The CrossFit Journal

Moving Beyond Muscle part 2: Flexibility Training for CrossFit

Chris Frederick (co-creator of Stretch Win®) and his student, Kevin J. Kula (FlexibilityRx™) explain how CrossFitters can design a personalized flexibility program based on functional stretching for CrossFit

By. Chris Frederick & Kevin J. Kula March 2013

CrossFit values observable, measurable, repeatable data. While many CrossFit coaches are skilled at teaching stretches and warming up a class - it seems that there is no agreed upon *system* of how to stretch. Stretching is just something we "need to do more of." The average gym member is still using stretches they learned in high-school – the runner's quad stretch, the rounded back one leg hamstring stretch, the bouncing up and down forward bend stretch.

It seems like it requires a physics degree to understand stretching – proprioceptive neuromuscular facilitation – "Say What?!! "How many seconds do I hold a stretch?" "Do I have to do jumping-jacks first?" "What about before and after exercise?" "Someone told me that I shouldn't stretch" - Not to worry, this article, will be to stretching what the squat clinic was to the understanding of the squat – you will walk away with a simplified, practical understanding of stretching – that is observable, measurable, and repeatable - in other words you will learn what it means to "Stretch to Win".

I: Introduction

A critical part of continued success with CrossFit is a self-stretching program. The concept of functional movements is well understood – 'Movements that mimic motor recruitment patterns that are found in everyday life which are mechanically sound and capable of eliciting a high neuroendocrine response'. This understanding is a direct result of Greg Glassman's daring attempt to do what others in the fitness industry did not. He operationally defined fitness and outlined the functional movements that make functional fitness practical and possible. If flexibility needs to be defined and the practical stretches that make it possible outlined, then what can we agree upon with regard to flexibility and stretching?

During 2002, in the second issue of the CrossFit Journal, Greg Glassman correctly pointed out that, "*The science of stretching is weakly developed and many athletes like gymnasts who demonstrate great flexibility receive no formal instruction"*. The last ten years the CrossFit community has been hard at work refining, and redefining the concept of fitness. Starting back in 2004, specialists like Mark Rippetoe and Mike Burgener brought their expertise in the areas of barbell training and Olympic weightlifting to CrossFit. In 2013, whose expertise can be utilized in understanding and implementing stretching?

My 2012 CrossFit Journal article, "Moving Beyond Muscle" explained how connective tissue based therapies can help CrossFitters resolve chronic injuries. The focus was on a therapy called Structural Integration, which consists of a series of sessions of soft-tissue manipulation that re-aligns the skeletal system through the connective tissue. In the resource section of the article I mentioned a second therapy called Fascial Stretch Therapy (FST). FST is part of Ann and Chris Fredericks' "Stretch to Win" system of flexibility training – which has two components – assisted and self-stretching. Since 1995 Ann, (and then Chris in 1999), have been defining, developing, and refining the science of stretching – outlining the 'why, where, when, and how' of functional stretching. But what is functional stretching?

Chris Frederick's answer to that question is, "A stretching exercise is functional when it directly enhances an athlete's performance in his or her specific sport. When an athlete stretches using a training system that incorporates principles of sport-specificity, he or she can achieve optimal functional flexibility." This article will examine their system with a focus on providing practical self-stretching information. To quote Greg Glassman, "The soundness and efficacy of functional movement is so profound that exercising without them is by comparison a colossal waste of time." CrossFit's commitment to elite fitness affords no tolerance for isolated movements or stretches. By moving beyond muscle–based thinking - once again - we can adopt some better stretching for CrossFit.

Here is what you will walk away with after reading this article

- Enough science to understand flexibility and stretching
- How to assess your flexibility (PFA)
- 10 Principles you can apply to stretching (FLOW)
- How to turn flexibility into performance (PR-Formula)
- Four essential pre-workout stretches (Core-Four)
- A stretch routine for your squat (SquatRx)
- How to develop a 'Personal Flexibility Plan' (PFP)

II: Chris Frederick

A: What is Flexibility?

The late great sport scientist, researcher, and renown powerlifting coach, Mel Siff, PhD, told me (Chris) in 2002 that performing the splits has long been a "supreme indicator of flexibility" - yet he observed that it was quite common for toe touchers and splitters to be "quite unable to sit on their haunches in a low squat position with heels flat on the ground". Another way of saying this is, what you see (the splits) is not what you get (flexibility).

Flexibility means different things to different professions, people, athletes and coaches. It even means different things to massage therapists, physical therapists and doctors, who mostly think its just range of motion.

We like Merriam-Webster's definition of 'flexible': "characterized by a ready capability to adapt to new, different, or changing requirements". That's CrossFit – it prepares you physically and mentally to successfully adapt to a dynamic world of life, whether you are training, competing or just living. Optimal adaptation requires all of it – strength, mobility, range of motion, balance, speed, agility, endurance and a determined will to push your limits. CrossFit is flexibility training at its best.

In his book "Supertraining", Dr. Siff sub-categorized terms like 'flexibility-strength', 'flexibility-endurance', 'flexibility-speed' and flexibility deficit, because flexibility was obviously a very important part of training that he used when he coached and worked with some of the world's best, strongest weightlifters (1).

So, flexibility is much more than simply range of motion. But if that is true, then why has stretching to achieve better flexibility been the least researched, coached and understood aspect of strength and conditioning? Ann Frederick, my wife, and co-author of the book "Stretch to Win", states that when she did research on stretching in 1997 at her university's library "there was a ton of books on strength and conditioning but only one book on flexibility." She thinks some of the reason for the information lacking on stretching is partly due to misconceptions.

B: Misconceptions about Stretching

True or false: Stretching makes you weak? The answer is, it depends. There are plenty of research studies that have found that stretching decreases muscle strength anywhere from 10 minutes to 24 hours after static stretching (2,3). Yet there are growing studies that show increased strength after stretching (4, 5, 6, 7). Dr. Siff states that flexibility-strength is "the ability to produce efficient, powerful static and dynamic movements over a full ROM". So, if your muscles don't stretch to accommodate a full movement such as a squat, then we must conclude that you lose flexibility-strength. So, how does stretching make you weak?

Increasing evidence since the 80's does show that static stretching makes you temporarily weak immediately afterwards, so don't do static stretching before training/competing or your risk for injury goes up. Instead, do what I refer to as "The Stretch Wave™" (8). These are undulating, movement-based stretches specific to your individual needs and then matching the specific activity to give you the exact range of motion you need. For example, it is well known that tight hip flexors will neurologically weaken your glutes, which makes your back and hamstrings work harder and raises risk for injury during squats and overhead lifts.

The Stretch to Win quick solution for this common problem prescribes the Fast Stretch Wave on your hip flexors right before lifting. This routine rapidly removes tightness (hip flexors) that causes weakness (glutes), which increases strength (low back-glute-hamstring movement chain). Immediately follow up with air squats, barbell only squats then progressive weight training and your PR will soon be right around the corner. The Slow Stretch Wave is done after training as part of your cool down to restore flexibility that you may lose from hard-core training.

Conclusions in the scientific literature that static stretching decreases power (vertical jump) and speed (sprinting) are for similar, as well as other reasons it decreases strength. So, doing the wrong stretching – static before activity – makes you weaker and slower. Doing the right stretching – what we call doing the "Stretch Wave™" – makes you stronger and faster more quickly and safely.

C: The Stretch to Win® System

Founded in 1995 by former professional dancer and flexibility fitness instructor Ann Frederick, the Stretch to Win Center became an exclusive location for flexibility training and therapy for professional athletes, chief executives, kids, parents and grandparents. Here's the quick story of how it all started and ended up becoming the flexibility training of choice in the NFL, MLB, NBA, UFC, and the Olympics.

When Ann Frederick, a former professional dancer, became a flexibility instructor for a fitness center in 1995, she had no idea that the majority of the general public was incredibly tight and inflexible. After the Olympic Men's Wrestling team beat the Russians for the first time in 1996, they gave Ann, their stretch coach, a lot of the credit for keeping them flexible and strong enough to win more medals than ever before. When she started doing one-on-one assisted stretching with the Sun Devils football team as a student graduate assistant at Arizona State University, she was told injuries went down 45%, which was one of the reasons they went to the Rose Bowl in 1997. All this work inspired her to do a research study for her thesis that showed much better outcomes using her stretch method compared to traditional static stretching technique. At that time, no other scientific studies showed as much gains from one technique of stretching. Ann also realized that she had a passion to be an expert and specialist in the least researched and least understood niche of strength and conditioning…flexibility.

Through much trial and error and honest client feedback, Ann developed a system that I (her husband) also contributed to when I joined her in 1999. The Stretch to Win (STW) System of flexibility training is based on 10 Principles (discussed later in more detail) that has 17 years of practice based evidence, improving athletic performance and recovery and helping to eliminate pain in many medical conditions. The technique is called Fascial Stretch Therapy and focuses on the connective tissue and nervous systems to get rapid, permanent positive changes to improve function and quality of life.

D: Fascial Stretch Therapy™ (or FST™)

FST is the technique of the STW System and is guided by its 10 Principles. The system is what makes FST unique and much more than just another stretch technique. Specifically, it works globally (whole body), then works locally (specific body part), and is done by certified therapists or can be performed on your own.

Here's an example: many CrossFitters have 9-5 sit down jobs that negatively compresses, shortens and loads the body all day long. FST recognizes that as a major problem that slows down your CF goals, makes training harder than it has to and makes it more challenging to attain PRs. Even if you have an ergonomic chair and workstation or desk, it's hard to attend to your posture when you have a job to focus on. By the end of the day, most people transform into a turtle and shrink up to 2" via the following:

- turtle head (stuck way out)
- no neck (shoulders pulled up in a shrug)
- turtle shoulders (rounded, like their shell)
- slumped back (compressed, no wonder it's stiff or painful)
- sway back (called 'anterior pelvic tilt' often from weak abdominals)

- flexed knees (tight hamstrings)
- pronated feet (can be genetic but your collapsed from head to toe, literally)

You may think this is not a big deal that you'll just work out and feel great. Problem is that while your positive will and attitude will take you far, it cannot overcome basic structural and neurological facts. When you sit all day, you become locked short in the front of your body and locked long in the back. That means, short tight muscles in the front dominate (pecs, hip flexors) and long, weak ones (between the blades, glutes) are weak. Add to that the fact that your discs and joints also get compressed.

FST takes the turtle out of the shell and makes him/her feel 10 feet tall. That's called full body decompression. Compression over a lifetime makes us shorter as we age, not taller. Just ask your father or grandmother. Strength training alone does not fix this but increased flexibility can and does. When clients tell us they have to adjust their rear view mirror in the car after a therapist guided FST session, you know they "grew" taller. It's also possible to get many of these effects with self guided FST too.

After a FST certified practitioner works on your whole body to decompress joints and get length and space in the body where it has been lost, they work on local problems. That is, much of the pain, weakness and stiffness will have left your body but you may still have "scar tissue from an old surgery" or "an old disc" or "my bum knee" that still bugs you. The good news is, after the initial "issues in your tissues" are eliminated, what's left is easier to fix. Instead of wasting time chasing multiple pains or problems, they all get rapidly fixed simultaneously from the global attention of FST on your entire body. So that what's left is not a compensation but an actual problem that is easier to focus on, now that all the other stuff is gone. That's one common example of how FST uniquely and efficiently works to balance out the structure of the body.

E: Client's of the Stretch to Win® System
Here is a short list of only a few clients that have used the STW System; CrossFitters should feel like they are in good company: Fighters Mike Tyson and Frank Mir; football players Emmit Smith, Kurt Warner, Larry Fitzgerald, Donovan McNabb, Terrel Owens; Olympic medalists Kurt Engle and Tom Brands (wrestling), Sanya Richards (track), Stacy Dragila (pole vault), basketball player & NBA analyst Charles Barkley; multiple Ultraman winner Kevin Cutjar; WWE stars CM Punk and Triple H; "4 Hour Body" author Tim Ferris and many, many more.

The STW System has been used by some of the best athletes to help individuals break records and teams to win championships. Many others have also used it to prevent surgery and get out of chronic pain. Likewise, CrossFitters can take their training to whole new level by intelligent integration of this system. Read on to see how this system can help you remove personal physical obstacles that can diminish or impede optimal training effects. You're on your way to getting leaner, stronger, faster and more powerful in mind and body by adding specific flexibility training into the mix.

<u>III: Turning Flexibility into Performance</u>

'The PR-Formula'
Flexibility is the quickest path to performance. If you want to lift heavier, move faster, or improve your endurance - flexibility's return of investment is second to none. At CrossFit Scottsdale members hit 'PR's one after another - after attending my workshop. How did they do it? They applied my 'PR-Formula'. First assess flexibility, 'FLOW' into your stretches (knowing where and how to stretch), and then retest your flexibility by setting a 'PR' in your WOD.

<u>The 'PR-Formula'</u>
#1: Properly **Assess** Flexibility
#2: **'FLOW' into your Stretches**
#3: '**PR**' in your Workout

Both Chris Frederick and Kelly Starrett place a high emphasis on assessment before stretching and retesting flexibility after stretching. What better way to assess your flexibility than to 'PR' in your workout? Retest your range of motion actively first and then in sport specific movements like the squat, before using your workout as the ultimate test.

Section Four of this article will examine the Stretch to Win system of self-stretching which is based on a personal flexibility assessment and application of ten stretching principles. I created the phrase 'FLOW' to bring the theory of the ten STW principles into the practical application of any stretch – Focus, Lengthen, Observe, and Wave. Section Five introduces two stretch routines – a pre-workout stretch routine ('Core-Four) and a stretch routine for the squat ('SquatRx'). You will be able to test the 'PR-Formula' yourself after reading this article.

IV: The Stretch to Win® System Part 1 – Self-Stretching

A: Midline-Stabilization and Flexibility
Flexibility can be screened separately through passive or active range of motion; sport-specific movements like squatting are more complicated ways of assessing flexibility. Why? Squatting, bending, lunging, pressing/pulling, running, and overhead movements all require mid-line stabilization - 'best set' or hollow positions.

Observing knees tracking forward in the squat doesn't automatically indicate a lack of flexibility - the movement must be fixed first, and then flexibility can be better evaluated. As Kelly Starett phrases the question, "Were they able to do the movement after a little cueing? Yes, maybe it is not a mobility problem. Maybe I have a motor control problem. Motor control is just as important as, hey, my hip capsule is tight, its just as important as hey I'm having a sliding surface dysfunction."

Sometimes fixing the movement is enough – flexibility may not be an issue. In other instances fixing the movement will actually expose flexibility limitations that were not apparent before – it goes both ways, to quote Kelly Starrett again, "Spinal stabilization increases range of motion - this is why we prioritize midline stabilization in front of mobilization, because it solves a lot of problems, it solves a lot of mechanics." "I try to fix the movement first then I see what the result and restriction is afterwards and then combine the two."

B: 'Personal Flexibility Assessment'
Knowing what areas need to be stretched enables a systemized approach for developing a personal flexibility plan. Focusing on key areas leads to quick improvements in range of motion, better movement quality, and makes stretching more time effective. "The Stretch to Win system aligns with today's philosophy of functional out- come training. This means that when you implement the program you are not just stretching to increase ROM for the sake of improving general mobility, but rather you are performing a specific stretch program based on an analysis of your own flexibility requirements specific to your sport or movement." – Chris Frederick

The basis for the Stretch to Win assessment is called a 'Personal Flexibility Assessment', which is found on page 49 of their book. The PFA has three parts. The first component is a health history where you identify pain/problems; assess posture and your skeletal alignment. The second component involves assessing active range of motion on your own and additionally assessing passive range of motion if you are working with a FST practitioner. The third component is assessing the flexibility involved in sport specific movements.

"Without a precise three-dimensional assessment of posture, gait, flexibility, strength, and other functional movements related to your activity or sport, you do not have most of the objective information you need to create an optimal stretching program to enhance your performance or rehabilitate an injury." - Chris Frederick

Before stretching you want to identify what specific areas are restricted so that stretching is efficient and effective. However, just assessing range of motion before a stretch is not enough – you need to retest flexibility to ensure that you applied the right stretch or if additional stretches are needed. When assessing flexibility you can use my concept of, "PASS" – passive, active, stretch, and squat – four different types of feedback. In addition to passive and active range of motion, you can use the stretch itself to notice any side-to-side differences in tightness and the feel of the area being stretched. Using the squat and other relevant movements can be useful because improvements in flexibility do not always produce increased range of motion. There may be a quality difference to your squat that you feel after stretching your quads - even if the range of motion is the same.

The PFA on the following page is my own adaptation of the PFA for CrossFit that focuses on the flexibility required by the squat.

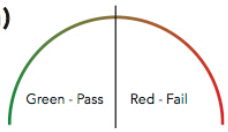
FlexibilityRx™

SquatRx Personal Flexibility Assessment

This example of a **PFA** is specific to the squat which is a starting point and great movement to test changes in flexibility. After performing the assessments in this guide, apply the stretches found in the **SquatRx** and **Core-Four** handouts. Then re-assess your flexibility so that you have the confidence and flexibility needed to **PR** in your workout. The Active ROM (Range of Motion) Assessment is based on a pass (green) or fail (red) range of motion – if you pass the AROM move on to another area until you find what is limiting your squat. You can still use the Stretch and Squat Assessments (which are more subjective), noting how you feel during the stretches and how your squat changes afterwards. Passive ROM is not included – the emphasis here is on self-assessment.

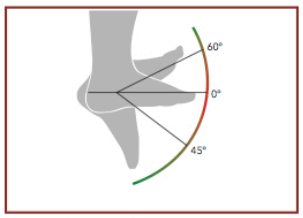
Four Ways of Assessing Flexibility (See if you **'PASS'**)
Passive (someone else moves you through a ROM)
Active (you move through a ROM)
Stretch (note how you feel as you stretch aside from ROM)
Squat (use movement to note any restrictions)

AROM (Active Range of Motion) Graphic Key

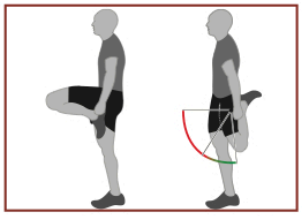


Active Range of Motion Assessment

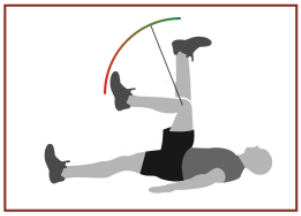
Begin by assessing AROM on both sides. The stretches correlated with each AROM are listed below – which stretch to apply if you fail. Keep in mind that you want to stretch in terms of fascia (in different planes of movement to address all the fiber directions) not just in terms of muscles.



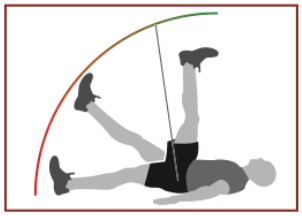
Ankle Up/Down L__R__
(Lower Leg Routine)



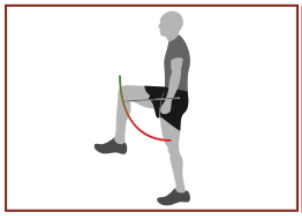
Knee Flexion L__R__(Quads)
Keep heel to butt and
leg straight inline with hip.



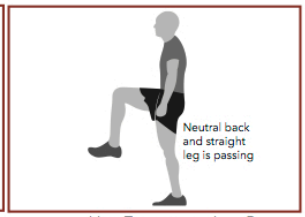
Knee Extension L__R__
(Calves, Hamstrings)



Straight Leg Raise L__R__
(Glutes,Hamstrings,JointCapsule.)
Avoid arching back.

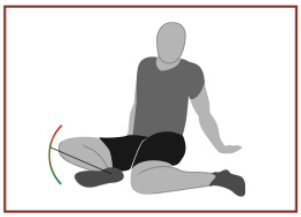


Hip Flexion L__R__
(Glutes, Hamstrings)
With neutral back assess
bent knee leg.



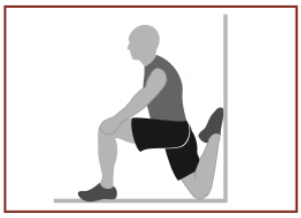
Hip Extension L__R__
(Psoas, Quads)
With Neutral back
assess standing leg

Hip Internal Rotation L__R__
(Joint Capsule)
Does left knee touch floor?



Hip External Rotation L__R__
(Joint Capsule)
Does right lowerleg touch floor?

Stretch Assessment

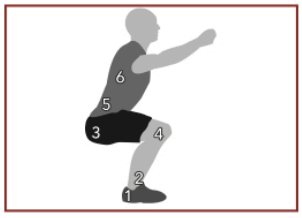


After doing active ROM, use the stretch itself to notice any tightness – there may be a quality difference to your squat that you feel after stretching – even if the ROM is the same. Use the stretch and squat assessments along with the active ROM.

1.Use stretches themselves as an additional way to assess your ROM.
2. What is the feel (tightness) or intensity of stretch? – Do you need the stretch?
3. Note side-to-side differences in ROM or tightness. Stretch restricted side longer or more often to address imbalances.
4. Is there pinching or impingement in the ankle, knee, or hip during the stretch? If so, stretch out pinch, re-position stretch and go easy on re-stretch.

Squat Assessment

While it is important to correct movement first through proper cueing, observe the following points while squatting to assess the quality of your movement.



1. Weight on heels? (Lower Leg Routine, Quads, Hamstrings)
2. Ankle/shin restriction? (Lower Leg Routine)
3. Hips below parallel? (Hip Flexors/Extensors, Adductors, Joint Capsule)
4. Ability to push knees out? (Hamstrings, Adductors, Joint Capsule)
5. Maintain lumbar curve? (Hamstring flexibility)
6. Upright torso? (Psoas/Quads)

C: Ten Stretch to Win® Principles
These ten principles (the how, why, where, and when of stretching) are based on clinical research, years of practice, and are the basis for the STW system of flexibility training. All quotes below are from the "Stretch to Win" book.

#1: Synchronize Your Breathing with Your Movement
The answer to the common question, "How long do I hold a stretch" is breathe into it and feel the tissue respond. "Counting puts an arbitrary time constraint on the stretch that competes with the actual release of the restricted tissues – which have their own biological time-clock for responding. Instead of counting, athletes can stretch better by synchronizing their breathing with their movement. In this way, the breath actually assists the stretching movements by easing rather than forcing the athlete into increasing ranges of motion. When you coordinate breathing and stretching in this way, you discover that areas need different amounts of time to release the restrictions to movement. **By synchronizing your movements with proper breathing technique, you will see profound changes on how you move in the gym."**

#2: Tune Your Nervous System to Current Conditions
One of the biggest confusions is with the different styles of stretching (passive, dynamic, ballistic) and when they should be utilized. A warm-up should increase focus and alertness in the mind and body while optimizing oxygen capacity and blood flow. A cool-down should foster relaxation and recovery through the stimulation of the parasympathetic nervous system. Instead of dynamic and static stretching - **Ann and Chris utilize what is called a 'Stretch Wave™' - an undulating stretching movement that is faster pre-workout and slower post-workout. This fast, medium, or slow undulation consists of synchronized breathing and movement in and out of a stretch allows for effective pre-workout stretching and a greater response from the nervous system post-workout.**

#3: Following a Logical Anatomical Order
Another question that needs to be considered is, "What area should I stretch first?" Chris points out that stretching the joint before the deeper muscles surrounding it results in better functional flexibility, "After the joint capsule and shorter, single-joint muscles are made more flexible, the longer, multi-joint muscles may be stretched more effectively as the layers of muscles and connective tissue, from deep to superficial and from short lengths to long lengths, are released in an easy-to-follow form." Doing hip-openers to mobilize the joint-capsule, then stretching the hip flexors first, before the gluts and then hamstrings (bent then straight leg) is an example of this principle.

#4: Make Gains in Your Range of Motion without Pain
One of the major reasons some athletes do no stretch consistently or at all is the tightness, soreness, and lack of change in flexibility often reported after stretching. **Stretching too intensely without breathing and without clear intention often leads to a 'rebound effect of stretching'.** This retightening of the muscle being stretched is a result of a stretch that is too deep or too prolonged causing a 'stretch reflex' in which the muscle re-contracts or spasms to avoid further injury or prevent micro-tearing of the muscle. This can be avoided by understanding that, "After performing a stretch, if you return to the starting position along the same path of movement in which you went down into the stretch, you will re-contract the very muscle fibers that you were trying to release; this will counteract any of the gains you might have made with the stretch itself. Therefore, learning how to return to a neutral starting position without re-tensing the stretched muscles is another crucial key to optimal flexibility and increasing ROM without subsequent pain."

#5: Stretch the Fascia, Not Just the Muscle
While focusing on mobilizing movements and the resulting muscles that are involved in that ROM is a good starting point - stretching one muscle to relieve tightness or soreness does not work. How many CrossFitters commonly complain of chronically tight and sore hamstrings, despite doing daily hamstring stretches? Extremely tight hip flexors, gluteals, deep hip external rotators, as well as tightness of the joint capsule must be addressed. "The condition of the fascia (a specific type of connective tissue in your

body) is just as important as the muscle, if not more so, in terms of gaining more usable flexibility – the condition of the fascia determines the condition of the muscle."

"The reason most stretching programs fail is that they do not address all the factors that limit ROM. The key to gaining optimal flexibility is understanding the three-dimensional structure and function of the body" "In exploring the three-dimensionality of how your body feels and responds under different conditions of stretching, you will get to know how, why, and where the fascia changes when it shortens, lengthens, tightens, or twists during athletic activity."

#6: Use Multiple Planes of Movement

If an athlete has a tighter quadriceps on the right side and stretches both equally – they are merely increasing 'relative flexibility' – the right side will still be tighter perpetuating muscle imbalance. Chris also points out that, "Frequently, the tighter side remains tight even when it is stretched more than the other, looser side. This happens because there is a fascial restriction connected to the tight arm or leg that is perpetuating the flexibility imbalance" **It is important to stretch along multiple angles and planes of movement including components of rotation, diagonals, and traction.**

#7: Target the Entire Joint

Research shows that 47% of flexibility potential is in the joint capsule itself. "The joint capsule is made up of fascia that encapsulates our joints and fuses with the ligaments that connect the bones to each side of the joint. Since the joint and its capsule are located in the deepest part of the fascial planes (lines of connective tissue), the condition of the joint capsule determines the condition of the fascial planes that cross over and connect the joints. **When full ROM in a joint is inhibited, then ROM in the muscle is also restricted, because muscles attach to bones and bones connect to other bones by way of joints."**

#8: Use Traction for Maximal Lengthening

Before moving into a stretch you want to reach out with your arm or leg to create space in the joint. Always straighten the spine and think of creating length as you move into a stretch– "If research shows that almost 50 percent of tightness is within the joint capsule and surrounding ligaments, the first step is to remove this restriction before stretching with traction." "The muscles that are the closest and deepest layers will react to positive or negative changes in the joint capsule – they are innervated by the same nerves that control resting tissue tone or tension as well as the nerves that make the muscles, with their fascia, contract and relax in response to all movements. These muscles are shorter in length and anatomically and functionally closer to the joint capsule than the muscles that cross two or more joints; when released, therefore, they pave the way for the longer muscles to release faster and more efficiently."

#9: Facilitate Body Reflexes for Optimal Results (PNF)

A great way to begin stretching a tight or painful area is to utilize the 'Stretch Wave™'. Once you are able to move deeper into the stretch the concept of PNF (muscle contraction/relaxation) can be added to the progression. "Research in sport science and other disciplines repeatedly demonstrates that stretching using specific proprioceptive neuromuscular facilitation (PNF) techniques yields the most gains in range of motion in the shortest amount of time. Our version of this technique (undulating, low intensity PNF) employs well-known neurological reflexes that enable the body to take advantage of windows of opportunity in getting more range of motion and longer-lasting flexibility from stretching than would otherwise be possible."

What is PNF?

PNF stretching consists of first inhaling and gently contracting the area being stretched against resistance for 3-5 seconds, before exhaling and releasing the contraction to move a few inches deeper into the stretch. To use a hamstring stretch as an example, picture yourself lying on your back – with your left leg straightened on the floor. With a band hooked around your right foot begin by lifting your straight right leg off the floor until you experience a good stretch maybe at 65° (full ROM would be the leg at a 90° angle to the torso). Using the band as resistance you would inhale and gently push the leg down to the floor using the band as resistance to hold it in place. After the 3-5 second contraction you would exhale and release the contraction before pulling the leg closer to 90°. Now the 'Stretch Wave™' can be applied focusing on moving in and out of the stretch without releasing it completely. Repeat the PNF (contract-relax) 3-5x moving a few inches further towards 90° every time.

#10: Adjust Your Stretching to Your Present Goals

"Three factors to consider when designing any training program are intensity, duration, and frequency of each component of the program. Determining the intensity of a stretch means knowing how far into the range of motion you can easily and safely go for the maximal effect. Duration refers to how long you hold the stretch to get the most gain in flexibility per stretch. Frequency means how often you must repeat the stretch sequences at one time or another over the course of the day to get optimal results specific to the task at hand." This concept applies to the difference between pre-WOD stretching and stretching based on your own 'Personal Flexibility Plan".

"In summary, the way to get maximal lengthening of tight tissue is to traction and stretch with undulation all the tissue along a fascial track – joint capsule, ligament, tendon, muscle – without pain. Move from the deep to the superficial layers, from myofascia that crosses one joint to that that crosses multiple joints, and then add multiple planes of movement as dictated by a synchronized breath and a properly tuned nervous system suited to the current conditions."

V: Stretch Routines & Practical Applications

A: 'FLOW'ing' into a Stretch

A simple way of applying the theory behind the Stretch to Win principles is to use my 'FLOW' method. FLOW stands for Focus, Lengthen, Observe, and Wave. When moving into any stretch FOCUS on your **breathing** and stretching **tempo** in relationship to your **goals**. Your goals are the 'Why' you are stretching (warming up or cooling down) and the 'Where' you are stretching (order and sequence based on the flexibility demands of the workout). When moving into any stretch, LENGTHEN your spine, as well reach out through the arm or leg being stretched to **create space in the joint** capsule. OBSERVE the initial **resistance** (R1) before opening deeper into the stretch **without pain**. To target all the muscle fibers, WAVE in and out of the stretch in **different directions** each time, exiting the stretch in a different direction than you entered it to **avoid a re-tightening** of the muscle.

Finesse not Force – Understanding R1

The first response of resistance to a stretch is called Resistance 1 or simply, R1. The concept of R1 applies to both assisted and self-stretching (passive and active stretching). It takes sensitivity to feel this first barrier of resistance to a stretch – which is where the stretch should begin. Going too deeply into a stretch causes pain and muscle tightening which is counterproductive. R1 can be felt during a stretch by noticing where your range of motion is initially limited - whether it is at the beginning or end of your range of motion. Finding R1 allows you to gauge how quickly you should enter a stretch and then allows you to gradually apply the Stretch Wave™. When 'FLOW'ing into a stretch – FOCUS on your breathing and tempo, LENGTHEN out through the joint, and then OBSERVE R1 to avoid pain, before applying the WAVE in and out of the stretch as it deepens.

B: 'The Core-Four Stretch Matrix'

The four stretches found in the guide below are foundational to all athletic performance due to their ability to limit hip movement. The 'Core-Four' stretches are essential pre-workout and the starting point for a more personalized sport-specific stretching program.

C: SquatRx Stretch Routine

The squat is the most revealing movement in terms of lower body flexibility. Overhead movements like the clean, snatch, and over-head squat all require a flexible lower body as a foundation. The SquatRx is a routine I have devised working at CrossFit Scottsdale to quickly assess flexibility limitations and provide a stretching template to quickly improve the squat.

D: 'Personal Flexibility Plan'

The PFA reveals your ROM limitations - which are the result of your posture at work, old injuries, and connective tissue patterning. Addressing those restrictions as well as stretching for the workout of the day lays a solid foundation for a self-stretching protocol. The 'PFP' is the resulting application of

Stretch to Win® Matrix

Core Four Lower Body Stretches

1 Hip Flexors

1. Lunge Position

2. Arm Reaches Up

3. Side Bend

4. Trunk Rotation

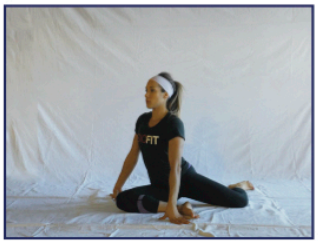
1. Begin in a lunge position with the left leg back. Keep your chest lifted up as you press your left hip forward. Take a deep breath and exhale as you wave into the stretch. Release the stretch slightly on the next inhale and repeat wave into the stretch on the exhale again. Repeat the stretch wave as many times as necessary synchronizing your breath with movement until you feel the tissue release.

2. Reach your left arm up as you continue pressing left hip forward. Again exhale into the stretch wave as you reach your hand upward and lift your torso and arch back slightly. Inhale as you release the stretch position.

3. Lean your body over to the right side and push left hip out slightly as you exhale into stretch and inhale on release.

4. Rotate your torso by turning your chest upward. Reach left hand up and turn palm to ceiling. Play with the angles of your arm as you exhale. Repeat until you feel all the tissues are moving freely.

2 Glutes



1. Beginning Position

2. Lengthen Into Stretch

1. Take a comfortable seated position with the right leg forward. Slightly shift weight to side of right hip and adjust back left leg to a comfortable position, avoiding any pitching sensation in front of that hip.

2. Lengthen your torso out from the top of your head as you exhale and move forward into stretch keeping length in the spine.

Slowly roll–up through spine into beginning position. Repeat stretch–taking torso forward over front knee at different angles targeting the different glute fibers

.

Continue using your breath to wave into and out of the stretch until you feel your tissue release. Drop your body down closer to floor and move from side to side.

3 QL

Drop Onto Right Arm

From the last position drop your right forearm to floor behind you and lower body down toward floor while lengthening your torso as you exhale.

Press your left hand into the floor and gently twist looking behind to your right as you exhale to open up QL and lateral hip.

4 Lats

Reach Arm Overhead

Inhale from last position and exhale as you reach your left arm overhead extending the arm out from the hip.

Rotate torso to your left lifting chest to the ceiling as you exhale and continue reaching hand outward with your palm up toward the ceiling.

"Static stretching before activity - makes you weaker and slower. Doing the StretchWave ™ - makes you Stronger and Faster - safely, in less time."

- Chris Frederick

FlexibilityRx™

SquatRx Stretch Routine

Use this stretch routine after filling out the **SquatRx PFA**. After applying the stretches in this routine, re-assess flexibility. Remember to breathe with your movement in and out of stretches. Also, remember to stretch in terms of fascia (connective tissue) not just muscles – moving in and out of the stretches in different directions targets the different fiber directions.

Understanding How to 'FLOW'
F: **Focus** on **Breathing** and **Tempo** in relation to **Goals**
L: **Lengthen** out from the joint creating space
O: **Observe** initial **Resistance** and stretch **Without Pain**
W: **Wave** in/out of stretch exploring **Different Directions**

Lower Leg Routine (Foot/Ankle Flexibility)

1. Ball Under Foot

2. Front Of Shin

3. Calves

1. Maintaining downward pressure slowly knead ball from heel to front of foot through middle arch. Repeat along inner/outer arch..
2: From kneeling position, lean back onto hands with towel under foot (pictured). Keeping the top of the R foot resting on the towel/floor, gently rock the R knee up/down. To increase stretch, lift the R knee higher off the floor.
3: To stretch the R calf (gastroc) take a light lunge and press the hips forward while keeping the R leg straight – with R heel on floor. Wave in/out of stretch (bringing hips forward/back). Rotate hips L and R targeting inner/outer calf. Repeat with R leg slightly bend to target soleus.

Hip Flexors (Psoas/Quads) & Hip Extensors (Glutes/Hamstrings)

4. Psoas/Quad

5. Quad /Abdominal

6. Glute/Lateral Hamstring

7. Hamstring Straight Leg

4: Target R psoas (front of hip) by twisting torso to L (away from back leg). For quads pull foot closer to hips and drop onto L forearm. Wave in/out of stretch by twisting L into stretch and back R - deepening stretch each time.

5: Begin lunging with R foot against wall. Wave hips forward/back slowly to begin stretch. To increase intensity move knee back closer to wall (pictured) so that the R lower leg is more vertical and R foot closer to hips. Next wave hips forward-back slowly before arching chest up to include abdominals.

6: For glute stretch place front R leg at 90° – shift weight to R hip and lengthen torso while moving down to floor. For hamstring stretch (pictured) take angle of front R leg past 90°. First stretch bent leg gradually sliding foot foward until leg is fully extended.

7: Lie on your back with L leg straightened. With a band around the R foot straighten then raise the R leg lifting it towards the ceiling. Slowly increase the stretch as you gently push the leg up and out of the joint.

Adductors and Joint Capsule

8. Adductor Short

9. Adductor Long

10. Internal Rotation

11. External Rotation

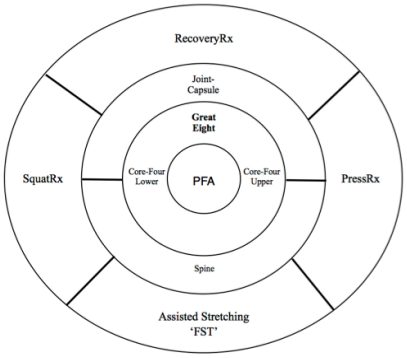
8: From kneeling side lunge take hips towards R knee until you feel a stretch in the R inner groin. Adjust R foot position as needed to feel stretch in different adductor fibers.

9: From previous side lunge, slide your R foot out until R leg is straight. Lean the torso forward waving hips forward/back. To increase stretch – slide the R heel further out.

10: From seated position (pictured), lift your R hip up slightly while bringing your R knee across to touch floor. Next lift the L hip and touch L knee to the floor. Stretch will be felt on outer hip. Drop back onto elbows and repeat.

11: To stretch R hip begin as pictured with back L knee blocking R foot (keeping R hip in external rotation). Center weight over R knee while dropping onto forearms. Push back through R hip while twisting torso to left.

stretches in response to what was revealed in the PFA. As Chris emphasizes, **"Instead of a generic stretching program, you can have a refined flexibility training program that will be much more responsive to your individual needs as they change over time."** It is important to begin with one simple goal. My 'PFA' revealed that my quads are tight – I will try the quad wall stretch and see if my squat improves is much better than – everything's tight or it hurts all over.



It is important to be aware of the 'Why and When' of stretching so that you can figure out the 'Where and How'. The stretches and intentions for stretching based on your PFA - are related to - but different than the intentions for stretching before a workout. Your PFA tells you where you are normally tight; while the workout imposes specific flexibility demands that you can integrate into your PFA. This is where the concept of sport-specificity applies – in your case this means noting where your restrictions are not only in relation to normal range of motion, but to the demands of your sport, in this case CrossFit. This is a subtle distinction between obtaining overall flexibility for good health and fitness and chasing elite performance. Many CrossFitters simply desire enough flexibility to CrossFit without any problems caused by a lack of ROM. Competitors in the sport of CrossFit will want to utilize the PFA in a more precise way.

E: Pre-Workout Stretching

For the general CrossFit population, stretching can be simplified by utilizing the 'Core-Four' pre-workout, which generally takes less than five minutes. Assessing 2-3 areas that need to be flexible for the workout is great but can add an element of complexity for the average gym member that does not have a coach to guide them. **Warming-up with the 'Core-Four Stretch Matrix' releases the body's core group of muscles and fascia that are most important for athletes.** Once members learn the 'Core-Four' routine the concept of the "Great Eight" can be applied – which is the addition of four upper body stretches: pec-minor, levator scapula, rhomboids, and the rotator cuff. The 'Core-Four' stretches are mainly lower body – hip flexor (psoas), gluts, and the quadratus lumborum, but also include the lat muscles, which connect the hip to the arm on both sides of the body. Flexibility in the lats is essential for CrossFit (pullups, front-rack overhead squats). After stretching the lats the 'Core-Four' upper stretches can be added to complete, the "Great Eight" which are the basis of the two-day Fascial Stretch Therapy Essentials™ course. Lower body flexibility is essential to the squat, which is why this article focuses mainly on lower body stretch routines as a starting point – 'Core-Four' and 'SquatRx'.

<u>VI: The Stretch to Win System® Part 2 – Assisted Stretching</u>

A: What Happens in a FST™ Session?

After going through an assessment and laying your back on the table you will be instructed to slide one leg under a set of straps that immobilizes the leg not being stretched. You would then be instructed to tune your breathing with the movements of the therapist so that you are working with them – not against their resistance. Sessions are individualized but often start with the lower body by freeing up the hip. The initial focus is on the joint capsule itself and the surrounding muscles and fascia. The therapist would then begin to talk "TOC" to the tissue using traction, oscillation, and circumduction allowing for deeper gains in range of motion. The therapist gently 'dances' the leg in different non-linear directions noting restrictions -building trust – or as Ann Frederick describes it, "romancing the nervous system". Someone that has had a bad experience being stretched – tightening up in response to pain – will be amazed at the quick changes in ROM without pain.

The low-back, hamstrings, gluts, deep lateral rotators, and adductors are stretched first with a bent, then straight leg before turning onto your side for stretching of the hip flexors (quads and psoas). Undulating movements - rather than passive stretches -are applied by the therapist moving your leg in and out of the stretch at different angles. Once the deeper restrictions are freed and ROM improves, PNF is applied to tight areas to increase maximal range. After switching legs muscles of the lower leg are then stretched, before the therapist begins the upper body stretching. In my assessment if I find that one of the quads is tighter I will apply FST differently to that leg, each area is given specific attention.

During shorter sessions (pre-workout stretching) I will first have CrossFitters squat – then stretch an area of restriction before having them get up and retest. Sometimes the movement will improve and reveal a second area to be addressed – I will continue to piece the puzzle together until a full squat is achieved. Common observations include, "I feel lighter", "I can stay grounded on my heels", "My shin/ankle flexibility has improved", and "The pull I felt in my hips is gone". **After just 15 minutes of FST, CrossFitters report profound changes in flexibility.**

B: Benefits of Fascial Stretch Therapy™

Working out with members I see firsthand how flexibility limitations compromise good movement positions and how problems can either be corrected through CrossFit or amplified. Knees tracking forward in the squat and limited shoulder internal rotation in the clean are common problems. Athletes then report more soreness from workouts, slower recovery time, and HOT areas – shoulder impingement, knee or low-back pain. By eliminating stress on the joints and the surrounding ligaments, injury is prevented. In the lower body, chronic foot, shin, knee, hip, and low back pain all benefit. Trunk rotation, scapular position, and arm flexibility also improve. Hip and shoulder impingement and the resulting nerve pain are eliminated. As I mentioned in my previous article, chronic injuries, pain, and problems are all primarily a result of connective tissue dysfunction, **"The literal layers of anatomical structure are located in regions of the body—joint capsules and fascia—that have traditionally not been fully addressed in other stretching and flexibility training programs." – Chris Frederick**

C: Current Integration of FST with CrossFit

Gym owners and trainers can develop their own flexibility program by modeling what I have done at CrossFit Scottsdale. Affiliates that do not have FST practitioners working in or with the gym can utilize the 'PFA' to screen members, the 'Core-Four', 'SquatRx', and STW book. In Toronto Kevin Darby (Darby Training Systems) works with Reebok CrossFit Liberty Village programming flexibility training into Olympic lifting workouts. In Langley (Vancouver) Paul Turner (Three Peaks Kinesiology), Travis Braich and Tom Turner work with multiple CrossFit affiliates screening gym members. In New Jersey Artie Kreutzer co-owner of CrossFit 201 provides FST for members. FST practitioner Jeffrey Kong in Michigan is building relationships with Plymouth, Hines Park, and Ann Arbor CrossFit. FST Practioner Kris Fiser works with CrossFit Soco and RedRocks CrossFit in Colorado Springs, Colorado. Lastly Cori Safe and Craig Peugh (coaches at Windy City CrossFit) are integrating their FST training into their Chicago box.

CrossFit Scottsdale Flexibility Program

At CFS new members are taken through a baseline flexibility assessment as part of an introductory session that includes assessment/goal-setting, assisted stretching and instruction on the 'Core-Four'. The PFA enables me to identify problems that are communicated to the trainers at the gym and to the member for his/her own stretching program. The STW book is available for purchase so that members have the support they need. In the coaches training program I teach the 'Core-Four' stretches and the ten stretching principles. I discuss assessment strategies the coaches can use if they see movements that increase the potential for injury. Lastly I put on stretching workshops focused on my 'PR-Formula' and

'FLOW' method of stretching. The integration of flexibility screening, pre-workout stretching, paid sessions, and workshops, greatly reduces the likelihood of future injuries, resolves old injuries, and allows members to continue to progress in their fitness levels.

VII: Flexibility for CrossFit

Flexibility along with endurance, stamina, strength, power, speed, coordination, agility, balance, and accuracy takes time to develop. But quick changes are possible with the right dose - the right kind of flexibility training. While there are hundreds of stretches and dozens of variations of each stretch, focusing on fundamentals is key.

Studying flexibility with Ann and Chris Frederick I am constantly reminded of Greg Glassman's own philosophy, "If you insist on basics, really insist on them, your clients will immediately recognize that you are a master trainer. They will not be bored; they will be awed. I promise this. They will quickly come to recognize the potency of fundamentals. They will also advance in every measurable way past those not blessed to have a teacher so grounded and committed to basics." The ten STW principles, the "Core-Four', the 'Personal Flexibility Assessment' are the fundamentals, all of which can be applied to CrossFit in a observable, measurable, repeatable way.

Being a student of Chris Frederick has been a rich and rewarding experience. I have come to realize that flexibility is more than just range of motion. The true essence of flexibility is revealed in its relation to qualities like strength. Flexibility without strength is weak, strength without flexibility is rigid. Optimal strength development requires a master of adaptation to challenging demands.

Flexibility is the personal expression of how someone responds to adversity. Those who overcome the stressors found in and outside the gym – become strong – developing strength through flexibility. When the yin of flexibility and the yang of strength are harmonized an athlete will display not only power, but grace. Strong but yielding, adaptable yet rooted – when strength and flexibility are both cultivated in the gym a person's fitness, emotional well-being, and personal growth will reach new potentials.
My journey from coaching CrossFit to working as a SI and FST practitioner exclusively with CrossFitters has lead me to arrive at the following conclusion: If you want to 'PR' in your workouts you need to stretch. You need the flexibility training that will deliver CrossFit in its full dose – as prescribed. In other words, you need FlexibilityRx.

More Free Assessments & Stretch Routines

CrossFitters that are interested in utilizing and testing out additional flexibility assessments and stretch routines (For Free) can visit www.FlexibilityRx.com. As I refine my adaptation of Chris' system for CrossFit - all I request is honest feedback about how you are hitting PR's!!

Chris Frederick
Chris is a physical therapist, KMI Structural Integrator and co-Director with his wife Ann of the Stretch to Win Institute, which offers training and certification in Fascial Stretch Therapy (FST). He is author of the book "Stretch to Win" and has written numerous articles on stretching and flexibility training for fitness and scientific journals. Contact Chris at chris@stretchtowin.com (www.StretchToWin.com).

Kevin J. Kula
Kevin is the Director of the CrossFit Scottsdale Flexibility Program and holds Five CrossFit Coaching Certifications. Kevin studied with the top stretching, joint mobility, and manual therapists in the world - Chris Frederick (*Stretch to Win*), Structural Integrator Tom Myers, and CrossFit Mobility Expert Kelly Starrett. Kevin is a Serial Entrepreneur, Author, Marketer, Teacher (*Stretch to Win*) and Business Owner (*Ready State Fitness*). Kevin has written two articles for the CrossFit Journal, "***Moving Beyond Muscle***" and "***MbM p2: Flexibility Training for CrossFit***". In 2013 Kevin is publishing a book based around his system of Flexibility Training for CrossFit and is launching a Digital Magazine, "***FlexibilityRx™***" - initiating a conversation with the top strength and conditioning experts about the interplay of Flexibility and Strength. Contact Kevin at Kevin@FlexibilityRx.com (www.FlexibilityRx.com).