

Current concepts of the vestibular system reviewed: 1. The role of the vestibulospinal system in postural control

Current Concepts of the Vestibular System Reviewed: 1. The Role of the Vestibulospinal System in Postural Control

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Abstract

This paper reviews the research findings that support the presence of vestibulospinal reflexes in corrections for head and body instability. Studies of the importance of labyrinthine inputs to the central nervous system organization of eye, head, and body movements demonstrate that the vestibular nuclei are more than a simple relay station for labyrinthine activity. At all levels of the vestibular system beyond the primary vestibular afferents, parallel processing of labyrinthine signals occurs with input from other sensory systems. Thus, output of the vestibular nuclear complex (VNC) is not equivalent to the labyrinthine input. It is the VNC output that influences motor behavior. Various sensory inputs are available to the nervous system to detect and correct postural instability. Most notably, vestibular, visual, and proprioceptive signals contribute significantly to the stabilizing responses in humans. The intent of this paper is to review experimental results rather than to discuss treatment interventions. Wherever possible, conclusions are drawn as to the clinical implications of current research findings.

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