

# Proprioceptive senses



# Body movement and position

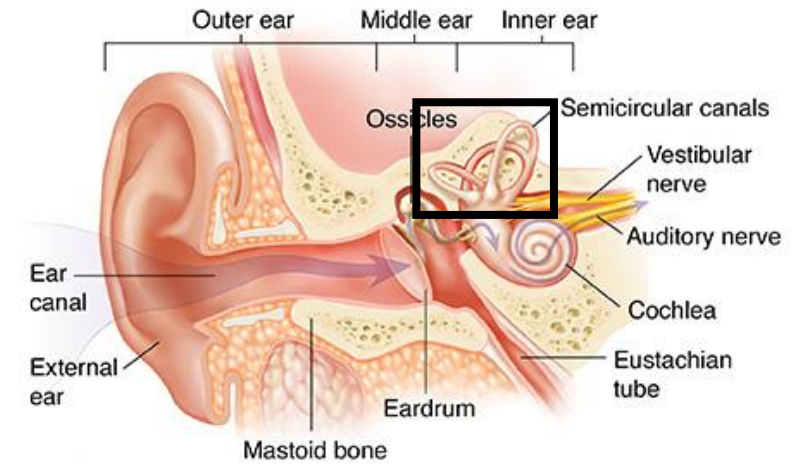
*Vestibular system:* provides information about the position of the body in space (orientation), head position and self motion. This information is used to understand where the body is in space and help us maintain our balance.

*Proprioception:* provides information about the position of parts of the body and muscle tension.

These senses are not independent of each other and also integrate with other sense like vision to provide a representation of where we are in space.



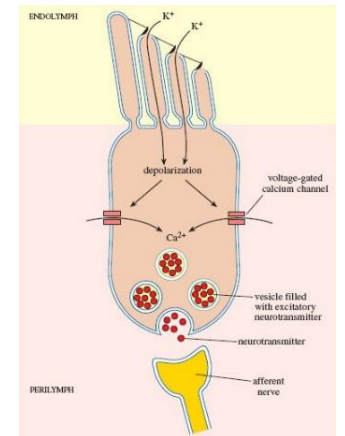
# Vestibular system



An important cue from the vestibular system comes from the semicircular canals in your ear.

These three canals are positioned at right angles to each other. This formation means that movement can be captured in each of these three directions. For example, head nodding, shaking side-to-side, and bending the head left-to-right can be separated.

Each of the canals contains a small amount of fluid that is displaced when you move. There are hair cells which can be agitated by the movement of fluid.



# Proprioception

Nerve endings in the muscles, tendons, and joints

This information is used to represent the current state of the body (e.g. hand extended or hand resting in lap), and this is helpful for planning and executing movements of the body.



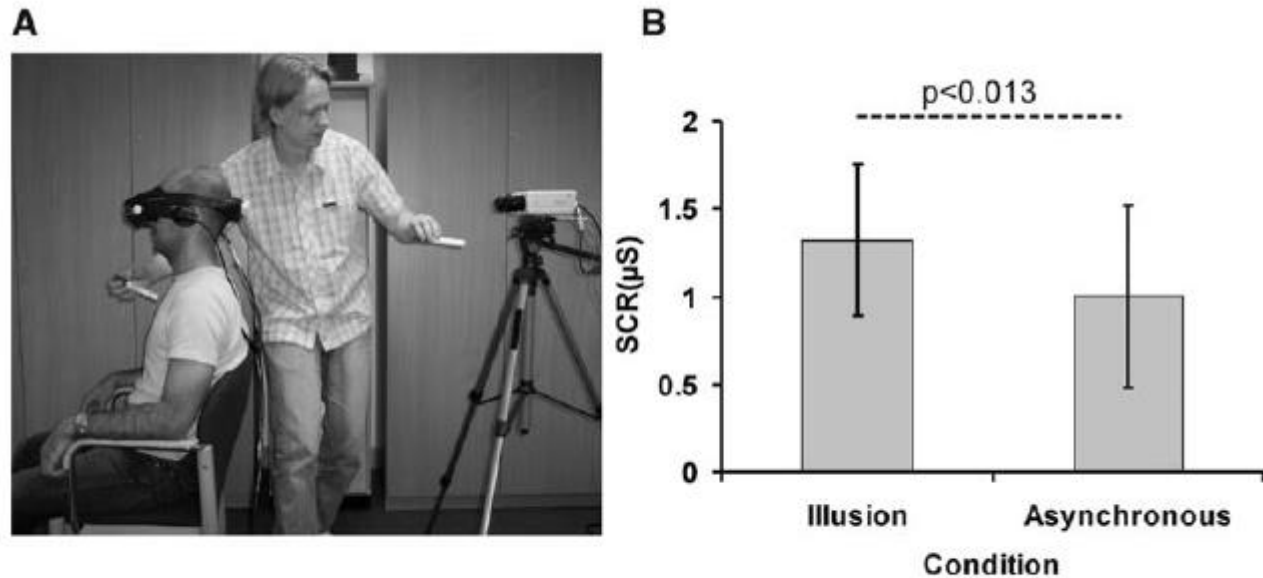
# Interesting stuff (not examinable)

## Alien hand syndrome

- These people have involuntary movements of their left hand (and less frequently other limbs), including reaching and manipulating objects
- Some patients believe that their hand is not theirs and feel persecuted by it
  - Sometimes the alien hand works against the hand which is in control
- Generally from neurological damage



# Interesting stuff 2



**Fig. 1.** (A) The setup used to induce the out-of-body illusion. (B) The SCRs from the 12 participants when the illusory body was "hurt." Mean values and standard deviations (error bars) are presented.

(Ehrsson, 2007)

You can trick yourself to think you are in another body!

