Sitting Disease: New Evidence and Cost Effective Strategies for a Healthier Workplace

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The Value You’ll Get Today – 4C’s

- Data that Frames the Problem
- Potential Health & Performance Issues
- New Alternatives for Active Movement
- Case Study Applications (ROI)
Changing Workplace Dynamics
GLOBAL WORKFORCE GENERATIONS

THE SILENT GENERATION
born before 1946
Values Hard Work

BABY BOOMERS
born between 1946 & 1964
Values Loyalty

GEN XERS
born between 1965 & 1980
Values Work-Life Balance

GENERATION Y aka MILLENNIALS
born between 1981 & 2000
Values Innovation and Change

GENERATION Z
born 2001- present
Self-Reliant and Activities Oriented
Multigenerational Workforce Drivers

• Labor shortages (not surplus)
• Knowledge base (not physical labor)
• Team dynamics (not hierarchy)
• Technology
• Globalization

The first true digital natives
LIVING MORE SEDENTARY LIVES

Change for the Worse - Sedentary jobs have risen 83% since 1960 and now account for 43% of all U.S. jobs.

How do you feel when you sit all day?
Hazards of Prolonged Sitting
New Evidence on Sedentary Risks

• **The Maastricht Study** - An extra hour of sedentary time was associated with a 22% increased odds for type 2 diabetes and a 39% increased odds for the metabolic syndrome

• Results suggest that sedentary behavior may play a significant role in the development and prevention of type 2 diabetes
Obesity Trends Among U.S. Adults
Obesity Epidemic

• Obesity has risen due to highly accessible inexpensive energy-dense foods and concurrent physical inactivity.

• Two-thirds of the USA population are overweight (BMI >25kg/m²) and one-third are obese (BMI>30kg/m²),

• Problem attributed to a persistent positive energy balance as small as 100kcal/day.

New Global Evidence on Sedentary Risks

• Research has repeatedly linked sedentary behavior with increased risk of obesity, cardiovascular diseases, diabetes, and more.

• A study published in the American Journal of Preventive Medicine (August 16, 2016) estimated that prolonged sitting is responsible for 430,000 all-cause deaths over 54 countries, and that sedentary behavior is a leading risk factor for mortality, second only to smoking.
New Evidence on Sedentary Risks

- The Maastricht Study - An extra hour of sedentary time was associated with a 22% increased odds for type 2 diabetes and a 39% increased odds for the metabolic syndrome.

The Maastricht Study.
New Evidence on Sedentary Risks

doi:10.1007/s00125-015-3861-8
The Maastricht Study.
Newton’s 1\textsuperscript{st} Law
It’s fine if you want to sit. Just so it's an informed decision

• Beware of the risks for Workout – Sit Cycle
  – Just like a salad doesn’t undo a cigarette
  – Sit less, move more

Deborah Rohm Young et. Al Sedentary Behavior and Cardiovascular Morbidity and Mortality. A Science Advisory From the American Heart Association, Circulation, August 2016
Basal Metabolic Rate Declines with Age

Decrease in basal metabolic rate with age, an indication of the decline in energy utilization and production

More Caloric Intake + Less Exercise = Weight Gain
Marc Hamilton, Ph.D. found that sitting shuts down expression of lipoprotein lipase (LPL) in skeletal muscle, preventing muscle cells from importing fat.
Prolonged Sitting and Back Pain
Traditional Sitting is Under Pressure

“Today the AMA adopted policy recognizing the potential risks of prolonged sitting and encouraging employers, employees and others to make available alternatives to sitting... **Prolonged sitting**, particularly in work settings, can cause **health problems** and offering employees alternatives to sitting all day will help create a healthier workforce.”

– June 18, 2013

Policy H-440.843 Health Risks of Sitting
The Evolution of Sedentary Time

March 16, 2017 - Government of Canada invests in program to combat sedentary behavior in the workplace. Sit Kicker is a nationwide initiative focused on encouraging Canadians who work in office settings to reduce sedentary behavior and "kick the sit" out of their work habits.
Competition for Top Talent
Competition for Talent

• The average tenure for employees, regardless of age is?

www.bls.gov/news.release/tenure.nr0.htm updated December 22, 2016
“Experts, leaders and youths all expressed the need for the workplaces in 2030 to support overall wellbeing. These demands will impact building and workplace design. An industry of wellness in buildings is emerging – with a broad and holistic perspective.”
Goal for Greektown: No cars, more traffic

WELL Building Standard Structure

We believe that buildings should be developed with people’s health and wellness at the center of design. The WELL Building Standard takes a holistic approach to health in the built environment addressing behavior, operations and design.

WELL is a performance-based system for measuring, certifying, and monitoring features of the built environment that impact human health and wellbeing, through air, water, nourishment, light, fitness, comfort, and mind.

WELL is composed of 102 Features that are applied to each building project, and each WELL Feature is designed to address issues that impact the health, comfort, or knowledge of occupants.

Features can be:

- **Performance-based standards**: allow flexibility in how a project meets acceptable quantified thresholds.
- **Descriptive standards**: require that specific technology, design strategies, or protocols are implemented.

WELL Features are categorized as either **Preconditions**—necessary for baseline WELL Certification or Compliance, or **Optimizations**—optional enhancements, which together determine the level of certification above baseline certification.
Informal interactions that foster relationships among coworkers.

Allows workers to concentrate on a specific task without distractions.

Opportunities for knowledge building, or exploring ways to improve on what’s already happening.

Bringing individuals together to achieve one goal.
Comfort + Active Movement = Ergonomics 2.0
THE SCIENCE
Research: Sedentary Time Risk

• Prolonged sedentary time was independently associated with deleterious health outcomes regardless of physical activity.

Active Couch Potato

- A person who sits for up to 9-10 hours of their waking day and yet still goes to the gym and performs moderate to vigorous exercise for at least one hour per day.

If you're 60 and older, every additional hour a day you spend sitting is linked to 50% greater risk of being disabled -- regardless of how much moderate exercise you get.

*Source - Northwestern University; “Dangers of sitting”, 2014*
Non-Exercise Activity Thermogenesis

Kcal/day

- Basal metabolic rate (1000)
- Thermic effect of food (2000)
- Activity thermogenesis (3000)

Exercise
Non-exercise Activity Thermogenesis (NEAT)
STANDING MATH

- Heart Rate = on average 10 beats per minute higher
- Equals a difference of .7 of a calorie per minute
- That’s up to about 50 calories/hour
- If you stand for 3 hours a day for 5 days, it’s around 750 calories
- Over the course of a year, adds up to about 30,000 extra calories
- You burn about 3,000 calories to lose a pound of fat

THAT IS 10 POUNDS A YEAR!
Sit-Stand Desks – An Incomplete Solution

• How long is someone able to stand up?  Answer:

Prolonged Standing Risks

• Prolonged standing at work has been shown to be associated with a number of potentially serious health outcomes
  – musculoskeletal disorders, chronic venous insufficiency, and carotid atherosclerosis have been identified as common health problems associated with prolonged standing
• Certain interventions are effective in reducing the hazards associated with prolonged standing
• This includes floor mats, footrails, & semi-standing seats

Objective

- **Evaluate** the physiological and biomechanical **differences** influenced by different office **working postures** (seated, perching, and standing)
Approach

Motion
- Postural transitions and joint kinematics

Muscle Activity
- Muscle forces and shared activation patterns

Spinal Loads
- Personalized model dependent on anthropometry, muscle activity, and motion

Discomfort
- Heart rate variability
- Subjective ratings of discomfort
Results

Postural Transitions

- Movement was generally found to be higher during perching and standing for all parts of the body.
- Most of the motions were found in two directions: forward/back (Z) and side to side (X).
Hip Motion (# of Shifts > 1cm / min)

X = Lateral
Y = Superior/Inferior
Z = Anterior/Posterior
Peak CI
Condition*Time (p = 0.0012)
Spinal Loads

- Coactivation patterns may be associated to the compressive and shear loads of the spine
Results

Discomfort – Heart Rate Variability

- Frequency and time responses of the variability of the heart rate may be linked to discomfort
- A higher LF/HF ratio may suggest higher discomfort
Cost Competitive Options
Design opportunities for movement into your workspace

- Try moving printers from individual desks to shared spaces
- Placing coffee makers in central pantries
- Encourage use of the stairs
Your Best Posture is the Next One
Ergonomists agree, saying it is important to strike a balance between sitting, standing and movement throughout the day.

For every 30 minute period, ergonomists recommend:

- 20 minutes of sitting/leaning/perching
- 2 minutes of movement
- 8 minutes of standing
BRAIN AFTER SITTING QUIETLY

BRAIN AFTER 20 MINUTE WALK

Research/scan compliments of Dr. Chuck Hillman University of Illinois
Create Flexible “Team Space”

Organizations are restructuring for several reasons, including the rise of millennial and gen Z workers who grew up playing team sports and have the same expectations at the office. Cisco was one of the first companies to embrace this trend, creating “Team Space,” a platform that delivers intelligence on how teams can work best to win together.

Small teams thus could have an Integrated Workforce Experience (IWE) presence without having to maintain the whole community—much like a storefront that showcases the merchandise of a shopkeeper while the mall owner provides the overall infrastructure, security, and the maps to locate the shop.

A Team Space menu was added to the GMCC IWE community to allow users to easily locate the various related communities and Team Spaces.

- Government Affairs: ~$12,000 annual savings in content publishing costs
- Advertising and Digital Marketing: developer time saved at 4 hours or $500 per week for a total savings of $26,000 per year
- Analyst Relations: ~$10,000 savings expected in content publishing costs

a total savings of $26,000 per year
Quantitative Productivity Data: Standing desk intervention

1. A recent study of Call Centers that have converted to stand biased workstations have shown a 45% increase in productivity compared to their seated counterparts.

2. At 6 months, nearly 75% of those with stand-biased workstations experienced decreased discomfort compared to the seated control group who experience no statistically decrease in discomfort.

Gregory Garrett, Mark Benden, Ranjana Mehta, Adam Pickens, Camille Peres and Hongwei Zhao - Department of Epidemiology & Biostatistics, Texas A&M Health Science Center, Published online: 24 May 2016
DOI: 10.1080/21577323.2016.1183534

- Collaborative team-work in creative problem-solving projects
- Increase in group engagement, decrease in group idea territoriality
- Better information elaboration and better group performance
- "Seeing that the physical space in which a group works can alter how people think about their work and how they relate with one another was very exciting…"
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Questions?

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