Why It Hurts, How to Fix It

A Guide to Troubleshooting and Maintenance for the Most Common Physical Dysfunctions

GMB

GMB Why It Hurts, How To Fix It Guide

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CHAPTER ONE: INTRODUCTION

Pain, limitations, and tightness throughout the body are common problems today. Excessive sitting and lack of movement, coupled with artificial attempts to "get in shape" (e.g. running on the treadmill) just make these problems worse.

We get countless emails and messages from people saying things like,

"I want to use your programs, but I have an old shoulder injury and I'm not sure I'll be able to."

Or,

"My back pain makes it hard enough to pick up my 3-year-old. Can I do the stuff you guys promote?"

We understand your pain (both literal and figurative), and we want to help.

But first:

GMB's Public Service Announcement

We've said it before, and we'll say it again. We're not doctors.

Shocking, I know.

But here's a bit of obligatory advice, simply because we keep receiving messages from clients who should definitely be directing those queries to their local health professionals.

This guide and the suggestions included in it are no substitute for being seen by a real-live professional in person, so if you're having ongoing aches and pains that don't seem to improve with rest, you really should make an appointment to see a doctor or physical therapist as soon as possible.

Okay?

Good, now let's continue.

This guide is designed to empower you with some helpful information about the most commonly troublesome areas.

And, as long as you've been cleared by a doctor or physical therapist, the exercises included in this guide should help you to start addressing those nagging issues.

How to Use This Guide

We've already given our disclaimer, so you know this guide is not meant to be used in place of seeing a qualified professional.

From here on, we'll assume you've done your due diligence and are cleared for exercise.

In this guide, we'll go through the four areas people tend to have the most problems with:

1. Spine
2. Hips
3. Shoulders
4. Knees
5. Feet & Ankles

In each section, we'll give you an overview of that problem area, including some fancy-sounding anatomy (don't worry, we've made it all as easy-to-digest as possible).

Then, we'll describe what can go wrong in that problem area, and finish off with some exercises you can practice to address your issues.

We've separated these four problem areas into individual chapters, but it's worth mentioning that no bodypart works in isolation.

If you are having issues in your spine/back, it's likely that you could benefit from working on strengthening your hips as well. When one thing is out of whack, there's often a cascade effect and you'll notice it in other areas as well.

So, we recommend reading this guide all the way through, even if you don't have a specific issue with your knees, shoulders, or what have you.

You may be surprised by what you'll learn.

CHAPTER TWO: THE SPINE

An Overview of the Spine

Our backs are amazing, complex structures.

The spine alone houses the spinal cord and nerves that control our every movement and process the sensations that allow us to connect with the world around us. It's also part of a system that both absorbs and distributes force, such as lifting and carrying loads through our shoulders and arms, while our legs move us around.

In order to accomplish the many tasks it's supposed to, the back has to be flexible enough to move in every direction, while remaining rigid enough to transfer heavy loads through our arms and legs, whether we are sitting, standing, or lying down.

We don't really think too much of it until things start to hurt. Then it becomes very apparent how much the joints, ligaments, and muscles of our spine are used in pretty much everything we do our daily activities.

Below, we'll shed some light on this complicated structure, to give you insight into what our backs are capable of, what can happen when things go wrong, and how to maintain and improve your back flexibility for improved performance, both in recreational activities and in daily life.

Basic Structure and Function of the Spine

Starting with the bony structures, the spine is separated into four basic regions:

- ★ Cervical (neck)
- ★ Thoracic (upper and mid back)
- ★ Lumbar (low back)
- ★ Sacral (between low back and tailbone)

With 7 cervical vertebrae, 12 thoracic, and 5 lumbar, the big sacrum, and all the associated ligaments and discs, the spine is such an exceedingly complex structure that people can spend their whole lives studying just portions of it.

Needless to say, we're just going to be able to give you the basics here, but we'll provide you with the details that most affect you in your training and everyday routine.

We'll focus on the thoracic and lumbar spine, which comprise the bulk of what we tend to think of as our "back".

The thoracic spine, with its attachments to the ribs and as the transition point between the neck and the low back, is designed for higher levels of mobility, particularly in rotation, as we need to twist and turn to direct our upper bodies on the stable platform of our low back, hips, and legs.

Good flexibility in back bending and forward bending - extension and flexion, respectively - are also very important, both for health and for good performance in our physically challenging activities.

The low back is not as well designed for rotation, but is more suited for flexion and extension movements.

In bending forward and reaching, the movements in the thoracic and lumbar regions work together to give us a great amount of mobility. In bringing our hips forward and underneath us, proper lumbar extension puts us in a better position to use the powerful strength in our hips and legs.

The Nuts and Bolts of the Spine

We can start by describing the back from its deep structure, which are the vertebrae and joints.

The bony structure of the vertebrae provides support both directly, as the bone resists compression from gravity and other forces, and indirectly, as the attachment point for various ligaments and muscular attachments.

It becomes a stable base for us to use our arms and hips/legs as effectively as we can for every movement available.

Carrying, lifting, pushing, pulling, etc., can only happen with a flexible and strong spine.

In between the vertebrae are the “discs” that you’ve likely heard can be “slipped,” “bulging,” or “herniated.” This is because it has a tough outer layer and a firm jello-like inner layer.

This unique configuration resists vertical loads well, whether it's simply the weight of our upper bodies or other stuff that we pile on our shoulders to move.

The disc also acts as a kind of ball bearing, which facilitates more mobility than if the spine were just made up of blocks of bone stacked on top of one another.

As is obvious from its location, the thoracic spine has to be a supportive and mobile structure for upper extremities. There are direct connections to the ribs by joint and ligaments, and indirect muscular and fascial attachments to the shoulder blades and arms.

In the lumbar spine, we see the junction point between the hips and our upper back and arms.

Here, mobility is, of course, very important, but not as much as the stability necessary to transfer force well from the hips and even the upper back and arms. This is most apparent in carrying and throwing activities.

What You Really Need to Know About the Spine

It would be far too complicated to describe every structure and function in the whole back.

And, the truth is, for most people, more details wouldn't really be much more helpful than just saying that strength and flexibility in this region is necessary for proper functioning in everything we do each day of our lives.

The muscles throughout the back are classified in layers, with the deepest ones being the multifidus - small postural and stability muscles - in the "groove" of the spine, providing stability and information. In the more shallow layers, there are the trapezius (upper, middle, and lower), latissimus dorsi, rhomboids, and "erector" muscles which connect the spine to our arms and legs.

Our back and pelvis are literally the base for all movement in our bodies, and we are made most aware of this when we have back problems and attempt the simplest tasks.

What Can Go Wrong in the Spine

When dealing with a complex structure like the spine, a lot can go wrong. Below, we'll look at what can go wrong with regards to mobility, strength limitations, and causes of pain.

Common Mobility Restrictions in the Spine

In the thoracic spine, it's common to see issues with extension (backward bending), simply because of the more common forward bending activities we do in everyday life.

As mentioned above, most of the rotation in our torso occurs in the thorax, so restrictions happen here when we don't work our mobility to it's fullest extent.

Between driving, and sitting, we rarely have an opportunity to extend and rotate our back to our true capability. This is when we lose what we don't use.

In the low back, there are issues with both forward and backward bending.

Forward bending issues most likely occur because of the relationship to the tightness in the hips most people have, and backward bending problems most likely occur because of the same issues as described for the mid and upper back. This is why hip flexibility exercises can do a lot for improving low back problems.

I describe the hips and various ways to exercise and improve their mobility and strength in the next chapter.

This lack of mobility is then worsened after an injury, and can result in very limited movement.

In this case, even the simplest rehab or yoga exercises can have such a profound affect on acute back pain. I've seen people come into the clinic barely able to move and with some gentle handling and exercise, they walk out nearly normal.

Some people live too long in such a restricted range that trauma or even just a slight overreach can cause significant pain and dysfunction. Their bodies overreact to strain and stress, whereas a more conditioned and mobile back would have better handled the pressure and tension.

"An ounce of prevention is worth a pound of cure" holds true here, as it's much better to restore and maintain our back strength and flexibility than working on regaining it after an injury.

Anyone that has had back pain before can tell you that it can be a very frustrating road to recovery.

Common Strength Limitations

The rounded back posture commonly found in the seated position, where your shoulders flare out and roll forward, along with that classic "bad posture," slumping puts you in poor alignment to use your back (and neck and shoulder) muscles correctly.

Imagine how it feels to carry a big, heavy box in an awkward position, where you have to reach around and bring your arms and shoulders forward to get your grip. It's much more difficult than having your shoulders dropped down and back slightly, with your elbows in closer to your sides.

This is why even the strongest men have difficulty in those specialized competitions of picking up massive stones. It's not just the stones' weight, but also their awkward sizing forcing a compromised lifting posture.

Now add on to this a long standing habit of poor posture and positioning, and the muscles will tend to be weaker, even without lifting an awkward object.

The muscles between and surrounding your shoulder blades (rhomboids, upper, middle, and lower traps and the rotator cuff) become not just posturally weak, but weak in general. The deep and intermediate muscles of the spine, which act as stabilizers and support, will also weaken from long hours of sitting and slumping.

There are quite a lot of different and great ways to strengthen the back, from weight training to bodyweight leverage exercises. We need the stimulation of active back work in a variety of activities. Lifting, carrying, and bending in all planes of motion help to improve and maintain back strength.

Common Pain Complaints in the Spine

We've all heard lots of different ways to describe back pain in all the various areas.

Words like "pinched," "ache," "sharp," "jammed," and even "out," as in "my back is out," are all parts of normal conversations between high level athletes and garage gym trainees alike.

There are quite a few pain generating structures in this region: ligaments, tendons, discs, muscles, and joints can all cause separate and combined issues.

You could try to narrow it down to one particular part to blame, but that's a tricky subject. The connectedness and adaptability of the body points to more than one cause, even in what seems like a cut and dried injury to a specific area.

Rather than focus on a particular area - not including issues after surgeries - it's best to work on everything in a "wholistic" way.

Pain occurs not just in one body part, but also as our body's reaction and adaptation in reaction to an injury or trauma.

The best ways to decrease and prevent pain issues are to work on them gently and progressively, increasing your strength and flexibility in all motions by exploring your active movement in new and creative ways, and understanding that pain doesn't necessarily mean damage from one causative factor.

Pain is a complicated issue and anybody selling you the "one secret way" to deal with it is either deluded or predatory.

How to Fix Issues in the Spine by Focusing on Active Flexibility and Motion Exploration

The spine and all of its related structures do better in full movements vs. ones done in isolation.

In other words, you can start with fully flexing the spine with forward bending from your neck all the way down to your pelvis. Then reverse the direction and backward bend as far as you can as well.

These repeated motions, along with experimenting with different angles of bending and loading and unloading are a great way to realize what your back is capable of and what you need to work on the most.

In the series of videos linked below, we have Keira Newton from dkb Fitness demonstrate sequences that emphasize forward bending, backward bending, and rotation.

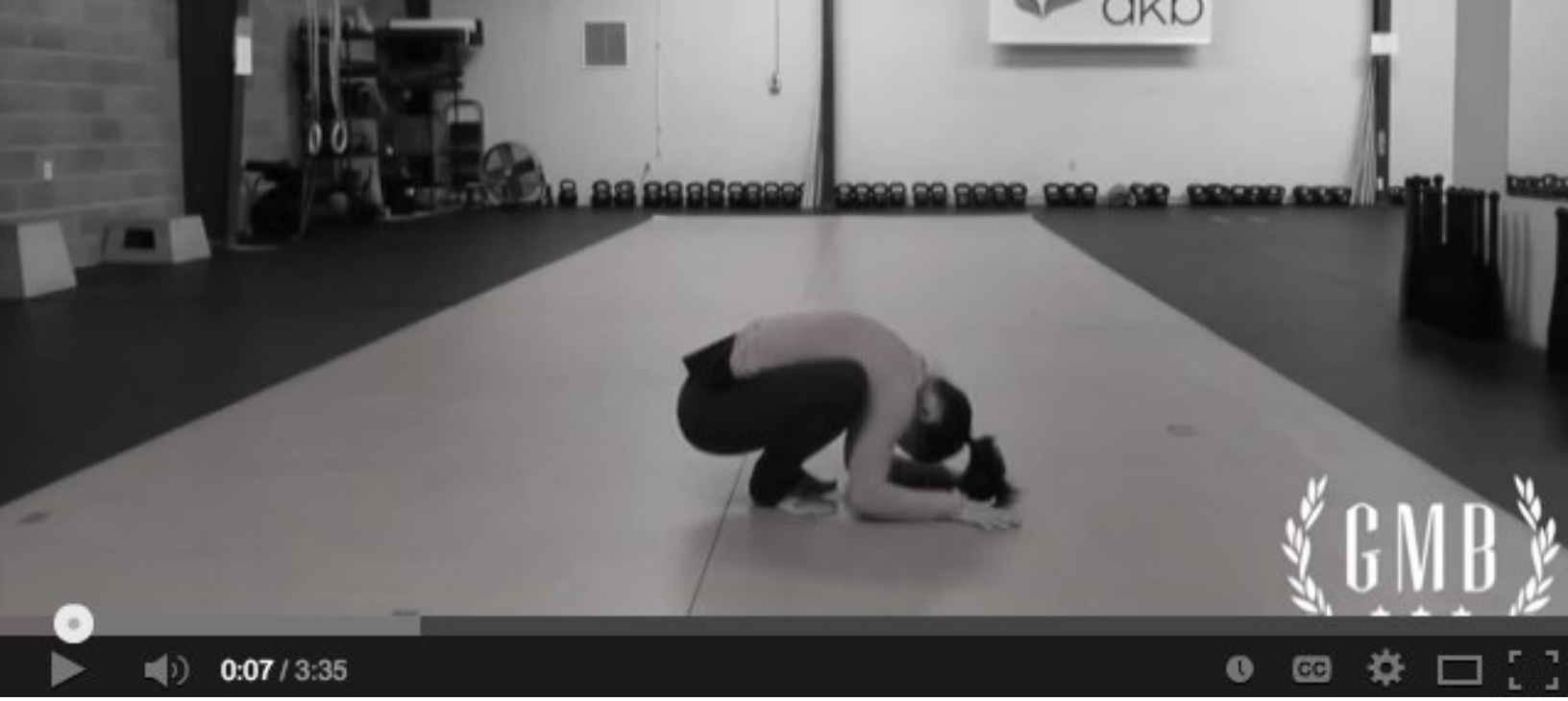
Now, Keira obviously has a very good level of flexibility and motor control.

Do NOT let that stop you from going through these sequences.

The point is not to do these sequences and exercises just like her. Though if you can, you should. The point is to emulate the positioning as best as you can and use the details of the techniques to explore your ranges of motion.

The details I explain will help you zero in on particular areas and understand what you should be working towards.

Be patient and work through these concepts slowly. Over time, everything changes with smart, consistent effort, so allow yourself that time to make it happen.



Forward Bending Sequence

Click here to watch the demo video for this movement:

★ https://www.youtube.com/watch?v=8vT2GHiFJwQ

Forward bending involves spinal joint and hip flexion, and the associated flexibility of the muscles and other soft tissues of the posterior chain.

It can be difficult to isolate one specific cause as the key issue if you have tightness.

While it's very easy to say you have tight hamstrings, the fact is that the sensation of tightness in the hamstrings may very well come from an issue in your low back.

This sequence is a demonstration of "covering all the bases," with a comprehensive approach that can be pared down as you practice and figure out what you need to work on for yourself.

A quick run-through of the sequence can give you a baseline as well, and act as a measure for progress.

We begin with a full spinal flexion movement, from your neck all the way to your pelvis. You want to round out as much as possible, then move into full extension (back bending). Though the emphasis is on the forward bend, you'll want to move into extension as a break in between. It takes the spine through a full range of motion and is a good warmup for the sequence.

Squat

1. In the squat, point your toes out at around 45 degrees. This positioning assists in helping you round out your lower back and go into a posterior pelvic tilt (the pelvis tucking under you).
2. Get your chest between your knees and tuck your chin down, as well as letting your tailbone sink down.
3. Play with rocking back and forth between your toes and your heels. Then sit back and drop down even further.
4. Next, jump into a push-up position. Then drop your hips down to the floor and lift your chest up and out, locking your elbows out if possible. Remember to look up as well, for extension throughout the entire spine.
5. Do ten repetitions, or more if you feel up to it.

Standing Forward Bend

1. Next is a standing forward bend, where you bring your hands to one side and keep them on the ground as you stand up. This is a combined forward bend and rotation.

2. Another variant is to sit back into the opposite hip. So if your hands are to the right of your body, you'll sit back to the left.

3. Spend a couple minutes going between one side and the other.

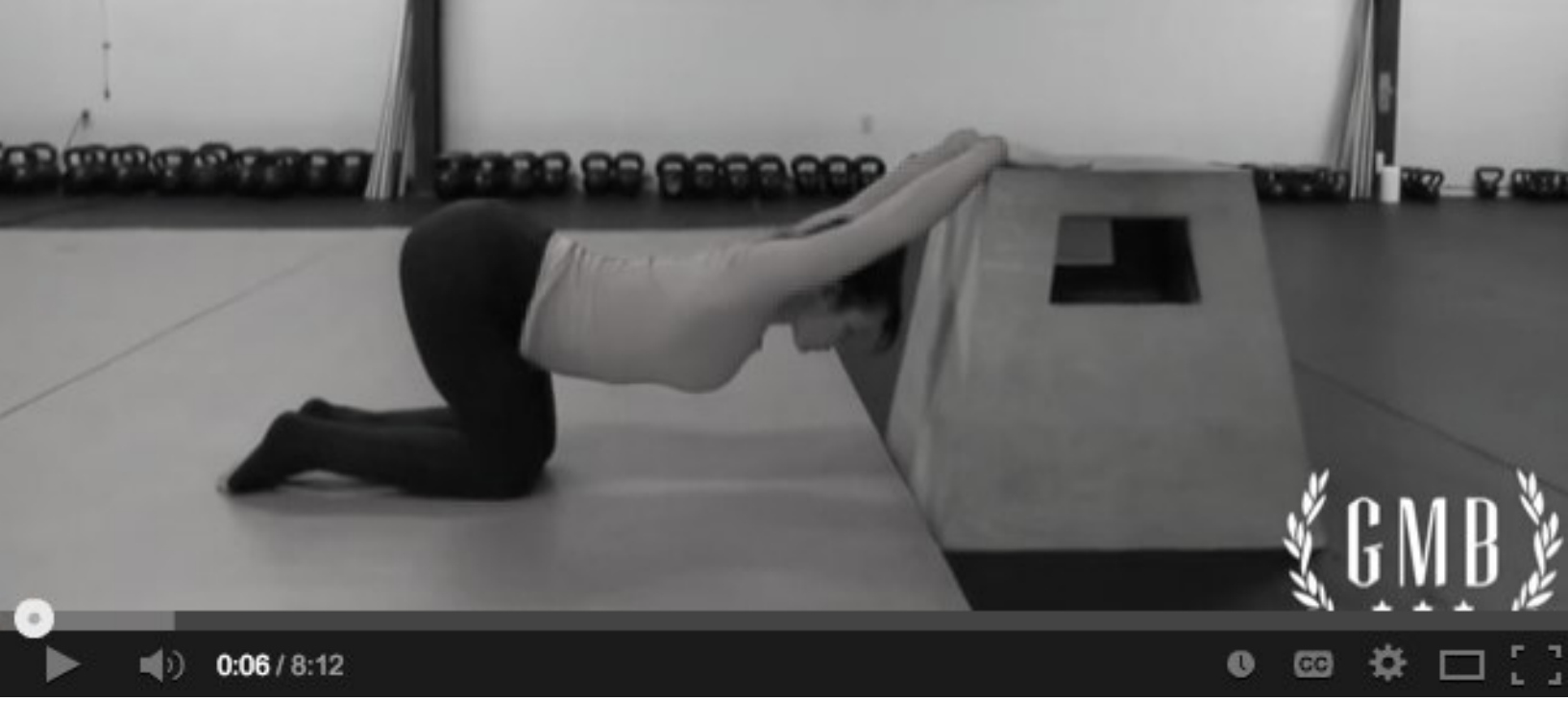
Seated Forward Bend

1. The last move in the forward bending sequence is the seated forward bend.

2. With this move, you'll add a rotation to the forward bend, just as you did in the standing forward bend.

3. With your legs locked out straight in front of you, pick a side and fold forward at a diagonal on that side.

4. Move in and out of the stretch at least ten times on each side, as well as straight forward, and hold the stretch on one side for upwards of a minute.



Back Bend Preparation

Click here to watch the demo video for this movement:

★ https://www.youtube.com/watch?v=ya-vDObLgtw

Backbending (spinal extension) can be a very uncomfortable and difficult motion for many people.

When you add up all the hours we sit, drive, and are parked in front of the computer, you'll see how rarely we get into backbending positions during our normal daily activities.

So it's no surprise that a full backbend like the bridge posture can be so daunting.

With this in mind, it helps to go through a thorough preparation before going to the limits of your spinal extension range of motion.

The first emphasis is on the thoracic spine (your midback), and improving extension and rotation in this region.

Improving mobility in this part of the spine prevents undue strain on the lower back by distributing the motion throughout the spine rather than all on the lower back.

Thoracic Extension

1. In the first exercise in this video, you'll see that Keira has to emphasize the motion, not straight down but also forward, as her shoulders are so flexible that she isn't moving at the spine.

2. When she improves her direction of force, you can see that the stretch is now where it needs to be.

3. Work on this for three sets of one minute each.

Thoracic Rotation

1. Next is thoracic rotation, which is essentially extension at the side of the spine you are rotating towards. This, in combination with side bending, takes you to the end-range of the extension motion. So you'll be working on all the structures that need to be pliable for a good backbend.

2. Keira is demonstrating two movement variations: the first is up on forearms and knees with the back starting in a neutral position, and the second is more on the back of the upper arm and shoulder with the torso bending to the side.

3. When you try these out, you'll notice that the second variation places you in a sort of pre-stretched position, so you won't be moving as far.

4. You may skip the first variation if you are already flexible, but even then, the first one is a good warm-up to do.
5. Play with shifting your weight more onto your knees or your arms to find the best angle for you.
6. Start with three sets of 30 seconds on each side.

Last in this video is a more direct back bend preparation and is adapted from a sequence taught by my Ashtanga yoga teacher, Cathy Louise Broda. It starts with a kneeling back bend, then works on the hip flexors, quadriceps, and shoulder bridges, to fully warm up and prepare the body for more intense spinal extension postures.

Kneeling Backbend

1. In the kneeling backbend, it is key to elongate and lift the spine as you lean back.
2. Pushing your hips forward and lifting your chest up and back will create this "open" spine, and will prevent a jammed up feeling in the low back.
3. Relaxing your hips and buttocks will be difficult at first, but that is another key to a good backbend.
4. 10 – 12 slow repetitions here will do you well.

Lunge Sequence

1. Next up are lunge stretches with rotation to the side of the front knee.
2. Adding rotation to this position adds depth to the stretch and is a great concept to employ in almost any exercise.
3. You don't have to do this in full splits like Keira is showing, just go into as deep a lunge as you are comfortable. The effect is still the same.
4. Do three sets of 30 seconds on each side.

Camel Stretch

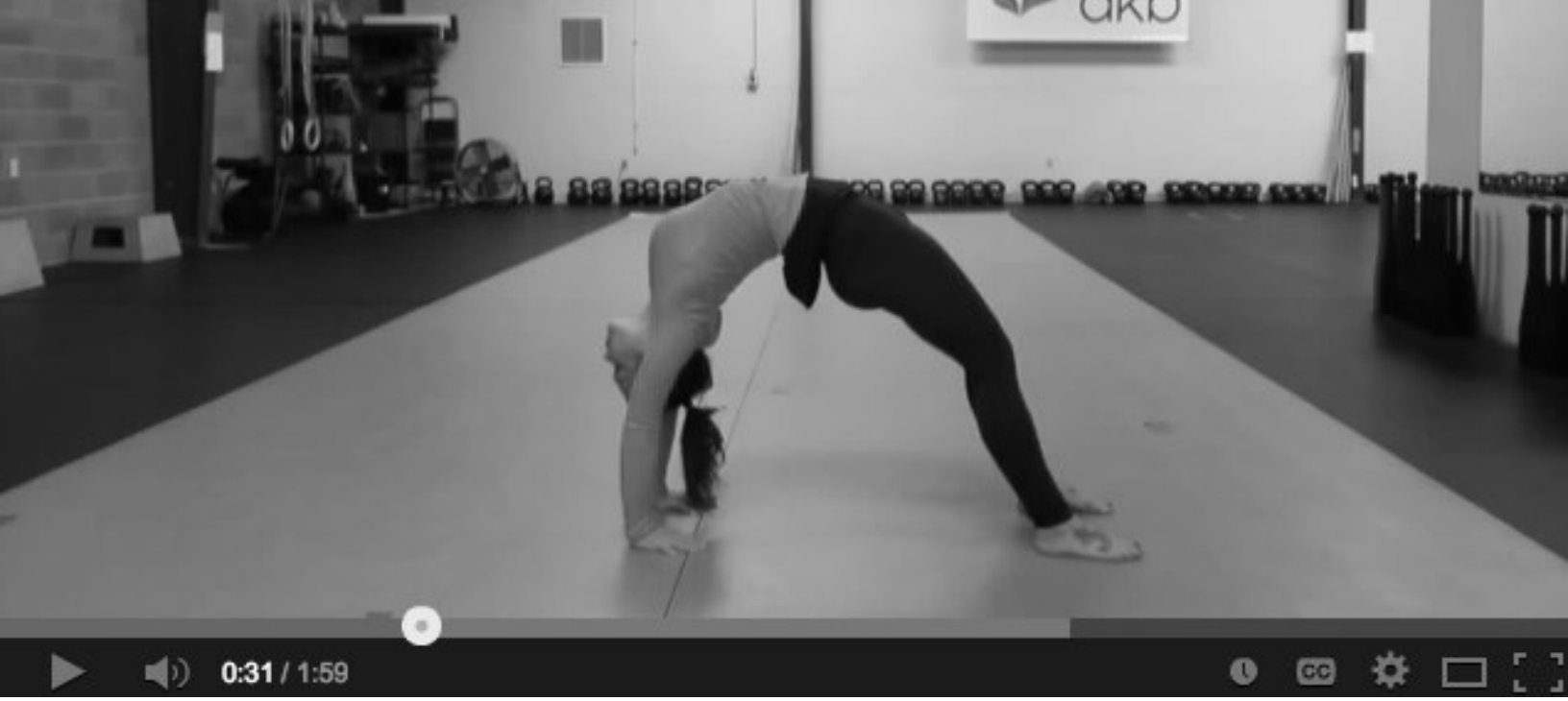
1. The camel pose in yoga is a backbend with arm support, and can allow you to improve your backbending technique with relatively little strain.
2. With the support of your arms you can stay in the position a bit longer than you could just bending back.
3. Remember the details of pushing your hips and chest away from each other to open up your spine.
4. Work up to three sets of 30 seconds on this posture, as that's a good amount of time to experience this position.

Quadriceps Stretch

1. Following the camel is the kneeling quadriceps stretch.
2. If your knees bother you in this position, you can sit on a small stool or a few cushions to take some pressure off. If this doesn't help, don't force it, and try a standing or side lying quad stretch instead. You'll be able to do this later, but don't hurt your knees and put yourself out of commission.
3. The key point here is to avoid a low back arch. Keep your back flat, so the forces of the stretch will be on the upper thighs and not on your back.
4. Take your time and gradually lean back further when you can do so without pain.
5. Three sets of 30 seconds to a minute will work well here.

Shoulder Bridge

1. Lastly, shoulder bridge practice starts you on a more active backbend and is a great way to get a lot of repetitions in with good technique.
2. You'll pull all of what you've practiced so far in the sequence and work on a smooth spinal curve, relaxed hips, and good mobility and strength in the quads.
3. Choose the shoulder bridge variation that works best for you.
4. Perform a couple sets of 10 repetitions to improve your bridge.



Full Bridge

Click here to watch the demo video for this movement:

★ https://www.youtube.com/watch?v=0zk9OhFCXnQ

In the full bridge, or "wheel pose" in yoga, you'll need good flexibility in your shoulders, hips, and the entire back. But you'll also need proper technique.

Important details here are to create that smooth curve and arch, like an archway in a building that can support weight evenly, and simply looks good.

You can tell when a person does a bridge and there is a sharp angle in one part of the spine – in that case, there will be more of a strain rather than a curve that distributes forces evenly.

Bridge Technique

1. For a proper bridge, your arms and legs are the support structures and your hips and back should be relaxed and open.
2. Your chest should be projected up and back, toward the top corner of the wall behind you, and your hips should be lifted up and forward, toward the top corner of the wall in front of you. This aiming in opposite directions creates that "openness" in the spine.
3. Breathing should be steady and even.
4. Hold the position for 5 to 10 breaths.
5. Again, don't force things. Take your time and improve steadily.
6. As you improve you can play with shifting your weight more toward your feet or toward your hands.

You'll find which way is more difficult, and that'd be what you need to work on! It will also lead you back to which of the preparation exercises to focus on. It may be the thoracic extension, or your hip flexors and quads if they are holding you back.

Keeping Your Spine Healthy

Our backs are such a complicated area with interconnections to our entire body. Because of this, it can be daunting to work on and it's easy to be led in a lot of different directions on how to properly train and improve our function there.

Not to say that any of those directions are necessarily bad or wrong, but a fundamental approach as outlined above provides a good foundation.

Spending the majority of your time on controlled active motion into progressively bigger ranges of motion combines flexibility and motor control training.

This is especially important in such an interdependent area as your spine.

Understanding the basics of your back's motion and function will give you insight into what is working well and what you need to spend more time on improving.

This critical exploration process for working on your back also translates well into how you can approach other areas and your training in general. This philosophy is ingrained into the GMB method, which emphasizes skill development with strength and flexibility training tailored to your specific needs.

We should all strive for a structured process that also allows for exploration and specialization for our own individual concerns.

CHAPTER THREE: THE HIPS

An Overview of the Hips

It's difficult to exaggerate the importance of hip flexibility and strength for every athletic activity.

The hips provide most of the incredible power and force that our lower body can generate for running and jumping, and deficiencies in strength and flexibility in this area of the body can mean the difference between a winning performance or a painful end to the game.

Beyond athletic activities, though, issues with your hips can negatively impact your daily life.

Possible issues include:

- ★ Pain
- ★ Decreased mobility for activities such as stooping and squatting
- ★ Difficulty with simple daily encounters such as jumping over a puddle in the street

Below, we'll share some essential points about the hips that can help you understand a bit more about what's happening in this area and how it can impact your training and life.

Let's Take a Look at the Hip Structure

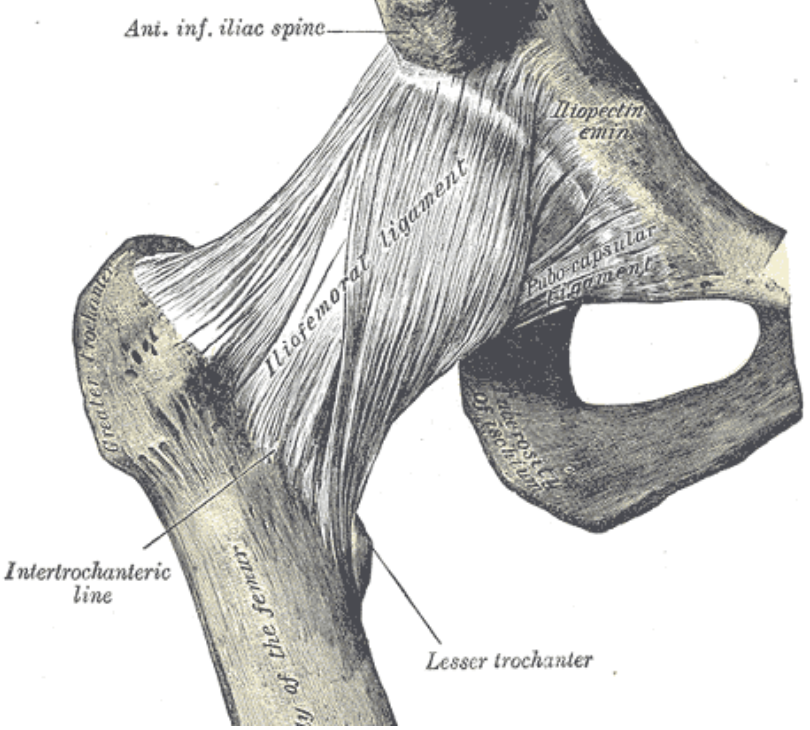


PHOTO CREDIT: WIKIPEDIA

When our clients describe some of their hip issues to us, they can point to a pretty wide area that seems to be anywhere from right below their low back to the middle of their legs.

And actually, because of all the various muscles and structures in the region, that's very reasonable.

Though the hip joint itself refers to the femoral head (the "ball" on the top of your leg) connecting to the acetabulum (the "socket") of the pelvis, it really is a much bigger area

than you might think, especially when we account for the large amount of myofascial structures surrounding the joint.

Just to give you a picture of what's shaking in your hip, here's a list of the relevant muscles:

- ★ Hip Flexors (rectus femoris, pectineus, psoas, iliacus, tensor fascia lata)
- ★ Hip Extensors (gluteus maximus, semitendinosus, semimembranosus, biceps femoris)
- ★ Hip Rotators and Abductors (quadratus femoris, obturator internus, gemilli, gluteus medius, gluteus minimus, piriformis, sartorius)

- ★ Hip Adductors (adductor longus, adductor brevis, adductor magnus, obturator externus, gracilis)

All of these muscles support and allow the hip to move and generate force in a variety of angles and positions.

Weakness and decreased flexibility in any of these muscles can compromise performance and possibly generate pain through inappropriate stress and strain from normal daily and recreational activities.

The Hip vs. The Shoulder

Compared to the shoulder joint (which we'll get to later), the hip is much bigger and sits more deeply in the socket.

Because the hips have to carry the majority of our bodyweight through thousands of steps a day, they need to be quite stable, whereas the shoulders need to be more mobile in order to move our hands through all our daily tasks.

This isn't to say that hip mobility isn't as important as hip stability, especially when we consider that we want to do much more than just walk or stand all day.

Flexible hips are necessary for most movement and skill-oriented exercise modalities you might be interested in pursuing.

The ligaments of the hip are also much thicker and stronger than the shoulders because of the larger amounts of strain and pressure in this area.

You generally only see hip ligament issues due to high force trauma or moderate force, repetitive overuse in sports that require a lot of jumping/landing, and force production in supranormal ranges of motion (such as with dancers, track and field athletes, martial and performing artists).

The Two Most Common Hip Complaints

The two primary complaints when it comes to the hip are:

1. **Muscle strains** (in the hamstrings, hip adductors, flexors), due to unfamiliar exertion or overuse, with the root cause of poor movement patterns as a result of deficient strength, flexibility, and/or coordination
2. **Hip tightness**

Perhaps it's because of all the sitting we do, in our cars, at our desks at work, and on the couch plopped in front of the TV, but we lose a lot of the natural hip flexibility we had as children.

Unless your day job has you squatting and twisting on a regular basis, it'd do us well to take our hips through a much greater range of motion than is needed for our daily tasks alone.

Decreased strength is a concern as well, since the big (and small) muscles surrounding the hip need more stimulation than is gained from everyday walking.

The prevalence of hamstring and groin strains in "weekend warriors" is a testament to how poorly conditioned we are for more athletic activities when we spend 6 days out of 7 sitting on our butts.

It would be oversimplifying to the point of error to generally identify particular hip muscles as either weak or tight.

For example, most people think they have tight hamstrings, but in reality many of these people actually have weak hamstrings and weak glutes.

Tightness doesn't necessarily go along with strength, nor flexibility with weakness. It is entirely possible, and likely more probable, to be both tight and weak simultaneously, especially at the hips.

How To Build Strong and Flexible Hips

So, you know by now that, to build the healthiest hips possible, they need to be both strong and flexible – one or the other won't cut it.

In the following videos, I'll show you some exercise variations to improve these attributes.

These exercises will help you address the various weaknesses and inflexibilities that tend to build up over years of misuse and poor movement patterns.

Hip Flexibility Training Video

Click here to watch the demo video for these movements:

★ https://www.youtube.com/watch?v=Tc2iwy4vAAc

I've shown a variety of stretches and flexibility exercises in previous posts, and there's literally no end to flexibility material on YouTube and other sites online.

So, in this video, I wanted to share some twists on old standbys to demonstrate how to approach flexibility training in a less regimented and more exploratory manner.

In general, I suggest moving in and out of a stretch a few times before holding the position for 30 seconds or longer.

This serves as both a warmup and as a natural priming for the muscles to accept a stretch without the natural reflex resistance.

Don't worry about sets and reps and hold times; instead, re-frame stretching as experimenting with different angles and positions.

From time to time we get comments from people that they "can't even get into the starting position" of some of the stretches we show. Well really, the starting position is wherever you can start it.

The idea is not to mimic the exercises exactly but to begin wherever you can, and go from there.

Hip Strength Training Video

Click here to watch the demo video for these movements:

★ https://www.youtube.com/watch?v=_K8bIIORNBg

The standard big strength moves such as squats and lunges are important pieces for building great hip and leg strength, but be wary of training the same patterns over and over again.

It's nothing to do with "muscle confusion" or any nonsense like that; rather, it's that we tend to form fixed movement patterns with consistent repetition of any skill.

Consistent repetition is the basis of motor learning!

This concept is important when trying to learn new movements and/or skills. Yet, this is a double edged sword as every repeated movement gets ingrained and fixed, even if we don't necessarily benefit from the move and even if it's harmful.

It is generally desirable to be able to have as much freedom of movement as possible within safe ranges of motion that do not compromise our joints, ligaments, and other connective tissues.

We can accomplish this by changing position and angle of force during our exercises. This stimulates not just the local muscle, but also the neurological connections between the respective body areas and the brain.

In the above video, I'll show you a few new ways to change up classic leg strength exercises. Give these a test run and let it inspire you to create some variations of your own.

Again, don't worry too much about sets or reps.

Just see this as an opportunity to practice. Too often we find ourselves performing the same movements every day.

Absorbed in the routine of work and home life, we lose sight of our hips' incredible potential strength and mobility. Spend even just ten to fifteen minutes a day on fundamental and creative hip exercises and you'll notice a dramatic increase in your ability to move your whole body strongly and gracefully.

Poor movement involves a combination of strength, flexibility, and motor control/coordination so it behooves us to work on a diverse range of movement and exercise, both to keep us motivated and optimally functioning.

Explore What Your Hips Can Do

Click here to watch the demo video:

★ https://www.youtube.com/watch?v=Zc6AbQXPICU

It's great to have a foundation of a regimented exercise routine and plan, which along with consistent, hard effort, brings the best increases in performance and ability. This is especially true for beginners and people returning to their training after a long period off.

But at some point you'll be hitting diminished returns based upon the time spent doing the same repetitive actions day after day. When you start to feel stale, or your energy levels drop, remember the fun you had as a child just playing around, and seeing what new things you could do with your body. I shot this video, not to teach a particular exercise, but to show what I mean by 'playing around' with movement.

Take your time and give yourself room to explore all the various actions and positions your hips can handle. This is the true key to improving all aspects of your hips range of motion and power.

CHAPTER FOUR: THE SHOULDERS

An Overview of the Shoulders

If you're like most people, you've got, not just one, but two shoulders.

Besides simply keeping your arms attached to your body, the shoulders do a lot of work, so keeping them healthy is definitely in your best interest. This article is going to explain how the shoulder works and what to do when it's not working the way it should.

Shoulder is pain extremely common, with estimates of up to 70% of people affected over the course of their lifetimes.

If left untreated, it can turn into a chronic problem that affects daily activities, such as carrying your groceries and reaching to put them away, as well as recreational activities like handstands and other bodyweight control moves we teach here at GMB.

We ask a lot from our shoulders – the strength and flexibility to reach, hold, lift, carry, press and pull.

It's no wonder that the stress and strain of everyday life can cause as many shoulder problems as traumatic injuries. We simply use our upper extremities so much that issues are bound to happen.

Let's take a look at how they work, and how just about every upper body movement and muscle involves the shoulder.

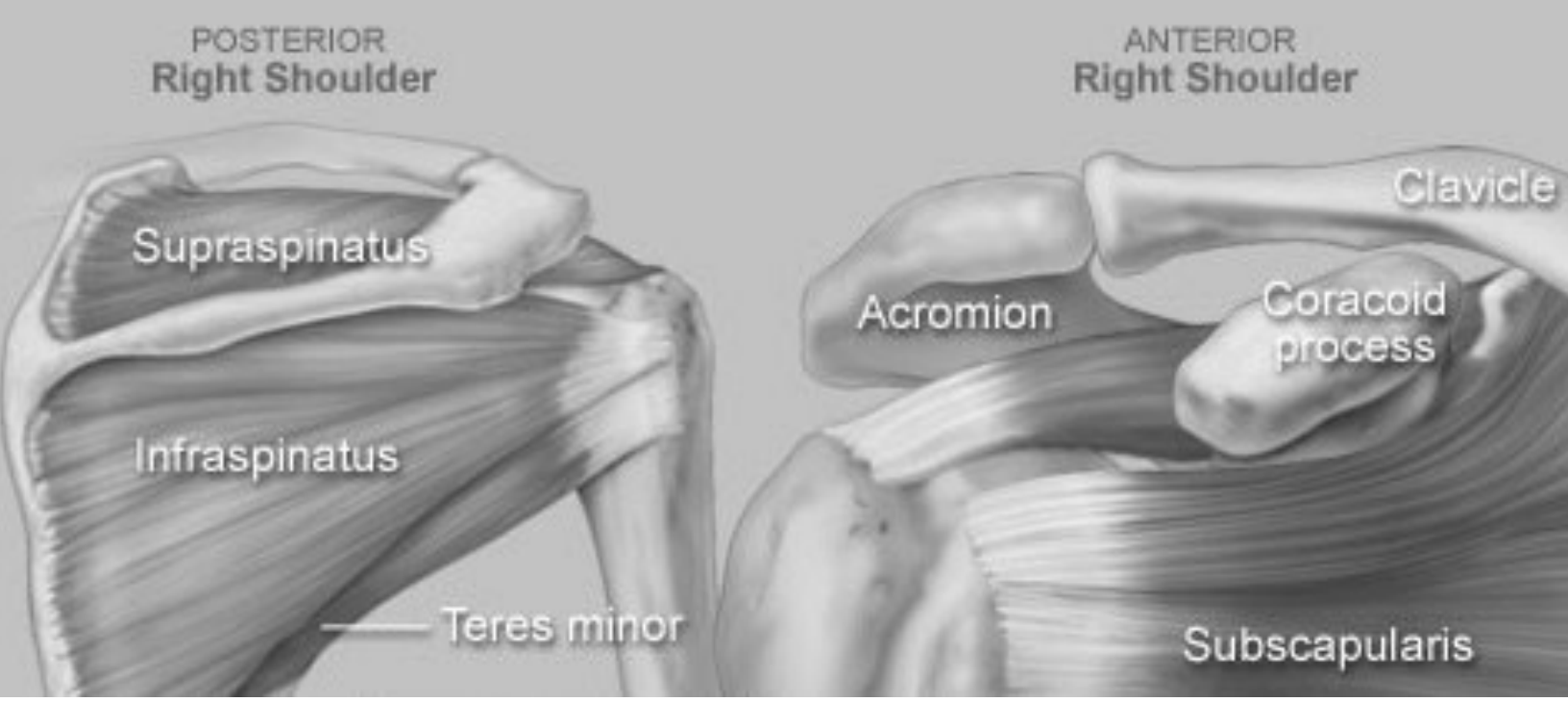


PHOTO CREDIT: WEBMD

How the Shoulder Works

When most people speak about the "shoulder joint," they are likely referring to the ball and socket joint formed by the humerus (the upper arm) and the scapula (the shoulder blade).

It's a shallow socket, the glenoid fossa, which allows for a much greater range of motion at various angles than the deeper socket of the hip.

Another joint is formed at the connection between the clavicle (collarbone) and the acromion process of the scapula. This "A-C" joint is what is injured when someone has "separated" their shoulder. You can actually see a gap or "step off" at that junction point in more severe separations.

In addition to these joints, there is the connection between the scapula and the ribs, the so-called scapulothoracic joint.

Unlike most joints that are attached by ligaments, the scapulothoracic joint is controlled and limited solely by muscle attachments.

So with these three joint connections, along with the many muscles strapped around the area, the shoulder is a complicated structure that keeps many health care professionals in steady business.

Our purpose in this article isn't to present all of the finer details of the anatomy of the shoulder, but to give a broad understanding of what's happening in the area. This general understanding can help to prevent and/or assist in the various shoulder injuries that can happen to us.

What Can Go Wrong?

The preceding brief description of the shoulder girdle shows just how complex and overwhelming this area of the body can be, and all the problems and issues that can occur with even just one structure not doing its job.

Virtually all of our upper body muscles converge with the shoulder in some way and their interrelationship is key for optimal shoulder health and performance.

Though the causes and solutions to shoulder problems are certainly complex, especially when considering the contributions of the spine and even hips and lower body, it basically boils down to poorly coordinated movement at the shoulder.

As I outlined in a previous article, the particular causes of injuries can range from the obvious (trauma from a fall) to the more intricate (nerve irritation decreasing muscle strength, leading to improper joint positioning).

Whether it is specific muscle weakness, or flexibility problems (both too much and too little) at muscles, ligaments, and within the joint itself, these all lead to impaired movement patterns.

And these poor movement patterns can cause repetitive damage to the tissues in your shoulder even from simply using it in normal everyday activities. This is why shoulder pain is so common in both professional and recreational athletes.

The Joints of the Shoulder

Because the shoulder girdle is so complex, some basic knowledge of how joints work will help you understand the recommendations that follow.

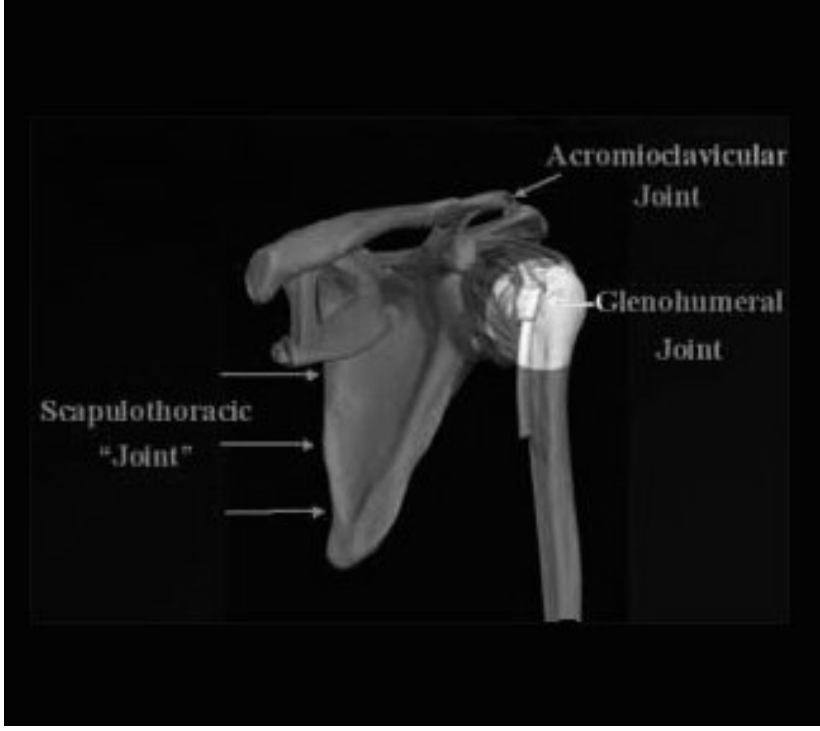
On the simplest level, any joint is the connection between two bones and determines the axis upon which those bones can move. The physical connection between joints are ligaments, which prevent abnormal motion and protect the joint from forces that would pull it apart.

The most movable joints, the ones we are most concerned about in our physical activities, are surrounded by a capsule comprised of thick outer tissue and a thinner inner tissue. Within this capsule is fluid, cartilage, and other tissue, all of which protect, nourish, and assist in shock absorption and free movement – the most important qualities we want in our joints.

Since the joints are what allow us to move, they are good reference points to describe the shoulder girdle and its components that can cause pain, stiffness, and other issues.

To simplify and provide the most amount of information with the least amount of headache, we'll focus on three major joints of the shoulder:

- ★ Glenohumeral
- ★ Acromioclavicular
- ★ Scapulothoracic



THE GLENOHUMERAL JOINT. PHOTO CREDIT: WHEELCHAIRNET

Within and surrounding these structures are the various soft tissues that make the shoulder both strong and mobile.

The Glenohumeral (G-H) Joint

The glenohumeral (G-H) joint is responsible for most of the range of motion of our arm through space, so even relatively minor stiffness in this joint can affect our activities quite a bit. As previously mentioned, this is a relatively shallow joint, and although it allows for a greater range of motion, it also makes the shoulder less stable and more vulnerable to traumatic forces.

The G-H ligaments (superior, middle, and inferior), along with the joint capsule, work to keep the ball in the socket. When someone dislocates their shoulder, these are the structures that are damaged.

Because of the variety of soft tissues within the G-H joint, lack of use often causes stiffness due to adhesions between the many folds and sliding points. Structures effectively get "stuck" together like plastic wrap and restrict your motion. Use it or lose it applies well to the shoulder.

The big muscles in the upper body all converge at this joint to move our arms (or our body through our arms).

The pectorals pull the arms forward and across the body, while the latissimus pulls the arms down and behind the body, and the deltoids and traps raise your shoulder girdle and arm upward.

These are powerful muscle groups that work hard in all the lifting, carrying, pushing, and pulling tasks we set out to do.

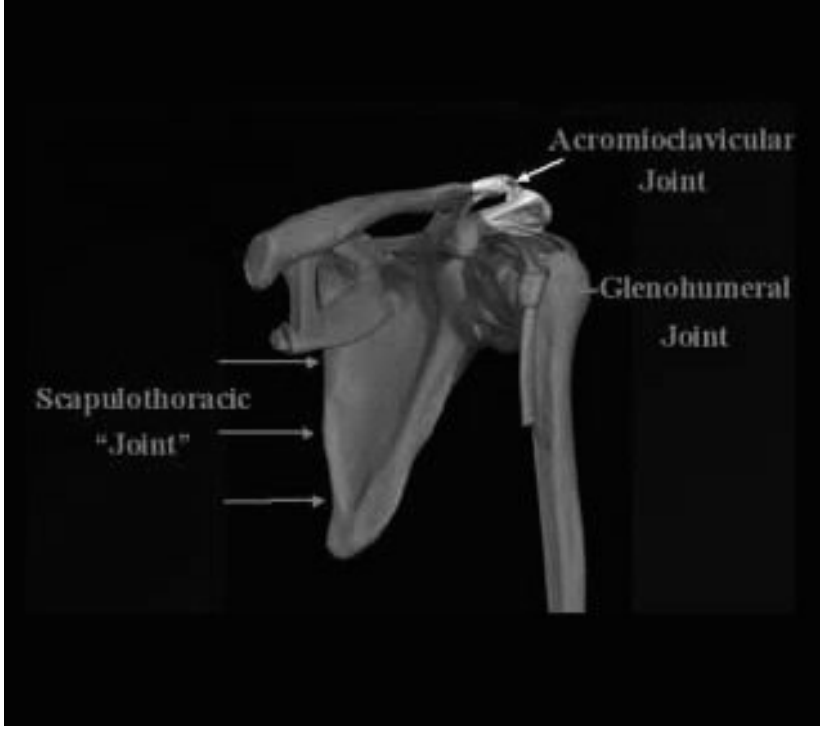
The smaller muscles at the G-H joint that make up the "rotator cuff" assist in maintaining proper position of the humerus within the joint.

The individual muscles have specific motions: Supraspinatus (beginning of shoulder abduction), Infraspinatus (external rotation), subscapularis (internal rotation), and teres minor (external rotation and adduction), but their main job is to hold the humeral head in position while the bigger surrounding muscles raise the arm up and overhead.

Other important soft tissues at this joint are the bursa.

The bursa are fluid-filled sacs that decrease friction and provide padding between bone and other structures for protection and freer movement. They can be irritated through trauma (such as a fall or being hit), or from repetitive stress and inflammation and swelling here can cause motion limitation and pain in the area.

The Acromioclavicular (A-C) Joint



THE ACROMIOCLAVICULAR JOINT.
PHOTO CREDIT: WHEELCHAIRNET

The acromioclavicular (A-C) joint does not allow as much movement as the G-H joint, but the movement it does allow is important for the last degrees of motion for reaching overhead.

It also serves as a rotation point to assist the shoulder blade in moving correctly, so that we can reach across in front of our body and back behind us. The A-C joint is also one of the last joints to mature and one of the first to experience degenerative changes.

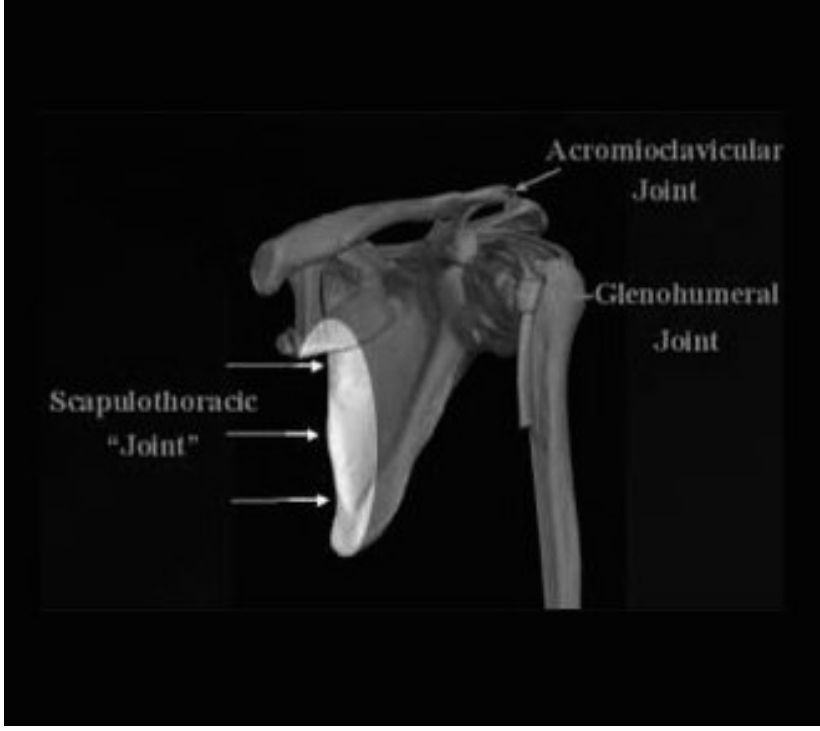
Apparently there's only a small window of "optimal" health for our A-C joint!

Just as in the description of the G-H joint, daily exercise of working your shoulder through its full range of motion and flexibility does much for minimizing problems in this area.

The deltoid and trapezius muscles strap over the joints indirectly, and provide a dynamic support, but the main protection from trauma are the ligaments (acromioclavicular and coracoacromial).

These ligaments attach the collarbone to the shoulder blade, and from points from one part of the scapula to the other. They support the joint to provide a stable pivot point for shoulder blade motion, and also help to form the "roof" above the rotator cuff and humeral head.

The Scapulothoracic Joint



THE SCAPULOTHORACIC JOINT.
PHOTO CREDIT: WHEELCHAIRNET

Full shoulder motion in all directions can only be accomplished with a freely moving shoulder blade along the ribcage.

This motion is dependent upon the muscles attached at the scapula to the ribs and spine. And there are quite a few muscles – the trapezius, pec minor, all the rotator cuff muscles, rhomboids and deltoids – that have attachments at the scapula.

As such all these muscles are affected and can impact shoulder blade mobility and support.

The shoulder blade is essentially free-floating with no ligamentous attachments to the spine or arm, so the various muscles and fascial attachments provide both movement and stability.

This is an incredibly important area for all upper body work in bodyweight style and calisthenic training. The scapula needs to be strong and mobile in all directions and combinations of directions (forward and back in both elevated and depressed positions), to both protect the shoulder and transfer power correctly from the trunk to our extremities, and vice versa.

Unfortunately, because of our decreasingly active daily lives and the ubiquity of desk and computer work, we rarely move our scapulae in all the varieties of motion they are meant to do, and that we need for peak shoulder health.

And even in most gym and sport exercise, we often limit ourselves to repetitive common patterns rather than all the available motion. This is why the fundamental "shoulder opening" gymnastic and handbalancing exercises can be surprisingly difficult and hugely beneficial additions to our training.

The Most Common Problems Facing the Everyday Athlete

Now that we've described the basics of the shoulder girdle, it's easier to understand the two most common causes of shoulder pain.

- ★ Impingement - Repetitive irritation of structures under the acromial "roof" and the head of the humerus
- ★ Tendonitis - Literally inflammation of the tendon. If symptoms don't subside with rest (~2 weeks), this indicates a continued stress on the tissue is continuing the inflammatory response.

There are a variety of causes of the impingement syndrome from muscle strength and flexibility imbalances, capsular tightness, neurological effects and so on, but the global end result is the irritation of tendons, bursa and other tissue causing inflammation and pain.

The inflammation and swelling that can occur is a critical problem because there is not a lot of open space in this region, and the expansion of tissue from swelling can further irritate the issue. It becomes a vicious cycle, which is why this syndrome is so common.

Tendonitis should actually be easily taken care of, with adequate rest and staying away from the painful motion, the inflammation should run its course and heal within two weeks.

But, just as with impingements, there can be several reasons for continued irritation, and this condition lingers and can progress to more damage to the tissue (tendonosis). It's essential to address the root causes if you want to resolve the condition permanently.

Preventing the Vicious Cycle of Injury

This shoulder anatomy primer is meant as a basic introduction to the various structures at the shoulder girdle.

The joints, muscles, ligaments, and other tissues all combine to create strength and mobility for all of our daily and recreational activities. When there is a disruption in this coordination, pain and dysfunction follow.

Poor motor patterns in the torso and upper body can nudge nagging injuries into a vicious cycle by preventing them from progressing through the healing stages.

Even at our worst, none of us has to actually carry the weight of the world on our shoulders.

Yet the majority of us will experience some kind of shoulder pain during our lives, whether it be related to training, stress, or accident. Let's look at some interventions that can help.

Below, I'll share some strategies and tips to help get you out of the pain cycle and back into the game.

This was difficult for me to write this part of the article because, although the following techniques and concepts are useful and have helped my patients and clients, I have simply no way of knowing if they will help you in particular. Without an in-person assessment, these are just friendly suggestions.

The movement assessments, history taking, hands on work and patient-therapist rapport in the clinic are what drive the most successful outcomes, so please apply some cautious sense before trying out the information in this article.

Using this Section to Fix Your Shoulder Pain

I like to joke about "shotgun" therapy.

You essentially throw everything at a patient and hope something sticks. It often works, but then you have no idea what single intervention (or combination thereof) worked, or didn't work.

It's a total crapshoot, and I for one don't like gambling on my patients' wellbeing.

That's why I don't recommend trying all of these suggestions at once. I'm providing you with options and allowing you to use your instinctive feelings of "This feels right!"

That's the very best I can do over the internets.

Everybody Feels Pain Differently, Mmmkay?

Pain is a very complex subject. One man's pain is another woman's discomfort.

The latest pain science reveals that there can be little correlation between tissue damage and the perceived pain. You can take two MRI scans of different people showing obvious structural problems, and one will report no pain while the other can barely move without wincing.

Pain is a construct that is emergent, complex, and without simple solutions.

This is quite clearly seen by the millions of people dealing with a variety of back, neck, and extremity pain, some resolving quickly and some turning into years of problems despite many types of treatment.

(This article is a great summary of the current pain science. Though it may be a bit too technical for the lay reader, the list at the end of the article is a great synopsis of useful strategies for changing perception of pain through movement.)

Magic bullets do work sometimes, but they aren't a high percentage bet. The miracle treatments that do occur involve a peculiar combination of good timing, patient/practitioner rapport, the particular condition, and a bit of luck.

The reality of pain science requires an approach that is flexible and adaptable to your individual situation and may require all the avenues available to break through the problem. So how do we know if what we are doing is going to affect our pain and function?

You Just Have To Give Things A Try

Yes, there is available research with "evidence-based" therapy and training that is quite good, but honestly and practically you won't know until you try.

It doesn't seem very science-y but it is actually the essence of science.

Tips to remember:

- ★ Perform an intervention over a reasonable amount of time and then measure the results – that's about as scientific as it gets. Give these strategies a try for 1 month, then reassess.
- ★ I've broken the the following strategies into categories for both ease of understanding and integration into your current training.
- ★ You'll soon see that certain exercises match well together. Also, the category of motor control/patterning is very important and if you can do the movements without pain, you should include these into your program as soon as possible.

Improving your skill in these exercises and changing your habits, especially those generating pain, are the key to long lasting change.

Exercises to Address Your Shoulder Pain

There are three major issues that can cause shoulder pain – issues with flexibility, strength, and/or motor control. Below, you'll find videos with exercises to help you address each of these issues.

Exercises for Improving Shoulder Flexibility

Click here to watch the demo video:

★ https://www.youtube.com/watch?v=JNaLqploNBQ

The above video offers some tips and tactics for improving your shoulder flexibility and motion.

The goal isn't necessarily to stretch a particular muscle, but to open your shoulders into new positions that allow a freer movement pattern.

These improved motions can decrease stress to irritated tissues and also make your chosen recreational activities/exercise smoother and easier to perform.

With each of these exercises, don't be afraid to play with different angles and different lines of force – sometimes a slight variation of the basic movement can allow you to access different regions of that range of motion.

In general I use a dynamic contraction – in and out of the end range of the stretch for a few repetitions (5 to 12) – then hold for a period of time (30 seconds to a minute), as shown in our Focused Flexibility program.

Don't be afraid to experiment with repetitions and hold times, some days will be better than others, and some days you'll find yourself doing the bare minimum.

The most important thing in flexibility training is consistency.

Do a bit everyday and you'll get results.

Shoulder openers on bench

1. Both arms or one at a time
2. Side -to-side motion at end range
3. Scapular flaring at end range
4. Improves shoulder flexion and upper thoracic back bending

Shoulder L-stretch

1. Shift to the same side arm for a light joint traction
2. Roll forward and back to find the specific area of greater tightness
3. Works on deltoid and posterior joint capsule

Scaption angle chest stretch

1. Hand elevated on bench or on floor
2. Both hands or one at a time
3. Angled for safe and deeper stretching of chest and anterior shoulder

Elbows on bench

1. Improves upper thoracic back bending with less strain on shoulders
2. Play with angles of shifting side to side and also rotation.

Foam roll

1. For a more specific spinal extension force
2. Play with side bending and breathing patterns
3. End with back muscle contraction/activation

Strength Exercises for Reducing Shoulder Pain

Click here to watch the demo video:

★ https://www.youtube.com/watch?v=0zVP5tSRbd4

This video outlines a variety of strengthening options that you are likely not including in your current training program. Targeting the muscles of the shoulder blade and rotator cuff, these are great movements to improve the stability of the shoulder girdle.

These exercises are best done either at the end of your current routine, two to three times a week, or as its own dedicated training session.

Prone scapula series

1. Emphasizing shoulder blade retraction (pinching together) and depression (pulling down towards the hips)
2. Performed with shoulder externally rotated (thumb rotating outwards) to decrease impingement and to activate the rotator cuff
3. Best done in higher repetitions range (12 to 20 reps)
4. Play with static holds along with dynamic motion.

Side-lying external rotation

1. Lying on side with elbow propped up to create space between arm and your torso
2. This improves blood flow to the shoulder and improves the angle of force
3. Best done in moderate repetitions range (8 to 12 reps)
4. Play with static holds along with dynamic motion

Scapular motion with weight bearing through the arms

1. In a variety of positions, training scapular elevation and depression in both protracted (shoulders pulled forward) and retracted (shoulder blades pinched together) positions
2. Trains scapular muscles and also the rotator cuff, particularly the more vertical the pressure, such as in the inverted “shrugs”
3. Shift weight side to side while maintaining shoulder elevation or depression
4. Play with static holds along with dynamic motion
5. Best done in higher repetitions range (12 to 20 reps)

Shoulder Motor Control Exercises

Click here to watch the demo video:

★ https://www.youtube.com/watch?v=o47GYJtu-C0

The video demonstrates a key part to improving shoulder function – the introduction of new movement patterns with stress and force from different angles, and with challenge to coordination and spatial awareness.

The crucial word here is "play". Play with movement variations, angles of pressure, and make each repetition slightly different than the last. Feel free to add these moves whenever you can, either as a warmup for your current routine, or as a cooldown, or even when you have a spare few minutes of time.

Scapular motions in straight arm positions

1. The scapula should move freely through countless angles of motion
2. Perform in a variety of straight arm positions – On all fours, on p-bars (or other elevated equipment), "crab" and "bear" positions, and upside down
3. Don't count repetitions, don't push past fatigue, take your time and play with it using a concentrated and mindful attitude

Play! Have fun! It's okay, you're allowed.

Choosing the Right Exercises for Your Needs

The broad categories of shoulder strength and flexibility encompass a variety of exercises and movements – much more than we can show in one article.

The exercises presented above will address common issues for most people, and are especially useful for those who participate in movement disciplines and activities like those we teach here at GMB. The best approach is to assess your particular needs and choose the exercises that best fit your situation.

In general, look at how symmetrical your strength and flexibility are between both shoulders. Is one a bit different than the other?

If so, that's a great starting point and measurement for adding on specific shoulder exercises.

Decide Based on Your Goals...

If you are training for a sport or have physical goals in your exercise regimen, you are probably already aware of what you need to do to improve your performance.

Being "as strong and flexible as possible" is a great goal, but it's not a useful training focus.

Instead, you should have specific targets, especially when you have issues such as shoulder pain and stiffness. As we keep harping here at GMB, goals are important tools for your training. Goals give you direction and a sense of purpose, when you otherwise may feel like you are just floating along.

Floating isn't necessarily a bad thing, but it's not the fastest way to reach a goal either.

...But Don't Neglect Novelty and Exploration

In the case of Motor Control, the sense of free-form play is the right attitude.

Novel movements break up your normal routine and wake up your mind and body. Physical habits and holding patterns creep up on you slowly and settle in without you being aware.

New movements just for the sake of doing them give you benefits far beyond those of the actual physical effort. Every way of getting out of the doldrums and plateaus of training is a precious commodity. Especially when it concerns chronic pain.

There can indeed be a habit of pain - you can be so accustomed to pain and dysfunction that it gets "sticky." We tend move in the same ways day after day especially in our exercise training.

Being stuck in these same movement patterns is a big player in continuing pain complaints despite different treatments. In the pain science article above, the emphasis is on variety and altering movement as much as possible to break free of patterns and the pain cycle. And the last tip "Ad lib and have fun" could have been taken out of the first page of the GMB playbook!

Don't neglect the importance of improvising and playing with movement. It's more than just fun, it's also a key to better health and fitness with less pain and dysfunction.

Creating Your Own Shoulder Recovery Routine

Take some time to examine your particular needs and play with adding a few of these techniques to your training.

- ★ For the flexibility exercises, choose a couple of variations for the shoulder opening and see how it affects your condition over a couple of weeks.
- ★ And the same for the strength exercises – pick two moves that seem to be the weakest for you, and incorporate them into your regimen and re-assess in a month.
- ★ For the motor control exercises, pick a couple that look the most fun to do and sprinkle them in to your sessions and daily activities, you'll be glad you did.

CHAPTER FIVE: THE KNEES

An Overview of the Knees

Knee pain, whether minor or major, is a common problem that interferes with our enjoyment of many aspects of our lives.

We get a lot of feedback and questions from clients regarding current and past issues with their knees and how to best accommodate these injuries while training.

So we decided it would be helpful to talk about some of the common concerns and problems that can happen at these joints.

But first...

In prior articles, I've talked about the causes of injuries and when you should go get it checked out, so that's a good place to start if you'd like to learn how to identify and deal with training injuries in general.

In this article, we'll get you more familiar with the knees in particular, and I'll explain how to keep them healthy so you can continue to enjoy your training.

I'll also give you some insight into what may be causing stress and strain if you have recurring knee issues.

How Your Knees Work (and a few of the things that can go wrong)

Basically your knee is a hinge joint.

It has two major motions:

★ Flexion (bending)

★ Extension (straightening)

Your shin moves on your thigh when your foot is in the air, and your thigh moves on your shin when your foot is planted.

There's a small degree of rotation available at the joint, but only to allow for the proper mechanics of the major motions of extension and flexion.

So what's the take home point here?

Any rotation and lateral movement beyond a certain point can cause significant damage (this is why pro football players and soccer players often suffer from knee injuries).

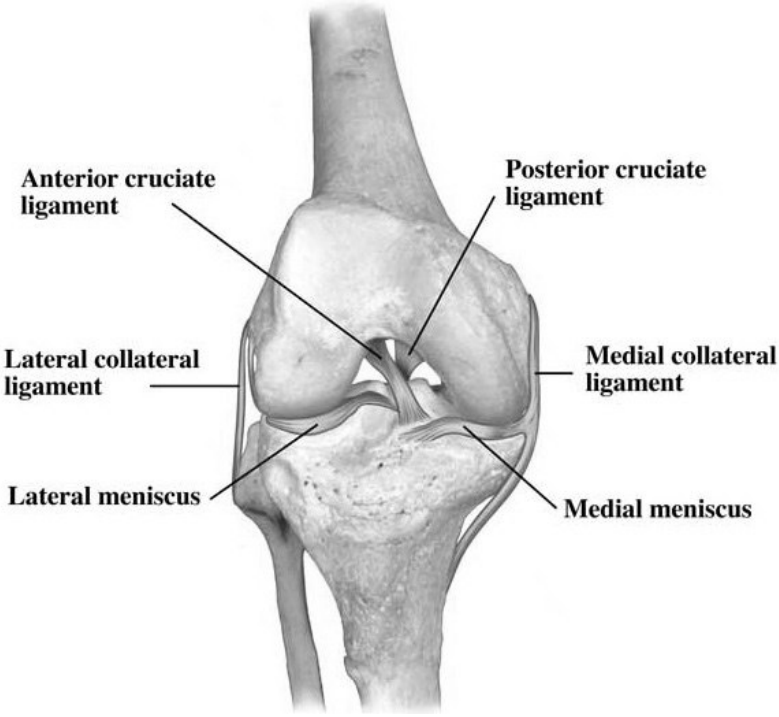
Make sense so far?

Great, let's keep this short anatomy lesson going! Now let's discuss the moving parts between your hip and your knees.

Ligaments Are There To Protect You

The ligaments of the knee serve to protect the joint from excessive movement in shear (sliding), rotation, and lateral (side to side) movements.

Four major ligaments protect the knee in these planes, one on each side (the collaterals), and two in the center (the cruciates). Without these four, your lower legs would be flopping all over the place!



SEE THAT STUFF BETWEEN THE BONES? THEY PROTECT YOUR KNEES. WHEN THEY WEAR OUT, THAT'S WHEN PAIN STARTS.

PHOTO CREDIT: KNEE.IN

The menisci (medial and lateral) in between your upper and lower leg help cushion the joint to reduce friction between bony surfaces and absorb forces.

Forceful twisting at the knees place strain on these tissues and they are very commonly damaged, either from repetitive strain or from trauma.

Kneecaps (we have nothing very nice to say about them)

Your kneecap (patella) is an intermediary structure between the quadriceps muscles and its tendon, and the tendon (patellar) that attaches to your shin bone (tibia). It improves leverage to better improve the muscular force generated by the quadriceps.

Unfortunately, when movement at the patella is not optimal there can be irritations to the underside of the bone and at the patellar tendon.

This is the common source of the complaint of "crunchy" knees and of course the very prevalent pinpoint pain of patellar tendinitis, the bane of runners everywhere.

And more specifically the attachment site at the tibia is also a source of pain in what people call the "jumper's knee" in both young kids and old fogey weekend warriors.

Your Muscles Absorb the Shock of Movement

The quadriceps and hamstrings are the familiar and major muscle groups of the knee, with the four quadriceps in the front of the leg converging into a common tendon to the patella and the hamstrings (biceps femoris, semimembranosus, and semitendinosus) to separate tendon attachments.

Repetitive strain and acute trauma are very common in these muscles because they provide much of the force in all daily and recreational activities.

Though it's been en vogue to assign hamstring weakness as a major problem leading to knee injuries, the quadriceps are the major shock absorbers and stronger quads are essential to knee health.

At the inner thigh, the large hip adductors don't cross the knee joint but three smaller muscles do (sartorius, gracilis, and the hamstring muscle mentioned above, semitendinosus) and form a single tendinous connection called the pes anserinus.

There's a bursa (fluid filled sac to reduce friction) under this tendon and is implicated in chronic medial knee pain.

At the lateral side of the knee, the iliotibial band is a tough tissue that runs from the outside of the hip past the knee to the tibia.

The infamous "I.T. Band" syndrome is generally from increased repetitive stress from adding too much mileage too quickly.

In addition to the hamstrings, the bigger calf muscle (gastrocnemius) crosses the knee to act as a weak knee flexor, but the significance here is not that it assists in knee flexion, but that tightness can interfere with full knee extension. An inability to fully straighten the knee can cause knee joint irritation, overwork particular muscle groups, and can cause enough of a leg length difference that repetitive motions can create problems into the hip and back.

The preceding wasn't a full list of the conditions that could cause knee pain, but the most common and likely to affect people in average recreational activities.

Actions You Can Take to Ensure Knee Health

So how can you use this information to help you with taking care of your knees?

Well the preceding anatomy primer has probably made you more aware of the knee's role as the middleman between your hips and your feet on the ground.

Your knees can be more prone to problems when the connections from the hip to your lower limbs aren't coordinating as well as they should.

Knee issues can be fairly complicated and have a variety of separate and intermingling causes, but we can break down basic knee issues into three major causes:

1. Lack of strength
2. Lack of flexibility
3. Poor movement technique

Improve Your Quad Strength

Earlier, I mentioned the importance of quadriceps strength to help absorb the forces the knee is subjected to in running, jumping, and even simply taking the stairs and walking.

In particular, it's the eccentric quad strength that is most helpful for knee joint protection. It's the strength you have in handling forces while the quadriceps are lengthening under load.

The lowering part of the squat is a good example. The same goes for strong and enduring calf muscles, they can take a lot of the load off from landing.

It's not so much the jump that gets you, as it is the landing.

Hamstring strength at the knee is important as well, but more so for the ability of co-contraction with the quadriceps to keep the knee joint stable during activities.

With both muscle groups working together correctly, you'll be able to lessen the shear and rotational strain at the knee.

It's more essential to have increased hamstring strength at the hips, where they are a big contributor to hip extension along with the glutes. Good hip action provides the majority of strength in jumping and running and should be developed to its fullest to take away undue stress at the knees.

Strong hips are also helpful for preventing a "caving in" at the knee during loaded knee bending activities.

When you allow your knees to fall inward, the stress on the inner and medial ligaments is substantial and is the cause of many traumatic injuries.

Do More (Specific) Stretching

Though greater hip strength is a factor for improved knee health, improved hip flexibility may be even more important as hip flexor (rectus femoris) and hamstrings tightness can interfere with proper knee mechanics.

They can also provide a buffer for rotational stresses as well, decreased hip flexibility in rotation can transfer more forces to the knee. Freer hips give you a bit more margin of error, and that little bit can save you a world of hurt.

As mentioned earlier, calf and IT band flexibility work is helpful as well if their tightness is an issue.

It is possible just to "stretch all the things!" but a more efficient way is to do a bit of self-assessment as I describe in Focused Flexibility.

Less exercises to do often means an increased chance of actually doing them consistently!

Change the Way You Move

Click here to watch the demo video:

★ https://www.youtube.com/watch?v=_Ny_n5jnh-0

A phenomena that I see often in the clinic in acute (single incident trauma) knee issues are the "non contact" injuries where the problem wasn't from being tackled or even falling, but from excessive forces at the knee from poor movement patterns.

In the short video above, I illustrate the rotation and lateral bending forces upon the knee that result from a fixed foot and hip.

The shear and torsion stress at the knee, along with the weight of your body (and maybe someone else's) can create incredible damage!

The "unhappy triad" of an ACL (anterior cruciate ligament), MCL (medial collateral ligament) and medial meniscus tears happens when the perfect storm of rotation and lateral bending under load hits the knee.

It's not a pleasant thing to see.

When you think of the knee as the "middleman" joint between the prime movers of the strong hip, and the more mobile foot and ankle, you get a better sense of how to protect your knee in sport and daily activities.

A simple change in the way you allow your foot to move and rotate while you move can prevent a lot of knee injuries.

Good strength and flexibility aren't of much help if poor movement patterns are placing you at a high risk for injury.

Improving your technique in running and jumping can have a huge effect on decreasing your risk of ACL injuries, as evidenced by the success of similar kinds of programs at youth organizations like Sportsmetrics.

The Cliff Notes Version to Put into Practice Immediately

The three best actionable steps for preventing knee problems and allowing current issues to heal are addressing your strength, improving your flexibility, and adjusting your movement technique.

#1 - Address Your Strength

1. Focus on improving your quadriceps and calf strength, especially eccentric contraction control.

2. Focus on improving your hip extension and rotation strength to correctly activate the hips as the prime movers in jumping and running.

#2 - Improve Your Flexibility

1. Identify and improve the specific limiting motions of the hip and leg to decrease repetitive and acute forces at the knee. (We've got just the thing for that.)

#3 - Adjust Your Movement Technique

1. Change your movement patterns in your twisting and lateral motions to decrease stress at the knee.

These basic changes will do wonders for addressing the majority of knee problems that afflict weekend warriors and professional athletes alike. I won't guarantee that this will cure 100% of you, but it's a solid start.

Take Care of Your Knees, and They'll Take Care of You

This primer on knee health addresses the fundamental issues that cause the majority of knee problems, and hopefully provides you with a better understanding of the joint and how it's affected by your training and recreation.

Injuries are no fun – they affect not just what we do for enjoyment but every aspect of our daily lives. This is why GMB has always emphasized a practical and reasonable approach to fitness.

It's not about settling for average or being afraid of hard work; it's simply being mature enough to understand that being injured prevents consistent practice. It is much better to do less and build up slowly than to overdo it and get injured, and then not be able to train at all.

CHAPTER SIX: THE FEET AND ANKLES

Our feet and ankles are very important, considering we couldn't stand, walk, run, or roundhouse kick someone in the face without them. Unfortunately, our lower limbs tend to be neglected unless something goes wrong.

Strong and flexible feet, ankles, and calves provide our base for stable movement, and are essential for performing our daily activities without pain or strain.

In this chapter, I will give you a brief introduction to the the basic anatomy and movements in the ankle and foot (just enough for a good familiarity, but not enough for you to perform surgery...). Then, I'll discuss the primary importance of working on this area, and finally, how to incorporate exercises for these areas into your training routine.

An Overview of the Feet/Ankles/Calves

Your lower leg is made up of the bigger tibia on the inside and the smaller fibula on the outside, then connects lower down to the talus and the calcaneus (heel), then to the five small bones of the instep and the metatarsals and phalanges (your toes).

Lots of different sized ligaments connect the bones together for stability, along with various muscles from the big calf to the small muscles that move your toes.

The ankle and foot is made to move in a great variety of angles to provide stability and dexterity, carrying us over all types of terrain from soft sand to rocky ground. Your ankle is not like a hinge on a door, and your foot isn't just one big lump you slide your socks onto.

All the large and small joints in this area work together to provide this nimbleness, but only if we keep them moving like they are supposed to!

Your Lower Legs Work Hard for You – Here's What They Do

Our calves (the bigger gastrocnemius and smaller, deeper soleus muscles) point the foot down, giving us the power to rise up on our toes and assist with running and jumping. But even with the foot flat on the ground, our calves provide stability in squatting, lunging, and other big movements.

On the front and sides of the shin are the anterior tibialis, posterior tibialis, and peronei muscles, which provide stability like stirrups and slings, and also the fine motor control that keeps us balanced and steady.

Down into the foot are many small muscles that control our arches and toes.

These foot intrinsic muscles are the most at risk for atrophy from disuse when we don't actively get out of our shoes and move our feet as we're meant to do.

What Can Go Wrong in the Foot and Ankle

With all this considered, it's easy to see the complexity of large and small muscles and joints working together to keep us upright and walking, as well as running, jumping, and balancing.

The coordination and differentiation of all these possible movements is key to foot and ankle control, and to moving freely and gracefully through your feet.

It's also likely why we hear so many complaints about stiff ankles and feet.

If the smaller muscles are too weak to support your foot and ankle, your body reacts by increasing the tension where it can, in the bigger muscles. The tightness in the calf and ankle is then a protective mechanism that stretching may help a bit, but improved control and strength in the foot would solve.

Another common issue people experience is collapse arches in the feet. This is caused by poor mobility in the midfoot, along with weak posterior tibialis and intrinsic muscles. With improved mobility and strength in these areas, the arches should correct themselves over time.

Below we'll discuss a variety of exercises with an emphasis on coordination and dexterity to wake up dormant muscles and restore proper mobility and control over this important area.

8 Exercises for Building Strength and Motor Control in the Feet and Ankles

The exercises we show here have an emphasis on active movement in various angles and ranges of motion.

A lot of people don't fully explore the movement our feet and ankles are capable of, and this results in stiffness and weakness. The first step is knowing that it is actually possible to move this way, and the next and best step is to practice!

Below, we'll look at each of these exercises in detail so you can understand the mechanics and benefits of each exercise, as well as programming recommendations.

Click here to watch the demo video:

★ https://www.youtube.com/watch?v=apCIhoPmHW8

1. Foot Circles with Toes Flexed (Curled)

This movement concentrates on the small muscles in the arch of the foot. These foot intrinsics support the foot, and control over them means improved control and dexterity, which is so important in graceful and athletic movement.

It's a simple movement – it's just making a circle! – but the addition of flexing your toes makes this surprisingly difficult and can lead to muscle cramping in the beginning. Start off by not flexing your toes strongly and do the circles slowly.

Do 10-15 reps in each direction for 2-3 sets.

2. Toe and Ankle Movement Coordination

Here is another simple movement that works on coordinating the use of the muscles of the lower leg and foot. Simply lift your foot up and down through your full range of motion and add the toe movements with it as well.

The coordination is toe extension (lifting toes upward) as you lift your foot upward, and toe flexion (curling in) as you point your foot down. And the other variation is then flexing your toes down as you lift your foot upward, and extending your toes as you point your foot down.

Do 10 repetitions of both variations for 2 sets.

3. Diagonal Patterns

These are combined motion patterns of either your foot lifting up and rolling inward and then pointing down and outward; or your foot lifting up and rolling outward and then pointing down and inward. You are essentially tracing an X with your foot as you work on the coordination of ankle and foot motions.

This can be another surprisingly difficult exercise and is extremely useful for learning how your ankle can move.

Do 10-20 reps for 2-3 sets.

4. Rolling up Onto the Toes

This is the first exercise where we are putting weight onto our feet.

The goal here is to combine a loaded active stretch to the ankle and foot together. It's a dynamic move, so don't hold too long in any position, instead go slowly through the full range and back again to encourage active movement through all the positions.

Do 5-8 reps for 3 sets.

5. Squats with Ankle Rotation

In this exercise, don't worry if you can't drop down into the full deep squat position. The purpose of this exercise is to practice rolling on the inside and outside of your feet while weightbearing in a "compromising" position.

If you were to run and unexpectedly roll onto the side of your foot, you'd likely get a nasty ankle sprain. The exercise shown here is a progressive way to practice these common stresses to your feet and ankles. You can control the pressure and stress of the movement and use it to strengthen these positions to make it less likely to be severely injured when it unexpectedly happens.

Do 5-8 reps for 3 sets.

6. Ankle Rolling Side-to-Side

Here we move to standing and up on the ball of the foot as we practice rolling our ankle from side to side.

Again, it's better to do this while we are controlling the forces so we can strengthen them, rather than having it happen randomly and possibly causing injury.

Do 5-8 reps for 3 sets.

7. Weightbearing Ankle Circles on the Heel/Ball of Foot

Continuing in standing, we'll now practice ankle circles while placing as much weight as we are comfortable with on either our heels or on the ball of the foot.

There are different forces and strains involved in the two variations, so it's good to familiarize yourself with both.

Do 10 reps in each direction for 2 sets.

8. Calf Raises

Another classic exercise, this is the most direct way of strengthening the calf muscles in their full range of motion from a full stretch to a full contraction. You can adjust your intensity by how much you hold on with your hands and by eventually adding weight to your body through a backpack or holding dumbbells.

If this is too much for you, then work both feet at the same time or start on a flat floor versus a step to reduce the range of motion until you get stronger and can handle strengthening from the full stretch.

Do 8-12 reps for 3 sets.

Fundamental Calf Stretches for Flexible Lower Legs

A very common complaint we hear from people is their lack of ankle flexibility.

Many bodyweight exercise moves, especially as you move into intermediate and advanced work, such as the pistol squat and various locomotive patterns, require good ankle flexibility.

The calf muscles are a very dense muscle group because we use them constantly – even just in standing and walking. And the ankle joints, because of the lack of variety of motion throughout the day, tend to be stiff and immobile. This can require aggressive stretching, in terms of load, not intensity, to achieve improvements in range of motion.

Click here to watch the demo video:

★ https://www.youtube.com/watch?v=vLMd8LcMk0M

A classic and effective exercise is using a step or sturdy block for your foot so you can drop your heel down to stretch.

It's simple, not fancy, but works extremely well if you are consistent and approach it the right way.

I recommend doing this in shoes, in this way you can place the middle of your foot on the edge of the step comfortably for the stretch. This is protective of your foot arch and allows you to put more weight into the stretch.

The variations are with your knee locked out straight and with your knee bent. The straight leg version emphasizes more of a gastrocnemius stretch, and the bent knee version gives the calf muscles a bit of slack and thus puts more of a stretch in the ankle joint.

The calf responds well to long holds of stretching, so 1 to 2 minutes for 3 sets should be a minimum goal.

Stretch before active movement such as the strength and motor control exercises above so that your body learns to adjust and retain the new range of motion from the stretching.

Self-Massage Techniques for Healthy Feet, Ankles, and Calves

A bit of self massage work is very useful in the lower leg and foot to loosen some tension prior to stretching and exercise.

The massage itself doesn't make you more flexible, but it does temporarily help you feel less tight and gives you a window of opportunity to stretch further with less discomfort.

Just make sure not to overdo it, the trick is to apply just enough pressure to ease tension, not push as hard as you can to force it to happen!

Click here to watch the demo video:

★ https://www.youtube.com/watch?v=LPaBwgZixDc

Starting at the foot, work along the sole along the contours of the bones and feel the small muscles in you feet, keep the pressure light at first then gradually increase the pressure. If you are doing it correctly you'll notice an easing off of tension in the muscles.

You can then add more pressure and continue if you feel you need it, or move on to the next area.

Move on to the sides of your shin, into the calf and the front of your shin. The calf can be especially sore to massage deeply, so be aware of this and go gradually until you get accustomed to the pressure.

You can also use a ball to change the pressure and get into the muscles from a different angle.

Along with being mindful of gradually increasing pressure, you should limit your time on self massage to no more than 5 minutes. Too much of a good thing is still too much. And it is much more valuable to spend the majority of your time on active exercise.

Keep Your Feet Healthy for a Lifetime

Our ankles and feet are too often under-exercised and taken for granted considering how much we rely on them everyday. It's no surprise that this neglect of their full range of motion and total potential for coordinated movement can lead to stiffness and weakness, and perhaps even pain.

This article focused on simple, yet effective exercises that not only lessen the chances of potential injury, but may also reverse some damage that has already been done (barring any true injuries in need of surgery or more intensive therapy).

Spend 5-10 minutes on these exercises every day, and you're likely to feel your feet getting stronger, more flexible, and more able to handle variations in movement.

OUTRODUCTION

This troubleshooting and maintenance guide was designed to give you a foundational understanding of the most common problem areas in the body, and some things you can do to protect and rehabilitate yourself.

Obviously, there's a lot we haven't covered in this guide, but these basics will serve you well for education and exploration of your back, hips, shoulders, or knees.

One thing we can't stress enough is the importance of building a strong and flexible body that can handle the inevitable stresses life throws at it. Our most popular program, Focused Flexibility, was created with that purpose in mind.

Thank you. We hope to see you soon!

The GMB Team

Ryan, Jarlo, Andy, Amber, Rachel, Clayton, and Jason