

## Aeromedical Advice for Aircraft Passengers

*Some of the more than one billion air passengers recorded last year might have benefited from these hints on safety and how to minimize the discomfort possible with air travel.*

For the last two years, the world's commercial air carriers have carried in excess of one billion passengers. And, at one time or another, a small percentage of them had discomfort associated with flight at the high altitudes.

In the following, we offer the views of two medical doctors related to safety in flight and to some common physiological problems that could be encountered by air passengers.

### Emergency procedures

In the event of a loss of cabin pressure, oxygen masks will drop in front of you; please extinguish your cigarette, place the mask in front of your nose and mouth and breathe normally.

How many times have you really paid attention to a cabin attendant's demonstration and directions?

Human beings have adjusted to life at or near sea level-equivalent altitudes and therefore exposure to altitudes beyond physiological limits can result in problems. This is the reason why technology has helped civil aviation by providing modern aircraft with excellent cabin pressurization systems which permit passengers, even those afflicted with minor ailments, to fly in relative comfort. However, in the event of failure of the pressurization systems, it may become necessary to use supplemental oxygen.

On your next trip, pay careful attention to the oxygen mask demonstration. Read the emergency procedures card. Remember the procedures.

### Emergency evacuation

Crash landing and/or water landings are extremely infrequent. However, in those cases,

the need for speedy and orderly evacuation is of paramount importance.

Pay careful attention to the instructions related to seat belts, life vests, emergency exit doors and evacuation procedures. Be sure to use your seat belt at all times while seated. Plan, in your mind, an escape route much as you would do for emergency planning at home.

### Ear Problems

The most common complaint experienced by passengers is ear discomfort. Despite the fact that modern technology permits pressurization systems to regulate the ascent and descent of the cabin pressure at rates compatible with normal physiological adaptation, ear problems may develop, particularly if the passenger has a cold.

Nasal congestion can lead to ear discomfort and/or, in some case, pain, usually upon descent. This is due to the differential pressure between the middle ear and the external ear (see the accompanying diagram), which

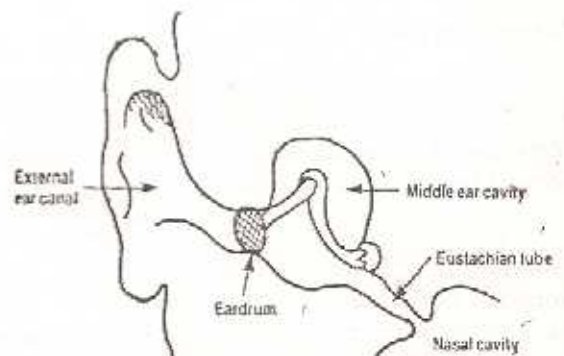


Diagram of the external and middle ear.

occurs with cabin pressure changes. When the aircraft is climbing, the pressure inside the middle ear is greater than the pressure in the surrounding atmosphere inside the cabin. Air is pushed outward through an opening (the Eustachian tube) until pressures on both sides of the ear drum are equivalent.



However, on descent, air must re-enter through the tubes. This may be accomplished by active manoeuvres such as swallowing or yawning. In infants, mother nature has provided a natural response by having the child cry in response to the discomfort, thereby opening the Eustachian tubes. Feeding an infant during descent may serve the same useful purpose.

When the crew announces the beginning of descent, be sure to swallow and/or chew a candy to permit the equalization of pressures inside and outside the drum.

The Eustachian tube, connecting the middle ear to the throat, ventilates the middle ear. The tube's opening to the middle ear is easily opened during ascent and pressure is ventilated to the nasal cavity. But the connection to the throat is usually closed during descent when pressure in the throat increases relative to that in the middle ear. Therefore, more effort is needed to ease discomfort.

If you fail to equilibrate, you may use what in medicine is called the Valsalva manoeuvre. To accomplish this, you should pinch your nostrils and blow forcefully; you will feel a clicking sensation in your ear drum and the discomfort will disappear.

### **Cabin Dryness**

Relative humidity in pressurized aircraft is very low. In some cases, the values approximate those found in desert regions. This can result in discomfort during a long flight.

Researchers have tried to differentiate between general dehydration of the human body produced by this environmental problem vs. local dehydration of the portions of the body exposed to the ambient air - for example, the membranes of the nose, eyes and mouth. Data available indicate that the majority of problems arise from peripheral and/or local dehydration. The dryness of the cabin may also produce discomfort for contact lens users. Dryness of the skin may be noticed.

During a long flight, drink water in sufficient quantities to minimize dehydration, probably about one drink per hour. For contact lenses,

either use artificial tears or remove them while flying. Use of a moisturizing agent or a neutral body cream may ease drying of the skin. Avoid dehydrating beverages such as alcohol, coffee or colas which contain caffeine.

### **Alcohol consumption**

In response to consumer demand and to create a more relaxed ambience in the cabin, most airlines serve alcoholic beverages. However, it should be pointed out that altitude potentiates alcohol effects. From a physiological point of view, this practice is not only non-beneficial but it may be harmful.

Since alcohol has a pharmacological effect on antidiuretic hormones, this results in a larger output of urine, thereby facilitating dehydration. In addition, there is an inconvenience factor; the increased amount of urine originates more frequent trips to the toilets. Thus, it is not uncommon when alcohol is served, to see lines of people in front of the cabin toilets awaiting their turn.

Restrict or suppress alcoholic beverages while flying; if desired, drink sufficient quantities of non-alcoholic fluids.

### **Swelling of the ankles**

During a long flight, sitting for many hours in the same position produces shifts in the body fluids, leading to swelling of the lower extremities. This is mostly due to immobility and gravitation factors. Although swelling of the ankles is not a painful occurrence, it might produce significant discomfort and could be serious if wearing a cast or if one has varicose veins. Exercise your feet and ankles frequently during a long duration flight. If at all possible, when conditions in the aircraft permit, walk up and down the aisle a couple of times. If you are wearing a cast or have varicose veins, consult your physician before flying.

### **Jet lag**

With the speed achieved by modern aircraft, leading to multiple time-zone shifts, a phenomenon described by scientists as desynchronosis or, more commonly, jet lag



occurs. A substantial amount of research has been conducted in trying to devise methods for relief of jet lag: diets, sleeping pills, exercise, acupuncture and/or their combination. Other means also have been proposed, such as pre- and post-flight adjustments in eating and sleeping, as the best solutions. Airlines have tried to solve this problem for their crews by providing accommodations in hotels where the time (daylight, night) mostly resembles home base. However, for practical considerations, most passengers are not able to use this system.

Many passengers have found relief from jet lag by planning a trip in three phases.

- *Pre-flight - One day ahead of your trip, adjust your schedule (i.e., meals, bedtime, etc.) one hour closer to the destination schedule.*
- *During flight - as soon as you board the aircraft, set your watch to the destination time. Avoid alcohol and dehydrating beverages; instead, drink the equivalent of a glass of water every hour or two. Avoid heavy, fatty foods. Sleep during the flight as much as possible.*
- *Arrival - Avoid the temptation of sleeping for prolonged periods. Try to plan your trip so that you do not have to work the first day of your visit. Be extra cautious when driving or crossing the street on foot.*

#### Fifty Years of Jet Age

Fifty years ago, August 27, 1939 saw the beginning of the revolutionary jet age: on that day, the first jet engine-powered He 178 made a historical flight as the test bed for this revolutionary engine concept.

On October 3, 1944 Germany's first jet fighter Me 262 began to enter operational service, but, ironically, three months after the Royal Airforce inducted its first jet fighter.

Comet, the first commercial jetliner, flew for the first time forty years ago, on July 27, 1949. It had accommodation for 36 passengers in two cabins. On May 2, British Overseas Airways Corporation, predecessors of British Airways, inaugurated the world's first jet service with Comet over London-Johannesburg route. With its cruising speed of 788 km/h, the Comet covered the distance of 10,821 km in less than 24 hours. Thus dawned a new era of jetliner transportation, reducing travel time to less than half. Russia's Tu-144 prototype made its first flight on December 31, 1968, the first supersonic commercial transport airliner to fly.

*Courtesy : Indian Aviation Vol. IV No. 1 pp 36 (1989)*

#### Airline Traffic to Double by 2000

International Civil Aviation Organisation (ICAO) has just issued long-term forecasts of scheduled passenger and freight traffic which indicate a doubling of traffic worldwide by the year 2000.

Total world passenger-kilometers flows on scheduled service is expected to grow at a 'most likely' rate of six per cent per annum over the 1988 to 2000 period, from 1,700 to 3,450 million, similar to the growth rate achieved over previous ten years.

International traffic is forecast to grow at a greater rate than domestic, seven per cent per annum compared with five per cent.

In terms of passengers carried, scheduled traffic worldwide is expected to grow from just over 1,000 million in 1988 to just under 2,000 million in the year 2000.

The European share of passenger traffic is anticipated to fall by over five percentage points to 25 per cent of total world traffic by the year 2000, while the Asia/Pacific region is expected to increase its share by about eight percentage points to reach 26 per cent by the year 2000.

*Courtesy : Indian Aviation Vol. IV No. 1 pp 37 (1989)*