The Role of Physical Activity in Cardiometabolic Health

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Every Body WALK!
The Campaign to Get America Walking

Exercise is Medicine™
What Factors Determine Our Health and Longevity?

- Behavior
- Genetics
- Environment
# Leading Causes of Death in the World; 2014

<table>
<thead>
<tr>
<th>Cause</th>
<th>Number</th>
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</thead>
<tbody>
<tr>
<td>Heart Disease</td>
<td>7.4 Million</td>
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<tr>
<td>Stroke</td>
<td>6.7 Million</td>
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<tr>
<td>COPD</td>
<td>3.1 Million</td>
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<tr>
<td>Lower Respiratory Infection</td>
<td>3.1 Million</td>
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<tr>
<td>Lung Cancers</td>
<td>1.6 Million</td>
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<tr>
<td>HIV/AIDS</td>
<td>1.5 Million</td>
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<tr>
<td>Diarrheal Disease</td>
<td>1.5 Million</td>
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<tr>
<td>Diabetes</td>
<td>1.5 Million</td>
</tr>
<tr>
<td>Road Injury</td>
<td>1.5 Million</td>
</tr>
<tr>
<td>Hypertension</td>
<td>1.3 Million</td>
</tr>
</tbody>
</table>

World Health Organization
Actual Causes of Death

Leading Actual Causes of Death in the U.S.

1. Tobacco, 18.1%
2. Physical inactivity and Poor diet, 16.6%
First generation on pace to **NOT** out-live their parents?
Cardiovascular Disease (CVD)

- The major cause of death in developed countries.
- Combination of risk factors lead to CVD:
  - Some of the most important ones are modifiable (inactivity, smoking, diet).
  - Others less modifiable (psychosocial factors) or non modifiable (genetics, age and sex).
- Physical inactivity (and low fitness) is arguably the most important.
  - This is not reflected by current medical practice.
  - Inadequate emphasis on increasing PA.
The Classification of Risk Factors for Cardiovascular Disease

- Surrogate outcomes of poor lifestyle choices and stress (hypertension, obesity, cholesterol and diabetes), along with smoking are given “causal” risk factor status for CVD disease.

- Physical inactivity is generally referred to as a “predisposing” risk factor.
  - Suggesting its influence on disease is entirely due to intensification of the causal factors.
  - Result has been disproportionate focus on drugs (mainly lipid and BP) to treat disease.
  - Research has proven this is incorrect.
The Effect of Exercise on CVD Risk

Even after accounting for traditional CVD risk factors (BP, DM, lipids, weight), the inverse relationship between PA & CVD risk persists.

- ~59% of the reduction in CVD risk with exercise is due to reducing Inflammation & Clotting (32.6%), BP (27.1%), lipids (19.1%), BMI (10.1%), A1C (8.9%).
- 41% of risk reduction due to other unknown mechanisms (perhaps endothelium function and remodeling or LV structure and function).
- Effect of weight loss is only on traditional risk factors.

Mora, Circulation, 2007
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Mora, *Circulation*, 2007
Fitness Correlates with CVD Mortality Risk* Regardless of BMI

*2316 Men with Diabetes; 179 CVD Deaths
Adjusted for age and examination year

Church, Arch Int Med, 2005
Patient’s deserve to know the facts...
Unfortunately – We have systematically engineered physical activity out of our daily routine.
“Eating alone will not keep a man well; He must also take exercise. For food and exercise… work together to produce health.”
Physical Activity at Work Prevents Coronary Artery Disease

Morris JN et al. *Lancet* 1953
The Effect of Physical Activity on CVD Primary and Secondary Prevention

- It can help prevent the major risk factors for CVD.
- In those that have risk factors for CVD, it can attenuate them.
- It lowers mortality associated with CVD.

It's not that diabetes, heart disease and obesity runs in your family. It's that no one runs in your family.
Physical Activity Prevents CVD Risk Factors
Fitness and Risk of Hypertension

Barlow CE et al. *Am J Epidemiol* 2006; 163:142-50

4884 healthy women; 5 yr follow-up; Controlled for BMI, age, hx of HTN
Fitness and the Incidence of Type 2 Diabetes


8633 healthy U.S. men
Reduction in Risk of Diabetes Lifestyle vs. Metformin

*Moderate intensity exercise of ≥150 min/week; Low calorie, low fat diet

**Reduction in Risk of Diabetes**

Lifestyle Intervention* 58%
Metformin 31%

DPP Research Group NEJM. 2002
The Multiple Effects of Exercise on CVD Risk Factors

- **Improved Lipids**
  - Higher HDL and improved cholesterol/HDL ratio
  - Lower serum triglycerides

- **Lower blood pressure and peripheral vascular resistance**

- **Improved glucose tolerance and insulin sensitivity**

- **Reduce inflammation and clotting**

- **Improved sleep, anxiety and depression**
Physical Activity Attenuates CVD Risks

“My doctor said only 1 glass of alcohol per day – I can live with that…”
CVD Events Compared With levels of Fitness and Severity of Hypertension

Most Importantly!
Physical Activity Lowers CVD Mortality
Fitness Correlates with CVD Death Rates in Both Men and Women*

*7,080 Women; 25,340 Men

*Adjusted for age, exam year and other risk factors

Blair et al. JAMA, 1996
Fitness, CVD Risk Factors and Mortality in Men

Risk Factors
- Current smoker
- SBP >140 mmHg
- Chol >240 mg/dl

*Adjusted for age, exam year, and other risk factors

Blair SN et al. JAMA 1996
PA Lowers Mortality in CAD Patients
Cardiovascular Health Study

- 1045 men and women ≥65 years with coronary artery disease.
- Followed for mortality for 9 years.
  - 489 deaths in 7284 patient years of follow-up.
- Physical activity assessed at baseline and at 3 years of follow-up.
- Shows dose-response relationship between PA and mortality in patients with CAD.

Janssen I & Jolliffe CJ. MSSE 2006
Change in Activity and Adjusted* Risk of Death

*Adjusted for baseline activity, age, sex, race, smoking, alcohol, adiposity, comorbidities

Janssen I & Jolliffe CJ. *MSSE* 2006
Stable CAD
Exercise Training vs Angioplasty

Exercise was 20 minutes/day on a cycle ergometer

Hambrecht R et al. *Circulation* 2004
4 Drug Treatments for CAD Cost Comparison

- **Plavix (Clopidogrel) 75 mg daily**
  - $160 per month; $1920 per year

- **Altace (Ramapril) 20 mg daily**
  - $166 per month; $1992 per year

- **Toprol XL 400 mg daily**
  - $170 per month; $2040 per year

- **Lipitor 40 mg daily**
  - $136 per month; $1632 per year

- **Grand Total**: $632 per month; $7584 per year
Exercise and Quality of Life
Quality of Life; The Geriatric Curve

High-Risk Lifestyle (inactive, smoke, poor diet)
The Effect of an Unhealthy Lifestyle
“Deficient Survival”

High-Risk Lifestyle (inactive, smoke, poor diet)

Deficient Survival
The Effect of a Healthy Lifestyle
“Squaring off” the Geriatric Curve

“The idea is to die young as late as possible.”
Ashley Montagu

NEJM, April 1998
Why Has the Medical Community Neglected Physical Activity as a Treatment?

- Easier for physician to issue a prescription to reduce BP, cholesterol, glucose or BMI.
  - Medication adherence is very low (1 in 6 take meds as prescribed).
  - Reliance on pills transfers responsibility for health to doctor resulting in lower patient physical activity.

- Widespread belief we cannot change physical activity habits. However:
  - Evidence brief counseling and pedometer programs can increase physical activity.
  - We are able to convince patients to take insulin shots, Coumadin, chemotherapy, etc – why not exercise?
Dose-Response Curve for Exercise

- **A** = Sedentary
- **B** = Moderately Active
- **C** = Highly Active

Weekly Exercise Time vs. Benefit

- Low to High weekly exercise time correlates with increasing benefit.

KAISER PERMANENTE
What Can We Do?

- **World Wide Exercise Rx initiative:**
  - Every patient; Every visit;
  - Every treatment plan.

- **Physical activity should be recorded as a vital sign and patients advised to get 30 min of mod exercise, 5 days per wk.**

- **Message should be the same from every medical provider.**

- **We must begin to merge the healthcare industry with the fitness industry.**
Exercise as a Vital Sign

- Essential first step in moving the EIM initiative forward.
  - Every patient needs to be asked about their exercise habits at every visit.
  - Record with BP, HR, temp, BMI and smoking history.

- All Electronic Medical Records (EMR’s) need a query for exercise.
  - Medical assistant should ask about exercise during patient intakes.
  - Must be easy to ask and record.
Write a walking Rx for patients!

Name: John W. Smith  Age: 30

Walking Rx

Date: ______

Recommended activity level: Moderate

Minutes per day: 30 minutes

Number of days per week: 5 or more

Intensity: Hard enough that you can’t sing, but not so hard you can’t talk during exercise.

Stop: If you experience chest pain, excessive shortness of breath or feel ill.

Signature: Robert Sallis, MD

Every Body
WALK!
www.everybodywalk.org
Exercise Vital Sign Correlates With Risk of an Acute Coronary Event (MI or Angioplasty)

Sallis. MSSE 2016; abstract
Change from Mean A1C

Young et al. Prev Chronic Dis; 2014

Exercise Vital Sign Correlates With Cardiometabolic Risk Factors in Women*

*369,120 Women
*Controlled for age, sex, race, BMI and smoking
“At Kaiser Permanente, we want you to Live Well, Be Well and THRIVE!”
EVERY BODY WALK!
LET’S ALL WALK FOR FUN AND BETTER HEALTH

I’d like to personally invite you to join me on an important and fun mission to walk 30 minutes a day, five days a week — and to help us spread the word about how walking may be the single most important commitment you can make to your health and the health of our nation.

If we each walk 30 minutes a day (or 15 minutes twice a day), five days a week, we will be taking the most effective course of action possible to help prevent or help manage chronic health conditions, including type 2 diabetes, heart disease, depression, and asthma. It’s really that simple. The research supporting the benefits of walking is irrefutable and growing every day — and you’ll feel good doing it.

I am pleased to announce that we are introducing a new online walking program, called KP Walk!, to support and encourage all of us at Kaiser Permanente to walk 30 minutes a day, five days a week. To learn more about this program, go to www.kpwalk.com and get started on your journey to better health.

KP Walk! is complemented by an external campaign that Kaiser Permanente is launching called Every Body Walk! Information about this campaign can be found at www.everybodywalk.org.

Let’s all walk ... and thrive!

George Halvorson
Chairman and CEO
Kaiser Health Plan and Hospitals

George Halvorson
Chairman and CEO
Kaiser Health Plan and Hospitals
Vivek Murthy, MD, MBA
Surgeon General’s Call to Action on Walking

Washington DC
September 9, 2015
Clinicians need help!
How do we integrate fitness into healthcare?

- I need something beyond telling my patient to go walk!

- Components of fitness
  - CV fitness
  - Strength
  - Flexibility

- Need to be able to refer
  - Health Club and Fitness professional
  - EIM Solution
Muscle Strength and CVD Mortality; 8762 Men*

*145 CVD deaths during average follow-up of 18.9 years

Death Rate per 10,000 MY

- Low
- Middle
- High

Summary

- Evidence is overwhelming for benefit of exercise in the primary and secondary prevention of CVD.
  - PA levels should be assessed at every visit using a PA vital sign.
  - The “Big 3” (exercise, smoking, diet) should be much more aggressively managed in clinical practice.
  - Merge fitness industry with healthcare industry.

- All Healthcare Providers should prescribe exercise to patients and take it themselves.

- Exercise is Medicine for CVD and it’s free!
It’s time for a change...