PCS
CHEAT SHEET

# Posterior Circulation Stroke

*Vascular Anatomy for ED Clinicians*

**▸ Why anatomy matters in the ED**

Posterior circulation strokes cause dizziness in ~25% of AVS presentations — and early CT is falsely negative in up to 50% of posterior fossa infarcts. Knowing the territory predicts the syndrome and guides urgent imaging.

## Key Vessels & Territories

| Vessel | Territory & Structures |
|---|---|
| **Vertebral artery (VA)** | Lateral medulla; posterior inferior cerebellum via PICA; posterior spinal cord |
| **PICA** | Dorsolateral medullary syndrome (Wallenberg); inferior cerebellum / vermis |
| **Basilar artery** | Pons + midbrain; cranial nerve nuclei III–VIII; corticospinal tracts |
| **AICA** | Lateral pons + anterior inferior cerebellum; cochlea + labyrinth (labyrinthine artery) |
| **SCA** | Superior cerebellum + superior pons; coordination tracts |
| **PCA** | Occipital lobe + thalamus + midbrain; top-of-basilar syndrome |

## Territory-to-Syndrome Map

| Syndrome | Vessel | Classic Presentation |
|---|---|---|
| **Wallenberg (lateral medullary)** | PICA or VA | Ipsilateral facial numbness + contralateral body numbness; Horner's; dysphagia; ataxia; vertigo — NO limb weakness |
| **AICA audiovestibular** | AICA | Sudden hearing loss + vertigo; ipsilateral facial weakness; HIT may be ABNORMAL (mimics neuritis) — stroke trap |
| **Locked-in syndrome** | Basilar (complete) | Quadriplegia + anarthria; preserved vertical gaze and blink; fully conscious — frequently missed |
| **Top-of-basilar** | Basilar (rostral) | Altered consciousness; vertical gaze palsy; vivid hallucinations; amnesia |
| **Cerebellar infarct** | PICA, AICA, or SCA | Vertigo + severe truncal ataxia; cannot stand; normal HIT; deterioration at day 2–4 (oedema) |

## AICA Stroke — The HINTS Trap

**▸ AICA territory stroke can mimic vestibular neuritis**

The labyrinthine artery arises from AICA — AICA infarct causes sudden hearing loss + vertigo and may produce an ABNORMAL head impulse, mimicking peripheral vestibular disease.
HINTS Plus: add audiometry. New unilateral hearing loss with acute vertigo = stroke workup even if HIT is abnormal.
Diplopia, facial palsy, or limb ataxia alongside vestibular symptoms = AICA until proven otherwise.

# Posterior Circulation Stroke — *continued*

## Imaging Decisions

| Modality | Role | Limitation |
|---|---|---|
| **CT head (non-contrast)** | Immediately available; excludes haemorrhage | Sensitivity less than 50% for posterior ischaemia in first 24 h — negative CT does NOT exclude stroke |
| **CT angiography** | Identifies basilar occlusion; fast; wide availability | No sensitivity for small brainstem infarcts |
| **MRI DWI + FLAIR** | Gold standard; sensitivity greater than 95% after 24–48 h | Sensitivity 70–80% in first 24 h; not always immediately available |

## Time-Critical Actions

| Action | Timing | Detail |
|---|---|---|
| **Stroke team activation** | Immediate on suspicion | Do not wait for imaging if HINTS is central or basilar symptoms present |
| **IV thrombolysis** | Within 4.5 hours of onset | Door-to-needle target 60 min; applicable to posterior ischaemic stroke |
| **Mechanical thrombectomy** | Up to 24 hours (basilar) | CTA first; neurointerventional team; high posterior fossa benefit |
| **Antiplatelet loading** | Within 24 h if not thrombolysed | Aspirin 300 mg + clopidogrel 75 mg x 21 days (POINT trial) |
| **Reverse anticoagulation** | If haemorrhage confirmed | Warfarin → Vit K + PCC; DOAC → specific reversal agent |

## Red Flag Symptoms

| Red Flag | Significance |
|---|---|
| **Normal HIT in acute continuous vertigo** | Most sensitive HINTS sign of posterior fossa stroke in AVS |
| **Direction-changing or purely vertical nystagmus** | Central — cerebellar or brainstem involvement |
| **Skew deviation (positive cover test)** | Brainstem lesion |
| **Sudden severe occipital headache + vertigo** | Cerebellar haemorrhage or SAH — CT urgently |
| **Neck pain + Horner's + vertigo** | Vertebral artery dissection — CTA urgently |
| **New unilateral hearing loss + vertigo** | AICA territory infarct — HINTS Plus; stroke workup |
| **Bilateral limb weakness / quadriparesis** | Basilar occlusion — immediate CTA; thrombectomy team |

## Documentation

| Element | Record |
|---|---|
| **HINTS result** | Each component; peripheral or central pattern explicitly stated |
| **Audiometry** | Finger rub both ears; asymmetry noted |
| **Onset time** | Last known well — critical for thrombolysis (4.5 h) and thrombectomy (24 h) |
| **Vascular risk factors** | HTN, DM, AF, prior TIA/stroke, anticoagulation |
| **Imaging result** | CT — haemorrhage excluded; MRI arranged or deferred with rationale |