

How to Fight a Key Source of Aging

Just before this last Super Bowl, I was watching a short video featuring Tom Brady, the quarterback of the New England Patriots. Whether you're a fan of his or not, it's amazing by anyone's standards that, at the age of 40, he is still able to play professional football with such a high level of flexibility and agility.



Dr. David Williams

The video briefly depicted several aspects of his fitness routine. In addition to weightlifting and running, there was a huge focus on various forms of stretching and intense deep

massage. I believe this is one of the keys to his ability to continue playing the sport. In fact, maintaining flexibility and counteracting the "adaptive shortening" that occurs with age is a primary key to remaining agile and physically independent.

I've written several articles discussing various tests that predict longevity. Simple abilities—like getting up from a chair unassisted, balancing on one foot, standing up from a seated position on the floor without using your hands, and even the strength of your handshake—can be used to predict longevity. In addition to muscle strength and proprioception, most of these actions require flexibility. And if we don't make an effort to preserve it, flexibility is something we lose with age.

Similar to what occurs when a broken arm is put in a cast, muscles contract and adapt to static positions like sitting. Tendons, ligaments, and the fascia that cover muscle fiber bundles can also calcify and shorten from injuries and lack of movement.

When joints aren't moved through their entire range of motion each day, the cartilage covering joint surfaces begins to deteriorate, calcify, and

cause pain-limiting movement. It becomes a self-perpetuating cycle that eventually leads to immobility.

If that isn't bad enough, we also have gravity working against us. The constant downward pull of gravity compresses the discs, separating the spinal vertebra. They gradually lose their inner gelatinous fluid and begin to calcify. Our entire spinal column and its supporting muscles and ligaments also shorten as we age.

Tom Brady and his trainers understand the detrimental and limiting effects of adaptive shortening and are actively taking measures to counteract it. We need to do the same. Fortunately, since most of our lives don't involve the amount of physical contact and abuse experienced by a professional quarterback, our job should be a little easier.

Depending on your age, you may have noticed some the effects of adaptive shortening, such as hunched shoulders or difficulty straightening up when you stand from a seated position. It may take a few steps to really get moving; it may be hard to stand for any length of time; or it may take a lot of energy to stand straight. (In fact, a slouched posture may be more comfortable

Inside

Are Annual Wellness Exams Making You Sick?.....3
Gynecomastia.....4
Active Work Stations.....7

You will observe with concern how long a useful truth may be known, and exist, before it is generally received and practiced on.

— BENJAMIN FRANKLIN

because trying to stand straight causes the shortened muscles to fatigue more quickly.)

You may also find that practically any form of exercise causes you to fatigue rather quickly for the same reason—lower back pain, popping joints, painful movement, muscle tightness/cramping, stiffness, poor posture, inability to squat, etc.

Personally, I've experienced all of these problems at one time or another. We are all susceptible to the ill effects of adaptive shortening. And we each have a choice. We can just accept it and gradually lose our flexibility, ability to move around without assistance, and eventually our independence. Or, we can take specific steps to counteract it so that we can continue to move and better enjoy life and independence for a longer period of time.

Although it requires more discipline and effort than I want to expend at times, I've chosen the second option. Hopefully you choose to do the same.

I am going to cover many of the steps I've found to be helpful. They are based on decades of personal experience and experimentation, clinical studies, and interviews with dozens of experts

in the fields of kinesiology and body mechanics.

First, it's important to keep in mind that adaptive shortening isn't an overnight event. Our bodies reconstruct tissues to accommodate for a lack of joint movement and exercise, and this happens very gradually over decades. It creeps up so slowly that most people don't notice its effects until either they experience pain, or it keeps them from doing something they were able to do in the past.

Second, it takes time to correct and reverse this process. Not only have tissues shortened, the surrounding muscles have weakened and lost flexibility. They can be very slow to lengthen, for example, when you try to move from a seated to a standing position.

Adaptive shortening is responsible for most of the aches, pain, and stiffness we've come to associate with aging. But it's not aging that's the primary underlying problem. It's the fact that we've fallen into repetitive habits of moving, sitting, sleeping, etc., that limit our normal ranges of motion.

Restoring Flexibility

Counteracting adaptive shortening and restoring flexibility requires proper stretching. There are

two resources I recommend for learning how to properly stretch.

In the mid-1970s, Bob Anderson authored the book [*Stretching*](#). It has been updated since that time, but it continues to be one of best books to help someone get started in stretching correctly. It is full of illustrations and easy-to-follow instructions.

A more technical and advanced book, which I also highly recommend, is Pavel Tsatsouline's book [*Relax Into Stretch*](#).

Pavel was born in Russia and is credited with introducing kettlebell training to the West. I received my kettlebell instructor certification from Pavel several years ago, and he's a wealth of information on stretching and other training techniques.

It would be impossible to cover all of the fundamentals of stretching here, which is why I recommend these books. I can, however, cover some tools/techniques I've found very useful and a couple of routines that address two of the most common flexibility problems.

Two areas that affect almost everyone are low back pain/inflexibility and slumped shoulders. Properly stretching these two

Alternatives® Author: Dr. David Williams; Editor: Larissa Long

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NEWS TO USE *from around the world*

Are Annual Wellness Exams Making You Sick?

With the flu season starting to wind down, experts are saying it was the worst season since 2009. They're never able to tell what percentage of the population actually contracted the flu, but rather estimate how many had flu-like symptoms.

The public has also been given the same lectures and tips on how to avoid contracting the flu. One of those tips is to avoid contact with anyone

who has flu-like symptoms, which makes sense.

It is well known that some of the worst infections are acquired during hospital visits. However, what hardly ever gets mentioned is that taking your child to the pediatrician significantly increases the risk of flu.

A 2014 study found that when children are taken to the doctor for annual wellness exams and/or vaccinations, they are at increased risk of contracting flu-like symptoms over the next two weeks. It was estimated that these visits alone result in more than 700,000 cases of avoidable illness. The study only looked at

actual records of subsequent visits to doctors or hospitals.

A large percentage of people who get the flu never go to the doctor. And passing the flu to other family members, who wouldn't be counted, is very common. Wellness exams could easily be causing more than a million cases of flu each year.

Not having separate sick and well-child waiting areas, communal toys in those waiting areas, lack of hand hygiene, and infected patients not wearing masks are all things to keep in mind next time you visit the pediatrician or doctor's office. ■

areas will benefit most everyone and are a good place to start.

As you perform any stretching maneuver, there are five tips to keep in mind so you can achieve maximum benefits.

1. **Active exertion:** Instead of passively stretching, actively engage your muscles to gently and slowly "pull" that body part in the direction of the stretch.
For example, if you stretch your arm directly above your head, activate the various muscles to help push your arm toward the sky. If you are doing a squat, instead of just letting gravity and your body weight initiate the squat, consciously use your muscles to pull your body into a squat

position. Active exertion not only helps protect the ligaments and other supportive tissues surrounding a joint, it also helps prepare the body for the stretch.

2. **Recruitment:** As you actively move into a stretch, slightly rotate the body part back and forth. The slight twisting back and forth recruits more of the tight fibers surrounding the joint and provides for a better overall stretching effect of the fascia that covers muscle bundles.
Pavel refers to this as "wiggling into a stretch." Again, the twisting is performed slowly and gently. For example, as you gently pull yourself downward into a squat, slightly and

carefully rotate your hips and waist back and forth.

3. **Equal weight distribution:** While stretching, be especially careful about compensating for inflexibility. Our bodies will naturally compensate when one part of the body becomes inflexible.
For example, if your neck is stiff and you're unable to turn it to one side or the other, you will naturally turn at the waist. If one joint is stiff and immovable, another joint will try to pick up the slack to achieve the same motion. It's not something we have to think about—it just happens. Be mindful of this when stretching. Don't force a stretch or "cheat" by using bad form. Slow and steady is the proper

(continued on page 6)



What to Do About Gynecomastia

Question: This is a little embarrassing, but I'm starting to develop gynecomastia. I am 53, eat healthy but am still a little overweight, and have mild balding. I take blood pressure medication and Proscar for an enlarged prostate. Any suggestions? — K.G., Macon, GA

Answer: Gynecomastia (male breast enlargement, or "man boobs") is a result of excess estrogen in your system, which in males can lead to heart disease, diabetes, autoimmune diseases, and cancer (including prostate). I'm not trying to scare you, but it's more than just an inconvenience, and the quicker you start to address the issue the better.

Excess estrogen is a common problem in men over 40. Men make estrogen as well as testosterone. Under normal conditions, levels of the two hormones remain balanced. However, when testosterone levels drop, we begin to see the symptoms of excess estrogen in men. In addition to gynecomastia, I wouldn't be surprised if you're experiencing some other estrogen-related problems including:

- **Erectile dysfunction or low libido**
- **Benign prostatic hyperplasia/difficulty voiding and other urinary symptoms**
- **Chronic fatigue**
- **Depression or other emotional issues**
- **Abdominal fat**
- **Lean muscle tissue loss**
- **Type 2 diabetes**

Drugs Can Cause Gynecomastia

The drug finasteride in 1 mg strength is marketed as Propecia to treat hair loss. In 5 mg strength, it is marketed as Proscar to treat prostate enlargement. Finasteride increases both testosterone and

estrogen levels, and while supposedly it's rare, it is associated with the development of gynecomastia.

Other drugs associated with it are certain antidepressants (Invega, Elavil, Risperdal and Triavil), and antacid meds like Tagamet, Zantac, and other H2 receptor blockers. In fact, drugs are estimated to cause up to 25 percent of all gynecomastia cases.

Less Testosterone, More Aromatase

As men get older, they tend to produce less testosterone, which allows estrogen to become more dominant. They also begin to produce more of the enzyme aromatase, which converts testosterone to estrogen. Increased aromatase activity results in fat gain (primarily in the chest and belly), feminine physical characteristics, a decline in testosterone levels, and the inhibition of muscle growth. In large part, due to increased aromatase activity, older men have higher estrogen levels than postmenopausal women.

Aromatase is actually a complex of enzymes that is largely produced in fat tissue. Reducing body fat and making sure the liver is able to detoxify excess hormones are two ways to discourage aromatase activity.

It's important to keep in mind that fat is estrogen producing. Fat tissue not only contains aromatase and actively converts testosterone to estrogen, it also acts as a reservoir for storing estrogen. Visceral fat (the unseen intra-abdominal fat around organs) seems particularly loaded with aromatase. Visceral fat is more metabolically active than subcutaneous fat (fat just below the skin), leading to higher aromatase activity. Men with lots of belly fat typically have lower testosterone and higher estrogen levels.

Burning visceral fat requires a combination of weight training and cardio. Cardio alone is not effective. Muscle burns calories 24/7, and increasing muscle mass raises your metabolic rate, setting your body up to burn more fat.

Excess carbohydrates are also stored as fat. Reducing refined carbs is another requirement for losing visceral fat. A high-carbohydrate diet precipitates the release of additional insulin, and insulin stimulates aromatase activity and estrogen production.

Excess estrogen is broken down and deactivated by the liver. In many cases, though, the liver is constantly being flooded with other toxins, so this deactivation doesn't happen. This commonly occurs with individuals suffering from constipation. Waste material

that should be removed from the body remains in the intestines, gets absorbed into the bloodstream, and creates a constant toxic load on the liver.

A poor diet, chronic drug use (legal or illegal), excess alcohol, and chemical exposure are other factors that can interfere with the liver's ability to detox.

You also need to eliminate and/or limit your exposure to aromatase-promoting compounds like pesticides, herbicides, plastics, unfermented soy foods, clover, tea tree oil, lavender oil, licorice, whiskey, and beer.

I would strongly suggest increasing your intake of cruciferous vegetables (broccoli, cabbage, cauliflower, kale, Brussels sprouts, radish, turnip, bok choy, etc.). Cruciferous vegetables have high levels of sulfur-containing compounds called glucosinolates, which reduce estrogen activity and aid the liver in detoxifying and eliminating excess estrogen. These vegetables also contain indole-3-carbinol (I3C), a compound that blocks aromatase activity and has been found to inhibit breast, cervical, prostate, and other cancers.

Another glucosinolate in these vegetables is sulforaphane—a powerhouse when it comes to anti-cancer activity. Sulforaphane stimulates “suicide” of cancer cells, prevents their replication, inhibits their blood supply, and reduces their ability to spread. Raw broccoli and broccoli sprouts contain some of the highest levels. Sulforaphane is produced only after glucoraphanin mixes with an enzyme called myrosinase. After these two combine, the complete process takes roughly 40 minutes. (Myrosinase is also the enzyme that converts a compound called glucobrassicin into I3C when it is shredded and fermented into sauerkraut.)

Sulforaphane is one of the chemicals these plants produce as a form of protection against bacterial, viral, and fungal infections. Glucoraphanin is the “stored” chemical that gets converted to sulforaphane when the plant is attacked and damaged.

Unfortunately, myrosinase is destroyed by heat. Using frozen varieties of these vegetables doesn't sidestep the problem either. To increase shelf life, frozen vegetables are blanched prior to freezing.

But there are four ways to get around this problem.

First, you can eat these vegetables raw. Chewing allows glucoraphanin to mix with the enzyme. The sulforaphane is formed in your stomach.

Second, you can chop or blend the vegetables, then let them sit for at least 40 minutes (longer is

fine...even all day) for the conversion to take place. Sulforaphane is resistant to heat and once it has been formed, you can cook the vegetables any way you'd like and it stays intact and active.

Third, ferment the vegetables. Fermentation preserves enzymes like myrosinase and allows for the formation of sulforaphane to take place. The shredding of cabbage starts the process for sauerkraut, and with the other fermented vegetables, chewing gets the process started.

Finally, ground mustard seeds (mustard powder) contain a more resistant form of myrosinase. You can simply sprinkle powdered mustard on cooked broccoli after cooking it. This starts the conversion of glucoraphanin to sulforaphane. Horseradish and wasabi are also sources of myrosinase, but I'm not sure how those would taste on broccoli.

Other foods that block estrogen activity include garlic, onion, chamomile, grass-fed dairy, green and black tea, red wine, extra-virgin olive oil, turmeric, raw nuts and seeds, avocados, coconut oil, lemons, limes, and omega-3 oil from fish, flaxseed, and hempseed.

Make sure you take a daily multivitamin/mineral supplement that contains B12, folic acid (folate), betaine, and choline. These are required for estrogen metabolism and detoxification. And vitamin D is a natural aromatase inhibitor.

Testosterone Therapy Isn't the Answer

It may seem like the easiest way to increase testosterone would be with hormone replacement therapy. In some cases this might be the answer; however, it must be done with careful monitoring. Men who use injectable forms of synthetic testosterone almost always end up producing more estrogen. This can also happen with bioidentical testosterone creams when they are used in excess, or in men who are obese. Remember, that extra fat will convert testosterone to estrogen.

Also, synthetic testosterone tends to have negative impacts on HDL and LDL cholesterol, liver enzymes, hemoglobin, hematocrit, and red blood cells.

Even if you use testosterone therapy, reducing your aromatase activity is essential. Otherwise, you're just addressing one of the symptoms and not the underlying problem. Reducing aromatase and the influence of estrogen is the starting point for correcting your gynecomastia, and a good way of reducing your risk of a long list of other health problems as well. ■

way to make progress with stretching.

4. **Relaxation:** When you have reached your limit for a stretch, stop pulling your way into the stretch and relax. When you first initiate a stretch, the muscles being stretched start to contract. This contraction is a protective mechanism to prevent damage to the muscles. This contraction typically lasts about 15 to 20 seconds.

If you continue to hold the stretch after that period of time, the muscles relax. At this point, you can relax your entire body, breathe deeply to release overall body tension, and then gently continue the stretch for another 5 to 10 seconds. At about 30 seconds, the muscle will often be stretched as far as it can be at the time, and then the ligaments around a joint will start to be stretched. As such, I wouldn't suggest holding a stretch for longer than 30 seconds. There are times when the supporting ligaments of a joint need to be stretched, but lengthening ligaments unnecessarily can cause a joint to become hypermobile or too loose and unstable.

5. **Patience:** This is an area I need to work on. Adaptive shortening of muscles and body tissue doesn't happen overnight, and it can't be corrected overnight. On the bright side, you will only need 25 to 45 minutes a day to complete a great stretching routine. Success is measured in gradual degrees of improvement, not instant breakthroughs. This is why you first need to establish a baseline before you start any stretching program. Test your range of motion for

all stretches so that you'll have a baseline to which you can compare your progress.

Stretches for Lower Back and Leg Pain

The ability to deep squat is something most people lose with age. This is due to adaptive shortening of the muscles of the lower spine, hip, and legs. The changes in these areas explain why lower back pain is one of the most common health problems in our society.

When we were toddlers, squatting was a natural and easy movement to perform. Watch toddlers at play, and they quickly move from a squat to standing position with ease. If you've traveled internationally, you've also probably noticed that many cultures practice squatting as a comfortable method of sitting, even among the elderly. In our society and other Western countries, that's not the case. Our preference for the couch and conventional seating has accelerated adaptive shortening and its associated problems.

Goblet Squat

The goblet squat is one of the two basic beginner stretches for lower back issues. In a nutshell, you keep your back straight and sit your torso down between your legs as far as you can comfortably go. In the beginning, for stability and safety, I suggest doing this in a doorway. It will allow you to stabilize yourself if necessary.

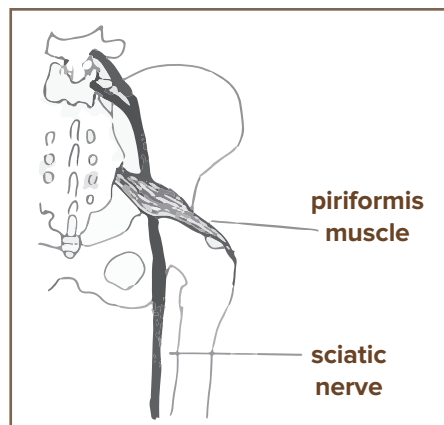
Here are step-by-step instructions on how to perform the goblet squat:

- **Keep your feet flat;**
- **Raise your chest;**

- **Cross your arms across your chest, if stable. (If not, hold the doorway.)**
- **Tighten and straighten your upper back;**
- **Look straight ahead with your chin horizontal;**
- **Finally, lower yourself so that you are sitting between your legs.**

Piriformis Stretch

The other exercise that is good for the lower back and legs is the piriformis muscle stretch.



The piriformis is a relatively short, small muscle right in the middle of your butt underneath the larger gluteal muscles. In about 15 percent of the population, the largest nerve in the body (the sciatic nerve) passes through the middle of this muscle. In most everyone else, the nerve passes under this muscle. In either event, a tight or shortened piriformis muscle can irritate the sciatic nerve and cause severe pain, numbness, or tingling in the lower back, buttocks, and down the leg.

The piriformis muscle is especially prone to adaptive shortening because of sitting. This is particularly true when someone sits with their legs wide and in external

Are Active Work Stations Worthless?

You've probably seen in the headline: "Sitting is the new smoking." As a result, the recent health rage has been standing desks or treadmills in the workplace. The perils of being sedentary have now extended from the couch to the office.

I'll be the first to admit, we all need to be more active, and sitting for long periods of time isn't beneficial. But the health claims for standing at work turn out to be more advertising hype than reality.

Researchers in Finland studied workers at a software company. They compared the effects of

working while sitting to working while standing. They discovered that standing has no effect on mental alertness. There was some decrease in musculo-skeletal strain in the neck and shoulders, but strain actually increased in the legs and feet. And they only saw very minor differences in the number of calories burned. (*International Journal of Networking and Virtual Organisations* 2017;17(4):371)

Another recent study actually measured the number of calories burned while sitting compared to standing and work. Seated workers burned 80 calories per hour, while those who stood burned 88 calories per hour. (*J Phys Act Health* 2016 Jun;13(6):573–8)

To put this in perspective, if you stood six hours a day at work

instead of sitting, you'd burn an additional 48 calories (roughly the calories in an orange). Standing at work instead of sitting would theoretically allow you to lose 22 pounds *over four years*.

Other studies have found that standing for hours takes a toll on the lower back, feet, and legs. (Ask anybody who waits tables for a living and they would undoubtedly agree.) It also can increase the risk of spider veins and varicose veins.

The take-away from this is that movement is what's important—not simply standing at a desk for the entire day. You can avoid sitting for long periods of time by taking breaks every 30 minutes or so to stretch and walk. ■

rotation (legs turned out like a frog).

There are various advanced stretching techniques for this muscle. But the ones I am giving you are some of the simplest ones to help lengthen and release tension in the piriformis.

Lie on your back and bend your right knee approximately 90

degrees so that your foot rests flat on the floor. Cross your left leg over your right so that your ankle rests on your right knee.

Next, grab your right knee and gently pull it toward your left shoulder. You should feel the stretch in your buttocks and hips. Hold the stretch for 20 to 30 seconds and then relax and repeat with the other leg. Repeat

this five times on each side. (Refer to illustration #1 at the bottom of this page for a visual of what this stretch should look like.)

If you aren't limber enough in the beginning to perform this stretch, you can do it as seen in illustration #2, or while seated, as seen in illustration #3, both below. All three are equally effective.

Piriformis Stretch #1



Piriformis Stretch #2



Piriformis Stretch #3



Stretches for Slumped Shoulders

You'll find several exercises to correct rounded or slumped shoulders online and in the two books I mentioned earlier. I recommend trying those, but in addition, some of the quickest and most effective results I've seen and experienced have come from using either a [high-density foam roller](#) or a [RAD roller](#).

A RAD roller looks like two lacrosse or tennis balls glued together. RAD roller is a name brand, but there are several similar products called peanut massage balls or massage therapy lacrosse balls. I have several kinds and the less expensive ones work just as well and cost half as much.

You simply place it on the floor or a mat and lay with your back on top of the ball. The double-ball should straddle your spine. Slowly move back and forth and let your body weight apply pressure to stiff and tense areas.

I tend to carry my stress in my upper thoracic area between my shoulder blades. I'm sure regularly working on a computer doesn't help matters either. When I first started using a peanut ball, certain areas were very painful and I could only hold the ball in certain positions for a very short time.

The relief and freedom of movement afterwards, however, was amazing. Within a week or two, I began to see a significant decrease in muscle tension in the area and an improvement in my overall posture.

Using these balls is one habit I intend to continue forever. It's a bonus that the small size makes

this tool easy to pack when I travel.

A foam roller can be used to relax and release tension in many larger muscles like the hamstrings and quadriceps. It's also a great tool to use with any stretching program. I specifically like it for helping correct slumped shoulders.

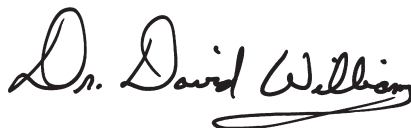
Place the roller on the floor and lay on top of it with your spine in line with the roller. Relax your shoulders so they fall toward the floor. All you have to do is concentrate on relaxing and the weight of your shoulders and arms will provide most of the stretching action.

Peanut balls and foam rollers are readily available and can be purchased online or locally at stores like Walmart.

For most of us, stretching isn't a fun and exciting form of exercise. But there's no vitamin or pill you can pop that can take the place of moving each of your joints through their total range of motion each and every day.

That's why stretching needs to be part of everyone's daily routine. It is one of the most important things you can do to stay limber and prevent adaptive shortening as you age...just ask Tom Brady!

Until next month,



This Month Online



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