	obstruction of Posterior Inferior Cerebellar Artery [PICA]																						
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Internal structures of pons			
Basis pontis		Tegmentum	
Site	Anterior part of Pons		Posterior part of Pons
Fibers / Tracts	1) Bundles of the pyramidal tract fibers: Corticospinal fibers and Corticobulbar fibers 2) Transverse pontine fibers: axons of pontine nuclei → Cerebellum 3) Fibers of the middle four cranial nerves: on their way outside the pons		1) 4 lemnisci: <ul style="list-style-type: none"> - Medial lemniscus “G,C” - Trigeminal lemniscus - Spinal lemniscus - Lateral lemniscus. 2) Medial longitudinal fasciculus (MLF): <ul style="list-style-type: none"> - connects the vestibular nuclei with motor nuclei that move the eyes (CN 3, 4 & 6) - To coordinate the eye movements  3) Other tracts: e.g: tectospinal, rubrospinal, central tegmental tract and other tracts
Nuclei	- Pontine nuclei: 2nd order neurons of the cortico-Ponto-cerebellar Pathway.		- Nuclei of the middle 4 cranial nerves: 5th, 6th, 7th and 8th - Pontine reticular formation
Lesion	Basal Pontine Syndrome		Tegmental Pontine Syndrome
	Caudal	Rostral	
Cause	Due to the occlusion of paramedian branches of basilar A	Due to the occlusion of short circumferential branches of basilar A	Due to the occlusion of long circumferential branches of basilar artery

6th CN nucleus + 7th CN fibers
 = **Facial Colliculus**