EXERCISE PRESCRIPTIONS IN OLDER ADULTS

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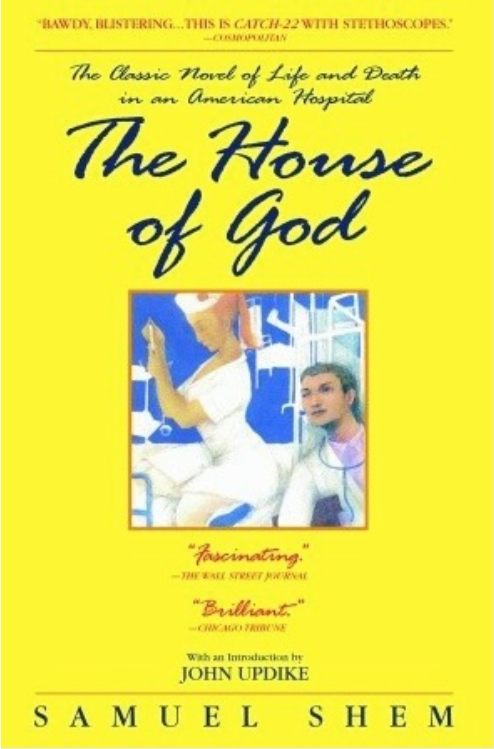
GOMERS GO TO GROUND

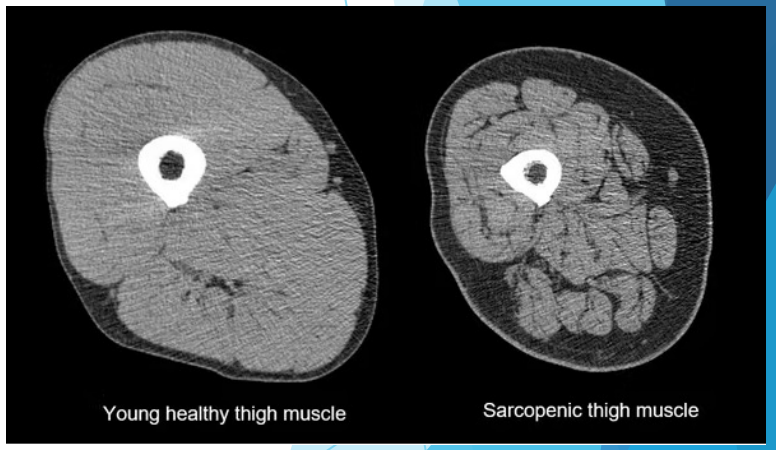


- Falling is inevitable
- Frequent causes of disability, institutionalization, and mortality
- Increased medical costs at end of life
- Costs are expected to further increase in the near future with the impending Silver Tsunami

Pahor, M. "Falls in Older Adults: Prevention, Mortality, and Costs" JAMA, June 2019.

AGING AND SARCOPENIA

- Aging is accompanied by a progressive decline in skeletal muscle mass and muscular strength
- The underlying cellular changes involve decrease of muscle anabolism and increased expression of inflammatory factors contributing to skeletal muscle catabolism.
- Accelerated rate of decline after age 50
- The consequence of sarcopenia include adverse outcomes like physical disability, poor quality of life and death
- Proper nutrition, especially protein intake, and increasing physical activity are important in the treatment of sarcopenia



Lang, T et al. "Sarcopenia: etiology, clinical consequences, intervention, and assessment." Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA vol. 21,4 (2010): 543-59. doi:10.1007/s00198-009-1059-y

AGING AND NUTRITION

- Protein intake or supplementation has a positive effect on muscle mass, muscular strength, and physical performance
- Increased protein intake inversely associated with frailty
- Older adults should consume 1.0 to 1.5 g of protein/kg of body weight/d, and include leucine-enriched essential amino acids to the diet (tofu, beans, nuts, seeds)
- Recommended Dietary Intake for protein in older adults is 25% higher than the Recommended Dietary Intake for the younger population in Australia and New Zealand

Naseeb, M. et al. "Protein and exercise in the prevention of sarcopenia and aging" Department of Nutrition Sciences, College of Nursing and Health Professions, Drexel University, Philadelphia. April 2017

COMING OF AGE

- Improve the health, function and quality of life for older adults to preserve independent living and psychological well-being
- Benefits of regular physical activity or exercise with regard to aging and disease are indisputable
  - Only 32% of clinicians deliver exercise counseling or education
    - Lack of knowledge
    - Concern for risk or adverse events
- Only 22% of adults >65 achieve the recommendations for physical activity

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COMING OF AGE: CONSIDERATIONS IN THE PRESCRIPTION OF EXERCISE FOR OLDER ADULTS

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GOALS FOR THIS TALK

1. Describe guidelines for exercise prescription in older adults

2. Apply recommendations for pre-exercise screening

3. Solve common barriers for adapting and maintaining exercise regimens in older populations

4. Demonstrate six exercises that can be done at home without equipment

"My doctor advised me to exercise religiously."

EXERCISE PRESCRIPTION

- Physical activity program designed in a systemic and individualized manner in terms of FITT-VP principle
  - Frequency
  - Intensity
  - Time
  - Type
  - Volume
  - Progression

AMERICAN COLLEGE OF SPORTS MEDICINE (ACSM)

- Recommend that older adults engage in a combination of aerobic, resistance, flexibility and balance training
- Older adults refer to men and women age >65 and adults age 50-64 years, with clinically significant chronic conditions and/or functional limitations.

The FITT-V Principle of the ExR_x	Professional Committee/Organization					
	ACSM/AHA[7,31]	CDC[9]	NIH[45]	CSEP[46]	BSG[47]	WHO[48]
***F*requency (How often?)**	If moderate intensity: ≥ 5 d/wk If vigorous intensity: ≥ 3 d/wk If combination of moderate and vigorous intensity: 3-5 d/wk	≥ 3 d/wk, throughout the week	Most or all days of the wk	NA	5 d/wk	NA
***I*ntensity (How hard?)**	Moderate to vigorous[c]	Moderate to vigorous[c]	Moderate to vigorous	Moderate to vigorous[c]	Moderate[c]	Moderate to vigorous[c]
***T*ime (How long?)**	If moderate intensity: ≥ 30 min/d If vigorous intensity: ≥ 20 min/d[d,e]	NA	≥ 30 min/d	NA	30 min/d, one bout or cumulative	NA
T*ype (What kind?) *Primary	Aerobic	Aerobic	Endurance	Aerobic	Aerobic	Aerobic
Adjuvant 1	Muscle strengthening ≥ 2 d/wk (non-consecutive) Moderate to vigorous intensity[c] 8-10 exercise; ≥ 1 set of 10-15 repetitions[g,h]	Muscle strengthening ≥ 2 d/wk Moderate to high intensity 2-3 sets of 8-12 repetitions[g,h]	Muscle strengthening ≥ 2 d/wk (non-consecutive) 30 min/d[g,h]	Muscle and bone strengthening ≥ 2 d/wk[g]	Muscle strengthening ≥ 2 d/wk (non-consecutive)	Muscle strengthening ≥ 2 d/wk[g]
Adjuvant 2	Flexibility ≥ 2 d/wk at least 10 min/d	Balance if at risk of falling ≥ 3 d/wk In addition, standardized balance exercise program	NA	Balance if mobility is poor	Flexibility before and after other types of activity Or ≥ 2 d/wk; ≥ 10 min/d	Balance if mobility is poor ≥ 3 d/wk
Adjuvant 3	Balance if at substantial risk of falling	NA	NA	NA	Balance if at substantial risk of falling ≥ 3 d/wk	NA
***V*olume[d]**	If moderate intensity: ≥ 150 min/wk If vigorous intensity: ≥ 75 min/wk[e,f]	If moderate intensity: ≥ 150 min/wk If vigorous intensity: ≥ 75 min/wk[e,f]	NA	≥ 150 min/wk[e]	NA	If moderate intensity: ≥ 150 min/wk If vigorous intensity: ≥ 75 min/wk[e,f]

THE FITT-V PRINCIPLE

1. **Frequency**
   - Moderate intensity: >5 d/wk
   - Vigorous intensity: >3 d/wk
   - Combination of moderate and vigorous intensity 3-5 d/wk
2. **Intensity**
   - Moderate - an intensity that causes *noticeable* increases in heart rate and breathing for aerobic activity
   - Vigorous - an intensity that causes *substantial* increases in heart rate and breathing for aerobic/muscle strengthening activity
3. **Time**
   - Moderate >30min/d
   - Vigorous >20 min/d

THE FITT-V PRINCIPLE

4. **Type**
   - Aerobic
   - Muscle strengthening
   - Flexibility
   - Balance
5. **Volume**
   - Moderate >150 min/wk
   - Vigorous >75 min/wk
6. **Progression**
   - Up to 300min/wk for moderate or 100min/wk for vigorous

TAKE AWAYS

- >5 days, >30 minutes
- Moderate intensity aerobic exercise supplemented by resistance exercise >2d/wk and flexibility >2d/wk
  - Aerobic: activities that do not impose excessive orthopedic stress, such as walking
  - Resistance: 8-10 exercises targeting major muscle groups
  - Flexibility: holding each muscle 30-60 seconds

PREPARTICIPATION HEALTH SCREENING

1.	Has your doctor ever told you that you have a heart condition or have you ever suffered a stroke?	Yes	No
2.	Do you ever experience unexplained pains in your chest at rest or during physical activity/exercise?	Yes	No
3.	Do you ever feel faint or have spells of dizziness during physical activity/exercise that causes you to lose balance?	Yes	No
4.	Have you had an asthma attack requiring immediate medical attention at any time over the last 12 months?	Yes	No
5.	If you have diabetes (type I or type II) have you had trouble controlling your blood glucose in the last 3 months?	Yes	No
6.	Do you have any diagnosed muscle, bone or joint problems that you have been told could be made worse by participating in physical activity/exercise?	Yes	No
7.	Do you have any other medical condition(s) that may make it dangerous for you to participate in physical activity/exercise?	Yes	No

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PREPARTICIPATION HEALTH SCREENING

1. Current level of exercise
   1. Physically active vs inactive
2. Presence or absence of asymptomatic/symptomatic known disease
   1. Cardiovascular
   2. Structural/Orthopedic
3. Desired intensity of exercise
   1. Moderate vs vigorous

"MORE EXERCISE?? I WATCH PEOPLE EXERCISE ON TV ALL THE TIME!"

SPECIAL CONSIDERATIONS

- Chronic diseases like CVD, cancer, diabetes, chronic lower respiratory infections are the leading cause of death among older adults
- Exercise has been shown to be an effective lifestyle therapy for most chronic conditions including HTN, DM2, and COPD.
- ACSM has published 18 unique exercise prescriptions for the most common chronic conditions

ACSM[a] FITT Principle of the ExR_x	Chronic Medical Condition				
	Healthy Older Adult[b]	Hypertension	Type II Diabetes Mellitus	Dyslipidemia	Arthritis
***F*requency (How often?)**	If moderate intensity: ≥ 5 d/wk If vigorous intensity: ≥ 3 d/wk If combination of moderate and vigorous intensity: 3-5 d/wk	Most, preferably all, days of the week	3-7 d/wk	≥ 5 d/wk to maximize caloric expenditure	3-5 d/wk
***I*ntensity[c] (How hard?)**	Moderate to vigorous	Moderate	Moderate to vigorous	Moderate	Light to moderate; very light if deconditioned
***T*ime[d,e]**	If moderate intensity: ≥ 30 min/d to total 150 min/wk If vigorous intensity: ≥ 20 min/d to total 75 min/wk	30-60 min/d	10-30 min/day to total 150 min/wk with greater benefits increasing to ≥ 300 min/wk	30-60 min/d with greater benefits with weight loss (i.e., 50-60 min/d)	Short bouts of 10 min/d increasing as tolerated to 30 min/d to total 150 min/wk
T*ype (What kind?) *Primary	Aerobic	Aerobic	Aerobic	Aerobic	Aerobic
Adjuvant 1[c,f,g]	Muscle Strengthening ≥ 2 d/wk (non-consecutive) Moderate to vigorous intensity 8-10 exercise; ≥ 1 set of 10-15 repetitions	Muscle strengthening ≥ 2 d/wk (non-consecutive) Moderate to vigorous intensity 8-10 exercise; ≥ 1 set of 8-12 repetitions	Muscle strengthening ≥ 2 d/wk (non-consecutive) Moderate to vigorous intensity 8-10 exercise; ≥ 1 set of 10-15 repetitions	Muscle strengthening ≥ 2 d/wk (non-consecutive) Moderate to vigorous intensity 8-10 exercise; ≥ 1 set of 10-15 repetitions	Muscle strengthening 2-3 d/wk; light to moderate intensity 8-10 exercise; ≥ 1 set of 10-15 repetitions
Adjuvant 2	Flexibility ≥ 2 d/wk At least 10 min/d	Flexibility ≥ 2 d/wk at least 10 min/d	Flexibility ≥ 2 d/wk At least 10 min/d	Flexibility ≥ 2 d/wk at least 10 min/d	Flexibility ≥ 2 d/wk at least 10 min/d
Adjuvant 3	Balance if at substantial risk of falling	Balance if at substantial risk of falling	Balance if at substantial risk of falling	Balance if at substantial risk of falling	Functional exercise can improve balance
Special Considerations	Intensity and duration should be light at first and progressed to tolerance and preference. Resistance exercise should precede aerobic training among frail individuals.	Encourage patients to exercise in the morning to benefit from the immediate blood pressure lowering effects throughout the day. Emphasis should be on aerobic exercise activities.	A combination of aerobic and resistance training improves blood glucose better than either alone. Avoid two consecutive days of inactivity per week. Vigorous intensity and high caloric expenditure should be goals of	A special focus should be on exercise that uses large muscle groups and maximizes caloric expenditure.	Avoid strenuous exercise during flare ups. A small amount of discomfort up to 2 hrs after exercise is common. Warm water exercises may aid in pain management.

CASE EXAMPLE

- 67 yo M with stage two HTN (146/92mmHg) seeking to initiate an exercise program in an effort to better control his BP.
- In the setting of HTN more emphasis should now be placed on aerobic exercise training due to the established BP lowering effects of aerobic exercise
  - Reduces resting BP by 5-7mmHb in individuals with HTN

PHARMACOLOGIC INTERACTIONS

- Consider the use of medications that may influence physical activity and alter exercise tolerance
  - Blood pressure medications
  - Diabetes medications
  - Appropriate inhalers
  - Statins

STATINS

- Data suggest that the combination of exercise training and cholesterol lowering drugs may be most beneficial for patients with elevated LDL
  - For example, after 12 weeks of resistance training in older adults, LDL was reduced on average by 18mg/dL and further lowered by another 12mg/dL with the concurrent use of statins
  - Another example of 10,000 veterans found that while both high fitness and statin drug use decreased mortality risk, individuals who were both highly fit and taking a statin had the lowest mortality risk
- However, statins may potentially have adverse effects on routine physical activity like muscle complaints, cramping, myalgia, soreness and weakness (5-10% of patients)
  - Certain adults may experience reduced benefit from the interactions between exercise and stain therapy

BARRIERS AND MOTIVATION

- Approximately 87% of older adults have at least one barrier to exercise participation
  - Low self-efficacy, fear of injury, lack of social support, social isolation, pain being the most commonly reported barrier
- Consider group based exercise for more social encouragement
- Work with your healthcare team to find a solution

CHANGING PRACTICE

- Record physical activity as a vital sign
- Prescribe exercise as one might prescribe a medication
- Screen for depression, isolation and lack of social support
- Assessment and adequate treatment of underlying pain syndromes
- Office demonstrations and handouts for patients
- Referral to physical therapy, chiropractor or acupuncturist if applicable

KEY POINTS

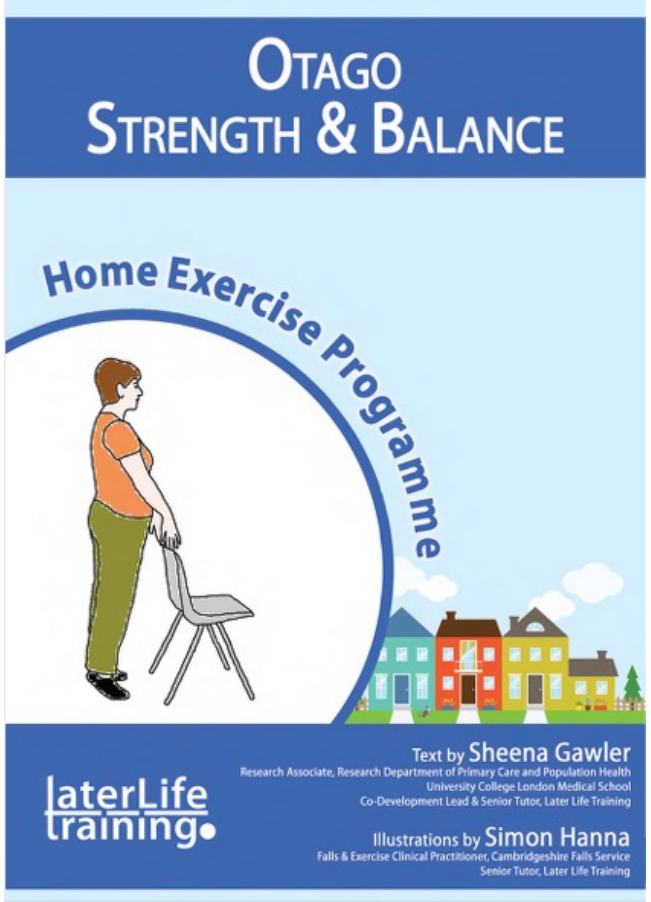
- Exercise prescriptions should be designed in a systemic and individualized manner, referring back to FITT-VP
- Components of the FITT-VP should be modified in the setting of certain chronic conditions
- 30 min/d or more of moderate intensity aerobic exercise 3-5d/wk to total 150min/wk and supplement with resistance, flexibility and balance training >2d/wk
- Preparticipation health screening should be implemented to identify at risk individuals
- Awareness of potential additive or deleterious interactions between exercise and medications used by older adults

BILLING AND REIMBURSEMENT

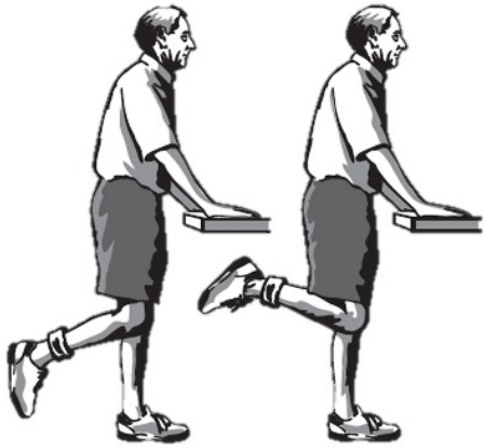
- Case 1: 67 yo M with PMHx of DM2, HTN, COPD seeking to initiate an exercise program in an effort to better control his BP.
- 30-39 minutes spent discussing signs and symptoms associated with his chronic medication conditions, review medication list, discuss recent blood work, and recommend exercise prescription
- 99214

PATIENT RESOURCES

- The Otago Exercise Program (OEP)
- Geriatric Focused Physical Therapy
- GeroFIT for Veterans



OTAGO EXERCISES



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