

# Brainstem & Spinal Cord Syndromes

Bilateral

Ipsilateral

Contralateral

| Syndrome  | Affected Artery / Cause  | Location of Lesion                           | Motor Deficits  | Sensory Deficits  | Cranial Nerve Involvement  | Other Findings                                     |
|---|--|--|---|---|--|--|
| <b>Central Cord Syndrome</b>  | Occlusion of <u>anterior spinal artery</u><br>(hyperextension of neck) | Central spinal cord (mostly cervical region) | <b>Bilateral</b> weakness, <b>upper</b> > lower limbs<br>⬆️ | <b>Bilateral</b> loss of pain & temperature sensation   | ---  | Bladder dysfunction                                |
| <b>Medial Medullary Syndrome (Dejerine's Syndrome)</b>                    | Occlusion of <u>anterior spinal artery</u>                             | Medial medulla<br>By pyramids                | <b>Contralateral</b> hemiparesis (corticospinal tract)      | <b>Contralateral</b> loss of proprioception, fine touch, vibratory sense (medial lemniscus)                                 | <b>Ipsilateral</b> tongue deviation when protruded (hypoglossal nerve) 🗑️  | Alternating hemiplegia ⚠️                          |
| <b>Lateral Medullary Syndrome (Wallenberg's Syndrome / PICA Syndrome)</b> | Occlusion of <u>PICA</u>   | Lateral medulla                              | ---   | <b>Contralateral</b> loss of pain & temperature from body<br><br><b>Ipsilateral</b> loss from face                          | -Hoarseness, dysphagia (nucleus ambiguus) 🗑️<br><b>-Ipsilateral</b> Horner's syndrome (hypthalmospinal fibers)<br>-Vertigo & nystagmus (vestibular nuclei) eye muscles | Loss of taste ( <b>Ipsilateral</b> half of tongue) |
| <b>Vascular Lesions of Posterior Spinal Artery</b>                        | Occlusion of <u>posterior spinal artery</u>                            | Dorsal spinal cord                           |   | <b>Ipsilateral</b> loss of proprioception & vibratory sense (PCML), <b>Ipsilateral</b> loss of pain & temperature from face |  |  |

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| <b>Foville Syndrome</b>         | Occlusion of <u>paramedian branches of basilar artery</u>           | Lower pons   | <b>Contralateral</b> hemiparesis (corticospinal tract) | <b>Contralateral</b> sensory loss (variable) damage to medial lemniscus       | <b>Ipsilateral</b> abducens nerve paralysis (lateral rectus weakness) 🙄➡️                             |  |
| <b>Millard-Gubler Syndrome</b>  | Occlusion of basilar artery ( <u>lateral</u> shift)                 | Lower pons   | <b>Contralateral</b> hemiparesis (corticospinal tract) |   | <b>Ipsilateral</b> facial paralysis (facial nerve) 😊  |  |
| <b>Midpontine Base Syndrome</b> | Occlusion of <u>paramedian &amp; short circumferential branches</u> | Mid pons   | <b>Contralateral</b> hemiparesis (corticospinal tract) | <b>Ipsilateral</b> loss of pain & temperature (face) (trigeminal nerve)       | <b>Ipsilateral</b> masticatory muscle weakness (trigeminal motor nucleus) 🗣️                          | Ataxia (middle cerebellar peduncle)  |
| <b>Weber Syndrome</b>           | Occlusion of <u>medial midbrain vessels</u>                         | Midbrain ( <u>Crus cerebri + Oculomotor nerve</u> )    | <b>Contralateral</b> hemiparesis (corticospinal tract) |   | <b>Ipsilateral</b> oculomotor palsy (ptosis, dilated pupil, eye down & out) 🙄➡️                       | <b>Contralateral</b> lower face weakness 😊<br><b>Contralateral</b> tongue deviation 🗣️ |
| <b>Claude Syndrome</b>          | Occlusion of vessels serving <u>central midbrain</u>                | Midbrain ( <u>Red nucleus + Oculomotor nerve</u> )     |  | <b>Contralateral</b> ataxia, tremor, incoordination (red nucleus involvement) | <b>Ipsilateral</b> oculomotor palsy dilated pupil, eye down & out – lateral rectus + superior oblique |  |
| <b>Benedikt Syndrome</b>        | Occlusion of <u>central &amp; medial midbrain arteries</u>          | Midbrain (Crus cerebri, Red nucleus, Oculomotor nerve) | <b>Contralateral</b> hemiparesis (corticospinal tract) | <b>Contralateral</b> ataxia, tremor, incoordination (red nucleus)             | <b>Ipsilateral</b> oculomotor palsy 🙄➡️ ( same above )  | <b>Combination of Weber + Claude</b>   |



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| <b>Tonsillar Herniation</b>         | -Increased ICP (tumor, hemorrhage)<br>- damage <u>ventrolateral</u> reticular area | Cerebellar tonsils pressing on medulla downward to foramen magnum | Variable motor deficits   | Variable sensory deficits                        |  | Severe respiratory & cardiac instability, loss of consciousness, possible death 🧠, hyperventilation, hypertension |
| <b>Arnold-Chiari Malformation</b>   | <u>Congenital</u> tonsillar herniation   | Cerebellar tonsils + Medulla through foramen magnum               | Possible progressive motor deficits   | Possible progressive sensory deficits            |  | May be <b>asymptomatic early</b> , surgical treatment is available 🏥  |
| <b>Central Herniation</b>           | Increased ICP (supratentorial mass lesion)   | Diencephalon pressing down through midbrain tentorium             | <u>Decorticate</u> then → Decerebrate posturing                             | Profound sensory loss                            |  | Respiratory dysfunction, loss of consciousness, eye movement irregular, tachypnea, apnea                          |
| <b>Upward Cerebellar Herniation</b> | Mass in posterior fossa → Upward shift <u>tentorial notch</u>                      | Cerebellum compressing midbrain                                   | Ataxia, motor deficits by occlusion superior cerebellar artery              | Obstruction of Cerebral aqueduct + hydrocephalus |  | Risk of hydrocephalus, increased ICP, vomiting, lethargy 🤢  |
| <b>Uncal Herniation</b>             | Temporal lobe (anteromedial) herniation over tentorium                             | Uncus pressing on midbrain  | <u>Contralateral</u> weakness (corticospinal tract) weakness of extremities |  | <u>Ipsilateral</u> oculomotor palsy, dilated pupil, abnormal eye movements, double vision 👁️ | Later : Progresses to respiratory failure   |