Fluid in the middle ear (otitis media with effusion) is the most common cause of temporary or fluctuating conductive hearing loss. One in ten children will have acute otitis media at some time. Most children will have an episode of secretory otitis media. Children with sensori-neural hearing loss can also be affected. It is most common in young children up to six years of age because of the position, size and poorer function of the eustachian tubes.

**Acute otitis media (ear infection)**

This is a viral or bacterial infection in the middle ear. It can occur with colds, sore throats, influenza and other respiratory illnesses. Severe ear ache and a conductive hearing loss can occur.

**Secretory otitis media (Glue Ear)**

Glue Ear occurs when fluid collects in the middle ear space of one or both ears. Bacteria gets into the middle ear and causes an inflammation of the lining, often after a cold, throat or ear infection. The adenoids often swell, or tonsils become enlarged, blocking the eustachian tube and making the situation worse. The air which is trapped in the middle ear is absorbed by the surrounding cell lining and bony structure and a negative pressure is formed. To balance this negative pressure fluid from the cells drains in to fill up the space. The fluid is often quite thin and runny but in time may become thicker, like glue. If the fluid is infected, the tympanic membrane may burst and blood-stained pus run from the ear.

**Obvious signs of Glue Ear**

- mouth breathing and/or snoring at night (due to enlarged adenoids)
- speaking loudly or shouting, saying “eh?”, “pardon?” or “what?” more often
- turning volume up on television/failure to hear sounds that can’t be seen eg traffic
- fluctuating hearing or attention.

**Diagnosis**

Otoscopy gives a view of the condition of the tympanic membrane and tympanometry gives information about the movement of the tympanic membrane, whether there is glue in the middle ear and the state of the eustachian tube. Behavioural tests, pure tone audiograms, including bone conduction and speech discrimination tests all give extra information. The conductive hearing loss may well fluctuate and be mild or moderate in degree.

Sound waves hitting the tympanic membrane are normally conducted across the air-filled cavity of the middle ear by the ossicular bones. However, when the middle ear cavity is full of thick viscous fluid it is more difficult for the bones to move and the sound is therefore dampened. Everyone experiences this when they have a heavy cold and their hearing is affected.

**Treatment**

There is much controversy over the treatment of Glue Ear. It is often is short term and rarely has a permanent damming effect on the ear.

The condition may clear up by itself or a variety of treatments may be used:

- medication – antibiotics, decongestants, ear or nose drops
- homoeopathic remedies/dairy free diet
- cranial massage
- hearing aids
- myringotomy – the ‘glue’ is removed from the middle ear after piercing the ear drum with a syringe whilst under anaesthetic
- grommets or T-tubes – these are inserted into the tympanic membrane whilst the child is under anaesthetic. Tonsils and adenoids are sometimes removed at the same time. The grommet allows air to circulate within the middle ear and prevents further build up of glue whilst it is in place. Grommets are temporary and are eased out into the ear canal as the tympanic membrane heals. T-tubes are fitted in more persistent cases eg children with Downs Syndrome. These have to be removed under anaesthetic. Multiple insertion of grommets can badly scar the eardrum.
Effects of a conductive hearing loss caused by otitis media

- child may become quiet, withdrawn, irritable, tired and generally less communicative or alternatively child may be more active or physical
- child may use voice less frequently and take less notice of speech
- if child is already speaking, the speech may become less clear
- new words may not be learned and little progress made in the child’s speech and language development
- child may experience difficulty at school with literacy and numeracy skills
- child may become unsettled at nursery or school and feel left out of activities
- child may daydream and appear to hear selectively
- child may have poor listening skills due to inconsistent listening experiences.

A child who has recurring conductive hearing loss due to glue ear in the early years may experience hearing losses at times to a threshold of 60 to 70 dBHL. A young child who has consistently had poor hearing will not have the linguistic experience to predict words when heard inaccurately. This results in poor vocabulary and understanding of concepts when starting at nursery or infant school. A conductive hearing loss affects all speech frequencies. Poor speech discrimination of the voiceless fricatives in particular means that the markers for tense, number and possession are missed. The Literacy Hour and Numeracy Strategy in school concentrate on the early introduction of phonics and mental arithmetic. These learning objectives are particularly difficult for children with a fluctuating hearing loss, who may be mistaken for being unresponsive, disruptive or of limited ability.

Children’s hearing difficulties are often not identified until their speech and vocabulary do not develop at the normal rate. This may be noticed at home, nursery or infant school. It can affect cognitive, social and linguistic development, particularly for children who may have an additional learning difficulty.

1. Grommet

2. View of eardrum with grommet in situ

3. Cross section of ear: grommet in situ