

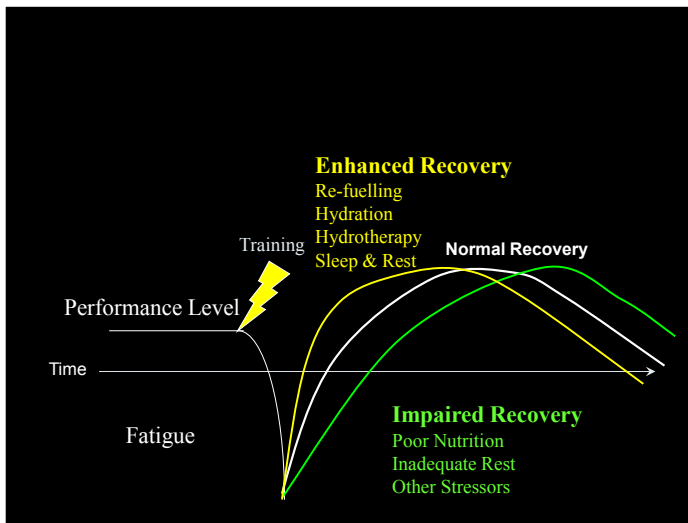
# Performance Point

*Sleep Your Way to a Better Performance*

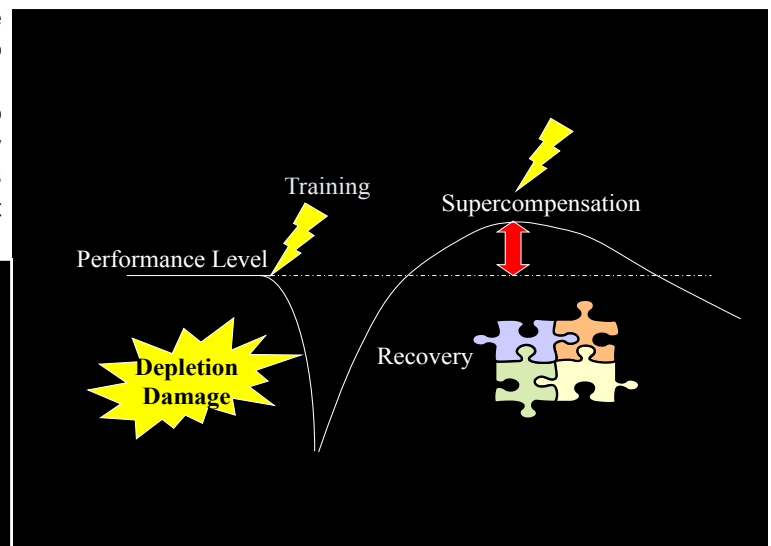
By Dr. Gordon Sleivert, VP of Sport Performance, Canadian Sport Centre Pacific

The importance of regular training at appropriate frequencies durations and intensities to develop skill, fitness, and enhance athletic performance is a critical part of any athletes regime. Indeed the creation of fatigue through training is accepted as a very important training process to achieve a training effect and a necessary pre-requisite to performance enhancement (Figure 1). Equally important however to eliciting fatigue is ensuring that appropriate recovery is allowed so that the physiological adaptation may occur.

The effective coach is a master of identifying and controlling the appropriate stimulus (or stress) to expose the athlete to but also critically ensures that recovery is appropriate for adaptation. Additionally, athletes may use a variety of recovery methods to enhance their adaptation to a particular training stress. They sometimes however make poor choices or have other demands outside of sport that impair recovery and slow down or even halt their rate of improvement (Figure 2).



**Figure 2: The impact of enhanced or impaired recovery strategies on the time-course of training adaptation**



**Figure 1: The fatigue theory of supercompensation**

A universal recovery strategy that is essential to both physiological adaptation and to the consolidation of skill development is sleep. It is well known that sleep deprivation and sleep disturbance can impair mental and physical function, immune response and other restorative processes important for athletes. Athletes need to ensure they are getting enough sleep at night and should also consider how napping can contribute to their recovery.

## **Sleep Facts**

Sleep can be divided into five stages: 1,2,3,4 and REM sleep. We cycle through these stages each night approximately every 90 -100 minutes.

- **Stage 1:** Occurs only once per night, lasts for 5 minutes and can be viewed as a warm-up activity for the brain to enter into the other sleep stages
- **Stage 2:** Plays a dominant role in increasing alertness,- one of the major benefits of sleep - and accounts for about half of our total sleep time. It is a critical period for the consolidation of motor learning through the wiring together of neurons associated with a particular skill
- **Stage 3 and 4 (slow-wave sleep):** Metabolism decreases, cortisol decreases and growth-hormone is released. This period of sleep is important for resting, re-building and re-fuelling the body.
- **REM Sleep:** Body temperature falls, brain blood flow rises 50% above waking levels, neurons fire at their highest rate, eyeballs dart from side-to-side (rapid-eye movement), and the body is paralysed. This is where we experience vivid dreaming. In this stage memory is improved through transferring information from short-term to long-term memory and REM sleep is particularly important for complex learning and creativity.

## Powering Sport Performance

The Canadian Sport Centre Pacific, in partnership with the network of Canadian Sport Centres and PacificSport Centres, delivers sport performance programs to help athletes and coaches win medals for Canada. Working in support of our national and provincial sport partners, the Canadian Sport Centre Pacific is creating a stronger system for the development of athletes, coaches, performance enhancement teams and sport performance facilities. [www.cspacific.ca](http://www.cspacific.ca)

## Sleep Your Way to a Better Performance

### A Good Night's Sleep

- **Sleep Requirement:** Athletes should aim for 10 hours of sleep per night. Sleep experts suggest that this is ideal for training athletes. Adolescent athletes may need more sleep. Interestingly, a recent study (Samuels, 2008) reported that the majority of athletes studied at a sports school were getting less than 8 hours sleep.
- **Sleep Quality:** Quality of sleep is very important. Many athletes get enough sleep but have poor quality sleep as a result of recurrent arousal or waking up, pain from injury, or not entering into all phases of sleep because of over-stimulation or arousal.
- **Sleep Timing:** Every athlete has their own unique schedule and we all know that there are “morning” people (larks) and evening people (owls). This classification of an individual's daily biorhythms (circadian rhythm) is known as chronotyping. If an athlete's schedule is dictating sleep timing that doesn't synchronize with their circadian rhythms then their quantity and quality of sleep may be impaired. For example, *Owls* may have impaired recovery if they are forced to get up early and train. Conversely, athletes that are larks and like to get active in the morning may need to plan to go to bed early if they are to achieve their sleep requirements. The Samuels study (2008) reported that most athletes were “morning” or “mid-range” chronotypes and only about 10% would be classified as *Owls*.
- **Sleep Habits:** It is important for athletes to develop good habits and behaviors prior to bunking down for the night to assist with falling asleep. Often poor sleeping patterns begin with inappropriate routines over the course of a day and in the hours before bedtime. Below are some factors to consider that may improve sleep.
  - A regular rising and bed time will help set your circadian rhythm and enhance your sleep.
  - Expose yourself to sunlight and bright-light during the day.
  - Wind down in the 1-2 hours before bedtime by engaging in relaxing activities such as reading or listening to quiet music. Avoid activation activities such as playing a heart racing video game, listening to heavy metal or exercising
  - Avoid heavy meals before bedtime since digestion slows at night.
  - If you snack before bedtime choose a low glycemic index carbohydrate snack [www.gilisting.com](http://www.gilisting.com)
  - Many athletes are focused on hydration. If you wake up at night because of a full bladder reduce your fluid intake after 8pm.
  - Avoid caffeine in the 4 hours prior to bedtime.
  - Make sure your sleep environment is optimal: very dark, quiet, and comfortable. Use ear-plugs if it is noisy and eye-shades if it is light. Turn your clock-face away from your line of sight.
  - If you are over-aroused use relaxation techniques such as progressive muscular relaxation, meditation, breathing or centering to relax before bed-time. A sport psychologist may assist with many techniques related to this area.
  - Keep your bedroom cool. Because body temperature falls at night this will help with that and with sleep. A fan or air-conditioner can mask unwanted noise and keep you cool.
  - Invest in a comfortable mattress. If travelling you may need to adapt and acquire an extra foamy or move the mattress onto the floor.
  - Do not use prescription drugs or natural over the counter remedies such as Melatonin without consulting with a Physician. If you are having trouble sleeping because of pain from an injury speak to a Physician about safe medications to use.

In Summary, sleep is critical to elite athletic performance and athletes need to ensure they take care of the very important aspect of preparation.

### Reference

Samuels, c. (2008), *Nuerol. Clin* 26; p169-180.

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