

Why Exercise prescription?

- Individual ageing process
- Personal life expectations

The optimal prescription for any individual is determined on an appropriate evaluation of:

- GOAL (S) - (Final target to reach)
- Physical Capacity - (Physiological Test Performance Task)
- Psychological profile - (attitude to exercise)
- Social aspects (Environment and Barriers)

Managing Exercise Prescription or Counseling?

Exercise for elderly is a matter of health not simply recreation (according to OMS)

In the past exercise for elderly was generally proposed on the basis of
...reduced intensity in order to increased safety without any check on the effects

Counseling is a good method, basically aimed at inducing behavioural changes, however we need to link appropriate prescription to it

The art of exercise prescription is the successful integration of medical and exercise science with behavioral techniques that resulting long-term program compliance and attainment of individual's goal.

**ACSM Guidelines for exercise testing and prescription.
6th edition 2004**

Milestones of Exercise Prescription

Appropriate mode(s) of exercise
Intensity
Duration
Frequency
Progression

**Aerobic training
(Cardiovascular endurance)**

- 1. Improve the ability of the body to utilise oxygen
- 2. Basis for physical fitness
- 3. Measured by VO₂ max or ... other indexes
- 4. Expected changes in elderly from 5 to 40%
- 5. Improvement is inversely related to initial level

**Aerobic training
Mode of exercise**

Use of large muscle for prolonged (several minutes) periods and rhythmic movements.....wide numbers of activities.....

Group 1	Activities easily maintained at constant intensity Low inter-individual diff. In EnExp or EnCost Precise control, rehabilitation, elderly (?)
Group 2	Activities where the rate of EE is related to skill EE is relatively constant for a given person Early stage of conditioning for skilled people
Group 3	Activities where skill and intensity are variable Provide group interaction and variety of ex Caution for high risk and low fit (not diseased ?)

Other considerations: risk of injuries,orthopedic stress, muscle strength requirement,travel cost, partner involvement

**Aerobic training
Intensity & Duration**

Intensity and duration are integrally related determining EE of exercise activities

The same results (in terms od cardiovascular endurance) can be reached with prolonged exercise and low to moderate intensity (not too low!!!!)

Desirable intensity for elderly is from 50 to 80% of VO₂ max but you can(have to) reached for short periods 90-100% V'O₂ max

Individual with very low fitness (< 25ml/Kg/min) can start from 40-50% of V'O₂ max

Aerobic training Intensity

How to establish intensity:
- evaluation....(you are very expert now!!!!)

Set the parameter:
- HR (% of maximum or HR reserve)
- RPE (rate of perceived exertion) example Borg Scale
- METs

others as:
- ventilatory requirements
- lactate
- pain limitation

HR reserve= HR max-HR rest (intensity range from 50 to 85%)

Classification of intensity
30-60 min of exercise

% HR max	% VO ₂ max	RPE	Classification of intensity
< 35	< 30	<10	Very light
35-59	30-49	10-11	Light
60-79	50-74	12-13	Moderate
80-89	75-84	14-16	Heavy
>90	>85	>16	Very Heavy

Aerobic training Duration

1. Time limitation of the individual leads the choice!!!
2. From 5-10 min to 30-40 min inversely related to intensity
3. Gold standard 20-60 min at 55-75% VO₂ max
4. Frail or low fit elderly could benefit also from repeated session of 5-10 min
5. Set the initial goal reasonably for the individual (auto regulation is the tomb of prescription!!!!)
6. Increase as a function of success and absence of fatigue

Aerobic training Frequency

1. Inter-relation: Intensity and Duration
2. Set on functional capacity:
 - very low fit subj. (<3 METs) require multiple daily sessions
 - low fit (3-5 METs) 2 or 3 sessions per day
 - normal (> 5 METs) 3-5 sessions/week

Number of exercise sessions per week also depend on **caloric goals**, subjects preferences and limitations lifestyle,.....

Aerobic training Rate of progression

1. It is determined by:
 - Functional capacity
 - Medical and health status
 - Age
 - Individual preference
2. Three stages:
 - I - INITIAL CONDITIONING STAGE (4-6 wks)
....avoid risk and fatigue...
 - II - IMPROVEMENT STAGE (4-5 mo)
....feel the increasing power...
 - III - MAINTENANCE STAGE (> 6 mo)
....enjoy your exercise as part of your life...

Musculoskeletal flexibility

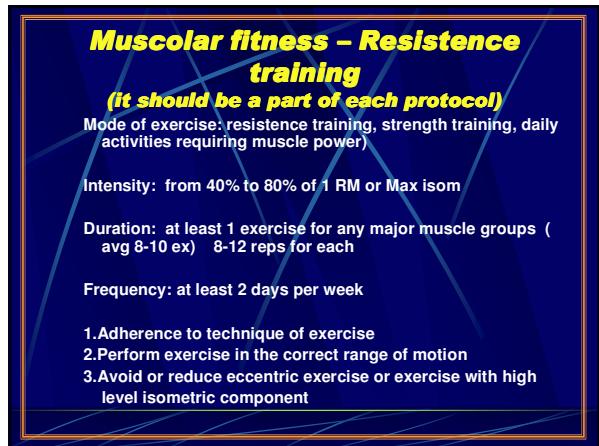
Mode of exercise: Any that maintain an adequate range of motion (generally called stretching ex.)

Static exercises are to be preferred in elderly with emphasis to low back and thigh area

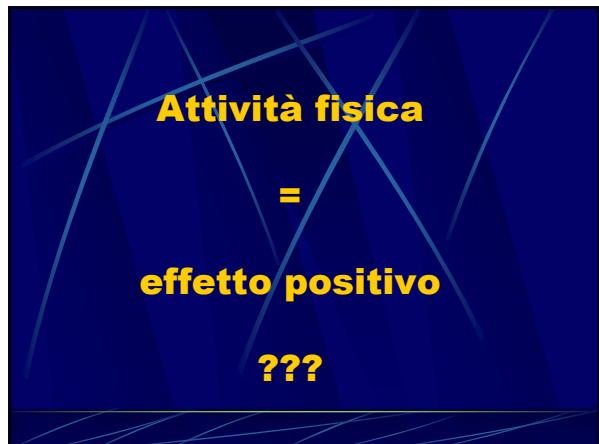
Intensity: to position at middle discomfort

Duration: 10 to 30 sec for each stretch 3-5 reps

Frequency: at least 3 days per week







Il rischio inefficacia

- Attività motoria totale ($> 45'$ / die)
- Intensità: moderata – media ($> 4-5$ mets)

Objectively measured physical activity and fat mass in a large cohort of children:
- DXA e accelerometri in 5500 bambini 12 anni
- no correlazione att. fisica totale e massa grassa
- buona correlazione inversa ($r^2=0.83$) tra attività fisica media-intensa e sovrappeso

Ness et al. 2006)

Obesità e capacità funzionali – bambini-

Sovrappeso e obesità moderata in bambini pre-puberi non producono alcuna limitazione al metabolismo energetico in cammino, corsa e pedalata su bici

(Maffei, Schutz, Schena et al J. Pediatrics 1993)

Obesità e capacità funzionali – anziani-

Sovrappeso e lieve obesità in anziani attivi (età media 69,4 anni) si associano con una riduzione delle capacità funzionali e motorie, specialmente per potenza aerobica, rapidità e flessibilità. Nessuna modifica per forza muscolare e coordinazione motoria.

(Schena, Lanza et al., J.A.P.A. 2004)

