Notes: Ear Anatomy

## Outer Ear

**Outer ear:**

- Made up of the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**



**Pinna** (also called the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**)

* The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**of the ear
* Shaped like a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** to pick up sound and carry it into the auditory canal

**Auditory canal**

* 2.5 cm long canal that **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**to the eardrum
* Lined with **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
	+ The glands produce **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Importance of earwax** (**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**):

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** the skin of the human ear canal, assists in **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and lubrication, and also provides some protection from **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.

**Why the hairs?**

* The hairs act like a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** to help trap material and prevent it from entering the ear

## Middle Ear



**Tympanic membrane (ear drum)**

* A thin, flexible and fibrous **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** about 1cm in diameter
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** when sound waves come in contact with it
	+ Turning sound waves into **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Ossicles**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**located in the temporal bone
* Made up of 3 bones:
	+ Hammer
	+ Anvil
	+ Stirrup
* The hammer (**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**)
	+ Touches the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**and moves as a response to the movements of the eardrum
	+ It then hits the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* The anvil (**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**)
	+ The anvil **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** vibrations from the hammer to the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* The stirrup (**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**)
	+ the stirrup **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**vibrations from the anvil to the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (another membrane)

**Eustachian tube**:

* The canal that links the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**to the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (throat)
* Allows for **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**on either side of the eardrum by swallowing
	+ There is **\_\_\_\_\_\_\_\_\_\_\_\_\_**on either side of the ear drum that can be at different pressures
	+ The Eustachian tube is **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**but can be opened to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**in order to equalize the pressure on both sides
	+ The Eustachian tube also allows for **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** to drain from the middle ear during allergies or an infection; this **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**can also lead to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Why do you sometimes have trouble hearing when you have a cold?**

* The build up of mucus can **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**of air between the middle ear and throat and thus decrease the ability of the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**or **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** to conduct sound properly.

## Inner Ear



**Semi-circular canals:**

* 3 sets of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**tubes
* Help in **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** when the body is in **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Vestibule:**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**structure that links the semi-circular canals to the cochlea
* Helps with balance when the body is in a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** position
* Linked to the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Cochlea:**

* Liquid-filled structure lined with hair-like **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* Connected to the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* The auditory nerve then transmits nerve impulses to the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**of the brain
	+ Remember from our notes on the brain?

## Hearing Loss

**Two main types of hearing loss**:

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Conduction deafness**:

* Conduction deafness occurs when there is a problem **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* It is a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**problem

*Where does conduction deafness occur?*

* Conduction deafness can occur anywhere along the route that sound travels. This can be in the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, the tympanic membrane (**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**) or in the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (damage to ossicles).
* It could also occur due to a build up of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** or **\_\_\_\_\_\_\_\_\_\_\_** (in an ear infection)

**Nerve deafness**:

* Occurs when there is damage done to or abnormalities in the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**or the processing centres in the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Presbycusis:**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**hearing loss that results from damage to the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in the cochlea
	+ Ability to hear **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**is the first to go usually

## Organs of Balance



The organs of balance:

* The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (3)
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**:
	+ Made up of the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

The organs of balance are again filled with fluid and lined with hair-like receptors that detect **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Vestibule**

* The saccule and utricle are filled with a jelly-like fluid (**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**) that contains small particles called **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
	+ Otoliths are small particles of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**in the jellylike substance filled inside the saccule
* When the head moves, the particles move in response to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (so if you move your head down, the particles would move down) and this triggers **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** which **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**to the brain, letting it know the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**of the head.

**The Semi-Circular Canals**

* The semicircular canals help you to respond to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
	+ like starting, stopping and turning
* The canals are set at right angles to one another and on **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**. The canals are filled with liquid and lined with **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** that respond to the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
	+ The brain will recognize which impulses are coming from which canal and therefore lets it know **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**your head is moving.