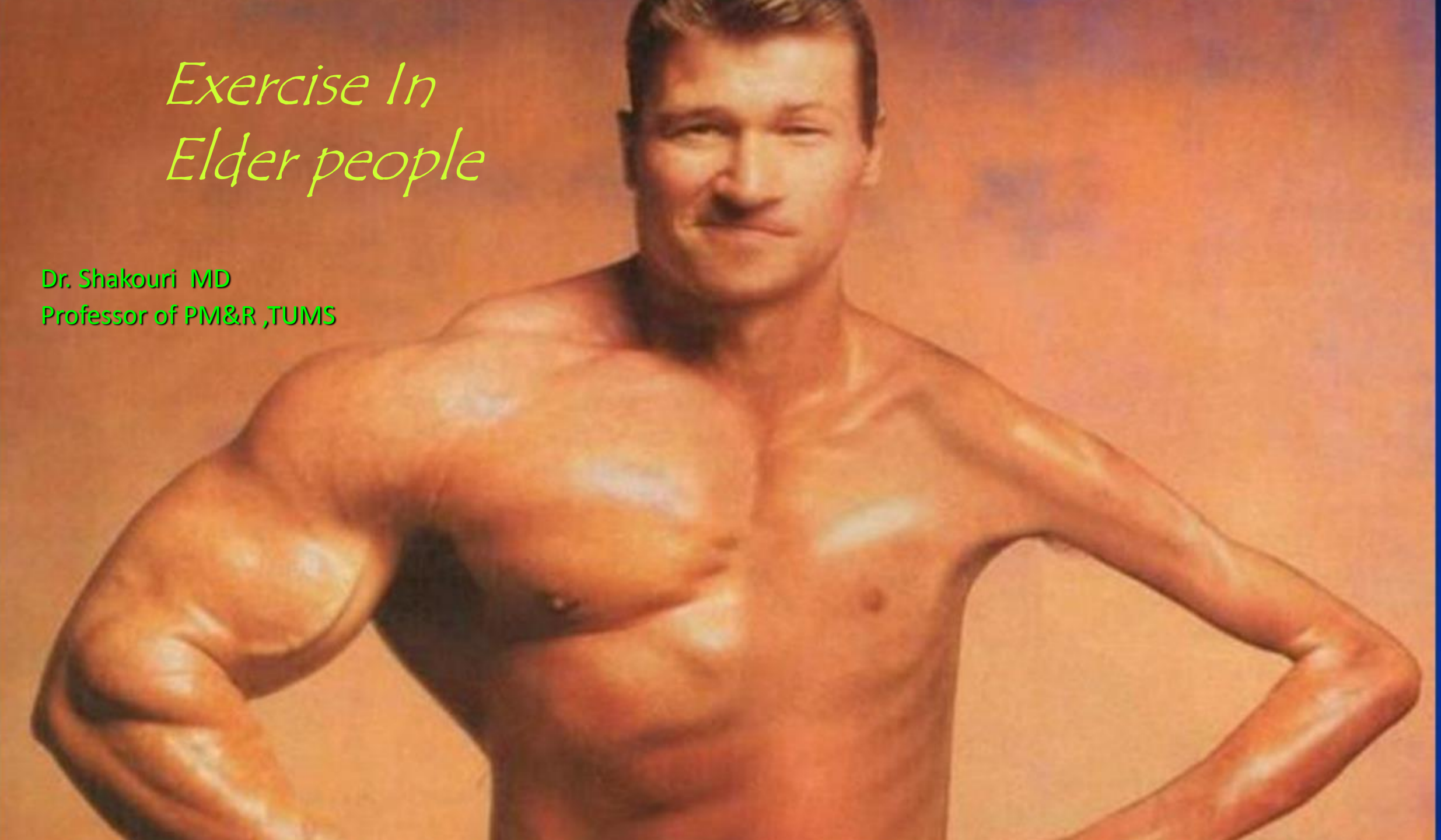
بنام خدا

Exercise In Elder people



Dr. Shakouri MD
Professor of PM&R ,TUMS

Goals

- Develop an understanding of normal aging physiology
- Incorporate aerobic and resistance exercise into treatment and prevention plans of the elderly
- Appropriate pre-exercise assessment

The Washington Post

SPORTS

Saturday, October 29, 2005

MARINE CORPS MARATHON

Charles Stalres, 77, plans to participate in the 30th Marine Corps Marathon tomorrow, marking the 29th time the Alexandria resident has run the race.

Years Ahead of the Competition

For Many Participants, District's 26.2-Mile Trek Never Gets Old

Still Running

By Rich Campbell
Special to The Washington Post

and I'm not quite ready to give it up."

The Marine Corps Marathon,

Exercise and aging physiology

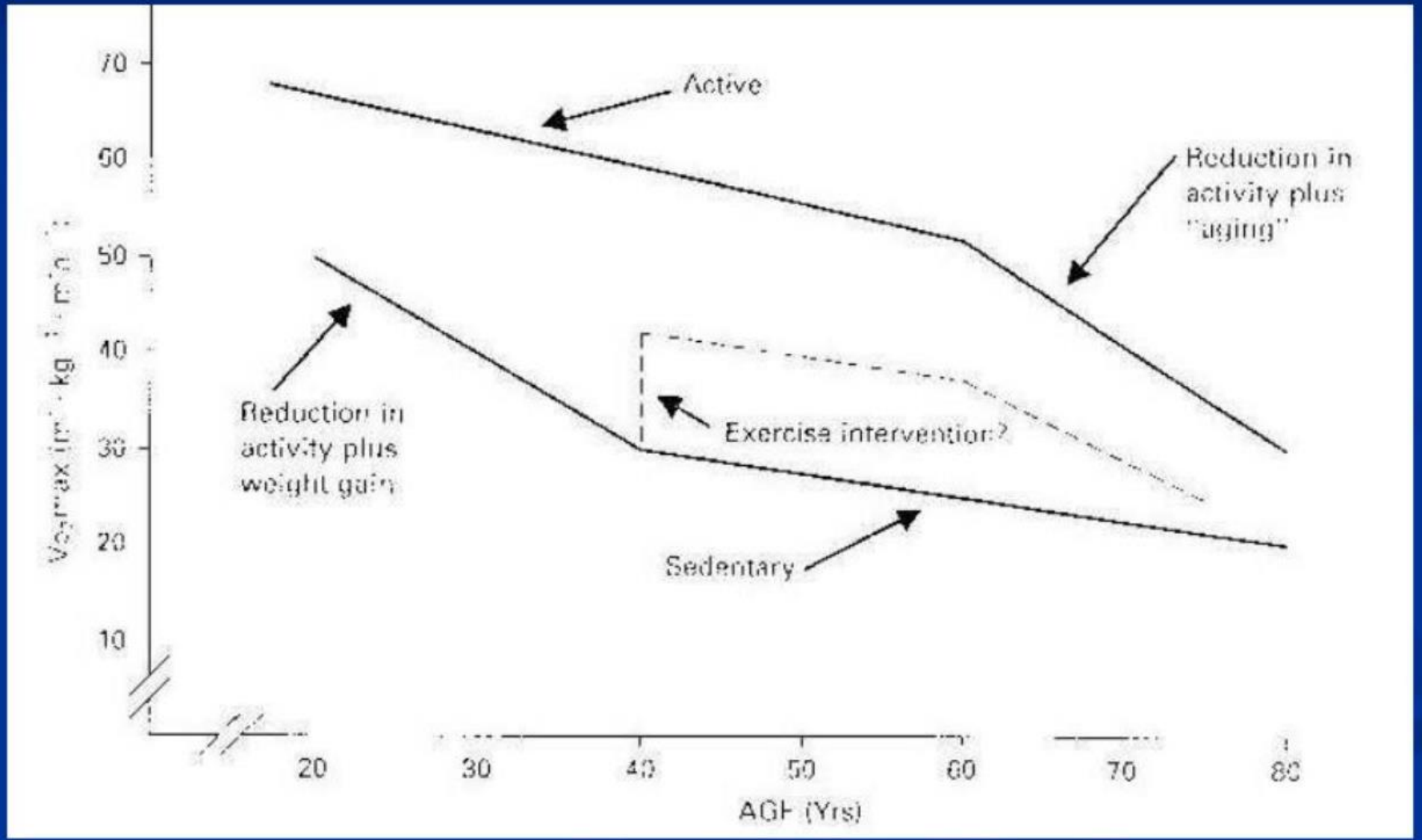
Physiologic changes with aging (Board Questions)

- Decreased
  - Muscle mass
  - Muscle strength
  - Muscle power
  - Muscle endurance
  - Muscle contraction velocity
  - Muscle mitochondrial function
  - Muscle oxidative enzyme capacity

Physiologic changes with aging (Board Questions)

- Decreased
  - Maximal and submaximal aerobic capacity
  - Cardiac contractility
  - Maximal heart rate
  - Stroke volume and cardiac output
  - Nerve conduction velocity
  - Balance
- Decreased
  - Proprioception
  - Gait velocity
  - Gait stability
  - Insulin sensitivity
  - Glucose tolerance
  - Immune function
  - Bone mass/strength/density
  - Collagen cross-linkage, thinning cartilage, tissue elasticity

Exercise and VO2 Max



Use It or Lose It

- Sedentary people lose large amounts of muscle mass (20-40%)
- 6% per decade loss of Lean Body Mass (LBM)
- Aerobic activity not sufficient to stop this loss
- Only resistance training can overcome this loss of mass and strength
- Balance and flexibility training contributes to exercise capacity

What is exercise?

- Lifestyle choices
- Organized sports
- Unstructured play
- Household and Occupational tasks

Increased Muscle Mass

- Endurance training emphasis
  - Walking isn't enough
- **Progressive resistance training**
  - DM prevention?
  - Dependency prevention?
  - Falls and fractures
  - Disuse
  - Sarcopenia
  - Frailty

Burning Fat

- Decreases in total body adipose tissue
  - Aerobic and resistive training
  - Energy restricted diets and/or high volume exercise (5-7 hours/week)
  - Visceral fat selectively mobilized

Geriatric Disease and Epidemiology:

- Top 10 Chronic Conditions (1989)
  - Arthritis
  - Hypertension
  - Hearing Impairment
  - Heart Disease
  - Cataracts
  - Orthopedic Impairment
  - Chronic sinusitis
  - Diabetes
  - Visual Impairment
  - Varicose Veins

Exercise and prevention

Common Chronic Diseases

- Genetic
- Environmental factors
- Most chronic illness related to behavior and patterns of physical activity
  - Exceptions: Parkinson's, degenerative neurologic diseases
  - Exercise may be protective with dementia

Diabetes and Osteoporosis

- Insulin Resistance
  - Improves insulin sensitivity
  - Detraining may reduce exercise effect
  - Primary prevention demonstrated
- Osteoporosis prevention and treatment
  - Stabilization or increase in bone density in pre- and postmenopausal women with resistive or weight bearing exercise
  - 1-2% per year difference from controls

Hypertension

- Most trials cross sectional and cohort
- Lower pressures in active individuals
  - 5-10 mmHg
  - Type and intensity
- Greater training effect in those with mild to moderate hypertension
  - 6-7 mmHg drop in systolic and diastolic pressure
  - Effect present in low-to-moderate exercise

Arthritis

- Improved functional status
- Faster gait
- Lower depression
- Less pain
- Less medication use
- Strength and endurance training benefit

Cancer

- Potential protective benefits with
  - Breast Cancer
  - Colon Cancer

Contraindications

- Relative
  - Acute illness
  - Undiagnosed chest pain
  - Uncontrolled diabetes
  - Uncontrolled hypertension
  - Uncontrolled asthma
  - Uncontrolled CHF
  - Musculoskeletal problems
  - Weight loss and falls
- Absolute
  - Inoperable Aortic Aneurysm
  - Cerebral aneurysm
  - Malignant ventricular arrhythmia
  - Critical aortic stenosis
  - End-stage CHF
  - Terminal illness
  - Behavioral problems

ACSM guidelines for healthy aerobic activity

- Exercise 3-5 days each week
- Warm up 5-10 minutes before aerobic activity
- Maintain intensity for 30-45 minutes
- Gradually decrease intensity of workout, then stretch to cool down during last 5-10 minutes
- If weight loss is goal, 30 minutes five days a week


Thanks for your attention