



ProActive

The regenerative orthopedics program designed to ensure peak performance well beyond middle-age.

Christopher J. Centeno, M.D.
First Edition



INTRODUCTION

The concept for this book and the whole Regenexx® ProActive program that goes with it came from observing what we active and aging physicians do for each other. In our clinic and when we meet with other Regenexx® providers around the country, we fix each other. What do I mean? I give many examples in this book, but we generally treat each other with various advanced Regenexx procedure technologies before things get bad. This keeps us all going and able to exercise at high levels. So before we get a big rotator cuff tear and right when that shoulder begins to hurt and isn't getting better, we get an immediate MRI or ultrasound to see if there are small tears in the tendon. If so, we get this treated using our own advanced techniques before things get worse. When we can't catch things before they get bad or we're not paying attention, we get aggressive quickly. So as an example, rather than messing around with a month of physical therapy after our back begins to ache, we know from experience that a quick epidural with our third-generation platelet lysate procedure will get us back into the gym in hours to days, preventing the muscle atrophy we would suffer if we had to wait because our insurance company was trying to cut costs. We definitely do physical therapy to get stronger, but it's sequenced in after the nerve in our back is calmed down, when the muscles can take maximal advantage of the therapy.

In many ways, the Regenexx ProActive program turns traditional medical wisdom on its head. It recognizes that much of what we usually do as physicians is dictated not by what's best for the patient but by what an insurer will cover. In addition, it tries to teach you how you prevent big problems or treat them when they're small, just like the experts in musculoskeletal care do for themselves. After all, why should we be the only ones to take advantage of this accumulated knowledge?

WORDS OF WISDOM FROM MORE THAN TWO DECADES OF OBSERVATION

I'm now 50 years old, a time when your body begins to ache and things start to go wrong. In fact, there are many big life-changing diseases that we doctors see happen in this decade of life. Being someone who loves to stay active, that scares me!

Like me, you've likely seen 60 and 70 and even 80 year olds that are running, biking 100 miles, climbing mountains, or just behaving like they're still 30. You've also likely known people this age who can't do these things and may struggle with walking a mile. While some of this is genetic, some of it is also based on the good and bad choices these people make throughout their lives. Like you, I desperately don't want to be like some of the 60 and 70 year olds I see that can't bike, hike, or run. I also really aspire to be that 80 year old who can still "kick it."

Given the same genes, what have these people done differently? After two decades as a physician spent watching both types of patients, I have found some common threads that will help keep you active as you age.

Avoid Surgery Whenever Possible

In my 20-plus years of clinical experience, the guy or gal who is still kicking it at 80 hasn't had much orthopedic surgery. Why? The research on surgical outcomes is becoming increasingly clear that surgery often hastens arthritis and degeneration, and it isn't very effective in the long run. Isn't surgery for orthopedic problems the standard of care? For now, but this will change as a new generation of physicians digests the existing research that surgery is often ineffective and there are often better nonsurgical options. Does this mean that all surgery will go away? No, there will always be problems with tendons, ligaments, bones, and joints that can only be addressed with surgery, but about 80% of what we treat with surgery today will eventually be replaced by less invasive needle-based procedures. Which surgeries are the most ineffective and most likely to make your joints, tendons, and ligaments old before their time?

- Meniscus Surgery (aka Meniscus Repair), Meniscectomy, Partial Meniscectomy, and Arthroscopic Meniscus Surgery: Despite meniscus procedures being the most common orthopedic surgeries in the world, we don't have a shred of credible scientific evidence that this surgery is effective. Hard to believe? [Read this piece](#) on four big recent studies that show just how poor the outcomes from this invasive surgery can be. In addition, removing parts and pieces of the meniscus just hasten arthritis.

• **Low Back or Neck Spinal-Fusion Surgery:** The fastest growing category of spinal surgery in the United States today is fusion, where the spine bones are “fused” by hardware and other devices. However, there is also no credible scientific research showing that this surgery works. In addition, the complication rates for the surgery are through the roof. Research continues to show that otherwise normal segments above and below the fusion begin to predictably break down after the fusion. Finally, as a physician who has for decades seen patients with fusions get worse not better, few patients in the long run are happy with their surgical result.

• **ACL Surgery:** All the big time athletes get this surgery, so there must be great evidence showing it helps athletes get back to play quicker and avoid arthritis, right? Wrong. [In fact in one recent study, return to sport wasn't any different between athletes who had the ACL surgery versus those who didn't.](#) In addition, [other studies have shown that the procedure doesn't protect the joint from getting arthritis,](#) even when performed in young people.

• **Rotator Cuff Surgery:** Failure rates are high and a [recent study](#) didn't demonstrate improvements in function with the surgery when [compared to just plain old physical therapy.](#) From my own personal experience, it's rare to see patients after rotator cuff repair who return to high levels of activity or who don't develop problems down the road.

• **Arthroscopic Hip Surgery for Impingement:** There is no high-level scientific evidence that the surgery is effective in preventing arthritis. More concerning, the [most common type of impingement](#) is a bone spur that research shows protects the joint, so there would be little rationale for removing this bone spur.

What if you've already had surgery? Do everything possible you can to avoid more surgery! In addition, start paying attention to your body and looking for less invasive ways to treat what crops up as you age.

Control Inflammation Smartly

While the average American has been convinced that taking regular NSAID drugs like Motrin, ibuprofen, Advil, Celebrex, or Aleve is just a rite of passage of old age, [these drugs all come with serious heart attack risks.](#) In addition, while steroids like prednisone taken orally or betamethasone or cortisone injected into a joint are potent anti-inflammatories, [they are also very bad for tendons, cartilage, bone, and stem cells.](#) Both of these strategies often result in more damage than help. Use natural anti-inflammatories to control aches and pain. Also realize that these aches are warning signs that need to be further investigated if you're going to make it to the end of the finish line in top shape. I'll discuss more on this issue later in the book.

AVOID steroid shots! The average American who has joint pain that doesn't go away gets a shot of steroids. However, [these injections can hurt the joint](#) as well as cause serious side effects, like bone loss, poor blood sugar control, and messed up cortisol levels.

Keep Your Weight Down

Carrying more body weight hurts your joints and spine from a mechanical standpoint, putting more wear-and-tear forces on these structures. However, it also hurts the cartilage from a chemical standpoint independent of the extra pounds. So if you're carrying extra weight, you get a double whammy—more pressure on joints and cartilage that's less healthy than it is for your skinnier counterparts. [You can read more about why this happens here.](#)

Fuel Your Body Right

Food has powerful effects on the body. Perhaps one of the greatest disservices done to nutrition science was the idea of counting calories, as this mistakenly led us to believe that all food was equal. The second biggest disservice to adults watching their weight was the mistaken idea that eating fat made you fat. In the quest for putting the right fuel into your body, follow these simple steps:

1. Avoid refined sugars or too much sugar. If you have the wrong genes (like many Americans), your biggest challenge will be avoiding the harmful effects of sugar. This food turns on a chemical switch in your body that causes too much insulin to be released, which in turn makes you eat more. Check the labels. If what you're eating or drinking has more than 5–10 grams of sugar per serving, you shouldn't be eating it.
2. Avoid processed foods. If what you're eating can sit on the shelf for more than a few weeks without going bad, it likely has hydrogenated or artificially created oils, which are a big problem for your health. These so called trans fats are the only types of fats you should be worried about.
3. Eat lots of fruits and vegetables.

To learn more about how best to feed your body, read our book [Nutrition 2.0 by John Pitts, MD.](#)

Take Control of Your Hormones

As we age, our hormone levels get messed up. If you've gained weight as you get to your 30s, 40s, and 50s, it could be due to declining hormone levels. If you have a certain type of genes when this happens, no amount of diet or exercise will get the weight off. However, simply supplementing hormones at an early age

may help. Could taking these hormones cause a heart attack or cancer? At the time of this writing, there seems to be little credible evidence of that risk. If you're thinking of [adding in testosterone](#), see this link for more information. If you're thinking of taking [female hormones](#), see [this link on the topic](#).

STATUS UPDATES

You probably pay attention to the status updates or texts on your phone more than you do your body. Yet paying attention to your body's status updates may make the difference between being that 80-year-old who is active and one who can barely walk. To be "ProActive" you need to catch small problems before they snowball into big issues, and prevent them when possible. To do this, you need to understand how your body works and its status updates.

So what are these updates? What do you need to know about your body?

The Status Updates and Texts Your Body Sends You

Your body talks to you every day, yet our managed care system has taught you and your doctors not to listen. How did this happen? The push to reduce costs has created what I call "not so benign neglect." The mantra is simple: ignore the small aches, pains, and other minor problems until someone else has to deal with the cost of fixing a big problem. In addition, we physicians aren't rewarded for finding problems. In fact, in the heavily managed care plans that are roaring back, the rewards will all be for ignoring problems. Finally, our sports mantra has always been similar: tell athletes to ignore aches and pains. [The "no pain, no gain" saying is only now just beginning to be replaced](#) with accessing athletes early and looking for biomechanical problems.

Let me give you a concrete example from my life—a time where I didn't listen to my body and I paid a big price. Had I paid attention, I could have avoided a Mack truck.

My neck had been bugging me for years when I lifted weights. This wasn't a big issue, just soreness when I lifted heavy. It would stay sore for a day or two, and often it would go away. Sometimes, while lifting with a personal trainer and feeling the competitive need to impress by lifting heavier and heavier, I would push it into soreness that would require me to take it easy for a few workouts. During the same time, I began noticing an "old man" forward head position. My shoulders were also getting tighter and tighter. This winter my right thumb began to go numb when I played football with my son. I assumed it was some mild irritation in my carpal tunnel, so I ignored it. In the late spring, my neck was growing sorer with every night's sleep, as if I was sleeping on my neck wrong. I furiously tried every pillow I could get my hands on, but nothing helped.

Then the Mack truck hit. The C6 nerve in my neck became pinched by a disc bulge and arthritis in the joints. I was miserable and gave up weeks of sleep with severe neck and shoulder pain. Luckily, Herculean and early intervention using autologous biologic therapies delivered by my partners brought the issues under prompt control, but the structural damage was done to my neck all because I had not listened to my body. The neck pain with lifting was a sign that I was lifting more than my neck muscles could handle and creating new bone spurs with every rep. The chest tightness pulling my shoulders forward and my ever-advancing forward head were indications that the nerves in my lower neck were losing precious “breathing room” as the new neck position closed off their little tunnels. Finally, the numb thumb was my first indication of a pinched nerve in the neck.

How about another example from a patient I saw a few weeks ago? This [37-year-old personal trainer](#) had a severe ankle sprain where the outside ligaments tore off the bone. She was placed in a walking boot and the bones mended, and she was cleared to return to training for a triathlon. Her ankle ached a bit, but she just pushed through it, having been taught the mantra, “No pain, no gain.” Then her knee began to hurt and she was told she needed knee surgery, which is when she came to see us. What happened? The ankle ligaments had been stretched and the ankle was unstable. In addition, nobody noticed that the knee ligaments were stretched at the same time. Running like this only allowed much more motion in these joints than normal, which began to cause wear and tear. This resulted in a small knee meniscus tear. She was headed toward that Mack truck—in her case rapid onset of ankle arthritis. However, simple injections to tighten the ligaments now will likely help her avoid being 40 and unable to run.

Why weren't these issues noticed by her surgeon? The focus was fixing the broken bone. In addition, her surgeon was ill equipped to identify the small amount of ligament laxity causing instability that in a triathlete can add up to big problems. The focus was fixing her ankle bone, and once the X-ray looked like the bone had healed, she was cleared to return to high levels of activity. Based on this and other experiences, one has to wonder how many other athletes and weekend warriors are ticking time bombs?

How You Can Start Paying Attention

There's a quick and dirty method of listening. The “CliffsNotes” of what to pay attention to is below.

The Top 7 Status Alarms

1. Joint or Body Part Aching after Exercise

You go for a run or workout at the gym and your knee aches, so you pop some Motrin. Why is this a big deal? Every time you're active, some cells die off and are replaced via local stem cells in the joint. A small amount of inflammation is created, and this is your body's natural repair mechanism in action. This is barely noticeable. However, when your joint aches, it's because too much damage is being caused or you no longer have the ability to repair small amounts of damage efficiently. [Popping a Motrin, or similar anti-inflammatory, may make it feel better, but it also inhibits that normal healing cycle.](#) So while these medications may be all right every once in a while, if you can't really exercise or function without them, there are serious problems brewing in the joint. This applies equally to knees, shoulders, and other peripheral joints and to whole body regions, like the neck or the back. The aching is the "tweet" from your body that something needs to be fixed or this area will soon not be able to function well. Ignore it at your peril.

2. Burning, Pressure, Numbness, or Tingling

There's really only one thing that causes these symptoms in the body: an irritated nerve. Most people don't really understand the significance of why this is a big deal. Nerves power muscles and fine-tune the movements and your reactions to things, like walking on uneven ground or a sudden shift or push. An irritated nerve not only doesn't completely fire muscles, leading to biomechanical imbalances, but also reduces the information flowing back about how your joints should move. For example, there are thousands of tiny position sensors in every joint, finely tuning your muscles many times a second to millimeter precision to keep your joint functioning at 100%. An angry nerve that carries these signals doesn't transmit all of that data, hence your muscles can't protect your joint.

There's another aspect of [irritated nerve that is only now being appreciated: they cause nasty chemicals to dump into a joint,](#) leading to more arthritis. A normal joint is an environment where carefully coordinated chemicals assist the cells in the joint in staying healthy and active. An angry nerve that goes to a joint causes this chemical balance to go awry, leading to the joint not being able to keep up with its own maintenance.

3. Chronic Tightness in Muscles That Keeps Returning

Are you that person who's always stretching your hamstrings or other muscle, and while it may relax for a while, the next time you work out, it's tight all over again? What causes this, and why is it a big deal?

Most people who have this problem are taught stretches or massages for the effected muscle. Many of them use a [foam roller on areas like the hamstrings or side of the thigh](#) (ITB or iliotibial band). They are told by athletic trainers, personal trainers, massage therapists, or physical therapists that it's just a tight muscle they need to stretch. If that's the case, why only this muscle, and why does it keep coming back? The answer is that the nerves in the spine that supply this muscle are irritated. While we doctors invented terms like "nerve" and "muscle" to describe the different structures we saw during anatomy class, to the body there is little difference between the nerve and the muscle it supplies—they are all one thing. So when the nerve is angry, so is the muscle.

These chronically tight muscles are causing other issues, such as parts of the body that don't move normally. For example, we'd all accept at face value that if an old car had parts that should be flexible but weren't, other parts connected to them would get worn out faster. For some reason, patients often can't conceptualize this in the body. In the case of chronically tight muscles, the tendons on either end that attach to bone tend to get overloaded and start to degenerate as we age. So, for example, chronically tight hamstrings can become pain behind the knee where the hamstrings muscle attaches. Or a chronically tight calf can become an Achilles tendon tear.

4. Asymmetry

Your body was built to operate at its best only one way—symmetrically. This means that the left-right and front-back balance is equal. If you have something like scoliosis (a curve in the spine), you know you're not balanced. However, most people have small parts that aren't equal side to side and don't know it. Small differences here can turn into huge issues over time.

For example, range of motion (how much a joint moves) is something most people don't notice. For example, do both hips rotate outward and inward to the same amount, or are they different? If one hip doesn't move as much in a certain direction, your body weight is being placed over a small area of the cartilage of the joint. This means that this hip will likely get arthritic more quickly as you age.

Another common issue is a high shoulder. Look in a mirror and see if your shoulders are the same height. If you carry a purse or a computer bag, does it slip off more easily on one side? Does one shoulder come higher when you lift weights? A high shoulder places more wear and tear on that rotator cuff and biceps tendon and kinks your neck on that side, which can lead to rotator cuff tears, biceps tendonitis, and more arthritis on that side of the neck.

5. Weakness

Just like your body was designed to be structurally symmetrical, it was also designed to be equally strong in most areas. While you may be right or left handed and be a little stronger on your dominant side, people often have weak areas they don't notice or maybe they do notice but they ignore. Weakness in any area can move the joints there abnormally or can fail to protect joints.

For example, the buttocks muscles act as shock absorbers for the hip as you land while running. They also protect the low back when lifting. Patients that have chronic kneecap pain often see a doctor who focuses on the knee, yet [recent research shows that most of these patients have weakness in the butt muscles](#) and the hip as the source of the problem! The quadriceps muscles must take the place of the weak butt muscles to absorb the shock of landing, which ends up overloading the kneecap joint. This leads to pain that has nothing to do with the original problem area. How would you know if you have a weak butt muscle?

6. Tendonitis

The muscles attach to the bones they move by a tendon. As I discussed above, the muscles are moved by nerves, and when the nerves aren't happy, the muscles malfunction ever so slightly. Parts of them shut down, developing trigger points. These areas are tight bands that don't contract and relax normally like a healthy muscle. This causes too much pulling on the areas where the tendons attach or tendonitis.

Why is this a status update you should be paying attention to? For example, chronic tennis elbow that won't easily respond to treatment is an indication of a pinched nerve in the neck. The C6 or 7 nerves supply these forearm muscles and can malfunction in small areas when these nerves are irritated. So what the patient believes is an elbow problem is really a status alert from the neck. Do patients generally understand this? No. Patients don't understand this because most of their doctors don't understand the connection!

7. Systemic Inflammation

Inflammation is how we heal, but this is apples and oranges when compared to chronic inflammation. This second type of inflammation creeps up as we age, more for some of us than others. This is the type of chronic problem that can hurt your heart as well as your joints. However, there are ways to help control this problem.

How would you know if you have this issue? Ask yourself these questions: Do you need Motrin, Aleve, or Celebrex (or a similar drug) just to keep your multiple aches and pains at bay? If you stop these drugs, can you make it, or are you unable to exercise?

HOW DO YOU PREVENT GETTING INJURED? BY PAYING ATTENTION

As I write this, I've been traveling all day on planes. My left calf and Achilles tendon is hurting. Did I work out too hard on that side? No, I know this is a status alert from my body telling me that I'm at a much higher risk for injuring that ankle until this calms down.

Why is this happening? I know from experience with my body and its quirks that sitting at odd angles has caused irritation of my left S1 nerve. This nerve goes to my calf and has caused portions of it to go "off-line." This is causing the tendon that attaches to the calf muscle (the Achilles tendon) to become overloaded and painful. What would happen to me, a middle-aged guy, if I tried to work out hard right now, before I let this calm down? I would be at high risk for an Achilles tendon tear!

I've used an understanding of similar alerts to both avoid injury and recover much more quickly when they couldn't be avoided. So what's the big deal? Isn't it obvious when you should pull back to avoid injury? Not for me, an experienced spine and joint specialist. At least not 10 years ago.

I had just come back from a long mountain bike ride and went to innocently lift my 1-year-old when "bam," my back went out and I went down. What happened? Now I know that being in that flexed position turns off the low-back stabilizing muscles, making the vertebra more likely to get into a bad position and pinch a nerve. The same thing has happened to me a few times in the morning while working out. The same flexed posture from sleeping on my side all night also turned off those critical stabilizers. So for me, just a simple thing like avoiding morning workouts has likely saved me substantial additional wear and tear on my low back.

Or how about the time, I discussed above, when my neck stabilizers went off-line? While I won't bore you with the details of how that happened, when most people would have been consulting surgeons for neck surgery, because of early identification and treatment using my own blood platelets, I was back in the gym cautiously getting back to six days a week workouts. In that case, as I write this book, I'm still reading the status alerts to get back to where I want to be. For example, two weeks ago when I attempted my usual weight for biceps curls, I noticed that my right shoulder would come much higher than my left, like a reflex. I immediately noticed that this was asymmetry and was happening because the small muscles in my neck that would normally keep the bones stable when I lifted that weight were "off-line," so my big shoulder and neck muscles were substituting. I knew that staying at that weight using the traditional "no pain, no gain" mantra would continue to tear up my neck, so I decreased the weights by about one-third until I didn't see this happen. Two weeks later, at around the same time most people would be starting low-level rehab in a neck brace from their recent surgery, I'm now back to 90% of my old biceps curl weight without any neck surgery!

So how can you do the same? Let me give you some examples using the 7 status alerts above.

1. Joint or Body Part Aching after Exercise

This is usually an indication of instability, problems in the joint, or asymmetry. The status alert is saying “STOP” until you fix the problem. Or at the very least, give the joint some help and stimulate it to keep up with the wear and tear. How?

As above, you need to look at why this is happening if you want to stay active. This generally doesn't mean getting an MRI and a 60-second hands-on exam and deciding to have surgery. It means getting checked out by a provider who will pay as much attention to the MRI as he or she does to why this is happening. Some examples of what I would do for my body based on what's wrong follow:

a. Instability—Small changes in joint motion due to lax ligaments can fry a joint or body area over time. Injections of platelets or stem cells (depending on the severity of the ligament) using precise ultrasound or x-ray guidance into the ligaments is what's needed. In our clinical experience, using these injections can make a huge difference and prevent that joint from getting worn out.

b. Problems in the Joint—An MRI can show the internal structure of most midsized and larger joints with good accuracy, so it can identify things like tears in the meniscus (knee), labrum (hip and shoulder), disc (spine), and cartilage (all joints). Be aware that [operating on a torn meniscus in a patient who is middle aged or older is about as helpful as doing nothing](#). However, catching small issues early and treating those with autologous biologic injections like platelets and stem cells (in our clinical experience) can help keep aging athletes going!

If you can't fix the issue, is there another option? Yes, help the joint tolerate the extra wear and tear. How? I use my own blood platelets using our second-generation platelet-rich plasma to help my joints stay in the game. How does that work? I ProActively get these joints treated when they begin to complain, which practically means that my problem joints get injected a few times a year.

2. Burning, Pressure, Numbness, or Tingling

As above, these are often a function of irritated nerves. These are serious issues that often get ignored, so when this occurs frequently, the source of nerve irritation must be found. How? There are two possibilities:

a. The nerve is being trapped in the extremities. Examples are carpal tunnel syndrome or an irritated peroneal nerve at the knee or a compressed tibial nerve (tarsal tunnel syndrome) at the ankle. These issues can often be solved by using sophisticated [ultrasound imaging to carefully inject platelet growth factors around the nerve, freeing it up from scar tissue \(called nerve hydrodissection\)](#).

b. The nerve is being pinched in the spine. If this is happening, the stabilizing muscles there are also quickly going south, so the spine is becoming unstable. This will beat up the discs and spine joints. Finding this is often as simple as an MRI of this area. We often solve these issues by simply [injecting platelet growth factors via an epidural or using platelet-rich plasma to tighten and heal damaged and lax ligaments that are making the spine unstable](#).

How can you use this information to keep you going? Recognize these issues early. As an example from my life, I know when my small disc bulge in my back is causing small amounts of nerve irritation. When this happens, my left leg gets uncoordinated ever so slightly. My workouts cause more wear and tear on the hip, knee, and ankle. When I see this happening, I can back off on a certain activity that might be causing the problem or just reduce the pounding activities on that leg. If that doesn't work, we simply inject the growth factors from my blood platelets into the area around the nerve, and within a week I'm back at full activity levels again. In addition, I can also get injections of platelets into the knee and ankle to help keep those joints healthy.

3. Chronic Tightness in Muscles That Keeps Returning

Most people think of these tight-muscle issues as something that just needs to be stretched. However, realize that when stretching doesn't help and the problem keeps returning, you have a bigger problem. That issue is likely an irritated nerve in your neck or back, and its only manifestation may be felt in that tight muscle (i.e., you may not feel any neck or back pain).

How can you use this information to keep yourself active? For example, tightness in the right hamstring that won't go away with stretching is likely an irritated S1 nerve. If you ignore this problem, the extra tightness in that calf muscle is overloading the Achilles tendon and the ankle ligaments, both of which

can fail. So rather than stretching something that won't relax and ending up with an Achilles tendon tear down the line, recognize the cause in your low back and get it treated. [Oftentimes an injection of platelet growth factors around the irritated nerve using precise imaging guidance will help the chronically tight muscle.](#)

4. Asymmetry

Your body is meant to work optimally as a symmetrical machine, meaning the front/back and left/right are the same. When things get out of whack, more forces get put on certain parts of the body, which causes arthritis, tendonitis, and/or ligament laxity. Take the symmetry test in our [Orthopedics 2.0 book](#) to see where you need help.

How can you fix these problems once you find them? Let's take my "old man" forward head problem. My chest had grown tight from overworking it, pulling my head and upper spine forward. This put pressure on the nerves in my lower neck by decreasing the room for these nerves as they exited the spine. Since I wasn't too far along, I could aggressively stretch the chest and shoulders and consciously notice my forward head and correct that problem. If I was further along, I might have needed aggressive myofascial work (Rolfing is a good therapy to lengthen tight muscles). Since my head had been forward, the ligaments in the back of my spine had gotten loose. So these needed to be tightened via injection.

That same mantra to help solve asymmetry issues is a simple formula. Stretch and/or lengthen on the tight side and tighten and/or strengthen on the weakened and lax side. [A great rehabilitation program that addresses these issues and that we've seen many patients respond well to is Egoscue.](#)

5. Weakness

Your muscles protect your spine and joints so weak muscles mean you're frying your joints. Despite this, there's a general laissez-faire attitude toward the problems that come from weakened muscles. To find out where you're weak, take muscular stability tests in the back of the chapter on stability in our [Orthopedics 2.0 book](#).

Strengthening muscles may sound easy, and sometimes it is simple. However, making sure the nerves, joints, ligament stability, and symmetry are working optimally may be necessary before strengthening can happen. Hence, if physical therapy or trying some home exercises doesn't allow you to strengthen, then you need to see a Regenexx provider or other provider that understands the SANS system.

6. Tendonitis

As discussed above, angry tendons can be from irritated nerves or even an asymmetrical body. These tendons develop small microtears that can eventually develop into bigger tears and do damage. To avoid this pitfall, you first have to understand what's causing the tendon to have issues.

Let me give you an example from my daily life. Yesterday I was working out to a CrossFit DVD I use twice a week. First, while I wouldn't normally recommend a specific video, this one is so well done that it's worth a look. [FOCUS T25 is a program](#) that allows you to modify every move in every level of the workouts and focuses on common sense 360-degree core stability, so if you want a good workout you can do quickly and can modify on those days that things are not going right, this is a good one.

Second, the video has a student with forearm bands that are commonly used for elbow tendonitis. Despite being in great shape, his head and neck was bent forward just like mine. This means that he didn't have some sort of overuse elbow tendonitis; he likely had angry nerves in his neck with the only noticeable symptom being problems in his forearm muscles that were tearing up the tendons where they attached to his elbows. What did he need? Certainly not the silly elbow straps, as they were mere Band-Aids. He was also headed for big problems down the road as those angry nerves would slowly work themselves into a frenzy that would end his workouts. What he needed were simple chest and shoulder stretches, and if that didn't work, injections of his own blood platelets into the damaged tendons and the growth factors from those blood platelets around the irritated nerves in the neck. He also needed to understand that this forward head position is something he needed to be conscious of at all times. However, like many of us, he only noticed and focused on his elbows as that's where it hurt.

The lesson is, this guy has a window of opportunity to change things before the time bomb in his neck goes off. Small things now can prevent irreversible damage later. Minimally invasive injections in his elbows can prompt healing. The problem is that without a program like ProActive, he has no way to know what lies ahead.

7. Systemic Inflammation

If you can't get off Motrin; Aleve; ibuprofen; or prescription anti-inflammatories, like Celebrex or Mobic, you likely have a serious systemic inflammation problem you're masking with these drugs. In addition, if you're not addicted to these pharma crutches right now, [why are you dramatically increasing your heart attack risk](#) by taking them?

The first way to find out if you have a problem is with a blood test like C-reactive protein (CRP) or an AA/EPA ratio. These tests measure inflammation. If they're high, you can supplement your omega-3 fatty acid: [for information on doing that, see this link](#). Our [Stem Cell Support supplement](#) is also a great way to control inflammation.

We all take for granted that our car needs annual maintenance. You likely go to the doctor annually to get your blood pressure and blood tests checked. So while the above signs and alerts are like seeing oil on the ground under your car and then taking it in to get it evaluated and fixed, how can you treat your body at least as well as you treat your car?

WHY YOUR BODY'S LEVEL OF CHRONIC INFLAMMATION MAY BE HOLDING YOU BACK

As I discussed above, inflammation is a big deal. The term means swelling or redness. It can not only make you physically stiff, but it can also break down cartilage, cause heart attacks, hurt tendons, and cause strokes. [It can even negatively impact your stem cells](#).

Think of whole-body inflammation like environmental conditions that are ripe for a forest fire. If it's hot and dry and there's dead wood, all it takes is a single spark to set off a major blaze. The level of inflammation in your body is a similar situation. As a concrete example, a recent study showed that people who had [higher levels of systemic inflammation in their body were more likely to suffer from more and longer pain from a herniated disc](#). Why? Think about our forest analogy. If a small fire starts in a wet forest where it's raining (like a normal body without loads of inflammation), it's more easily contained. That same small fire in our hot and dry forest can easily turn into a blaze that's out of control. This is just like our body with high levels of inflammation—a small problem can quickly balloon into a major whole-body meltdown.

How does this out-of-control forest fire translate into the world of real people? I meet some patients who are addicted to Motrin or Aleve or other prescription NSAID drugs, like Celebrex. If they literally stop taking these for a day or two, they're disabled or in loads of pain. Why? What can you do if this is you?

First, why is this happening? Your body has two types of inflammation: acute and chronic. Acute inflammation is how we heal ourselves. For example, when you sprain an ankle, it swells and gets red and heals. Your body brings healing cells to the area and tries to repair what was damaged. Chronic inflammation is different: it's the silent killer that is causing everything from heart disease to Alzheimer's to why you're unable to wean yourself off Motrin. It's the low-level forest fire that never ceases.

From a dietary standpoint, the modern American diet is an inflammation nightmare. This can be linked to increased omega-6 fatty acid consumption, high-glycemic carbs, decreased omega-3s in our diet, and less polyphenols. What types of foods are stoking this pro-inflammatory, whole-body forest fire?

The omega-6 fatty acids that are found in cheap oils used in mass-manufactured foods are a big culprit. Our diet has changed radically in this regard since the turn of the nineteenth century. For example, the amount of [soy oil consumed has increased a thousandfold](#). Why? Its dirt cheap and a great way to lower costs in food production so profits can be optimized. Soybean oil, canola oil, corn oil, safflower oil, and sunflower oil are all rich in Omega-6 fatty acids. These oils (but not olive oil or coconut oil), break down to a nasty pro-inflammatory chemical known as arachidonic acid (AA). From an inflammation standpoint, AA is like bringing gasoline to our forest fire.

High-glycemic foods are another huge problem in the American diet. Food manufactures have found a way to dramatically increase the sugar in just about everything. Our daily sugar consumption has gone from about 5 grams in 1700 to 22 grams in 1800 to 112 grams in 1900. Today, half of Americans consume about 225 grams! Too much sugar causes too much insulin to be released, dramatically increasing inflammation.

Omega-3 fatty acids counteract the pro-inflammatory effect of omega-6 fatty acids. Because they can be found in fish and other seafood, they used to be a big part of the American diet when most Americans were clustered near the coasts or rivers with a port. However, our omega-3 consumption as a country has dropped off a cliff as most of us would prefer a burger to seafood. [In fact, one component of omega-3s is very important in controlling inflammation. It's called EPA](#). Remember this acronym as it will become important later.

As a nation, our consumption of fresh vegetables has also dropped off precipitously. Polyphenols are what give our vegetables color. [They are an important part of controlling inflammation through many different mechanisms.](#) One common polyphenol is called [resveratrol, which has been shown to help control blood sugar, activate a gene that helps to block arthritis, reduce inflammation, and reduce the effects of aging.](#)

Can we clean up this “kindling” and gasoline for the whole-body forest fire by changing diet? Yes, in part. The diet portion of getting off toxic anti-inflammatory drugs has the following components:

1. Get rid of the nasty inflammatory oils in your life. Become a label reader, and if you see soybean oil, canola oil, corn oil, safflower oil, and sunflower oil—you can’t have this product. Butter, lard, olive oil, and coconut oil are fine.

2. Get rid of high-glycemic foods. What do I mean by high glycemic? The white granular stuff plus bread, pasta, juice, super sweet fruits, and so forth. All of this produces too much insulin production, which when combined with far too little activity causes a metabolic syndrome. Consider going on a strict Atkins, Zone, or South Beach diet. These are all low-glycemic diets—meaning they can help control blood sugar and excessive insulin release.

Another quicker test to see if you’ve beaten sugar addiction is what I call the chocolate bar test. Get a 70%, 80%, and 90% bar and taste them. If you try the 70% bar and feel it’s not sweet enough, go back to square 1—you’re a major sugar addict. If the 70% was sweet and the 80% was not sweet enough and very bitter, then you’re on your way, but not there yet—strict up the diet and cut more sugar. If you try the 80% and it’s a little sweet and the 90% tastes bitter, you’re about on track.

3. Supplement the heck out of your Omega-3s. Most people I know who supplement these fatty acids go to Costco and buy some huge bottle of fish oil caps, pop two in the morning, and call it good. First, [the brand really matters, so see the information at this link.](#) Second, this is about one-twentieth of the fish oil dose you need to control inflammation.

How much should you take? Since Eskimos are where the fish-oil trend began, let’s take a look at what they consume. One study found that Greenland Eskimos consumed on average 5,700 mg of omega-3 EPA per day. So using this math, these Eskimos consume about the equivalent of 28 usual fish oil caps (8,400 mg of omega-3) per day (assuming a usual 2:1 ratio of EPA to DHA). I’d recommend this higher “Eskimo” dose. One way to cut down on all of those capsules is to find a brand of EPA/DHA purified fish oil. These can have as much as 600 mg or more of omega-3. So for a concentrate that has 600 mg of omega-3, this would mean about 9–10 caps a day, or 3 with each meal.

A concrete example is a brand called Nordic Naturals that makes an EPA Xtra formulation with about 1,000 mg of EPA and 1,500 mg of omega-3 per 2 capsules. Here, a 100–130 pound woman would start at 3 pills twice a day (6 pills per day or 3,000 mg total omega-3), a 130–180 pound person would take 4 pills twice a day (4,000 mg EPA), and someone larger would take more.

4. Polyphenols are found in colored veggies, so consume at least 3–4 servings a day or more. You can also get them via supplements like resveratrol, which is found in many supplements. [Our Regenexx Stem Cell Support Formula](#) has this plus several anti-inflammatory polyphenols, including curcumin and bitter melon.

How do you know if you have a pro-inflammatory diet problem and whether your body is a chronic inflammation time bomb? There's actually a test we use that is the level of the pro-inflammatory AA mentioned above to the anti-inflammatory EPA also mentioned. This test is not commonly performed outside of research, but it is available. Where should it be?

AA/EPA Ratio	
1.5–3.0	Ideal for Fighting Chronic Inflammation
3–6	Good
6–10	High
10–15	Very High
>15	Serious Problem

Using this metric is easy. Just get your blood tested, and if the AA/EPA ratio is high, follow the advice above and retest until you're in the good range. You should do this under the advice of a physician.

THREADING THE NEEDLE—PUTTING ProActive INTO DAILY PRACTICE

You've read about my neck blowup above. For the past two days, I had to sit through a conference with bad seating, so the back of my right shoulder was aching. Since I know this is coming from my neck, and my supplement regimen didn't help it as much as I would have liked, can I find a way to use over-the-counter medications smartly so I can still work out?

As you can read in my Orthopedics 2.0 book, over-the-counter medications for pain, like Motrin, Aleve, and others have real problems. However, using these tools wisely every once in a while can help you if you know how. This morning I knew that taking 2 regular-strength Tylenols would reduce the swelling around the nerve in my neck that was complaining through my shoulder. That would also allow the muscles that protect my nerve and disc to be more likely to do their job, as they shut down when the nerve is aggravated. So while excessive Tylenol use can damage your liver, a little bit today got the workout done with better neck protection.

Shouldn't I just pop two Tylenol every 4–6 hours like the pharma company wants? No. Your base protection should be an anti-inflammatory diet and supplements to keep the chronic inflammation dial in your body turned down to manageable levels. Also realize that NSAID drugs like Motrin, Aleve, Ibuprofen, Celebrex, and others markedly increase your risk of dying from a sudden-death heart attack, so use them sparingly.

How about another example from my life. I have a degenerated disc at L5–S1 that comes from a car crash in residency where I broke several low-back vertebrae. The bulge that irritates the nerve there would have long since been removed surgically if I were the average patient, dooming that level to severe degenerate disc disease rather than the lower levels of degeneration I do have. I also would have likely had my first low-back fusion by now, which would be overloading my SI joints and L4–L5 segment, causing more havoc. Suffice it to say, if I didn't practice what I preach in the Regenexx ProActive program, I would not be able to exercise at this phase of my life and likely would be taking narcotics every day. Yet despite this problem acting up severely at the beginning of the week, as I sit here writing this on Sunday, I completed three good high-level workouts on Friday, Saturday, and today. How?

On Monday morning I twisted just the wrong way and my back went into spasm. Well before that, over the past two weeks, I was on high alert for a pending back blowup. How did I know this? I listened to my body's status alerts, which were my left calf jumping (called fasciculation—a sign the nerve wasn't connecting with the muscle), my left ankle feeling like it was sprained, despite no real trauma. All of this I knew was coming from the S1 nerves in my low back. So when my back finally blew up, I knew it was because the [deep muscular stabilizer \(multifidus\)](#) was going off-line that morning because the nerve that supplied that

important spinal protection system was not able to tell the muscle when or how to contract.

When my back finally did act up, it was bad. I literally couldn't bend forward to put on my pants or pick anything up because the spasm was just too severe. It's pretty funny trying to get your underwear on by yourself when you can't bend! If I hadn't acted, I predicted that based on the recovery curve, I would have lost about 2 weeks of working out. Yet I lost one day.

So what did I do? First, I understood that the stabilizing muscles were off-line, so I tried to do nothing that would challenge them. This meant no heavy lifting or activities that involved bending forward. Why? This was my high-risk time for doing serious structural damage. So on Tuesday I worked out on the elliptical and lifted only weights that allowed my low back to be stabilized. I missed my Wednesday workout and just did legs on Thursday, which again allowed me to rest the low back. However, it's what I did on Friday that allowed me to hit three hard workouts to end the week.

On Friday, I had one of the doctors in our clinic (Dr. Pitts) inject our [third-generation platelet lysate between my S1 nerves and the L5-S1 disc \(Regenexx-PL-Disc™ procedure\)](#). What did this do? It cleared out the bad inflammatory chemicals (cytokines) that had accumulated around that nerve over the weeks, added anti-inflammatory growth factors from my blood platelets, and added growth factors to beef up the local blood supply and repair process. I had that procedure at 9:00 a.m. on Friday, which was walk-in-walk-out. I went back to work and finished the day and then got in a normal workout on the elliptical and with weights on Friday. The back was still a bit sore, so I made sure to keep it stabilized, but the back pain had already receded 50% and I could bend over. The following day I was able to complete a CrossFit workout with no issues.

So in summary, to keep my 50 year body active, I did the following:

1. Avoided the stuff, like surgery, that would likely keep me out of the game long-term
2. Listened to my body's status updates and understood what they meant
3. I avoided doing further damage by modifying my activities.
4. Got a minimally invasive procedure quickly to address the issue, using natural growth factors from my own body (not high-dose steroids that would have hurt my tissues)

In order to do the same, you'll also need to learn how to "thread the needle" and find a physician who can help you do that with regenerative solutions rather than harmful steroids and surgeries.

MORE WAYS TO PUT REGENEXX ProActive INTO DAILY PRACTICE

Get preventative! Our medical care system, especially in orthopedics, only kicks into gear as a result of serious injury, yet by that time, sometimes it's too late to completely repair the area and get it back to a normal healthy state. I also see patients who don't think twice about changing their oil and taking their car in for checkups and who maybe even get an overall health checkup, but they never think about if the musculoskeletal system they depend on every day is about to explode. One of my favorite authors, a physician-poet named John Stone, once said, "I've seen death come on as slow as rust, or as quickly and suddenly as a door knob come loose in the hand..." I see this happen to active people every day. The warning signs have been screaming for years that there are serious problems brewing, and yet they are surprised when they can no longer walk or run. They just thought these were small issues that would go away. Heck, I even have found myself ignoring what should have been obvious warning signs because I'm too busy. Get yourself in to see a physician who can perform a complete 5-point body inspection before something breaks beyond repair. The 5-point body inspection includes the following:

1. Range of motion of every major joint
2. Stability and strength testing of every major body area
3. Nerve and muscle testing to identify brewing issues
4. A complete ultrasound or MRI exam of every area identified that could be breaking down
5. A game plan to keep your body going and treat small problems while they're small and manageable, to prevent a major system breakdown!

Let's explore in more detail what you should be doing with your doctor to help prevent issues.

REGENEXX ProActive EXAM AND IMAGING

As I've said, a big part of staying active is knowing what's about to break. We do this with our cars every day, but somehow we ignore our musculoskeletal (MSK) system. For example, you take your car in for an annual service, and the mechanic checks the oil and fluids and looks for flags in the car's computer that indicate that a system is beginning to fail. He also looks for leaking from the oil pump, water pump, radiator, and so forth. Sometimes when small problems are found, nothing needs to be done; other times if the part is about to break, it's fixed to reduce the likelihood of serious and more expensive problems later. So how do you do this with your joints, muscles, tendons, and ligaments?

The simplest method is to get a SANS exam that looks at your stability, joints (articulations), nerves/muscles, and symmetry ([see our Orthopedics 2.0 book for more information on this system](#)). This is not an exam from your family doctor or the 5-minute exam from your orthopedic surgeon. It is about a 1–2 hour assessment of the functioning of every major joint and system. What does this look like?

Let's break it down using the system discussed above.

Stability

The exam should test the stability of every major ligament of the shoulders, elbow, wrist/hands, knee, and ankle/foot. For example, is the right medial collateral ligament of the knee lax, even though the knee doesn't hurt? What could be the harm of leaving this ligament loose? The knee joint is more likely to develop meniscus tears and cartilage issues (arthritis) if the knee joint moves around too much when you're active. Another example is someone who sprained an ankle many years ago and it seemed to heal, but remained loose. Leaving this ligament lax can lead to more arthritis of the two large ankle joints, and active people are at more risk.

An important part of this exam is ultrasound imaging, where many of these ligaments can be stressed and observed while they move. To do this, the doctor places the ultrasound probe over the ligament and stresses the joint. The amount of movement in that part of the joint is compared to the normal side and to the amount of motion that a normal joint will usually allow. Regrettably, this type of ligament laxity usually doesn't show up on a static MRI as it needs the dynamic stress test to bring it out.

Articulation

This is a fancy word for joint. In this case, the major joints of the upper and lower extremity, including shoulder, elbows, wrist/hand, hip, knee, and ankle/foot, should be checked for tenderness, and if any suspicion of problems exists (even if the joint is not a major pain generator right now), in-office ultrasound imaging of the joint should be performed to look for structural problems. If any suspicion still exists of potential problems, and the tissue in question isn't best seen with ultrasound, an MRI should be obtained.

As an example, the right knee “sort of” aches after runs. The initial ultrasound exam shows that the ligaments are fine, but the doctor measures the cartilage thickness on the inside where the patient has pain. If it's thinning or getting thinner or pot marked over time, the doctor orders an MRI. The knee is treated with the [Regenexx-SCP™ procedure](#) before problems start that would need a same-day or cultured stem cell procedure or worse, a knee replacement. If bigger issues are present, stem cells are used to keep the joint as viable as possible.

Neuromuscular

While most patients who have been raised in today's modern surgical orthopedics system know about joints, tendons, and ligaments—nerves and muscles are sometimes a bit foreign. Yet the nerves tell the muscles what to do, and as far as your body is concerned, both are one big structure. What happens in the nerve happens in the muscle, and an angry nerve means a dysfunctional muscle.

In the case of a proper exam, all the nerves and muscles are also examined. This means that if the knee hurts, the quadriceps, adductors, and hamstrings are also carefully vetted for normal movement and trigger points. What's a trigger point? A portion of the muscle that's caused by an angry nerve and is shut down and not functional. In addition, the doctor checks to see if the nerves are working by a very careful neurologic exam. In particular, this is not the 20-second, “can you feel this,” quick neurologic exam performed 95% of the time. Instead, it's ferreting out if the patient can feel the same amount of sensation at one site as compared to the opposite side or a different site on the same side.

As an example, the hip hurts getting in and out of cars, and the patient has been told that he or she has early arthritis on a hip x-ray and as a result the hip may eventually need to be replaced. The doctor instead finds that the adductor muscles have trigger points and clears these with a muscle acupuncture technique known as IMS (intramuscular stimulation). The hip no longer hurts, and the hip replacement (which the patient didn't need in the first place) is avoided. In addition, the muscle now fires normally, preventing abnormal motion in and poor protection for the hip joint.

Symmetry

All too often the physician fails to ask the most obvious question: Why does one knee, shoulder, or hip have arthritis and not both sides? The answer is simple: the patient is asymmetrical. If you can do one thing to prevent your joints from slowly wearing away, it would be to find these areas that aren't symmetrical and make the body even on each side.

So this exam looks at the range of motion of all major joints. Is the right like the left in each one? How about the position of the head/neck and the curve of the low back?

For example, the cartilage in the front of the right shoulder joint has been wearing out. This joint can't move in internal rotation (hand behind the back) like the other side. This tightness in the back of the shoulder joint causes the front of the joint to compress, beginning to wear it out. Left this way, the front of the joint will have no cartilage in a few years; however, just restoring the normal range of motion will save the joint.

KEEPING YOUR AGING JOINTS GOING—A JOINT PREVENTION PROGRAM

As I have said, I have a smoldering left knee problem. Not arthritis yet, but sometimes after I work out in either the wrong shoes or on a repetitive-motion machine, like an elliptical, it will ache a bit, for a few hours to a day, then resolve. I know enough about my body to know that this is connected to low-level nerve irritation in my low back. The back itself doesn't always hurt, but the nerves get fired up enough to cause my left leg to be ever so slightly uncoordinated when I exercise, which increases the trauma in that knee. I am ProActive with my back and keep it in good order through periodic epidural injections using my own growth factors derived from my blood platelets. At the same time, I also work on that knee's stability and it has improved. However, to stay working at a high level, I also need to make sure my aging knee is able to keep up with the wear and tear. How is that done?

As we age, the stem cells that act to repair small amounts of damage in the knee (and elsewhere) become fewer in number. This can mean that the same amount of wear and tear that would be easily fixed by the body at 20 isn't fixed as well at 50. So to keep ProActive about my knee, I have my partners periodically inject my [super-concentrated platelets](#) into the joint. We do this about every 6–12 months to allow the growth factors in the platelets to stimulate my existing knee stem cells into “high gear.”

So as you can see, staying proactive means not only identifying the issue, but also knowing how to care for it so it doesn't become a big problem down the road. As discussed, many patients perform this type of preventative maintenance on their house or car, but fail to think about for their knees. If my gutters or car fails, I can always get new gutters or a new car, but getting a new knee is not so easy.

In summary, here are the components of a joint protection program:

1. Know which joints are starting to go bad. You can do this via a Regenexx ProActive exam combined with listening to the status updates from that joint.
2. Monitor the joint over time with ultrasound and other tests.
3. Get rid of biomechanical and other SANS problems, like stability and nerve issues.
4. Take the right supplements to control inflammation and ramp up repair.
5. Place biologics in the joint to keep it healthy.

HOW CAN REGENEXX HELP YOU TO BE ProActive?

At Regenexx we have two ways to check your MSK health: at-home resources, like this book, and our Regenexx ProActive service. The at-home system is a combination of the information in this book and a simple set of physical tests and questionnaires that are contained in our [Orthopedics 2.0 book](#) that focus on stability, articulation (joints), neuromuscular, and symmetry (SANS). The larger Orthopedics 2.0 book then delves deeper into each area and provides solutions to common problems.

Our Regenexx ProActive service is another innovative way to allow your Regenexx Network physician to help you find problems and solve them before they can become big issues. This annual, “deep dive” focuses on early detection using advanced ultrasound imaging, SANS analysis, blood tests, early treatment, and maintenance. Let's explore that service.

Do you see your MSK provider or orthopedic surgeon and feel like a number? Many patients tell me that especially with orthopedists, they only get a few minutes of the doctor's time. He or she takes a quick history, pushes and prods for 30 seconds, maybe glances at an imaging report, then makes a decision about care. In fact, I've met surgeons who schedule 30–50 patients a day. Is it possible to get a handle on all of your possible early problems and explore how the parts of your body are interacting in a few minutes? In short—absolutely not! The Regenexx ProActive service is designed to change all that, allowing several hours of comprehensive evaluation of your MSK health every year.

The comprehensive hands-on exam of someone's MSK system that I described earlier (joints, muscles, tendons, ligaments, and nerves) takes time. Yet that time can be well spent if it identifies early issues before a part breaks down. Let me start with yet another personal example.

My right ankle doesn't really hurt all that much, but standing in an airport line, I noticed that it bends slightly inward. Noticing that asymmetry, I felt my main ankle joint and sure enough, right where that bend would overload the inside of the joint, I'm tender. An ultrasound exam identified a small bone spur my body was creating there to "beef up" the area and make it stronger. Knowing my history, I know that this is being caused by irritated nerves in my low back that cause my ankle stabilizing muscles to be less efficient. All of this is exactly what a Regenexx ProActive exam is all about. My ankle doesn't really hurt yet, and if I was using a "no pain, no gain" mind-set, I'd ignore it. So what do I need to do to make sure the inside of the joint doesn't end up with arthritis? For my body, it was using a pair of orthotics, keeping the irritated nerves in my back under control, strengthening those ankle muscles, and getting injections of my super-concentrated blood platelets into that joint to help that cartilage keep up with the extra loads.

WHAT GETS EVALUATED IN A REGENEXX ProActive EXAM?

The SANS analysis as discussed earlier is a key part of a comprehensive Regenexx ProActive exam. Again, SANS stands for stability, articulation, neuromuscular, and symmetry. The first part of our staying active mantra is stability, so let's see what that looks like.

All of these critical findings for staying optimally active are placed into a report that allows you to see where you have issues. This is an example of one part of the stability portion of the knee report to give you an idea of the level of detail we're talking about:

KNEE LIGAMENTS

Ligament Treatment: Leaving ligaments lax can cause knee joint damage over time. There are a number of injection-based treatments that we offer that can help tighten ligaments based on our extensive clinical experience. If the ligament is less lax, it can usually be helped by an injection of concentrated blood platelets (Regenexx-SCP™). If the ligament injury is more significant, a same-day stem cell treatment (Regenexx-SD™) may be needed.

So our Regenexx ProActive report would discuss that your knee ACL ligament is loose and that this may cause more arthritis down the road. Your PCL is a bit off and could cause issues, but isn't as big a deal as the ACL. It would also let you know that the LCL, MCL, and patellar ligaments are fine and don't need any help.

Another part of the Regenexx ProActive program is following certain blood tests that are involved in MSK problems. There are three things we follow closely:

1. Inflammatory Markers

As discussed, the serum AA/EPA ratio is a good way to look at whether low-level inflammation is an issue. In addition, we follow a second inflammatory marker associated with better overall health and [less arthritis pain: hs-CRP](#). This high-sensitivity C-reactive protein marker helps us see when the patient has too much in the way of low-level chronic inflammation in the whole body. When we find that these markers are too high, we can help by increasing omega-3 in the diet or via supplements and reducing omega-6 exposure. In addition, adding in other supplement anti-inflammatories, like [curcumin, can also help push these values down](#). Finally, a great mix of anti-inflammatory supplements can be found in the Regenexx Stem Cell Support formula.

2. A Cartilage Breakdown Marker

Here we use serum hyaluronic acid, a sensitive marker of cartilage breakdown in the body. When this marker goes up, the amount of cartilage loss and likelihood of arthritis also goes up. By [using supplements](#), giving regenerative injections in the problem area, and fixing biomechanical problems, our goal is to keep this cartilage marker and thus cartilage breakdown under control.

3. A Blood-Sugar Control Marker

As discussed, issues with excessive insulin release and unstable blood sugar can cause cartilage breakdown and inflammation as well as weight gain. Hence we follow a marker known as HbA1c that allows us to see how stable the blood sugar is or isn't, and if we detect issues, we can advise you on diet or related issues.

WHAT'S NEXT?

So what can you do next to be that person who's the envy of all of us—the older athlete who's clearly taken some wear in miles, but who is still able to kick it with the best of them? I've tried to set the stage with this book, to show how you make the choices that will stack the deck in your favor. In the end, it means leaving the mentality of the managed care health system and forming a close relationship with a provider who can advise you on how best to keep all your parts in good working condition. In addition, you have to learn how to listen to your body so that you know when something's not quite right. The Regenexx ProActive program was designed to make all of that as easy and convenient as possible!