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

## Creating a Culture of Wellness in Health Care Settings

Nebraska City, NE

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# Faculty Disclosure

- Member, Scientific Advisory Board, OnLife Health Inc. (A subsidiary of Tennessee Blue Cross)
- Royalties, ACSM's Exercise is Medicine: A Clinician's Guide to Exercise Prescription, Wolters-Kluwer, 2009

# 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
- Make your Commitment to Change

# 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"

Caspersen CJ et al. *Public Health Rep*. 1985;100:126-131.

# 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

Caspersen CJ et al. *Public Health Rep*. 1985;100:126-131.

# Physical Fitness

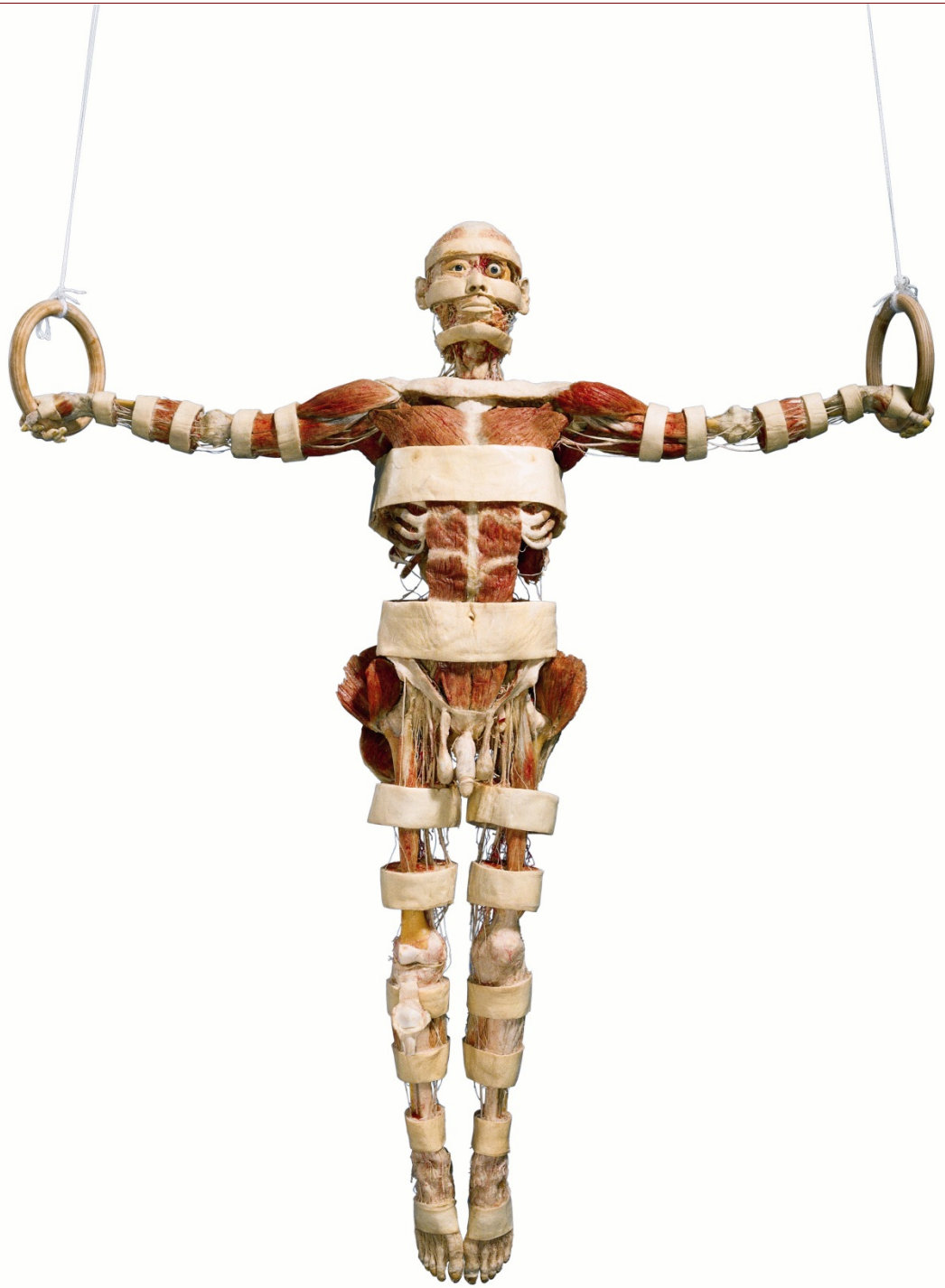
- Outcome of physical activity and exercise:
  - Strength and power
  - Cardiorespiratory fitness
  - Balance
  - Flexibility
  - Body composition
  - Agility, etc.

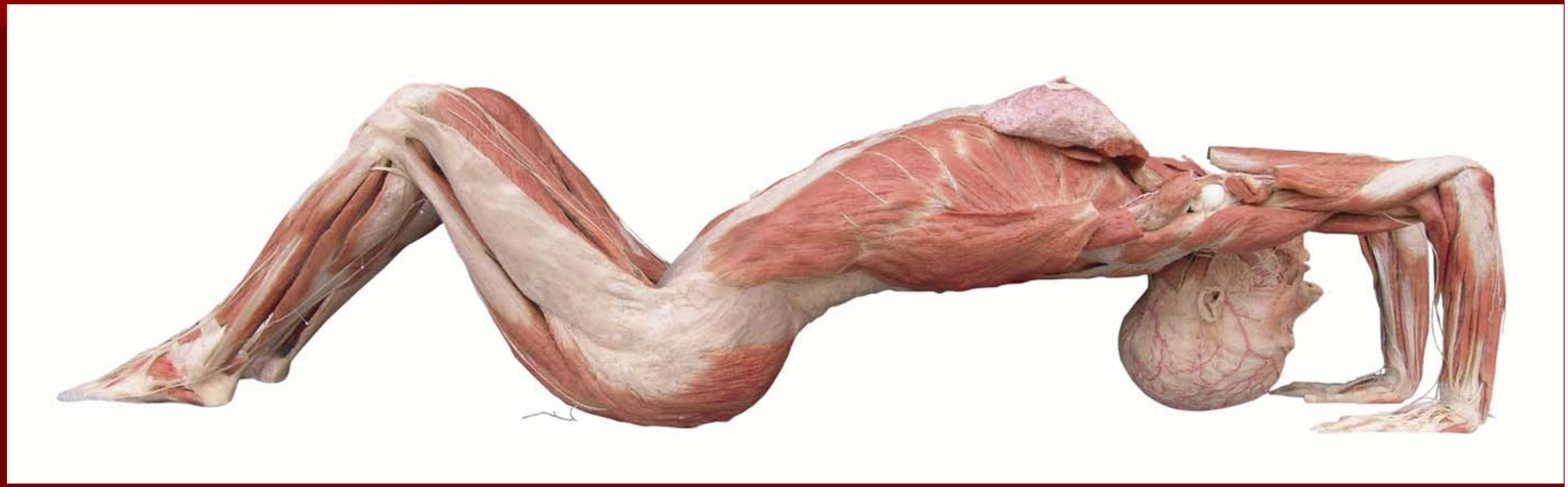
# Types of Exercise

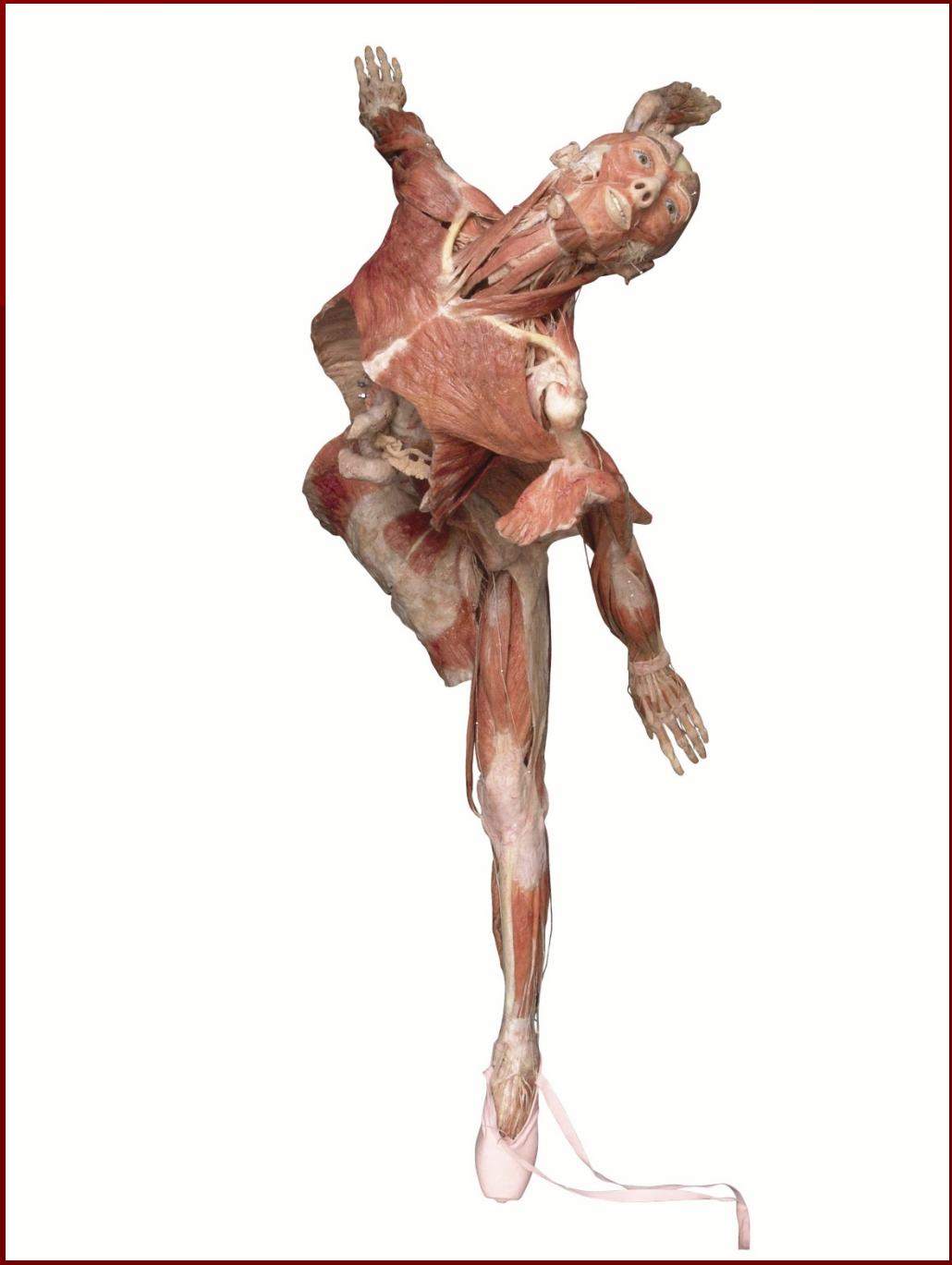
- Physical activity vs exercise
  - Structured exercise
  - Lifestyle exercise
- Inactivity (sedentary behavior)
- Cardio-vascular (aerobic)
- Resistance training (strengthening)
- Flexibility (stretching)

# Pedometer Challenge

- Need 2 volunteers who have not previously used pedometers (step counters)
- Walk around the room at a comfortable pace for around 20 minutes.







# Benefits of Exercise

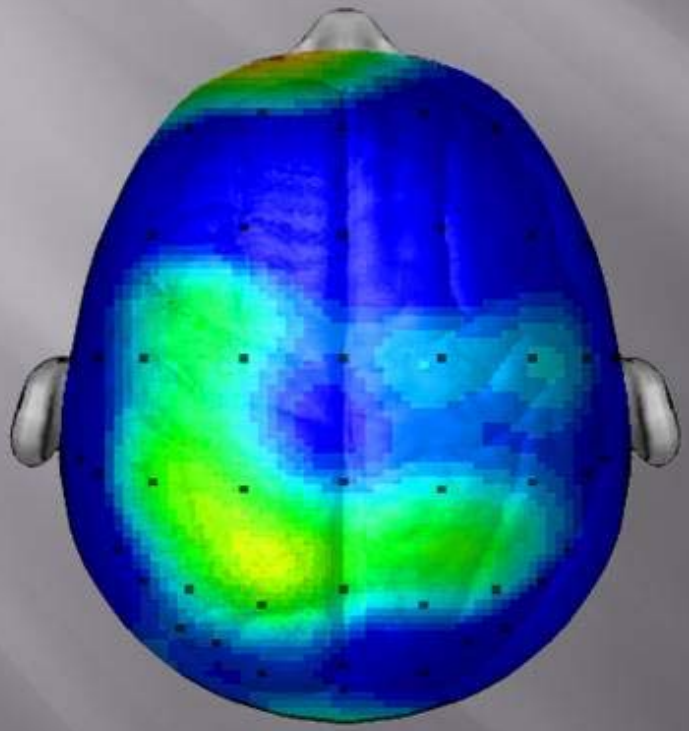
- Coronary heart disease[1]
- Corrects other risk factors for heart disease:[1]
  - Obesity
  - Smoking
  - High blood lipids
- Stroke[2]
- Hypertension[1]
- Diabetes[1]
- Sexual functioning[3]
- Improved functional capacity[1]
- Increased bone density[1]
- Increased lean body mass[1]
- Decreased risk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

# Exercise Break!

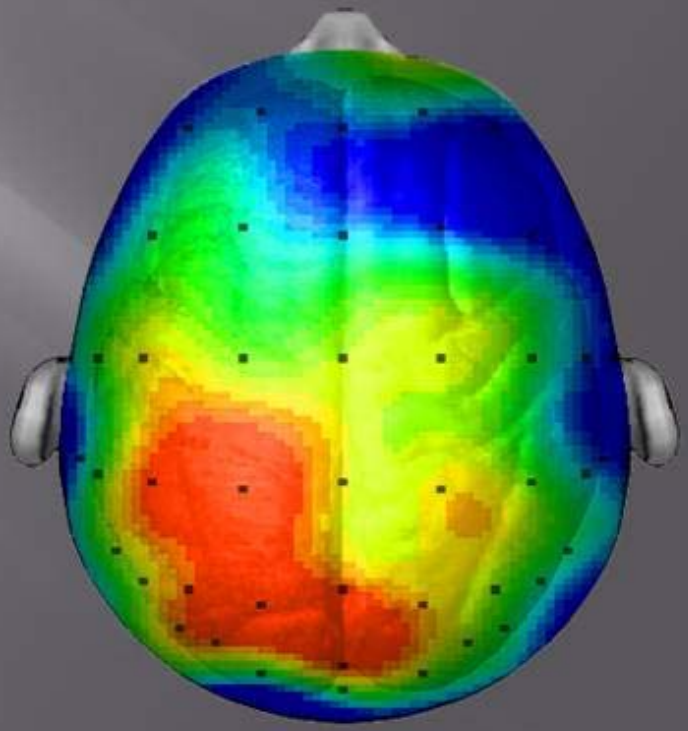
- Strength
- Flexibility
- Stretching
- Balance

# Average composite of 20 students brains taking the same test

BRAIN AFTER SITTING QUIETLY



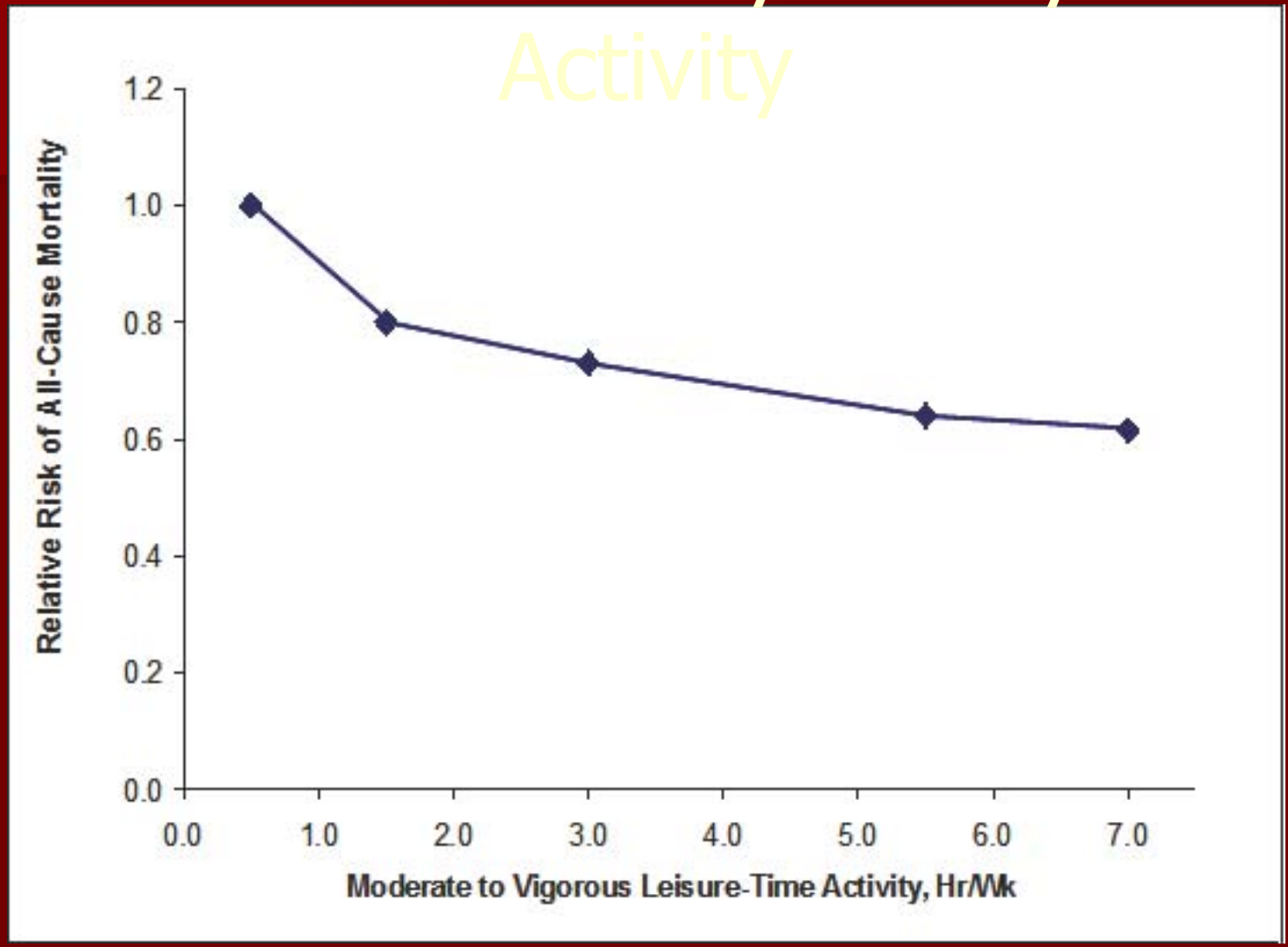
BRAIN AFTER 20 MINUTE WALK



Research/scan compliments of Dr. Chuck Hillman University of Illinois

# How Much Physical Activity Should We Recommend?

# All Cause Mortality vs Physical Activity




Adapted from US Department of Health and Human Services. 2008 Physical Activity Guidelines for Americans. http://www.health.gov/PAguidelines; Jonas S, Phillips EM. *Exercise is Medicine™: A Clinician's Guide to Exercise Prescription*. Philadelphia, PA: Lippincott Williams & Wilkins; 2009.

# 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

US Department of Health and Human Services. 2008 Physical Activity Guidelines for Americans. http://www.health.gov/PAguidelines.

# 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
- NHANES – National Health and Nutrition Examination Survey (1999-2006)
  - 33.5% are physically active
  - 32.4% are physically inactive

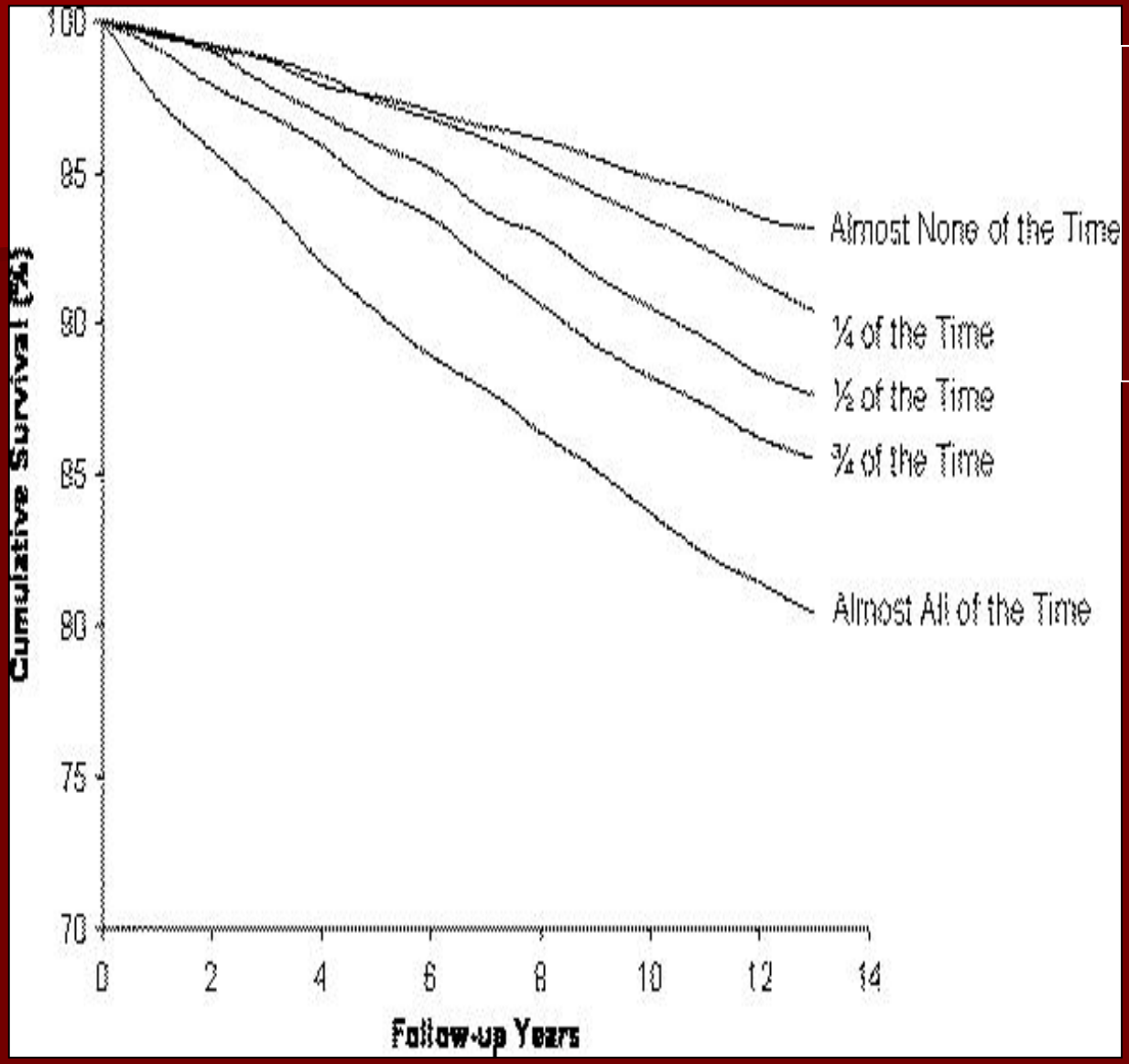
NHIS, National Health Interview Survey; NHANES, National Health and Nutrition Examination Survey
Carlson SA et al. *J Phys Act Health*. 2009;6(Suppl 1):S18-27.

# 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

Thompson PD et al. *Circulation*. 2003;107:3109-3116.

# Sitting Time and Mortality from All Causes, Cardiovascular Disease and Cancer[1]

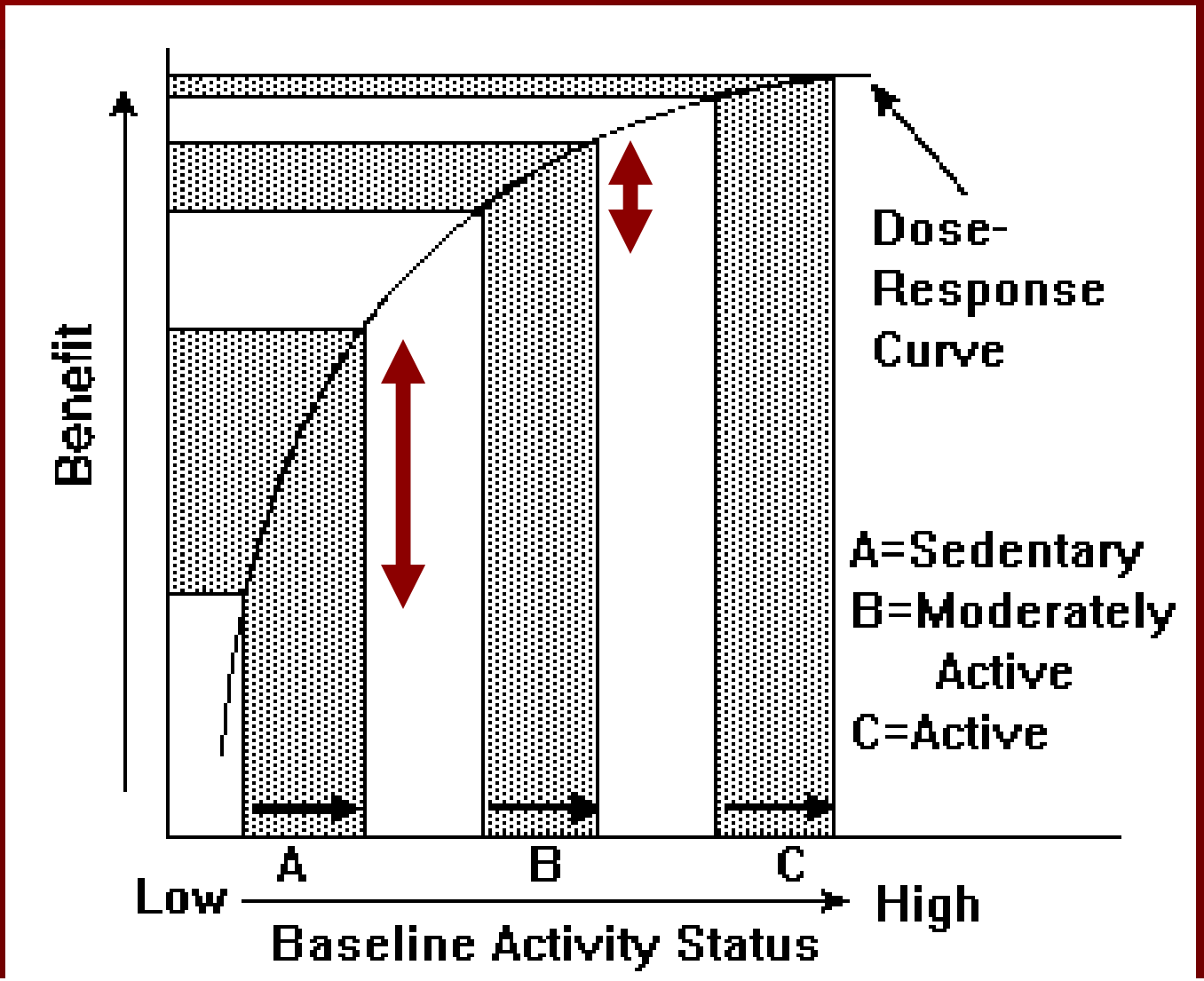



**Sitting Time and Mortality from All Causes, Cardiovascular Disease, and Cancer.**
KATZMARZYK, PETER; CHURCH, TIMOTHY; CRAIG, CORA; BOUCHARD, CLAUDE

Medicine & Science in Sports & Exercise. 41(5):998-1005, May 2009.
DOI: 10.1249/MSS.0b013e3181930355

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, 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.

# Physical Activity and Health Benefits: Dose-Response Curve



# Sedentary Behavior

- "Exercise Deficit Disorder"

  Marian Klepser, MD, Internist, McLean Hospital
- "Exercising is not an anti-depressant, not exercising is a depressant"

  – Tal Ben Shahar, PhD
- The results of sedentary behavior so closely mimic "normal" aging that they are indistinguishable

# Does Clinician Prescription of Exercise Make a Difference?

# Evidence Base: Exercise Rx

## Prescribing Exercise at Varied Levels of Intensity and Frequency

*A Randomized Trial*

*Glen E. Duncan, PhD, RCEPSM; Stephen D. Anton, PhD; Sumner J. Sydeman, PhD; Robert L. Newton, Jr, PhD; Joyce A. Corsica, PhD; Patricia E. Durning, PhD; Timothy U. Ketterson, PhD; A. Daniel Martin, PhD, PT; Marian C. Limacher, MD; Michael G. Perri, PhD*

- 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

Duncan GE et al. *Arch Intern Med.* 2005;165:2362-2369.

# 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

Peek ME et al. *J Gen Intern Med*. 2008;23:1858-1864.

# 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

Halm J, Amoaka E. *Ethnicity and Disease.* 2008;18:278-282.

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- Physical activity vital sign
- Cardiovascular (aerobics)
- Exercise prescription
- Resources: further education

# 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)?"

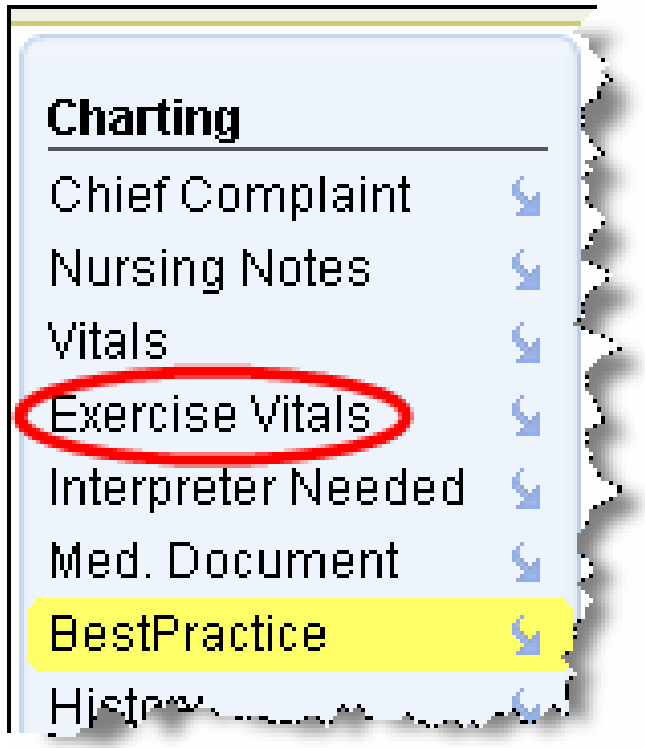
   Followed by a pull down 0 to 7 days

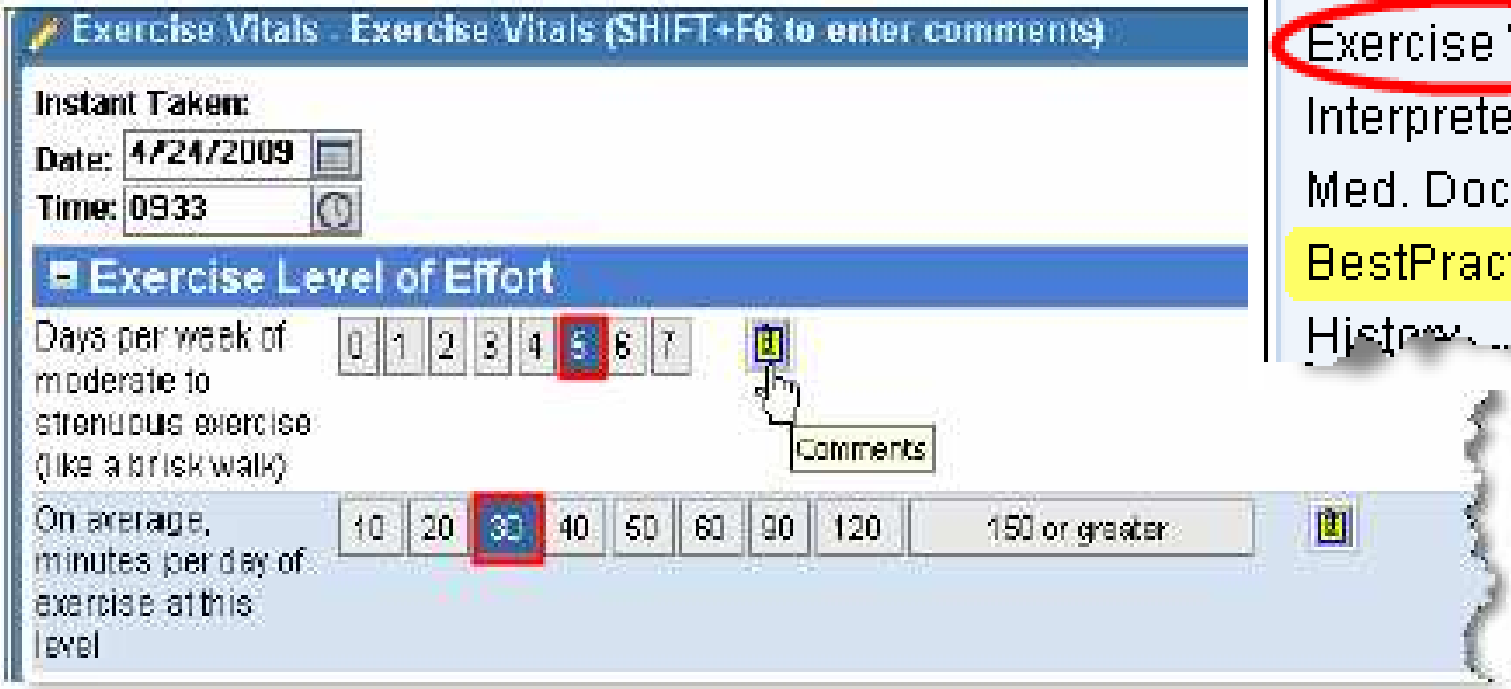
# Physical Activity Vital Sign at Kaiser Permanente

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

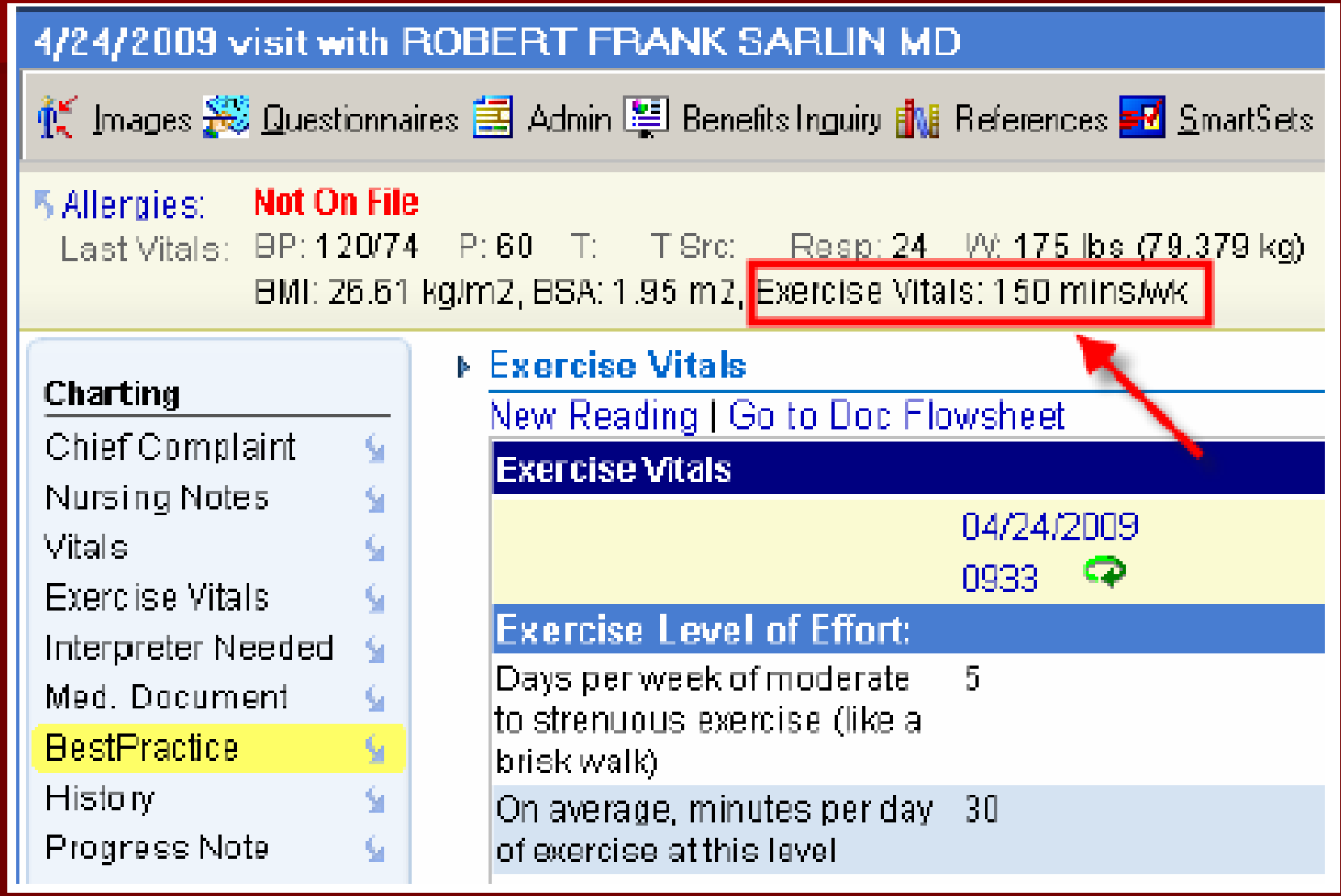
   Followed by a pull down 10/20/30/40/50/60/90/120/150 or more minutes

# 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

PAVS, physical activity vital sign

# 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

Greenwood JL et al. *J Phys Act Health*. 2010;7:571-576.

# 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

Greenwood JL et al. *J Phys Act Health*. 2010;7:571-576.

# Exercise Prescription

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

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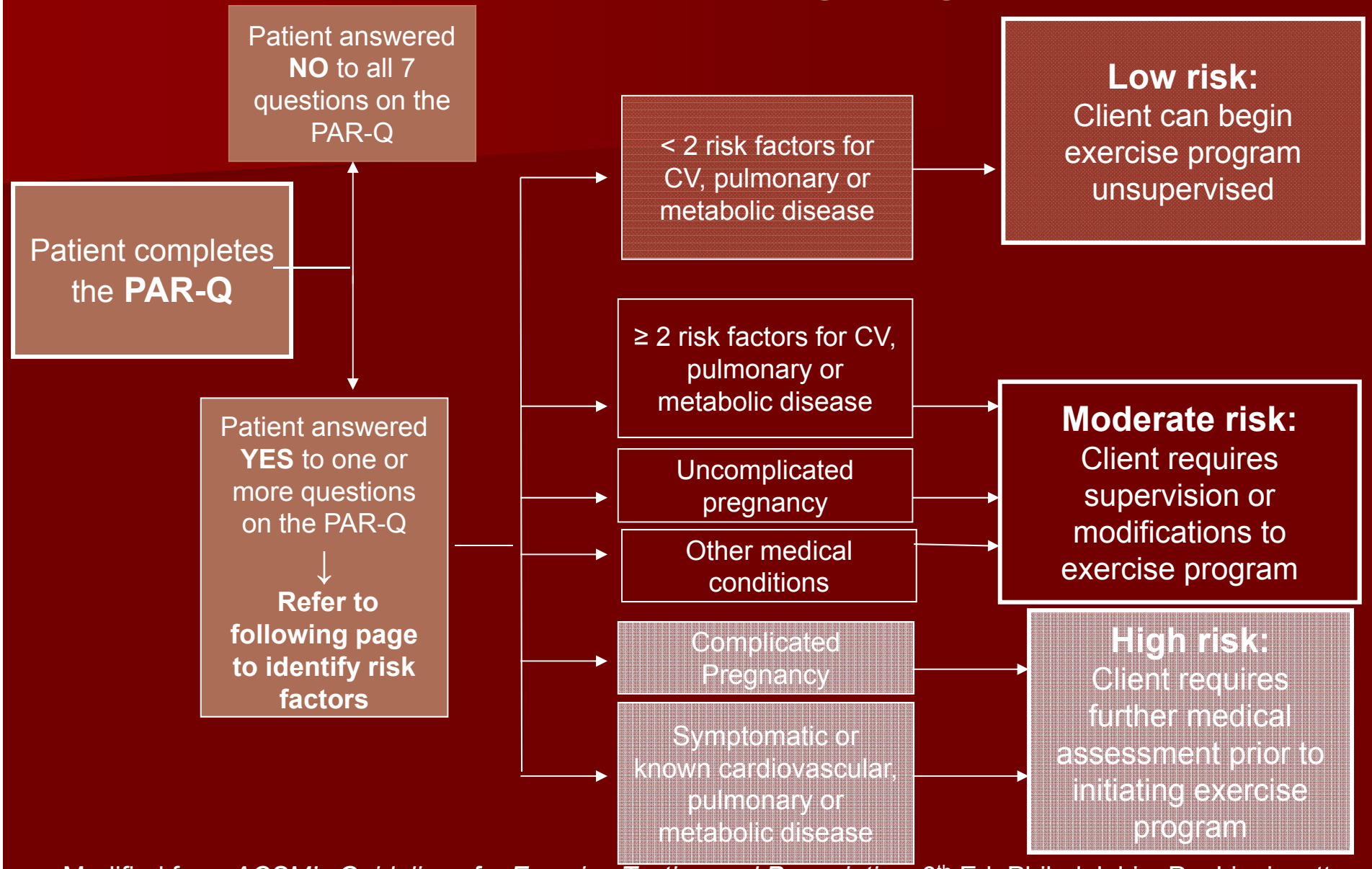
# Screening for Exercise

- 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

Jonas S, Phillips EM. *Exercise is Medicine: A Clinician's Guide to Exercise Prescription*. Philadelphia, Pa: Lippincott Williams & Wilkins; 2009.

# Exercise Screening Algorithm




Modified from *ACSM's Guidelines for Exercise Testing and Prescription*, 8th Ed. Philadelphia, Pa: Lippincott Williams & Wilkins, 2009.

# Physical Activity Readiness Questionnaire PAR-Q

- Developed by the British Columbia Ministry for Health and Canadian Society of Exercise Physiologists
- Adopted by American College of Sports Medicine
- Determines health risk of exercise for individuals
- PAR-Q requires minimal involvement of medical staff

Canadian Society for Exercise Physiology. http://www.csep.ca/cmfiles/publications/parq/par-q.pdf.

# Activity: PAR-Q

- Complete your own Physical Activity Readiness Questionnaire (PAR-Q)

Canadian Society for Exercise Physiology. http://www.csep.ca/cmfiles/publications/parq/par-q.pdf.

# PAR-Q

1. Has your doctor ever said that you have a heart condition and you should only do physical activity recommended by a physician?
2. Do you feel pain in your chest when you do physical activity?
3. In the past month, have you had chest pain when you were not doing physical activity?

Canadian Society for Exercise Physiology. http://www.csep.ca/cmfiles/publications/parq/par-q.pdf.

# PAR-Q

4. Do you lose your balance because of dizziness or do you ever lose consciousness?
5. Do you have a bone or joint problem (for example, back, knee or hip) that could be made worse by a change in your physical activity?
6. Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?

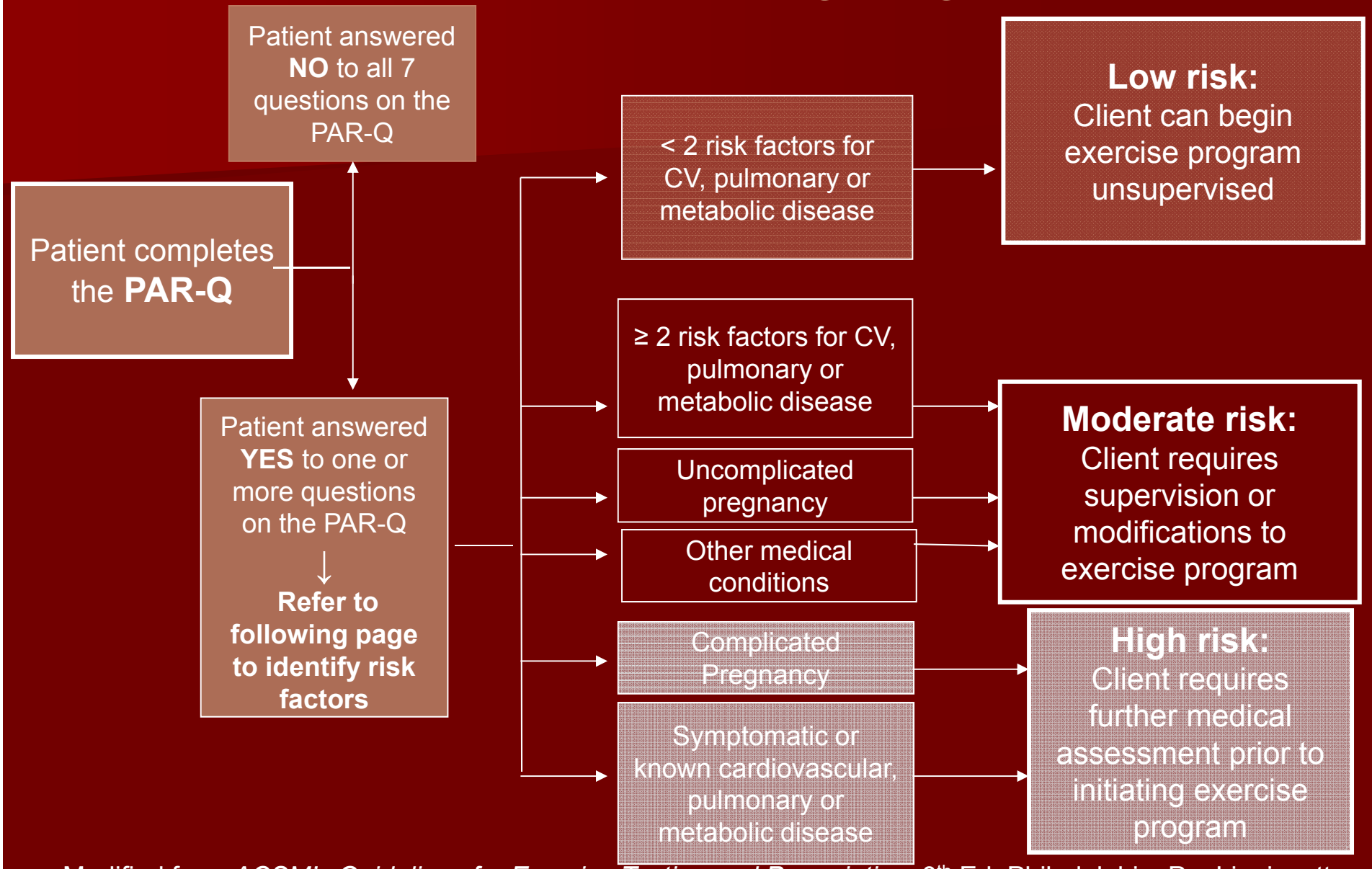
Canadian Society for Exercise Physiology. http://www.csep.ca/cmfiles/publications/parq/par-q.pdf.

# PAR-Q

7. Do you know of any other reason why you should not do physical activity?

Canadian Society for Exercise Physiology. http://www.csep.ca/cmfiles/publications/parq/par-q.pdf.

# Exercise Screening Algorithm

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# Risk Stratification for Sedentary Patients

**CARDIOVASCULAR and PULMONARY Signs and Symptoms or Disease (HIGH RISK):**

- heart attack or heart failure
- heart surgery or transplantation
- cardiac catheterization
- coronary angioplasty
- pacemaker/implantable cardiac
- defibrillator/rhythm disturbance
- heart valve disease
- congenital heart disease
- chest discomfort with exertion
- unreasonable breathlessness
- dizziness, fainting or blackouts
- takes heart medications
- burning or cramping sensation in lower legs when walking short distances
- asthma or other lung disease

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# Risk Stratification for Sedentary Patients

**CARDIOVASCULAR/METABOLIC RISK FACTORS:**
**<u><2 risk factors = LOW RISK;  ≥2 = MODERATE RISK</u>**

- Male >45 years old
- Female >55 years old, or has had hysterectomy, or is postmenopausal
- Smoker (or quit within past 6 months)
- Blood pressure >140/90 mmHg
- On BP medication
- Blood cholesterol >200 mg/dL
- Close blood relative who had heart attack or heart surgery before age 55 (male) or 65 (female)
- >20 pounds overweight
- Pre-diabetes
- Sedentary lifestyle

- Negative risk factor (**protective):** high-serum HDL cholesterol ≥60 mg/dL (1.6 mmol/L)

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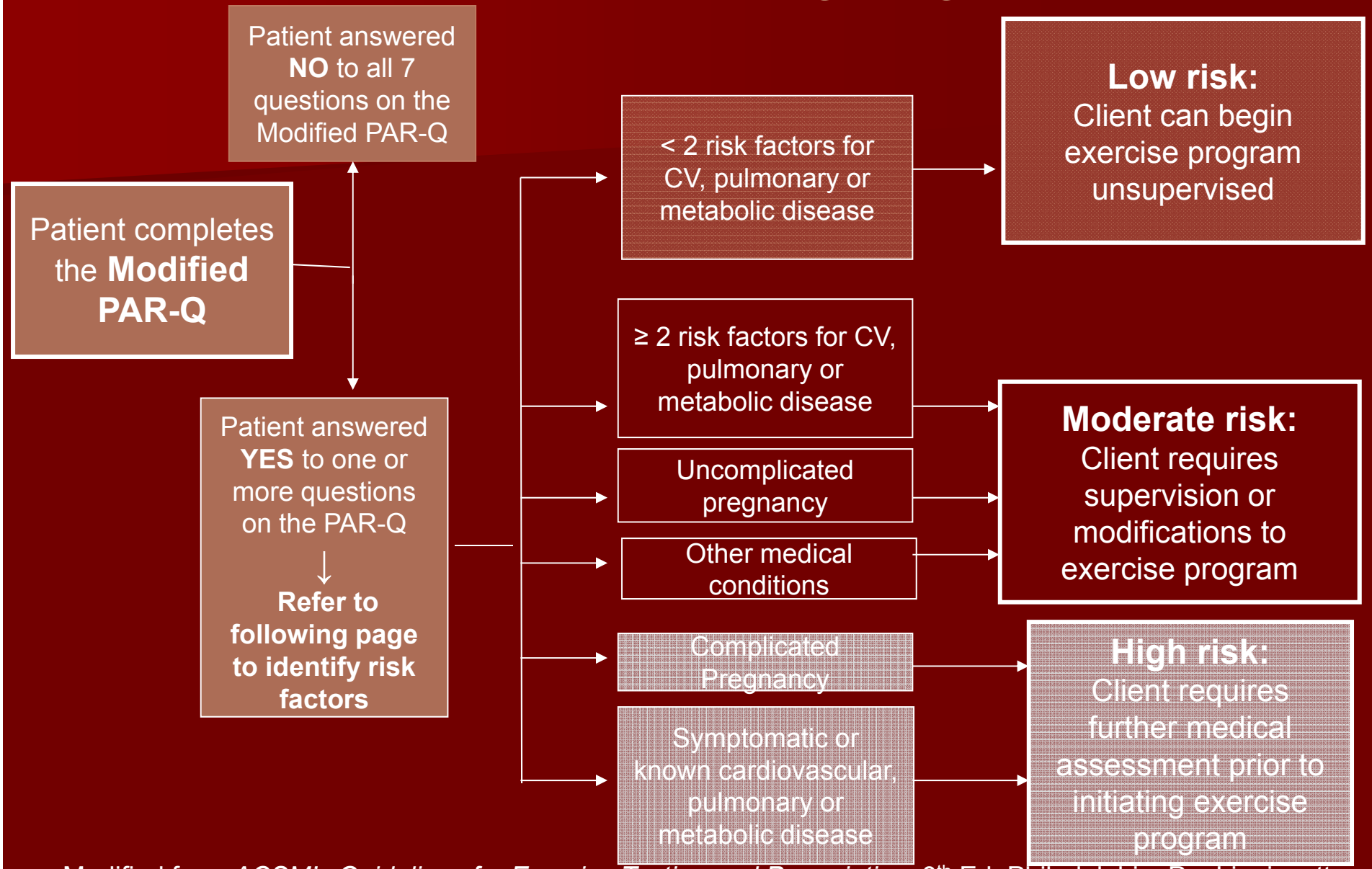
# Activity: Screening Cases

- 65-year-old male with history of an old MI s/p stenting in 2007
- 31-year-old female, smoker, sedentary, father had MI at age 51 years

MI, myocardial infarction; s/p, status post

# Exercise Screening Algorithm

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# Exercise Prescription

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

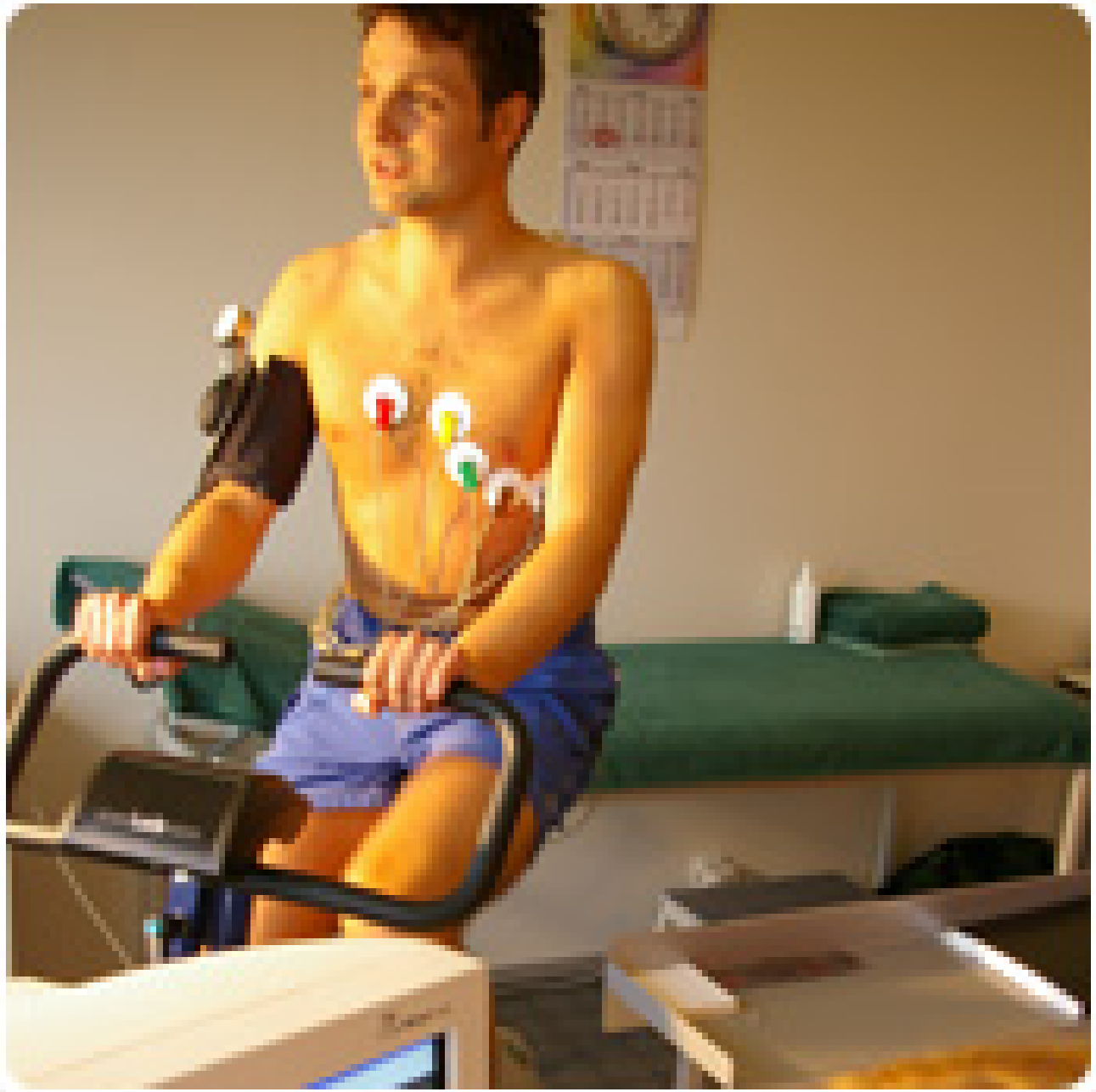
# Intensity: $VO_2$ Testing

- Clinical test measures fitness level as ability to extract and use oxygen
- Results measured in ml $O_2$/kg/minute
- One MET = 3.5 ml $O_2$/kg/min
- Measures true maximal heart rate
- Maximal vs. sub-maximal testing


S-WORKS

# Stress Testing

- Monitored exercise at sub-maximal or maximal levels
- Provides clearance to perform exercise at different intensities and maximal heart rates
- Supervised by professional (e.g. exercise physiologist) vs. clinical (e.g. cardiologist) depending on risk level



# Absolute Measures of Intensity

- Metabolic equivalents (METs) represent the absolute expenditure of energy needed to accomplish a given task such as walking up two flights of stairs
- One MET approximates the body's energy requirements at complete rest
- METs are a useful and convenient way to describe the intensity of a variety of physical activities and are helpful in describing the work of different tasks; however, the intensity of the exercise needed to achieve that task is relative to the individual's reserve (ACSM: Guidelines 2009)

# METs and Exercise Intensity

- Light physical activity <3 METs
- Moderate activities = 3–6 METs
- Vigorous activities > 6 METs
  - (ACSM and AHA Recommendations 2007)

| Light (<3 METs) | Moderate (3-6 METs) | Vigorous (>6 METs) |
|---|---|---|
| **Walking** | **Walking** | **Walking, jogging & running** |
| Walking slowly around home, store or office = 2.0* | Walking 3.0 mph = 3.3*<br><br>Walking at very brisk pace (4 mph) = 5.0* | Walking at very very brisk pace (4.5 mph) = 6.3*<br><br>Walking/hiking at moderate pace and grade with no or light pack (<10 pounds) = 7.0<br>Hiking at steep grades and pack 10-42 pounds = 7.5 – 9.0<br>Jogging at 5 mph = 8.0*<br>Jogging at 6 mph = 10.0*<br>Running at 7 mph = 11.5* |
| **Household & occupation** | **Household & occupation** | **Household & occupation** |
| Sitting - using computer work at desk using light hand tools = 1.5<br><br>Standing performing light work such as making bed, washing dishes, ironing, preparing food or store clerk = 2.0-2.5 | Cleaning – heavy: washing windows, car, clean garage = 3.0<br><br>Sweeping floors or carpet, vacuuming, mopping = 3.0-3.5<br>Carpentry – general = 3.6<br>Carrying & stacking wood = 5.5<br>Mowing lawn – walk power mower = 5.5 | Shoveling sand, coal, etc. = 7.0<br><br>Carrying heavy loads such as bricks = 7.5<br><br>Heavy farming such as bailing hay = 8.0<br>Shoveling, digging ditches = 8.5 |
| **Leisure time & sports** | **Leisure time & sports** | **Leisure time & sports** |
| Arts & crafts, playing cards = 1.5<br><br>Billiards = 2.5<br><br>Boating - power = 2.5<br><br>Croquet = 2.5<br><br>Darts = 2.5<br><br>Fishing – sitting = 2.5<br>Playing most musical instruments = 2.0- | Badminton - recreational = 4.5<br><br>Basketball - shooting around = 4.5<br><br>Bicycling – on flat: light effort (10-12 mph) = 6.0<br>Dancing – ballroom slow = 3.0; ballroom fast = 4.5<br>Fishing from river bank & walking = 4.0<br><br>Golf - walking pulling clubs = 4.3<br>Sailing boat, wind surfing = 3.0 | Basketball game = 8.0<br><br>Bicycling – on flat: moderate effort (12-14 mph) = 8,0; fast (14 – 16 mph) = 10<br>Skiing cross country – slow (2,5 mph = 7.0; fast (5.0-7.9 mph) = 9.0<br>Soccer – casual = 7.0; competitive = 10.0<br><br>Swimming – moderate/hard = 8-11†<br><br>Tennis singles = 8.0<br>Volleyball – competitive at gym or beach = 8.0 |

# Physiological/Relative Measures of Intensity

- Other more objective measures (used in formal exercise testing) include:
  - Percentages of maximal oxygen consumption ($VO_2max$)
  - Oxygen consumption reserve ($VO_2R$)
  - Heart rate reserve (HRR) and
  - Maximal heart rate (HRmax)

# Heart Rate Ranges

The ranges were calculated using the formula: [206.9 – (0.67 x age] x %HR max

Moderate intensity: 64%-76% HR max
Vigorous intensity: >76% HR max

| Age | LOW INTENSITY | MODERATE INTENSITY | VIGOROUS INTENSITY | $HR_{max}$ |
|---|---|---|---|---|
| 15 | < 126 | 126 – 150 | > 150 | 197 |
| 20 | < 124 | 124 – 147 | > 147 | 194 |
| 25 | < 122 | 122 – 145 | > 145 | 190 |
| 30 | < 120 | 120 – 142 | > 142 | 187 |
| 35 | < 117 | 117 – 139 | > 139 | 183 |
| 40 | < 115 | 115 – 137 | > 137 | 180 |
| 45 | < 113 | 113 – 134 | > 134 | 177 |
| 50 | < 111 | 111 – 132 | > 132 | 173 |
| 55 | < 109 | 109 – 129 | > 129 | 170 |
| 60 | < 107 | 107 – 127 | > 127 | 167 |
| 65 | < 105 | 105 – 124 | > 124 | 163 |
| 70 | < 102 | 102 – 122 | > 122 | 160 |
| 75 | < 100 | 100 – 119 | > 119 | 157 |
| 80 | < 98 | 98 – 117 | > 117 | 153 |
| 85 | < 96 | 96 – 114 | > 114 | 150 |
| 95 | < 92 | 92 – 109 | > 109 | 143 |

*ACSM's Guidelines for Exercise Testing and Prescription, 8th Edition*. Baltimore, MD: Lippincott Williams & Wilkins; 2009.

# Borg's Scale of Perceived Exertion

- The 15-point scale is an example: point 6 would be the equivalent of sitting down doing nothing, 9 would be walking gently, 13 a steady exercising pace and 19/20 the hardest exercise you have ever done

6
7 - Very, very light
8
9 - Very light
10
11 - Fairly light
12
13 - Moderately hard
14
15 - Hard
16
17 - Very hard
18
19 - Very, very hard
20 - Exhaustion

Borg GA. *Med Sci Sports Exerc*. 1982;14:377-381.

# Respiratory Rate

- Breaths can easily be counted by both an observer and the person doing the exercise, and are probably the best indicator of perceived exertion
- It is likely that respiratory rate (breaths/min) may serve as the more reliable and valid measure of physical exertion in both a research and clinical setting

Chen MJ. *J Sports Sci.* 2002;20:873-899.

# "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

Persinger R et al. *Med Sci Sports Exerc.* 2004;36:1632-1636.

# Exercise Intensity

| Intensity | "Talk Test" | Perceived Exertion (10 point scale) | HRR (%) $\dot{V}O_2R$ (%) | Maximal HR (%) | MET $\dot{V}O_{2max}$ |
|---|---|---|---|---|---|
| Very light | Able to talk and/or sing | <3 | <20 | <50 | > 3 |
| Light | | | 20–39 | 50–63 | |
| Moderate | Able to talk but not sing | 3 -4 | 40–59 | 64–76 | 3 -6 |
| Vigorous/hard | Difficulty talking | 5 - 6 | 60–84 | 77–93 | >6 |
| Very hard | | 7 -9 | ≥85 | ≥94 | |
| Maximal | | 10 | 100 | 100 | |

Abbreviations: METs = metabolic equivalent units (1 MET = 3.5 $mL \times kg^{-1} \times min^{-1}$); $\dot{V}O_2R$, = oxygen uptake reserve; HRR = heart rate reserve.

Jonas S, Phillips EM. *Exercise is Medicine™: A Clinician's Guide to Exercise Prescription*. Philadelphia, Pa: Lippincott Williams & Wilkins; 2009:102.

# Overview

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

# Benefits of Resistance (Strength) Training

- Reduced risk of injury
- Increased basal metabolic rate
- Reduced fatigue
- Improved performance
- Increases muscle and cross-sectional area
- Aesthetic changes
- Improves QOL, strength, endurance and BMD in early post-menopausal years
- Reduces body fat
- Improves lipid profiles
- Improves glucose tolerance

# Benefits of Resistance (Strength) Training

- Reduces pain and disability associated with arthritis
- Restores balance and reduction of falls
- Strengthens bone (reduced risk of osteoporosis)
- Maintains proper weight
- Maintains a healthy state of mind and reduces symptoms of depression
- Improves sleep
- Improves heart muscle functioning
- Improves glucose control and consequently diabetes control

# Resistance Training for Diabetes

- *Resistance training* may serve as a treatment for diabetes and should be encouraged for people with diabetes mellitus in the absence of contraindications such as retinopathy and recent laser treatments.
- Dunstan DW, et al. High-intensity resistance training improves glycemic control in older patients with type 2 diabetes. Diabetes Care 2002;25:1729-1736.
- Sigal RJ, et al. Effects of aerobic training, resistance training, or both on glycemic control in type 2 diabetes: a randomized trial. Ann Intern Med 2007;147:357-369.

# Chair Stand Test
## Lower-body muscle strength

- **How to do it:** Sit on a sturdy chair 18 inches high, with your feet shoulder width apart. Cross your arms at your wrists and hold them in front of you so your palms are facing your chest. With your back straight and feet flat on the floor, stand up and then sit back down, lightly touching your buttocks to the chair. Your score is the number of repetitions you can perform in 30 seconds.

# HOME FITNESS TEST NORMS

## 30 Second Senior Chair Stand Test Norms - SENIOR FITNESS TEST MANUAL, R.E. RIKLI AND C.J. JONES

| AGE | 10-14 | | 15-19 | | 20-24 | | 25-29 | | 30-34 | | 35-39 | | 40-44 | | 45-49 | | 50-54 | | 55-59 | | 60-64 | | 65-69 | | 70-74 | | 75-79 | | 80-84 | | 85-89 | | 90-94 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Rank | F | M | F | M | F | M | F | M | F | M | F | M | F | M | F | M | F | M | F | M | F | M | F | M | F | M | F | M | F | M | F | M | F | M |
| EXCELLENT | 30 | 32 | 32 | 34 | 34 | 36 | 32 | 34 | 30 | 32 | 28 | 30 | 26 | 28 | 24 | 26 | 22 | 24 | 20 | 22 | 18 | 20 | 16 | 19 | 16 | 18 | 16 | 18 | 15 | 16 | 14 | 15 | 12 | 13 |
| GOOD | 28 | 29 | 30 | 31 | 32 | 33 | 30 | 31 | 28 | 29 | 26 | 27 | 24 | 25 | 22 | 23 | 20 | 21 | 18 | 19 | 16 | 17 | 14 | 16 | 14 | 16 | 13 | 15 | 12 | 13 | 11 | 12 | 9 | 11 |
| AVERAGE | 26 | 27 | 28 | 29 | 30 | 31 | 28 | 29 | 26 | 27 | 24 | 25 | 22 | 23 | 20 | 21 | 18 | 19 | 16 | 17 | 14 | 15 | 13 | 14 | 12 | 13 | 12 | 13 | 10 | 11 | 9 | 10 | 7 | 9 |
| BELOW AVERAGE | 23 | 25 | 25 | 27 | 27 | 28 | 25 | 27 | 23 | 25 | 21 | 23 | 19 | 21 | 17 | 19 | 15 | 17 | 13 | 15 | 11 | 13 | 11 | 11 | 10 | 11 | 9 | 10 | 8 | 9 | 7 | 7 | 4 | 7 |
| POOR | 20 | 21 | 22 | 23 | 24 | 25 | 22 | 23 | 20 | 21 | 18 | 19 | 16 | 17 | 14 | 15 | 12 | 13 | 10 | 11 | 8 | 9 | 8 | 8 | 7 | 8 | 6 | 7 | 4 | 6 | 4 | 7 | 0 | 3 |

# How to Strengthen: FITT

- Frequency = number of times / week
- Intensity = % of 1 repetition max (1RM)
- Time (Duration) = sets/session
- Type

# Frequency:

- The ACSM/AHA recommends that patients participate in strengthening exercises on at least two non-consecutive days each week.

# Intensity:

- The amount of resistance used should be heavy enough that your patient is able to complete *only* 8-12 repetitions before needing a break. The patient should be able to complete 3 sets of 8-12 repetitions with short (1-4 minutes) breaks in between each set.

# Time (duration):

- Resistance training sessions do not need to consume a large amount of time – a routine consisting of 3 sets of 8-12 repetitions for 8-10 different muscle groups should take about 30 minutes.

# Type

- Weights such as dumb bells, bars or weight machines.
- Resistance training can also be done using body weight, elastic cords or even household objects such as soup cans.
- Free weights
- Variable resistance machines
- Low tech
  - exercise ball
  - sports cord / theraband

# Type (continued)

- Alternative types of muscle-strengthening activities include stair-climbing, weight bearing calisthenics and other resistance exercises that use the major muscle groups

# Common Resistance Exercises

- Dumb bell press – pectoral muscles (front of chest)
- 'Bent over' row with dumbbell – shoulders and upper back
- Arm curl with dumbbell – biceps
- Elbow extension – triceps
- Seated knee extension (with ankle weight) – quadriceps
- Leg press – quadriceps, hamstrings, and gluteal muscles in your buttocks.
- Hamstring curls
- Push-up – chest, arms shoulders and upper body
- Calf raise – gastrocnemius and soleus
- Squat – quadriceps and gluteal muscles
  - Mayo Clinic Web Site

# Strengthening: Definitions

- Strength: maximal force generated at a specific velocity
- Power: force X velocity = work/time
- Specificity
- Cross training
- Overload
- Reversibility

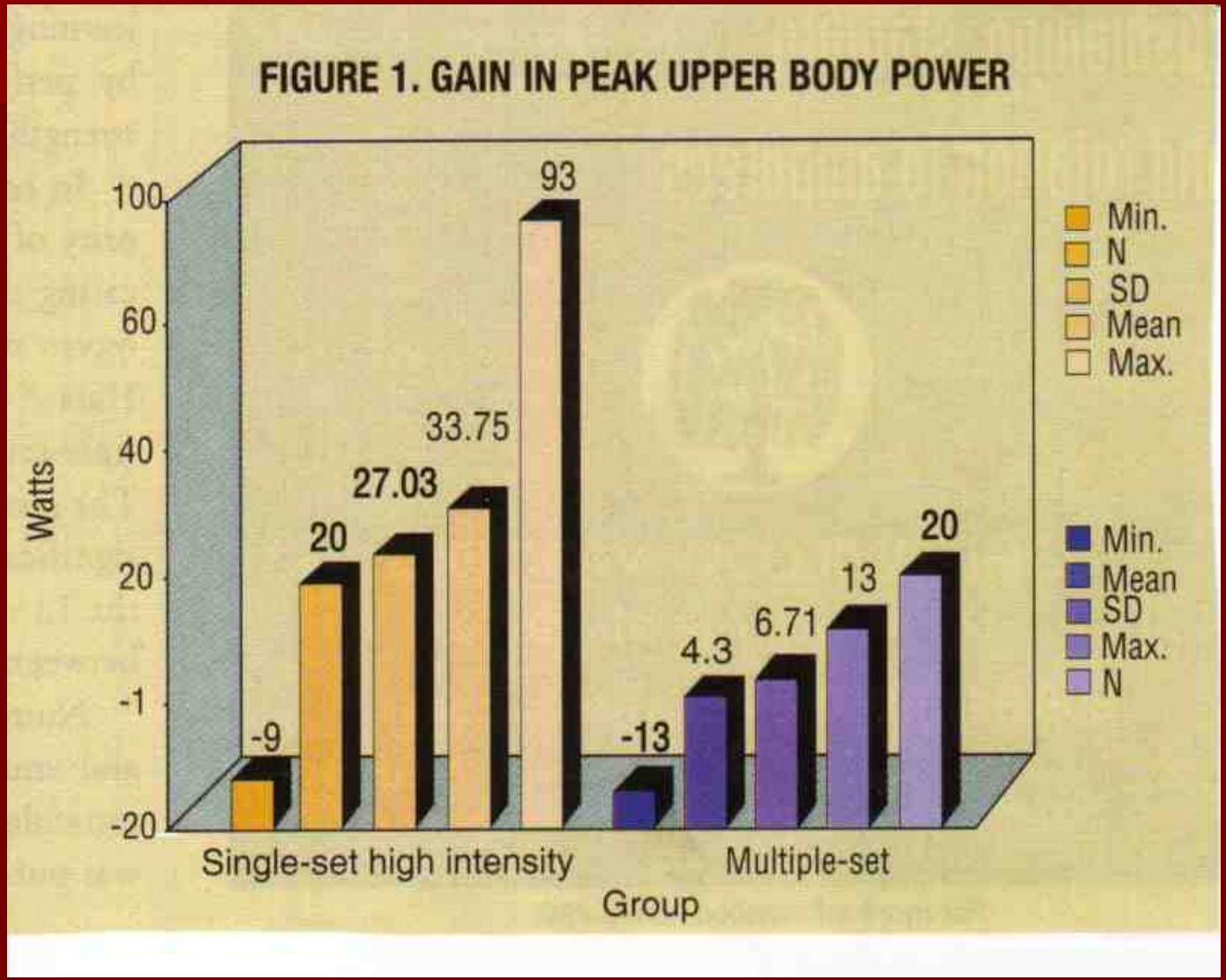
# Introducing Resistance Training

- Commonly even patients who are physically active and pursue the recommended dose of regular cardiovascular exercise do not perform resistance exercises.
- As a slow progression to avoid injury and muscle soreness your patient should be advised to initiate the resistance exercises at a lower intensity (e.g. a perceived exertion of 5 or 6 on a 10 point scale) and at a lower resistance such that she may complete 15 repetitions before fatiguing.

# Progressing Resistance Training

- In the first week only one set of each of the exercises is done on two non-consecutive days.
- During week 2 the exercises are repeated at the same intensity but a second set is added.
- During week 3 the resistance is raised such that your patient can now complete only 8-12 repetitions before they fatigue.
- The perceived exertion of each set will now be 6 or 7 on a 10 point scale or described as “really challenging.”

# Less is More in Resistance Training



# Strengthening: Safety Concerns

- Rest periods
- Correct form and balance
- Correct breathing
  - inhale during eccentric
  - exhale during concentric
  - avoid valsalva
- Order of exercise
  - larger groups followed by smaller
  - upper/lower alternate

# Strength Training Guidelines

- Lifting (concentric) and lowering (eccentric) phases should be controlled
- Normalize breathing pattern
- If possible, use a training partner

  - ACSM, 2000

# 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

Jonas S, Phillips EM. *Exercise is Medicine™: A Clinician's Guide to Exercise Prescription*. Philadelphia, Pa: Lippincott Williams & Wilkins; 2009:102.

# 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

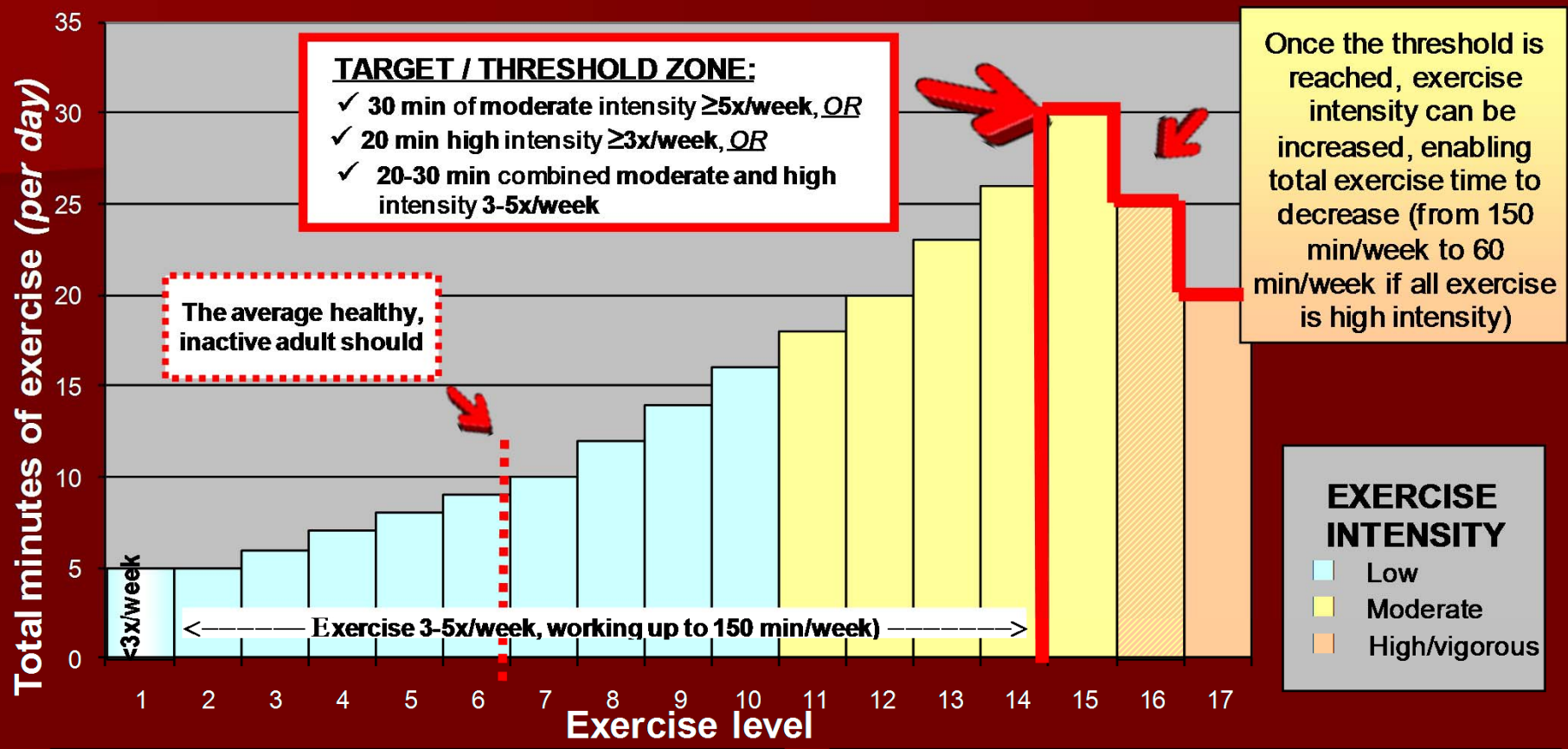
*(circle)*

**PRECAUTIONS:**

**OTHER NOTES:**

Jonas S, Phillips EM. *Exercise is Medicine™: A Clinician's Guide to Exercise Prescription*. Philadelphia, Pa: Lippincott Williams & Wilkins; 2009.

# Exercise Progression

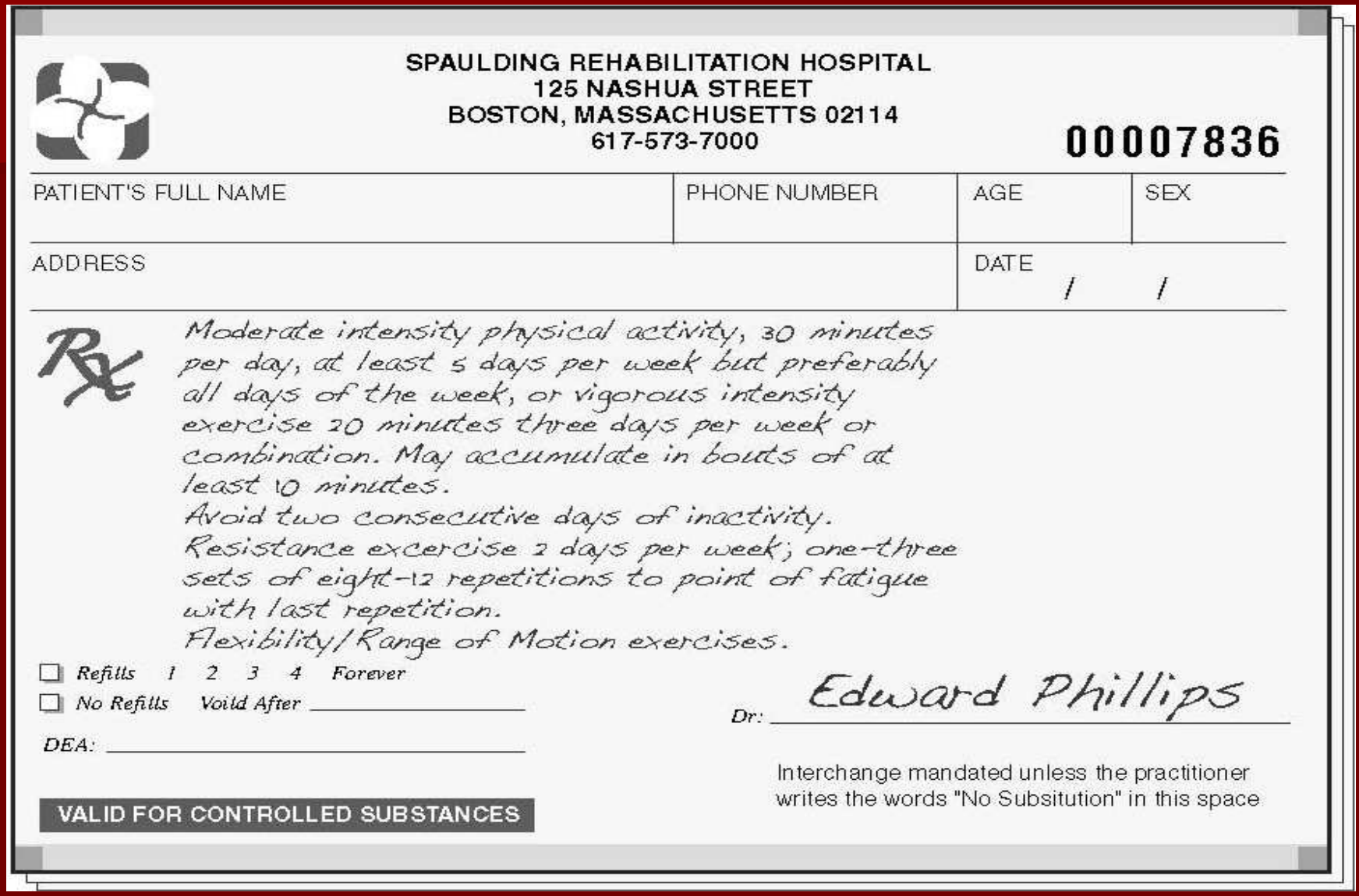



**TO DETERMINE STARTING LEVEL:** Determine how many minutes (see X-axis) you are comfortable exercising at least 3x/week. This is your starting level. Increase to 5x/week before progressing to the next level.

**PROGRESS:** to the next level (move 1 bar to the right) every week. Ensure that you continue exercising 5x/week. If you begin the program very deconditioned or sedentary and over the age of 65, then progress every 2-4 weeks.

Jonas S, Phillips EM. *Exercise is Medicine™: A Clinician's Guide to Exercise Prescription*. Philadelphia, Pa: Lippincott Williams & Wilkins; 2009.

# Sample Exercise Prescription



SPAULDING REHABILITATION HOSPITAL
125 NASHUA STREET
BOSTON, MASSACHUSETTS 02114
617-573-7000

00007836

| PATIENT'S FULL NAME | PHONE NUMBER | AGE | SEX |
|---|---|---|---|
| ADDRESS | | DATE / / | |

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 excercise 2 days per week; one-three sets of eight-12 repetitions to point of fatigue with last repetition.
Flexibility/Range of Motion exercises.

☐ Refills 1 2 3 4 Forever
☐ No Refills Voild After _____

DEA: _____

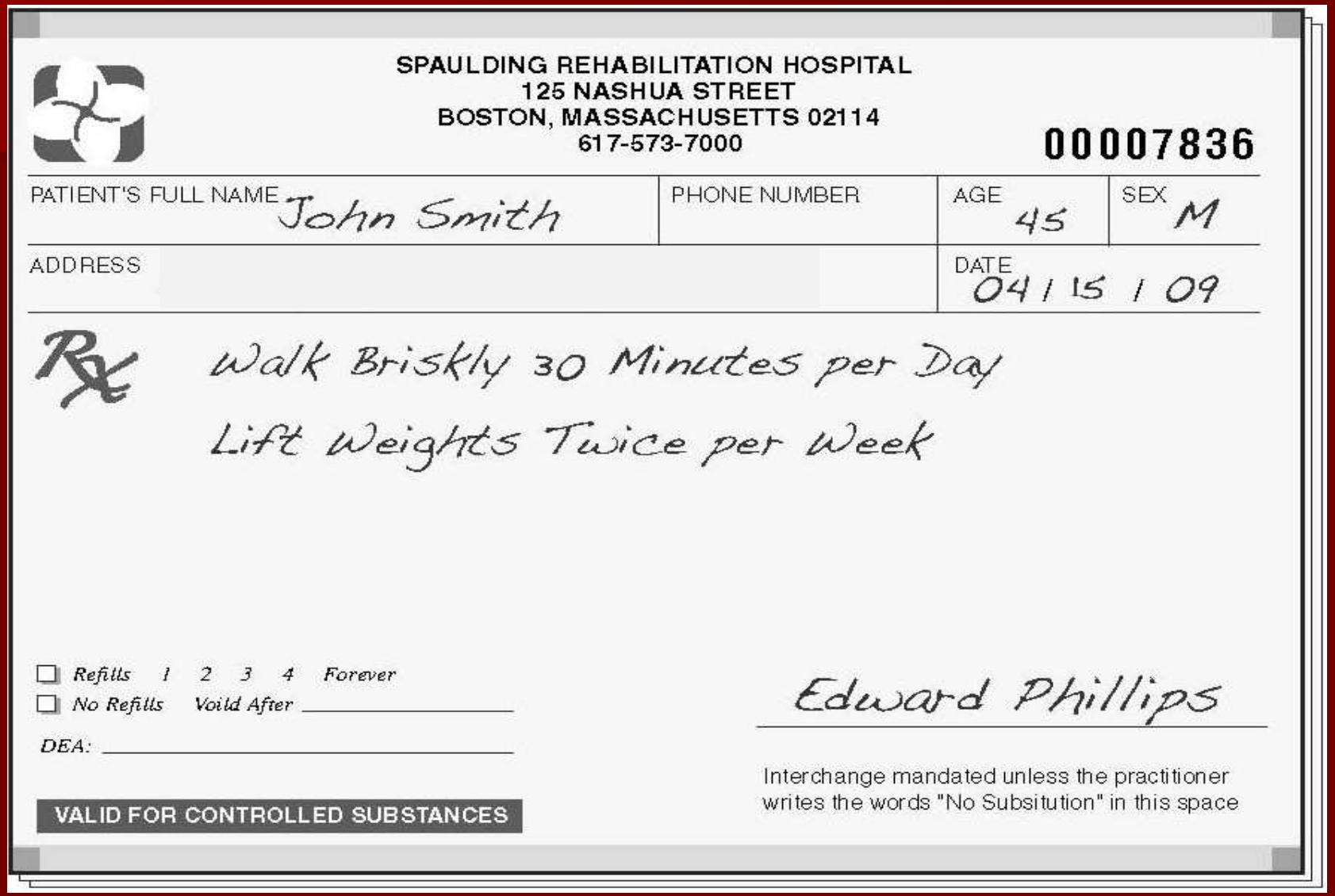
Dr: Edward Phillips

Interchange mandated unless the practitioner writes the words "No Subsitution" in this space

VALID FOR CONTROLLED SUBSTANCES

Jonas S, Phillips EM. *Exercise is Medicine™: A Clinician's Guide to Exercise Prescription*. Philadelphia, Pa: Lippincott Williams & Wilkins; 2009.

# Sample Exercise Prescription



SPAULDING REHABILITATION HOSPITAL
125 NASHUA STREET
BOSTON, MASSACHUSETTS 02114
617-573-7000

00007836

PATIENT'S FULL NAME: John Smith | PHONE NUMBER: | AGE: 45 | SEX: M

ADDRESS: | DATE: 04 / 15 / 09

℞ Walk Briskly 30 Minutes per Day
Lift Weights Twice per Week

☐ Refills 1 2 3 4 Forever
☐ No Refills Void After _____

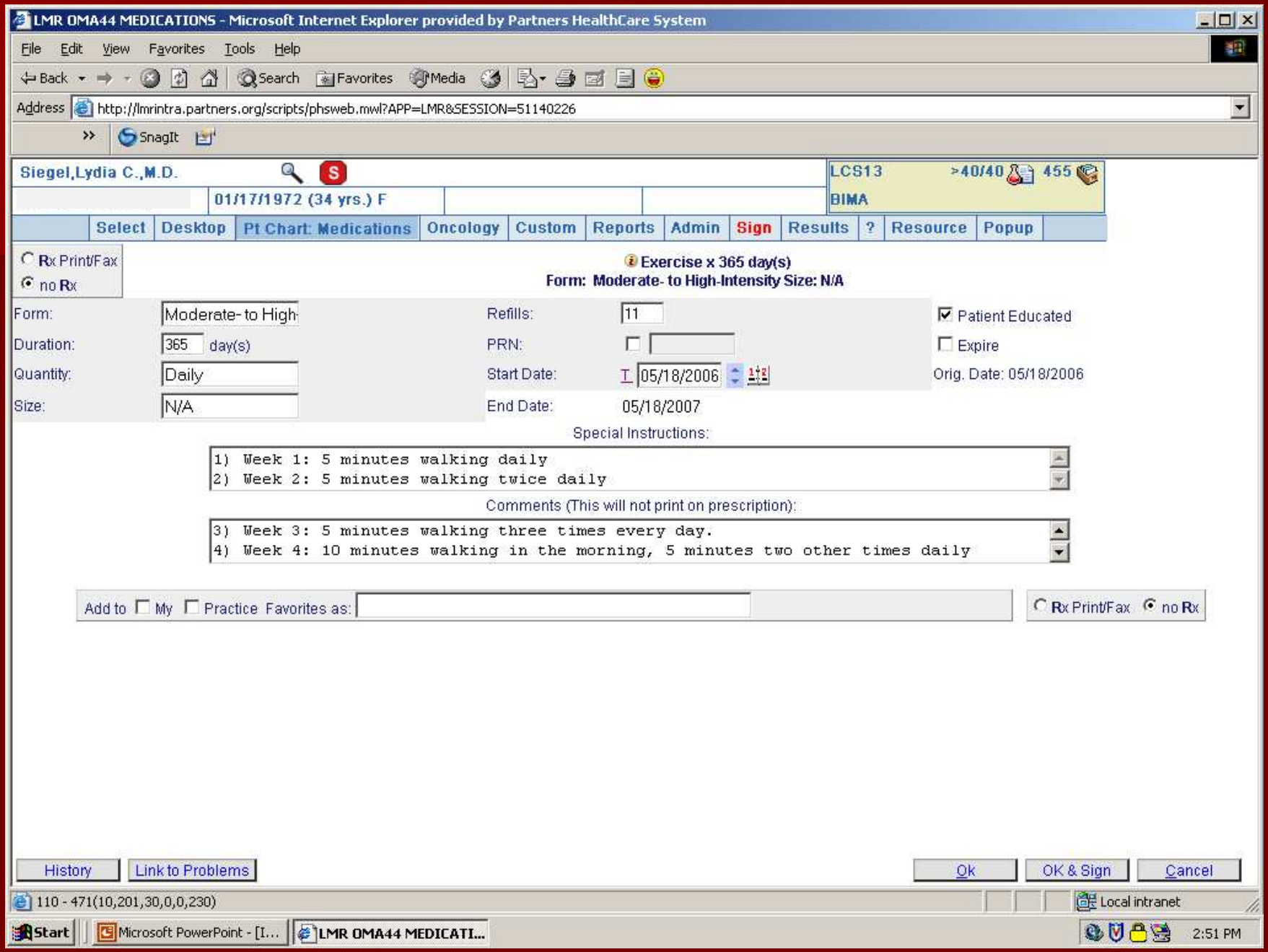
DEA: _____

VALID FOR CONTROLLED SUBSTANCES

Edward Phillips

Interchange mandated unless the practitioner writes the words "No Subsitution" in this space

Jonas S, Phillips EM. *Exercise is Medicine™: A Clinician's Guide to Exercise Prescription*. Philadelphia, Pa: Lippincott Williams & Wilkins; 2009.




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)

# 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:**

Jonas S, Phillips EM. *Exercise is Medicine™: A Clinician's Guide to Exercise Prescription*. Philadelphia, Pa: Lippincott Williams & Wilkins; 2009.


http://www.exerciseismedicine.org

# Background

- Launched in November 2007 by the American College of Sports Medicine (ACSM) and the American Medical Association (AMA)
- Founded to encourage primary care physicians to include exercise when designing treatment plans for patients. Calls on doctors to prescribe exercise to their patients
- Committed to the belief that exercise and physical activity are integral in the prevention and treatment of diseases, and should be assessed as part of medical care and integrated into every primary care office visit

http://www.exerciseismedicine.org

# Vision

- To make physical activity and exercise a standard part of a disease prevention and treatment medical paradigm in the United States and throughout the world

# EXERCISE PRESCRIPTION & REFERRAL FORM


PATIENT'S NAME: _____ DOB: _____ DATE: _____

HEALTH CARE PROVIDER'S NAME: _____ SIGNATURE: _____

## PHYSICAL ACTIVITY RECOMMENDATIONS

| Type of physical activity: | Aerobic | Strength |
|---|---|---|
| Number of days per week: | | |
| Minutes per day: | | |
| Total minutes per week*: | | |

***PHYSICAL ACTIVITY GUIDELINES**

*Adults aged 18-64 with no chronic conditions:* Minimum of 150 minutes of moderate physical activity a week (for example, 30 minutes per day, five days a week) ***and*** muscle-strengthening activities on two or more days a week (2006 Physical Activity Guidelines for Americans).
For more information, visit www.acsm.org/physicalactivity

## REFERRAL TO HEALTH & FITNESS PROFESSIONAL

Name: _____

Phone: _____

Address: _____

_____

Web Site: _____

Follow-up Appointment Date: _____

Notes: _____

_____

_____

_____

# A's of Physical Activity Counseling

- Considerations
  - Brief or extensive?
  - Formal or Informal?
  - Comprehensive or focused?
  - Intermittent or regular follow-up?
  - In-person or mediated?

Assess

Advise

Agree

Assist

Arrange

THANKS TO HEATHER CHAMBLISS, PHD

# Stages of Readiness to Change

**Precontemplation**

- **"I'm not physically active, and I do not intend to change my physical activity level"**

**Contemplation**

- **"I'm not physically active, but I intend to increase my physical activity level in the next six months"**

**Preparation**

- **"I'm doing some physical activity but not consistently"**

**Action**

- **"I am regularly physically active, but I have done this for less than 6 months"**

**Maintenance**

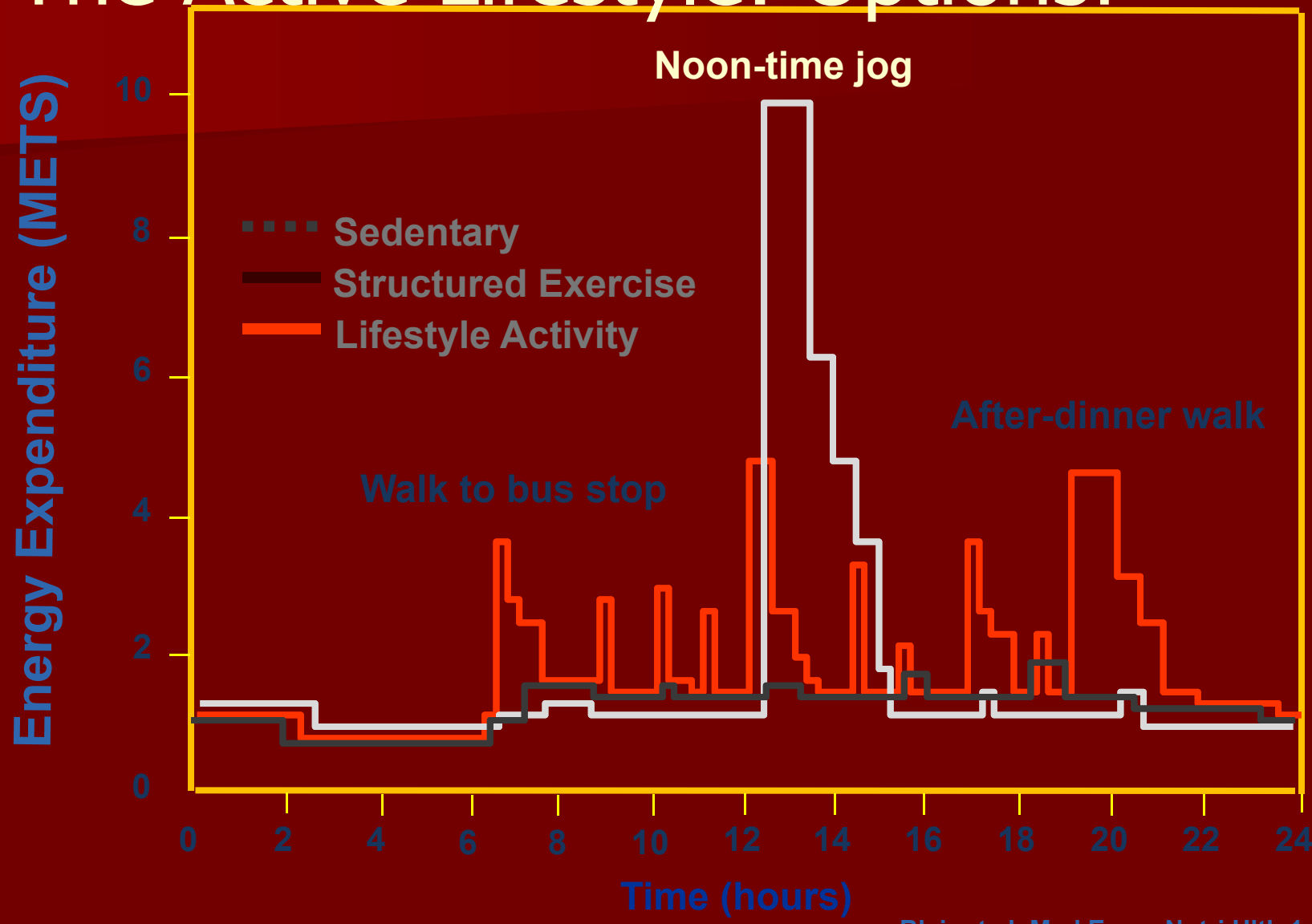
- **"I have been regularly physically active for more than 6 months"**

# Provide Tailored Knowledge and Advice

- Personalized messages on the benefits of physical activity based on medical history and disease risk factors
  - Better glucose control, weight management, increased fitness, improved mood, etc.
- Options for physical activity
  - Decreasing sedentary time, moderate-intensit lifestyle activity and short-bout e of fitness
- Consider:
  - Client needs (medical and self-stated goals)
  - Current behavior/Stage of change
  - Self-efficacy

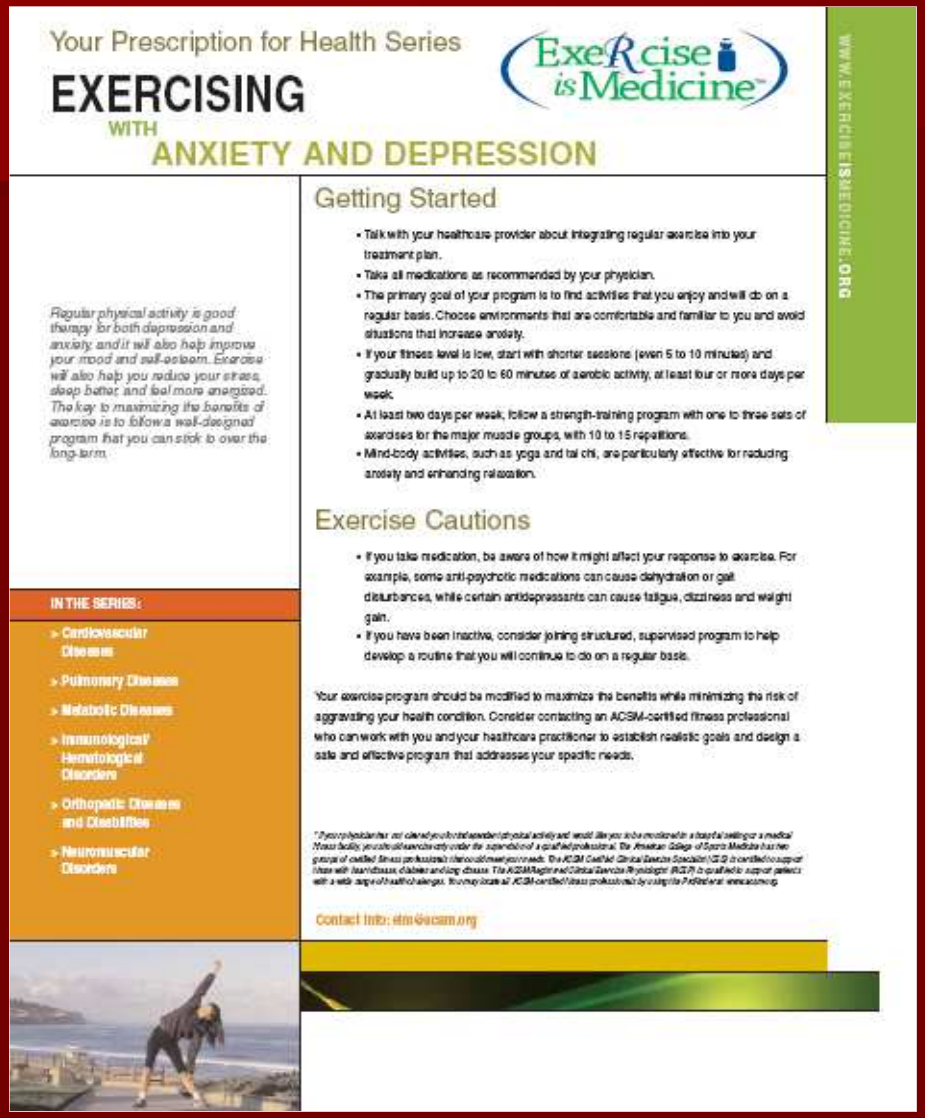
**Knowledge should be tailored to the individual patient: history, preferences, needs, goals**

# The Active Lifestyle: Options!




Blair et al. Med Exerc Nutri Hlth 1:54, 1992

# “Your Prescription for Health” Series



Your Prescription for Health Series

EXERCISING WITH ANXIETY AND DEPRESSION

Exercise is Medicine

WWW.EXERCISEISMEDICINE.ORG

*Regular physical activity is good therapy for both depression and anxiety, and it will also help improve your mood and self-esteem. Exercise will also help you reduce your stress, sleep better, and feel more energized. The key to maximizing the benefits of exercise is to follow a well-designed program that you can stick to over the long-term.*

IN THE SERIES:

- Cardiovascular Diseases
- Pulmonary Diseases
- Metabolic Diseases
- Immunological/ Hematological Disorders
- Orthopedic Diseases and Disabilities
- Neuromuscular Disorders

## Getting Started

- Talk with your healthcare provider about integrating regular exercise into your treatment plan.
- Take all medications as recommended by your physician.
- The primary goal of your program is to find activities that you enjoy and will do on a regular basis. Choose environments that are comfortable and familiar to you and avoid situations that increase anxiety.
- If your fitness level is low, start with shorter sessions (even 5 to 10 minutes) and gradually build up to 20 to 60 minutes of aerobic activity, at least four or more days per week.
- At least two days per week, follow a strength-training program with one to three sets of exercises for the major muscle groups, with 10 to 15 repetitions.
- Mind-body activities, such as yoga and tai chi, are particularly effective for reducing anxiety and enhancing relaxation.

## Exercise Cautions

- If you take medication, be aware of how it might affect your response to exercise. For example, some anti-psychotic medications can cause dehydration or gait disturbances, while certain antidepressants can cause fatigue, dizziness and weight gain.
- If you have been inactive, consider joining structured, supervised program to help develop a routine that you will continue to do on a regular basis.

Your exercise program should be modified to maximize the benefits while minimizing the risk of aggravating your health condition. Consider contacting an ACSM-certified fitness professional who can work with you and your healthcare practitioner to establish realistic goals and design a safe and effective program that addresses your specific needs.

*If you physician has not cleared you to participate in physical activity and would like you to be monitored in a hospital setting or a medical fitness facility, you should exercise only under the supervision of a qualified professional. The American College of Sports Medicine has two groups of certified fitness professionals that could meet your needs. The ACSM Certified Clinical Exercise Specialist (CES) is certified to support those with heart disease, diabetes and lung disease. The ACSM Registered Clinical Exercise Physiologist (RCEP) is qualified to support patients with a wide range of health challenges. You may locate all ACSM-certified fitness professionals by using the Find Referral www.acsm.org.*

Contact Info: etm@acsm.org



Your Prescription for Health Series

EXERCISING FOLLOWING A STROKE

Exercise is Medicine

WWW.EXERCISEISMEDICINE.ORG

*A safe and effective exercise program is an important part of the rehabilitation process following a stroke. Regular physical activity can help improve your balance and coordination, reduce the need for assistive devices, and enhance your general quality of life. And, perhaps most importantly, exercise may reduce the risk of having another stroke. The key is to determine what type of exercise is best for you and to follow a program that fits your specific needs.*

IN THE SERIES:

- Cardiovascular Diseases
- Pulmonary Diseases
- Metabolic Diseases
- Immunological/ Hematological Disorders
- Orthopedic Diseases and Disabilities
- Neuromuscular Disorders

## Getting Started

- Talk with your physician and rehabilitation therapist about integrating regular exercise into your treatment plan. Take all medications as recommended by your physician.
- The goals of your program should be to improve mobility and overall fitness, and to reduce risk factors, such as high blood pressure, that can lead to future strokes.
- Choose activities that are comfortable and well-tolerated, such as chair-based, water exercises or recumbent cycling.
- Exercises that emphasize straightening and rotating your spine will help improve overall strength and posture as well as helping you do daily tasks.
- Start slowly and gradually progress the intensity and duration of your workouts. Closely monitor your intensity level and stay within the target heart-rate range prescribed by your healthcare provider.
- Ask your physician how the medications you take influence your heart rate and blood pressure so you know what numbers are right for you during exercise.
- Shorter periods of exercise throughout the day (5-10 minutes at a time) can add up to help you achieve the amount of exercise you need. Aim to exercise three to five times per week.
- Exercise equipment may need to be modified to accommodate your specific needs.

## Exercise Cautions

- Always check with your physician prior to increasing your activity level.
- Reduced motion and control of your limbs may restrict your ability to do certain exercises.
- Avoid exercises that overload your joints or increase your risk of falling. Begin each exercise in a stable position and note your response before proceeding. Mild-moderate muscle soreness for 24 hours after exercise is normal. Extreme pain or pain following exercise usually indicates the need to decrease the intensity of the workout and to more gradually increase activity.
- Avoid holding your breath during strength training because this can cause large fluctuations in blood pressure. During aerobic activity, like walking or cycling, you should be able to talk or sing during your exercises.

Your exercise program should be designed to maximize the benefits with the fewest risks of aggravating your health or physical condition. Consider contacting an ACSM-certified fitness professional* who can work with you and your healthcare practitioner to establish realistic goals and design a safe and effective program that addresses your specific needs.

*If you physician has not cleared you to participate in physical activity and would like you to be monitored in a hospital setting or a medical fitness facility, you should exercise only under the supervision of a qualified professional. The American College of Sports Medicine has two groups of certified fitness professionals that could meet your needs. The ACSM Certified Clinical Exercise Specialist (CES) is certified to support those with heart disease, diabetes and lung disease. The ACSM Registered Clinical Exercise Physiologist (RCEP) is qualified to support patients with a wide range of health challenges. You may locate all ACSM-certified fitness professionals by using the Find Referral www.acsm.org.*

Contact Info: etm@acsm.org

http://www.exerciseismedicine.org

# Commitment to Change: Your Personal Plan

# Question # 1

List five key messages, tools, or techniques that you will take away from this course and plan to implement when you get home.

# Question # 2

List primary "spheres of influence" where you have the ability to create an impact (e.g., self, patients, family, office, colleagues, practice, hospital, schools, health plan, etc.).

# Question # 3

Look at your answers for Question #1, circle the item you plan to integrate first. Choose something you can integrate within 3 to 6 months.

Then, look at your answers from Question #2, circle the "spheres of influence" you will target to make this change.

# Question # 4

List the things you hope to achieve 6 months from now by implementing this change.

# Question # 5

List the steps you need to take in the next 3 to 6 weeks in order to realize your long-term goals.

# Question # 6

List the challenges you expect to encounter throughout implementation.

# Question # 7

List the strategies you will use to overcome these expected challenges.

# Turn to your neighbor…

In groups of 2, spend the few minutes discussing your individual plans, including challenges, expected outcomes, etc. The first person should talk through their entire plan, then switch.

# Formalize your commitment…

Use what you've learned from your neighbor and complete your own personal Action Plan (on page 3) and on the NCR three page form.

**Present your Action Plan to the whole group in the afternoon session.**

# Follow Up

- **Connect with the Institute of Lifestyle Medicine (ILM)**
- Website: www.instituteoflifestylemedicine.org/
- Facebook: https://www.facebook.com/InstituteofLifestyleMedicine
- LinkedIn: http://www.linkedin.com/groups/Institute-Lifestyle-Medicine-4598141
- Twitter: @ILMLifestyleMed