

Recovery

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What is Recovery?

- Process by which the athletes *physiological* and *psychological* function is restored
- Recovery can result in an enhanced performance by increasing the adaptation to training
- Increase the *quality* and *quantity* of training
- Reduce the risk of developing overuse injuries

Basic Training Theory

- The body needs to be physically stressed (**exercise**) to improve fitness
- However, the body actually improves when the body is at rest (**recovery**)
- Rest and recovery counteracts the physical damage done during exercise
- Improvements in fitness occur because of rest and recovery **AFTER** training
- Athletes need to give their body rest and recovery to gain the most out of their training

What are the essential recovery techniques?

- Stretching
- Active recovery (warm-down)
- Nutrition
- Sleep




What can I add during increased training/competition time?

- Hydrotherapy
- Compression
- Massage
- Nutritional supplements





Compression Garments

- Compression garments:
 - Decrease muscle soreness
 - Reduce swelling
 - Promote recovery of force
 - Decrease blood lactate levels
 - Increase blood flow
 - Increase venous return
- Wear between training/competition and at night



Massage

- Massage has been shown to be no more effective than passive rest in enhancing lactate removal
- Active recovery was significantly more effective than massage in removal of lactate
- Psychological benefits
- Injury prevention and maintenance



Hydrotherapy Options

- CWT**
Contrast water therapy- alternating hot/cold water immersion
- CWI**
Cold water immersion
- HWI**
Hot water immersion
- Active Recovery**
In warm or cold water



Contrast Therapy - Methods


- 1 minute in spa
- 1 minute in plunge pool
- Repeat 5-7 times

* Can use jets on large muscle groups
* Stretch and self-massage





NB: Spa at AIS 38°C.
Plunge pool at AIS 14°C

CONTRAST SHOWERS:

- 30 seconds warm to hot (comfort)
- 30 seconds cold
- Repeat 3-5 times



Cold Water Immersion

Ice Baths / Cryotherapy


- Ice baths: bath or bin filled with ice and water
- Cryotherapy is the most commonly used strategy for the treatment of acute soft tissue sports injuries
- Cryotherapy, including CWI may be an effective treatment to
 - Decrease skin, muscle and core temperatures
 - Reduce inflammation
 - Decrease pain

Submerging full body is important!



Sleep and Recovery

- Sleep loss may be related to the development of overreaching and overtraining
- Evidence that sleep loss increases the onset and/or magnitude of pain
- Sleep loss has many implications for cognitive/ skill-based sports
 - Decreased focus
 - Decreased concentration
 - Difficulty in determining why errors are made
 - Confusion remembering instructions, facts




Sleep and Recovery

- Effects of sleep deprivation evident after 3 days
- A low energy intake exacerbates the effects of sleep loss
 - Delay of sleep onset
 - Decrease in slow wave sleep and REM sleep
- Increasing sleep also increases performance

Interventions to Enhance Sleep

1. Valerian
2. Melatonin
 1. Useful in jet-lag
 2. Fewer side effects than typical sleeping medication* (non-addictive and little effect on sleep architecture)
3. High Glycemic Index Meals
 - white bread, potatoes
4. Meals high in Tryptophan
 - essential amino acid found in meat, yoghurt, eggs, cheese




Interventions to Enhance Sleep

5. Recovery- Hydrotherapy
 - Sleep onset corresponds closely to the timing of the maximal rate of decline in core temperature- medication and vasodilation
 - A 1% change in skin temperature results in a decrease in sleep onset latency of ~3 min (26%)
 - Water therapies can increase skin blood flow
 - Perhaps hydrotherapy may also work by not only reducing pain and inflammation but also by inducing sleep?



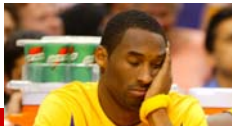
Interventions which may reduce Sleep

1. Caffeine
 - Increase sleep latency, decrease slow wave sleep and decrease total sleep time
 - Effects shown up to 8 h after administration
 - Individual responses
 - Athletes consuming caffeine for performance may have sleep interruptions if taken for evening/night time events
2. Alcohol
 - Alcohol decreases sleep latency
 - However, the second half of sleep is disturbed (increased REM sleep, frequent periods of wakefulness, increased dreams/nightmares)



Interventions which may reduce Sleep

3. Hyper-hydration
 - In a recent survey of AIS athletes, frequent waking to go to the bathroom was one of the major reasons for sleep disturbance
 - May be due to a large consumption of fluid with minimal amounts of sodium in the time between finishing training/competition and bed-time
 - Finding an appropriate balance between re-hydration and adequate sleep is important




Extended Sleep- is it good and how to get it

- Two studies from the US (swimming and basketball)
- Swimming- increased sleep duration to 10hr per night for 6-7 weeks
- Swimming- increased 15m sprint, reaction time, turn time and mood
- Basketball- told athletes to sleep as much as possible
- Basketball-faster sprint times and increased free-throw accuracy as well as increased vigour and decreased fatigue
- In athletes who cannot sleep longer during the day, naps have been shown to be effective in reducing fatigue and increasing performance
- Is there such a thing as too much sleep? Evidence says that while athletes perception of fatigue may increase, performance itself also increases.

Recommendations

Utilizing good sleep hygiene

- Maintaining a regular sleep-wake cycle (i.e. going to bed and getting up at the same time of the day)
- Use napping appropriately (naps should not interfere with nighttime sleep)
- Plan fluid/food intake
- Ensure bed is comfortable and the room temperature is appropriate (19-21°C is often recommended)
- Avoid thinking, planning or other mental activities while in bed- 'to-do list'



Things to consider when designing a Recovery Program

- What type of exercise session was performed?
- When does the athlete have to compete/train again?
- What are the environmental conditions?
- How soon after exercise can the athlete perform recovery?
- What facilities are available?
- How much time does the athlete have?
- Should the recovery session occur after the first or second training session of the day?
- Does the athlete need to recover?
- What is the athletes age?
- Are the athletes prone to injury?
- Are the athletes in a training camp/ intensive training/ competition?

Things to consider when designing a Recovery Program

- What type of exercise session was performed?
 - Running- CWT
 - Cycling- CWI
 - Swimming-? CWT
- When does the athlete have to compete/train again?
 - Within 24 hours- YES
 - 3-7 days- PROBABLY NOT
- What are the environmental conditions?
 - HOT- CWI
 - COLD-MEDIUM- ANY

Things to consider when designing a Recovery Program

- How soon after exercise can the athlete perform recovery?
 - Within 1 hour is ideal. Can still be useful within 24 hours if high intensity session is performed
- What facilities are available?
 - Spa, plunge/bath/bin, shower
- How much time does the athlete have?
 - Adapted protocols
- Should the recovery session occur after the first or second training session of the day?
 - What is priority session? How much time does athlete have? Aid in sleep?
- Does the athlete need to recover?
 - How hard was the session? When do they need to train/compete again

Things to consider when designing a Recovery Program

- What is the athletes age?
 - Older athletes may take longer to recover
- Are the athletes prone to injury?
 - Intensive recovery may aid in injury prevention or recovery from injury
- Are the athletes in a training camp/ intensive training/ competition?
 - Recovery focus

General Guidelines

- Choose 4-5 hard training sessions
- Consider increased use during training camps/ intense competition period
- Consider environment
- Consider type of training

Practical Aspects of Recovery

CONTRAST THERAPY

- Limit use of hot water in a hot/humid environment
- May be more effective than cold after weight training/ muscle damage
- 5-7 rotations of 1-2 minutes
- Equal ratio
- COLD- 12-15 degrees C
- HOT- 38 degrees C
- Can use ice bath and pool or showers for contrast

COLD WATER IMMERSION

- Is useful under all conditions
- At least 5 minutes
- 12-15 degrees C
- Under 10 degrees may be problematic


Practical Aspects of Recovery

SPA ONLY

- Limit use of hot water in a hot/humid environment
- Limit use if you have a recent injury
- Do not use after muscle damage (there are more effective techniques)
- No more than 20 minutes in duration
- 38 degrees C

Basics for Recovery

- **Massage**
 - Injury prevention/maintenance
- **Stretching/Warm-down**
 - Injury prevention/maintenance
 - Muscle relaxation
 - Reduce muscle soreness
- **Nutrition Recovery**
 - Replace carbohydrate, fluid and electrolytes
 - Repair the muscle- protein
 - Protect the immune system

Thankyou