Risky Business – A Geriatric Education Day Ottawa, May 5th, 2014.

Physical Activity and Health in Older Adults: How Much and How Often?

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Faculty/Presenter Disclosure

- Faculty: Robert Ross
- Relationships with commercial interests:
 - Grants/Research Support: CIHR
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 - Consulting Fees: University of Copenhagen

Canadian Physical Activity Guidelines

FOR ADULTS - 18 - 64 YEARS

Guidelines



To achieve health benefits, adults aged 18-64 years should accumulate at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more.

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It is also beneficial to add muscle and bone strengthening activities using major muscle groups, at least 2 days per week.



More physical activity provides greater health benefits.

Let's Talk Intensity!

Moderate-intensity physical activities will cause adults to sweat a little and to breathe harder. Activities like:

- Brisk walking
- Bike riding

Vigorous-intensity physical activities will cause adults to sweat and be 'out of breath'. Activities like:

- Jogging
- Cross-country skiing

Being active for at least **150 minutes** per week can help reduce the risk of:

Premature death

- Heart disease
- Stroke
- High blood pressure
- Certain types of cancer
- Type 2 diabetes
- Osteoporosis
- Overweight and obesity
- And can lead to improved:
 - Fitness
- Strength
- Mental health (morale and self-esteern)

Pick a time. Pick a place. Make a plan and move more!

- ☑ Join a weekday community running or walking group.
- Go for a brisk walk around the block after dinner.
- Take a dance class after work.
- Bike or walk to work every day.

- Rake the lawn, and then offer to do the same for a neighbour.
- Train for and participate in a run or walk for charity!
- ☑ Take up a favourite sport again or try a new sport.
- Be active with the family on the weekend!

Now is the time. Walk, run, or wheel, and embrace life.



www.csep.ca/guidelines

150 minutes per week of moderate (brisk walking) in bouts of 10 minutes or more.

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Brisk walking

Bike riding

Vigorous-intensity p to sweat and be 'ou

 Jogging Cross-country

the recommended amount of aerobic activity (whether of moderate or vigorous activity) is in addition to routine activities of daily living, which are of light intensity, such as self-care, casual walking, or grocery shopping or less than 10 min duration such as walking to the parking lot or taking out the trash"

- Strength
- Mental health (morale and self-esteern)

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www.csep.ca/quidelines

Canadian Physical Activity Guidelines

FOR OLDER ADULTS - 65 YEARS & OLDER

Guidelines



To achieve health benefits, and improve functional abilities, adults aged 65 years and older should accumulate at least 150 minutes of moderate- to vigorousintensity aerobic physical activity per week, in bouts of 10 minutes or more.

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It is also beneficial to add muscle and bone strengthening activities using major muscle groups, at least 2 days per week.

Those with poor mobility should perform physical activities to enhance balance and prevent falls.

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Moderate-intensity physical activities will cause older adults to sweat a little and to breathe harder: Activities like:

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- Bicycling

Vigorous-intensity physical activities will cause older adults to sweat and be 'out of breath'. Activities like:

- Cross-country skiing
- Swimming

Being active for at least **150 minutes** per week can help reduce the risk of:

- Chronic disease (such as high blood pressure and heart disease) and,
- Premature death
- And also help to:
- Maintain functional independence
- Maintain mobility
- Improve fitness
- Improve or maintain body weight
- Maintain bone health and,
- Maintain mental health and feel better

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- ☑ Take up a favourite sport again.
- Be active with the family! Plan to have "active reunions".
- Go for a nature hike on the weekend.
- Take the dog for a walk after dinner.

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150 minutes per week of moderate-to-vigorous physical activity

2 days per week of muscle and bone strengthening activity

Canadian Society for Exercise Physiology ; www.csep.ca

Physical Activity of Canadian Adults: Accelerometer Results from the 2007-2009 Canadian Health Measures Survey

Colley et al Health Reports 22 (1) March 2011

Table 6Percentage attaining selected physical activity criteria, household populationaged 20 to 79 years, Canada, March 2007 to February 2009

Days active out of 7	Moderate-to-vigorous physical activity accumulated in bouts of at least 10 minutes						
	At least 15 minutes a day				At least 30 minutes a day		
		95% confidence interval		_		95% confidence interval	
	%	from	to		%	from	to
Less than 1	36.7	31.5	41.8	4	16.6	42.7	50.5
At least 1	63.3	58.2	68.5	5	53.4	49.5	57.3
At least 2	41.2	35.3	47.1	2	29.6	25.3	33.9
At least 3	26.5	21.5	31.5	1	16.8	13.3	20.3
At least 4	16.2	12.5	19.8	_	94	6.9	11.9
At least 5	8.8	6.3	11.3		4.8	3.2	6.3

Source: 2007 to 2009 Canadian Health Measures Survey.

Activity, Fitness, and Mortality in Older Adults

Increase physical activity = Increase in cardiorespiratory fitness



~5 times - 30 min/day 150 minutes /week

Effects of Exercise Modality on Cardiorespiratory Fitness in Older Men and Women



Metabolic Syndrome, Fitness, and Mortality

Katzmarzyk et al. Arch Intern Med 2004;164: 1092-7.

CVD Mortality Among 19,223 Men from the Aerobics Center Longitudinal Study: 10 Years of Follow-up



"Fit" – top 80 percent ~ 30 minutes per day of physical

Cardiorespiratory Fitness and All-Cause Mortality, Women and Men ≥60 Years of Age

- 4060 women and men ≥60 years
- 989 died during ~14 years of follow-up
- ~25% were women
- Death rates adjusted for age, sex, and exam year

All-Cause death rates/1,000 PY



Multivariate + % Body Fat adjusted HR of All-Cause Mortality by Fitness Groups, ACLS, 2603 Adults 60+

Adjusted HR



*Adjusted for age, exam year, smoking, abnormal exercise ECG, baseline health conditions, and percent body fat

Sui M et al. JAMA 2007; 298:2507-16

What are the acute (one exercise session) Effects of Exercise?

Effect of Acute Exercise on Insulin Sensitivity in Men and Women

Perseghin et al. N Eng J Med. 335: 1996.



Critical Review

Signaling Mechanisms in Skeletal Muscle: Acute Responses and Chronic Adaptations to Exercise

Katja S.C. Röckl, Carol A. Witczak and Laurie J. Goodyear

Research Division, Joslin Diabetes Center and Department of Medicine, Brigham and Women's Hospital and Harvard Medical School, Boston, MA, USA



In tacked, weight independent mechanism

IUBMB Life 2008.

Is Health Benefit Associated with the numbers of Daily Steps?

Is there a Dose Response Between the Number of Steps Taken and Health Outcome?

Healthy older adults average 2,000-9,000 steps/day

Public health physical activity guidelines suggest that older adults should strive to achieve 3,000 steps/day of moderatevigorous activity

- This activity should be performed over and above activities that are part of daily living
- This activity should be performed in 10 minute bouts
- This activity should add up to at least 150 minutes of activity per week
- This suggests that in order to achieve improved health outcomes, older adults should strive for, on average, 7,100 steps/day

Older Adults Who Achieve 7,000-10,000 steps/day have Reduced Health Risk

Increased exercise in older adults can lead to:

Reduced fatigue
Improved quality of life
Reduced risk of metabolic syndrome
Improved immune system

•Reduced body fat

•Improved bone density

Reduced blood

pressure

Reduced

cardiometabolic risk



Importance of Self-Monitoring – Role for Pedometers

Accumulate 30-60 minutes per day



3000 to 10000 extra steps / day



Effects of Exercise Modality on Insulin Resistance and Functional Capacity in Aging: A Randomized Controlled Trial

Treatment Groups



Abdominally Obese Men and Women (Age ~68yrs) : 6 month exercise intervention, *without caloric restriction*.

Davidson et al. Arch Intern Med 169(2): 122-131, 2009.

Cardiorespiratory and functional fitness

Maximal graded exercise test (VO2max)



Functional fitness tests



Chair stands Arm curls 2-minute step 8-foot up and go









Effects of Exercise Modality on Cardiorespiratory Fitness in Older Men and Women



Effect of Fatness (BMI) and Fitness on Cardiovascular Disease (CVD) Mortality *Wei M et al. JAMA 1999; 282:1547-53*



"Fit" – top 80 percent – 30 minutes per day of physical activity

Effects of Exercise Modality on Body Weight and Waist Circumference in Older Men and Women



Effects of Exercise Modality on Visceral Fat, Total Fat and Skeletal Muscle in Older Men and Women



Exercise Modality on Skeletal Muscle Mass in Older Adults



Davidson et al. Arch Intern Med 169(2): 122-131, 2009.

Effects of Exercise Modality on Insulin Sensitivity in Older Men and Women



Effects of Exercise Modality on Functional Limitation in Older Men and Women



Principal Finding



150 minutes of weekly exercise

Reduction of abdominal and visceral fat Increase in skeletal muscle mass Improvement in insulin resistance Improvement in cardiorespiratory fitness

Balanced diet, exercise, no weight loss

Davidson et al. Arch Intern Med 169(2): 122-131, 2009.

Effects of Exercise Modality on Insulin Sensitivity in Older Men and Women



Effects of Exercise Modality on Functional Limitation in Older Men and Women



Why is it so hard to Exercise?

If physical activity is *the* answer..... what is the problem?



Increasing physical activity behavior in today's environment poses a challenge...

Optimal Default...

......Make Responsible Behaviors the Easy Choice

The challenge is to create better defaults. This will be possible only when we turn from blaming people for irresponsible actions to giving the nation what it deserves -- conditions that make responsible behavior the easy choice.

Kelly Brownell, Yale University, Rudd Center For Food Policy and Obesity

Economists use term "optimal defaults" to describe conditions that promote beneficial or healthy choices.



Challenges: Creating Optimal Defaults

Diet is driven by terrible defaults......

Large portion sizes,

Schools selling unhealthy foods,

Economic policy that makes healthy food cost more than calorie-dense processed foods.

FREE GYM



Optimal Default...Make Responsible Behaviors the Easy Choice

Russell Hotel, London







MUNICH



VIENNA







Montreal's *Bixi* program offers 3,000 bikes for rent at 300 stations

Bixi, a term coined from "bike" and "taxi"



Cyclists subscribe at a cost of \$78 for a year, \$28 for a month or \$5 for a day. The first 30 minutes of each rental are free.

SUMMARY

Physical Activity and Public Health in Older Adults: Recommendation from the American College of Sports Medicine and the American Heart Association

MIRIAM E. NELSON^{1,2}, W. JACK REJESKI³, STEVEN N. BLAIR⁴, PAMELA W. DUNCAN⁵, JAMES O. JUDGE^{6,7}, ABBY C. KING⁸, CAROL A. MACERA⁹, and CARMEN CASTANEDA-SCEPPA^{2,10}

AHA and ACSM advocate that regular physical activity is essential for healthy aging. That older adults engage in both exercise modalities to reduce the risk factors for chronic disease and disability.

MSSE 39:(8) 1435-1445, 2007.

Canada's Physical Activity Guides

Canadian Physical Activity Guidelines

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Is Exercise the same as Physical Activity?







Exercise is a subset of physical activity

Exercise = 'structured' or leisure time activity



Physical activity = 'unstructured' leisure and non-leisure activity