

Blood-labyrinth barrier and fluid dynamics of the inner ear.

[Juhn SK](#), [Hunter BA](#), [Odland RM](#).

[Int Tinnitus J](#). 2001;7(2):72-83.[Links](#)

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Department of Otolaryngology, University of Minnesota Medical School,
Minneapolis, Minnesota, USA. juhn001@tc.umn.edu

Under normal conditions, the inner ear possesses remarkably stable homeostatic mechanisms for the maintenance of functional integrity of the inner ear fluid. The inner ear fluid maintains its homeostasis by a variety of regulatory mechanisms such as an ion transport system, a blood-labyrinth barrier, and a constant blood supply. Highly regulated transport of ions into and out of the inner ear provides for the maintenance of inner ear fluid composition necessary for auditory transduction. Any disturbance in one of these mechanisms can disrupt homeostasis expressed by ionic, osmotic, or metabolic imbalance between the compartments. Free radicals, stress hormones, noise exposure, and aminoglycoside antibiotics may induce short- and long-term effects on cellular function of the auditory or vestibular system (or both) and serve as a triggering mechanism for abrupt functional disturbances of inner ear fluid ion homeostasis. In this article, we present a comprehensive review of the mechanisms underlying inner ear fluid homeostasis necessary for normal auditory function and factors that can disrupt homeostasis and lead to functional disturbances, namely sensorineural hearing loss, tinnitus, and vertigo.