Our early ancestors predominately consisted of hunter-gatherer types ensuring the “Running Man” as a standard of fitness for their survival. If you did not run, you did not eat. Individuals who could out-run & out-plan their peers would survive.
Movement of muscles
Primary motor cortex
Perceptions and memories are translated into plans and actions by the frontal lobes
Motor association cortex
Plans for movements
Primary auditory cortex
Auditory information
Temporal lobe pulled down to show primary auditory cortex
Perceptions and memories
Sensory association cortex
Primary somatosensory cortex
Visual information
Sensory information from body
Perceptions and memories
Primary visual cortex (mostly on inner surface)
Sensory association cortex
“That which we call thinking is the evolutionary internalization of movement.”

Lilnas, 2001
EVOLUTION TEACHES...

Early humans survived because they had the ability to perform demanding physical work. Individuals who could out-run & out-plan their peers would survive.

Humans are endurance predators.
Sitting Time and Mortality From All Causes, Cardiovascular Disease & Cancer

Sitting independent association with mortality beyond that explained by PA levels.

Independent of Physical Activity... There is a dose response association between sitting and mortality from all causes and cardiovascular disease.

In addition the promotion of physical activity and healthy weight.... “physicians should discourage sitting for extended periods.”

High amounts of sitting cannot be compensated for with occasional Physical Activity, even if the amount exceeds the current Physical Activity recommendations.

Sitting and mortality highest among obese subjects.
Early-Onset Obesity and Its Effect on I.Q.

- Prader-Willi Syndrome (19 children & 5 adults):
  - I.Q. Score: 63

- Siblings: 150% Ideal Weight before age 4 (18 children & adults):
  - I.Q. Score: 78

- Siblings: Normal Weight (24 children & adults):
  - I.Q. Score: 106


Chicago, March 2, 2007
Play evolved – to promote survival. Play makes the brain smarter - more adaptable - higher animals.

Play is the basis of social contact and group interaction - fostering empathy – The core of creativity and innovation.

Play gives us the ability to become smarter and more creative, to learn more about the world than the genes could ever teach, to adapt to a changing world.

In a world of continuously presenting unique challenges and ambiguities.. Play Prepares the Player to cope with the evolving planet.

The more recess… the better behaved and attentive the student or worker.
Every student at Madison Junior High completes a computer-based fitness test. Students spend one day a week in the school's state-of-the-art fitness center.

**California Department of Education 2001 Study**

33% of freshmen in California were overweight or obese.

**Naperville – District 203 – 2002 Study**

3% of freshmen were overweight or obese. 19,000 children in the district.

**TIMSS – Trends in International Mathematics / Science.**

An international benchmarking test comparing the achievement of eighth-grade students. In 1999, Naperville District 203 scored #1 in science and #6 in math. An amazing 94.1% of Naperville parents were satisfied with the PE curriculum.
BRAIN CHEMISTRY

EXERCISE is like taking ..... a little Prozac & a little Adderall
PTSD or LEARNED HELPLESSNESS

FAILURE
EMBARRASSMENT
SELF-HATE
GIVING UP
CLASS CLOWN

I'M NOT COMPLETELY WORTHLESS I CAN ALWAYS SERVE AS A BAD EXAMPLE
EXERCISE OPTIMIZES LEARNING

SYSTEMS

NEW Cell Growth

Cellular
Fitness, Hippocampus Size, and Memory

- Kids who were fit and who had better memory, also had larger hippocampii
- Fitness increases neurons, connectivity- 28 fit 21 non

Role of PA in diabetes management and prevention

Hayes, Kriska

PA lifestyle plays vital role in both management of type I diabetes and prevention and management of type 2 diabetes. PA contributes to weight loss and weight management, improves insulin/glucose profile for people with pre-diabetes, glycemic control with people with type 2 diabetes, and quality of life for everyone.

Type 2 diabetes – PA reduces risk of cardiovascular all-cause mortality.

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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
Love to measure and keep records

1.2 million boys born 1950-76; finished H.S. 15 and entered military 18. 270,000 brothers, 1300 identical twins

Tested cardio (ergonometric) muscle (knee, elbow, hand) and cognitive appraisal—both at 15 and 18.

Those that improved cardio fitness improved IQ and smarts. Not as much with muscle strength. Also those that improved went on to be better education, more satisfaction with life, and higher socio-economic standing.

"We believe the present results provide scientific support for educational policies to maintain or increase physical education in school curricula as a means to stem the growing trend toward a sedentary lifestyle, which is accompanied by an increased risk for diseases and perhaps intellectual and academic underachievement," write researchers Maria Aberg and colleagues of the University of Gothenburg in Gothenburg, Sweden in the Proceedings of the National Academy of Sciences. 2009 Nov 30. [Epub ahead of print]
Harvard on the Move, a new initiative sponsored by President Drew Faust (from left), kicked off with a panel discussion at Sanders Theatre on Wednesday. Panelists included Daniel Lieberman, professor of human evolutionary biology and department chair of human evolutionary biology in the Faculty of Arts and Sciences, Christopher McDougall ’85, author of "Born to Run: A Hidden Tribe, Superathletes, and the Greatest Race the World Has Never Seen," and John Ratey, an associate clinical professor of psychiatry at Harvard Medical School.