# Tinnitus SA

## Hearing Loss and Tinnitus

### How we hear

Our hearing system can be divided into three main parts: the external (E), middle (M) and inner (I) ears. These link to the brain via the auditory nerve.

The external ear (E) consists of the pinna (the part visible on the outside of the head), ear canal and ear drum. This section is also referred to as the outer ear and it acts as a sound funnel. The outer ear canal wall produces cerumen, or wax, which moves towards the outside. Wax protects the ear, removing foreign bodies and germs from the ear canal and away from the ear drum.

The middle ear (M) is an air filled space containing a chain of 3 tiny bones called the ossicular chain. The 3 bones (ossicles) are called the malleus, incus and stapes. The malleus is the first bone in the chain. It is attached to the back of the ear drum on one end and to the incus on the other. The incus attaches to the stapes, which rests in the oval window of the inner ear. The middle ear is connected to the back of the nose and throat via the Eustachian tube. This tube maintains equal air pressure between the middle ear and the air around us. The eardrum and the ossicular chain vibrate in response to sound waves entering the ear.

The inner ear (I) consists of the cochlea, a small snail-shell shaped organ set within the bone of the skull. The cochlea contains fluid and tiny hair cells which vibrate in response to the movements from the middle ear, and stimulate thousands of nerve endings in the auditory nerve. The auditory nerve travels through the skull, carrying sound messages to the brain, which decides what the sound is. The inner ear also contains the semi-circular canals, which contribute to one's sense of balance.

Messages from the ear travel up the auditory nerve pathways to the brain, where sounds are perceived and interpreted. Along the way, other nerve pathways communicate with the auditory pathway to help us associate sounds with memories and emotions.

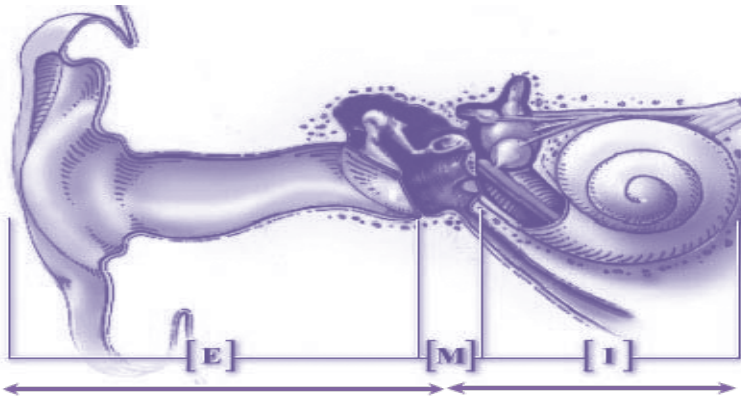
### Hearing loss

Hearing requires sound to travel through the outer and middle parts of the ear to the nerve endings in the inner ear. When there is a breakdown in the passage of the sound to the inner ear it is called a conductive hearing loss. When the disorder is in the inner ear or the auditory nerve it is termed a sensorineural hearing loss. If either the outer or middle ear and inner ear are affected, it is termed a mixed hearing loss.

### About Tinnitus SA

Tinnitus SA is a web based tinnitus information service designed to provide awareness, factsheets and information about management options for people with tinnitus and health professionals alike. Tinnitus SA services are provided by non-profit South Australian Audiology business Can:Do Hearing on behalf of the South Australian Government.

**tinnitussa.com.au**

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Lightens the load

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**Conductive hearing loss:** Many things can cause a conductive hearing loss, including wax blockage in the ear canal, a hole in the ear drum, infection in the middle ear, or disease of, or damage to, the tiny bones of the middle ear. Conductive hearing loss can also occur with other nose or throat problems.

**Sensorineural hearing loss:** The inner ear or auditory nerve can be damaged by loud noise exposure, viral and bacterial infections, some diseases, some prescribed medications, head injury, blood vessel problems and the aging process. These conditions can lead to sensorineural hearing loss.

Three significant symptoms of hearing loss include:

- Loss of the ability to hear soft sounds, e.g. quiet voices, the bell on the microwave. This is particularly noticeable when there are other sounds present
- Loss of sound clarity, "I can hear people talking but I can't make out the words"
- Increased sensitivity to loud sounds, some people find loud sounds intolerable.

### Tinnitus

Tinnitus can be defined as an individual's perception of a sound when there is no actual external sound present. Tinnitus perception varies greatly between individuals, but it's often described as a ringing, buzzing. hissing, roaring, clicking, or pulsing sound. It can be perceived in one ear, both ears and sometimes alternate between the ears. Some people may notice their tinnitus many times a day whereas others notice it seldom. People's perception, awareness and reaction to tinnitus vary greatly within the population.

Individuals with tinnitus tend to be most aware of it in quiet environments, such as when they go to bed or get up in the morning, as there is less external sound masking the internal noise of the tinnitus.

Tinnitus is not a disease, but rather a symptom of something wrong with or affecting the auditory system. It is a complex condition that can involve many structures in the head neck ear and brain. We do know that hearing loss is often associated with tinnitus (but not always).

### Hearing loss and tinnitus

In many cases, there is a strong correlation between hearing loss and tinnitus. It is particularly common in people who have been exposed to high levels of noise in their jobs or recreational activities. In particular, people working in noisy industries such as manufacturing, manual labour, farming and the music industry can have noise damage to the inner ear, leading to noise induced hearing loss and tinnitus.

Approximately 20% of the Australian population experience tinnitus and 90% of those have hearing loss. So it is important that if you have tinnitus, you have your hearing assessed by an audiologist and be examined by a GP or Ear Nose and Throat Specialist (ENT). The information they provide will ensure that the appropriate treatment or management strategy can be recommended.

If tinnitus is a result of a conductive hearing loss (problems in the outer or middle ear) it is possible that with medical intervention it can be treated, but if secondary to a sensorineural loss (inner ear or nerve damage) it is not usually improved through medicine or surgery.

For tinnitus which cannot medically or surgically be treated there are a wide range of management options which may include using hearing instruments, sound therapy or noise generators, and counselling.

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### Contact Us

We would love to hear from you. For further information about our services and to discuss your needs please contact us on;

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Can:Do Hearing would like to acknowledge the work done to develop these factsheets by David May and Judith Boswell