



Jet Lag: Preparation for Athens 2004

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As an Olympic athlete, you are required to travel internationally across several time zones to compete. International travel produces physiological stress on your body's internal clock. This physiological stress is more commonly called "jet lag". As you may have already experienced, jet lag can have a significant negative effect on your ability to train and compete.

This pamphlet is designed to help you as an athlete preparing for the Athens 2004 Olympics to deal effectively with jet lag. Strategies are provided on how to readjust your body's internal clock to Athens time:

- Prior to traveling from the USA to Athens
- In flight from the USA to Athens
- After arriving in Athens

Performing well at the Athens 2004 Olympics is a challenge that requires educated and detailed planning, in addition to a tremendous amount of physical training. Part of that detailed preparation should include a jet lag "battle plan" .

JET LAG “FACTS + FIGURES”

Jet lag affects each person differently, but in general the following facts are true:

1. Jet lag is more severe and lasts longer after a flight to the East than one to the West over the same number of time zones.
2. Jet lag is more pronounced the more time zones that are crossed.
3. It takes on average about 1 day for every time zone crossed to fully recover from jet lag.
4. Younger and fitter people tend to suffer less from jet lag than older persons.
5. Women may be affected more by jet lag than men due to menstrual cycle irregularities.
6. Jet lag is exacerbated by additional environmental stressors, such as heat, humidity, air pollution and altitude. Although Athens is located at a low elevation, it will be relatively hot and humid in August 2004 (mid-90s + 50% humidity) and the air quality may not be good in the central part of the city.

SYMPTOMS OF JET LAG

- Fatigue during the new daytime . . . yet inability to sleep at night.
- Loss of appetite, in combination with indigestion and possible nausea.
- Potential menstrual irregularities during the luteal phase due to asynchrony in melatonin secretion.
- Increased irritability, headaches, mental confusion and disorientation.
- Decreased mental performance . . . particularly in sports that require high concentration.





- Decreased physical performance . . . particularly in endurance sports and sports that require precise movement.





PREPARATION FOR TRAVELING FROM THE USA TO ATHENS

In preparation for traveling to Athens, altering your sleep pattern will help adjust your body's internal clock *forward/earlier* to Athens time. The following sleep schedules are based on two travel scenarios. The first scenario is one where you travel to Athens from the East coast, for example, New York City or Miami, a difference of 7 time zones.

Traveling from East Coast USA to Athens



2:00 PM
(Sunday) 6:00 AM
(Monday)



7:00 AM 11:00 PM

SUN →
M →
TU →
WED →
TH →
F →
SAT →

6:00 AM * 10:00 PM

6:00 AM * 10:00 PM

5:00 AM * 9:00 PM

5:00 AM * 9:00 PM

4:30 AM * 8:30 PM

4:30 AM * Depart NYC @ 5:00 PM

11:30 AM
(Friday) 3:30 AM
(Saturday)

* 30 min bright light exposure (BLE) upon awakening

Let's say that today is Sunday and you are scheduled to leave for Athens next Saturday. You normally get up at 7:00 AM ET and go to bed at 11:00 PM ET. When you got up today/Sunday at 7:00 AM, it was Sunday 2:00 PM in Athens. When you go to bed tonight/Sunday at 11:00 PM, it will be Monday 6:00 AM in Athens. During the week it will be beneficial for you to adjust your internal clock *forward/earlier* so that it is closer to Athens time. You can do this by gradually getting up earlier and going to bed earlier over the next six days.




As shown in the East coast schedule, on Monday you will get up an hour earlier at 6:00 AM and go to bed an hour earlier at 10:00 PM. Repeat this wakeup-sleep pattern on Tuesday. On Wednesday, get up an hour earlier at 5:00 AM and go to bed an hour earlier at 9:00 PM. Repeat this wakeup-sleep pattern on Thursday. On Friday, get up 30 minutes earlier at 4:30 AM and go to bed 30 minutes earlier at 8:30 PM. When you wake up at 4:30 AM on Friday, it will be Friday 11:30 AM in Athens. When you go to bed at 8:30 PM on Friday, it will be Saturday 3:30 AM in Athens. So over the course of six days (Monday-Saturday) you will have adjusted your internal clock *forward/earlier* by 2.5 hours and therefore it will be more in synchrony with Athens time.

Don't try to reset your body's internal clock to the entire 7-hour time difference by getting up at midnight! This will not help you significantly more than the 2.5-hour adjustment outlined in the schedule above. Attempting to make the full 7-hour adjustment will have a negative impact in your training and recovery and will do more harm than good.

It is also very important to expose yourself to bright light for at least 30 minutes upon awakening throughout the week. Bright light exposure (BLE) has been shown to be one of the best ways to help the body's internal clock adjust to an earlier time zone.

On Saturday, the day you fly to Athens, get up at 4:30 AM. Schedule your training so that it is completed by the late morning or early afternoon. Most trans-Atlantic flights that depart from the East coast of the USA leave in the late afternoon or early evening. Let's assume that your flight departs at 5:00 PM ET on Saturday.

The second scenario is one where you travel to Athens from the West coast, for example, Los Angeles or Seattle, a difference of 10 time zones.

Traveling from West Coast USA to Athens			
			
5:00 PM (Sunday)	9:00 AM (Sunday)	SUN →	7:00 AM 11:00 PM
		M →	6:00 AM * 10:00 PM
		TU →	6:00 AM * 10:00 PM
		W →	5:00 AM * 9:00 PM
		TH →	5:00 AM * 9:00 PM
2:00 PM (Friday)	6:00 AM (Saturday)	F →	4:00 AM * 8:00 PM
		SAT →	4:00 AM * Depart Chicago @ 5:00 PM
* 30 min bright light exposure (BLE) upon awakening			

As in the East coast travel scenario, let's assume that today is Sunday and you are scheduled to leave for Athens next Saturday. You normally get up at 7:00 AM PT and go to bed at 11:00 PM PT. When you got up today/Sunday at 7:00 AM, it was Sunday 5:00 PM in Athens. When you go to bed tonight/Sunday at 11:00 PM, it will be Sunday 9:00 AM in Athens.

As shown in the West coast schedule, on Monday you will get up an hour earlier at 6:00 AM and go to bed an hour earlier at 10:00 PM. Repeat this wakeup-sleep pattern on Tuesday. On Wednesday, get up an hour earlier at 5:00 AM and go to bed an hour earlier at 9:00 PM. Repeat this wakeup-sleep pattern on Thursday. On Friday, get up an hour earlier at 4:00 AM and go to bed an hour earlier at 8:00 PM. When you wake up at 4:00 AM on Friday, it will be Friday 2:00 PM in Athens. When you go to bed at 8:00 PM on Friday, it will be Saturday 6:00 AM in Athens. So over the course of six days (Monday-Saturday) you will have adjusted your internal

clock *forward/earlier* by 3.0 hours and therefore it will be more in synchrony with Athens time. As with the East coast scenario, don't try to reset your body's internal clock to the entire 10-hour time difference because it will have a negative impact on your training and recovery and will do more harm than good. Also, be sure to get at least 30 minutes of BLE upon awakening throughout the week to help your body's internal clock adjust to the earlier time zone.

On Saturday, the day you fly to Athens, get up at 4:00 AM. Schedule your training so that it is completed by mid-morning. Let's assume that you will fly from the West coast to the Midwest (Chicago, Dallas), where you will then take a trans-Atlantic flight that departs at 5:00 PM CT on Saturday.

IN FLIGHT FROM THE USA TO ATHENS

On the trans-Atlantic flight from the USA to Athens, try to establish as much of a personal "comfort zone" as possible. The general strategy is to reduce physical and psychological stress and therefore fatigue. Specific strategies include:

- When scheduling your flight, make a serious attempt to sit in bulkhead or emergency rows . . . consider an upgrade to first class when traveling to major competitions such as the Olympics.
- Wear comfortable, loose-fitting clothes. . . don't be worried about making a fashion statement . . . be comfortable!
- Wear compression stockings to reduce fluid buildup in the lower legs and ankles. . . compression stockings can be purchased at a drug store or medical supply store.
- Reset your wristwatch to Athens time.
- Travel with your own pillow . . . useful both on the plane and Athens housing.
- Hydrate with non-caffeinated, alcohol-free beverages such as fruit juice, carbohydrate-electrolyte drinks (Powerade), and ice water.
- Eat your own food (energy bars, fruit, healthy snacks) instead of airline meals.
- Walk around and stretch at least every 2 hours.
- Reduce stress by reading, listening to music, watching a movie, etc.





- Use earplugs to reduce extraneous noise.
- Use eyeshades for sleeping. Brief naps (20-30 min) may be better than prolonged sleeps.



UPON ARRIVAL IN ATHENS

A likely scenario in traveling from the USA to Athens is for your trans-Atlantic flight to land in western Europe (London, Frankfurt) at approximately 7:30 AM local time. You will probably have a layover of 1 to 3 hours before flying on to Athens, which will take 2 to 3 hours depending on your city of departure in western Europe. The sun will be up when you land in western Europe so try to take advantage of it by getting some BLE via the airport windows. Try to stay up and awake as the new day begins, just as you would back in the USA. Bright light exposure, either natural or artificial, will help you to do so. You will arrive in Athens later that day in the early to mid afternoon local time.

Upon Arrival in Athens			
			
SUN	Arrive Athens @ 1:00 PM BLE EX 1:30 AM		
M	9:30 AM	BLE EX	1:00 AM
TU	8:00 AM	BLE EX	12:00 AM
W	7:00 AM		11:00 PM
TH	7:00 AM		11:00 PM
F	7:00 AM		11:00 PM
SAT	7:00 AM		11:00 PM
BLE = bright light exposure			
EX = exercise (moderate-intensity)			

Let's assume that you will arrive in Athens on Sunday 1:00 PM local time. It is Sunday 6:00 AM on the East coast of the USA and Sunday 3:00 AM on the West coast. However, try to forget about what time it is in the USA now and over the next several days. It is important for you to adjust your *mind* as well as your body to Athens time. A good way to do this is to check the time on your wristwatch, which was reset to Athens time shortly after you got on your trans-Atlantic flight.

After checking into your hotel and unpacking, *it is very important for you to stay up and awake*. The best way to do this is to combine BLE with a light training session. The combination of BLE plus exercise has been shown to be the most effective way to adjust your internal clock to local time. Plan the training session in the mid to late afternoon and remember that it should be a light training session. Do not attempt a high volume, high intensity workout. Social activity is also a very effective way to adjust your internal clock to local time.

Now comes the tough part. Ideally, you will stay up and go to bed around 12:00 midnight Athens time (Sunday 5:00 PM on the East coast of the USA and Sunday 2:00 PM on the West coast). You may fall asleep before then. That's OK, just do your best to stay up as long as possible toward 12:00 midnight (without using caffeine). It is also possible that you may lie awake in bed at 12:00 midnight because your body may still be sensing that it is mid afternoon or early evening (in the USA) and therefore doesn't want to sleep. In this case, do what you normally do when you can't sleep . . . read, listen to music, watch TV . . . until you fall asleep. We also suggest that you sleep with the window blinds open so that you will wake up upon "first light" more easily.

The next morning (Monday), get up at about 9:30 AM. Again, be sure to combine BLE with exercise to help expedite the time change. Plan on two light training sessions on Monday. Also, plan on as much social activity when you're not training. Stay busy and avoid taking naps. Ideally, you will go to bed at about 1:00 PM, but in reality you may face some of the same challenges as the previous night. The next morning (Tuesday), get up at about 8:00 AM and try to expand on the previous day's BLE, exercise and social activity schedule. Go to bed at about 12:00 midnight on Tuesday night. On Wednesday, get up at 7:00 AM and go to bed at 11:00 PM. Feel free to begin more difficult training on Wednesday, which will be your third full day in Athens. So by Wednesday, you should be almost fully adjusted to Athens time in terms of your wakeup and bedtimes, as well as your normal training routine. It is important to note that the schedule shown in "Upon Arrival in Athens" can be accelerated or decelerated as needed.

RESUMPTION OF TRAINING UPON ARRIVAL IN ATHENS

- High-volume and high-intensity training should be avoided in the first few days.
- Fine motor skill and coordination will be impaired in the first few days . . . increased potential for injury and accident.
- Exercise/Training alone will not reduce jet lag.
- Exercise/Training *plus* BLE will reduce jet lag and help your body's internal clock adjust to the Athens time zone.

ERGOGENIC AIDS FOR JET LAG

- Timing and composition of meals
- Sleeping pills
- Melatonin
- Caffeine
- Compression stockings



At one time it was recommended to eat a high protein breakfast (eggs, meat, cheese) for the first few days at your new location for the purpose of reducing jet lag. This recommendation was based on the fact that a high protein meal may increase the amount of tyrosine in the blood, which in turn may lead to an increased production of the neurotransmitters, epinephrine and norepinephrine. Epinephrine and norepinephrine act on the sympathetic nervous system to promote alertness. It was also recommended at one time to eat a high carbohydrate dinner (pasta, potato, rice, bread) for the first few days at your new location. This recommendation was based on the fact that a high carbohydrate meal may increase the amount of tryptophan in the blood,

which in turn may lead to an increased production of the neurotransmitter, serotonin. Serotonin acts on the brain to promote sleepiness. Although this may sound like a good strategy to follow upon arrival in Athens, there is no conclusive scientific evidence to support this dietary regimen as a way to reduce jet lag. We recommend that you follow your normal dietary routine.

Scientific research has shown that sleeping pills have no effect on subjective, physiological or performance measures. Sleeping pills may actually be counterproductive if taken at the wrong time; they may actually “anchor” your body’s internal clock to USA time. We do not recommend the use of sleeping pills as a way to reduce jet lag.

Melatonin is a hormone that is secreted by the pineal gland, which is located at the base of the brain. It is secreted between 9:00 PM and 7:00 AM and helps to promote drowsiness and sleep. Melatonin is sold commercially in the United States but is not regulated by the Food and Drug Administration (FDA). The potential health risks of using melatonin have not been clearly established. Many athletes have successfully used melatonin as a way to reduce jet lag. Based on the scientific research, the following recommendations are made:

- In the days prior to going to Athens . . . take 5 mg melatonin at approximately 7:00 PM local time (i.e., at 7:00 PM in your home town).
- On the flight to Athens . . . take 5 mg melatonin when it is between 10:00 and 11:00 PM Athens time.
- In the first few days in Athens . . . take 5 mg melatonin between 10:00 and 11:00 PM Athens time.

If you choose to use melatonin, please consult with your team physician before doing so.

Caffeine may be helpful in reducing jet lag if it is well-timed and taken in moderate amounts. However, this recommendation is for regular caffeine users only. Caffeine ingestion may do more harm than good for non-caffeine users. Caffeine was formerly banned by the IOC/WADA in amounts that exceed 12.0 µg/ml urine, but was removed from the “banned” to “monitored” list effective January 1, 2004.

SUMMARY

When you travel to Athens to compete in the Olympic Games next summer, you will want to make the transition as smooth as possible. Having a jet lag “battle plan” will help you make that transition with relatively little stress and will allow you to resume training without getting injured or overtrained. Making a smooth transition from the USA to Greece will ultimately allow you to perform optimally during the Games. The information in this pamphlet is designed to help you as an athlete preparing for the Athens 2004 Olympics to deal effectively with jet lag. Should you want to receive additional individual consultation on jet lag strategies, please feel free to contact:

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