

Describe the components of the middle ear.

The middle ear (also known as the tympanic cavity), contains three very small bones, the malleus (“hammer”), incus (“anvil”) and the stapes (“stirrup”). These pick up and amplify the sound waves passing through the tympanic membrane, before the sound passes into the cochlea. The tensor tympani muscle attaches to the malleus and increases tension on the eardrum, and the stapedius muscle attaches to the stapes and limits its motion. It is the smallest muscle in the body.

How is balance transmitted from the semicircular canals to the brain? Is this static or dynamic equilibrium?

There are three semicircular canals: one is vertical, one is horizontal and one travels from the anterior to the posterior sides of the body (I don't know any better way to put it). These three can detect motion in any direction. When you move, the liquid in these canals moves also, disturbing cilia which are also in the canals. This motion produces nerve impulses that are sent to the ends of the canal, where there is a swelling (ampulla) connected to a crista which sends nerve fibers to the vestibulocochlear nerve, which of course carries the nerve signals up to the brain. The canals detect dynamic equilibrium.