

# RECOVERY FROM EXERCISE

**CTYI Introduction to Sports Science  
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# WHAT DOES THE TERM 'RECOVERY' MEAN TO YOU?

- With your copy, take a minute and list 4 terms/ concepts that come to mind.

# IS RECOVERY AN IMPORTANT CONCEPT?

- For athletes?
- For the general population, or special populations ?
- Why do you think it is, or is not important?

# DOMAINS OF RECOVERY

- Physical
- Psychological

# KEY CONCEPTS

- Exercise induced muscle damage (EIMD)
- Adaptation
- Overload
- Overtraining Syndrome
- Burnout

- Acute exercise and chronic training are stressors to our bodies!
- A stressor is any activity, event, or impingement which causes stress.
- Stress is a disruption in our bodies homeostasis, and attempts by our bodies to regain homeostasis.

- When we exercise, our bodily systems increase their normal function
- The amount of increase depends on the demands of the exercise.

# SELYE'S THEORY OF STRESS

## 3 Stages:

### 1. Stage of Alarm and Reaction

- Body responds to stressor with a disruption in homeostasis. It then immediately tries to regain homeostasis

### 2. Stage of Resistance/ Adaptation

- If the intensity remains constant, our bodies move to steady state after 1-3 minutes

### 3. Stage of Exhaustion

- This occurs when we become fatigued, or we lose the ability to respond to the stimulus.



## Selye's General Adaptation Syndrome



- This fatigue is temporary, and is reversed when we give our body adequate rest, and adequate nutrition.
- The goal of training programs is to make up a series of acute bouts of exercise, organised progressively to provide a stimulus which stresses our bodies...
- Followed by the recovery process which restores homeostasis, and encourages supercompensation

# ADAPTATIONS TO EXERCISE

- Altered homeostasis at rest
- Lesser homeostatic disruptions at the same intensity of exercise
- Greater maximum performance
- The goal of Sports Scientists is to ensure that athletes spend time in stages 1 and 2, and avoid spending time in stage 3

# IMMEDIATELY POST EXERCISE

- Warm down from exercise
- End goal of recovery immediately post exercise is a return to resting function and physical performance
- This is the first phase of our post exercise recovery Strategy

# EXERCISE INDUCED MUSCLE DAMAGE (EIMD)

- When we exercise, we damage our muscle cells.
- This causes an inflammatory response, which dulls our muscles ability to work as they usually do.
- The amount of EIMD we experience depends on how used to the stimulus (type, intensity, volume) we are.
- EIMD results in pain and/or tenderness in our muscles
- A decrease in muscular strength and power
- An increase in stiffness
- A decrease in the range of motion (ROM)
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# CYCLE OF TRAINING INDUCED ADAPTATIONS

1	2	3	4	5	6
	<i>Leads to</i>	<i>Resulting in</i>	<i>Which causes</i>	<i>And also</i>	<i>Leading to</i>
<b>Exercise</b>	<b>Muscle Damage</b>	<b>Inflammation</b>	<b>Functional Impairment</b>	<b>Repair</b>	<b>Functional Improvement</b>
			(Short term)	(adaptation)	

# TASK: YOUR RECOVERY STRATEGIES

- What recovery strategies have you used?
- Are you aware of any recovery strategies used by athletes?

# NUTRITION GOALS

- To give our bodies the fuel they need to enable recovery and adaptation to occur
- Replace glycogen (energy) stores which have been used during the exercise
- Replace fluid lost during the exercise
- Repair the damage done to the working muscles
- Reduce inflammation



# ACTIVE RECOVERY

- Low intensity exercise, following high intensity exercise session.
- This is done to induce a pumping effect.
- Repetitive mechanical squeezing and relaxing of the muscles may increase blood flow
- This is thought to improve range of motion, and remove markers of inflammation and other waste products from our muscles.

- This is often done after high-intensity exercise, which is often associated with increased levels of lactate in the working muscles.
- Usually lasts from 8-25 minutes, at an intensity of 35-65% of a person's maximal effort
- Can be performed in many different ways

# RECOVERY BOOTS

- Inflate and conform to the users legs
- Next, compressed air is applied from the feet, moving further towards the core (top of ball)
- Pressure is in pulses, moving like a wave.



# COMPRESSION GARMENTS

- Elastic, body moulded suits with an inbuilt compression gradient
- We often see these as lower or upper body pieces, but limb specific pieces are not uncommon
- The pressure applied by the compression is thought to improve blood flow, and reduce inflammation

# COLD WATER IMMERSION

- Hydrostatic pressure effect (similar to recovery boots and compression garments)
- Also the cooling of body tissue
- Hydrostatic pressure greater when standing versus sitting.
- Usually 10 - 15°C, for 1-15 minutes.
- Immerse the body parts which were trained

# SLEEP

- A basic requirement for us as humans
- Sleep has a restorative effect on us physiologically and psychologically.
- Our highest rate of growth hormone (anabolic role) are working on our skeletal muscle.
- Sleep has an important effect on muscle recovery, cognitive function, and the central nervous system

# SLEEP DEPRIVATION

- Decreases anabolic hormone concentration and increases catabolic hormone concentration
- Increases inflammation and sympathetic nervous system, which leads to impairments in our ability to generate strength and power
- Decreases motor control and skill execution

# LETS NOT FORGET

- Stretching
- Foam Rolling
- Massage
- Any others?



# PSYCHOLOGICAL FACTORS

- Fatigue following exercise or sports competition could be associated with less motivation, lower mood, and increased perception of bodily soreness.
- If prolonged, this can move a person to overtraining and burnout.
- Communicate effectively, review performance appropriately, and show the individual empathy

# TASK: DESIGN A HOLISTIC RECOVERY STRATEGY

- Choose an individual or athlete or your choice
- Choose a sport or physical activity.
- Describe this person in terms of general health, physical fitness, and experience of the exercise/ sport/ physical activity you have chosen
- Outline the goal of their physical activity
- Design a holistic recovery strategy for the 48 hours following the completion of their bout of exercise
- Think both physically, and psychologically.
- How are you going to evaluate their recovery?

# KEY MESSAGES

- We don't get fitter during exercise, we get fitter after exercise, if;
- We give our bodies appropriate stress during the exercise bout
- And if we appropriately refuel & use recovery methods after exercise
- And we wait an appropriate amount of time before undertaking a significant bout of exercise
- An imbalance in the exercise and recovery balance can lead to fatigue, and a reduction in physical and psychological well-being

# GO RAIBH MAITH AGAT

Thank you for taking part in this online class.

I hope you will enjoy applying this learning to an individual of your choosing.

The next class is our last class. We will be covering nutrition