

JET LAG

JET LAG AND MELATONIN

Jet lag symptoms are associated with the misalignment of the body's normal day/night rhythm. The body normally has a cycle in which melatonin (a natural hormone that aligns sleep cycles and other physiological functions) reaches peak blood levels at around 2 am. When crossing time zones, this peak needs to be adjusted (shifted) so that it always peaks at this time of the night. Because of the changed time zones, misalignment of the cycle occurs, giving many but not all travelers symptoms of jet lag. The range of symptoms include sleep disturbances, daytime fatigue, weakness, headache, sleepiness, and irritability. Most symptoms disappear by the fifth day after traveling across a 6-hour time zone. It is difficult to compensate for jet lag for trips shorter than 3 days and some would advise against attempting to do so.

One way of shifting the melatonin peak to its physiological position is to take melatonin tablets and push or pull the peak blood levels by timing the tablets appropriately. To use melatonin, the following schedule can be followed:

Eastward Travel

- **Away for 4 or more days:** When traveling eastward, take a 5mg melatonin tablet at 1800 to 1900 hours local time (6pm to 7pm) on the day of departure (if necessary, take while on the flight). On arrival, take a tablet at local bed time, 2200 to 2300 hours (10pm to 11pm), for the next 4 days.
- **Away for less than 4 days:** The evening preceding departure, take a dose of melatonin at 1800 to 1900 hours (6pm-7pm) local time. On arrival, take a daily dose at local bedtime, 2200 to 2300 hours (10pm to 11pm), until departure.

Westward Travel

- **Away for 4 or more days:** When traveling westward, take 1 tablet daily at local bedtime, 2300 hours (11pm) or later, for 4 days at the destination (or at each stop-over). If the traveler awakes in the very early hours of the morning (before 4am), he/she can take another capsule. Do not take melatonin pre-flight when flying west.
- **Away for less than four days:** Take melatonin at bedtime the night before departure.

Cautions

Melatonin can produce sleepiness and reduced alertness. Persons taking melatonin should not drive, operate heavy machinery, or perform tasks requiring alertness for 4 to 5 hours after taking melatonin. The timing of the dose of melatonin needs to be precise, since mistiming the dose can worsen rather than improve the jet lag symptoms. Persons who suffer from psychiatric problems or migraine headaches or who may be or intend to become pregnant should use melatonin with caution, if at all.

Zolpidem (Ambien) and Other Hypnotics

Zolpidem (10mg) has been shown as effective as melatonin alone or as melatonin/zolpidem in combination. Zolpidem should be used to induce sleep after arrival at the appropriate destination time-zone sleeping time, when the body is jet-lagged and cannot fall asleep. It can be used for up to 2 or 3 nights at each end of the trip. Zolpidem has a short half-life with no residual effect in the morning. Travelers should resist the temptation to sleep during the day the first few days at destination, since this will decrease the ability to sleep at night and prolong the adjustment cycle. Other short-active hypnotics have been recommended (zaleplon, temazepam, and triazolam) but have not been studied formally in the way that zolpidem has. Sedatives are no longer recommended on airline flights due to the risk of blood clots in the legs during prolonged immobility.

Other Ways to Reduce Jet Lag

Some ways of trying to reduce jet lag include the following:

- When possible, choose daytime flights to minimize loss of sleep and fatigue.
- Avoid large fatty meals, caffeine, and alcohol during the flight.
- Drink lots of water.
- Regular timed exposure to daytime outdoor light or high intensity artificial light (>10,000 LUX) can be useful in improving jet lag.
- There is no current evidence to the usefulness of homeopathic remedies or diet in the treatment or prevention of jet lag.

TRAVELER'S THROMBOSIS

INTRODUCTION

Deep vein thrombosis (blood clots in the leg veins) can occur during or after long flights on aircraft. The term "economy class syndrome" was coined after early cases occurred among people who had taken long-distance flights while seated in the "coach" section of the aircraft; however, the term is misleading. "Travel-related thrombosis" or "traveler's thrombosis" would be more accurate terms since this risk is not restricted to economy class or even to air travel. Deep vein thrombosis (DVT) can also occur in passengers during long distance transport by bus and train and can occur with activities other than travel.

Some people who develop DVT can also develop a complication called pulmonary embolism (PE). PE is a potentially life-threatening condition that occurs when a section of the clot in the leg dislodges, travels to the lungs, and plugs a blood vessel. Overall, PE occurs in about 0.4 per million airline passengers and is fatal in about 2% of cases.

RISK FACTORS FOR DVT

Whether or not a clot forms depends on the condition of the walls of the veins, blood flow, and factors that prevent or cause the clotting of blood. In addition, blood flow in the legs may be reduced during long flights or any long trip during which the traveler is sitting for long periods of time. For air travel, the risk of thrombosis increases with the length of flight. Passengers on flights 10 hours or longer are 2 to 3 times more likely to experience DVT than those who do not fly. DVT almost never occurs in young adults who have no risk factors and is almost always restricted to persons with one or more underlying risk factors. Even in those with risk factors, DVT is uncommon on flights of less than 6 hours.

Risk factors for DVTs include (most important ones listed first):

- a personal or family history of DVT or pulmonary embolism
- a personal or family history of a known blood clotting disorder predisposing to thrombosis
- major surgery, significant trauma, or prolonged immobilization (includes limb casts) in the last 6 weeks
- cancer within the last 2 years or currently receiving chemotherapy
- late pregnancy or the first 6 weeks after childbirth
- estrogen-containing medication taken for oral contraception, female hormone replacement therapy (HRT), or antiestrogen therapy (Tamoxifen)
- age greater than 50 years
- severe obesity
- congestive heart failure or recent myocardial infarction (heart attack)
- chronic venous insufficiency or large varicose veins
- other factors which have been associated with DVT in non-travel situations: chronic inflammatory disease, autoimmune diseases such as SLE (systemic lupus erythematosus) and inflammatory bowel diseases (ulcerative colitis or Crohn's disease), recent stroke, polycythemia vera (an abnormal increase in the number of red blood cells), dehydration (due to diarrhea or other condition)

In addition, subtle clotting abnormalities are surprisingly frequent in the overall population, and these people may not know they are at risk until they experience a problem after a long flight.

Many airlines now warn passengers about the potential for DVT development and include information and prevention tips along with long-haul tickets or in their online publications. Some airlines have developed videos and/or print material describing leg exercises to perform while flying.

PREVENTIVE MEASURES

Prevention of venous stasis (blood pooling in the legs) is the most important measure to follow in preventing DVTs. Travelers can help decrease their risk of DVT while traveling by observing the following precautions:

- Wear comfortable, loose-fitting clothing when possible. Avoid clothing that binds at the knees (such as socks/stockings with strong elastic tops) or at the waist (such as pantyhose).
- When flying, wear graded compression stockings that exert 20-30 mmHg at the ankle level (such as support

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- stockings).
- When practical and safe, walk around in the aircraft cabin at least every hour. This is easiest if you book an aisle seat.
- Stand up at your seat and stretch your arms and legs periodically. Many airlines now provide video presentations on stretching exercises during long flights.
- Exercise your leg and calf muscles frequently by flexing and extending the ankles and knees.
- Avoid crossing your legs since this may decrease blood circulation to your legs.
- Use a footrest when possible to reduce the pressure on the back of your thighs from the seat. Alternatively, elevate your feet on a briefcase, small bag, or pillow.
- At transit stops, get up and walk around.
- Drink plenty of water to prevent dehydration.
- Avoid alcohol and coffee, both of which contribute to dehydration.
- Avoid sleeping pills during a flight.

PRE-TRAVEL ADVICE

DVT occurrence during or after travel is a small but real danger. Therefore travelers who are or may be at risk of DVT should consult with their medical provider before making their travel plans, and all travelers should observe the general preventive tips noted above. It is particularly important to seek medical advice prior to travel if you have any pre-existing risk factors (especially a past history of DVT or pulmonary embolism). If you are on blood thinners (e.g., Coumadin/Warfarin), have your blood clotting test results checked prior to travel.

POST-TRAVEL ADVICE

During and after an extended flight, be alert for symptoms of DVT (usually involving only 1 leg, but possibly both). Most episodes of symptomatic DVT or PE occur during or immediately after flight while the passenger is still in the airport, but they may occur later. If you develop any of these symptoms, consult a health care provider:

- leg pain, ache, or discomfort
- leg swelling
- increased warmth in the leg
- leg skin discoloration (red)
- joint pain

SEEKING MEDICAL ASSISTANCE

If DVT is not treated, it can lead to serious complications such as pulmonary embolism. If you develop chest pain, shortness of breath, or difficulty breathing, seek immediate medical attention.