Exercise is Medicine: How to Get You and Your Patients Moving

Getting Men Healthier: A Physician’s Playbook
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Faculty Disclosure

- Member, Scientific Advisory Board, OnLife Health Inc. (A subsidiary of Tennessee Blue Cross)

Learning Objectives

- Increase the physical activity of patients by prescribing exercise based on the federal guidelines for weekly physical activity levels
- Incorporate the Physical Activity Vital Sign (PAVS) as part of the clinical encounter
- Improve personal levels of physical activity for better health and to serve as better role models for patients
Overview

- Definitions
- Physical activity recommendations
  - Cardiovascular
  - Resistance training
- Inactivity
  - Prevalence
- Physical activity vital sign
- Cardiovascular (aerobics)
- Resistance (strength training)
- Exercise prescription
- Resources: further education

Physical Activity

Physical activity is any bodily movement produced by skeletal muscles that result in an expenditure of energy

Exercise

Exercise is physical activity that is planned or structured. It involves repetitive bodily movement done to improve or maintain one or more of the components of physical fitness—cardiorespiratory endurance (aerobic fitness), muscular strength, muscular endurance, flexibility, and body composition.

Physical Fitness

- Outcome of physical activity and exercise:
  - Strength and power
  - Cardiorespiratory fitness
  - Balance
  - Flexibility
  - Body composition
  - Agility, etc.

Types of Exercise

- Physical activity vs exercise
  - Structured exercise
  - Lifestyle exercise
- Inactivity (sedentary behavior)
- Cardio-vascular (aerobic)
- Resistance training (strengthening)
- Flexibility (stretching)
Benefits of Exercise

- Coronary heart disease\(^1\)
- Corrects other risk factors for heart disease: \(^1\)
  - Obesity
  - Smoking
  - High blood lipids
- Stroke\(^2\)
- Hypertension\(^1\)
- Diabetes\(^1\)
- Sexual functioning\(^3\)
- Improved functional capacity\(^1\)
- Increased bone density\(^1\)
- Increased lean body mass\(^1\)
- Decreased risk for falls in older people\(^2\)
- Decreased anxiety and mild-moderate depression\(^1\)
- Decreased total morbidity and mortality\(^1\)

Exercise Break!

- Strength
- Flexibility
- Stretching
- Balance
How Much Physical Activity Should We Recommend?


All Cause Mortality vs Physical Activity

**USHHS Physical Activity Guidelines for Americans: Adults**

- 150 minutes of moderate intensity physical activity per week **OR**
- 75 minutes of vigorous physical activity (in bouts of at least 10 minutes)
- For more extensive health benefits:
  - 300 minutes of moderate intensity physical activity **OR** 150 min vigorous physical activity
  - Resistance (muscle strengthening) at least twice per week


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**Physical Activity Statistics**

- **NHIS-** National Health Interview Survey (1998-2007)
  - 30.2% are physically active
  - 40.7% report no physical activity outside of their work

  - 33.5% are physically active
  - 32.4% are physically inactive

Sedentary Lifestyle as Risk Factor

- The American Heart Association recognized “sedentary lifestyle” as a primary controllable cardiac risk factor in 1992
- The prevalence of sedentary lifestyle is at least twice that of smoking, hypertension and elevated total serum cholesterol


Sitting Time and Mortality from All Causes, Cardiovascular Disease and Cancer

FIGURE 1. Kaplan-Meier survival curve for all-cause mortality across categories of daily sitting time in 17,013 men and women 18-90 yr of age, in the Canada Fitness Survey, 1981-1993. Log-rank \( \chi^2 = 174.4, \text{df} = 4, P < 0.0001. \) The sample sizes across the categories were 3022 (17.8%), 6652 (39.1%), 4379 (25.7%), 2138 (12.6%), and 822 (4.8%), for the categories of almost none of the time, one fourth of the time, half of the time, three fourths of the time, and almost all of the time, respectively.
Does Clinician Prescription of Exercise Make a Difference?

Evidence Base: Exercise Rx

Prescribing Exercise at Varied Levels of Intensity and Frequency
A Randomized Trial


- Exercise prescription for brisk walking resulted in statistically significant, long term improvements in cardiopulmonary fitness ($P< .01$)

- Study limitations:
  - absence of a “no treatment” control group
  - patients with abnormal lipid profiles were excluded
  - Comparison group intervention (physician advice) may not parallel the impact of advice from a patient's personal physician
Efficacy of Exercise Prescription

- Two-year randomized, controlled trials
- Women given exercise prescription increased physical activity from 10% at baseline to 43% at 12 months, and 39% at 24 months ($P<0.001$)
- Limitations: inability to blind participants to the intervention, ongoing interaction with nurse in the study group may have acted as an intervention, sample size not large enough to detect significant difference in clinical outcomes

Lawton BA et al. BMJ. 2009;43:120-123.

Do Physicians Regularly Prescribe Exercise?
Dearth of Physician Counseling

- National prevalence of lifestyle counseling or referral among African-Americans and whites with diabetes
- A recent study showed that diabetic patients received counseling/referral for nutrition only 36% of the time, and for exercise only 18% of the time
- Limitations:
  - rates of counseling may not accurately assess actual practice; inability to detect racial differences in counseling quality; findings may not be generalizable to the most vulnerable African-American patients


Efficacy of Physician Counseling

- Study of hypertensive patients, only a third received counseling to engage in physical activity as a way to manage their hypertension
- However, 71% of the patients who were counseled followed the recommendations to exercise and reduced their blood pressure
- Limitations: Study data may be old, self-reported data may be limited

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Physical Activity Vital Sign at Kaiser Permanente

1. “How many days per week (on average) do you exercise at a moderate level or greater (like a brisk walk)?”
   Followed by a pull down 0 to 7 days
Physical Activity Vital Sign at Kaiser Permanente

2. “How long (on average) do you spend exercising at this level (moderate or greater) when you do exercise (in minutes)?”

Followed by a pull down
10/20/30/40/50/60/90/120/150 or more

Kaiser Permanente Exercise Vitals Screen Shots
Kaiser Permanente Exercise Vitals Screen Shot

Activity: Physical Activity Vital Sign

- Turn to your neighbor, colleague, client, patient (or yourself)
- Assess their PAVS
Physical Activity Vital Sign

- How many days (over the last week), did you participate in physical activity such as a brisk walk?
- (On average), how many minutes per day did you accumulate of physical activity at this level?
- Multiply the 2 numbers to get a minute/week average


Results

- Inactive (0-75 minutes per week)
  - Time to get moving. Building in 10 minutes of exercise each day would benefit your health
- Somewhat active (75-149 minutes per week)
  - There is room for improvement but you are almost there
- Active (≥150 minutes per week)
  - Congratulations! Keep up your healthy lifestyle and getting more out of life

Exercise Prescription

- Screening
- Precautions
- Frequency
- Intensity
- Type
- Time
- Progression

Exercise Prescription

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Screening for Exercise

- The screening process should not be a barrier for low level of physical activity.
- The risks of death are rare:
  - sudden onset vigorous intensity
  - patients with known disease or signs and symptoms
- The risks of sedentary behavior are universal


Exercise Prescription

- Screening
- Precautions
- Frequency
- Intensity
- Type
- Time
- Progression
Heart Rate Ranges

The ranges were calculated using the formula: \[206.9 - (0.67 \times \text{age}) \times \%\text{HR max}\]

- Low intensity: \(<64\% \ \text{HR max}\)
- Moderate intensity: \(64\% - 76\% \ \text{HR max}\)
- Vigorous intensity: \(>76\% \ \text{HR max}\)

<table>
<thead>
<tr>
<th>Age</th>
<th>LOW INTENSITY</th>
<th>MODERATE INTENSITY</th>
<th>VIGOROUS INTENSITY</th>
<th>HR_{\text{max}}</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>&lt; 126</td>
<td>126 – 150</td>
<td>&gt; 150</td>
<td>197</td>
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<tr>
<td>20</td>
<td>&lt; 124</td>
<td>124 – 147</td>
<td>&gt; 147</td>
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<td>109 – 129</td>
<td>&gt; 129</td>
<td>170</td>
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<td>60</td>
<td>&lt; 107</td>
<td>107 – 127</td>
<td>&gt; 127</td>
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<td>&lt; 100</td>
<td>100 – 119</td>
<td>&gt; 119</td>
<td>157</td>
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<td>80</td>
<td>&lt; 98</td>
<td>98 – 117</td>
<td>&gt; 117</td>
<td>153</td>
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<tr>
<td>95</td>
<td>&lt; 92</td>
<td>92 – 109</td>
<td>&gt; 109</td>
<td>143</td>
</tr>
</tbody>
</table>


“Talk-Test”

- The least objective but easiest measure of intensity is the “talk test”
- When performing physical activity at a low intensity, an individual should be able to talk or sing while exercising
- At a moderate intensity, talking is comfortable, but singing, which requires a longer breath, becomes more difficult
- At vigorous intensity, neither singing nor prolonged talking is possible

# Exercise Intensity

<table>
<thead>
<tr>
<th>Intensity</th>
<th>&quot;Talk Test&quot;</th>
<th>Perceived Exertion (10 point scale)</th>
<th>HRR (%)</th>
<th>Maximal HR (%)</th>
<th>MET VO₂ max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very light</td>
<td>Able to talk and/or sing</td>
<td>&lt;3</td>
<td>&lt;20</td>
<td>&lt;50</td>
<td>&gt; 3</td>
</tr>
<tr>
<td>Light</td>
<td></td>
<td>20–39</td>
<td>50–63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>Able to talk but not sing</td>
<td>3 - 4</td>
<td>40–59</td>
<td>64–76</td>
<td>3 - 6</td>
</tr>
<tr>
<td>Vigorous/hard</td>
<td></td>
<td>5 - 6</td>
<td>60–84</td>
<td>77–93</td>
<td>&gt;6</td>
</tr>
<tr>
<td>Very hard</td>
<td>Difficulty talking</td>
<td>7 - 9</td>
<td>≥85</td>
<td>≥94</td>
<td></td>
</tr>
<tr>
<td>Maximal</td>
<td></td>
<td>10</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: METs = metabolic equivalent units (1 MET = 3.5 mL×kg⁻¹×min⁻¹); \( \dot{V}O₂R \) = oxygen uptake reserve; HRR = heart rate reserve.

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## Overview

- **Definitions**
- **Physical activity recommendations**
  - Cardiovascular
  - Resistance training
- **Cardiovascular (aerobics)**
- **Strengthening (resistance training)**
- **Exercise prescription**
- **Exercise: further education**
Medication vs Exercise Prescriptions

**Medication Prescription:**
- **Medicine:** Ibuprofen
- **Strength:** 600 mg tablets
- **Route:** By mouth
- **Dispense:** 90 tablets
- **Frequency:** 3 times per day
- **Precautions:** Discontinue for stomach upset
- **Refills:** 3

**Exercise Prescription:**
- **Exercise:** Walk 30 minutes per day to improve mood and general health
- **Strength:** Moderate intensity
- **Frequency:** 5 days per week
- **Precautions:** Increase duration of walking slowly to avoid injury
- **Refills:** Forever

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**Activity: Exercise Prescription**

**BEGIN WITH:**
- **Frequency:** F ________ times each week
- **Intensity:** I ________ intensity (ie, an intensity where you can talk/sing while active)
- **Time/duration:** T ________ minutes each day (circle)
- **Type:** T ________ type of exercise (eg, walking, gardening, swimming, etc)

This corresponds to level ______ on the graph above
Maintain this level for _______ weeks before starting your progression

**PROGRESSION:**
Every week/2 weeks, progress to the next level on the graph above (circle)

**PRECAUTIONS:**

**OTHER NOTES:**

**Exercise Progression**

**TARGET / THRESHOLD ZONE:**
- 30 min of moderate intensity ≥ 5x/week, OR
- 20 min high intensity ≥ 3x/week, OR
- 20-30 min combined moderate and high intensity 3-5x/week

Once the threshold is reached, exercise intensity can be increased, enabling total exercise time to decrease (from 150 min/week to 60 min/week if all exercise is high intensity).

The average healthy, inactive adult should

**EXERCISE INTENSITY**
- Low
- Moderate
- High/vigorous

**EXERCISE**
- 3-5x/week, working up to 150 min/week

**EXERCISE LEVEL**
- Increase to 5x/week before progressing to the next level.

**PROGRESS:**
- Every 2-4 weeks if very deconditioned or sedentary and over the age of 65.
- Increase to 5x/week.


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**Sample Exercise Prescription**

RX

Moderate intensity physical activity, 30 minutes per day, at least 5 days per week but preferably all days of the week, or vigorous intensity exercise 20 minutes three days per week or combination. May accumulate in bouts of at least 10 minutes. Avoid two consecutive days of inactivity. Resistance exercise 2 days per week; one-three sets of eight-12 repetitions to point of fatigue with rest between.

Flexibility/Range of Motion exercises.

Dr. Edward Phillips

Interchange mandated unless the practitioner writes the words “No Substitution” in this space.

Sample Exercise Prescription


Source: Lydia Siegel, MD
**Activity: Exercise Prescription**

- **The exercise prescription**
  - Turn to your colleague, client, patient etc.
  - Assess their readiness for exercise
  - Negotiate:
    - Frequency
    - Intensity
    - Time
    - Type
  - Write a prescription for cardiovascular (and resistance training for extra credit)

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**Activity: Exercise Prescription**

<table>
<thead>
<tr>
<th>BEGIN WITH:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency</strong></td>
</tr>
<tr>
<td><strong>Intensity</strong></td>
</tr>
<tr>
<td><strong>Time/duration (circle)</strong></td>
</tr>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td></td>
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</tbody>
</table>

**This corresponds to level _____ on the graph above**
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**PRECAUTIONS:**

**OTHER NOTES:**

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Follow Up

- **Email:** ephillips1@partners.org
- **Connect with the Institute of Lifestyle Medicine (ILM)**
- **Website:** www.instituteoflifestylemedicine.org/
- **Facebook:** https://www.facebook.com/InstituteofLifestyleMedicine
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