



Internally Fit - by Gretchen Reynolds

How exercising keeps your cells young

Recently, scientists in Germany gathered several groups of men and women to look at their cells' life spans. Some of them were young and sedentary, others middle-aged and sedentary. Two other groups were, to put it mildly, active. The first of these consisted of professional runners in their 20s, most of them on the national track-and-field team, training about 45 miles per week. The last were serious, middle-aged longtime runners, with an average age of 51 and a typical training regimen of 50 miles per week, putting those young 45-mile-per-week sluggards to shame.

From the first, the scientists noted one aspect of their older runners. It "was striking," recalls Dr. Christian Werner, an internal-medicine resident at Saarland University Clinic in Hamburg, "to see in our study that many of the middle-aged athletes looked much younger than sedentary control subjects of the same age."

Even more striking was what was going on beneath those deceptively youthful surfaces. When the scientists examined white blood cells from each of their subjects, they found that the cells in both the active and slothful young adults had similar-size telomeres. Telomeres are tiny caps on the end of DNA strands -the discovery of their function won several scientists the 2009 Nobel Prize in medicine. When cells divide and replicate these long strands of DNA, the telomere cap is snipped, a process that is believed to protect the rest of the DNA but leaves an increasingly abbreviated telomere. Eventually, if a cell's telomeres become too short, the cell "either dies or enters a kind of suspended state," says Stephen Roth, an associate professor of kinesiology at the University of Maryland who is studying exercise and telomeres. Most researchers now accept telomere length as a reliable marker of cell age. In general, the shorter the telomere, the functionally older and more tired the cell.

It's not surprising, then, that the young subjects' telomeres were about the same length, whether they ran exhaustively or sat around all day. None of them had been on

earth long enough for multiple cell divisions to have snipped away at their telomeres. The young never appreciate robust telomere length until they've lost it.

When the researchers measured telomeres in the middle-aged subjects, however, the situation was quite different. The sedentary older subjects had telomeres that were on average 40 percent shorter than in the sedentary young subjects, suggesting that the older subjects' cells were, like them, aging. The runners, on the other hand, had remarkably youthful telomeres, a bit shorter than those in the young runners, but only by about 10 percent. In general, telomere loss was reduced by approximately 75 percent in the aging runners. Or, to put it more succinctly, exercise, Dr. Werner says, "at the molecular level has an anti-aging effect."

There are plenty of reasons to exercise - in this column, I've pointed out more than a few - but the effect that regular activity may have on cellular aging could turn out to be the most profound. "It's pretty exciting stuff," says Thomas LaRocca, a Ph.D. candidate in the department of integrative physiology at the University of Colorado in Boulder, who has just completed a new study echoing Werner's findings. In LaRocca's work, 57 people were tested both for their VO₂max - or maximum aerobic capacity, a widely accepted measure

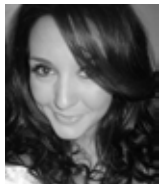
of physical fitness - and their white blood cells' telomere length. In subjects 55 to 72, a higher Vo₂max correlated closely with longer telomeres. The fitter a person was in middle age or onward, the younger their cells.

There are countless unanswered questions about how and why activity affects the DNA. For instance, Dr. Werner found that his older runners had more activity in their telomerase, a cellular enzyme thought to aid in lengthening and protecting telomeres. Exercise may be affecting telomerase activity and not telomeres directly. In addition, Stephen Roth has been measuring telomeres and telomerase activity in a wide variety of tissues in mice and has found, he says, the protective effects from exercise only in some tissues.

Another question is whether we must run 50 miles a week to benefit. The answer "can only be speculative at the moment," Dr. Werner says, although since he jogs much less than that, he probably joins the rest of us in hoping not. Given his and his colleagues' data, "one could speculate," he concludes, "that any form of intense exercise that is regularly performed over a long period of time" will improve "telomere biology," meaning that with enough activity, each of us could outpace the passing years.



How many sit-ups does it take to have sexy abs?



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One thousand, one thousand and one, one thousand and two, one thousand and three, one thousand and four, one thousand and five... should I keep counting or do you want a break from all of those un-necessary sit-ups? The general public seems to believe that the top fitness professionals in the industry are keeping the long desired secret of a flat stomach to themselves. Everyone is constantly seeking out this secret formula for sexy abs. How many sit-ups should I do? What are the best abdominal exercises? How do I get Jessica Alba's body? How do I lose my "love-handles"? Well my friends, you have waited long enough for the truth and here it is and you don't even have to buy my e-book, DVD series, abdominal apparatus for only 3 easy payments of \$29.99, or audiotape). The research has been done and there is only one very simple formula when it comes to "spot reduction", or losing fat in specific areas of the body. Are you ready to hear the long awaited truth? Let's make this simple to understand. Remember when you were a child and you were told that Santa Claus didn't exist, well, this may be tough to swallow but "spot reduction" doesn't exist unless you are paying for liposuction. Yes, it's true – spot reduction is a myth and you can file that under the same category as Santa Claus. Trying to lose fat from a specific part of your body by doing 1000's of leg lifts, or sit-ups will not work. It doesn't matter what exercise you choose, how many times you do it you will NOT look like Jessica Alba or Brad Pitt. "But my friend does 1000 sit-ups a day and you should see how fantastic she looks" – this may be true but maybe you should be asking her what else she is doing because it's not just sit-ups. Most people don't have their fat distributed evenly throughout their bodies. Each of us inherits a genetically determined pattern of fat storage just as we inherit our height or hair color. In other words, the fat accumulates to certain areas more than others. Men often tend to store more fat in the lower abdominal region. In women it's usually the hips and thighs. These are the first places the fat goes to, and the last places the fat comes off.

Of course abdominal exercises are an important part of your journey to great abs, but fat loss should be your main goal in your quest. Although we tend to accumulate excess fat in certain areas of our body it doesn't mean to get rid of it we have to work tirelessly on those particular areas. In order to get those sexy abs we all desire we must lose body fat!

The fact is that you probably already have 6-pack abs, but they are covered by a layer of fat. In order to reveal your 6-pack abs, you should slightly reduce your calorie intake and increase your activity level. That's it – that's the secret. There are certainly many people who will tell you differently, selling you a magic pill or a crazy device for a handsome profit. I wish I could tell you something

more magical, something easier, some sort of specific exercise, but the simple truth is that sexy abs have more to do with what's in your fridge than what the best ab exercise is. If you really want a flat stomach, consulting with a dietician or personal trainer who will give you honest, sound advice on how to reach your goals would be your best bet. If it were an easy process everyone would have sexy abs. Stop researching for a quick fix – this is the only true way. With the right guidance and motivation you CAN reach your goal of sexy abs. Remember this simple phrase and you'll hold the power of 6 pack abs: "Ab's are made in the kitchen".

If you have any questions on how to find your abs or any questions at all in relation to health and fitness please feel free to email me at micaelafitness@gmail.com



Running

Hello,

I'm 48 years old and, since June 2008, I have been working out at the gym at least three times a week. I finally started doing light jogging on a treadmill in January 2009. Everything was going well until my left knee started bothering me after four weeks. I then decided to go back to brisk walking for a little while. I started running a little later, but on an elliptical machine to lessen the impact. My basic question is the following: is the elliptical machine a good alternative to running? Am I still a runner?

Sylvie Lajoie

In the last few years, elliptical machines have inundated the cardio rooms of gyms and many residential basements. There are certainly many positive aspects to training on this type of equipment. It really all depends on your goals.

Training exclusively on an elliptical machine will not make you into a runner in the strict sense of the term. "Running" on an elliptical will not prepare you for the realities that await you outside on the pavement or the sidewalks. The continual changes in incline, the impact forces when you descend a hill, the additional work exerted by the muscles during inclines, the wind, and many other factors, will force you to understand the difference between the two activities. However, if you alternate the times you run with elliptical sessions, this machine then becomes an excellent tool for minimizing the effects of the ground impact imposed by running.

We can't ignore the fact that the impact that running has on our body is completely natural and especially beneficial, if this impact falls within a tolerable zone for the body.

If you use a good technique on the elliptical, the movement will be somewhat similar to running. From this perspective, the elliptical can be considered as an appropriate preparation for the sport and will therefore train the muscles necessary for running. New types of elliptical machines have recently appeared on the market. They more effectively stimulate the true running technique while practically entirely eliminating ground impact.

That being said, one always needs to consult a specialist if knee problems persist. The

methods mentioned above are used to minimize the wear and tear on the joints due to an endurance activity like running. Here are other ways of minimizing the impact that running places on your joints.

1- Best running technique: Video analysis

The simple fact of improving your running technique will significantly help you to protect your joints. In certain centres/running clubs, there are running professionals who will perform a really specific analysis of your running style, with the help of a video, if necessary.

2- Alternate running surfaces

Very often, people have one or two, maybe three favourite routes that they take several times a week, often on the same type of surface. Ideally, you should alternate the surfaces on which you run. The very fact of sometimes running in a park on the grass, sometimes on a dirt path in a nearby forest, or even on a treadmill, offers variation that is so beneficial for your body.

3- Deep-water training

This is a method that is truly advantageous for runners suffering from chronic joint problems. We're talking about deep-water running training. You obviously need to wear a flotation vest and be in the deep end of the pool, with your body in a vertical position, as if you are running. There is really no impact and the benefits are plentiful.

4- Strength-training and stretching

A training program specifically designed to strengthen the muscles will help improve your running technique (up to 18%) and also strengthen your joints and reduce the negative effects of repetitive ground impact.

5- Planning how often you run

We very often come back to this point, but we have to remember that running too often at an excessive intensity too quickly will put you at a high risk of developing one or more running-related injuries. You need to progress at a gradual pace to allow the body to adapt.

Good luck on your running journey!



We shouldn't feel excessive admiration for pro racers who log 600-mile weeks. They have plenty of time to ride and recover—that's their job. The real heroes are people like you, who find time to ride while still having a life away from the bike.

Full-time work, family commitments and cycling can be efficiently interwoven into your busy day. All it takes to schedule everything into 24 hours is maximum use of time-budgeting techniques.

Here's where to look for time slots that can accommodate your love for riding:

Commuting

Riding your bike to work or school and back may be the best way to create time cycling time.

When you commute by bike, time normally spent sitting in a car is used productively as part of the training day. An eight-mile ride to work or school takes about 30 minutes each way. Even if you do no other riding, that's still an hour of cycling each weekday. The trip home can be lengthened as much as time, daylight and energy allow.

Another benefit is arriving at your job refreshed and alert. It may be tough to get up earlier for the ride in, but the physical and mental lift of exercise will carry you through that 10 a.m. letdown that your sedentary colleagues experience. Then you ride home, clearing cobwebs and blowing away job-related frustrations. You're refreshed and ready for evening responsibilities or family fun.

Commuting Logistics

- Use a small backpack to carry clothes, lunch and papers. A waist strap helps eliminate swaying and bouncing as you ride.
- Keep a pair of shoes at work so you don't have their weight and sharp edges in the pack. Take the week's clothes to work on Monday morning and shuttle them home Friday afternoon, or whatever arrangement fits your situation.
- Clean up in the restroom with a lightly soaped washcloth. Meanwhile, get coworkers interested in commuting and lobby your boss to install a shower.
- Dress in your office if it has a door. If not, use the restroom or a storage room.
- Play on the way home. Scout out a longer route and ride for an hour or more as time



and commitments allow. Do intervals, time trials, or hit the hills hard to get a great workout while you're homeward bound.

If commuting simply won't work for you, here are two popular options:

Early Bird Special

Consider an early-morning workout. By the middle of March it's usually light enough to get in a ride before work. At dawn there are few cars on the road and the day is brightening every minute.

Getting up in the pre-dawn hour may be the ultimate test of whether you really want to ride. Roll out of bed the minute the alarm rings and don't think about anything. The longer you lie there moaning about how early it is, the harder it is to extricate yourself from the sheets.

Sleep loss is the biggest risk. Make up the

deficit with an earlier bedtime because it's vital to get enough rest. Lack of sleep can lead to deep fatigue and poor performance in everything you do.

Evening Rides

If your schedule prohibits riding most of the day, try from 9 to 10 or 10:30 p.m. For most people, the kids are in bed, the chores around the house complete, and you're probably wasting time watching TV.

To make this work, eat a moderate dinner at 6 or 7 p.m., allowing the food to digest by riding time. As an additional benefit this provides motivation not to overeat.

Riding in the dark used to be dangerous because lights were poor. You couldn't see road hazards clearly, and motorists couldn't see you. Modern lighting systems make night riding safer, but it's still smart to use lighted parks or suburban streets if they're available.