



University of Verona,  
School of Exercise and Sport Science,  
Laurea magistrale in Scienze motorie preventive ed adattate

Metodologia delle misure delle attività sportive

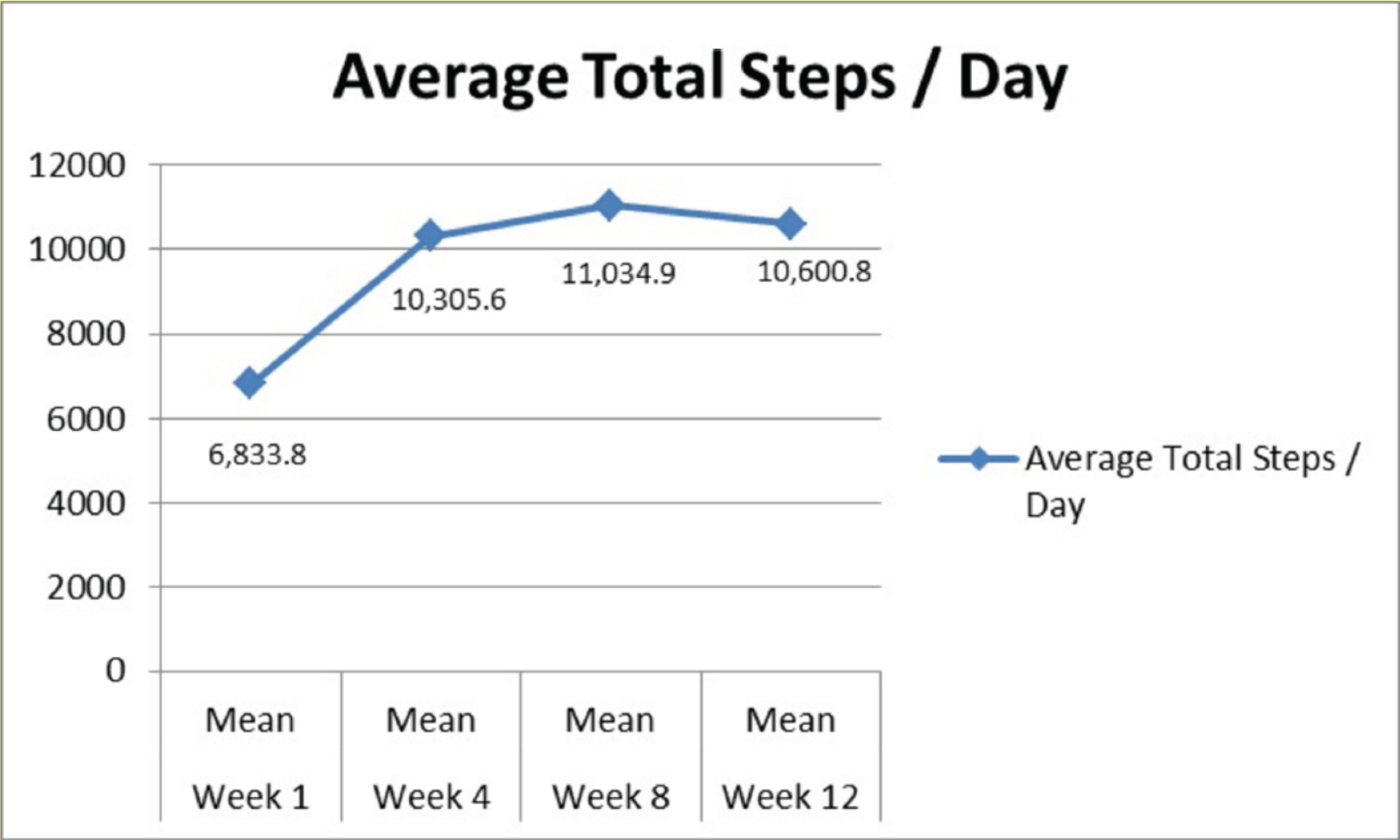
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Luca P. Ardigò Ph.D.

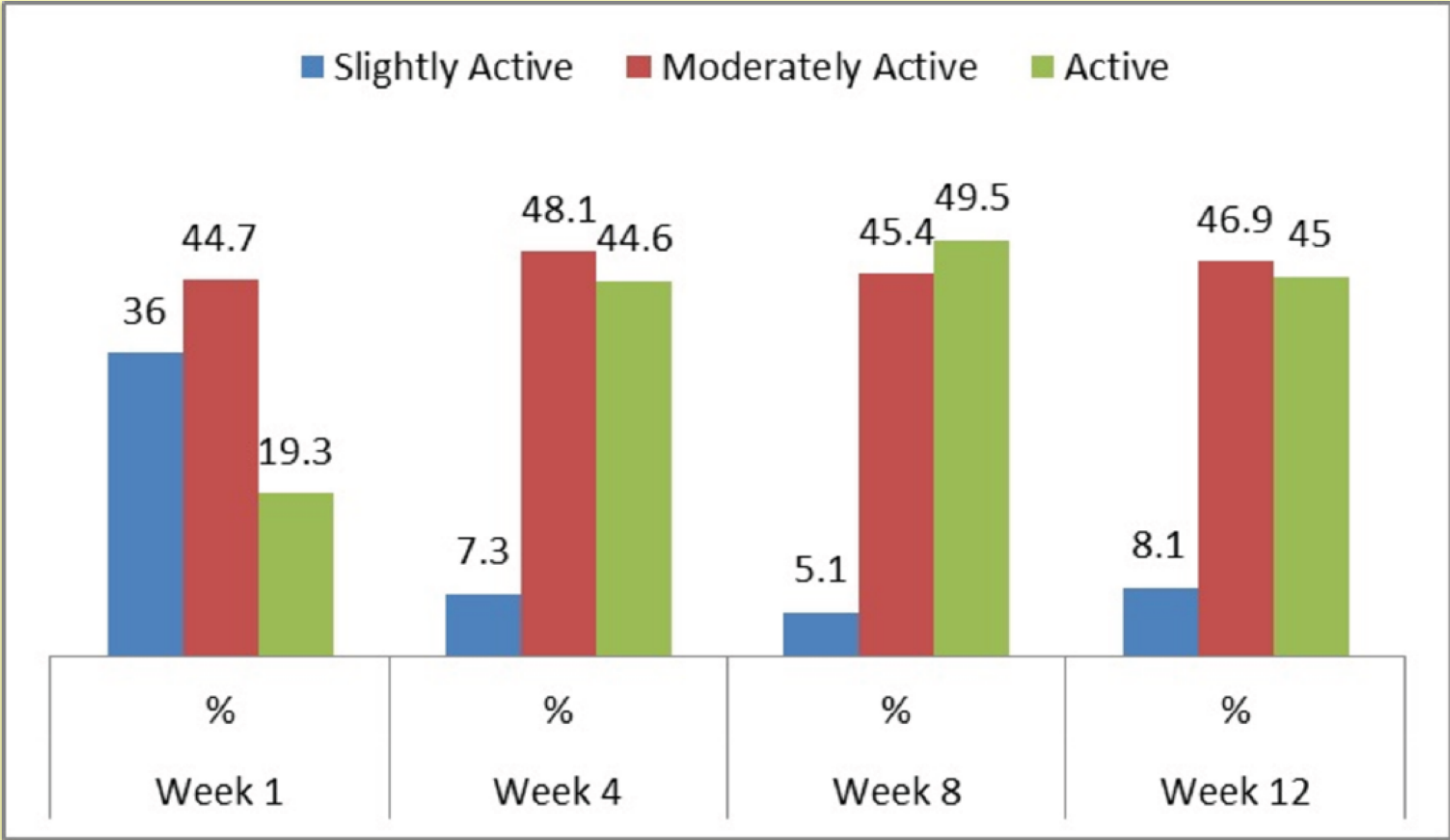
## Specific measures

How many steps/day are enough?

- 10,000 (Hatano, 1993);
- Tudor-Locke et al., 2004:
  - <5,000 sedentary lifestyle;
  - 5,000 ÷ 7,499 typical daily activity that does not include exercise or sports and can be defined poorly active;
  - 7,500 ÷ 9,999 includes a bit of extra-work (and/or fatiguing work) and can be defined a little active;
- > 10,000 active lifestyle;
- > 12,500 very active lifestyle



Effect of online pedometer program on physical activity in Qatar



# Pedometry

measures

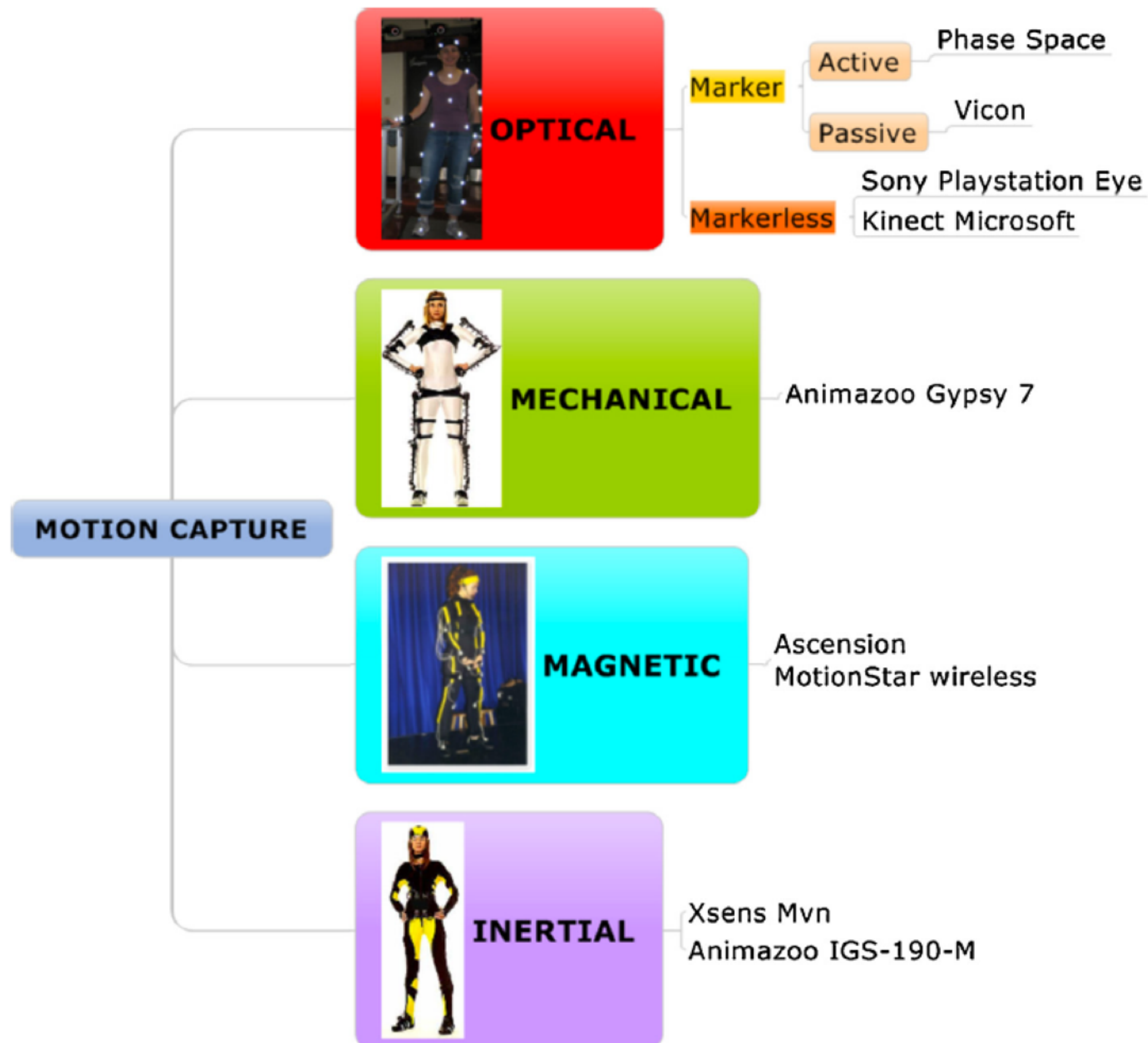
## Specs



Vital sign: HR, HRV, temperature  
Battery lifetime: Up to 10h (Rechargeable)  
Charging time: Appr. 1h  
Weight: 6,5g  
Dimensions: 4,5 x 1,8 x 3,8 cm (H x D x W)  
Radio frequency: 2,4 GHz  
Compatibilty: Bluetooth 4.0 & ANT+  
(certification coming soon)

cosinuss° One

# Mocap options



measures

Regazzoni et al, 2015

Fig. 1. Mocap system classification depending on the technology used.



## Top 20 fitness trends 2016

# 20

## Outcome Measurements

Outcome measurements are efforts to define and track measureable results to prove that a selected programme actually works. [Discover more at Human Kinetics](#)

# 19

## Core training

Core training stresses strength and conditioning of the stabilising muscles of the abdomen, thorax and back. [Discover more at Human Kinetics](#)

# 18

## Circuit Training

Circuit training is a group of 6 to 10 exercises that are completed one after another and in a predetermined sequence. [Discover more at Human Kinetics](#)

# 17

## Smart Phone Exercise Apps

These apps have become increasingly popular with younger gym members or people who exercise regularly outdoors. [Discover more at Human Kinetics](#)

# 16

## **Flexibility and mobility rollers**

These devices include the deep tissue roller, myofascial release and trigger point relief.

[Discover more at Human Kinetics](#)

# 15

## **Sport-specific training**

This trend incorporates sport-specific training for sports such as football and cricket, designed especially for young athletes. [Discover more at Human Kinetics](#)

14

## Outdoor activities

Outdoor activities often include hiking, canoeing, kayaking and games or sports.

[Discover more at Human Kinetics](#)

13

## Wellness coaching

Use a one-on-one approach similar to a personal trainer to provide support, guidance and encouragement. [Discover more at Human Kinetics](#)

# 12

## Worksite health promotion

Designed to improve the health and well-being of employees, this is a range of programmes and services that evaluate health, costs and worker productivity. [Discover more at Human Kinetics](#)

# 11

## Group personal training

Training two or three people at the same time in a small group seems to make good economic sense for both the trainer and the client.

[Discover more at Human Kinetics](#)

10

## Yoga

Yoga seems to reinvent and refresh itself every year, making it a more attractive form of exercise.

[Discover more at Human Kinetics](#)

9

## Exercise for weight loss

Health and fitness professionals who provide weight loss programmes are increasingly incorporating regular exercise and calorific restriction for better weight control in their clients.

[Discover more at Human Kinetics](#)

# 8

## Fitness programmes for older adults

As the baby boom generation ages into retirement, some of these people have more discretionary money than their younger counterparts to spend on fitness programmes.

[Discover more at Human Kinetics](#)

# 7

## Functional fitness

Uses strength training to improve balance and ease of daily living. It's closely related to personal training.

[Discover more at Human Kinetics](#)

6

## Personal Training

Education, training and proper accreditation for personal trainers have become increasingly important to the health and fitness facilities that employ them.

[Discover more at Human Kinetics](#)

5

## Certified professionals

It's important that consumers choose professionals certified through programmes that are accredited by bodies such as REPS.

[Discover more at Human Kinetics](#)

4

## Strength training

Sculpt the body you want with the help of some of the world's leading experts in strength training.

[Discover more at Human Kinetics](#)

3

## High-intensity training

Challenging workouts that push you to your limit and maximise results.

[Discover more at Human Kinetics](#)

2

## Body weight training

It's not just push-ups and pull-ups. New packaging, particularly by commercial clubs, has now made it popular in all kinds of gyms.

[Discover more at Human Kinetics](#)

1

## Wearable Technology

Includes fitness trackers, smartwatches, heart rate monitors and GPS tracking devices.

[Find out more at Human Kinetics](#)

# Wearable technology



# Wearable technology

## FROM HEAD TO TOE WEARABLE TECHNOLOGY

### SHIRT

Conductive thread means a computer is literally built into the fabric of the shirt, providing the processing power for all the other wearable gadgets.

### WRISTBAND

A sensor that tracks movement to determine the number of steps taken through the day – 10,000 is ideal – and how much sleep the wearer gets at night.

### TROUSERS

Also made with conductive thread, the trousers take the energy generated by movement and use it to power the other gadgets.

### GLASSES

Overlays navigation directions and information about points of interest directly on to the wearer's field of vision.

### WRISTWATCH

Vibrates when a message arrives and displays it on the watch face. Tells the time too.

### HAND

Embedded under the skin is a chip containing medical records, passport data and credit records. Information is transferred by waving the hand over a suitable scanner.

### SHOES

GPS chip provides directions using LED lights in each shoe: the left shoe indicates direction, while the right shows distance.

GRAPHIC: JOHN BRADLEY

# Summary

measures

- PA & ME overview;
- PA & ME measures overview;
- pedometry;
- first generation accelerometry;
- portable HR measure;
- $\dot{V}O_2$  measure overview;
- DLW method overview;
- second generation accelerometry (purely physical sensors);
- second generation accelerometry (physical + physiological sensors);
- GPS;
- GIS overview;
- DGPS overview;

# Summary

- multisensor portable devices/garments overview;
- IMUs overview;
- TurfTrax overview;
- RFID chip overview;
- ODBA overview

New methods for the evaluation of the energy expenditure in exercising humans in ecological conditions  
A three class module

Thank you for your attention

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