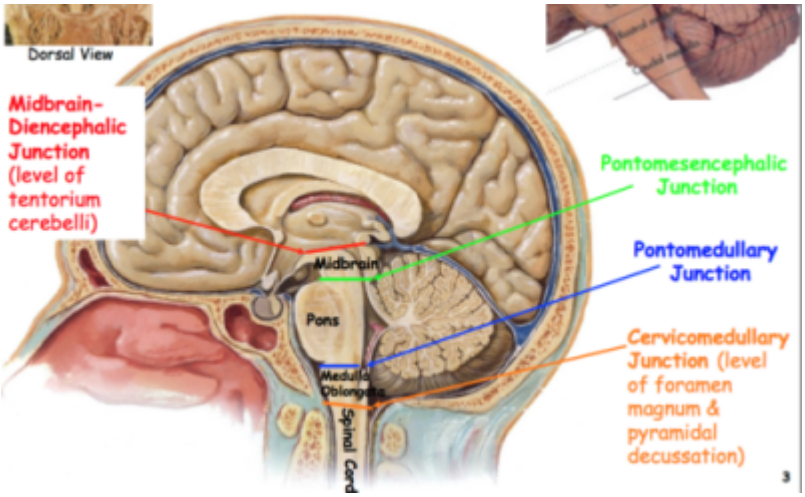
Pontomedullary junction



The term pontomedullary junction refers to the boundary of the pons and the medulla oblongata where the abducens nerve, the facial nerve and the vestibulocochlear nerve join the hindbrain.

The motor nucleus of the seventh nerve is located at the pontomedullary junction.

PICA origin ranges from as low as the foramen magnum to as high as the pontomedullary junction.

Brun’s nystagmus: lesion in the pontomedullary junction (PMJ)

The purpose of this study is to investigate changes in autonomic activities and systemic circulation generated by surgical manipulation or Electrostimulation to the human brain stem.

Hamasaki et al. constructed a system that simultaneously recorded microsurgical field videos and heart rate variability (HRV) that represent autonomic activities. In 20 brain stem surgeries recorded, HRV features and sites of surgical manipulation were analyzed in 19 hypertensive epochs, defined as the periods with transient increases in the blood pressure. We analyzed the period during Electrostimulation to the pontomedullary junction, performed for the purpose of monitoring a cranial nerve function.

In the hypertensive epoch, HRV analysis showed that sympathetic activity predominated over the parasympathetic activity. The hypertensive epoch was more associated with surgical manipulation of the area in the caudal pons or the rostral medulla oblongata compared to controls. During the period of Electrostimulation, there were significant increases in blood pressures and heart rates, accompanied by sympathetic overdrive.

Conclusions: Our results provide physiological evidence that there is an important autonomic center

located adjacent to the pontomedullary junction.

A large study would reveal a candidate target of neuromodulation for disorders with autonomic imbalances such as drug-resistant hypertension [1].

1)
Hamasaki T, Yamakawa T, Fujiwara K, Harashima H, Nakamura K, Ikuta Y, Yamamoto T, Hasegawa Y, Takezaki T, Mukasa A. Sympathetic hyperactivity, hypertension, and tachycardia-induced by stimulation of the pontomedullary junction in humans. Clin Neurophysiol. 2021 Mar 24:S1388-2457(21)00473-9. doi: 10.1016/j.clinph.2021.03.006. Epub ahead of print. PMID: 33867252.