

A brisk walk through the history of US physical activity guidelines



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- 
- A vibrant landscape featuring a bright rainbow arching across a cloudy sky. The foreground is filled with lush greenery, including tall grasses, purple flowers, and white lilies. In the background, rolling green mountains are visible under a dramatic, overcast sky. A small bird is seen flying in the upper right portion of the sky.
- “I get my exercise...



acting as pallbearer to my friends
who exercise.”

Chauncey Depew, Readers Digest 1938

<https://quoteinvestigator.com/2012/01/13/exercise-as-pallbearer/>

Two seminal studies

- Jeremy Morris 1953 – lower risk of CAD events in
 - **Bus conductors**—*light*-intensity walking in aisles of bus; short bouts *vigorous*-intensity climbing up bus stairs
 - **Postmen** – various length bouts of *moderate*-intensity walking
- Paffenbarger 1978 – lower incidence of CAD events in
 - **Harvard alumni** with higher levels of PA.
 - PA measured as total energy expenditure in: “*light* sports (e.g. bowling, baseball) + *vigorous* sports (e.g. running, skiing) + total stairs climbed (*vigorous*) + blocks walked per day (*moderate*-intensity).



Historical Trivia: First Federal PA guideline? 1979 SG recommendation -- in the appendix

HEALTHY PEOPLE

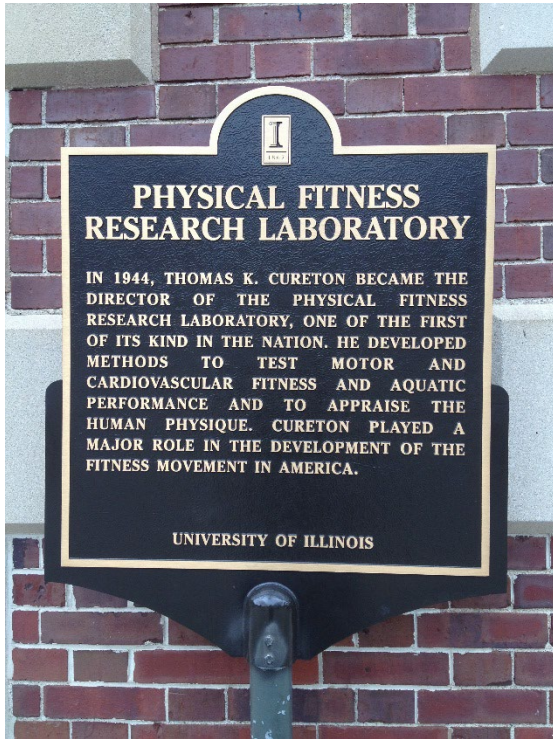
The Surgeon General's Report On
Health Promotion And Disease Prevention



- *Appendix A1*: “Adults should be encouraged to exercise vigorously—if possible, at least three times a week for about 15-30 minutes each time.”

(Julius Richmond MD was ASH and SG= Surgeon General)

Importance of Thomas K. Cureton, Jr.



- ❑ Main leader of America's fitness movement for a half century. Often called a "quack" & "charlatan." But he did research to back up his statements, esp PA and CVD.
- ❑ Famous photo of him running thru UIUC cemetery: He allegedly said: "*I run past the graves of my critics.*"
- ❑ Cureton: One must "*face the fact there are no short cuts. It will take three months of hard work-possibly the hardest work on your life—before you see sufficient changes.*"



1993/1995 CDC/ACSM guideline

- “Every US adult should accumulate 30 minutes or more of moderate-intensity physical activity on most, preferably all, days of the week.”

Front Page, New York Times, July 30, 1993



- Dr. Blair “we were wrong...”
- Dr. Pate (President of ACSM): "People can climb stairs instead of riding elevators and escalators. They can garden. They can rake leaves. They can dance. They can walk part or all of the way to work."
- **(Dr. Buchner is NOT involved in this)**



Special Communication

Physical Activity and Public Health

A Recommendation From the Centers for Disease Control and Prevention and the American College of Sports Medicine

Russell R. Pate, PhD; Michael Pratt, MD, MPH; Steven N. Blair, PED; William L. Haskell, PhD; Caroline A. Macera, PhD; Claude Bouchard, PhD; David Buchner, MD, MPH; Walter Ettinger, MD; Gregory W. Heath, DHSc; Abby C. King, PhD; Andrea Kriska, PhD; Arthur S. Leon, MD; Bess H. Marcus, PhD; Jeremy Morris, MD; Ralph S. Paffenbarger, Jr, MD; Kevin Patrick, MD; Michael L. Pollock, PhD; James M. Rippe, MD; James Sallis, PhD; Jack H. Wilmore, PhD

Objective.—To encourage increased participation in physical activity among Americans of all ages by issuing a public health recommendation on the types and amounts of physical activity needed for health promotion and disease prevention.

Participants.—A planning committee of five scientists was established by the Centers for Disease Control and Prevention and the American College of Sports Medicine to organize a workshop. This committee selected 15 other workshop discussants on the basis of their research expertise in issues related to the health implications of physical activity. Several relevant professional or scientific organizations and federal agencies also were represented.

Evidence.—The panel of experts reviewed the pertinent physiological, epidemiologic, and clinical evidence, including primary research articles and recent review articles

acceptance of the importance of physical activity, millions of US adults remain essentially sedentary.⁸

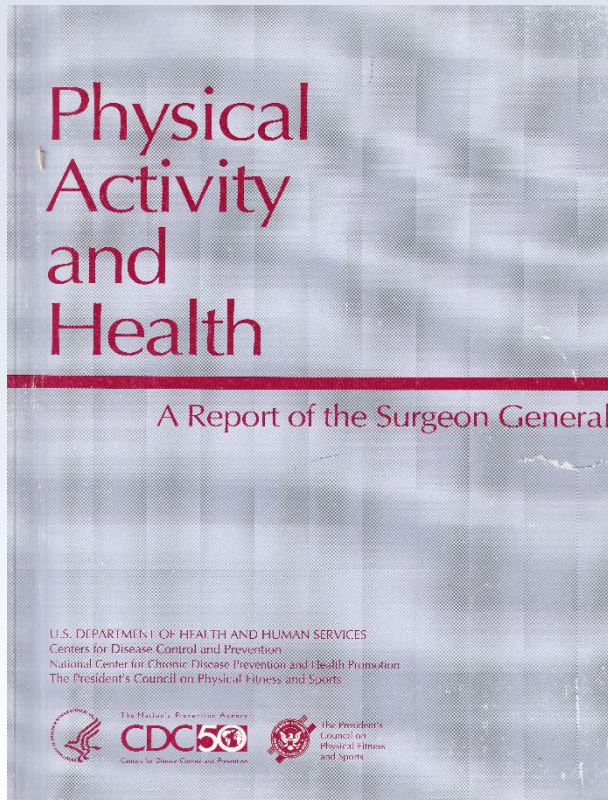
If our sedentary society is to change to one that is more physically active, health organizations and educational institutions must communicate to the public the amounts and types of physical activity that are needed to prevent disease and promote health. These organizations and institutions, providers of health services, communities, and individuals must also implement effective

Comments

- “Push back” against long guideline docs no one reads
 - Ironically, >11,500 citations of the 1995 JAMA paper
 - Too short to include “more is better”
- Difficult to communicate PA guidelines to public
 - Co-authors were surprised by this
 - “most”, “moderate-intensity,” “every” (what about vigorous PA?)
- Set the definition of Moderate-intensity (3.0 to 5.9/6.0) METs
 - With a “cut-point” problem –so 2.9 METs= no health benefit ?
 - Absolute METs not appropriate guide for older adults.
- Around 1994, I was asked by Steve Blair to work on companion paper on guidelines for older adults.



1996 Surgeon General Report



- Issued a VOLUME recommendation:
 - “Significant health benefits can be obtained by including a moderate *amount* ... of physical activity on most, if not all, days of the week.
- The disagreement between the SG volume rec and the CDC/ACSM moderate intensity rec went almost unnoticed
- Curiously, the CDC/ACSM guideline was cited by PA professionals as the Surgeon General’s guideline



From SG Report “At A Glance”

“A moderate amount of physical activity is roughly equivalent to physical activity that uses approximately 150 Calories (kcal) of energy per day, or 1,000 Calories per week.”

EXAMPLES OF MODERATE AMOUNTS OF ACTIVITY

Washing and waxing a car for 45–60 minutes

Washing windows or floors for 45–60 minutes

Playing volleyball for 45 minutes

Playing touch football for 30–45 minutes

Gardening for 30–45 minutes

Wheeling self in wheelchair for 30–40 minutes

Walking 1 ³/₄ miles in 35 minutes (20 min/mile)

Basketball (shooting baskets) for 30 minutes

Bicycling 5 miles in 30 minutes

Dancing fast (social) for 30 minutes

Pushing a stroller 1 ¹/₂ miles in 30 minutes

Raking leaves for 30 minutes

Walking 2 miles in 30 minutes (15 min/mile)

Water aerobics for 30 minutes

Swimming laps for 20 minutes

Wheelchair basketball for 20 minutes

Basketball (playing a game) for 15–20 minutes

Bicycling 4 miles in 15 minutes

Jumping rope for 15 minutes

Running 1 ¹/₂ miles in 15 minutes (10 min/mile)

Shoveling snow for 15 minutes

Stairwalking for 15 minutes

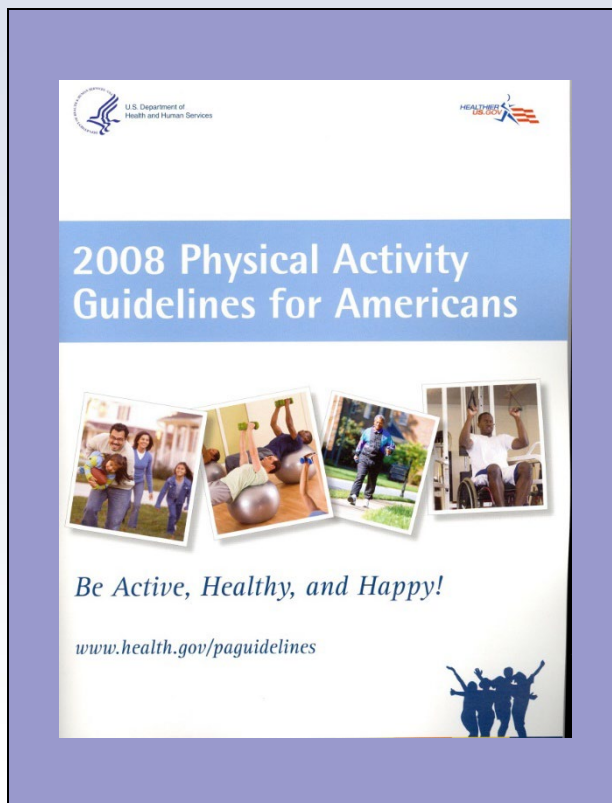
Less Vigorous,
More Time



More Vigorous,
Less Time



Process for Creating 2008 DHHS PA Guidelines



- Physical Activity Guidelines Advisory Committee (PAGAC) does evidence review (700+ pages)
- Federal scientists write *Guidelines* policy document based on PAGAC review (I chair the writing team) (50+ pages)
- Communication experts prepare materials for dissemination to public (1+ pages)



#5: 2002 Institute of Medicine report



- IOM report issues physical activity recommendation based on analysis of DLW dataset, to be used in *Dietary Guidelines*:
 - Adults & children should engage in at **least 60 minutes/day** of moderate-intensity PA
- Data analysis was contested



#4: 10,000 Steps “Guideline”



- People promoted it as a “guideline.” It is not.
- Inappropriate for most older adults.
- “Every step counts-- some more than others.” DMB
- Prof Finkelstein....



#3: Gap in BRFSS scoring:



- CDC Surveillance system BRFSS scored people as “sufficiently active” if met:
 - 20 x 3 vigorous guideline
- OR
 - 30 x 5 moderate guideline
- I find out:
 - A person who runs 60 minutes 2 days/week & walks 60 minutes 3 days/week DID NOT meet guidelines

#2: PA Guidelines are included in DHHS/USDA *Dietary Guidelines*



- No new evidence reviews
 - Re-state existing PA guidelines (except there are no comprehensive PA guidelines)
- I was asked to advise Dietary Guidelines clearance
 - Materials under review recommend *vigorous* activity for children. But no mention of vigorous in the dietary guidelines (!).
- I'm asked: "Is it OK to say children can engage in vigorous activity?"

What about the older adult CDC/ACSM Guideline paper?



#1: CDC will not clear updated CDC/ACSM Guidelines



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}

¹John Hancock Center for Physical Activity and Nutrition, Tufts University, Boston, MA; ²Friedman School of Nutrition Science and Policy, Tufts University, Boston, MA; ³Department of Health and Exercise Science, Wake Forest University, Winston-Salem, NC; ⁴Department of Exercise Science and Department of Epidemiology and Biostatistics, University of South Carolina, Columbia, SC; ⁵Division of Physical Therapy, Department of Community and Family Medicine, Duke University, Durham, NC; ⁶Evercare, Hartford, CT; ⁷Center on Aging, University of Connecticut School of Medicine, Farmington, CT; ⁸Departments of Health Research & Policy and Medicine, Stanford University, Stanford, CA; ⁹Graduate School of Public Health, San Diego State University, San Diego, CA; and ¹⁰Jean Mayer USDA Human Nutrition Research Center on Aging, Tufts University, Boston, MA

ABSTRACT

NELSON, M. E., W. J. REJESKI, S. N. BLAIR, P. W. DUNCAN, J. O. JUDGE, A. C. KING, C. A. MACERA, and C. CASTANEDA-SCEPPA. Physical Activity and Public Health in Older Adults: Recommendation from the American College of Sports Medicine and the American Heart Association. *Med. Sci. Sports Exerc.*, Vol. 39, No. 8, pp. 1435–1445, 2007. **Objective:** To issue a recommendation on the types and amounts of physical activity needed to improve and maintain health in older adults. **Participants:** A panel of scientists with expertise in public health, behavioral science, epidemiology, exercise science, medicine, and gerontology. **Evidence:** The expert panel reviewed existing consensus statements and relevant evidence from primary research articles and reviews of the literature. **Process:** After drafting a recommendation for the older adult population and reviewing drafts of the Updated Recommendation from the American College of Sports Medicine (ACSM) and the American Heart Association (AHA) for Adults, the panel issued a final recommendation on physical activity for older adults. **Summary:** The recommendation for older adults is similar to the updated ACSM/AHA recommendation for adults, but has several important differences including: the recommended intensity of aerobic activity takes into account the older adult's aerobic fitness; activities that maintain or increase flexibility are recommended; and balance exercises are recommended for older adults at risk of falls. In addition, older adults should have an activity plan for achieving recommended physical activity that integrates preventive and therapeutic recommendations. The promotion of physical activity in older adults should emphasize moderate-intensity aerobic activity, muscle-strengthening activity, reducing sedentary behavior, and risk management. **Key Words:** OLDER ADULTS, PHYSICAL ACTIVITY, BENEFITS, RISKS, HEALTH

In 1995 the Centers for Disease Control and Prevention (CDC) and the American College of Sports Medicine (ACSM) published a preventive recommendation that "Every US adult should accumulate 30 minutes or more of

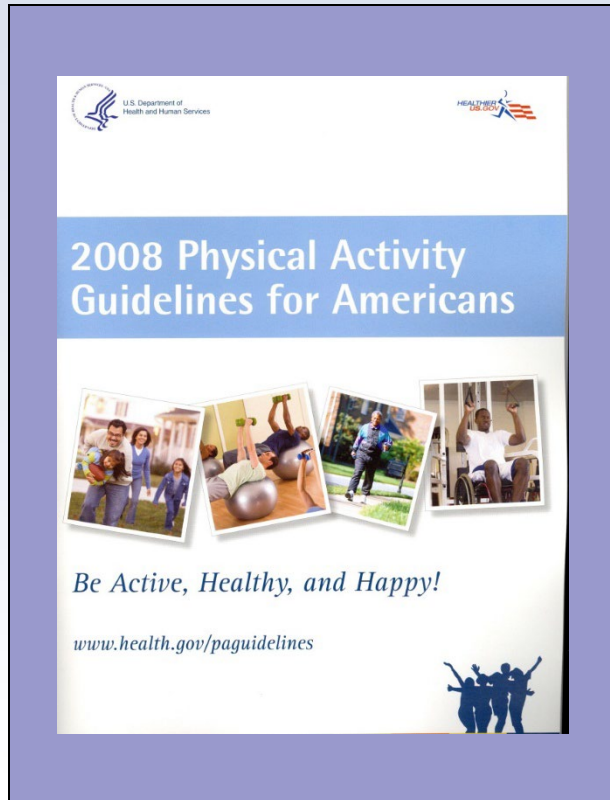
moderate-intensity physical activity on most, preferably all, days of the week" (46). Subsequently, ACSM and the American Heart Association (AHA), in a companion paper (25) to the present article, provide an update to this recommendation. The update is more inclusive and provides recommendations for moderate-intensity aerobic activity, vigorous-intensity aerobic activity, and muscle-strengthening activity. It states explicitly that many adults should exceed the minimum recommended amount of activity

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2008 Guidelines Writing Group



Success at last – I finish editing guidelines and go to my CDC goodbye party



- 1 min vigorous = 2 min moderate
- Relative intensity OK
- Dose response
- Child, Adult, Older adult, pregnant women, people with disabilities
- Injury Prevention (no evidence to support pre-exercise screening in healthy people)
- Last chapter on PA promotion; inc count steps during walk 10 min & then set step goal.



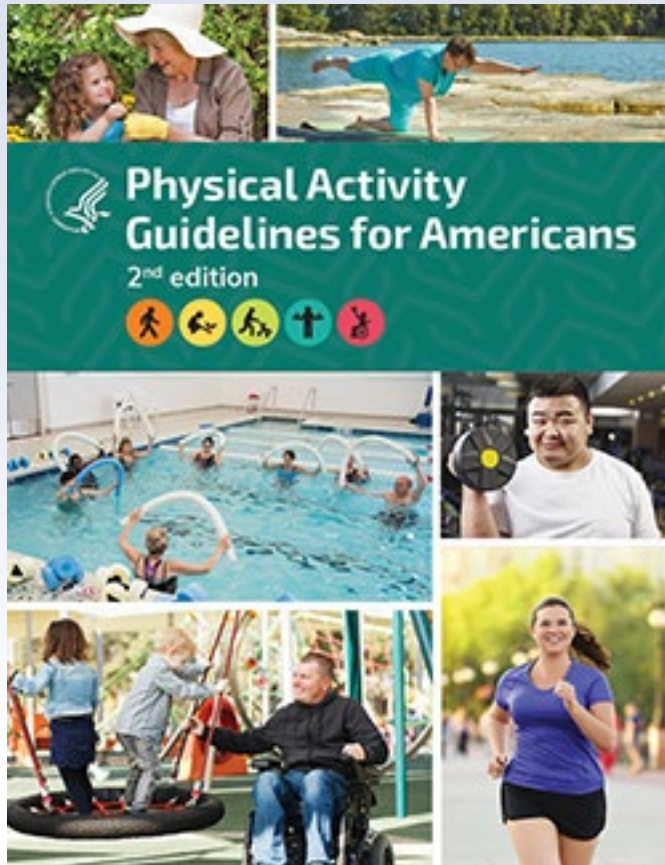
Worldwide Impact



- 2008 PAGAC report was the basis for
 - WHO PA guidelines
 - UK uniform guidelines across England, Scotland, Wales, and Northern Ireland
 - For her work in leading the UK guidelines, Fiona Bull was awarded Order of the British Empire (MBE) by Queen Elizabeth in 2014



2018 PA Guidelines



- I switch sides:
 - Now I'm a member of PAGAC
- I focus on evidence reviews
 - In older adults
 - In people with chronic conditions
- Just 4 comments



#1: Summary Paper of PAGAC report

Journal of Physical Activity and Health, 2019, 16, 1-11
<https://doi.org/10.1123/jpah.2019-0618>
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ORIGINAL RESEARCH

The Scientific Foundation for the *Physical Activity Guidelines for Americans, 2nd Edition*

Kenneth E. Powell, Abby C. King, David M. Buchner, Wayne W. Campbell, Loretta DiPietro, Kirk I. Erickson, Charles H. Hillman, John M. Jakicic, Kathleen F. Janz, Peter T. Katzmarzyk, William E. Kraus, Richard F. Macko, David X. Marquez, Anne McTiernan, Russell R. Pate, Linda S. Pescatello, and Melicia C. Whitt-Glover

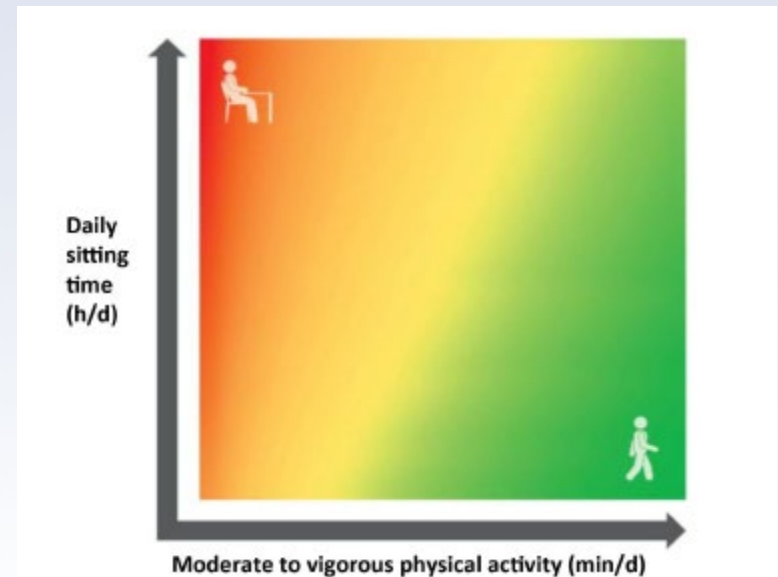
Background: The 2018 Physical Activity Guidelines Advisory Committee Scientific Report provides the evidence base for the *Physical Activity Guidelines for Americans, 2nd Edition*. **Methods:** The 2018 Physical Activity Guidelines Advisory Committee addressed 38 questions and 104 subquestions selected for their public health relevance, potential to inform public policies and programs, maturity of the relevant science, and applicability to the general US population. Rigorous systematic literature searches and literature reviews were performed using standardized methods. **Results:** Newly described benefits of physical activity include reduced risk of excessive weight gain in children and adults, incidence of 6 types of cancer, and fall-related injuries in older people. Physical activity is associated with enhanced cognitive function and mental health across the life span, plus improved mental health and physical function. There is no threshold that must be exceeded before benefits begin to accrue; the accrual is most rapid for the least active individuals. Sedentary time is directly associated with elevated risk of all-cause and cardiovascular mortality, incident cardiovascular disease and type 2 diabetes, and selected cancer sites. A wide range of intervention strategies have demonstrated success in increasing physical activity. **Conclusion:** The 2018 Physical Activity Guidelines Advisory Committee Scientific Report provides compelling new evidence to inform physical activity recommendations, practice, and policy.

Keywords: public health, exercise, disease prevention, health promotion

Regular physical activity is associated with a wide range of health benefits.¹ Unfortunately, only about 20% of adults and high school aged youth meet the current federal guidelines for both

aerobic and muscle-strengthening physical activity.² In 2016, the US Department of Health and Human Services convened the 2018 Physical Activity Guidelines Advisory Committee (PAGAC) to review and summarize the current scientific evidence regarding the relationship between physical activity and health. The committee's report serves as the basis for the *Physical Activity Guidelines for Americans, 2nd Edition*,³ which updates the 2008 Physical Activity Guidelines for Americans.⁴ The 2008 PAGAC Scientific Report⁵ provided a fundamental starting point for allowing the 2018 Committee to examine more broadly the wide-ranging benefits of physical activity to health, as well as the types, volumes, and intensities of physical activity that are associated with those benefits.

Powell is retired from the Centers for Disease Control, Georgia Department of Public Health, Atlanta, GA. King is with the Departments of Health Research & Policy (Epidemiology), and Medicine, School of Medicine, Stanford Prevention Research Center, Stanford University, Stanford, CA. Buchner is with the Department of Kinesiology and Community Health, University of Illinois at Urbana-Champaign, Champaign, IL. Campbell is with the Department of Nutrition Science, Purdue University, West Lafayette, IN. DiPietro is with the Department of Exercise and Nutrition Science, Milken Institute School of Public Health, The George



Recall the 1996 SG report....





#2: Balance training

- 2008 *Guidelines*:
 - BT recommended for older adults at increased risk of falls.

- 2018 *Guidelines*:
 - BT recommended for **all** older adults.

#3: In people with knee osteoarthritis, do more steps/day cause OA to get worse?

- PAGAC located cohort data of (1) baseline vs follow-up MRI measures of joint pathology (2) average steps/day
- Results = interaction effect.
- In mild knee OA:
 - No relationship between # steps/day and worsening of arthritis over time.
- In moderate-severe knee OA:
 - Walking more than 10,000 steps/day is associated with faster progression of arthritis joint pathology



#4 Tribute to Steve Blair

- Major finding of 2018 Guidelines:
 - Strong evidence that PA reduces risk of cognitive impairment
- Steve Blair's mantra:
 - If you have fitness, fatness doesn't matter (much).
- Reverse causation is a problem in studying whether fitness (lean body mass) reduces risk of dementia.
 - Possibly, in very early dementia, dementia causes lower PA, and hence lower lean mass.
- UK Biobank study finds genetic markers of lean body mass present at birth, to create genetic proxy measure of lean mass.



2023: Lean mass, but not fat mass, associated with risk of Alzheimer's disease

