The Ear

This organ has three parts:-

1) The outer ear – the part you can see and the ear canal leading down to the ear drum.
2) The middle ear – the ear drum, 3 ear bones, the air space behind the ear drum and the air entry tube (Eustachian tube)
3) The inner ear – inside the head where the nerve endings are for the organs of hearing and balance.

It is the middle ear which causes discomfort during air travel. Normally you swallow 5 times every minute and air passes up the back of the nose when you swallow and sometimes enters the eustachian tube which leads into the middle ear space. The air in the middle ear is constantly being absorbed by its lining so air keeps being replaced via the eustachian tube. In this way the air is kept at equal pressure either side of the ear drum allowing it to vibrate when sound enters your ear. If the air pressure on each side of the ear drum is not equal then you ears will feel blocked.

What causes the air pressure to not be equal?

The back of the nose can be blocked with the wet mucus. The lining at the back of the nose is the same as that in the mouth so if you have a “common cold” lots of stuffy wet secretions collect at the back of the nose and block off the entrance to the eustachian tube. When you swallow air cannot get to the opening of the tube and so no air is passed into the middle ear. The air already in the middle ear is absorbed and as not more air can get up the tube a vacuum occurs, sucking the drum inwards. This drum can then not vibrate effectively and sounds become muffled, also because the body does not like a vacuum it draws fluid from the lining if the middle ear in an attempt to overcome the vacuum this causes you to have “fluid in the ear” and feel more blocked.

The most common cause of blocking this tube is the “common cold” but another frequent problem is hay fever or nasal allergies. Children up to the age of 8 or 9 years have very small undeveloped eustachian tubes and consequently when they have stuffy noses they find difficulty getting enough air into their middle ear and this is the reason why many children have middle ear fluid and infections.

How air travel causes problems

When there is a change in air pressure outside the ear, the entrance to the eustachian tube has to be clear so that you are able to get air up the tube when you swallow to equalise the air both sides of the ear drum. Every time the air pressure outside the ear changes you must swallow or yawn again to open the tube and let air in at similar pressure. The greatest air pressure changes are noticed when an aircraft is in flight and the air pressure is higher nearer the earth. The changes as the plane descends causes a vacuum to form in the middle ear even faster than normal and there is more need to swallow more frequently and let air enter the middle ear. Some pressure changes are unavoidable especially if there is a sudden descent through hitting an air turbulence. You may have experienced similar problems when travelling by train through a tunnel or when diving or when driving in hilly country.

What will help?

Clearing the back of your nose is the main priority so that when you swallow, air can pass more easily into the eustachian tube. There are nasal sprays on the market which help clear the nose and these are useful for use an hour or so before descent but beware of making the use of these sprays a habit because after a few days of use they may cause the nose to become more congested than before. Use them just to clear the nose prior to descent. Nasal hygiene for a few days prior to travel will help children who may have nasal congestion.

Babies cannot equalise the air pressure as adults can and it may help if they are sucking on a bottle or dummy during the descent to encourage swallowing.

When your nose is clear of congestion just keep swallowing during descent, this is helped by chewing mints or gum. Yawning is a stronger activator of the tube opening and will help. Do not sleep during descent as you may not swallow enough to keep up with the pressure changes. Another way to unblock your ears is to force air into the eustachian tube by pinching your nostrils shut and then swallowing until your feel your ears “pop”. Don not use force from your stomach or chest to do this, it is sufficient to use pressure created only by your cheek and throat muscles.

Ear plugs – These will protect the outer ear from sudden pressure changes which in turn means that swallowing frequently is not so much required.

These may be helpful for smaller children. Pressure on the outer ear at the front will close off the outer ear canal for a short while which may also help in the short term.
Reversed problem It is important that the outer ear canal is not completely blocked if there is NO problem with your nose or eustachian tubes. This will cause a negative pressure in the ear canal and a positive pressure in the middle ear, which again could cause pain and discomfort, e.g. if your ear canal is full of wax or the ear plug fits tightly.

If your ears will not unblock

If these exercises and nasal drops do not help and pain persists you will need to seek medical advice.

Reference: Peter J Casano, American Academy of Otoloaryngology – Alexandra VA

For information in Primary Eye Care courses – please contact:

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EARS AND AIR TRAVEL

Ear problems are the most common medical complaint of air travellers. The problems may be just simple discomfort or can cause temporary pain and hearing loss. This leaflet will help you to understand the reasons for these ear problems and how they can be avoided or helped.