NORTHSHORE SLEEP MEDICINE
Sleep better with expert care.

3451 Church Sreet, Evanston, IL 60203
888-SLEEP-BETTER • www.nssleep.com

JET LAG SYNDROME

From an NS Presentation, August 2013

- Jet lag results from a misalignment between the endogenous circadian clock and the sleep/wake schedule of the destination time zone.

- This is not a trivial problem that pesters tourists. Jet lag can result in daytime somnolence and poor cognitive function. It can impair the judgment and performance of politicians, diplomats and military personnel. It is a disorder that deserves serious attention due to the possible public safety consequences.

- Besides the cognitive dysfunction, acutely jet lag can cause, unsurprisingly, mood disturbances such as irritability and depression. Going hand in hand with the somnolence during the destination wake times, is the inability to initiate and/or maintain sleep during the new desired sleep times. GI disturbances are another common problem.

- Frequent travel across seven or more time zones may carry long-term health risks according to a growing body of research on the subject. Different studies have shown increased risk of the following disorders: cardiovascular disease, diabetes, cancer, cognitive deficits.

- Flying eastward is more difficult than flying westward in terms of the time it takes to re-entrain the circadian clock if no special measures are taken. Humans have a tendency to phase delay at least slightly. Also, it much easier to stay up later than the circadian bedtime than it is to go to bed earlier than the inner clock dictates. If one could simply go to sleep because hands on a clock said it was time, then there would be few circadian rhythm disorders and no such thing as insomnia.

- The average, natural phase delay of the circadian clock is 92 minutes per day after westward travel, but the circadian clock phase advances at a rate of only 57 minutes per day after eastward travel. Thus, if nothing special is done to mitigate the jet lag, the symptoms resolve due to natural re-entrainment after approximately 7-10 days.

- What can be done to speed the progress of the re-alignment of the circadian rhythm to the destination sleep/wake schedule? Bright light, low dose melatonin and prescribed sleep/wake schedules can reduce significantly the time it takes to re-align to the new

time zone. However, for optimal results the recommendations usually need to be tailored to the individual traveler and take into account such things as the number of time zones traversed, the direction of travel, time of day of departure, lay overs, sleep schedule/habits prior to departure. It is complicated to formulate these recommendations and many sleep experts recommend making changes before travel. Few people have the motivation to do this.

- Here are some general recommendations to help adjust. Bright light therapy will be the most powerful modulator of sleepiness and alertness. However, be mindful of the CTmin (core temperature minimum). If one is attempting to advance sleep onset because travel is in the eastern direction (i.e., make sleep occur earlier), then light exposure needs to be after CTmin. If it occurs before, then it will further delay sleep onset the following night. Conversely, if travel is in the western direction and the need is to phase delay, the light exposure needs to come before CTmin.

- Upon arrival at the destination, it is important to remember that the circadian clock is still running according to the previous sleep/wake schedule. Calculate the timing of CTmin based on habitual wake time for the previous two weeks. CTmin is approximately two hours before habitual wake time. On subsequent days, the CTmin will have advanced at least 57 min, let's call it one hour for simplicity, and likely more than that if light exposure has been timed appropriately. However, it will do no harm in the case of eastward travel and attempts to phase advance if light exposure comes a bit after CTmin, whereas a great deal of effort is wasted if light comes before CTmin. Therefore, advance the timing of bright light exposure, preferably outdoor light, by one hour per day for the first week and likely by that time most jet lag symptoms will have resolved.

- Sleep during travel only if it coincides with sleep times at the final destination.

- Avoid naps, especially if you are trying to phase advance. If sleepiness seems insurmountable, keep the nap short, preferably only 10 minutes but certainly no longer than 30 minutes.

- Hypnotics may aid falling/staying asleep, but if the circadian clock is misaligned with the new time zone, people will still feel that alertness in the daytime is diminished. Sleepiness will still occur around the time of CTmin.

- Hypnotics should be used cautiously in the attempt to treat jet lag. There are reports of transient global amnesia with use of short-acting benzodiazepines.