EC2U Summer School
Transgenerational Ageing & Gendered Life Cycle Approach
Pavia | 18 - 25 September 2022

# PHYSICAL ACTIVITIES FOR SENIOR LADIES

Iulian DUMITRU | Alexandru Ioan Cuza University
Iasi | Romania

# TABLE OF CONTENTS

# 01 Conceptual approaches

## 1.1. What is ageing?

Comfort ( 1979 ) | lifelong process of progressive growth

Rose (1991) | a steady decline in the age-specific fitness components of an organism that are caused by internal physiological deteriorations

Khazaeli (1998) & Rauser (2005) | robustness

Rose (2002), Rauser (2006), Mueller (2011) | adaptation of the organism

## Adulthood

1) Early adulthood ( 20 to 30 years) period of the climax of motor efficiency
2) Middle adulthood ( 30 to 45 years) period of stabilized motor efficiency
3) Late adulthood ( 45 to 60 years) period of decline in motor efficiency

## Old Age

1) Early old age (60 to 75 years) period of initial involution of human motor skills
2) Middle old age (75 to 90 years) period of involution of human motor skills
3) Late old age (over 90 years) period of decline in human motor skills

Ageing

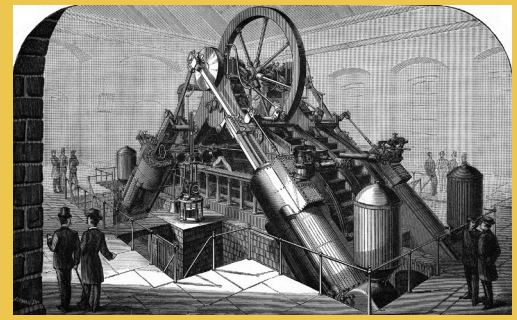
adaptation

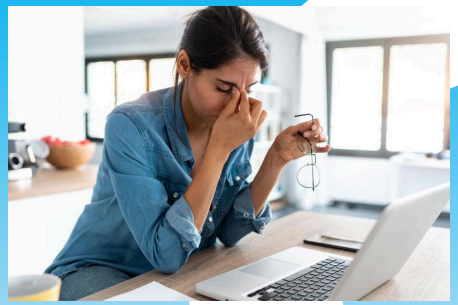
Natural selection

Dynamic contexts

# 1.2. Smart ageing concept (SAC)

SAC ⇔ Active ageing





constant physical activity

healthy nutrition

quality of sleep

technology for a better life

active living

leisure time

healthy lifestyle

*Adding years to your life is not automatically adding life to your years.*

# Quality of life

Healthy ageing

Physical exercise

Active life

Quality of life

# SMART AGEING

## General model

### Social

- network relationships
- communities
- communication channels

### Health

- accessibility
- support

### Fitness

- control of biological evolution through exercises
- functional health
- optimization of motor skills

### Economic

- financial stability
- advisory and info facilitation

### Mental

- a balanced mental status
- counselling and support

# 1.3. Physical activities portfolio for seniors

## 1.3.1. Strategy of all -around fitness improvement

### Dynamic life

### PA

- cardio -respiratory endurance
- neuromuscular efficiency
- improving flexibility
- improving dynamic and static balance
- relaxation capacity
- optimize body composition

### Active leisure

- active tourism
- motor entertainment activities

# 1.3.2 . Portfolio of physical activity

## Dynamic daily regime

### Active routines

- gardening
- house-keeping
- take the stairs
- visiting the local market
- choose a more distant market or store for your domestic or daily shopping

### All-around social mobility

- join voluntary programmes
- be involved in community projects

# Supervised activity

## Organized physical activities (OPA)

- Teambuilding activities (outdoor)
- Teambuilding activities (indoor)
- Active fun & games
- Various semi -structured outdoor physical activities
- Thematic physical activities

# Organized physical trainings (OPT)part 1

Aerobic choreographic activities

Cardio activities

Metabolic workout

Functional training

Strength training

Aquafitness

# Organized physical trainings (OPT) part 2

Flexibility

Balance exercises

Training for strengthen joints areas

Breathing management exercises

Relaxation techniques

Applicative drills

# Active leisure

- active tourism
- motor entertainment activities

## Active tourism

### Exploring the nature

- Combine soft hiking with other passions or activities (e.g. photography)
- Discover/visit natural sites
- Soft kayaking

### Power walking

- A more advanced touristic type activity
- Pace: 20-25 min/km for over 60 yo

### Trekking

- It is a advanced activity
- Precaution needed

### Cycling

- bike rides
- cycle tourism
- bike touring

# Motor entertainment activities

Outdoor activities

Adapted teambuilding activities

Physical entertainment activities

Fun games

Sports entertainment activities

# 1.4. Some methodological aspects and safe tips

## General approach

# Cardio fitness class

- Safe target zone for cardio trainings : 40-60 % of MaxHR (Karvonen formula)
- Progressive time for class : start with 35 min to 50 min
- Do not use jumps & leaps
- Extra precaution when running on a rough or uneven ground
- Use proper shoes

# Conditioning trainings

- Specific warm -up
- The weights (intensity of effort) used need a progressive load as follow :

  - Start : 40 % of 1RM
  - Progressive load : max 70 % of 1RM
  - *Obs: 1-RM (Brzycki 's formula)*

- Majority of exercises need to be performed with an intensity zone of 40-60% of 1RM

# Cycling activities

- despite the type of cycling activity, it is recommended to choose most of the times an organized cycle tour ;
- choose a group bike tour rather than a single one.

# Pool activities

- attend a class or at least train with a partner
- checks before entering the water: depth; temperature; devices or any structural accessories for a safety grab in case of necessity
- use water glasses if diving is part of the program
- work along the margins of the pool if you ’re single
- be cautious getting in and out
- avoid deep underwater dives or exercises
- avoid sudden movement

# Outdoor activities

- choose a group activity
- if choose to work alone:
  -don’t go to far from a residential area
  -don’t use unknown routes
  -carry an ID or a emergency info list
  -previously inform other person about the routes or area of exercise
  -be seen to be spotted (use bright colors)
  -use proper shoes
- check the time and calculate to finish before night time
- if use headphones, be sure the volume is low or use only one

# 02
# Exercises management on osteoporosis – practical and methodological approach

# STRUCTURE

- General Data
- Pathophysiology
- Approaches in prevention and treatment of osteoporosis
- Innovative design

# 1. GENERAL ASPECTS

**Statistics**

- 1 in 3 women over age of 50 will experience osteoporotic fractures
- 200 million people are osteoporotic
- osteoporotic fractures are more common than heart attack, stroke, and breast cancer (IOF, 2015)
- Osteoporosis causes >8.9 million of the fractures worldwide which makes it approximately 1000 cases per hour
- 12 million women has osteoporosis (Germany, France, Italy, Spain and UK only)
- financial burden: €38.7 billion in the 27 EU countries (2010)

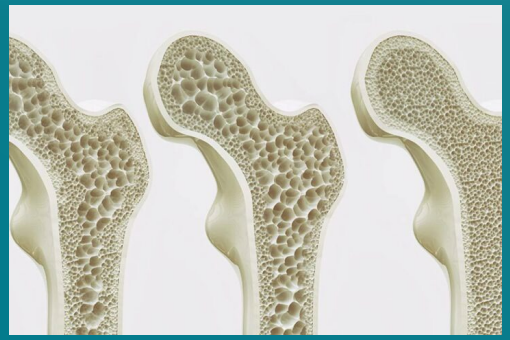
**Aging and osteoporosis**

- Aging ⇔ estrogen level
- Decreased estrogen ⇨ reduction of muscle mass and strength; reduction of bone density

**Background**

- Hormone replacement therapy (HRT) ⇨ worries
- non-invasive approaches
- quality of life & life expectancy ⇨ alternative strategies

# 2. PATHOPHYSIOLOGY



**Definition**

Osteoporosis is a disease of the bones that sets in with aging and consists of a reduction in BMD.

**The bones provide:**

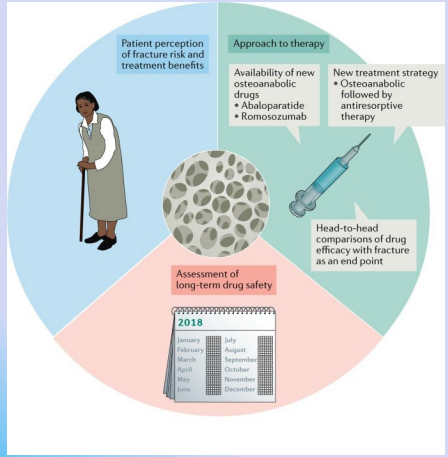
- structural support
- organ protection
- mineral deposit (calcium and phosphorus)

**Evolutive aspects**

- maximum bone density: 30 years
- bone mass ~ genetic matrix: diet, exercise, drugs, diseases
- osteoclasts ⇨ resorbs and degrades bone
- osteoblasts ⇨ maintain, grow and repair bones
- osteoblasts ⇔ osteoclasts ⇨ osteoporosis

# 3. APPROACHES IN PREVENTION AND TREATMENT OF OSTEOPOROSIS

- Medication intake
- Food management
- Management of physical exercises
- Safety protocols



# 4. Innovative approach

- Design
- Physical intervention systems (FIS) portfolio
- Protocol
- Assessment

# 4.1 Design

## Innovative contribution of HB Program

- Uniqueness
- Customization
- Progression
- Maximum Permissible Load
- Ergonomics and Posture

## Main directions

- adaptive & versatile physical exercises used as osteogenic tools

- concentrate the effort to specific areas

- improve balance and reduce the risk of falls

- improve muscle strength in particular lower limbs and trunk extensor muscles

- improve posture with particular attention to counteracting hyper kyphosis

- improve vertebral stability

- relieve pain, if present

# 4.1 Design (continuation)

- **Operational objectives**

- **Principles and methods**

- Safety
- Customization & Progression
- MPL
- Accuracy
- Diversify
- Lower Limbs – Flexors Exercises
- Ergonomics and Posture
- Breathing
- Stay Active

# 4.2 Physical intervention systems portfolio

1. adaptive weight bearing exercises & calisthenics
2. Light & medium weight portable objects exercises
3. progressive resistance exercises
4. partner exercises
5. exercises on specific devices with segmental and / or multiarticular neuromuscular solicitation
6. LIA

# 4.2 Physical intervention systems portfolio
(continuation)

7. suspension cables exercises (SCE)
8. exercises on mobile surfaces or with variable support (with / without assistance) & controlled slip exercises
9. functional exercises
10. static and dynamic exercises to improve the flexibility indices
11. non-impact exercises - submersion exercises (in water)
12. static and dynamic balance exercises

# Mandatory exercisess & Exercisess chosem by the trainer

## Mandatory exercises

1. Squats

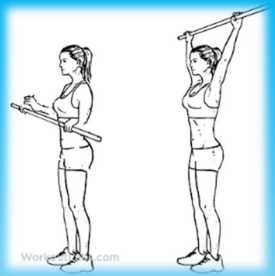
2. Abductor exercises

3. Adductor exercises

4. Hip flexor exercises

# Mandatory exercises (continuation)

## 5. Upper back exercises



## 6. Modified b ridge exercises

## 7. Head rise exercises


## 8. Sfinx type exercises

# Exercises chosen by the trainer

1. LIA

2. Core muscle & stability

4. Postural exercises & static balance

3. Progressive resistance exercises

5. Portable weights exercises

# Exercises to avoid

# 4.3 PROTOCOL

## Planning

**Lessons:** 72

**Period:** 24 weeks

**Exercises program includes:**
- supervised classes: 3 days / week
- home training: 5 days / week

## WEEK PROGRAM

### supervised classes

**Lesson 1**
- group training
- cardiovascular training
- strength training

**Lesson 2**
- cardiovascular training
- exercises on resistance machines

**Lesson 3**
- group training
- cardiovascular training
- strength training

# Periodization

## Week 0

**Tests**

## Week 1

- study of the mandatory exercises
- cardiovascular training

## Week 2

- group training with or without small props
- cardiovascular training
- study of exercises on resistance machines according to the correct biomechanics and ergonomics

## Week 3

- group training with or without small props
- cardiovascular training
- exercises on resistance machines
- **strength tests**

## Week 4-13

- group training with or without small equipment
- cardiovascular training
- implementing the program according to the protocol

## Week 14

- group training with or without small equipment
- cardiovascular training
- **strength tests**

## Week 15-23

- group training with or without small equipment
- cardiovascular training
- exercises on resistance machines (new loads)

## Week 24

- group training with or without small equipment
- cardiovascular training
- administration of strength tests
- **battery tests (Week 0) & strength tests**

# Customization & Progression

## Lesson duration

- 35 min (first lessons)
- Gradualy incrise up to max 45-50 min
- Cardiovascular exercises: start with 15min; add 5 min each week; max30 min

## %HR

- Target intensity: 70-75%
- Heart rate zone: Karvonnen formula

Target Heart Rate = [(max HR − RHR) × %Intensity] + RHR

## Strength training

- 4 strength machines:
  - leg extension
  - leg curl
  - leg press
  - gluteus machines
- 2-3 series of 10/15 repetitions
- Intensity: 50 to 70% of 1-RM
- Brzycki formula

Maxi weight = [Weight used in the test / [1,0278 – (0,0278 * number of repetitions)]

# 4.4 Assessment

## Osteoporosis Assessment Questionnaire

- QUALEFFO41
- WHQ
- IPAQ: Short Forms

## Functional and motor testing

- 30 Second Chair Stand
- Handgrip Strength
- 6MWT
- Single Leg Stance
- SEBT

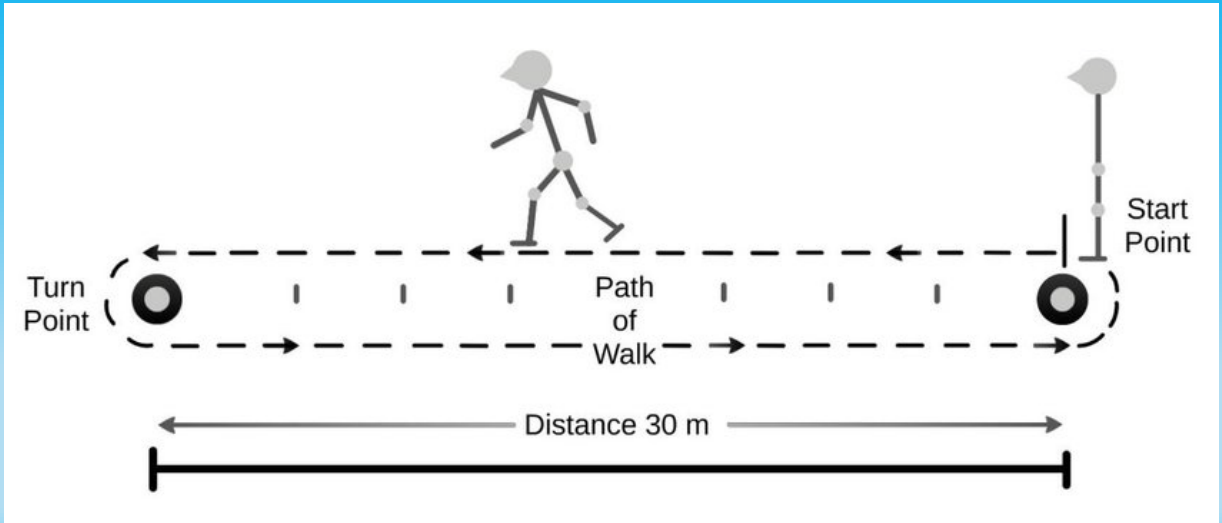
# Functional and motor testing

## 30 Second Chair Stand

## Handgrip Strength

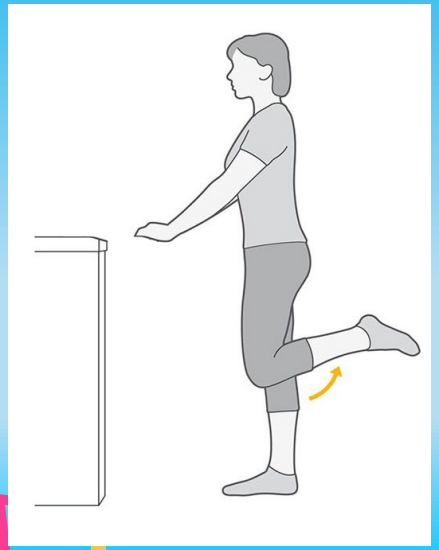
# Functional and motor testing
(continuation)

## 6MWT

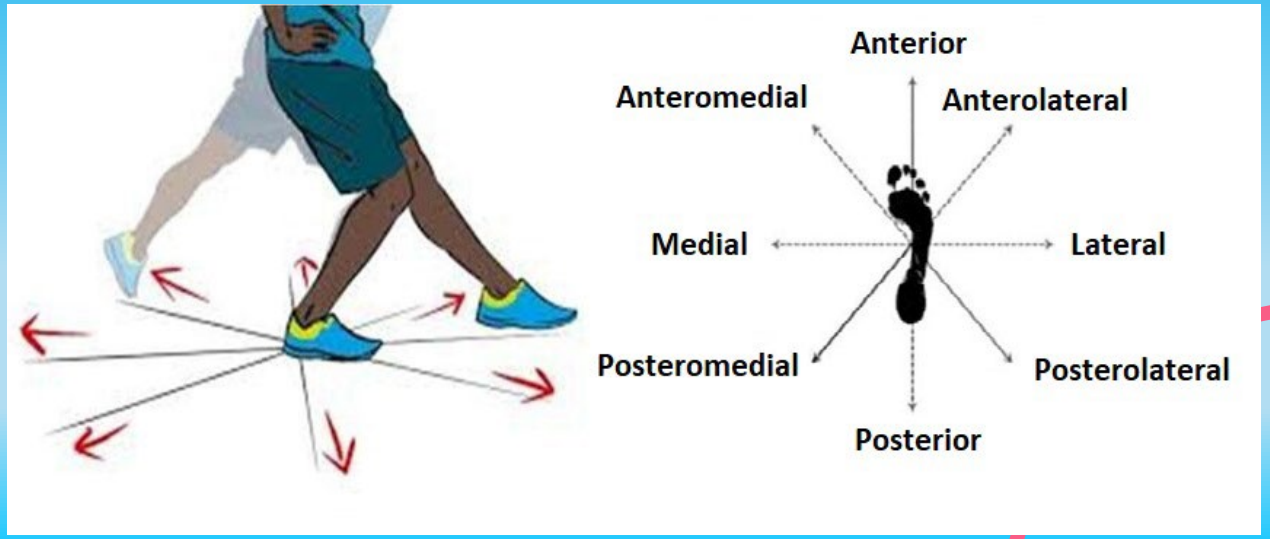


# Functional and motor testing
(continuation)

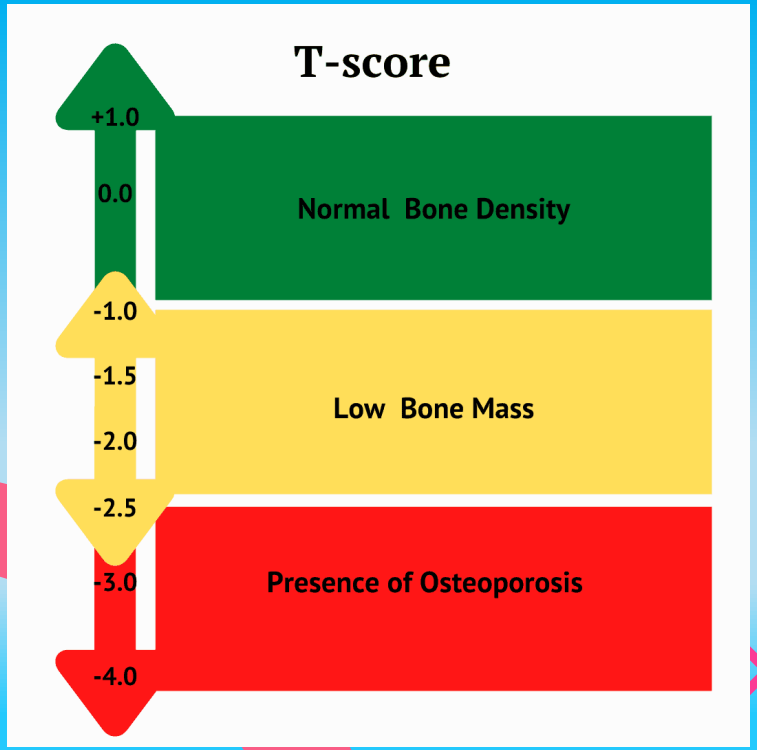
## Single Leg Stance

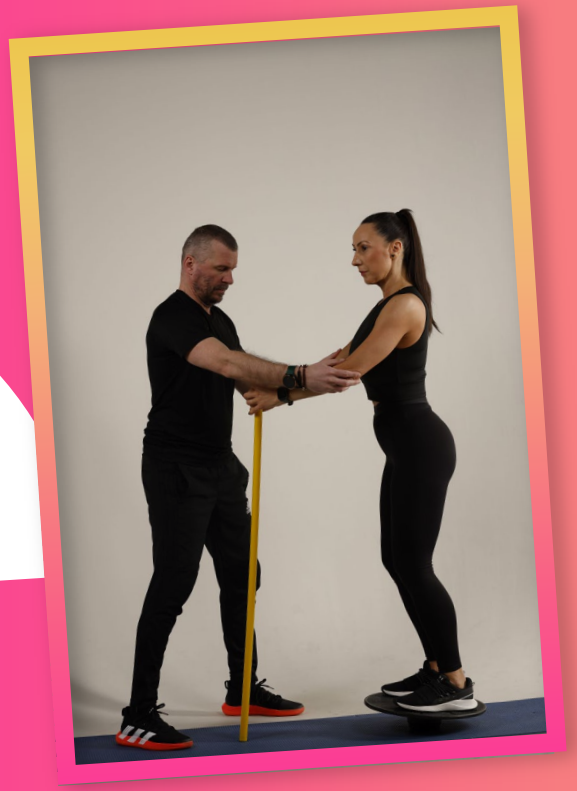


## Star Excursion Balance Test



# If the T-score at at the femoral neck or spine is:



# GRAZIE MILLE

Do you have any questions?

imdumitru@yahoo.com
iulian.dumitru@uaic.ro

Faculty of Physical Education and Sport
Iasi | Romania

www.sport.uaic.ro

UAIC FEFS IASI