

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”

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.

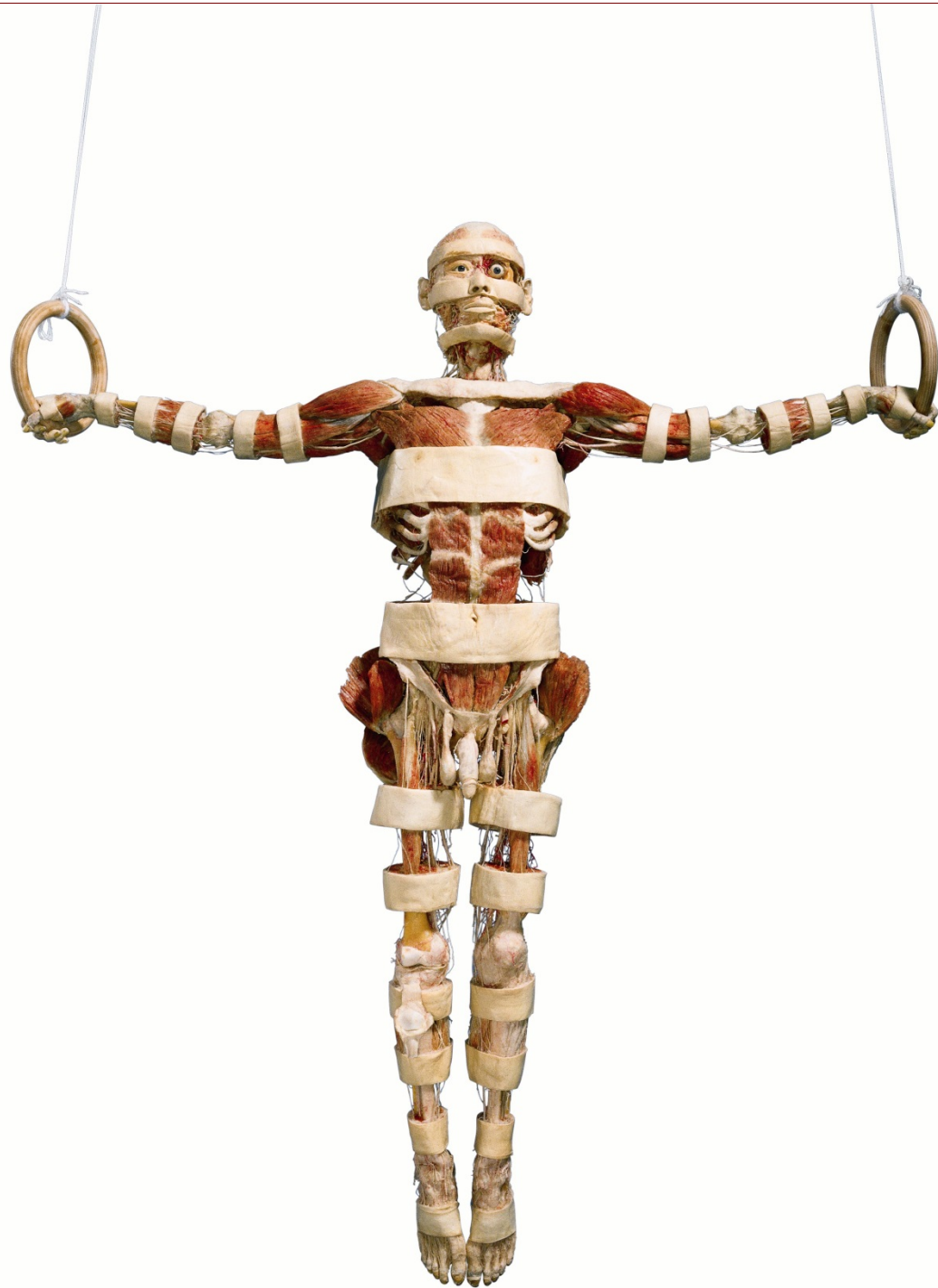
Types of Exercise

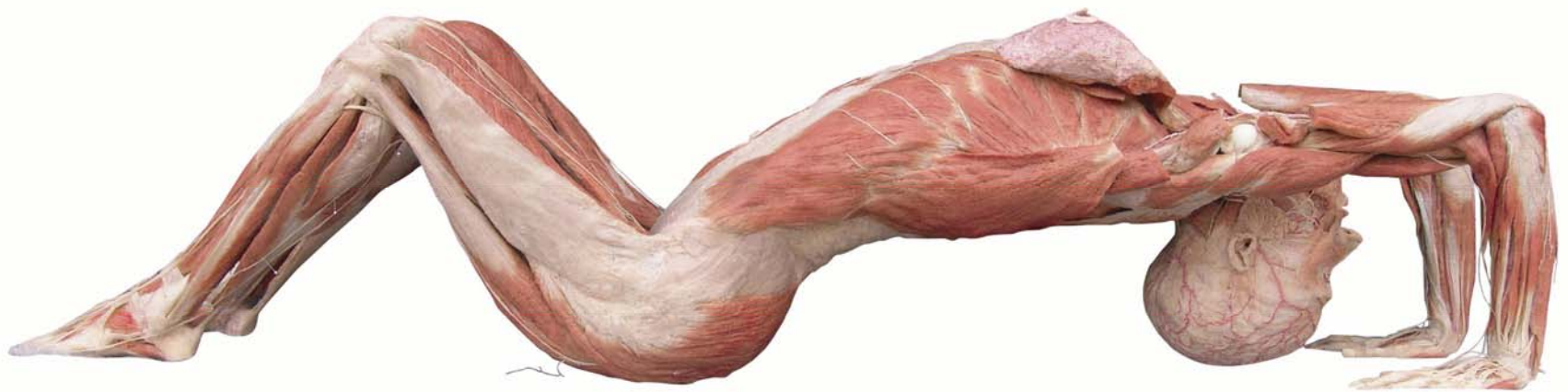
- Physical activity vs exercise
 - Structured exercise
 - Lifestyle exercise
- Inactivity (sedentary behavior)
- Cardio-vascular (aerobic)
- Resistance training (strengthening)
- Flexibility (stretching)

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

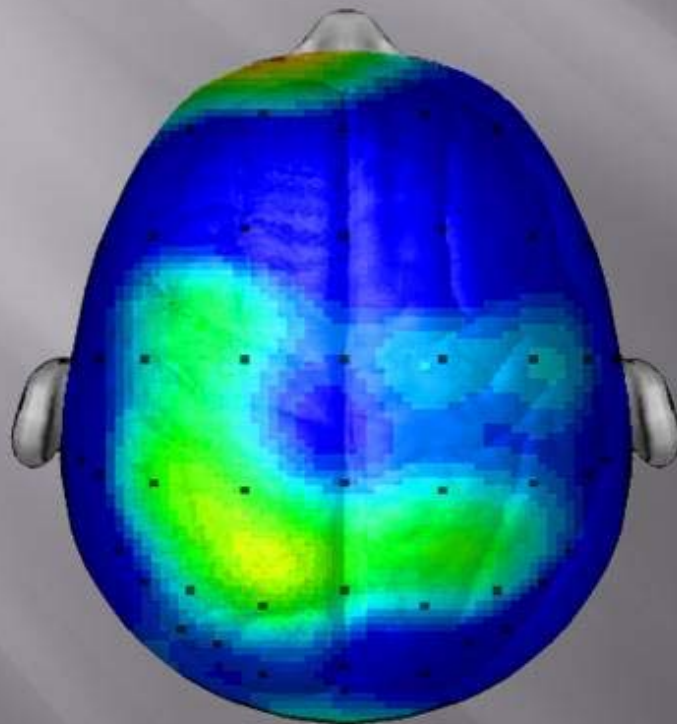
- Coronary heart disease¹
- Corrects other risk factors for heart disease:¹
 - Obesity
 - Smoking
 - High blood lipids
- Stroke²
- Hypertension¹
- Diabetes¹
- Sexual functioning³
- Improved functional capacity¹
- Increased bone density¹
- Increased lean body mass¹
- Decreased risk for falls in older people²
- Decreased anxiety and mild-moderate depression¹
- Decreased total morbidity and mortality¹

Exercise Break!

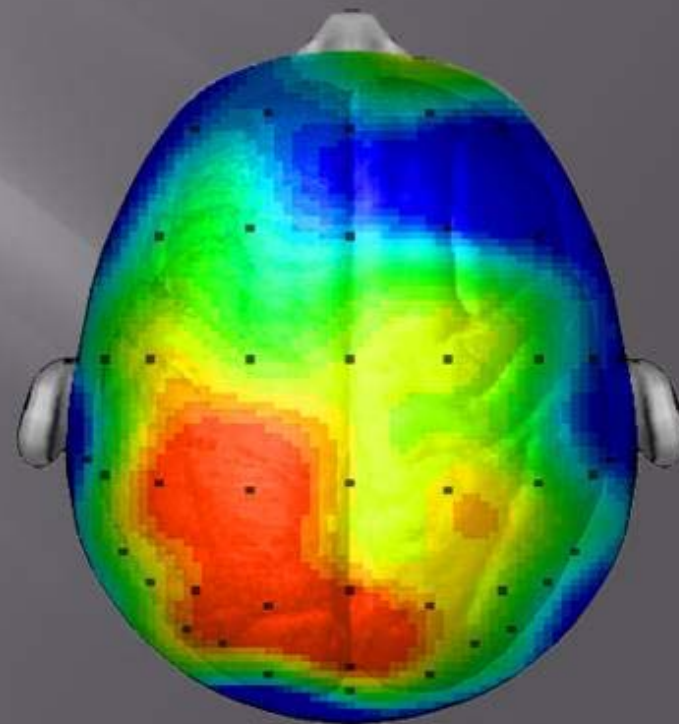
- Strength
- Flexibility
- Stretching
- Balance

Average composite of 20 students brains taking the same test

BRAIN AFTER SITTING
QUIETLY



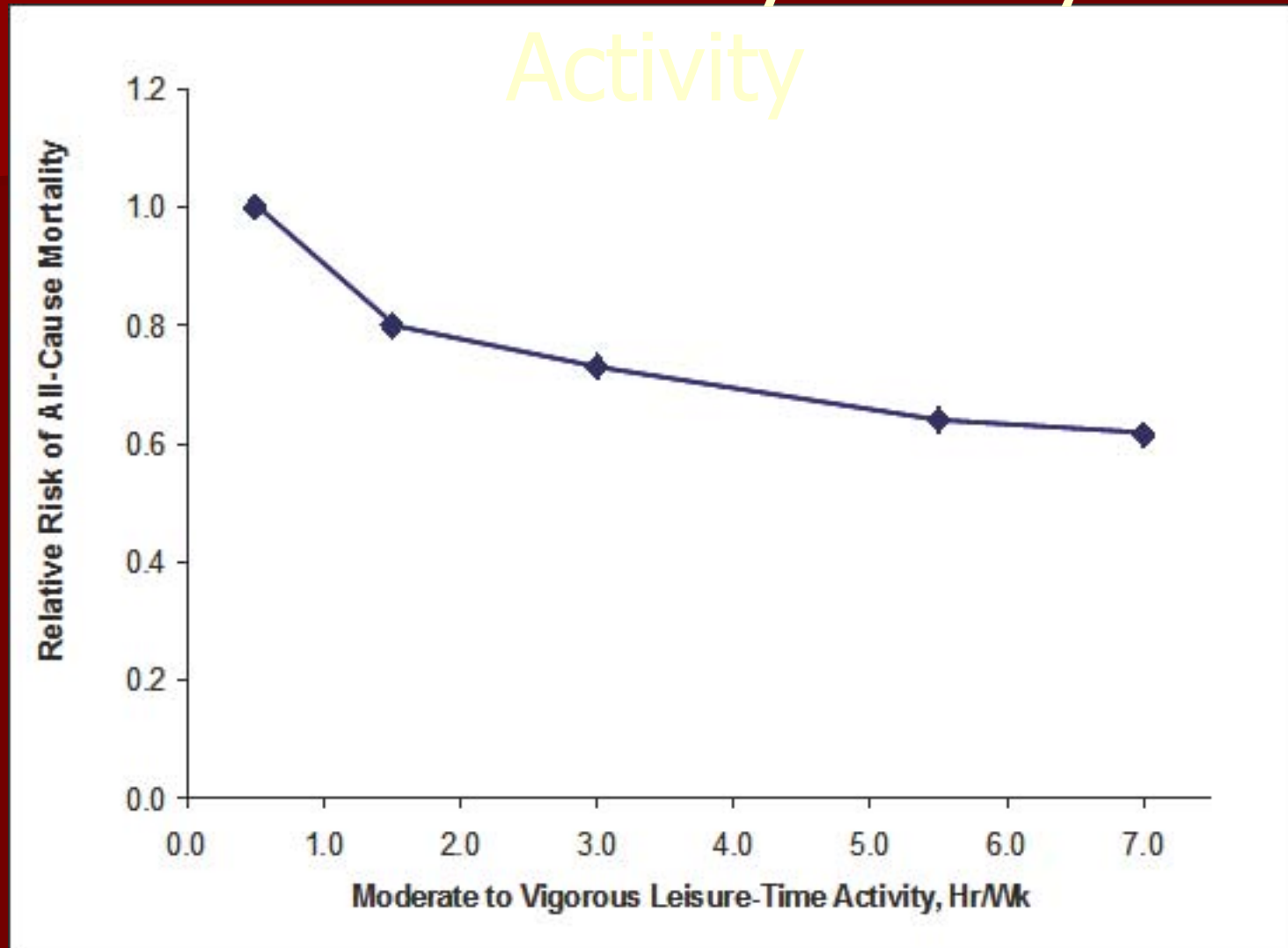
BRAIN AFTER 20 MINUTE
WALK



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

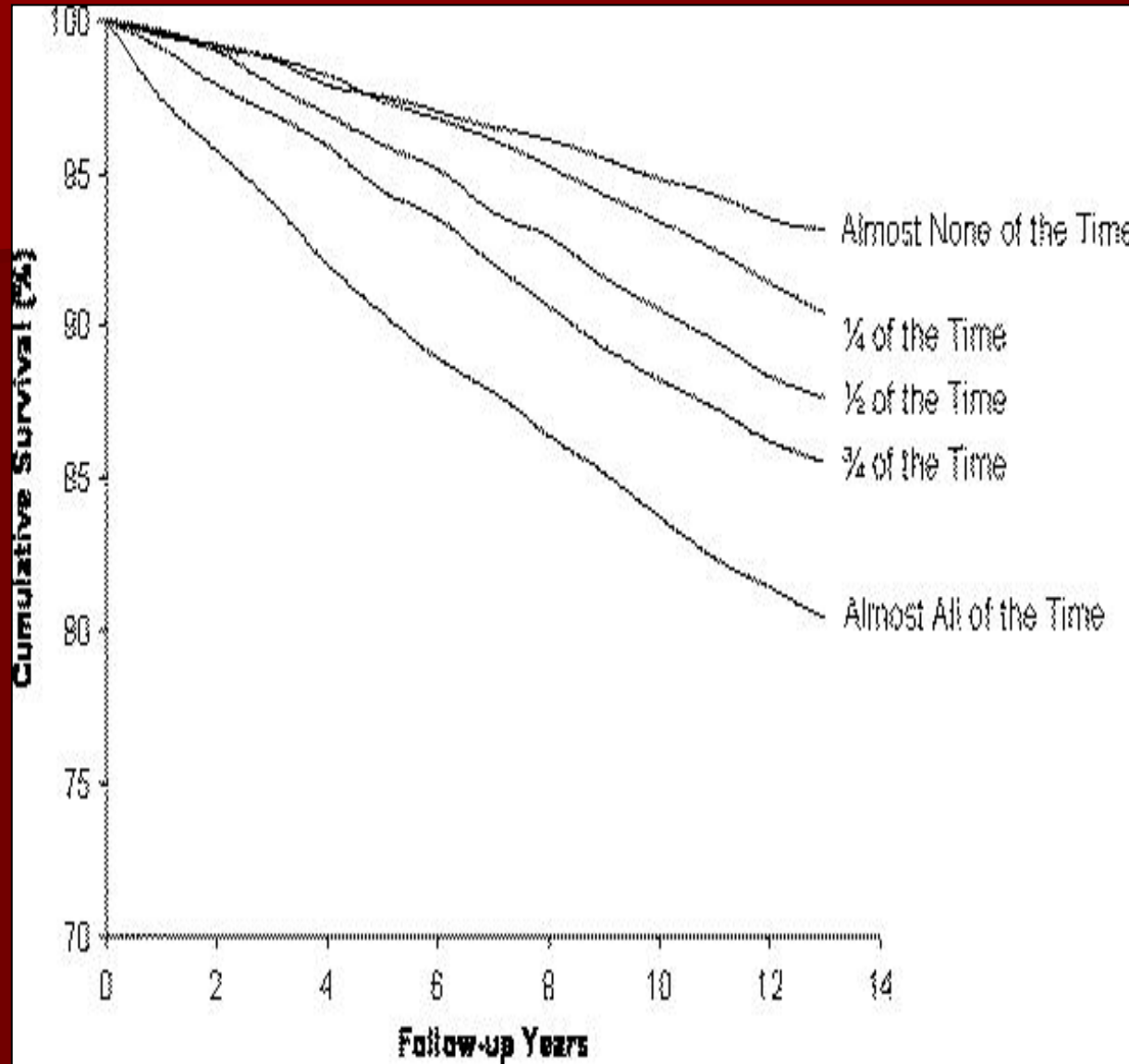
Physical Activity Statistics

- 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

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 Cancer¹



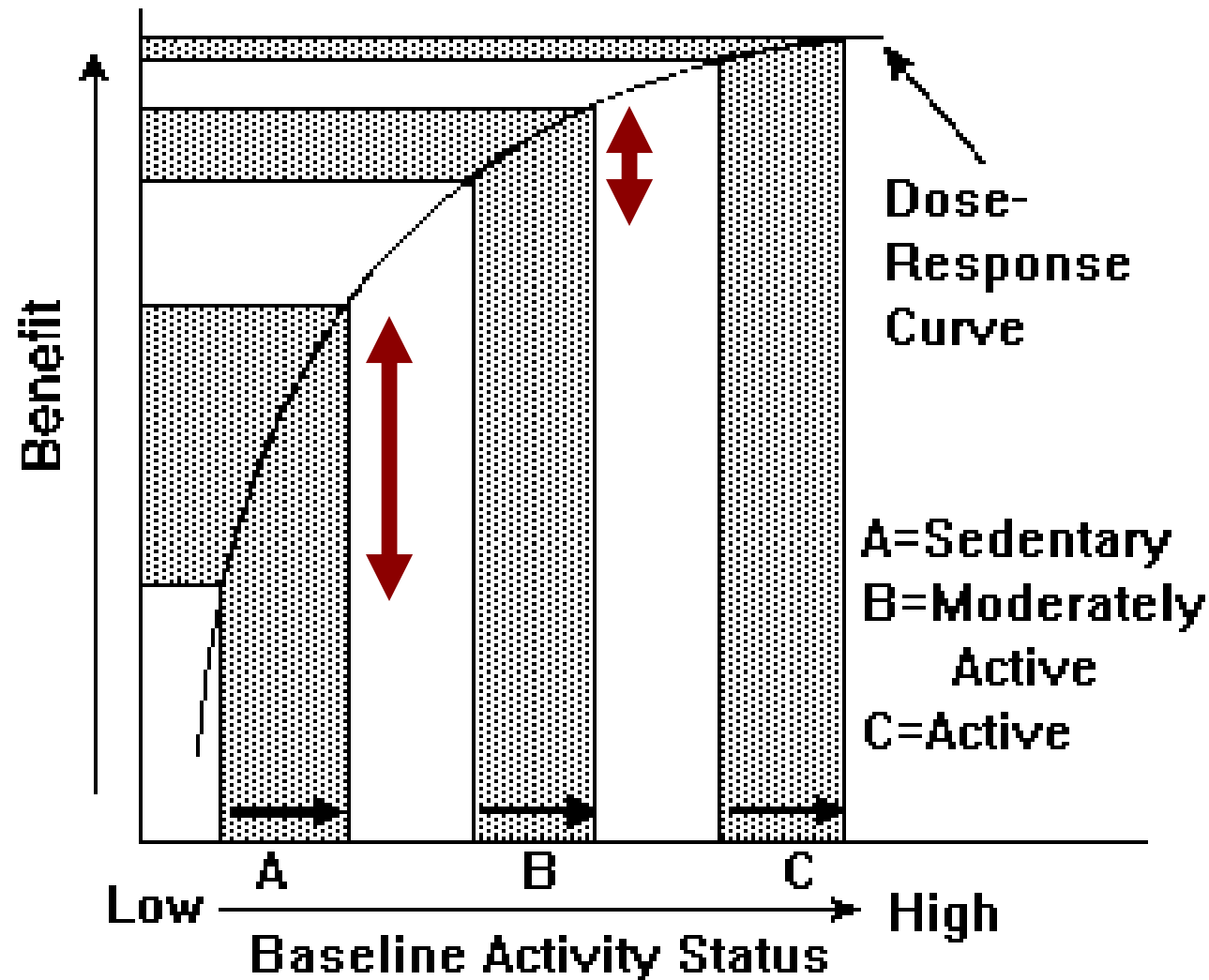
Sitting Time and Mortality from All Causes, Cardiovascular Disease, and Cancer.

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. Sydeeman, 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

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

**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**
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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
minutes

Kaiser Permanente Exercise Vitals Screen Shots

Exercise Vitals - Exercise Vitals (SHIFT+F6 to enter comments)

Instant Taken:

Date: 4/24/2009

Time: 0933

Exercise Level of Effort

Days per week of moderate to strenuous exercise (like a brisk walk)

0	1	2	3	4	5	6	7	Comments
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On average, minutes per day of exercise at this level

10	20	30	40	50	60	90	120	150 or greater	Comments
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Charting

Chief Complaint

Nursing Notes

Vitals

Exercise Vitals

Interpreter Needed







Med. Document

BestPractice

History

Kaiser Permanente Exercise Vitals Screen Shot

4/24/2009 visit with ROBERT FRANK SARLIN MD

 Images  Questionnaires  Admin  Benefits Inquiry  References  SmartSets

Allergies: **Not On File**


Last Vitals: BP: 120/74 P: 60 T: T Src: Resp: 24 W: 175 lbs (79.379 kg)
BMI: 26.61 kg/m², BSA: 1.95 m², **Exercise Vitals: 150 mins/wk**

Charting

- Chief Complaint
- Nursing Notes
- Vitals
- Exercise Vitals
- Interpreter Needed
- Med. Document
- BestPractice**
- History
- Progress Note

Exercise Vitals

[New Reading](#) | [Go to Doc Flowsheet](#)

Exercise Vitals	
04/24/2009	
0933	

Exercise Level of Effort:

Days per week of moderate to strenuous exercise (like a brisk walk)	5
On average, minutes per day of exercise at this level	30

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

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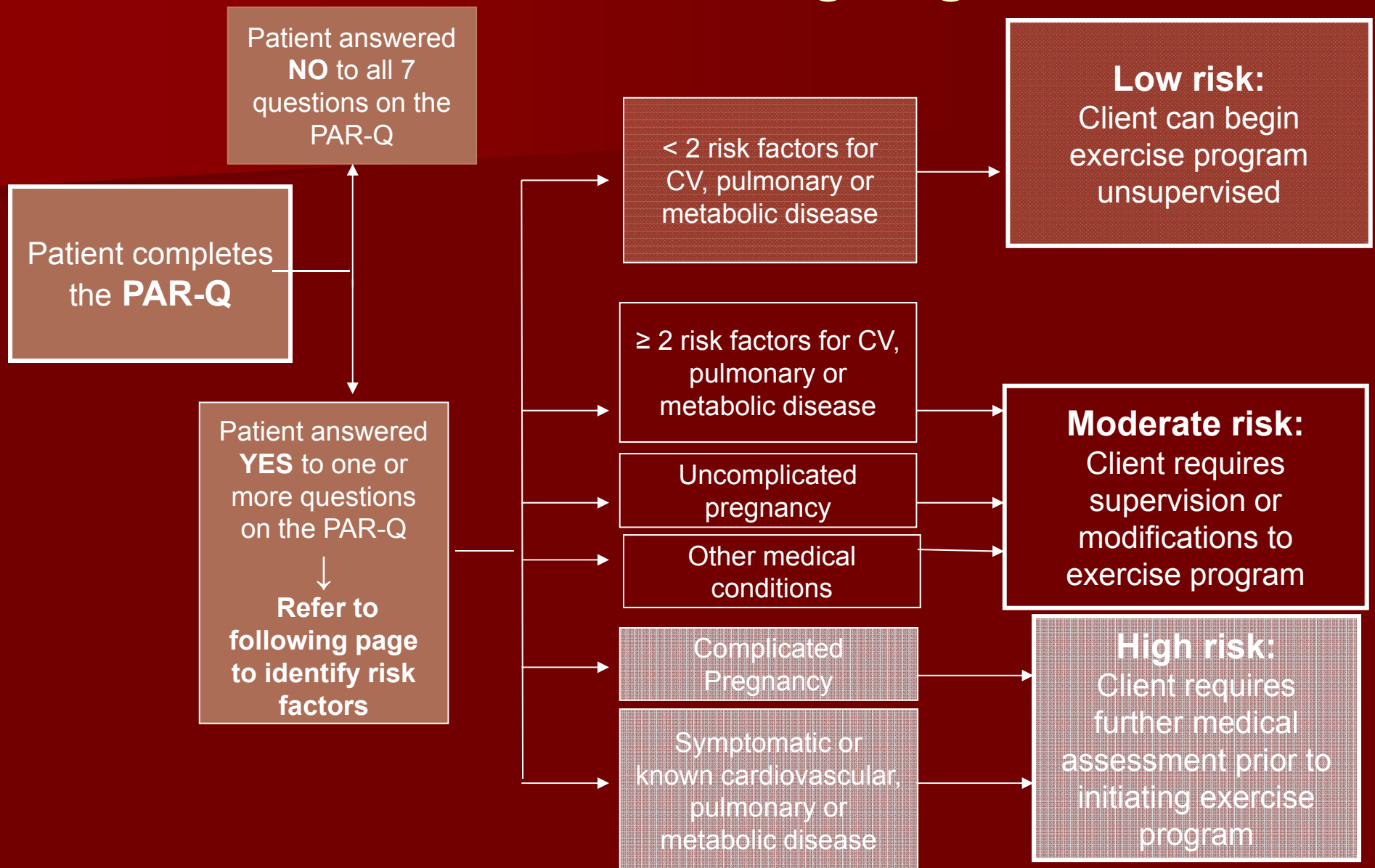
Screening for Exercise

- 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

Activity: PAR-Q

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

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?

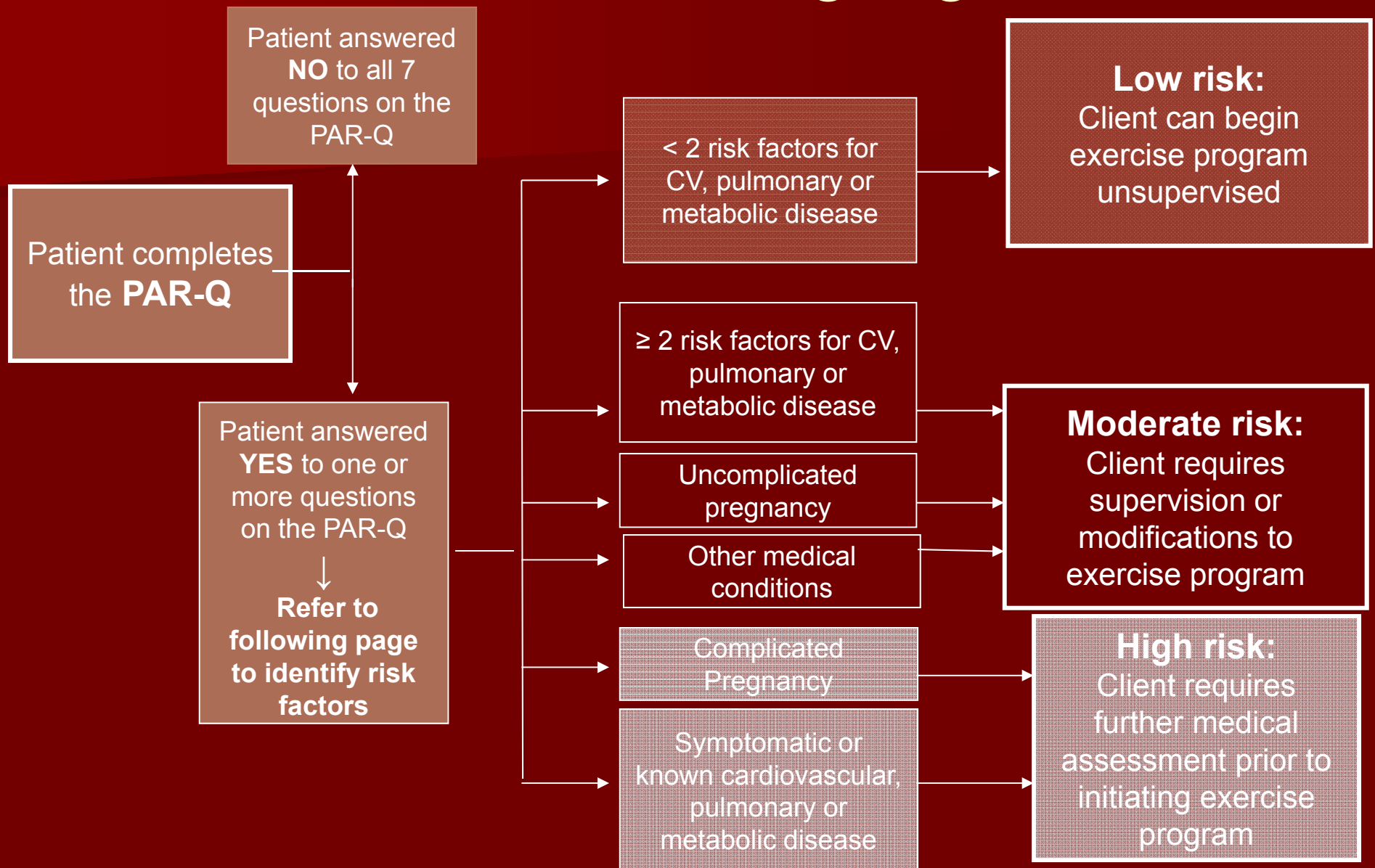
PAR-Q

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?

PAR-Q

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

Exercise Screening Algorithm



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

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:

<2 risk factors = LOW RISK; ≥2 = MODERATE RISK

- 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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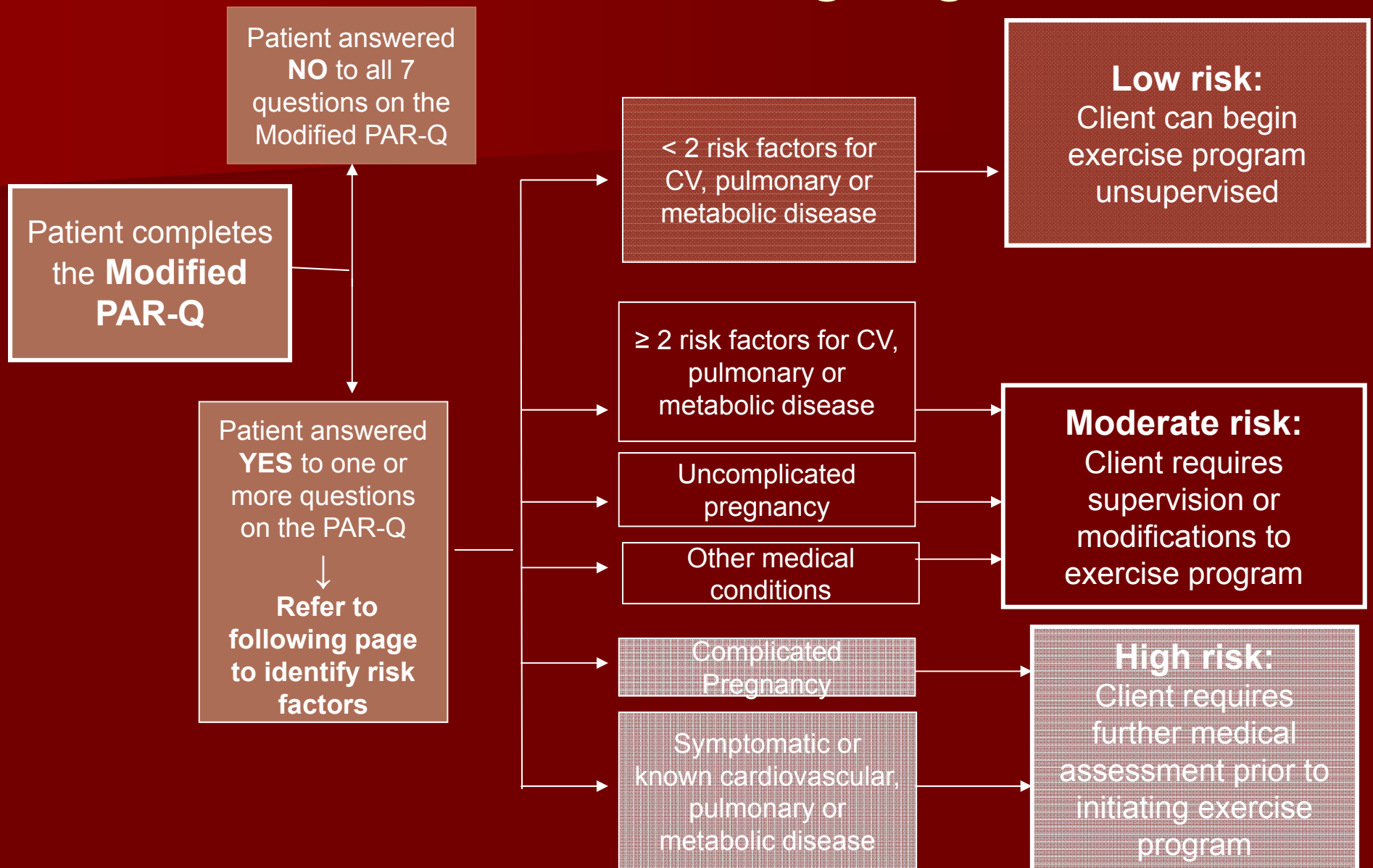
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- Negative Risk Factor (protective): high-serum HDL cholesterol ≥60 mg/dL (1.6 mmol/L)

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

Exercise Screening Algorithm



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

Exercise Prescription

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

Intensity: $\dot{V}O_2$ 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



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 slowly around home, store or office = 2.0*	Walking Walking 3.0 mph = 3.3* Walking at very brisk pace (4 mph) = 5.0*	Walking, jogging & running Walking at very very brisk pace (4.5 mph) = 6.3* Walking/hiking at moderate pace and grade with no or light pack (<10 pounds) = 7.0 Hiking at steep grades and pack 10-42 pounds = 7.5 – 9.0 Jogging at 5 mph = 8.0* Jogging at 6 mph = 10.0* Running at 7 mph = 11.5*
Household & occupation Sitting - using computer work at desk using light hand tools = 1.5 Standing performing light work such as making bed, washing dishes, ironing, preparing food or store clerk = 2.0-2.5	Household & occupation Cleaning – heavy: washing windows, car, clean garage = 3.0 Sweeping floors or carpet, vacuuming, mopping = 3.0-3.5 Carpentry – general = 3.6 Carrying & stacking wood = 5.5 Mowing lawn – walk power mower = 5.5	Household & occupation Shoveling sand, coal, etc. = 7.0 Carrying heavy loads such as bricks = 7.5 Heavy farming such as bailing hay = 8.0 Shoveling, digging ditches = 8.5
Leisure time & sports Arts & crafts, playing cards = 1.5 Billiards = 2.5 Boating - power = 2.5 Croquet = 2.5 Darts = 2.5 Fishing – sitting = 2.5 Playing most musical instruments = 2.0-2.5	Leisure time & sports Badminton - recreational = 4.5 Basketball - shooting around = 4.5 Bicycling – on flat: light effort (10-12 mph) = 6.0 Dancing – ballroom slow = 3.0; ballroom fast = 4.5 Fishing from river bank & walking = 4.0 Golf - walking pulling clubs = 4.3 Sailing boat, wind surfing = 3.0	Leisure time & sports Basketball game = 8.0 Bicycling – on flat: moderate effort (12-14 mph) = 8.0; fast (14 – 16 mph) = 10 Skiing cross country – slow (2.5 mph) = 7.0; fast (5.0-7.9 mph) = 9.0 Soccer – casual = 7.0; competitive = 10.0 Swimming – moderate/hard = 8-11† Tennis singles = 8.0 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: $[206.9 - (0.67 \times \text{age})] \times \%HR_{\text{max}}$

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

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	Very, very light
7	Very light
8	Light
9	Very light
10	Steady
11	Easy
12	Light
13	Moderately hard
14	Hard
15	Very hard
16	Very hard
17	Very hard
18	Very hard
19	Very, very hard
20	Exhaustion

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

“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

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 = $3.5 \text{ mL} \times \text{kg}^{-1} \times \text{min}^{-1}$);
 $\dot{V}O_2R$, = oxygen uptake reserve; HRR = heart rate reserve.

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		
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	29	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

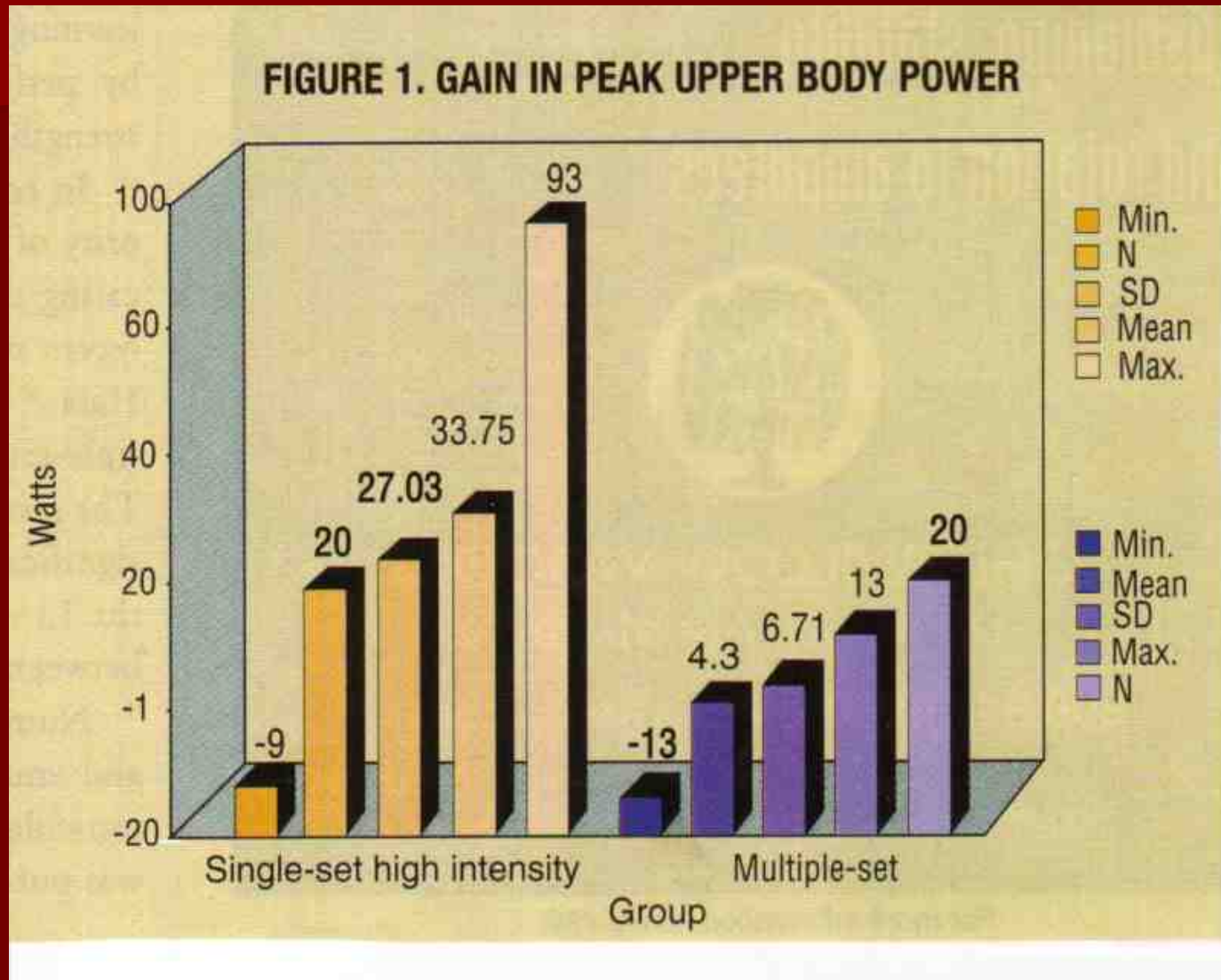
Introducing Resistance Training

- 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

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

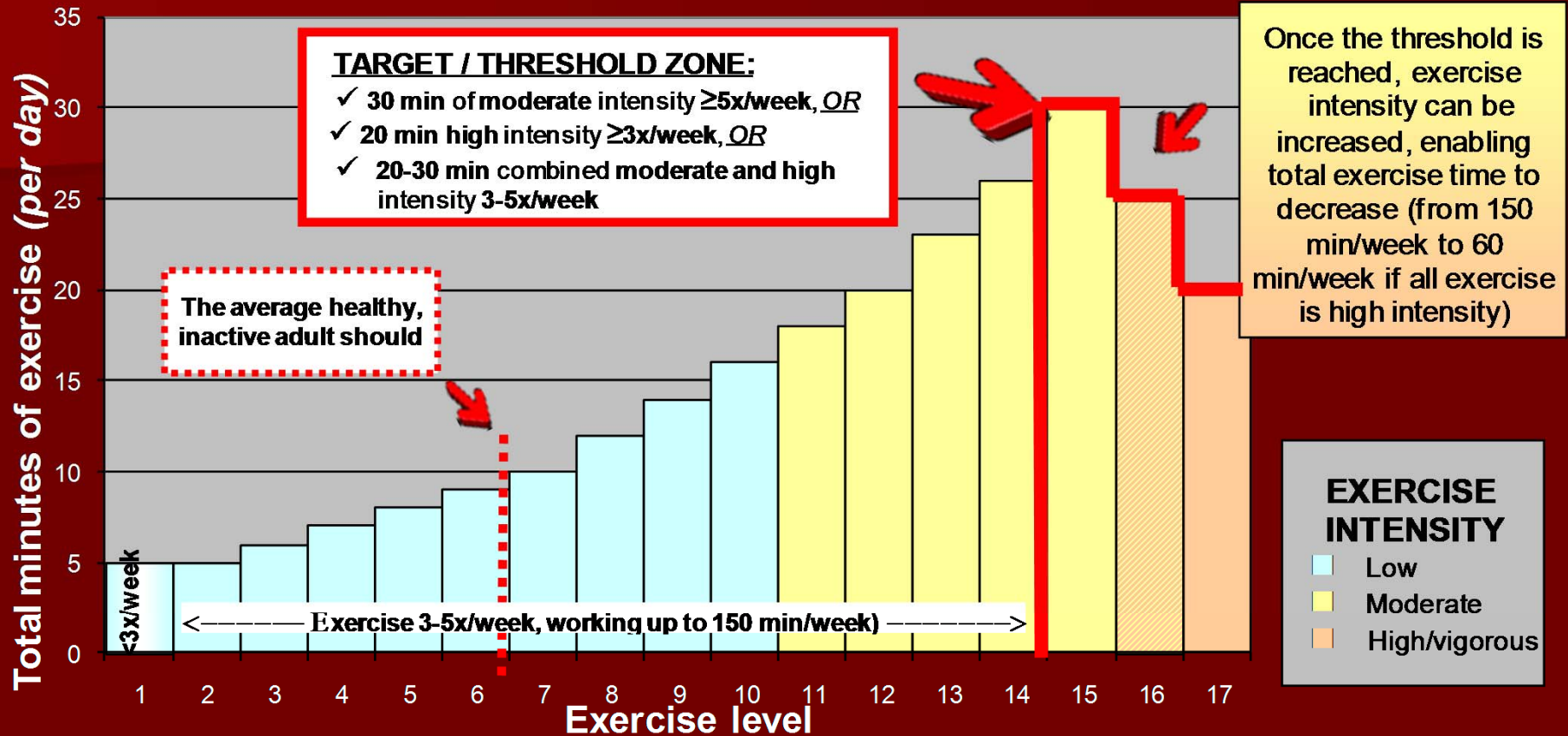
PROGRESSION:

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

PRECAUTIONS:

OTHER NOTES:

Exercise Progression



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.

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 / /	



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 last repetition.

Flexibility/Range of Motion exercises.

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

DEA: _____

Dr: Edward Phillips

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

VALID FOR CONTROLLED SUBSTANCES

Sample Exercise Prescription



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

00007836

PATIENT'S FULL NAME <i>John Smith</i>	PHONE NUMBER	AGE <i>45</i>	SEX <i>M</i>
ADDRESS		DATE <i>04 / 15 / 09</i>	



Walk Briskly 30 Minutes per Day
Lift Weights Twice per Week

Refills 1 2 3 4 Forever
 No Refills Void After _____
DEA: _____

Edward Phillips

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

VALID FOR CONTROLLED SUBSTANCES

LMR OMA44 MEDICATIONS - Microsoft Internet Explorer provided by Partners HealthCare System

File Edit View Favorites Tools Help

Address http://lmrintra.partners.org/scripts/phsweb.mwl?APP=LMR&SESSION=51140226

Siegel, Lydia C., M.D. 01/17/1972 (34 yrs.) F LCS13 >40/40 455 BIMA

Select Desktop Pt Chart Medications Oncology Custom Reports Admin Sign Results ? Resource Popup

Rx Print/Fax no Rx

Exercise x 365 day(s)
Form: Moderate- to High-Intensity Size: N/A

Form: Moderate- to High- Refills: 11 Patient Educated
 Duration: 365 day(s) PRN: Expire
 Quantity: Daily Start Date: 05/18/2006 Orig. Date: 05/18/2006
 Size: N/A End Date: 05/18/2007

Special Instructions:

1) Week 1: 5 minutes walking daily
 2) Week 2: 5 minutes walking twice daily

Comments (This will not print on prescription):

3) Week 3: 5 minutes walking three times every day.
 4) Week 4: 10 minutes walking in the morning, 5 minutes two other times daily

Add to My Practice Favorites as:

Rx Print/Fax no Rx

History Link to Problems Ok OK & Sign Cancel

110 - 471(10,201,30,0,0,230) Local intranet

Start Microsoft PowerPoint - [I...] LMR OMA44 MEDICATI... 2:51 PM

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:



<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

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 ([2008 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?

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

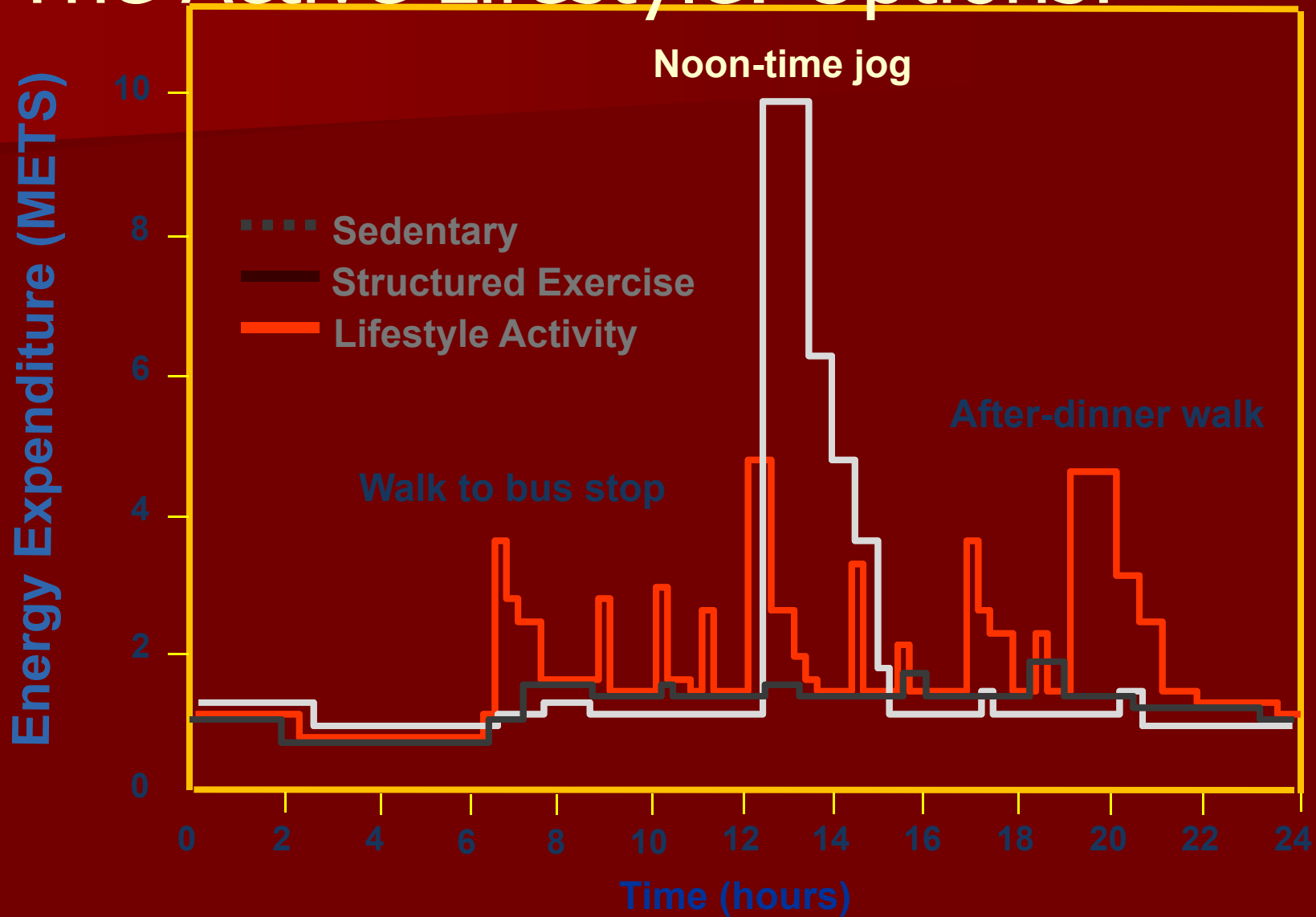
“I have been regularly physically active for more than 6 months”

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-intensity lifestyle activity and short-bout exercise to increase 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!



“Your Prescription for Health” Series

Your Prescription for Health Series

EXERCISING WITH ANXIETY AND DEPRESSION



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.

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.

*These professionals are cleared to provide supervised physical activity and would like you to be monitored in a hospital setting or a medical fitness facility. You will not exercise only under the supervision of a qualified professional. The American College of Sports Medicine has no general of certified fitness professionals. 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 an ACSM-certified fitness professional by visiting the Professional membership page.

Contact Info: etm@acsm.org

Getting Started

- Talk with your healthcare provider 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 exercise 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-to-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.

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Your Prescription for Health Series

EXERCISING FOLLOWING A STROKE



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.

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 exercise or recumbent cycling.
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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