

AUSTRALIAN OPEN, ROLAND GARROS, WIMBLEDON, US OPEN, SHANGHAI MASTERS AND BACK

WINNING OUT OF A SUITCASE

– *Written by the ITF Sport Science and Medicine Commission*

Tennis at the top level is a sport that requires a lot of travelling as it is a world-wide sport. The Association of Tennis Professionals (ATP)/Women's Tennis Association (WTA) offer 62/59 tournaments in 31/33 countries, whereas the International Tennis Federation (ITF) Men's/Women's circuit offers 600+/500+ tournaments across 77/65 countries. In 2015, 126 nations participated in the Davis Cup, making it the world's largest annual international team competition in sport.

As a result, high-level tennis players have to deal with issues such as long-haul flights, jet lag, acclimatisation, vaccinations, foreign food, traveller's diarrhoea, sleep and safety.

Many articles have been written about the optimal way to prepare for competition, but 'perfect preparation' is simply not possible for professional tennis players because there are so many factors affecting their exact schedule. Most tournaments

take place over a 7-day period (Monday to Sunday) with 2 days of qualifying competition before the event starts. However, players can be knocked out at any stage along the way, requiring them to leave the city/country and travel on to the next event on their schedule with limited advanced notice or opportunity to adjust.

This article provides examples of best practices recommended by the ITF Sport Science and Medical Commission, but recognises the fact that some of these are difficult, if not impossible to achieve, for a professional tennis player travelling on the ATP, WTA or ITF Tour.

TRAVELLING

All methods of travel – airplane, car, bus or train – entail long periods of waiting, inadequate sleep and unfamiliar food. Regular eating habits and patterns will be disrupted and varying meals will be

consumed at different times. When you arrive at your destination, it is wise to establish and stick to regular times for breakfast, lunch and dinner (e.g. if you normally have breakfast at 8 am, lunch at 1 pm and dinner at 6 pm at home, try to do the same when you are away, but at the local time of destination).

If you are going to travel by plane across several time zones, set your watch corresponding to the time of the destination as soon as you step on board. Try to eat your meals on board as if you are already at your destination. Order low fat meals and bring your own snacks to ensure that your carbohydrate intake will be high enough while travelling. During any long flight, people tend to become dehydrated so it is recommended that you drink more than you would normally do (water, juice or sports drink). A long trip will also involve sitting for a long time, which may result in stiff limbs,

cramp and swollen ankles. It is beneficial to get up and walk around as this can prevent or reduce these symptoms. Take a stroll and do some simple stretching exercises. You may also consider using compression stockings on board. These stockings are woven so that the compression level is highest around the ankle and lessens towards the top of the hose. They are effective and available from most chemists/pharmacies.

JET LAG

Jet lag is a phenomenon that occurs after crossing multiple time zones (three or more) in a short period of time (i.e. 1 to 2 days). The more time zones that are crossed, the greater the effect. This is due to a disturbance of the sleeping-waking rhythm, which is regulated by a biological clock in the brain (adjusted by exposure to daylight). With jet lag, the body's biological clock is desynchronised with time cues from the environment. It is still tuned to the place of departure, while a different rhythm is required in the country of destination. It takes time for the body to adjust to the new situation and the sleep hormone, melatonin, plays an important role in this process. This hormone is produced in the brain whenever

it is dark and production ceases when it is light. Melatonin can shift the day/night rhythms i.e. the circadian clock earlier, thereby promoting earlier sleep onset and morning awakening.

The main features of jet lag are fatigue and sleep deprivation (because of a disrupted circadian rhythm), but symptoms may also include loss of energy and concentration, headaches, confusion, dizziness, loss of appetite and stomach and bowel problems. Jet lag may have a negative impact on your mood and ability to perform, which is something that a tennis player does not need on the eve of an important match.

The severity and duration of jet lag also depends on the direction of travel eastward (e.g. from Qatar to Australia) or westward (e.g. from Qatar to America). On a trip to the east, the biological clock must be moved forward and on a trip to the west, the biological clock must be moved back. Interestingly, the body has more difficulty in moving the clock forward (travelling eastwards when the adjustment takes about one day per hour time difference) than when travelling westward (when adaptation takes about half a day per hour time difference). Melatonin has been shown

to be able to aid in reducing the effects of jet lag, especially in eastward travel, by re-setting of the body's sleep-wake phase.

What can players do to get used to the new time zone as quickly as possible?

Before leaving

If the trip is planned with little time to adjust before the first match, you can attempt to adjust to the new time zone before you leave. This is quite simple to achieve:

- Going west – go to bed and get up an hour later than usual.
- Going east – go to bed and get up an hour earlier than usual.

In addition, you can shift your meal times to the pattern of the destination.

During the flight

As mentioned above, set your watch to the time of your destination city and eat your meals on board as if you are already at your destination. Make sure you keep moving during the flight and regularly stretch your legs. Drink ample fluids during the flight. Your pre-match preparation and hydration starts at the beginning of your travels.

When you arrive

After a long trip it is not always wise to immediately grab a bite to eat and head off to bed. It is highly recommended that you establish a new rhythm as soon as possible and adjust to the time of the country. So if you arrive during the day, try to stay up till the evening, although you can take a short powernap for a maximum of 1 hour. If you arrive in the evening/at night, you can go straight to bed, but avoid sleeping in late in the morning. Choose fixed times to eat from the first day onwards and try to stick to these times. That will prevent your metabolism from getting upset and will stop undesirable weight gain or loss. Besides the right (timed) nutrition, it is important to drink enough fluids. The hotter the country, the more fluids the body loses and the more you should drink. <<TABLE 1>>

A GOOD NIGHT'S SLEEP AWAY FROM HOME

The amount of sleep, the quality of sleep and the timing of sleep are all important factors that significantly influence a player's ability to practice, maximise the training response, perform and recover. There is a critical link between sleep, mental processes, metabolic function and circadian rhythm. To monitor quality and quantity of sleep in players, the Player Sleep Screening Questionnaire (ASSQ) can be used, a subjective, self-report screening questionnaire.

Top players train and compete in many different places and under a variety of conditions. There are also individual variations as some players can sleep well anywhere and some players have much more trouble sleeping. This usually includes

waking up in the middle of the night and lying awake for hours. There are a number of practical tools available that can help you fall asleep more easily.

For a player to go to sleep, the proper stimulus from the so-called 'sleep centre' is needed, a small group of nerve cells in the hypothalamus that acts as a 'master clock'. The two main determining factors of whether you get sleepy or not are the circadian system (time of day or night) and, how long you have been awake. You can activate the sleep centre through the vagus nerve, which helps you to calm down and relax.

Tips for basic sleep hygiene:

1. Temperature: reduce the inner body temperature by having a short warm shower. This stimulates peripheral vasodilatation and allows you to lose more heat through the skin. Also make sure the room temperature is not too high (ideally around 18 to 20°C).
2. Muscle tension: consciously relax the muscles when lying in bed. Don't do any exercises in the hour before you go to bed. However, a short walk in fresh air can have a tension-relieving effect.
3. Reduce outside stimuli: do not handle annoying phone calls just before you go to bed and avoid using mobile phones, tablets or computers, particularly for accessing social media. Make sure the room is dark and reduce excessive noise by using earplugs.
4. Breathing: you can stimulate the vagus nerve with deliberate slow and deep breathing.
5. Empty your head: Before going to sleep, it is advisable to 'close the day' mentally

in order to get into bed with an empty head. It may help to write things down that will keep you busy before you go to bed.

6. Use your bed for sleeping only: your bed is not an office! Do not spread all your belongings over the bed and sit there all day reading, playing and studying.

But what if you still are not able to fall sleep despite the above?

Then our advice is to get out of bed and try to reprogram your sleep ritual. Go for a short walk, listen to soothing music and then go to bed again and try to fall asleep. Do not continue to lie there tossing and turning, as it will create more stress, which will make it even more difficult to sleep.

Nutritional supplements and sleep

We do not recommend using any sleeping aids, natural or not, on a regular basis. However for occasional use, we can give some general recommendations.

1. Melatonin is a naturally occurring hormone. Its production in the body is stimulated by darkness. As melatonin blood concentration increases you begin to feel less alert and you get ready to sleep. Melatonin (3 to 6 mg 30 minutes to 1 hour before bed) can induce sleep in about 20 to 30 min. This does not work for everyone, but it can help to adjust the internal clock.
2. Valerian/hops (420/120 mg 30 minutes to 1 hour before bed). This herbal sedative affects the activity of the central nervous system.
3. Meals with a high carbohydrate and protein content (consumed about 4 hours before bedtime), induces sleepiness.

Try to avoid:

1. Caffeinated drinks (coffee, tea, coca cola) in the evening. Caffeine is a stimulant and will keep you awake. The half-life of caffeine is 3,7 hours (with a spread of 2 to 10 hours).
2. Hyperhydration. Drinking too much liquid in the hours before bedtime can lead to the urge to urinate several times during the night, which will hamper sleep.
3. Benzodiazepine drugs (Temazepam etc.), reduce the time to sleep onset and prolong total sleep time. However, these

TABLE 1

- Go on the trip well rested.
- When travelling to the east, start to adjust a couple of days in advance by getting up and going to bed earlier. When travelling to the west start a couple of days in advance by getting up and going to bed later (jet lag is more common when travelling east rather than west).
- Set your watch before departure to the time of destination.
- When you reach your destination, get into the local rhythm as soon as possible. Take a walk and be active and go to bed and get up at your normal times.

Table 1: Preventive measures for jet lag.

medications can reduce deep sleep and increase light sleep, particularly after longer durations of use. When starting to use benzodiazepines, you may continue to feel sleepy during the day, so they should be used sparingly and with great caution.

4. Imidazole Pyridine drugs (Zolpidem etc.). Despite the fact that this group of drugs is not listed among the benzodiazepines, the same effects apply and caution should also be taken over their use.

The below is recommended:

1. Eat a low-fat meal that is rich in protein and carbohydrate 3 to 4 hours before bedtime.
2. Make sure that the room is well ventilated and cool.
3. It may also help to travel with your own pillow!

ANTI-DOPING, MEDICATIONS AND SUPPLEMENTS

When travelling abroad, adhere to the following advice:

- Bring enough medication to continue any treatment for the duration of the trip.
- Check the status of all products before you travel.
- Check if the medication is permitted in the country of travel and whether it is permitted to bring through customs.
- Before you purchase any product abroad, make sure to check it carefully with your physician. The ingredients in common medications can and do contain different substances to those available at home.

Some countries have different customs and laws that may prohibit the import of certain substances into a particular country.

Athletes carrying a prohibited substance for a legitimate medical condition should carry the following documents at all times:

- The prescription from the prescribing doctor including the name of the substance, the dose and the frequency of use.
- The 'Therapeutic Use Exemption' certificate to demonstrate that an authorised Anti-Doping Organisation has permitted the use of a prohibited substance for medical purposes.

Supplements

Before taking any supplements, including the ones mentioned in this article, assess the need and assess the risk. There are no guarantees that any supplement product is free from prohibited substances and you may accidentally commit an anti-doping rule violation by taking them. Check every single substance before you use it, even if you have used it before - including the name of the product and the ingredients/substances listed. Make sure you only buy substances that have been tested for contamination with prohibited substances as part of a risk minimisation programme (UK: Informed Sport, Netherlands: NZVT).

Important information for China and Mexico

In 2011, WADA issued a statement regarding contaminated meat products in Mexico and China. This continues to be a serious concern in 2016.

Please note:

- Clenbuterol is a prohibited substance that has been found in meat products in Mexico and China.
- Exercise extreme caution when eating meat in these countries.
- Eat onsite or only in restaurants and cafeterias approved by the tournament organisers.
- When eating outside the designated restaurants, do so in large groups.

Please visit the WADA website for more information www.wada-ama.org

HEAT ACCLIMATISATION

The continuous travel of tennis players means that they switch climates on a regular basis. One day you will be playing a tournament in the winter in northern

Europe, the next day you will be playing tennis in the blazing heat of Melbourne. How can you best adapt to these temperature changes?

The general advice is to acclimatise for at least 1 week in the heat before trying to compete. Ideally, a player should acclimatise for 2 weeks, but there is not always time to do that. After 2 weeks, sweat production will be increased and core temperature will have adjusted². As a result, the capacity to store heat in the body is higher and may enable you to perform better in the heat. You need to spend at least 60 minutes each day in the heat and train with moderate intensity in the conditions in which you have to perform.

Fluid Management

Before play: for optimal performance in the heat, you should be well-hydrated before the start of your match. On the day of the match, you should drink 6 ml of fluid per kg body weight every 2 to 3 hours (about 500 ml for an 80 kg player) to be adequately hydrated before play.

There has been some confusion over whether or not to consume carbohydrates before exercise, because of the suggested increased risk of 'rebound hypoglycemia'. Based on the evidence currently available, most players can safely consume carbohydrates in the pre-exercise period³. Those athletes that are prone to symptoms of rebound hypoglycemia can use any of the following strategies:

1. choose carbohydrates with a low glycemic index
2. ingest carbohydrates just before exercise (in the 5 mins before) or during the warm-up (a snack or sports drink) or
3. avoid carbohydrates in the 90 mins before exercise altogether.

During play, you should aim to include 30 to 60 grams per hour of carbohydrates in your hydration regimen for exercise lasting longer than 1 hour and up to 90 grams per hour for events lasting over 2.5 hours. This can be achieved through a combination of fluids and solid foods.

Since sodium is lost during sweating, it is important to consume sodium during exercise in the heat. Most sports drinks contain salt, usually around 1 gram per litre or less (check the label for salt content, written as sodium chloride or NaCl). On a very hot day, you may consider adding 6 g (a teaspoon) of salt to 1 litre of sports drink.

After play, it is important to restore the fluid lost during exercise. You should drink 100 to 150% of the volume that you lost during the match and any recovery drink should contain protein (from 0.2 to 0.4 grams per kg body weight per hour), carbohydrates (0.8 grams per kg body weight per hour) and sodium.

Cooling

You can cool your body in many ways: cooling vests, cold water baths, 'ice slushies', spraying with water, fanning or using cold, wet towels. There is evidence that pre-cooling can be effective, particularly between two bouts of exercise. We suggest to use the cool pool 30 mins prior to play and the use of air conditioner and ice vests pre-play. Cooling vests are of particular benefit in wheelchair players whose heat regulation systems may be disrupted. It is recommended to all players to use cold, wet towels during change-overs when it is hot.

VACCINATIONS

Players have an increased risk of infections due to their regular pattern of global travel

and their close contact with other players who have recently arrived from distant destinations⁴. In addition, intensive physical training without compensatory recovery can have an adverse effect on the immune system and can increase the susceptibility to infectious diseases. The increased incidence of viral infections (particularly of the upper respiratory tract) occurs mainly during periods of intense exercise training and competition due to the combination of physiological and psychological stress coupled with inadequate rest. Elite players' increased risk of infection, even the common cold, can seriously impact on their ability to train and therefore compromise performance.

Preventative strategies are therefore important in maintaining health e.g.

- Recovery practices
- Jet lag /sleep deprivation management
- Food hygiene (see 'traveller's diarrhoea' below)
- Sleeping arrangements (choose a single room if possible)
- Hand washing
- Appropriate vaccination cover

The standard vaccination advice to travellers is in most cases appropriate for travelling tennis players. Correct vaccination is important for the prevention of diseases and is typically well tolerated. Mostly mild side effects (light fever, pain and swelling) occur in some rare cases, therefore you should plan vaccinations early enough before competition or during regeneration and training.

In any case, you should take protection against:

- Tetanus
- Diphtheria
- Pertussis
- Influenza
- Hepatitis A and B
- Measles
- Mumps
- Poliomyelitis
- Varicella

TRAVELLER'S DIARRHOEA

When travelling to countries where standards of hygiene and food preparation are not universal, there is an increased risk of contracting traveller's diarrhoea. About a third of the travellers visiting Central and

***Ut landaes audae estia corepel incim
nim dolupta tionecto quis si tent, ut
et omnium aligentent del in con
porerat urepre vendae santior eperfero
volupta veliquis autempo repudi simi***

South America, Africa and parts of the Far East contract this disease – and players are not immune to it. It is caused by consuming products, which are contaminated with bacteria, viruses or parasites. The most common cause of traveller's diarrhoea is enterotoxigenic *Escherichia coli* (ETEC) bacteria (80% of cases). Unfortunately, contaminated food cannot be recognised: it looks, smells and tastes normal. Foods you may consider safe include: hot tea and coffee, boiled water, soup, bread, butter, soda in bottles, fruits you can peel, all food that has been cooked and served right away, and canned products.

Traveller's diarrhoea is often contracted in the first week of your stay, but may occur at any time while travelling and even after returning home. The most common symptoms are diarrhoea, cramps, bloating, fever and nausea. Most cases improve within 1 to 2 days without treatment and clear up completely within a week. This may be a problem during an important tournament. In those cases you need to consult the tournament doctor, who may prescribe antibiotics to speed up recovery.

Because you lose vital fluids, salts and minerals during a bout of traveller's diarrhoea, it is important to take plenty of rest and drink enough fluids to avoid dehydration. Mineral water, weak tea, soup, bouillon and oral rehydration salt are suitable. Oral rehydration salt is a mixture of salt and glucose and available from most drugstores and pharmacies. You can also prepare it yourself by mixing six level teaspoons of sugar and a half level teaspoon of salt in one litre of clear water.

You should consult a doctor if you develop a high fever, if the diarrhoea continues for more than 3 days or you become dehydrated.

Traveller's diarrhoea is usually a self-limiting disorder, but players who develop three or more loose stools in an 8-hour period especially if associated with nausea, vomiting, abdominal cramps, fever or blood in stools may benefit from antibiotics (ciprofloxacin, norfloxacin or bismuth salicylate). If this is the case, you need to consult a doctor. Antimotility agents (e.g. loperamide) can be used to reduce stool frequency, especially when you have to play or travel, but should be

used with caution as it can increase the severity of disease by delaying clearance of causative organisms.

Since traveller's diarrhoea can seriously affect a player's performance, prevention is of utmost importance.

How you can prevent traveller's diarrhoea

- Wash hands thoroughly after using the toilet and before eating.
- Do not drink tap water and avoid ice in any form.
- Do not drink unpasteurised milk or other unpasteurised dairy products.
- Do not buy food on the street.
- Do not consume raw vegetables.
- Do not consume fruit that cannot be peeled.
- Do not consume raw meat, poultry, raw fish and raw egg (egg yolk).
- Do not consume non-packaged ice cream.
- Do not consume cold food, such as salads, cold meat and chopped steak.

GENERAL SAFETY

Players are at increased risk when travelling abroad and should prepare accordingly. It is important to take good care of your belongings and your personal data. When personal information ends up in the wrong hands, it could not only cost money, but also your reputation.

The following tips might be of assistance:

- When travelling by car, make sure you always lock it.
- Keep important possessions with you (passport, wallet, credit card) or use a safe/locker.
- Be careful with reservations through the internet: check whether the website is safe. Use a second credit card with a lower limit to make reservations.
- Electronic hotel keys contain personal details. Hence, keep them safe at all times.
- Never walk outside in an unfamiliar neighbourhood or in the dark. It is best if you can arrange that someone from the tournament collects you at the airport or train station.
- If you notice any suspicious behaviour, the tournament organisers should be informed.

- Do not mention personal information (bank details) when calling in a public area.
- Be careful with information on social media.
- Use the safety lock on the back of the hotel room door when you are in the room.

References

1. *Samuels C, James L, Lawson D, Meeuwisse W. The athlete sleep screening questionnaire: a new tool for assessing and managing sleep in elite athletes. Br J Sports Med 2015. [Epub ahead of print].*
2. *Racinais S, Alonso JM, Coutts AJ, Flouris AD, Girard O, González-Alonso J et al. Consensus recommendations on training and competing in the heat. Br J Sports Med 2015; 49:1164-1173.*
3. *Jeukendrup A, Killer SC. The myths surrounding pre-exercise carbohydrate feeding. Ann Nutr Metab 2010; 57 (suppl 2):18-25.*
4. *Gärtner BC, Meyer T. Vaccination in elite athletes. Sports Med 2014; 44:1361-1376.*

ITF Sport Science and Medicine Commission:

*Chair, Brian Hainline POST NOMS
Babette Pluim M.D., M.P.H., Ph.D.*

Mark Bullock POST NOMS

Miguel Crespo POST NOMS

Nicky Dunn POST NOMS

Bernard Montalvan POST NOMS

Dave Miley POST NOMS

Stuart Miller POST NOMS

Machar Reid POST NOMS

Per Renström M.D., Ph.D.

Kathleen Stroia M.S., P.T., ATC

Eva-Maria Schneider POST NOMS

Sue Wolstenholme POST NOMS

Contact: bpluim@euronet.nl