

# Exercise is Medicine: A Call To Action !!

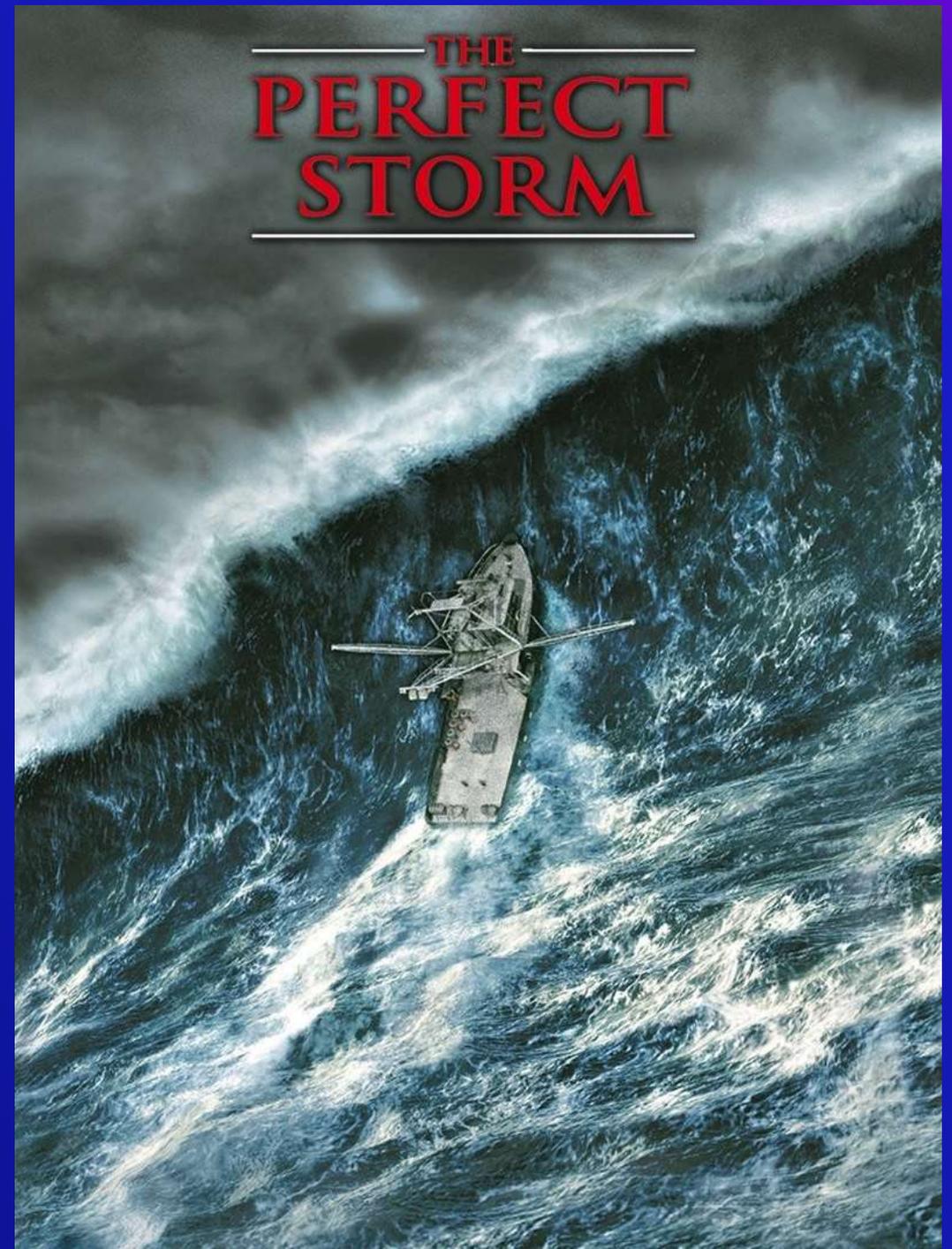
**Dr. Murray Low, EdD., MAACVPR, FACSM, FAACVPR**

**Program Director, Cardiac Rehabilitation**

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**Stamford Hospital**



**We are heading in the  
wrong direction !**





+





**IS**  
**SITTING**

There's no running away from it:  
The more you sit, the poorer your  
health and the earlier you may die.

**no matter how fit you are**

**THE NEW**  
**SMOKING**

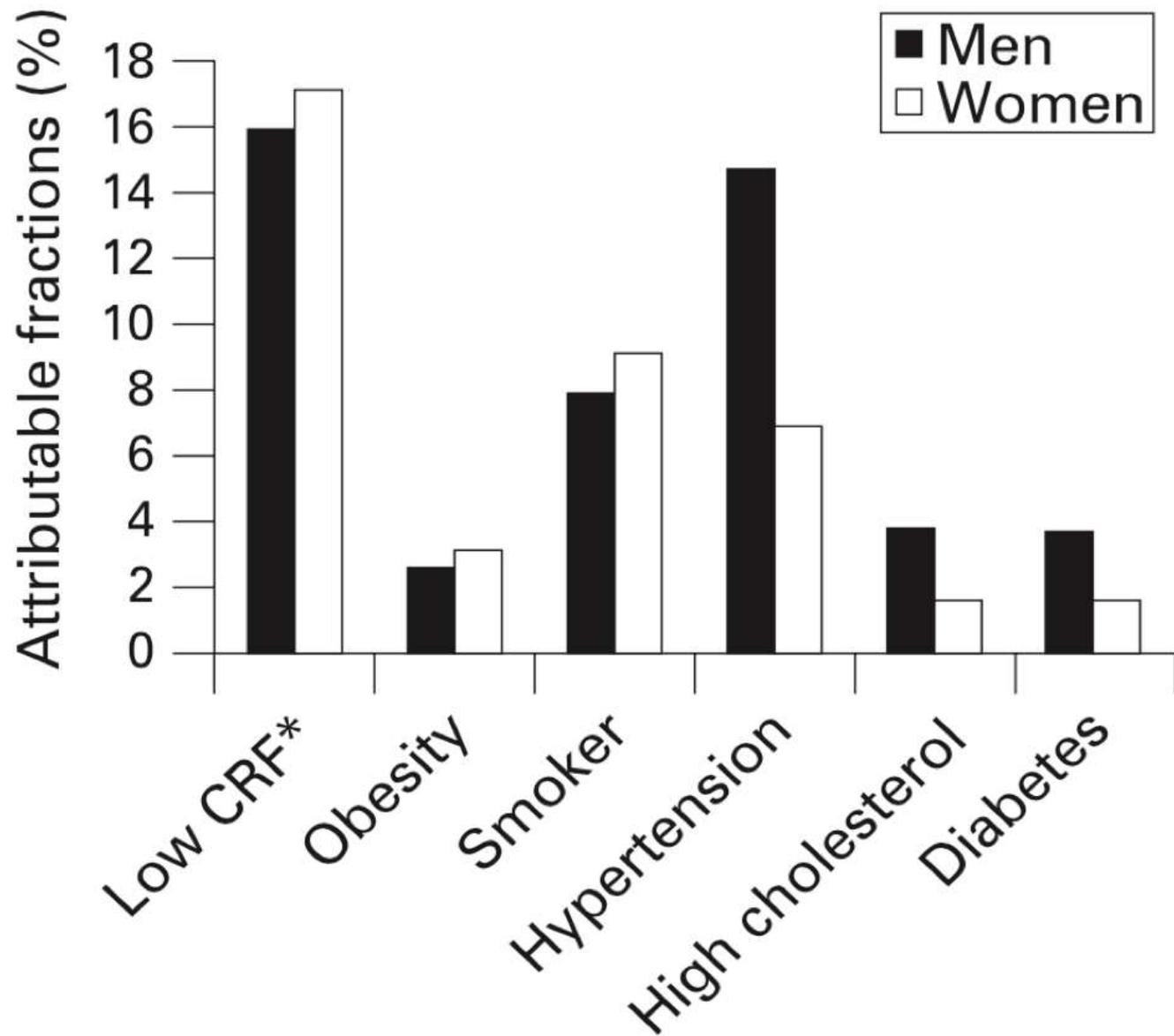
BY SELENE YEAGER ? PHOTOGRAPHS BY Nick Ferreri



# Physical inactivity: the biggest public health problem of the 21st century

[Steven N Blair](#)

*Br J Sports Med* 2009;43:1-2



**Figure 1** Attributable fractions (%) for all-cause deaths in 40 842 (3333 deaths) men and 12 943 (491 deaths) women in the Aerobics Center Longitudinal Study. The attributable fractions are adjusted for age and each other item in the figure. \*Cardiorespiratory fitness determined by a maximal exercise test on a treadmill.

*Br J Sports Med* 2009;43:1-2

**Attributable Fractions(%) for All-Cause Deaths**

**CRF: Cardiorespiratory Fitness**



American Journal of Epidemiology

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Vol. 166, No. 3

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Advance Access publication May 10, 2007

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## Original Contribution

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# Physical Activity and Mortality: Is the Association Explained by Genetic Selection?

Sofia Carlsson<sup>1,2</sup>, Tomas Andersson<sup>1,2</sup>, Paul Lichtenstein<sup>3</sup>, Karl Michaëlsson<sup>4</sup>, and Anders Ahlbom<sup>1,2</sup>

| Sex   | Physical activity level | All-cause mortality |                          | Cardiovascular mortality |                          |
|-------|-------------------------|---------------------|--------------------------|--------------------------|--------------------------|
|       |                         | Hazard ratio        | 95% confidence intervals | Hazard ratio             | 95% confidence intervals |
| Men   | Low                     | 1                   |                          | 1                        |                          |
|       | Moderate                | 0.84                | 0.72, 0.98               | 0.86                     | 0.68, 1.08               |
|       | High                    | 0.64                | 0.50, 0.83               | 0.55                     | 0.36, 0.85               |
| Women | Low                     | 1                   |                          | 1                        |                          |
|       | Moderate                | 0.82                | 0.70, 0.96               | 0.85                     | 0.64, 1.13               |
|       | High                    | 0.75                | 0.50, 1.14               | 0.34                     | 0.1, 0.95                |

Hazard ratios of all-cause mortality and cardiovascular disease mortality associated with physical activity, results from the Swedish Twin Registry, 1975–2004 ..... **Am J Epidemiol 2007;166:255–259**



**Are We  
Sitting  
Too Much ?**



## Sitting Hurts

- 2X** Greater Risk Of Diabetes
- 90%** Greater Risk Of Cardiovascular Disease
- 49%** Greater Risk Of All-Cause Mortality

Sources:  
Katzmarzyk BMJ Open, 2012  
Wilmot, Diabetologia, 2012

**Sedentary behaviour and life expectancy in the USA: a cause-deleted life table analysis**

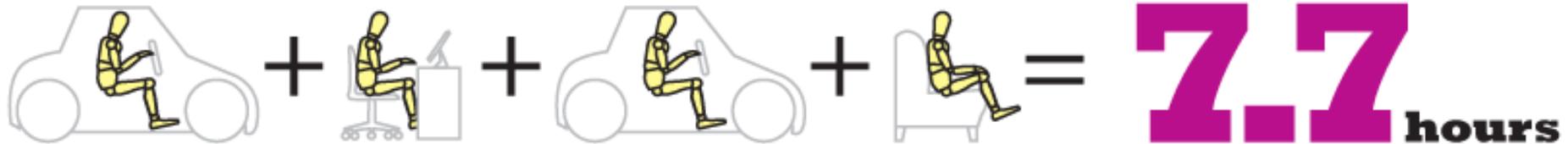
**Katzmarzyk PT, Lee I-M. British Medical Journal, 2012**

# A Systemic Problem for Americans

## “Sitting Disease” by the numbers

Our modern sedentary lifestyles,  
both at home and in the workplace,  
are costly for us and for our employers.

Average hours of seated commute  
+ average hours of seated homelife = too much sitting!



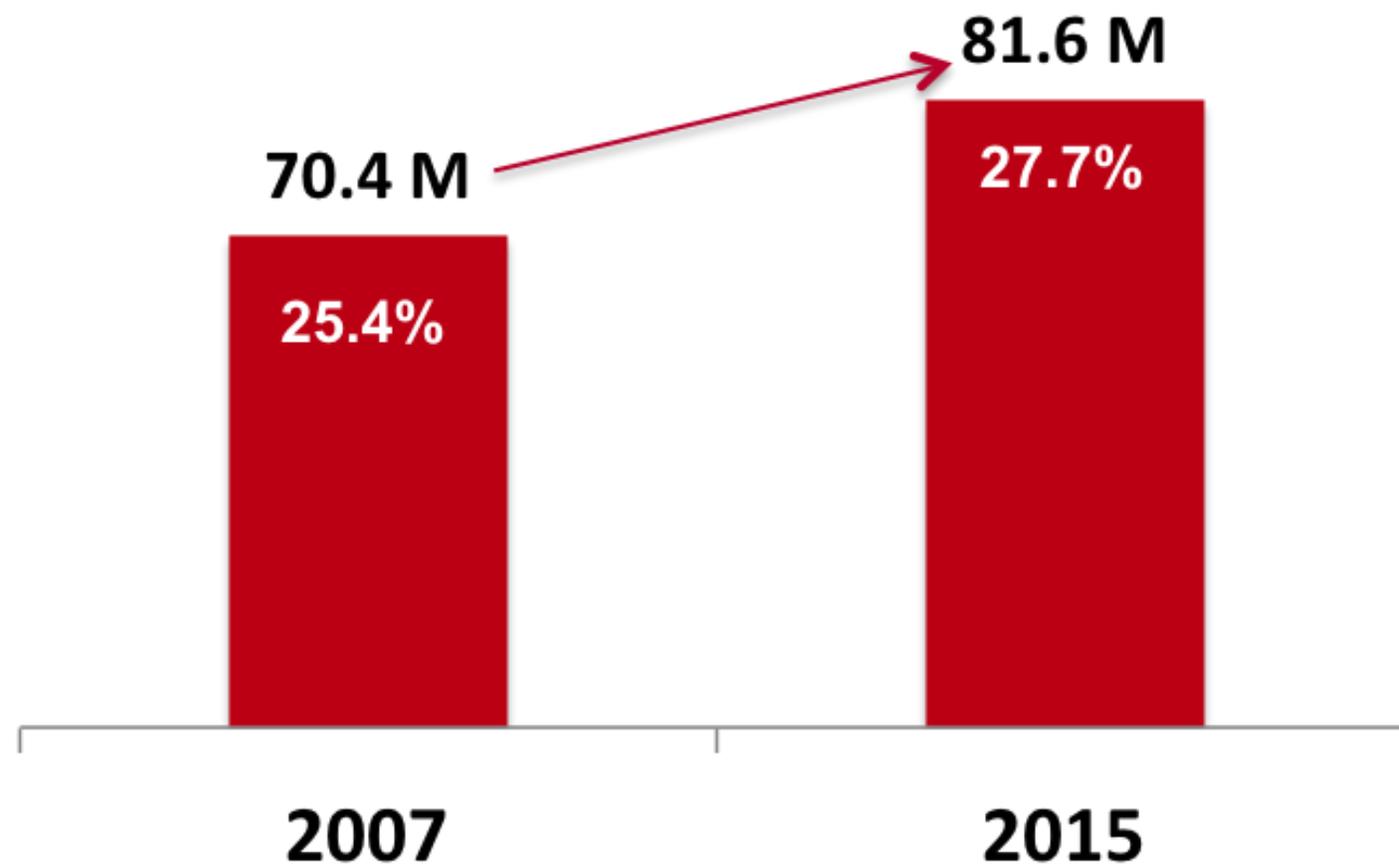
A 2008 Vanderbilt University study of 6,300 people published in the *American Journal of Epidemiology* estimated that the average American spends 55% of waking time (7.7 hours per day) in sedentary behaviors such as sitting.

WE ARE SITTING TOO MUCH



# 81.6 Million Or 27.7% Of Americans Are Totally Inactive

Not Active In Any Of 104 Activities In The Past Year



A photograph of a man sitting on a couch, eating a burger. A dog is sitting next to him. The background is a simple indoor setting.

# Get Off the Couch and Save America \$27 Billion

Around the globe, the U.S. accounts for two-fifths of the \$67 billion in losses tied to physical inactivity.

Photographer: Getty Images

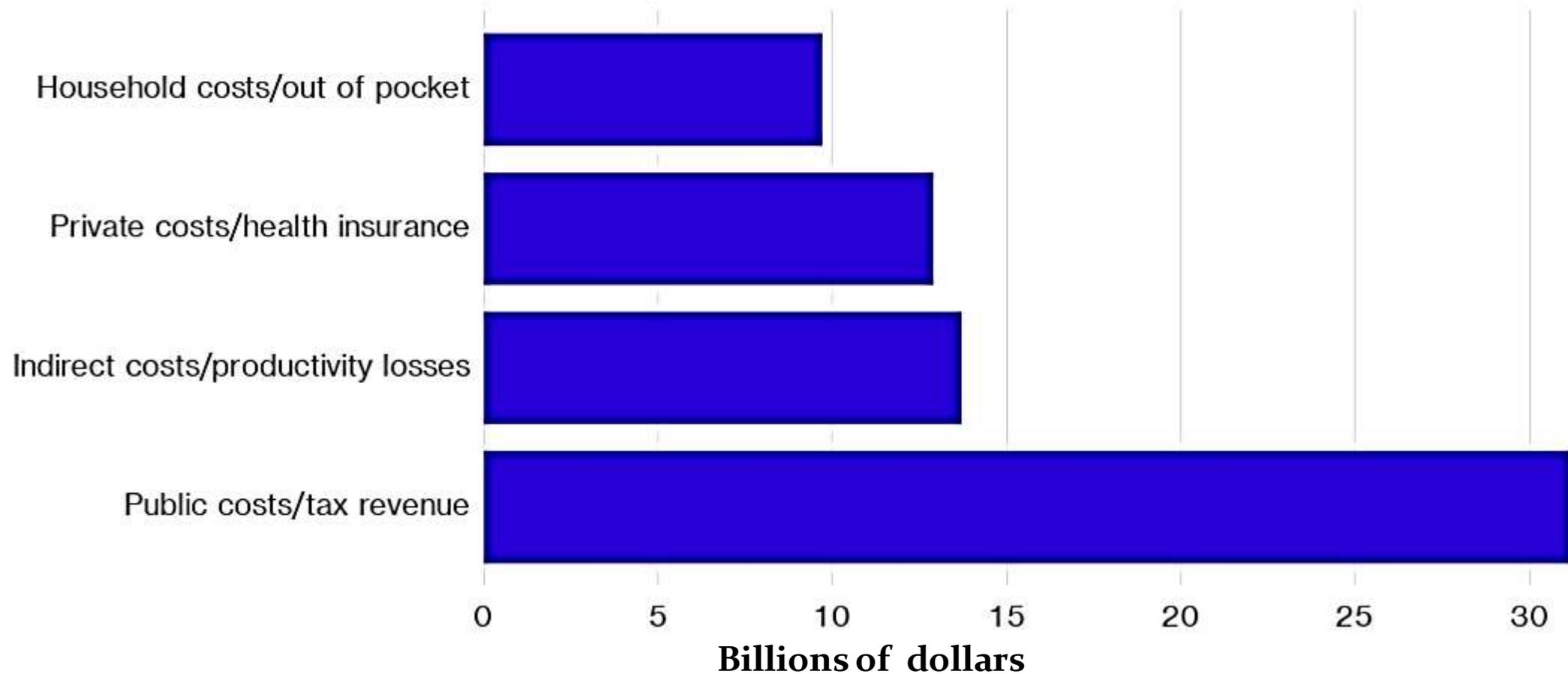
Physical inactivity costs the global economy over **\$67.5** billion per year

[#PhysAct2016 https://t.co/nbx3xsETRw](https://t.co/nbx3xsETRw) [pic.twitter.com/MF6C218SKt](https://pic.twitter.com/MF6C218SKt)

— The Lancet (@TheLancet) [July 28, 2016](https://twitter.com/TheLancet/status/721111111111111111)

# Physical inactivity cost the world \$67.5 billion in 2013

Public costs accounted for almost half of that

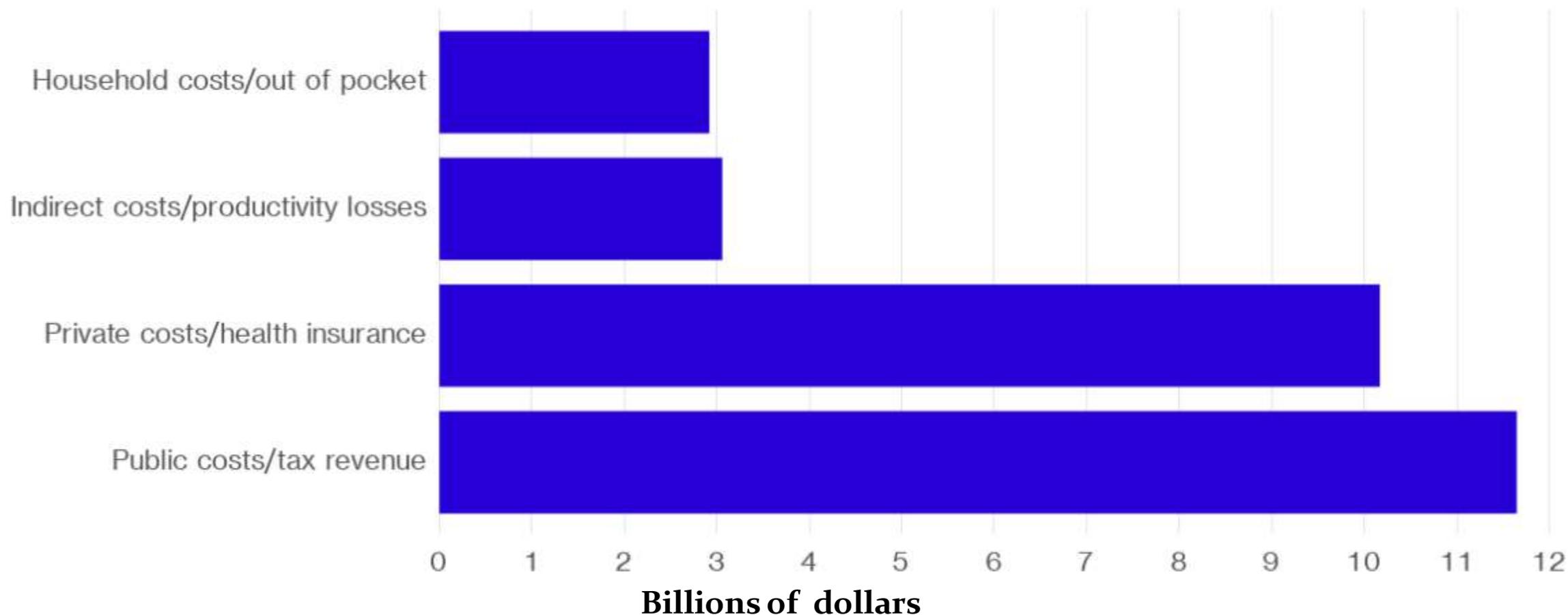


Source: Study in The Lancet

Bloomberg

# Who foots the bill because of physical inactivity in the U.S.?

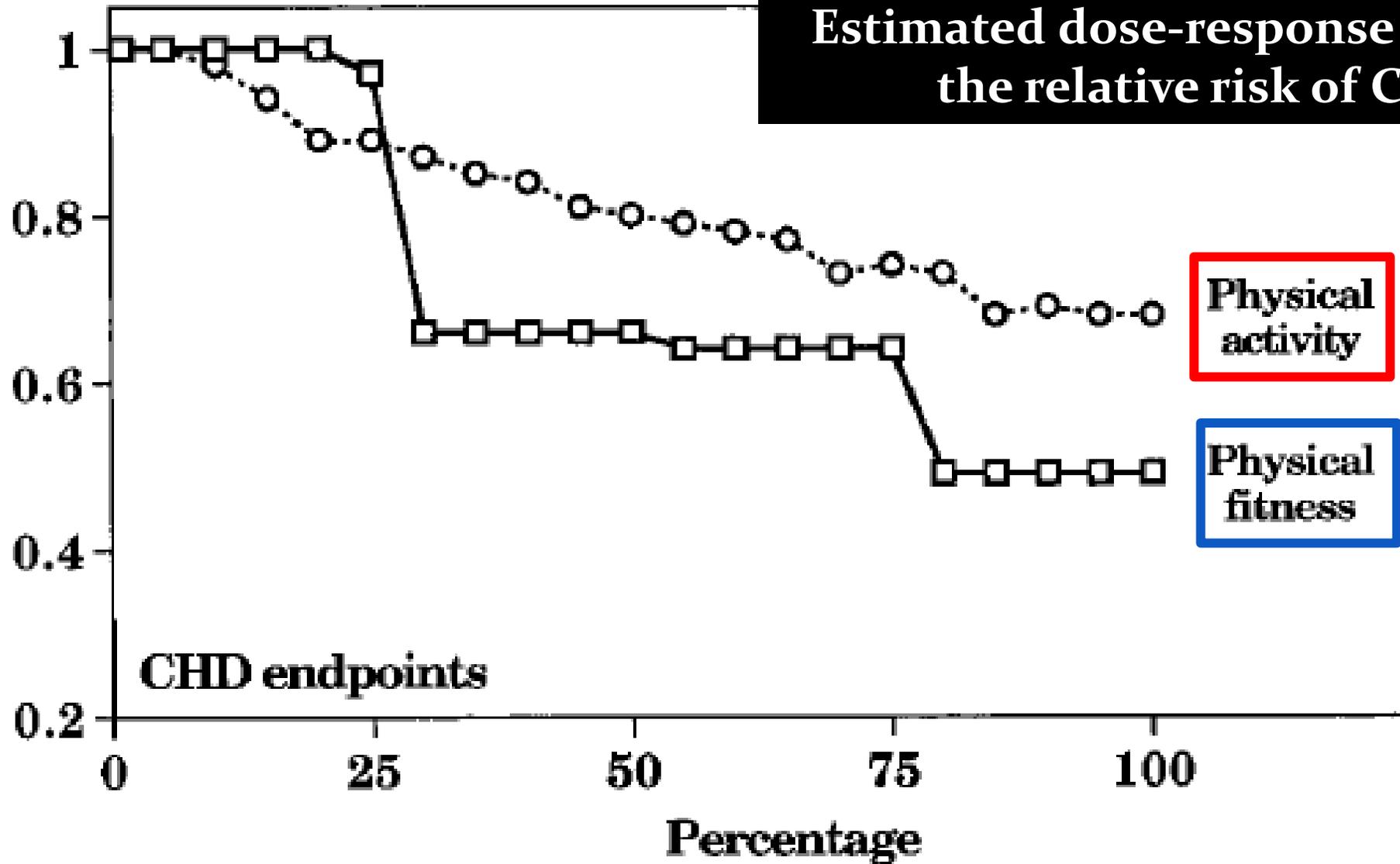
Americans' inactivity cost \$27,792,555 in 2013



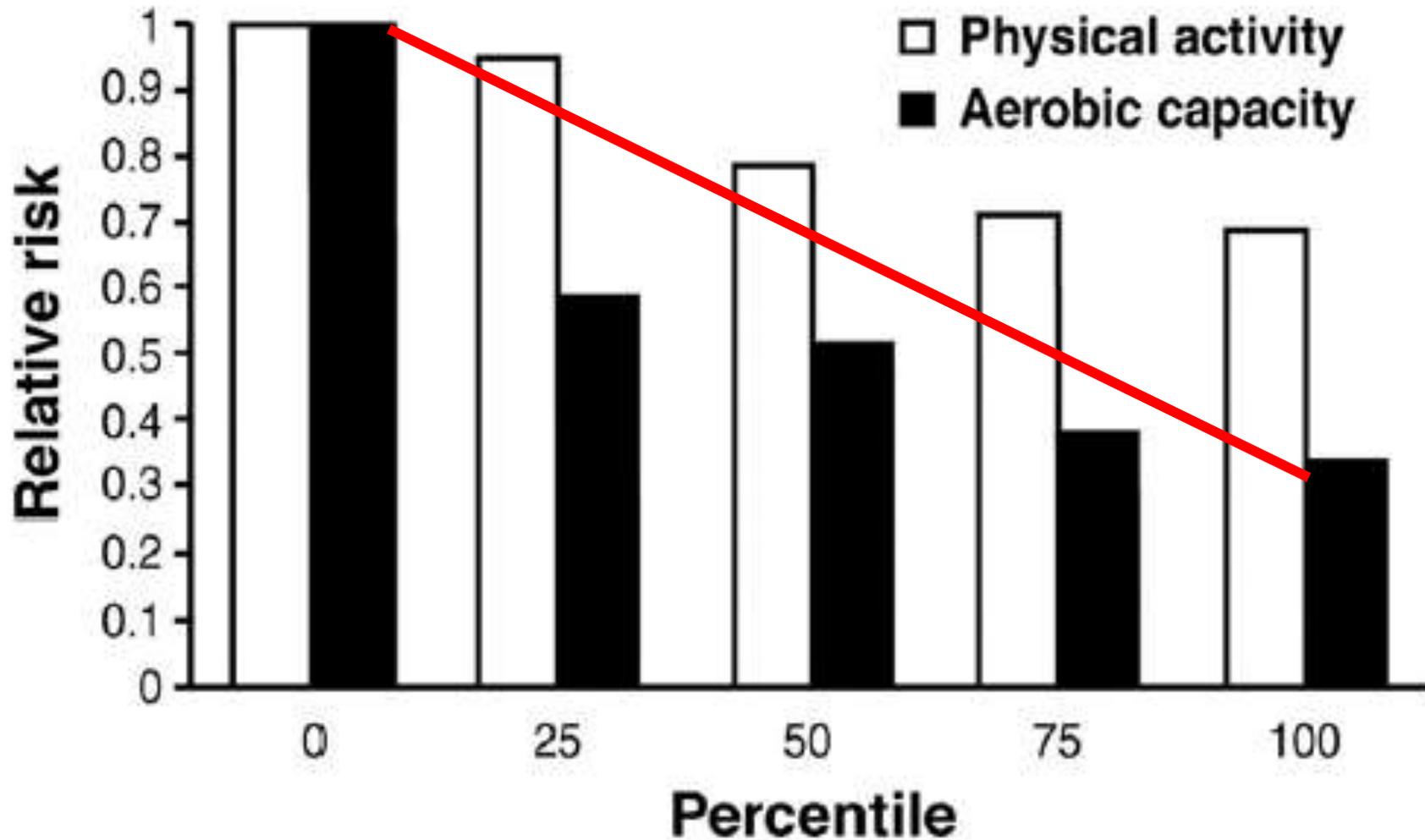
Source: Study in The Lancet

Bloomberg

Relative Risk



Physical fitness and activity as separate heart disease risk factors: a meta-analysis  
Paul T. Williams. *Med. Sci. Sports Exerc.*, Vol. 33, No. 5, 2001, pp. 754-761

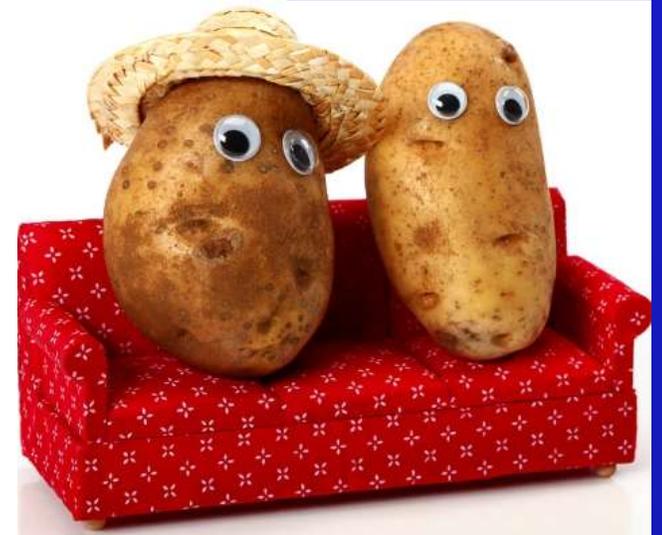
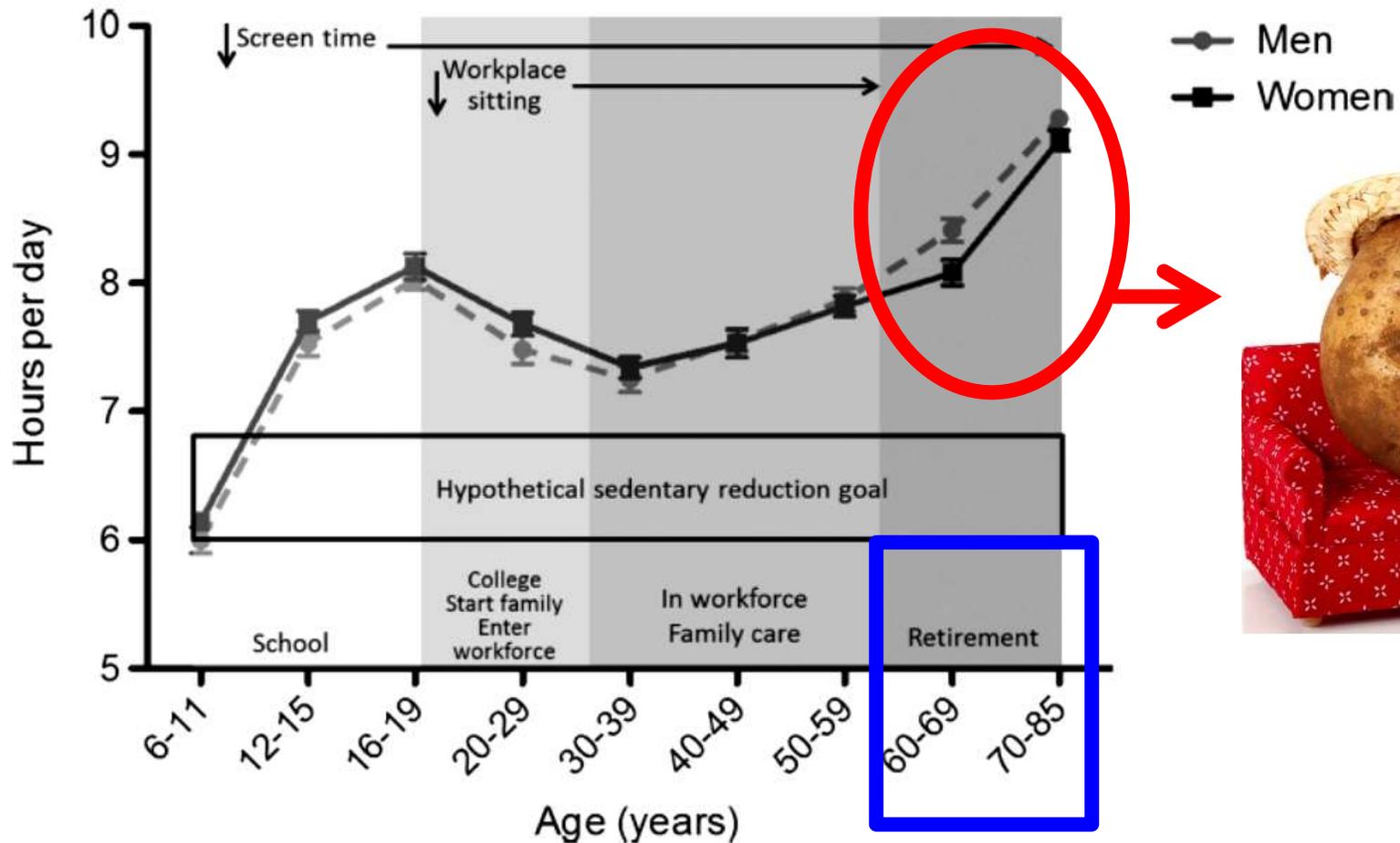


The risks of coronary heart disease and cardiovascular disease **decrease linearly** in association with increasing percentiles of **physical activity**

# Interventions to Reduce Sedentary Behavior

Med. Sci. Sports Exerc., Vol. 47, No. 6, pp. 1306–1310, 2015

## Daily hours in sedentary behavior across the lifespan



**AHA SCIENCE ADVISORY**

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# **Sedentary Behavior and Cardiovascular Morbidity and Mortality**

**A Science Advisory From the American Heart Association**

*Endorsed by The Obesity Society*

**Circulation Published Ahead of Print  
August 15, 2016**

**“For people who sit most of the day, their risk of heart attack is about the same as smoking.”**

**- Martha Grojan, Cardiologist, Mayo Clinic**



<http://circ.ahajournals.org>

# Sedentary Behavior and Cardiovascular Morbidity and Mortality: *A Science Advisory From the American Heart Association*

Circulation: Published Ahead of Print: August 15, 2016

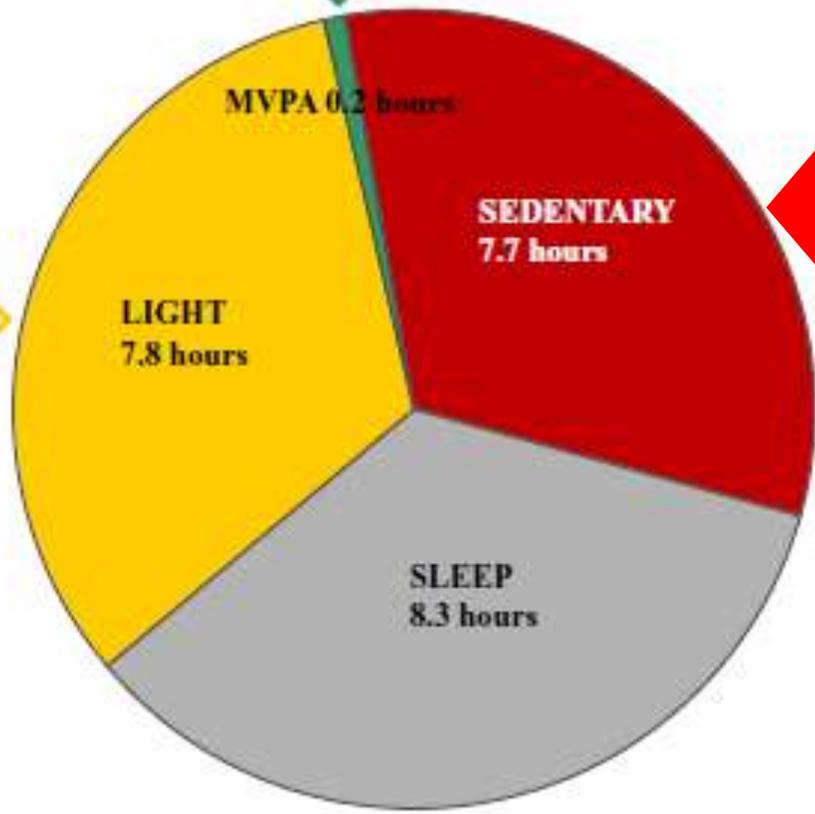
- U.S. adults spend an average of **6 to 8 hours per day sitting**
- Epidemiologic **evidence is accumulating** that indicates greater time spent in sedentary behaviors is associated with **all-cause and cardiovascular MORBIDITY and MORTALITY in adults**
- While the evidence base for guidelines on sedentary behavior continues to grow, it is appropriate to recommend that adults  
**“sit less, move more”**

MVPA indicates **moderate to vigorous** physical activity

Substantial evidence available on its association with cardiovascular risk.  
*Basis for physical activity guidelines*

Estimated daily time spent in different contexts of energy expenditure among adults, based on the National Health and Nutrition Examination Survey

Limited evidence available on its association with cardiovascular risk



New evidence emerging on its contribution to cardiovascular risk

**Table. Common Sedentary Behavior Activities Performed While Sitting or Reclining That Require Energy Expenditure <1.5 METs**

| Home                           | Work/School          | Transportation                 | Leisure                       |
|--------------------------------|----------------------|--------------------------------|-------------------------------|
| TV viewing: sitting, reclining | Computer work        | Driving or riding in a vehicle | Playing an instrument         |
| Talking on the phone           | Sitting              |                                | Arts and crafts               |
| Listening to music             | Writing              |                                | Knitting/sewing               |
| Eating                         | Talking on the phone |                                | Meditating                    |
| Bathing                        | Sitting in class     |                                | Playing cards or board games  |
| Reading                        | Typing               |                                | Viewing a sports event        |
|                                | Reading              |                                | Attending a religious service |



“For **Moderate to Vigorous Physical Activity**, there is a large body of experimental evidence identifying how different durations, intensities, and types of physical activity can influence CVD risk biomarkers.” .....

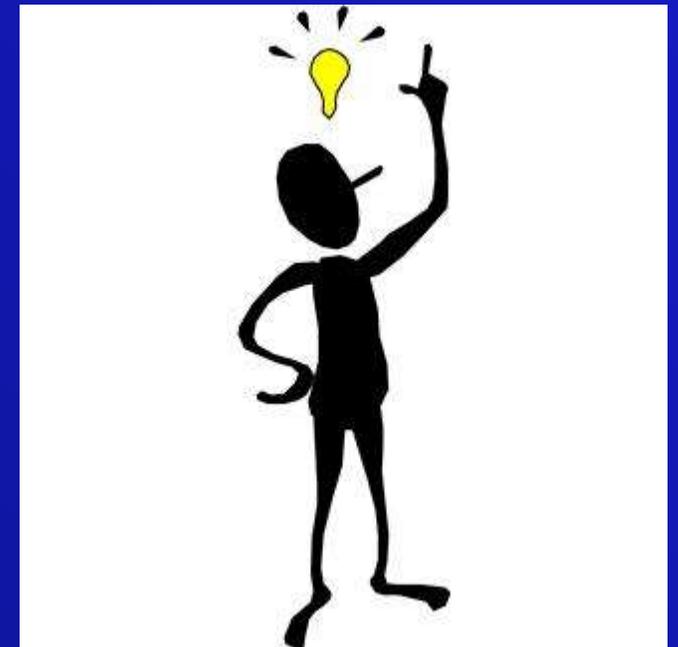
However, **it is likely that sedentary behavior influences risk in part through some distinct mechanisms that act independent of Moderate to Vigorous Physical Activity**”

## Summary of Key Findings: Potential Mechanisms

- **Sedentary behavior** might increase CVD and Diabetes Mellitus risk through distinct mechanisms that are **independent** of Moderate to Vigorous Physical Activity
- **Reduced insulin sensitivity** is found during **prolonged sedentary behavior** that can be mitigated with short bouts of physical activity

## Key Finding:

**“Interventions** focusing solely on **reducing sedentary behavior** appear to be **more effective** at reducing sedentary behavior than those that include strategies for both increasing physical activity and reducing sedentary behaviors”



# Let's Look at Some Recent "Sedentary Time" Studies....



# Sedentary Time and Its Association With Risk for Disease Incidence, Mortality, and Hospitalization in Adults

## A Systematic Review and Meta-analysis

Avirop Biswas, BSc; Paul I. Oh, MD, MSc; Guy E. Faulkner, PhD; Ravi R. Bajaj, MD; Michael A. Silver, BSc; Marc S. Mitchell, MSc; and David A. Alter, MD, PhD

*Ann Intern Med.* 2015;162:123-132.

- **Meta-analysis** were performed on outcomes for cardiovascular disease and diabetes (14 studies), cancer (14 studies), and all cause mortality (13 studies)
- Prospective cohort designs were used in all but 3 studies; sedentary times were quantified using self-report in all but 1 study

## **Significant hazard ratio (HR) associations were found with Sedentary time and;**

- 1. All-cause Mortality (HR, 1.24)**
- 2. Cardiovascular disease mortality (HR, 1.18)**
- 3. Cardiovascular disease incidence (HR, 1.14)**
- 4. Cancer Mortality (HR, 1.17)**
- 5. Cancer Incidence (HR, 1.13)**
- 6. Type 2 Diabetes Incidence (HR, 1.91)**

# Conclusions:

- Prolonged sedentary time was **independently** associated with deleterious health outcomes **regardless of physical activity**
- The results reaffirm the need for greater public awareness about the **hazards associated with sedentary behaviors**



Research

Original Investigation

# Continuous Dose-Response Association Between Sedentary Time and Risk for Cardiovascular Disease

## A Meta-analysis

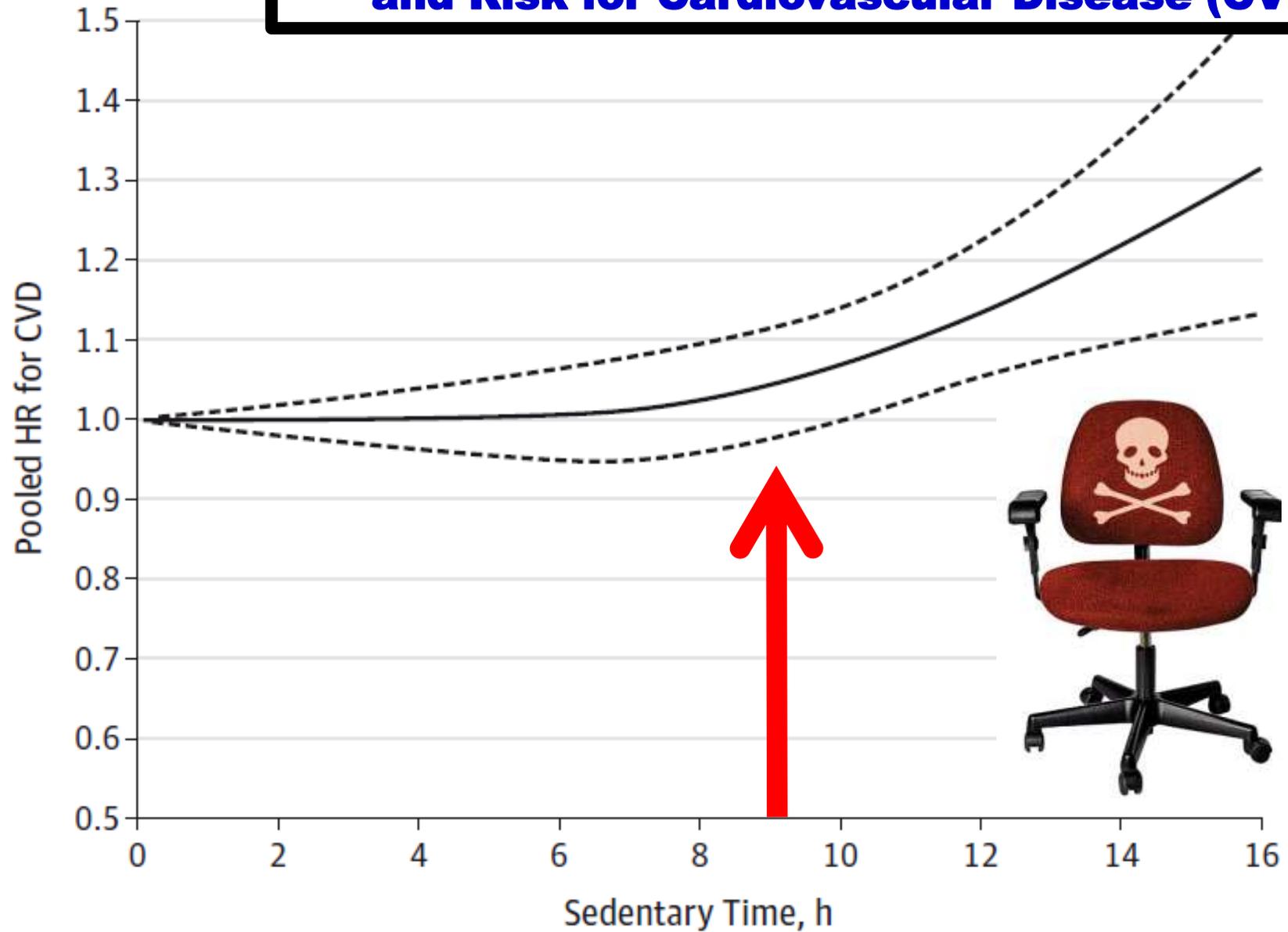
Ambarish Pandey, MD; Usman Salahuddin, MD; Sushil Garg, MD; Colby Ayers, MS; Jacquelyn Kulinski, MD; Vidhu Anand, MD; Helen Mayo, MLS; Dharam J. Kumbhani, MD, SM; James de Lemos, MD; Jarett D. Berry, MD, MS

***JAMA Cardiol.* Published online July 13, 2016**

- **Nine** prospective cohort studies  
with **720,425 participants**  
(57.1% women; 42.9% men;
- Mean age, 54.5 years)
- Median **follow-up of 11 years**

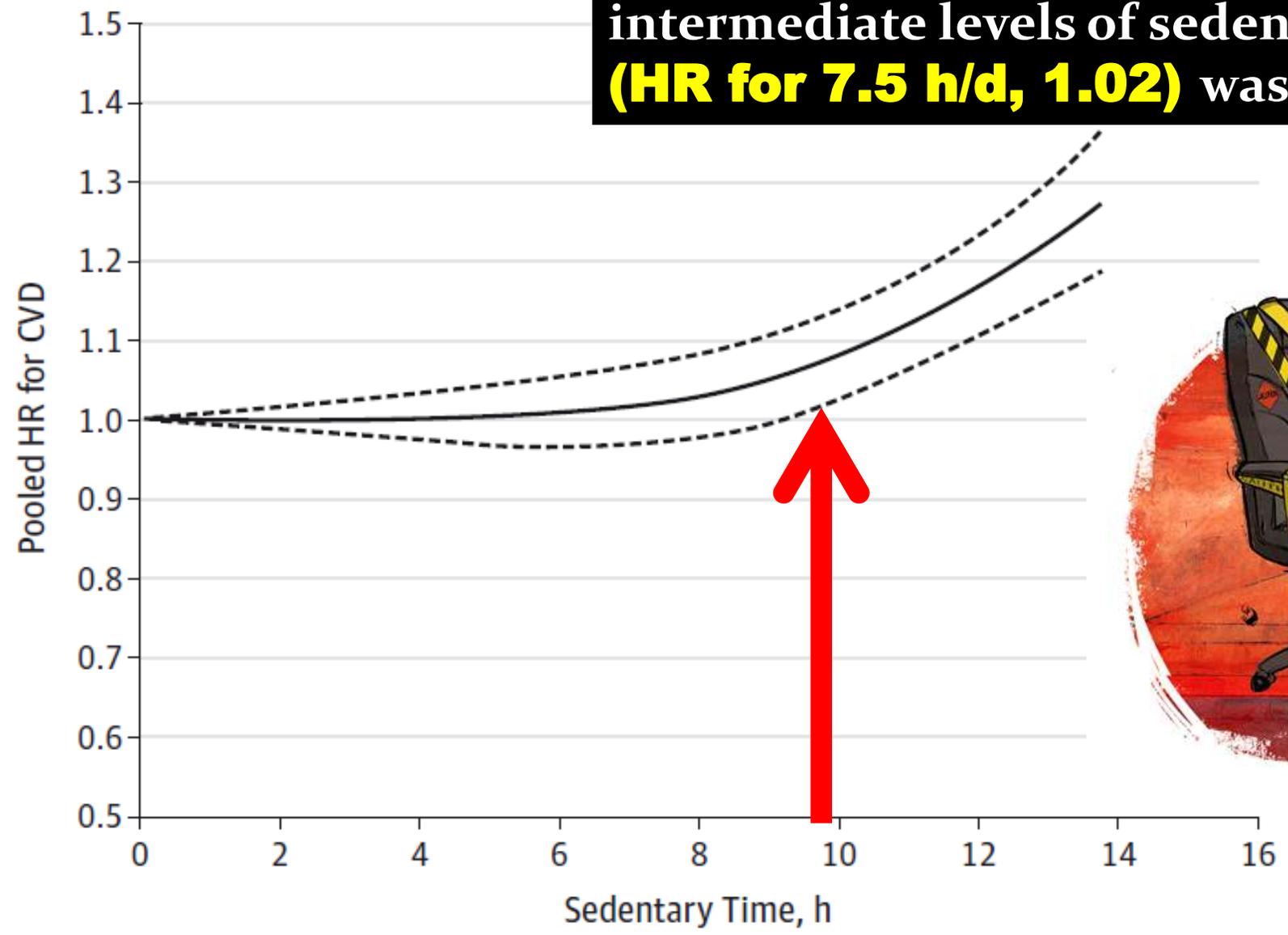
A All studies

## Association Between Total Sedentary Duration and Risk for Cardiovascular Disease (CVD)



**B** Excluding physical activity

• **No** apparent risk associated with intermediate levels of sedentary time (**HR for 7.5 h/d, 1.02**) was found



## CONCLUSIONS:

The association between sedentary time and the risk for CVD was nonlinear with an **increased risk at very high levels**

After adjustment for physical activity and other CVD risk factors, significant risk for CVD was observed with very high levels of sedentary time (**>10 h/d**), with no apparent risk associated with intermediate levels of sedentary time.

“The biological mechanism underlying this nonlinear association is not completely understood, but it appears to reflect an apparent **threshold effect** of sedentary time on cardiometabolic risk factors”

# Physical Activity Weakens Dangers of Prolonged Sitting

Confirmation for the risks associated with sedentary lifestyle, and the benefits of exercise

"Does physical activity decrease, or even eliminate, the detrimental association of sitting time with mortality?  
A meta-analysis of data from more than **1 million men and women**"  
... Ekelund U, et al

**The Lancet 2016; (16)3072-1** (Published Online July 27, 2016)



- 16 studies were analyzed
- A total of **1,005,791** men and women
- 84,609 died during the follow-up period

- Previous reports have demonstrated a direct link between time spent sitting, and an increased risk for death.
- Other studies have suggested an inverse relationship between physical activity and the risk for death.
- This unique new study analyzed the **joint implications** of both sedentary lifestyles and physical activity
- The study hoped to answer the question of whether or not this association could be **counteracted by physical activity**

Those who sat for more than **8 hours a day** and completed less than **2.5 METs** of a task had a **59% increased risk** for mortality when compared with those who **sat for less than 4 hours** a day but completed more than **35.5 METs**  
(HR=1.59)

Participants who sat for over **8 hours a day** and **averaged 35.5 METs a day** had lower chances **(HR 1.04)** of dying during the study's follow-up period compared with participants who **sat for less than 4 hours a day** but averaged **less than 2.5 METs a day (HR 1.27) (+27% Risk)**

## Conclusions:

High levels of moderate-intensity physical activity **attenuate** (**decrease**) the increased risk associated with high TV-viewing time, and eliminate the increased risk of death associated with high sitting time.



# **Frequency, Type, and Volume of Leisure-Time Physical Activity and Risk of Coronary Heart Disease in Young Women**

**Andrea K. Chomistek, ScD. Beate Henschel, MPH, et al.**

***Circulation.* 2016;134:290–299**

## METHODS:

- Prospective analysis among **97,230 women** aged 27 to 44 years at baseline in 1991.
- **Leisure-time physical activity** was assessed by questionnaire
- Examined the associations between physical activity frequency, type, and volume, and CHD risk.
- **20 years of follow-up**

**Supplemental Table 1 Hazard ratios (95% CI) of coronary heart disease according to categories of cumulative average physical activity, 1997 – 2011, Nurses' Health Study II**

|                         | Categories of Cumulative Average Physical Activity, MET-hrs/wk |                |                 |                  |                    |                          |
|-------------------------|--|----------------|-----------------|------------------|--------------------|--------------------------|
| Total Physical Activity | 1<br>( $< 1$ )   | 2<br>(1 – 5.9) | 3<br>(6 – 14.9) | 4<br>(15 – 29.9) | 5<br>( $\geq 30$ ) | p-value for linear trend |
| Cases                   | 99   | 159            | 130             | 86               | 70                 |                          |
| Person-years            | 250,780  | 434,577        | 489,027         | 410,155          | 326,958            |                          |
| Age-adjusted            | 1.00   | 0.84           | 0.61            | 0.50             | 0.55               | $<.0001$                 |

| Categories of Average Physical Activity |             |             |             |             |             | p-value for linear trend      |
|---|-------------|-------------|-------------|-------------|-------------|-------------------------------|
|   |             | Walking     | Jogging     |             |             |                               |
| Total Activity MET-hrs/wk               | ( $<1$ )    | (1-5.9)     | (6-14.9)    | (15-29.9)   | (>30)       |                               |
|   |             | <b>-16%</b> | <b>-39%</b> | <b>-50%</b> | <b>-45%</b> |                               |
| <b>Hazard Ratios:</b>                   | <b>1.00</b> | <b>0.84</b> | <b>0.61</b> | <b>0.50</b> | <b>0.55</b> | <b><math>&lt;.0001</math></b> |

## Results:

- Physical activity was associated with lower risk of coronary heart disease (CHD) in young women
- Exercise **did not have to be strenuous** to have such associations; moderate-intensity physical activity, including brisk walking, was associated with lower risk of CHD
- Frequency of physical activity not as important as **total volume**
- The associations between physical activity and lower CHD risk were evident **regardless of body mass index**

# Being Unfit May Be Almost as Bad for You as Smoking

By GRETCHEN REYNOLDS

New York Times JULY 27, 2016



*Original scientific paper*

# **Low aerobic capacity in middle-aged men associated with increased mortality rates during 45 years of follow-up**

**Per Ladenvall<sup>1</sup>, Carina U Persson<sup>2</sup>, Zacharias Mandalenakis<sup>1</sup>,  
Lars Wilhelmsen<sup>1</sup>, Gunnar Grimby<sup>2</sup>, Kurt Svärdsudd<sup>3</sup> and  
Per-Olof Hansson<sup>1</sup>**

European Journal of Preventive  
Cardiology

0(00) 1–8

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Cardiology 2016

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DOI: 10.1177/2047487316655466

[ejpc.sagepub.com](http://ejpc.sagepub.com)



***European Journal of Preventive Cardiology, published on July 26, 2016***

## **METHODS:**

A representative sample of men born in 1913 was followed from **50–99 years of age**, with periodic medical examinations and data from the National Hospital Discharge and Cause of Death registers.

At 54 years of age, 792 men performed an ergometer exercise test, with 656 (83%) performing the maximum exercise test

## **Results:**

The variable impact of **predicted  $\dot{V}O_2$  Max (aerobic capacity)** on mortality was **secondary only to smoking**

The risk associated with low predicted Max  $\dot{V}O_2$  was **evident throughout four decades** of follow-up

## **Conclusion:**

**Low aerobic capacity** was associated with increased mortality rates, **independent** of traditional risk factors, including smoking, blood pressure and serum cholesterol, **during more than 40 years of follow-up.**

# Physical activity and risk of breast cancer, colon cancer, diabetes, ischemic heart disease, and ischemic stroke events: systematic review and dose-response meta-analysis for the Global Burden of Disease Study 2013

Hmwe H Kyu,<sup>1</sup> Victoria F Bachman,<sup>2</sup> Lily T Alexander,<sup>1</sup> John Everett Mumford,<sup>1</sup> Ashkan Afshin,<sup>1</sup> Kara Estep,<sup>1</sup> J Lennert Veerman,<sup>3</sup> Kristen Delwiche,<sup>4</sup> Marissa L Iannarone,<sup>1</sup> Madeline L Moyer,<sup>1</sup> Kelly Cercy,<sup>1</sup> Theo Vos,<sup>1</sup> Christopher J L Murray,<sup>1</sup> Mohammad H Forouzanfar<sup>1</sup>

*British Medical Journal:*  
*August 2016; 354:i3857*

## Methods:

Used data from **174 cohort studies**

First **meta-analysis** to quantify the dose-response association between total physical activity and the risk of chronic diseases.

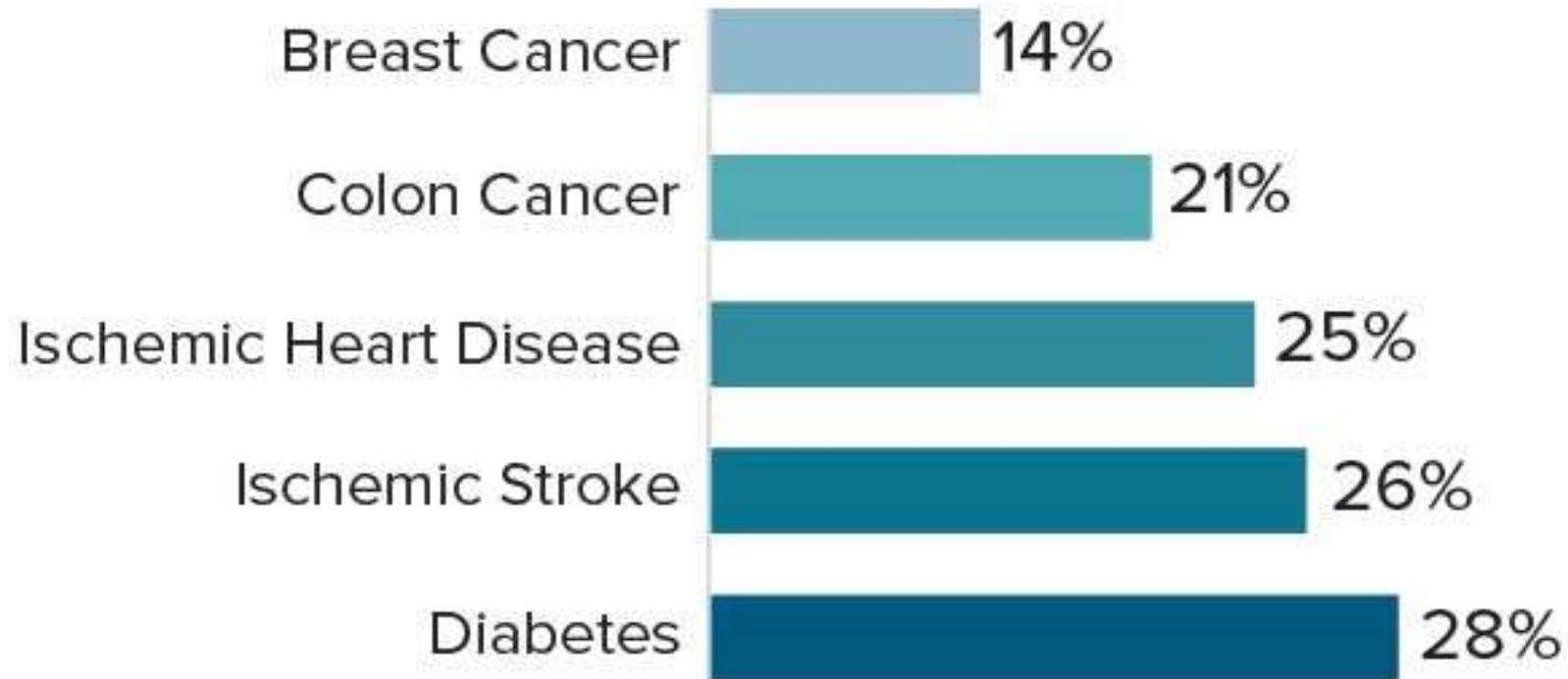
Examined the association between physical activity and the risks of one of five outcomes:

- **Breast cancer**
- **Colon cancer**
- **Diabetes**
- **Ischemic heart disease**
- **Ischemic stroke**

Estimated relative risks of diseases for each dose of **total physical activity** in MET minutes/week.

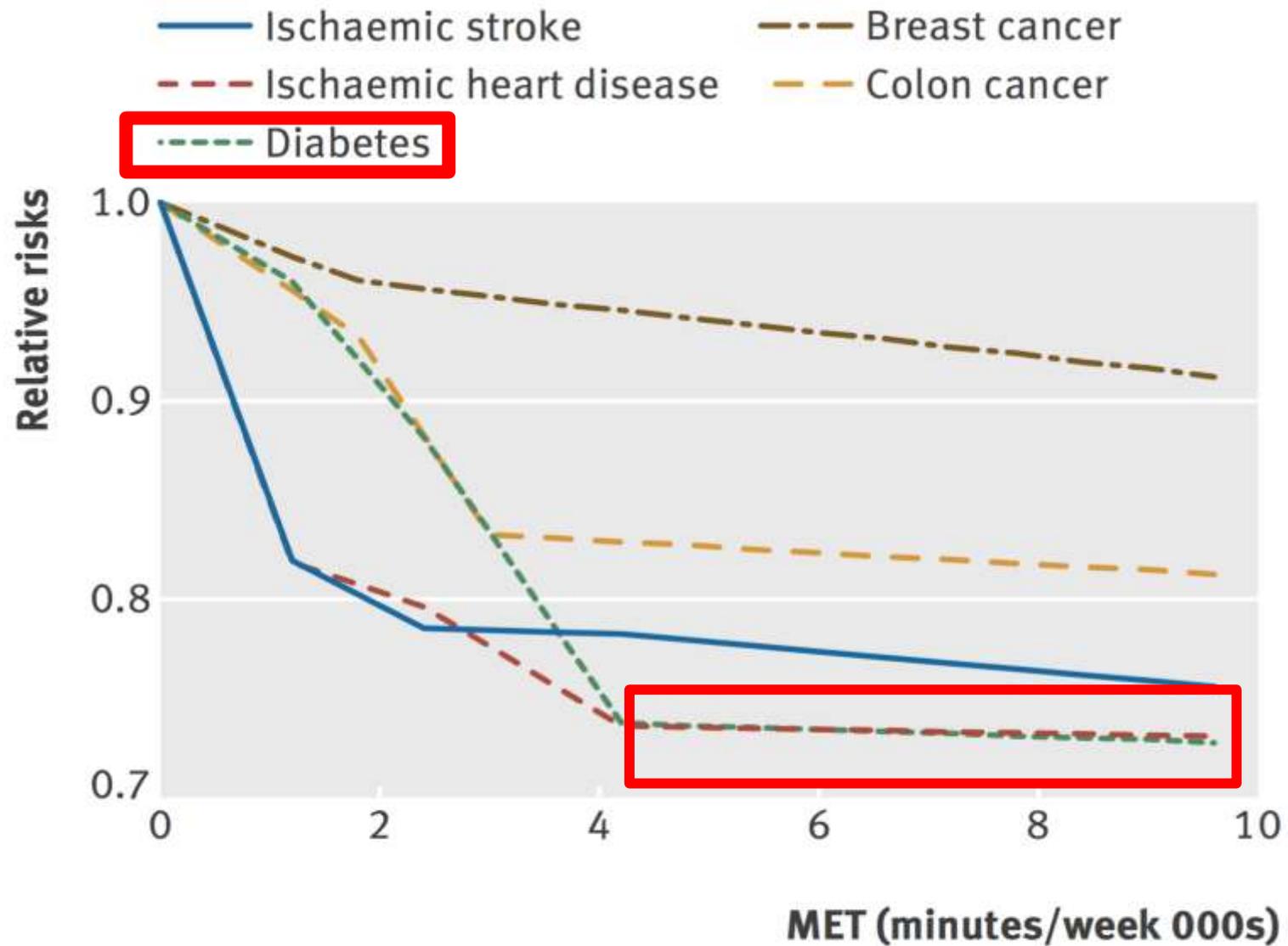
# Get Moving: High Physical-Activity Level Reduces Risk of 5 Diseases

## Disease Risk Reduction for Highly Active Participants ( $\geq 8000$ MET minutes/week)



Source: *BMJ*. Published online August 9, 2016.

Medscape



**Fig 7 | Continuous risk curves for association between physical activity and breast cancer, colon cancer, diabetes, ischemic heart disease, and ischemic stroke**

## Conclusions:

Higher levels of total **physical activity** were significantly associated with **lower risk** for all outcomes

Major gains occurred at **lower levels of activity** and there were diminishing returns at levels higher than 3000-4000 MET minutes/week

Greater attention and **investments** in interventions to promote physical activity in the general public is **required**

**How little can you exercise and  
still get benefits**



**“Do what you  
can, with what  
you have,  
where you are.”**

Theodore Roosevelt

# Prolonged sitting-induced leg endothelial dysfunction is prevented by fidgeting

Takuma Morishima,<sup>1,2,3</sup> Robert M. Restaino,<sup>4</sup> Lauren K. Walsh,<sup>1</sup> Jill A. Kanaley,<sup>1</sup> Paul J. Fadel,<sup>5</sup>  
and Jaume Padilla<sup>1,6,7</sup>

*Am J Physiol Heart Circ Physiol* 311: H177–H182, 2016  
First published May 27, 2016

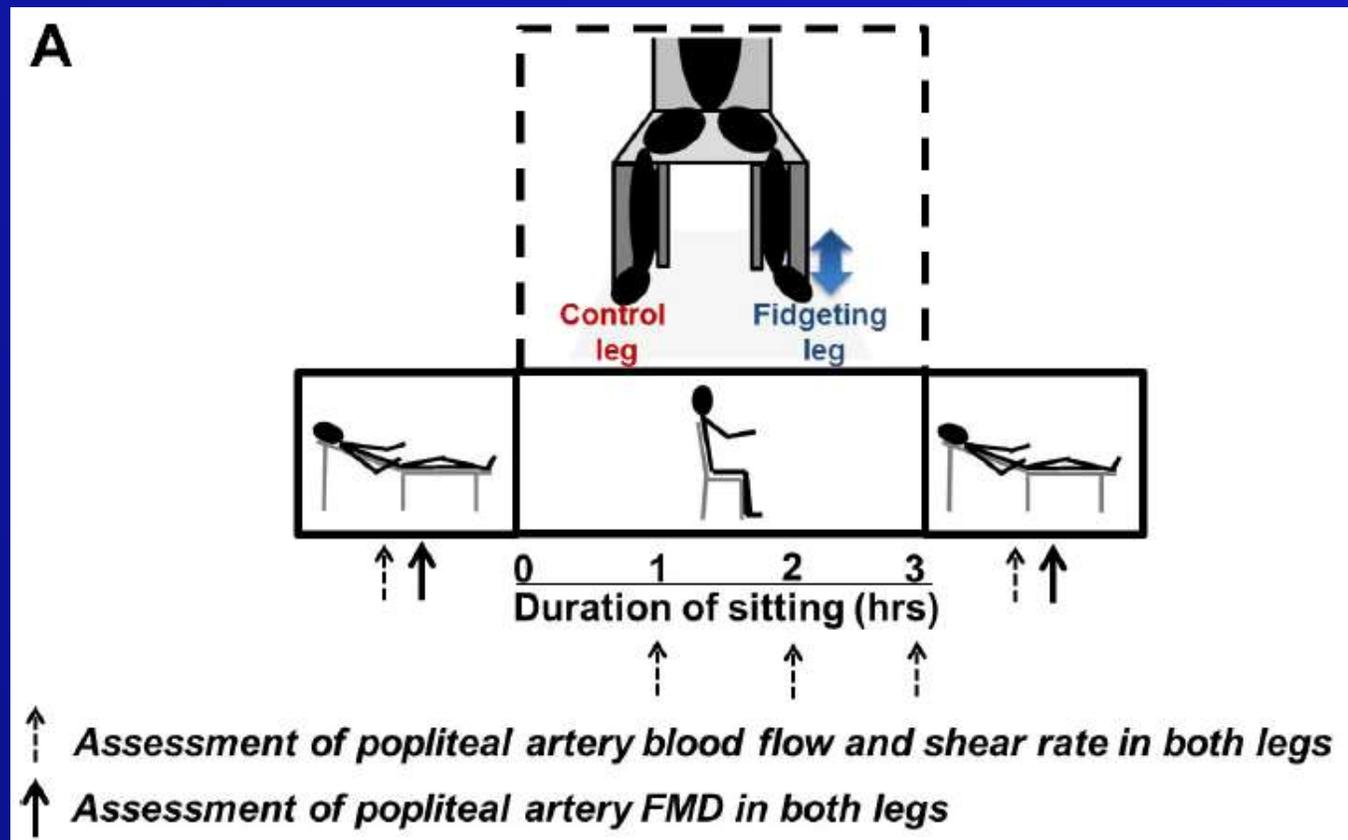


Prolonged sitting **impairs endothelial function** in the leg vasculature, and this impairment is thought to be largely mediated by a sustained reduction in blood flow-induced shear stress

**Can endothelial dysfunction be prevented by periodic leg movement, or “fidgeting” ?**



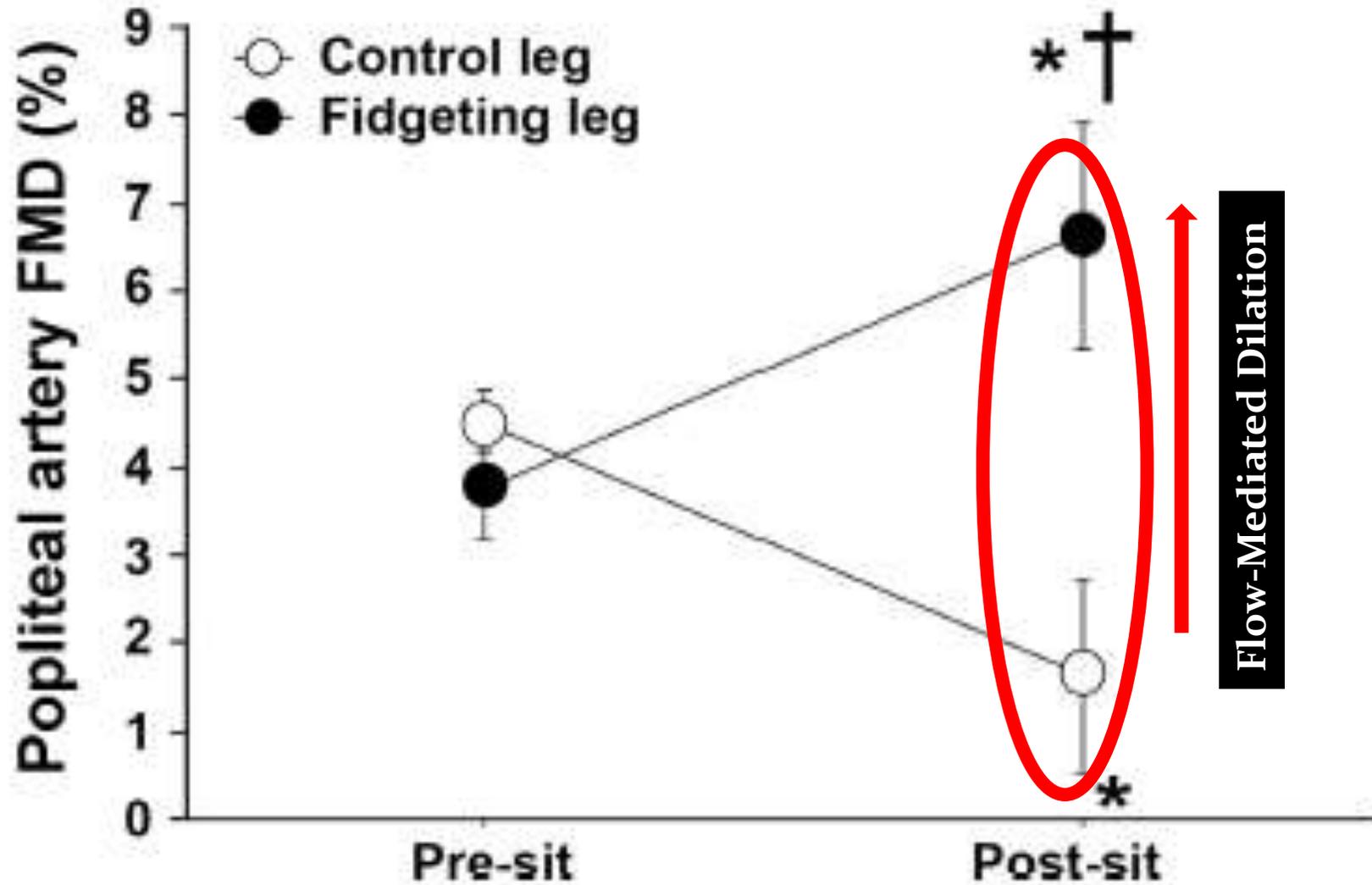
**Methods:** In 11 young, healthy subjects, bilateral measurements of popliteal artery **flow-mediated dilation (FMD)** were performed before and after a **3-hour sitting** period during which one leg was subjected to intermittent **fidgiting (1 min on/4 min off)** while the contralateral leg remained still throughout and served as an **internal control**.



# RESULTS:

- Popliteal Artery **flow-mediated dilation** was **impaired** after 3 hours of sitting in the control leg (**presit**, 4.5 to **postsit**: 1.6;  $P > 0.03$ )
- Popliteal artery **flow-mediated dilation** improved in the fidgeting leg (**presit** to **postsit**, 6.6; ( $P > 0.01$ ))

Time:  $P = 0.995$   
Leg:  $P = 0.015$   
Interaction:  $P < 0.001$



## Conclusions:

- Simple behavior of **fidgiting** is sufficient to counteract the detrimental effects of prolonged sitting on leg endothelial function, likely through the intermittent **increases in blood flow-induced shear stress**
- This study provided the first evidence that the detrimental
- vascular **effects of sitting are preventable** with small amounts of leg movement while seated for an extended period
- **People should be encouraged to consciously engage in leg movement when sitting for prolonged periods of time either at work or at home**

# Impact of moderate physical activity on the longitudinal trajectory of a cardiac specific biomarker of injury: Results from a randomized pilot study of exercise intervention



Christopher R. deFilippi, MD,<sup>a</sup> James A. de Lemos, MD,<sup>b</sup> Anne B. Newman, MD, MPH,<sup>c</sup> Jack M. Guralnik, MD, PhD,<sup>d</sup> Robert H. Christenson, PhD,<sup>e</sup> Marco Pahor, MD,<sup>f</sup> Timothy Church, MD, PhD, MPH,<sup>g</sup> Mark Espeland, PhD,<sup>h</sup> Stephen B. Kritchevsky, PhD,<sup>i</sup> Randall Stafford, MD, PhD,<sup>j</sup> and Stephen L. Seliger, MD, MS<sup>k</sup>,

Am Heart J 2016;179:151-6.



## Background:

“In animal models, physical activity (PA) prevents cardiac myocyte cell death. Data for PA mitigating myocyte injury in humans are limited to observational studies

A randomized controlled trial design sought to determine if introducing moderate **Physical Activity (PA)** to previously sedentary older adults could reduce the trajectory of myocardial injury as measured by the **high-sensitive cardiac troponin T (hs-cTnT) assay.**”

# Methods:

hs-cTnT : High-Sensitivity Cardiac Troponin T

Participants (**age  $\geq 70$  years**) were assigned to a 1-year intervention of moderate Physical Activity or health education control

High-sensitive cTnT measured at baseline & 1-year

Changes in hs-cTnT within 1 year were compared between Physical Activity and control groups

Moderate to vigorous Physical Activity in kcal/week was estimated with a questionnaire

## RESULTS:

- Activity kcal/week increased in the Physical Activity , but not in the control group at 1 year.
- The median increase in **hs-cTnT** level from baseline was >3 times larger in the control (0.73 ng/L vs the PA group 0.19ng/L)

## Conclusions:

Initiation of **moderate Physical Activity** in sedentary older adults may favorably modify subclinical myocardial injury





**Measuring Vital Signs**

# Medicare Documentation Guidelines

The following **Seven** items are considered **“Vital signs”**:

- Sitting or standing blood pressure
- Supine blood pressure
- Pulse rate and regularity
- Respiration
- Temperature
- Height
- Weight

**“a fundamental change in approach or underlying assumptions”**

Paradigm shift





# **A Physical Activity Vital Sign (PAVS)**

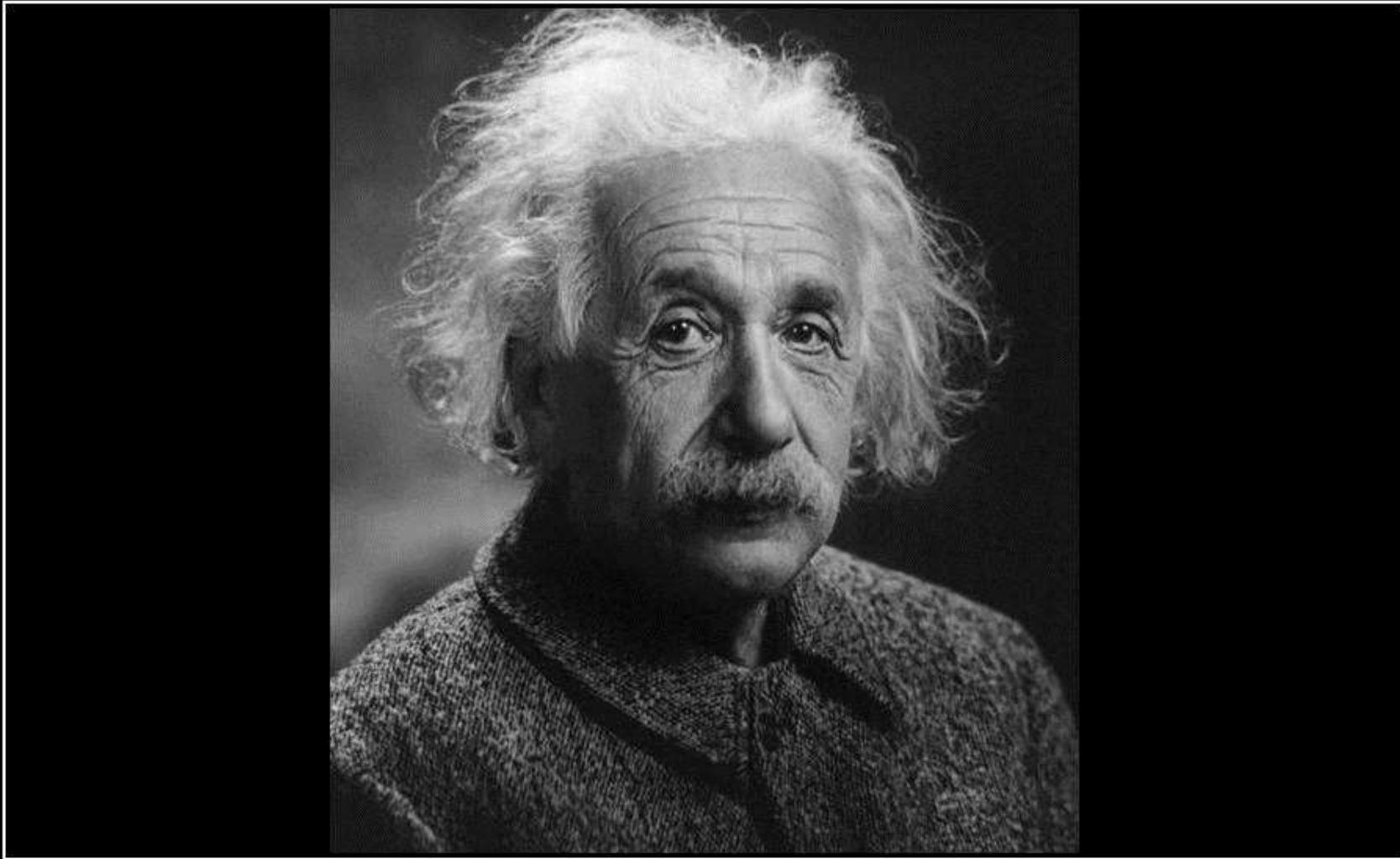
could provide valuable insight into a patient's health status and lead to opportunities to advance a culture of Wellness

## **Exercise as a Vital Sign**





**The New Stamford Hospital**



## **Problem Solving Requires New Approaches**

“We can’t solve problems by using the same kind of thinking we used when we created them.” – Albert Einstein



Never doubt that a small group of thoughtful,  
committed citizens can **change the world**;  
indeed, it's the only thing that ever has.

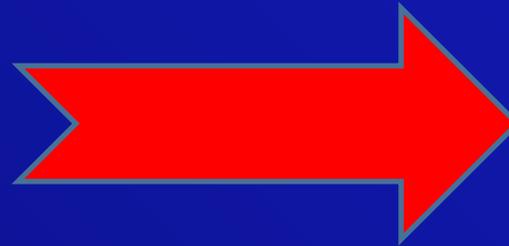
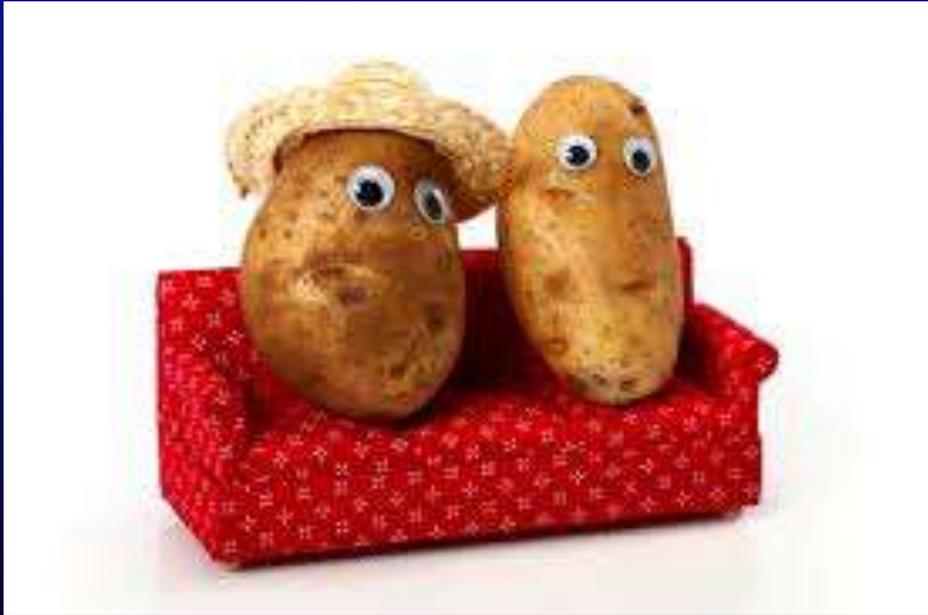
*Margaret Mead*

# Call to Action on Making Physical Activity Assessment and Prescription a Medical Standard of Care

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**American College of Sports Medicine**

**WARNING: Prolonged sitting and physical inactivity cause chronic disease and premature death.**



# Using an Electronic Medical Record to Assess Physical Activity ?



# Physical Activity Vital Sign (PAVS)

1. On average, how many days per week do you engage in moderate to strenuous exercise (like a brisk walk)?

\_\_\_\_\_ days

2. On average, how many minutes do you engage in exercise at this level?

\_\_\_\_\_ minutes

## Exercise Vitals

Exercise Vitals (SHIFT+F6 to enter comments)

Instant Taker:

Date: 4/30/2009

Time: 1149

## Exercise Level of Effort

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

0 1 2 3 4 5 6 7

On average,  
minutes per day of  
exercise at this  
level?

10 20 30 40 50 60 90 120 150 or greater

Restore



Close F9



Cancel



**One  
minute  
or less**

**THE TIME IT TAKES TO  
COLLECT EXERCISE AS  
A VITAL SIGN.**

A-44 Exercise is Medicine®/Poster - EIM in Clinical Practice, Universities and Communities  
Wednesday, June 1, 2016, 313 Board #150

## Exercise Vital Sign Correlates with Acute Coronary Events

Robert E. Sallis, FACSM. *Kaiser Permanente Medical Center, Fontana, CA*

Kaiser Permanente in Southern California (KPSC) pioneered the use of an **Exercise Vital Sign (EVS)** to record minutes per week of **Physical Activity (PA)** at every visit

### **PURPOSE:**

Evaluated the correlation between self-reported **Physical Activity** level (**using EVS**) and the likelihood of suffering an ACE (**acute MI or revascularization procedure**)

## **METHODS:**

Data were abstracted from electronic medical records of KPSC (**N=1,423,525**)

3 **Exercise Vital sign (EVS)** measurements spanning over a yr. from 2009 to 2011

Patients were classified into 1 of 3 distinct categories for EVS;

- **Consistently Inactive (CI)** EVS=0 min/wk for every measure),
- **Insufficiently Active (IA)** EVS 10-149 min/week) and
- **Consistently Active (CA)** EVS $\geq$ 150 min/week for every measure)

## RESULTS:

- **Consistently Active men** were found to be less likely to experience an ACE compared to Consistently Inactive men (**HR (CI) = 0.74 (-26%)**)
- **Consistently Active women** were found to have a nearly 3 fold decrease in the hazard of an ACE (**HR = 0.33**) compared to Consistently Inactive women.
- **Women who were Insufficiently Active** were also found to be less likely to experience an ACE (**HR = 0.79**) compared to **Consistently Inactive**

## CONCLUSIONS:

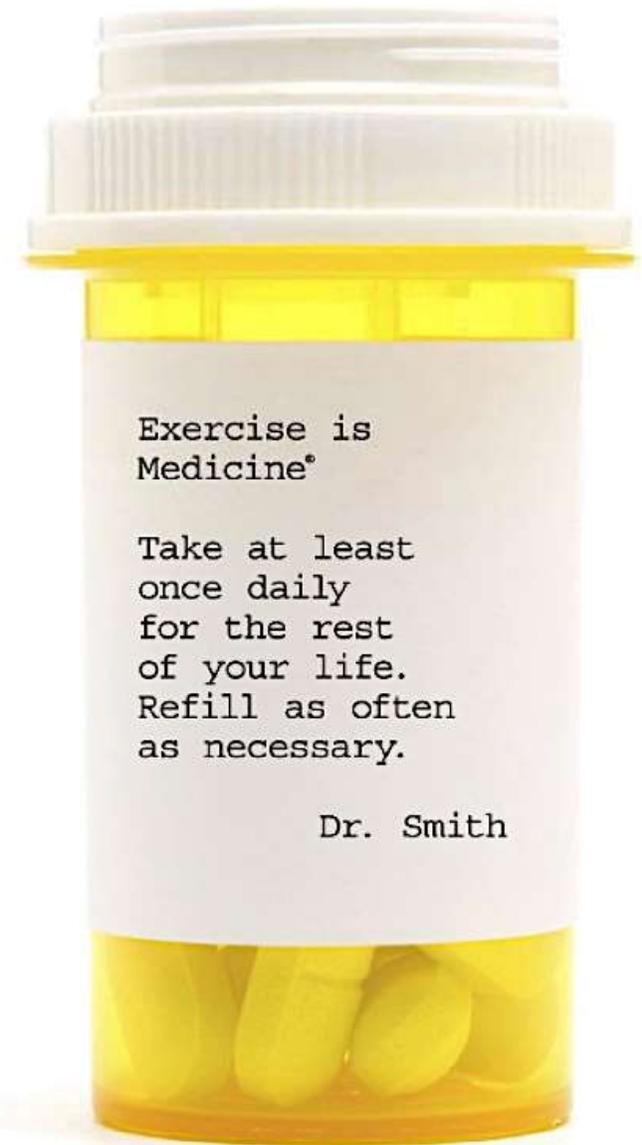
Based on **Exercise Vital Sign Data (EVS)**, **self-reported PA** was strongly correlated with the likelihood of suffering an ACE.

Study suggested that **a low EVS** predicts increased risk for CVD

“For this reason, any patient presenting with chest pain or other symptoms of an acute coronary event, should be asked about their **exercise habits** and a **Low EVS** should add to the clinical suspicion for heart disease in such a patient”.

**Start Here!**

**Asking** about Physical  
Activity sets the stage  
for Advising !



**THE SECRET OF CHANGE IS TO  
FOCUS ALL OF YOUR ENERGY NOT  
ON FIGHTING THE OLD, BUT  
ON BUILDING THE NEW.**



# Facilitating effective health behavior change counseling during a medical visit



Last 3 have the greatest impact on healthful behavior change

Change Starts Here !

## Conclusion:

- Clinicians have a responsibility to inform their patients of the risks of physical inactivity
- Patients should understand that the **benefits** of exercise far outweigh the risks
- Regular physical activity should be advocated for the prevention and **first-line treatment of chronic disease**
- The default exercise prescription is to **walk at least 30 minutes** a day, most days of the days week
- **Any type of physical activity done** at a moderate pace can count toward the latter weekly goal



The  
**Revolution**  
is coming

**JOIN THE REVOLUTION**

**We** need to promote implementation of a **Physical Activity Vital Sign** in our medical record, to be assessed at every medical office visit

Please invite your colleagues to **join us** in this important population health initiative



**SUCCESS  
STARTS HERE**



IF YOU'RE  
WAITING  
FOR A SIGN (S)

THIS  
IS IT.

**DANGER**

**KEEP OFF!**



**WARNING!**

Sitting for extended  
periods of time  
WILL cause  
IRREPARABLE  
harm to your health

ARE YOU  
SITTING  
Too Much?



***NO  
ELEVATORS  
DAY***



**Take the Stairs**

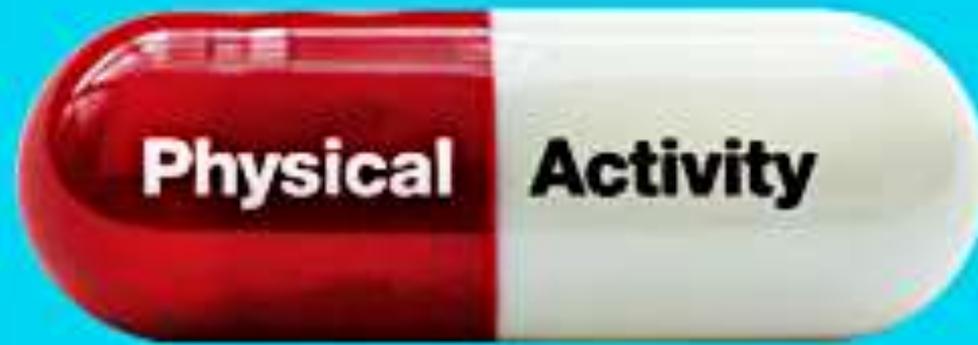
**Burn Calories,  
Not Electricity**



**WALK TO**  
**WORK DAY**

**THURSDAY APRIL 7, 2016**

# Miracle Cure!



**If any single drug had the same range  
of health benefits as Physical Activity it  
would be sold as a miracle cure!**

There is no magic pill.  
No shake.  
No special diet.

Just get off your butt.

som**ee**cards  
user card





**Final  
Thought ....**

**“If I had first concentrated on heart disease prevention, rather than saving the lives of 150 people, I could have saved the lives of 150 million.”**

**Christian Barnard, MD, 2001**

**(Performed The First Successful Heart Transplant, 1967)**



Time for  
Questions