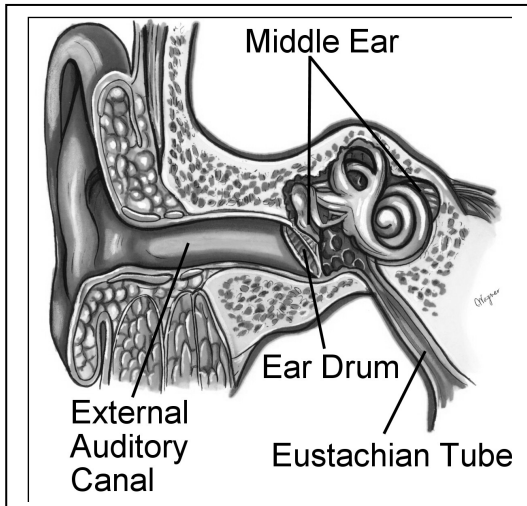


# Barotrauma (flying/ diving)



## WHAT IS BAROTRAUMA?

A pressure gradient develops across the ear drum when you ascend or descend in an airplane (or go scuba diving).

Normally the Eustachian tube allows equalization of this pressure (especially after yawning, swallowing or chewing gum). If you have a cold causing swelling in the nose and Eustachian tube, this equalization may not occur. Children have smaller Eustachian tubes and are more likely to have had a recent cold. During ascent, air will tend to bubble out once the pressure gradient is high enough whereas

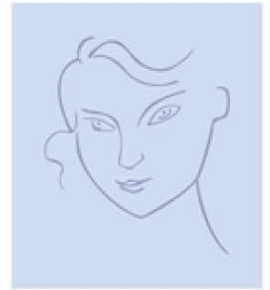
on descent the negative pressure will “suck” the Eustachian tube further closed causing a vicious cycle where you cannot equalize and the pressure gradient becomes worse.

In most cases, this may result in a full feeling in the ear, slight hearing loss and moderate discomfort which resolve within a few hours after landing. In severe cases, you may experience severe pain, longer lasting but non-permanent hearing loss from fluid accumulation or even bleeding from the ear (which may indicate ear drum perforation). The most severe cases (thankfully very rare) are of ear drum perforation or inner ear damage (causing instant severe dizziness and hearing loss that may be permanent).

The same pressure change can occur in the sinuses if you have had a sinus infection. This may cause pain but does not generally pose any risk of serious injury.

## HOW TO MINIMIZE THE RISK OF BAROTRAUMA.

1. Equalize your ears frequently as soon as you begin descent. Try yawning, chewing gum and swallowing saliva. Try to “pop” your ears by pinching your nostrils with your mouth closed and try to force air into the nose (like blowing with the nostrils held shut). Do not sleep on descent.
2. Try filtered ear plugs (eg Ear Planes ®), which are developed to slow the pressure change across the ear drum. These are available at airport gift shops and chemists. Put them in when you start take off or descent and leave them in for 30 minutes after landing.
3. Give young children a dose of paracetamol before boarding a plane.
4. Use a nasal decongestant (eg drixine/oxymetazoline) before flying (do not use this for more than 3 consecutive days as they may result in worsening of nasal swelling with prolonged use). This should be administered 15-30 minutes before take off and only repeated before landing if the flight is longer than 8 hours.
5. Treat allergies if you have them with oral antihistamine (eg fexofenadine 180mg/ day) at least an hour before flying.
6. Avoid flying immediately after a cold or sinus infection.
7. In severe cases or if the above measures do not provide sufficient relief, grommets may be inserted (tiny metal or plastic tubes surgically inserted into



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the eardrum to drain fluid and equalize pressure between the middle and outer ear).

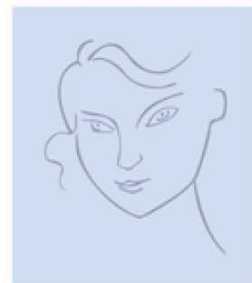
## RISKS OF GROMMETS

Usually the grommet tubes are safe and cause no trouble. Possible risks of grommet tubes are:

1. Drainage from the ear (10%)- usually can be treated with topical antibiotic drops (ciproxin 3 drops 3x/day for 1 week)
2. The grommet tube not fall out on it's own and require removal (5%)
3. The hole made by the grommet may not healing and requiring repair (2%)
4. Scarring on the ear drum afterwards (15%) usually does not affect hearing
5. Serious complications are fortunately rare and include such problems as hearing loss, ringing in the ears (tinnitus), skin cyst formation (cholesteotoma), bleeding or reactions to general anesthetic agents.

## CARING FOR GROMMET TUBES

Because the grommet tube opens a tiny hole between the outer and the middle ear, water can accidentally travel into the middle ear from the outside (soap makes this more likely). Children with tubes ideally should not get water into their ears- especially if the ears are draining. Earplugs should be worn in the bath and shower if possible. It is important that children still learn to swim but should be encouraged to wear earplugs (Doc's proplugs are best) and avoid diving deeply under water.



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