HOW TO MINIMIZE/AVOID JET LAG

PHASE ADVANCE/PHASE DELAY

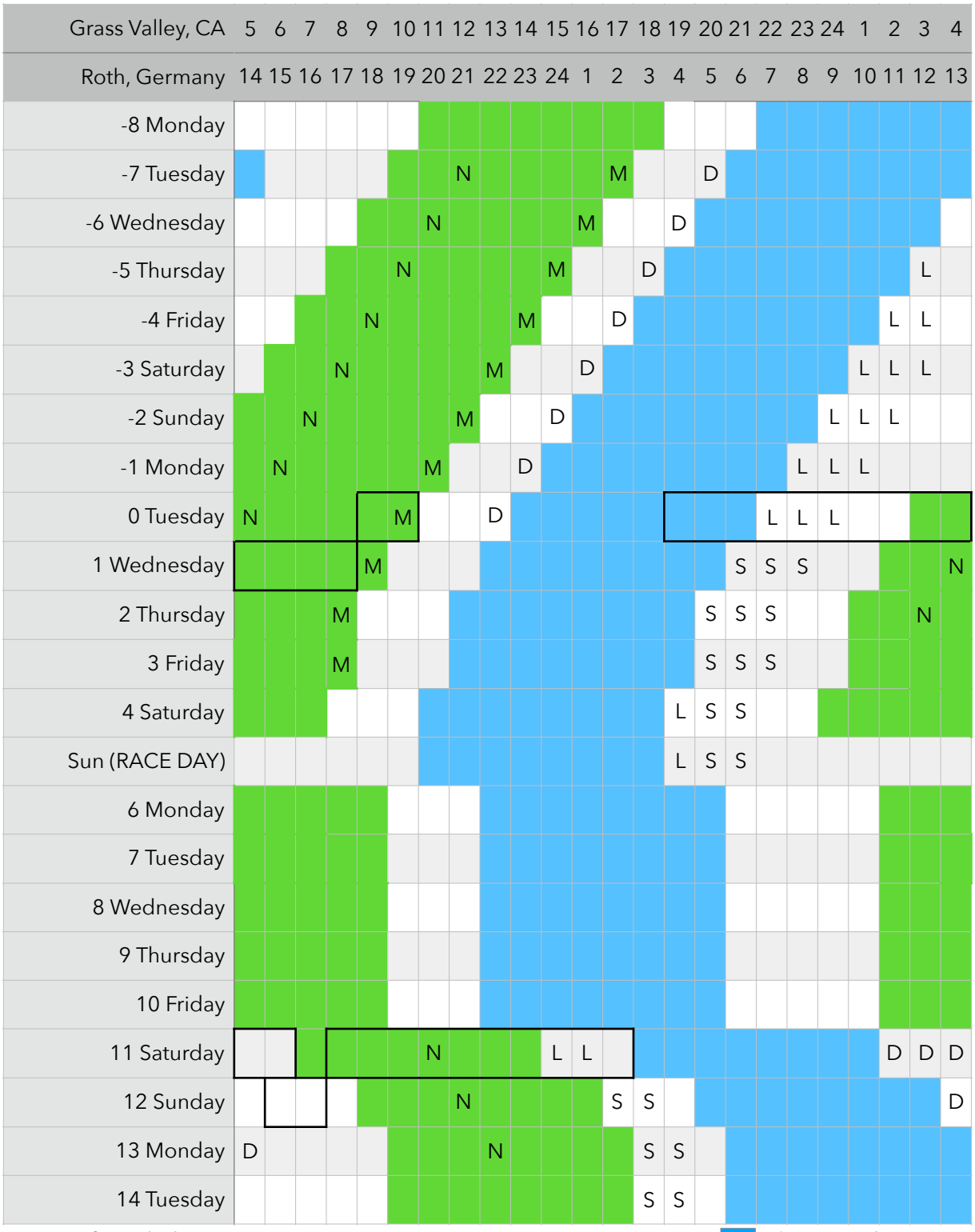
Jet travel across multiple time zones produces jet lag, which includes difficulty initiating or maintaining nighttime sleep, daytime sleepiness, decreased alertness, loss of concentration, impaired performance, fatigue, irritability, disorientation, depressed mood and gastrointestinal disturbance[1]. Jet lag is caused by a temporary misalignment between the endogenous circadian clock which controls the body's circadian rhythms and the destination time zone and sleep/wake schedule.

To avoid jet lag, gradual changes prior to travel in the time of sleep episodes (dark), exposure to light, meal timing and consumption of melatonin to phase shift your circadian clock and avoid circadian misalignment and jet lag can be helpful. Flying east requires a phase advance of the circadian clock, and flying west requires a phase delay. It takes longer to reset the circadian clock following an eastward than a westward flight, which might be explained by the fact that the average free-running period of the human circadian clock is slightly longer than 24 hours. This means that humans have a natural tendency to drift slighter later each day, and can therefore create more difficult to phase advance the human circadian clock than to phase delay it.

Laboratory studies with an abrupt shift of the sleep/wake schedule, which mimics what happens after jet travel, show that the circadian clock can phase shift faster when people are exposed to bright light at the appropriate time, especially in the first 4 days in the new time zone. However, it is common during that natural phase shift for people to report common jet lag symptoms, such as the ones mentioned previously.

To minimize or completely avoid common jet lag symptoms, a gradual shift in the sleep/wake cycle, meal timing, melatonin and exposure to light at the appropriate times prior to travel can ease, and often times completely eliminate jet lag. Majority of the recommendations made from current research suggests a phase advance of 1.5 hours per day and a phase delay of 2 hours per day. The use of melatonin, light exposure and meal timing can all help make the phase shift quickly and smoothly.

The following chart provides an example of a phase shift from the Pacific Time Zone in the USA to Germany, which are 9 time zones apart. This specific example shows a gradual phase shift of just 1 hour/day, starting 7 days before travel. This allows a near complete phase shift by the time of arrival in Germany since the purpose of travel is for a race, which is scheduled just 4 days after arrival. The time of day in both the USA and Germany are at the top of the chart in 24 hour format.



N- Nap (if needed)
M- Melatonin 3mg
L- Bright light box (5000+ lux)
D- Darkness or blue light blocking glasses

Sleep Window
Feeding Window
Flight

REFERENCES

1- Eastman and Burgess, *How to travel without jet lag*, Sleep Med Clin. 2009 Jun 1; 4(2): 241–255.