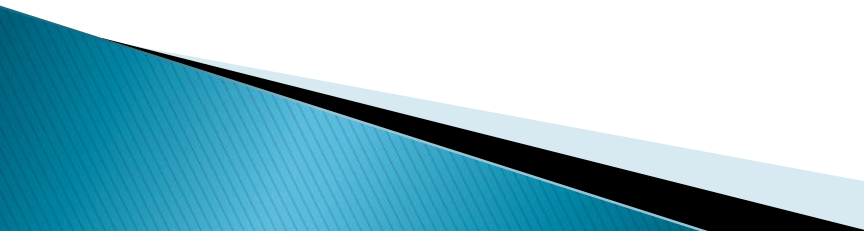


Physiological Measurements to Monitor Physical Training Intensity

Asst.prof Dr. Akram Abdulwahed

**College of Physical Education & Sport Sciences
Salahaddin University/Erbil
2022-2023**

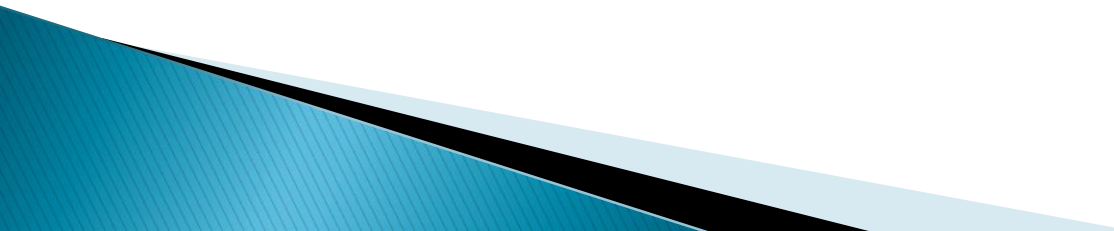
What is exercise intensity

- ▶ In the strictest sense, exercise intensity is defined by the amount of energy required to perform the physical activity per unit of time.
 - ▶ In general, though, the easier way to think of (and explain) the concept of intensity is a measure of how hard the body is working during physical activity.
 - ▶ Exercise intensity is usually measured as low, moderate, or vigorous.
- 

What is Heart Rate Training Zone

- ▶ A heart rate training zone is a range that defines the upper and lower limits of training intensities. It is calculated using an age-related predicted maximum heart rate (HR_{max}) and a special equation called heart rate reserve

Heart Rate Zones Based on MHR

- ▶ Healthy heart rate zone: 50–60% MHR
 - ▶ Fitness heart rate zone: 60–70% MHR
 - ▶ Aerobic heart rate zone: 70–80% MHR
 - ▶ Anaerobic heart rate zone: 80–90% MHR
 - ▶ Red-line zone: 90–100% MHR
- 

How to measure exercise intensities

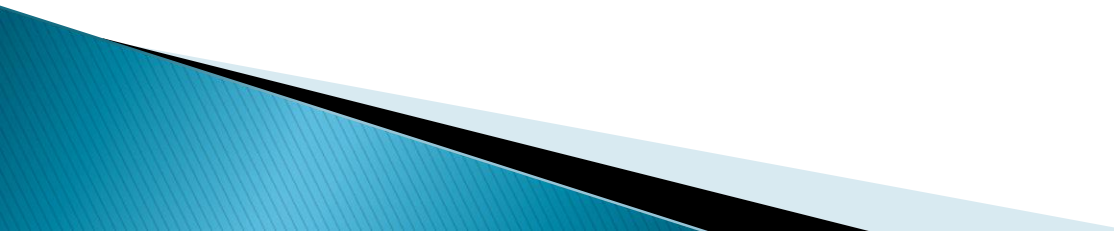
▶ There are several ways:–

▶ 1. Measure your ***Heart Rate.***

Measuring your heart rate is another way to gauge energy expenditure during exercise. You'll need to determine your maximum heart rate, find your target heart rate zone, then check your pulse to see if you're in the zone.

▶ 2. Test your *Oxygen Consumption*.

Testing your level of VO_2 , during physical exercise is the most accurate way to measure exercise intensity. Muscles need oxygen during physical activity, and the heart must pump enough blood through the circulatory system to meet the needs of the exercise.

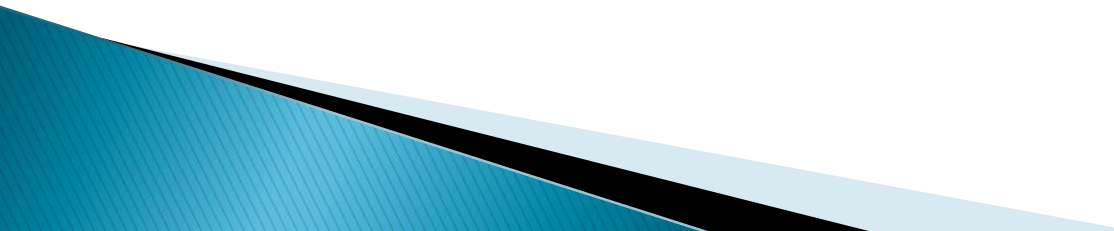
- ▶ To get a VO₂ test, you'll need to go to a sports facility lab where you will pedal on a stationary bicycle or walk on a treadmill while wearing a mask that measures how much air you inhale and expel. The test determines your maximal heart rate, which measures exercise intensity when combined with resting and target heart rate ranges.
- 

▶ 3 – Perform the *Talk Test*.

This free and simple method can help you easily figure out your exercise intensity level. If you can talk or sing without any strain while exercising, it's light-intensity. If you can't say more than a few words, it's vigorous-intensity

4. Rating of Perceived Exertion scale (RPE)

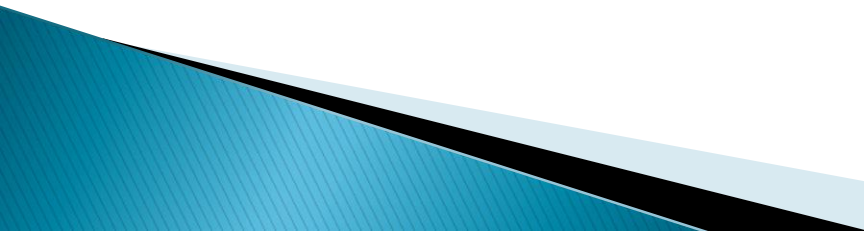
The Borg Rating of Perceived Exertion Scale is a straightforward way to determine exercise intensity. This test relies on how you feel while exercising and rates your exertion on a scale between six and twenty. Moderate-intensity activity is between twelve and fourteen on the RPE scale.



Instruction to the Borg -RPE- Scale

- ▶ how heavy and strenuous the exercise feels to you and how tired you are. The perception of exertion is mainly felt as strain and fatigue in your muscles and as breathlessness or aches in the chest. Use this scale from (6 to 20), where 6 means “No exertion at all” and 20 means “Maximal exertion.”
- ▶ – 9 Very light. As for a healthy person taking a short walk at his or her own pace.
- ▶ – 13 Somewhat hard. It still feels OK to continue.
- ▶ – 15 It is hard and tiring, but continuing is not terribly difficult.
- ▶ – 17 Very hard. It is very strenuous. You can still go on, but you really have to push yourself and you are very tired.

Instructions to the Borg-RPE-Scale

- ▶ 1- Try to appraise your feeling of exertion and fatigue as spontaneously and as honestly as possible, without thinking about what the actual physical load is.
 - ▶ 2- Try not to underestimate, nor to overestimate. It is your own feeling of effort and exertion that is important, not how it compares to other people's.
 - ▶ 3- Look at the scale and the expressions and then give a number. You can equally well use even as odd numbers.
- 

RPE Scale

| BORG 6-20 Rate of Perceived Exertion Scale (RPE) | | |
|---|-----------|---|
| No Exertion | 6 | Little to no movement, very relaxed |
| Extremely Light | 7 | Able to maintain pace |
| | 8 | |
| Very Light | 9 | Comfortable and breathing harder |
| | 10 | |
| Light | 11 | Minimal sweating, can talk easily |
| | 12 | |
| Somewhat Hard | 13 | Slight breathlessness, can talk |
| | 14 | Increased sweating, still able to hold conversation but with difficulty |
| Hard | 15 | Sweating, able to push and still maintain proper form |
| | 16 | |
| Very Hard | 17 | Can keep a fast pace for a short time period |
| | 18 | |
| Extremely Hard | 19 | Difficulty breathing, near muscle exhaustion |
| Maximally Hard | 20 | STOP exercising, total exhaustion |

TANKE YOU