



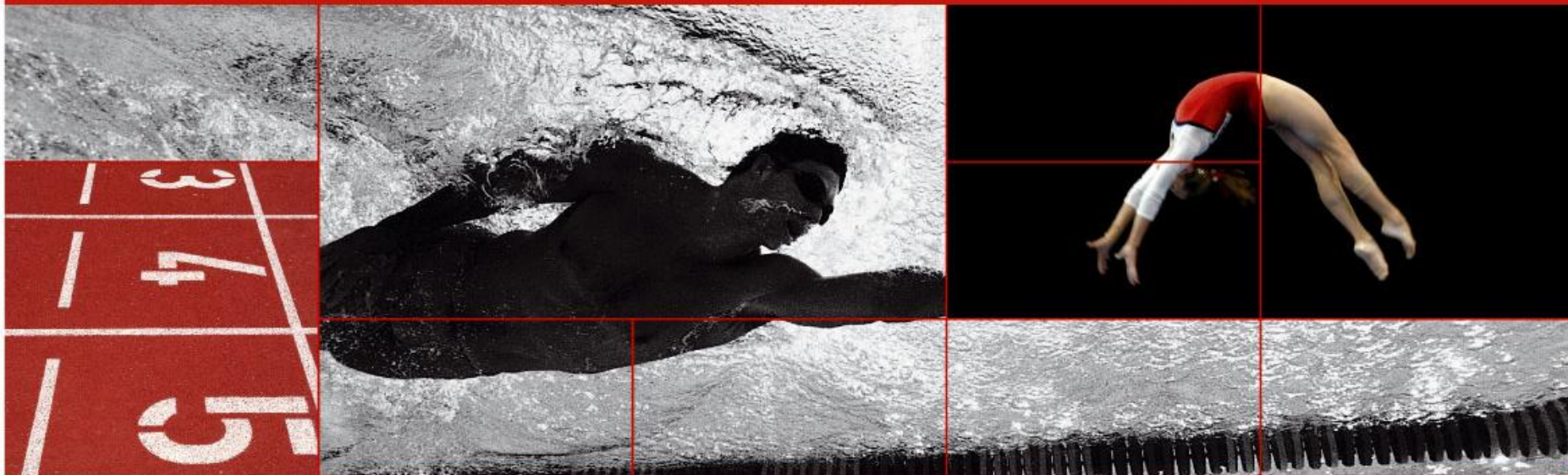
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# Recovery

Shona Halson, PhD  
AIS Recovery





# 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



# 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
  - Decrease blood lactate levels
  - Increase blood flow
- Wear between training/competition and at night





# 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

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- 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





# Ice Baths / Cryotherapy

Ice baths: bath or bin filled with ice and water

- At least 5 minutes
- 12-15 degrees C
- Under 10 degrees may be problematic
- Do not do ice baths if you have a short time between events

Submerging full body is important!









# 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



## 1. Caffeine

- Increases time taken to fall asleep
- Effects shown up to 8 h
- Individual responses
- Athletes consuming caffeine for performance may have sleep interruptions if taken for evening/night time events



## 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





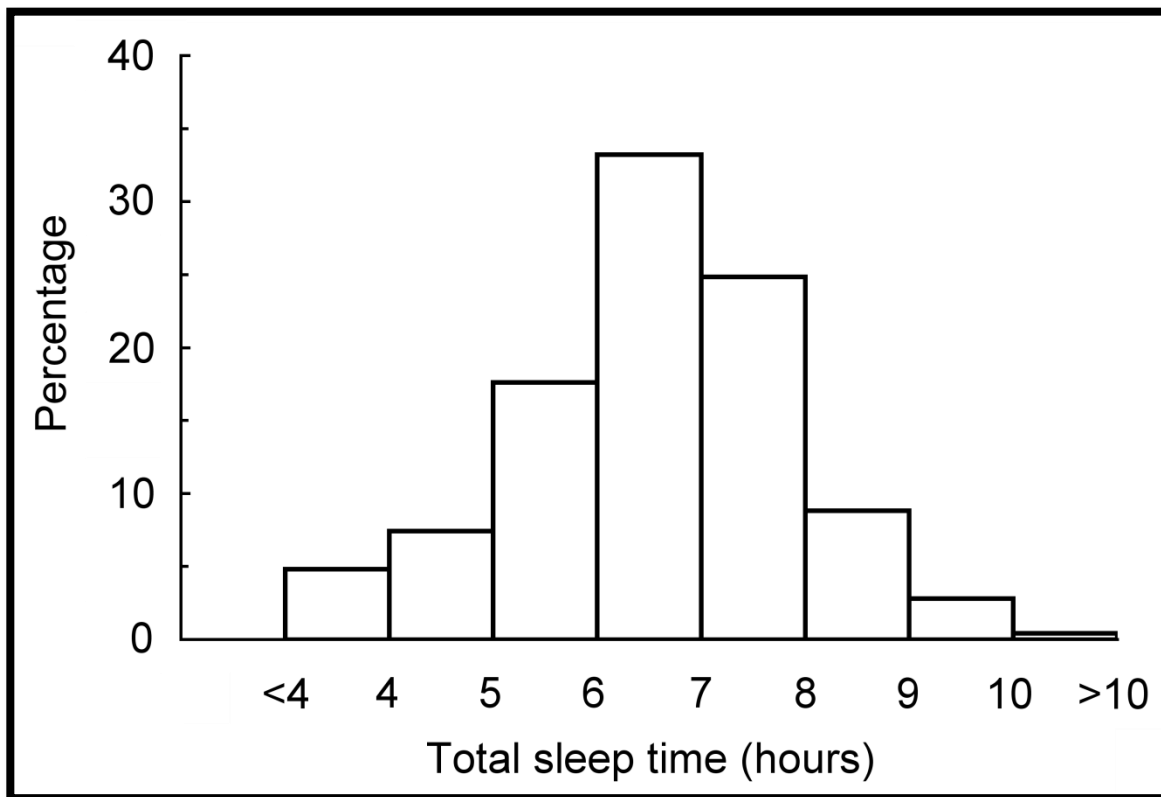
# Sleep- Actigraphy

- *2636 nights of data (7 years)*

<b><i>n</i> = 2636</b>	<b>Mean ± SD</b>
Bedtime (hh:mm)	23:22 ± 01:25
Wake Up time (hh:mm)	07:00 ± 01:30
Time in Bed (h)	8:14 ± 1:22
Total Sleep Time (h)	6:31 ± 1:26
Sleep Efficiency %	85 ± 7
Wake in Sleep (min)	66 ± 30
Sleep Latency (min)	23 ± 34
Sleep Quality	2.65 ± 1.02



# Sleep Duration





# Sleep in Swimmers

Table II. Sleep/wake variables on training days and rest days (mean  $\pm$  s)

Measure	Training days	Rest days	<i>p</i> -Value
Bedtime (hh:mm)	22:05 $\pm$ 00:52	00:32 $\pm$ 01:29	<0.001
Get-up time (hh:mm)	05:48 $\pm$ 00:24	09:47 $\pm$ 01:47	<0.001
Time in bed (h)	7.7 $\pm$ 0.9	9.3 $\pm$ 1.7	<0.001
Sleep onset latency (min)	40.8 $\pm$ 43.2	31.8 $\pm$ 21.6	0.543
Sleep duration (h)	5.4 $\pm$ 1.3	7.1 $\pm$ 1.2	<0.001
Sleep efficiency (%)	70.7 $\pm$ 15.1	77.2 $\pm$ 7.5	0.220
Wake after sleep onset (%)	17.6 $\pm$ 8.8	16.2 $\pm$ 7.7	0.629
Daytime nap duration (h)	0.2 $\pm$ 0.5	0.0 $\pm$ 0.0 <sup>a</sup>	0.108
Total sleep time (h)	5.6 $\pm$ 1.4	7.1 $\pm$ 1.2	0.006

Note: <sup>a</sup>Participants did not nap on rest days.



# Extended Sleep

- 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 in longer in the morning, naps are a good idea**





# Recommendations

- 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 before sleep
- Ensure bed is comfortable and the room temperature is appropriate (19-21°C is often recommended)
- Remove TV, computer, internet from bedroom, lower lighting (power down hour)
- Avoid thinking, planning or other mental activities while in bed- 'to-do list'





# 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





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# Thankyou



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