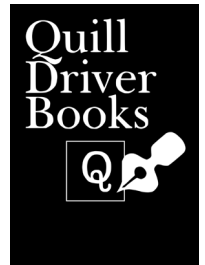


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Your chair is killing you! New book *Sitting Kills, Moving Heals* is a wake-up call to sedentary Americans

“Thought-provoking Consider this book a compelling call to action.” —Booklist

You’ve seen the recent medical news — a number of new scientific studies have consistently shown that too much sitting will shorten your life, even if you exercise regularly. Americans have struggled for decades to exercise more and eat less, but one thing hasn’t changed: we still spend hour after hour each day virtually immobile in our chairs, and we’re fatter, sicker and more tired than ever before. The way we live is killing us, and we can’t seem to stop it.

In her new book *Sitting Kills, Moving Heals: How Simple Everyday Movement Will Prevent Pain, Illness, and Early Death — and Exercise Alone Won’t* (Quill Driver Books, December 2011), Dr. Joan Vernikos, former director of NASA’s Life Sciences Division, presents a comprehensive scientific explanation for why Americans are so unhealthy — and delivers the solution, an easy-to-follow, scientifically proven plan to restore Americans’ health.

Vernikos’ pioneering medical research for NASA documented the systemic damage that weightlessness inflicts on astronauts’ muscles, bones and bodily systems. In *Sitting Kills, Moving Heals*, Vernikos uncovers the unsuspected medical connection between the health dangers of weightlessness in space and the chronic diseases caused by sedentary lifestyles here on Earth, where sitting most of the day nullifies the healthful and invigorating benefits of resistance to gravity that the human body was designed for. There is no doubt — too much sitting results in obesity, physical decline, decrepitude and early death.

In her groundbreaking research at NASA, Vernikos discovered that living with constant resistance to the force of gravity is essential to good health. In weightlessness, astronauts, who are far fitter than the average adult, seem to rapidly age; their muscles, bones and overall health degenerate to levels usually seen in elderly people. Searching for a way to duplicate this degeneration in volunteer medical subjects on Earth, Vernikos found that keeping subjects resting and immobile caused the same health problems as extended weightlessness.



Vernikos' NASA studies are the only research that has provided a complete explanation for why sitting is so bad for health. Excessive sitting, like extended weightlessness, removes the body from its natural condition of constantly resisting gravity. Being weightless rapidly ages the body; staying immobile has the same effect as being weightless; and therefore modern American sedentary lifestyles promote rapid aging and poor health.

People in the developed world, who work at desks, watch TV, and move far too little, have experienced a steady increase in serious illnesses such as obesity, diabetes, heart disease, osteoporosis, muscle wasting and arthritis, balance and coordination problems, poor sleep, and lack of stamina. These disorders, once believed to be consequences of aging, are now appearing much earlier in life — even in children, who are increasingly glued to different forms of sedentary electronic entertainment. Traditional exercise doesn't help. Even the most strenuous gym workouts don't solve the underlying health problems of people who, like most Americans, spend over half their lives sitting. Vernikos' studies of both astronauts in space and test subjects on Earth shows exercise is never more than partially effective in keeping muscles and bones from wasting.

A Prescription for Lifelong Health

There is good news: Astronauts can be quickly restored to full fitness by returning to active life on Earth, and so can you. *Sitting Kills, Moving Heals* shows that the key to reversing the damage of sedentary living is to put gravity back in your life through frequent, nonstrenuous actions that resist the force of gravity throughout the day, 365 days a year. Vernikos' easy-to-follow method of incorporating "G-Effective Activity" into everyday life will improve health, increase fitness, and even delay the effects of aging.

Different from an exercise or diet plan, *Sitting Kills, Moving Heals* gives readers of all ages a simple blueprint for transforming their lives with everyday healthful activity. The *Sitting Kills, Moving Heals* method is fun, easy to follow, takes no time commitment, can be practiced at home or at the office — and it works, giving far better results than conventional diet and exercise plans. A lifetime of vitality and freedom is possible through an applied knowledge of gravity.

Sitting Kills, Moving Heals is a landmark book that explains why the obesity and diabetes epidemics are happening and gives ordinary people the knowledge and weapons to fight it and win a lifetime of good health. This is a must-read book for all people who care about their health and the health of their loved ones.

Book Details:

Title: *Sitting Kills, Moving Heals: How Simple Everyday Movement Will Prevent Pain, Illness, and Early Death — and Exercise Alone Won't*

Author: Joan Vernikos, Ph.D.

Publisher: Quill Driver Books, an imprint of Linden Publishing

Publication: December 2011, \$14.95 (\$16.95 Canada)

Health and Fitness, ISBN 978-1-61035-018-1, 6" x 9" trade paperback, Kindle, Nook, EPUB, 132 pages, index

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About Dr. Joan Vernikos

*Author of **Sitting Kills, Moving Heals***



Joan Vernikos, Ph.D., is a pioneering medical research scientist who has conducted seminal studies in space medicine, inactivity physiology, stress and healthy aging. Born in Alexandria, Egypt, in 1934, Vernikos received her Ph.D. in pharmacology at the University of London. Vernikos became a researcher at the NASA Ames Research Center in 1964. She was a foundational figure of space medicine research and served as Life Sciences Director at the NASA Ames Research Center from 1986 to 1993 and Director of the Life Sciences Division at NASA headquarters from 1993 to 2000.

In her research at NASA, Vernikos spearheaded groundbreaking medical studies on the effects of weightlessness on health. Vernikos'

NASA research on the health effects of weightlessness helped establish the scientific causal relationship between sedentary living, rapid aging and poor health, and played a key role in Senator John Glenn's return to space flight at age 77 in 1998.

Vernikos has held numerous academic posts as a lecturer and professor in life sciences and medicine. She is twice winner of NASA's Exceptional Leadership Award, and has also received NASA's Scientific Leadership Award, the Melbourne Boynton Award from the American Astronautical Association, the Strughold Award in Space Medicine from the American Aerospace Medical Association, the Jeffries Award from the American Institute of Aeronautics and Astronautics, the Lifetime Achievement Award from Women in Aerospace, and numerous other academic and scientific awards.

Vernikos is a member of the International Academy of Astronautics, a research fellow of the International Strategic Studies Association, a fellow of the National Academy of Sciences-National Research Council, a fellow of the Aerospace Medical Association and a fellow of the World Economic Forum.

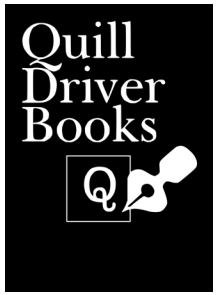
Vernikos is also a prolific journalist and science writer. She has written about space, defense and foreign affairs, medicine, health, stress, aging and physical fitness for numerous scientific, academic and popular publications, including *Defense & Foreign Affairs*, the *New York Times*, *Popular Science*, *Muscle and Fitness*, and *Gerontology*.

Vernikos has written three previous books: *Inactivity: Physiological Effects* (1987, co-written with Harold Sandler), *The G-Connection: Harness Gravity and Reverse Aging* (2004) and *Stress Fitness for Seniors* (2009).



For more information on *Sitting Kills, Moving Heals* or to arrange an interview with author **Dr. Joan Vernikos**, please contact Jaguar Bennett at Quill Driver Books, Publicity@QuillDriverBooks.com, (800) 345-4447.

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Sitting too long increases risk of cancer, says new American Cancer Society study

Conventional exercise does little to improve health problems caused by sitting; in new book, author Joan Vernikos recommends all-day low-intensity movement instead

A new medical study by the American Cancer Society linked prolonged sitting with an increased chance of cancer death, even in people who exercise regularly, prompting the American Institute of Cancer Research to recommend frequent standing breaks — and a new book by former NASA Life Sciences Director Dr. Joan Vernikos offers a practical plan for avoiding the health risks of sitting.

The American Cancer Society study, presented Nov. 3, 2011, at the AICR Annual Research Conference on Food, Nutrition, and Physical Activity in Washington, D.C., suggested that up to 49,000 cases of breast cancer and 43,000 of colon cancer each year may be caused by sitting more than six hours a day.

The study, led by Alpa V. Patel of the American Cancer Society's Epidemiology Research Program, compared physical activity and mortality in a population of 123,216 men and women. Researches found that women who sat more than six hours a day were 37 percent more likely to die and men who sat more than six hours a day were 18 percent more likely to die.

Most significantly, the study found that regular exercise did little to improve the chances of people who sat more than six hours a day. Time spent sitting, not overall activity level, was identified as a critical factor affecting cancer mortality rates.

The American Cancer Society study is the latest in a growing body of research that links sitting time with numerous health risks, including cancer, heart disease, obesity and premature death. The health problems associated with sitting are an increasing problem as Americans more and more sit all day long at desk jobs, in



their cars during long commutes, and in front of the TV. Even Americans who exercise regularly still spend most of their time sitting.

Based on these findings, the American Institute for Cancer Research has advised Americans to take frequent standing breaks and not sit continuously for more than one hour.

Dr. Joan Vernikos presents a practical plan for avoiding the health risks of sitting in her new book *Sitting Kills, Moving Heals: How Simple Everyday Movement Will Prevent Pain, Illness, and Early Death — and Exercise Alone Won't* (Quill Driver Books, December 2011).

Based on Vernikos' NASA research on the health effects of weightlessness in astronauts, *Sitting Kills, Moving Heals* presents an action plan for improving health through all-day low-intensity movement that challenges the force of gravity.

Sitting Kills, Moving Heals isn't about getting more exercise; Vernikos recommends a different kind of exertion — natural, habitual, low-intensity movements made throughout the day in the course of active living, like walking briskly, climbing stairs, stretching and pacing.

Sitting Kills, Moving Heals presents a step-by-step plan for incorporating low-intensity movement into everyday life, with easy activities that can be done many times throughout the day at home or in the office.

Vernikos emphasizes that traditional, high-intensity, three-times-a-week exercise doesn't prevent the ill health caused by sitting. Numerous medical studies by Vernikos and other researchers have shown that even regular traditional exercise only partially improves health in people who, like most Americans, sit all day long.

The first popular health book that addresses the danger of sitting — and presents a practical plan for fighting “sitting disease” — *Sitting Kills, Moving Heals* is a must-read book for everyone who is concerned about health and fitness.

Book Details:

Title: *Sitting Kills, Moving Heals: How Simple Everyday Movement Will Prevent Pain, Illness, and Early Death — and Exercise Alone Won't*

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Is it aging — or lack of healthy movement?

Excerpted from *Sitting Kills, Moving Heals*

Astronauts returning from space show a pattern of symptoms that collectively resemble those seen in older persons. The medical community initially concluded in the early 1970s, when these observations were first made during the Skylab missions, that astronauts grow old faster in space. However, it soon became clear that astronauts fully recover shortly after they return to their normal lives on the ground. Was this a reversal of the aging process? And were astronauts really aging more quickly in space?

Like others, I had initially believed that advanced age in a subject would further slow down this rate of recovery, but I was proven wrong. In fact, when senior astronauts such as 77-year-old John Glenn and 55-year-old Story Musgrave flew in space, they not only suffered deterioration during spaceflight that was no more severe than what their younger crewmates suffered, but they also recovered just as quickly once back home on Earth. From this and many other observations and experiments, I arrived at the conclusion that astronauts do not in fact grow older in space. The lack of gravity causes a rapid progression of the kinds of changes in their bodies that we on Earth *associate* with age. But these changes don't come about from merely piling up years of life — these are actually a direct consequence of the sedentary lifestyles we tend to adopt as we get older, lifestyles that don't use the head-to-toe gravity “vector,” and instead involve a great deal of sitting.

By putting together all the consequences of gravity deprivation in astronauts, I realized that I had come across this mix of symptoms, or “syndrome,” before. They are common features we identify with someone old and frail, those who are bedridden because of an injury or suffering from a wasting disease such as AIDS/HIV or a long-term infection.

In 1997, a list of the “Physiological Changes in Sedentary Adults” was published in *American Fitness* magazine. The following is an approximate comparison of this list with the changes we observe in astronauts in space:

Astronauts in Space	Changes on Earth with Age
aerobic capacity decreases by 25% in 7–14 days	aerobic capacity decreases 10% per decade
plasma volume decreases by 10–20% in 7–90 days	plasma volume decreases by 0.5–1% per decade
bone density decreases by up to 5 % per month	bone density decreases by 1% per year
muscle mass decreases by 1% per month	muscle mass decreases by 1 % per year
muscle strength proportionately reduced	muscle strength proportionately reduced
flabby muscles	flabby muscles
fetal/curved stance	stooped posture
reduced force, explosive power	reduced force, explosive power
abnormal reflex patterns	abnormal reflex patterns
increased fatigability	increased fatigability
decreased cardiac output	decreased cardiac output
decreased heart stroke volume	decreased heart stroke volume
slower movement and reaction time	slower movement and reaction time
increased body fat replaces muscle	increased body fat replaces muscle
reduced sensitivity to insulin	reduced sensitivity to insulin
decreased testosterone	decreased testosterone
decreased growth hormone	decreased growth hormone
aching joints	aching joints

HOW CAN WE BE DEPRIVED OF GRAVITY ON EARTH?

We start using gravity less whenever development peaks — on average at around age 20. Think of how active and energetic you were as a child: running, jumping, skipping rope, swinging on a swing, hanging upside down. Then, as an active teenager, you may have spent many hours playing football, baseball, tennis, swimming, followed by partying into the wee hours! But, for the typical adult in a so-called developed country, what follows high school graduation is work or college. With that comes hours of sitting. The average office worker spends six hours a day sitting. There's also sitting while studying or attending classes, and perhaps additional hours each day sitting in front of the television or computer at home. Often laden with new worries and responsibilities, such as taking care of their own needs, or the needs of others — remembering when to do what, attending to food, lodging, laundry — the level of activity for the young adult takes a nosedive. Add to that cheap, readily available food that is not home-cooked — food unavoidably high in sugars and fats — and the slippery slope toward gravipause becomes steeper every day.

In the last century, symptoms of Gravity Deprivation Syndrome (GDS) first became obvious after age 50. As a child, I remember thinking people in their 30s and 40s were old. AARP, when first formed in 1958, defined a senior at age 55. Using more sensitive techniques, we can now detect subtle GDS changes as early as in the 20s.

Both in space and in bed rest, the heart muscle atrophies as well. Not unlike the rate of loss of skeletal muscle in space or bed, studies have shown that the heart muscle of intensive care patients can lose 1 percent of heart muscle per week. The calculated loss of cardiovascular function in three weeks of lying in bed in young men, as measured by their aerobic capacity (VO_2 max), is equivalent to that seen in those of over 30 to 40 years of aging.

But here's some good news: You can slow down this rate. It's in your hands ... and in your legs and in your head! The sooner you start, the better. *It is never too late.* If that doesn't get you out of your chair, I don't know what will!

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For more information on *Sitting Kills, Moving Heals* or to arrange an interview with author **Dr. Joan Vernikos**, please contact Jaguar Bennett at Quill Driver Books, Publicity@QuillDriverBooks.com, (800) 345-4447.

Your Action Plan

Excerpted from *Sitting Kills, Moving Heals*

We've all heard of exercise routines, diets and financial plans that promise to change our lives for the better in just 30 days. And most of us have seen these plans fail or bring initial results that are hard to keep up. The good news is that when it comes to gravity and the benefits it brings, you don't have to disrupt your life or schedule. There are unlimited opportunities for fitness all around us. Clearly the answer lies in restoring the amount of natural, habitual physical activity we do throughout the day, every day of our lives: perpetual motion. But how do we do this?

TURN ALL DAY NATURAL NON-EXERCISE ACTIVITIES INTO G-HABITS

Developing a varied set of habitual *non-exercise* movements is the most important thing you can do. Even if you do exercise regularly at the gym, pay attention to your habits when you are not exercising, for they benefit your body in a very different way. If your life and work are such that you cannot get away to exercise, you do not enjoy playing a sport, and you spend much of your day sitting in an office or a car, all is not lost. This is all the more reason why you will derive great benefits from restoring gravity habits — G-habits — back into your life. You had these habits as a growing child, so it's simply a question of getting them back.

Healthy seniors seem to have benefited from G-habits perhaps because they retain those activities that target the stabilizer muscle system. Think of your grandmother or aunt who would never ignore a speck of lint on the floor, but quickly bent over to pick it up. "She has always hated exercise," says Elsa, describing her vigorous 92-year-old mother. "But she is always getting out of her chair to get something from the kitchen, straighten the afghan on the sofa, putter with her plants. Even riding in the car she never sits still, she's always fidgeting with her hair or her purse or the seat belt. In an everyday conversation, she's the type who couldn't talk if she didn't wave her hands."

Tip: Exercise is not a substitute for activities that come naturally throughout the day, 365 days a year, for the rest of your life.

G-HABITS ARE NON-EXERCISE ACTIVITIES

Developing good G-habits takes time. Do not expect overnight results. Eight to 12 weeks is a reasonable time frame to cement new G-habits into your daily ritual, although you'll start noticing the good results from these habits much sooner than that. Do not try to work on too many new habits at the same time. Work incrementally. This is crucial to lifelong success because the object is to acquire, restore, or rediscover lifelong habits. Such habits must be realistic and mesh with your particular lifestyle. Only when an activity becomes a habit will it become part of your daily life, rather than a chore that must be remembered, like medicine that must be taken.

For optimal effectiveness, the intensity of your G-habits should be low. Traditionally, exercise has focused on mobilizers and neglected the importance of stabilizers. For many people this has resulted in chronic pain,



mostly back pain. When stabilizers atrophy as they do in our modern sedentary lifestyle, mobilizers cannot function properly because they lack a firm base from which to work. The consequence of this is instability of segments of the body, distorting the movement and causing lower back pain or potentially injurious falls.

Stabilizers are meant to provide the stable basis from which mobilizers can work to prevent wear and tear of the body. To stand still you do not need mobilizers, but you do need stabilizers. Among the styles of exercise we typically see today, yoga and tai chi — which, you will note, are ancient forms of activity — are the exceptions, as they target mainly stabilizers. Maintaining fitness of stabilizers by continuous low intensity activities forms the foundation of a healthy, active body. Acquiring all-day repetitive, sustained, low-intensity habits is nature's way of not allowing the stabilizer system to weaken.

G-HABITS ACTION PLAN

By **Star Rating** habits, activities, and exercises (like the star rating system for hotels and restaurants), I've indicated which are of the most benefit. And for those of you who are used to thinking in terms of calories burned, I also give you an estimate of the energy value of each move as total **calories burned** or calories per hour for a 120- to 140-pound person. If your weight is different, divide the calories burned for each activity by 130 and multiply by your body weight in pounds to get the calories you would burn. You will notice that calories do not always correlate with gravity-value star rating, but both are important for good health and fitness. Expressed as calories per minute or per hour, you would need to calculate the duration of each activity to estimate how many calories were burned. For instance, carrying bags of groceries to your car uses up the same number of calories/hour — 180 — as carrying a baby around in a sling or backpack, but you would likely spend only a few minutes carrying the groceries, whereas many new parents carry their baby for an hour or more at a time.

There are innumerable core habits we all do at one time or another, the most obvious being light housework like vacuuming (a ** rating), good for 200 calories an hour (cals/hr). More strenuous activities like raking and picking up leaves and shoveling snow (****) could be worth up to 350 cals/hour. Milder gardening, pruning, planting, weeding, and mowing (* to ****) could be worth 300–350 cals/hour; plus, they increase stamina and work long-neglected muscles. Less strenuous is a stand-up stimulus, such as getting a glass of water — still, this simple effort yields tremendous gravity value (****; 10–15 cals/hr). You might also carry a baby (**; 180 cals/hr), stir a large pot of Sophia Loren's pasta sauce recipe (**; 132 cals/hr), roll out cookie dough (**; 132 cals/hr), crack nuts (*; 100 cals/hr), or carry your grocery bags to the car (**; 15 cals/hr). You might take the garbage bin out (**; 18 cals/hr), paint a room (****; 270–350 cals/hr), scrub the bathtub (**; 160 cals/hr), paint your fence (****; 300–350 cals/hr), grow your own vegetables (**; 100–150 cals/hr), and get fit!

Here's an important tip: You can vary the activities in the following list by doing each move, such as standing up or sitting down, as slowly as you possibly can. This will make them harder to do, thereby yielding greater G-value. Remember: *Keep gravity in mind as you do these activities.* That should help you focus on what you're doing and remember why it is important to your health.

GET BACK INTO THE STRETCHING HABIT *****

MUSCLES/ JOINTS/ LIGAMENTS/ TENDONS/BONES/SPINE/NECK/SHOULDERS/FEET (100 CALS/HR)

We think of a child waking up with a good stretch, and we've all noticed that cats and dogs do the same thing. But many of us just stumble out of bed when the alarm goes off. As you age, or if you have stopped

stretching at any age, your muscles tighten and the range of motion in your joints decreases. This can put a damper on active lifestyles and even hinder day-to-day, normal motions. Tasks that used to be simple, such as zipping up a dress or reaching for a jar on the top shelf, now become difficult. The AARP's driving course for seniors includes stretching exercises as a safety precaution. Many elderly drivers lose their range of neck motion to such a degree that they cannot rotate their head to look behind them when backing out of a parking space or driveway — the result is often an accident! A regular stretching or yoga program can help lengthen your muscles and make daily living activities easier.

Tip: Do not bounce when you stretch, as this can put strain on tendons and joints. Extend the stretch as far as you can and hold it, continuing to breathe naturally. You may use a timer or a clock that displays seconds to time your stretches — 30 seconds is good, 60 seconds better.

STAND UP: SIT DOWN *****

BLOOD PRESSURE CONTROL/MUSCLES/JOINTS/BONES (2 CALS/MIN)

If you do nothing else from this book, this is the *single most important habit you can acquire*. The key to independence in old age is being able to stand up. It's no more complicated than that. Start practicing now so you will be able to stand up and sit down without help for as long as you live. Do this exercise correctly to get the most out of it. From a using-gravity perspective, standing up is excellent, especially if you raise your weight out of the chair slowly and repeat it many times throughout the day. If you stand up quickly the same number of times, but in a short period, it is an aerobic exercise — note how your heart beats faster and you pant.

Research indicates it would take at least 32 posture changes from sitting to standing and back again to maintain healthy blood pressure regulation. I know this for a fact from my studies with volunteers lying in bed continuously, 24 hours a day for four days. It took standing up from bed 16 times a day to prevent the tendency to faint when they got up. That means it took that many changes in posture to maintain the blood pressure that the sensors measured. It would take as many as 32+ times of standing from sitting, since that is a smaller change in the gravity stimulus than it is from lying down to standing. Consider 32 your lowest goal. More will not hurt you, though less may not produce the desired effect.

On the way up you defy gravity. How do you get out of your chair? Do you lean on the arms of the chair? Do you lean on your knees? Create opportunities to get up often — for example, ask a neighbor to ring your doorbell and say hello as she goes by. Keep your mobile phone at a distance, or dock it so you have to get up to answer it. When watching TV, get your own drink. Drink plenty of water so that you must get up to use the bathroom often.

Aspire to stand up without leaning on anything. However, even if at first you do use furniture for support, you are strengthening the arms. Once standing up without support is mastered, do it very slowly to perfect it. Then try getting up from a low armchair or sofa without the help of the firm seat. That adds challenge to this habit.

Tip: When I recommended frequent standing up at one of my talks, a man in the audience complained he could not do that because he worked all day with a computer. If he stood up every so often his boss would fire him. Asked whether he drank water, he replied, "Yes, of course. I have a bottle on my desk." "Put it on a shelf just far enough so that you have to stand up to reach it!" It does double duty keeping you toned and hydrated.

STRETCH AT YOUR DESK *****

POSTURE/ SHOULDER BLADES/LIFT CHEST/TENSION RELIEF (1 CAL/MIN)

As you work at your desk, hold your head high away from your shoulders. Make sure you are not dropping it forward. Bend your left arm behind your back to grab the elbow of the right arm held straight downward beside you. You will immediately feel your shoulder blades come together, your shoulders move downward, and your chest rise. Hold as long as you can. Alternate arms. Repeat often. This stretch releases shoulder tension, as well as strengthening the good posture habit. Grasping your hands behind your back can also help you relieve the tension in your back.

Sitting in armchairs does no good to your posture because your elbows are raised and rest forward. I found an easy way to train the shoulder blades back is to sit with your hands resting high up on your thighs. Holding this position naturally presses the shoulder blades together.

Here is another easy variation as you work: Keeping both arms against your sides and bent at the elbow, move the elbows backward, bringing your shoulder blades together. Hold it. When you become good at it, you can work on your keyboard in this position. This stretch is also great on long flights or when waiting at traffic lights. If you make this move often while you work at your desk and while you sit at traffic lights holding your shoulders down, you will greatly reduce your risk of suffering from a stiff neck and shoulders.

WALK TALL *****

POSTURE/BALANCE/SPINE/NECK MUSCLES (150–350 CALS/HR)

When you walk, remember that toddlers, as well as astronauts returning to Earth, walk with their legs far apart to keep from falling. Keep your sense of balance strong and move like a runway model by walking with your legs and feet close together. Aim to keep your gaze focused straight ahead rather than at your feet. This will help you walk taller and keep your spine strong.

A brisk walk in a park or other pleasant surroundings can be emotionally rewarding, too. If you take an hour to walk two miles, you will burn a good number of calories (144 to 168 calories for a 120- to 140-pound person, more if you're larger). On the other hand, a brisk or power walk of two miles in 40 minutes burns 192 to 222 calories, depending on your weight. If you want to burn twice as many calories for the same distance in the same time, try carrying a backpack. But whatever you do, be sure to walk tall! The emphasis is on moving briskly and with purpose. Why brisk? Think back to Chapter 3 and the value of intermittent, low-intensity, high-frequency movement. Walking is a series of intermittent steps, each one generating a vertical gravity stimulus by its impact. The faster you take those steps, the higher the frequency.

Former astronaut and U.S. Senator John Glenn makes a habit of power-walking two miles a day. And he works with weights three times a week. Power-walking is covering more ground in less time while swinging your arms outward at the same time. Glenn started doing this long before a recent study showed that gait speed — how fast you walk — helps you live longer. The study concluded that the ideal for people over 65 was walking 2.25 miles in one hour every day. As I write this, John Glenn is 90 and still going strong. He must be doing something right!

THE STAIRS OPTION ***

BALANCE/COORDINATION/MUSCLE/BONE/JOINTS (8–10 CALS/MIN)

Start off by taking the easy way up — elevator, escalator — and using the stairs going down. Going up

stairs and going down stairs are two separate kinds of activities. Going down has a greater balance component; in addition, the impact loading with each step as you accelerate forward provides gravity stimulus to your legs, hips, and lower spine bones. Going up is more of an aerobic activity and builds stamina. It is also a form of weight training, as you pull your weight up each step. Going both up and down stairs are great exercises to strengthen muscles, but they work on different muscles, so you need to do both to strengthen both the front and back leg muscles — eccentric and concentric.

(a) Down — I am amazed at how early in life balance problems appear, especially in women. Ask young women in their 20s whether they need to look at their feet while going down the stairs and you will be surprised to find how many do. Many also hold onto the rail. In my personal poll of young receptionists, a quarter of them said they looked at their feet, and about a tenth did that and held onto the rail. What do you do? If you are unsteady on your feet, wait until you get stronger to try this, or start off by holding the rail. Put on a pair of low-heeled, comfortable shoes and test yourself. If you hold the rail, try to barely touch it until you acquire the confidence to do without it. Instead of keeping your eyes on the stairs all the time, try to look ahead a few steps at a time as you descend. If you find this difficult, build up to it by stepping on and off a low step stool while alternating feet. Once you master that, check the stairs again. Work on increasing the number of flights you're taking and on letting go of the rail. Your goal is to descend an entire flight without looking at your feet and without touching the rail.

Many older persons avoid leaving their homes because they are afraid of falling when stepping up onto a bus, or even into an SUV-type vehicle. The step-stool exercise mentioned above can help them regain their confidence and independence by strengthening the necessary muscles and their sense of balance in the safety of their home.

Tip: Did you know that going down stairs is a more effective bone stimulus than walking? That is because you generate more G impact and stretch your tendons more with every step down.

(b) Up — Add going up stairs to coming down stairs. Climb stairs till you are just out of breath. Now let go of the rail and look straight ahead, not down at the stairs. Then increase the number of flights. If you don't have too many flights to climb, take every opportunity to choose the stairs rather than the easier method.

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For more information on *Sitting Kills, Moving Heals* or to arrange an interview with author **Dr. Joan Vernikos**, please contact Jaguar Bennett at Quill Driver Books, Publicity@QuillDriverBooks.com, (800) 345-4447.