

Minimising jet lag

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Some advice to give travellers on strategies for preventing or at least minimising jet lag.

The symptoms of jet lag are differentiated from those of travel fatigue in that jet lag symptoms occur with rapid travel across multiple time zones, rather than with flights of the same length but along the same meridian.¹

Typically, but not always, the symptoms are worse when travelling east and increase with the number of time zones travelled. As many as 94% of travellers suffer from jet lag, and 45% describe the symptoms as severely bothersome.²

Symptoms of jet lag

The main symptoms of jet lag include fatigue, malaise, sleep disturbance with nocturnal insomnia or restlessness and episodic daytime drowsiness, impaired mental and physical performance, and altered physiological function (Table 1). With rapid changes in time zones, it can take several days to adjust to local time, generally at a rate of one time zone a day.

Cause of symptoms

The symptoms result from desynchronisation of the body's natural biorhythms with the local destination times. This particularly applies to the circadian rhythm or 'body clock', which regulates

the natural cycles of temperature, blood pressure, sleep-wake times, hormone levels and a range of other metabolic functions.

It has been recognised for some time that the human circadian rhythm is longer than 24 hours but that a number of external synchronising cues or 'zeitgebers' adapt us to the shorter 24-hour time schedule (Table 2). The most powerful zeitgeber is light, which, via the retina and suprachiasmatic nucleus, suppresses the release of melatonin from the pineal gland. The amount of light needed for this is at least 3000 lux, equivalent to an overcast day and much



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greater than general office illumination.² This fact has spawned a plethora of websites promoting various light-producing devices, all claiming to drastically reduce the symptoms of jet lag. Some websites will even let you calculate a program to reduce jet lag for your next flight. While the scientific validity of many of these contentions and devices is unclear at this time, surfing through these sites makes for great entertainment.

Strategies to minimise jet lag

Jet lag can be minimised in three ways:

- minimise sleep deficit
- maximise alertness
- promote synchronisation of circadian rhythms.²

Table 1. Symptoms of jet lag

Fatigue
Sleep disturbance (sleep-wake cycle reversal)
Malaise
Irritability
Poor concentration
Reduced co-ordination and reflexes
Muscle weakness
Headache
Blurred vision
Dizziness
Reduced mental acuity
Reduced physical ability
Altered gastrointestinal and urogenital function:
– anorexia
– constipation
– diarrhoea
– nocturnal urinary frequency
– decreased libido

Table 2. Zeitgebers*

Light
Melatonin
Exercise/physical activity
Mental activity
Social cues
Diets (a controversial claim)

*Synchronising cues for the human circadian rhythm.

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Travellers can be given the following advice.

Prior to flying

- Have a few good nights of sleep before the departure date.
- Try to nap in the afternoon, if embarking on a night flight.
- Schedule the quickest, most direct flights.
- Schedule flights during home-time daytime if possible.

During the flight

- Switch to destination time as early as possible – set watch to destination time, take meals and have sleep times as per destination time.
- For very short trips of only a few days, continue to use home time.
- Avoid stimulants such as caffeine.
- Avoid dehydration by having an adequate fluid intake and limiting alcohol use.
- Consider a short-acting hypnotic (e.g. temazepam [Normison, Euhypnos, Temaze, Temtabs], zolpidem [Stilnox], zopiclone [Imovane]) or antihistamine (e.g. diphenhydramine [Unisom Sleepgels], promethazine [Phenergan], trimeprazine [Vallergan]).

At the destination

- Sleep at the local night-time.
- Consider a short-acting hypnotic for the first few nights if needed (see above).
- Take short (less than one hour) 'power naps' during the day if needed.
- Stay in sunlight if possible (particularly with westbound flights).
- Exercise during the first part of the day (avoid exercising just prior to bedtime).
- Stimulants such as caffeine may be used during the first part of the day (avoid them within six hours before bedtime).

- Allow a few days' rest, where possible, before commencing complex intellectual activities.

Exposure to bright light

Bright light is the most effective zeitgeber, although it is best avoided in the morning after eastbound flights because early morning exposure to bright light advances the body clock (shortens the normal circadian cycle). Evening light exposure lengthens the normal circadian cycle and so is best avoided after crossing more than nine time zones in either east- or westbound flights.² Bright light has the least effect in the middle of the day and time exposures as short as 30 minutes are as effective as longer exposures.³

Melatonin

Melatonin (*N*-acetyl-5-hydroxytryptamine) consistently appears to be effective in most studies on preventing or minimising jet lag.^{4,5} Melatonin taken in the afternoon will cause a phase advance; if taken in the early morning it will cause a phase delay.³ The synthetic form (rather than the pineal gland extract) is probably safe in the short term, although it appears that there are no defined standards on the amount of active substance per dose.

It has been estimated that up to 50% of travellers would benefit from the use of melatonin; however, there have been no large randomised controlled trials confirming safety or efficacy. Side effects may include mild sedation, headache or migraine, nausea and light-headedness. Case reports have suggested avoiding the use of melatonin in people with epilepsy or on warfarin,⁴ but more studies are needed on its other properties, including antioxidant nature and effect on immune and pituitary function.⁶ It is important to note that melatonin may need to be taken at different times of the day in order to work effectively and avoid unwanted sedation at inconvenient times.

Despite melatonin not being licensed

in the western world and the abovementioned concerns, it is sold as a vitamin product overseas and is available via the web. Therefore, large numbers of people access this medication for use during their overseas travel.

Other remedies

Aside from the zeitgebers listed in Table 2, there are a large number of alternative proffered remedies that lack scientific evidence of effectiveness but may help the users take their minds off their symptoms. These remedies include massage, hot baths, crystals and aromatherapy. Provided there is little possibility of harm, few doctors would deny their patients these strategies. MT

References

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Note: Some medications discussed in the travel medicine updates are not available in Australia, but travellers may be offered these treatments overseas.

DECLARATION OF INTEREST: Dr Cohen is Medical Director, Travel Clinics Australia.