

primed

10:45 – 11:30 am

The Benefits of Exercise

SPEAKER
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primed

Presenter Disclosure Information

The following relationships exist related to this presentation:

- ▶ Edward M. Phillips, MD: No financial relationships to disclose.

Off-Label/Investigational Discussion

- ▶ In accordance with pmiCME policy, faculty have been asked to disclose discussion of unlabeled or unapproved use(s) of drugs or devices during the course of their presentations.

Exercise

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Learning Objectives

- Review the current Physical Activity Guidelines for Americans
- Employ physical activity vital signs in practice
- Define your role as a physician in helping patients to adopt and sustain more physically active lives
- Develop and write a rudimentary Exercise Prescription
- Devise personal changes to best adhere to the Physical Activity Guidelines for Americans.

Definition: Physical Activity

Physical Activity- Any bodily movement by skeletal muscles that that results in energy expenditure above resting (basal) levels. PA broadly encompasses exercise, sports, and physical activities done as part of daily living, occupation, leisure, and active transportation

(Garber CE et al. Med Sci Sport Exerc 2011)

Definition: Exercise

- **Exercise-** "Physical Activity that is planned, structured, and repetitive and (that) has a final or intermediate objective, the improvement of physical fitness."

(Garber CE et al. Med Sci Sport Exerc 2011)

Definition: Physical Fitness

Physical Fitness- "The ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to enjoy (leisure) pursuits and to meet unforeseen emergencies."

Elements:

- Cardiorespiratory fitness
- Muscular strength and endurance
- Body Composition
- Flexibility
- Balance
- Agility
- Reaction time
- Power

(Garber CE et al. Med Sci Sport Exerc 2011)

Definition: Sedentary Behavior

Sedentary behavior- Activity that involves little or no movement or physical activity, having an energy expenditure of about 1.0-1.5 METS.

Examples of sedentary behavior include:

- Sitting
- Watching television
- Playing video games
- Using a computer
- Attending medical conferences(?)

Volunteers Needed

Willing to continuously walk around the auditorium for ~20 minutes during this presentation.

Types of Exercise

- Cardio-vascular (aerobic)
- Resistance Training (strengthening)
- Flexibility (stretching)
- Postural/Balance
- Physical activity vs. exercise
 - Structured exercise
 - Lifestyle exercise

What did you just experience?

- Novelty
- Group/ social connection
- Challenge
- Reminder of your physicality
- Relief of physical discomfort
- Neuro transmitter release
- Fun

Case Study

- 62 year old Hispanic woman working as executive secretary in financial industry. Drives to work. No leisure time physical activity except weekly walk to church. Seeks counseling to lose weight and improve her energy.
 - BMI 31.2 kg/m²
 - HgB A1c = 6.2%
 - BP: 141/91 mm/Hg
 - LDL 180 mg/dL
 - Family history: breast and colon cancer

Case Study

- What single treatment can help her to:
- ↑energy
- ↓ blood sugar
- ↓ blood pressure
- ↓ cholesterol
- ↓ risk of breast and colon cancer and
- maintain her weight?

Benefits of Exercise: Strong Evidence

Lower Risk of:

- Early Death
- High Blood Pressure
- Colon Cancer
- Adverse Blood Lipid Profile
- Coronary Heart Disease
- Metabolic Syndrome
- Breast Cancer
- Stroke
- T2 Diabetes

US HHS, 2008 Physical Activity Guidelines for Americans

Benefits of Exercise: Strong Evidence

- Prevention of weight gain
- Weight loss, particularly when combined with reduced calorie intake
- ↑ cardiorespiratory and muscular fitness
- Prevention of falls
- ↓ depression
- ↑ cognitive function (for older adults)

US HHS, 2008 Physical Activity Guidelines for Americans

Benefits of Exercise: Moderate to Strong Evidence

- ↑ functional health (for older adults)
- ↓ abdominal obesity

US HHS, 2008 Physical Activity Guidelines for Americans

Benefits of Exercise: Moderate Evidence

- ↓ hip fracture
- ↓ lung cancer
- ↓ endometrial cancer
- Weight maintenance after weight loss
- ↑ bone density
- ↑ sleep quality

US HHS, 2008 Physical Activity Guidelines for Americans

Exercise \geq Medications for ↓Death from Stroke, DM, CAD

Comparative effectiveness of exercise and drug interventions on mortality outcomes: metaepidemiological study

- Naci H, Ioannidis J *BMJ* 2013
- 305 Randomized controlled trials
- N= 339,000 subjects

Exercise \geq Medications for \downarrow Death from Stroke, DM, CAD

- *Exercise > Meds:*

Post Stroke

- Anti-coagulants and Anti-platelets

- *Exercise = Meds:*

- 2^o Prevention of Coronary Heart Disease and
- Pre-Diabetes

- *Exercise < Meds:*

- Heart Failure
- Diuretics

Naci H, Ioannidis *J BMJ* 2013

Exercise \geq Medications for \downarrow Death from Stroke, DM, CAD

Conclusions Although limited in quantity, existing RCT's on exercise interventions suggests that exercise and many drug interventions are often potentially similar in terms of their mortality benefits in the secondary prevention of coronary heart disease, rehabilitation after stroke, treatment of heart failure, and prevention of diabetes

Naci H, Ioannidis *J BMJ* 2013

Benefits of Strength Training

- \downarrow risk of injury
- \downarrow risk of osteoporosis
- \uparrow basal metabolic rate
- \downarrow Fatigue
- \uparrow performance
- \uparrow muscle and cross-sectional area
- Aesthetic changes
- \uparrow QOL, strength, endurance and BMD in early post-menopausal years
- \downarrow body fat
- \uparrow lipid profiles
- \uparrow glucose tolerance

Kraemer et al. *Curr Sports Med Rep.* 2002
Kemmler, *Med Sci Sport Exerc.* 2002

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) OR an equivalent combination
- For more extensive health benefits:
 - 300 minutes of moderate intensity physical activity OR 150 min vigorous physical activity OR an equivalent combination
 - Resistance (muscle strengthening) at least twice per week

– US HHS Physical Activity Guidelines for Americans, 2008

Prolonged Sitting: Impact on Mortality

- NIH-AARP Diet and Health Study
 - N = 240,819 (Age 50-71)
 - Adults watching television ≥ 7 hours/day:
 - \uparrow 47% greater risk of:
 - All cause (HR: 1.47; 95% CI: 1.20, 1.79) and
 - Cardiovascular mortality (HR: 2.00; 95% CI: 1.33, 3.00)
- compared to those watching <1 hour/day, **despite also reporting high levels of moderately-vigorous physical activity**

Matthews et al. *Am J Clin Nutr* 2012

Reducing Sedentary Behavior

"In addition to exercising regularly, there are health benefits in concurrently reducing total time engaged in sedentary pursuits and also interspersing frequent, short bouts of standing and physical activity between periods of sedentary activity, even in physically active adults."

(Garber CE et al. *Med Sci Sport Exerc* 2011)

Bottom Line: Take Home #1

Talk to your patients about:

- ↓ sedentary behavior, not just
- ↑ physical activity.

Bottom Line #2: Don't Just Sit There!

Prolonged Sitting: Impact on Morbidity

Sedentary time detrimentally associated with:

- waist circumference
- HDL cholesterol
- C-reactive protein
- triglycerides
- insulin
- beta cell function
- insulin sensitivity

- N= 4757 NHANES Data
- Healy et al. Euro Heart J. 2011

Prolonged Sitting: Impact on Mortality

- 45 and Up Study N=222,497
 - Adults sitting
 - 8-11 hours/day: ↑**15% mortality** 95% CI (1.06-1.25),
 - ≥11 hours/day: ↑**40% mortality** 95% CI ((1.27-1.55)
 - compared to those sitting <4 hours/day.

van der Ploeg et al. Arch Int Med 2012

Effect of physical inactivity on major non-communicable diseases worldwide

- Physical inactivity →
- 6% coronary heart disease,
- 7% of T2-DM,
- 10% of breast cancer, and
- 10% of colon cancer.

Lee IM et al, Lancet. 2012

Effect of physical inactivity on major non-communicable diseases worldwide

- Inactivity causes 9% of premature mortality, > 5.3 million of the 57 million deaths that occurred worldwide in 2008 vs.
- Tobacco related deaths 5.1 million
- ↓ inactivity by 10% saves > 533,000 deaths

Lee IM et al, Lancet. 2012

The Solution:

Integrating modest amounts of physical activity throughout the day to reduce sedentary behavior.

Treadmill Desks

- Made popular by Dr. Robert Levine of Mayo Clinic
 - Levine's research revealed that on average his subjects burned 100 extra calories every hour while walking less than one mile per hour.
 - "...sustained pulses of low-grade activity are going to have more of an impact on metabolic parameters than a three-times-a-week visit to the gym"

Woodham US News and World Report 2012

Bike Desks

Belgium-based company WeWatt created the **WeBike**, a pedal-powered table that generates electricity for devices such as laptops and cell phones.

"WeBike. Wheel to feel it." Watt Now. May 14, 2012.

Take Home Messages #3

- Prolonged sitting is harmful.
- Health and productivity are improved with modest amounts of physical activity throughout the day.
- Solutions to accommodate this are creative, plentiful, engaging and fun.

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 minutes

Physical Inactivity as Risk Factor

- The prevalence of a physically inactive lifestyle is at least twice that of:
 - smoking,
 - hypertension or
 - elevated total serum cholesterol

Thompson PD et al. *Circulation*. 2003

Efficacy of PCP's counseling – Meta analysis

- **Effectiveness of physical activity promotion based in primary care: systematic review and meta-analysis of randomized controlled trials**

- 15 trials (N=8745 patients)
- In 13 trials presenting self reported PA, we saw small to medium positive intervention effects at 12 months (odds ratio 1.42)
- NNT with an intervention for 1 additional sedentary adult to meet internationally recommended levels of activity at 12 months was 12
[NNT for lipitor to prevent 1 heart attack = 100]

1. Orrow G. et al. BMJ. 2012
2. Orrow G. et al. Br J Sports Med. 2013

Are PA Interventions in Primary Care and the Community Cost-effective?

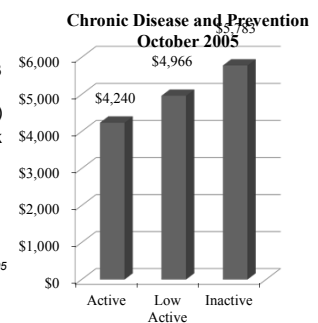
Systemic review, 12 studies: The cost to move one person to the 'active' category at 12 months ranged from \$500 to \$5000

- Most interventions to increase physical activity were cost-effective
- Brief exercise advice delivered in person, or by phone or mail appeared to be more cost-effective than supervised gym-based exercise classes

Garrett S. Br J Gen Pract. 2011

Activity Level and Health Claims

- Health claims increase as activity levels decrease
- Inactive persons cost \$1543 more per year more than active ones (in 1997 dollars)
- >\$12/hour benefit from brisk walking



Anderson L. et al. *Prev Chron Dis* 2005

Exercise Prescription

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

BEGIN WITH:

Frequency **F** _____ times each week

Intensity **I** _____ intensity (i.e. an intensity where you can talk / sing while active)

Time/duration **T** _____ minutes each day
(circle)

Type **T** _____ type of exercise (e.g. walking, gardening, swimming, etc.)

Maintain this level for _____ weeks before starting your progression

PROGRESSION:

Every week / 2 weeks, progress to the next level
(circle)

PRECAUTIONS:

OTHER NOTES:

Bottom Line: Take Home #4

Provide a written exercise prescription to your patients and follow-up with call, email, text, letter from your office ~ three weeks later.

ACSM Guidelines as Applied to Step Counts

"To meet current guidelines, individuals are encouraged to walk a minimum of 3,000 steps in 30 minutes on 5 days each week. Three bouts of 1,000 steps in 10 minutes each day can be used to meet the recommended goal."

Marshall SJ et al. Am J Prev Med 2009