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The information in this manual is offered for educational purposes only. The reader should be cautioned that there is an inherent risk assumed by the participant with any form of physical activity. With this in mind, those participating in strength and conditioning programs should check with their physician prior to initiating such activities. Anyone participating in these activities should understand that such training and stretching initiatives may be dangerous if performed incorrectly. The author assumes no liability for injury; this is purely an educational manual to guide those already proficient with the demands of such programming.

### **Band Stretching for Baseball**

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## Real World Flexibility

As a young athlete I never considered flexibility a significant key to better performance. However as a 40+ adult it has become the primary reason I remain competitive in high level recreational athletics and continue to train at high levels.

In doing this project my goals were to....

1. Provide baseball coaches, athletes, and parents the guidelines for what is by far the most effect stretching routine I have every implemented personally and with my athletes.
2. Provide a time efficient and cost effective stretching routine that follows the laws of functional flexibility
3. Create a better understanding of the role of flexibility as it relates to function and specifically baseball.

If you step onto a baseball field before practice or a game and watch the warm-up you will probably see athletes...

- Immediately doing some easy running
- Doing a few arm swings while they put the glove on
- Performing a shoulder stretch that looks more like a game of twister
- A hamstring stretch that is nothing but a compensation of the low back
- A standing quadricep stretch that looks like a 1 legged balancing act

As a physical therapist, it is not what I would classify as a highly productive stretching routine.

It is evident that our baseball athletes give flexibility the same level of respect as I did as a young athlete and as our present society does in general.

The fact is flexibility gets no respect and I know because until age 35 I was just as guilty as anyone.

Flexibility is our way of building a functional **"Margin of Error"** into our daily function routine. Awkward movements will happen in baseball. Baseball players will have to over reach, sprint on demand, over stretch for a ball and have to land awkwardly during a game.

The simple fact is, if their body has the ability to lengthen further than what daily or athletic demand dictates, they will always have a "margin of error" to work with, just in case their body decides for a split second to go beyond the normal routine movements.

# Understanding Flexibility as it Relates to Functional Movement and Baseball

The emphasis on developing strength and cardiovascular conditioning in baseball is often provided far more attention than the area of dynamic flexibility. Yet when you look at the ballistic nature of baseball, this probably should be switched around.

Flexibility training has long been looked upon as that necessary evil a coach or athlete felt compelled to do prior to practice or an athletic event. Remember those painful, contortionistic positions that were suppose to warm you up and prepare you for competition while helping prevent injury; well there are better and more productive ways to lengthen out the body besides the traditional static stretching which is definitely no longer the answer.

Flexibility is often misunderstood simply because the term “flexibility” is misused and not well understood.

## Let's define flexibility

Anatomical Range of Motion is defined as the range of motion (ROM) available to a particular joint

Functional Range of Motion is the ROM of a particular joint that an individual optimally needs to perform efficient movement through that joint

Traditional Flexibility is the maximum length a muscle can be **passively** lengthen to without being influence from gravity, momentum or ground reaction forces

Dynamic flexibility is the maximum length a muscle can **actively** lengthen spontaneously in all 3 planes of motion as a result of being driven by gravity, momentum and ground reaction forces

Instability is excessive ROM at a particular joint that is not neuromuscularly controlled and creates excessive stress to joint soft tissue. This often can lead to probable injury.

Traditional flexibility training is often characterized by long duration holds performed in non-functional positions that do not replicate normal movement patterns or require a need for actively stabilize.

Research has shown that static stretching may not be the best form of stretching as it relates to pre-training or pre-competition preparation due to inhibiting or decreasing the level of excitement to the Central nervous system (CNS). In fact it may be predisposing our athletes to injury even more because of this CNS inhibiting effect. Obviously, the last thing a baseball athlete wants before a game or practice is a slow reacting CNS.

With dynamic resistance band stretching, long holds are replaced with progressive overpressure stretching performed in a controlled highly active contract and relax manner.

Dynamic band stretching maximizes muscle length by challenging the athlete to contract against a resistance (the band) or by creating an accommodating force that takes muscles and related joint soft tissues further into a range of motion.

*To get better flexibility...You must go where you can't not where you can!!*

## **Understanding the Facts of Functional movement**

Functionally if an athlete cannot neuromuscularly lengthen, they are not able to optimally load, which in turn means they are not going to produce the force needed to explode on demand. Baseball is all about "loading to explode" when it comes to throwing and swinging.

To best understand the theory behind *Band Stretching*, you must understand how resistance band stretching mimics several characteristics of "real world" functional movement.

### **Fact 1**

*Functional movement is driven by momentum, gravity and ground reaction forces not by conscious thought*

Momentum, gravity and ground reaction forces cause the body to lengthen out quickly and ballistically on demand. There are very few examples in real life or baseball where an isolated joint is slowly taken into a lengthened position and then held there for an extended period of time. Yet this is exactly what occurs with static stretching.

On the contrary, band stretching is performed using active rhythmical movements, done in multiple planes of motion while an accommodating overpressure is being applied. This is obviously much closer to what really happens in life and baseball.

The action of pressing against the band not only actively stretches muscles but, in many ways, simulates the ground reaction forces being transferred through the lower chain while the over pressure of the band represents momentum taking us beyond normal range of motion.

Baseball by far is a sport that requires unpredictable range of motion when considering the demands placed on the body as it relates to running down a fly ball, swinging a bat, fielding a ball deep in the hole or having to jump to catch a line drive.

## **Fact 2**

*Functional movement requires stability with mobility to achieve optimal movement efficiency and performance*

In order to safely move into extended lengths or ranges of motion the body will require stability in those ranges of motion. Motion that is not controlled is classified as “hypermobility” and is a recipe for injury. Athletes must be able to go into joint ranges of motion with effective muscle control.

This is why band stretching, which uses an active contraction to lengthen muscles, is superior to traditional static stretching. The active contraction against the band actually lengthens and stabilizes at the same time while still providing a passive over pressure. As a result the body is training to lengthen and strengthen simultaneously which is a perfect combination for all athletes, but especially baseball players.

## **Fact 3**

*Compensation often occurs as a result of contralateral or opposite side deficiencies*

Muscles do not lengthen in isolation but rather lengthen as an integrated unit. The right lower extremity can easily compensate for left side deficits and visa versa. In baseball very often a limitation in the left hip leads to poor right side throwing mechanics. As a result an effective flexibility program must incorporate a total kinetic chain response.

Band stretching creates stabilization with mobilization by actively incorporating the total body in the exercise.

With band stretching, contralateral (or opposite side) stabilization is used to enhance stretch side lengthening. This contralateral action creates greater active lengthening of the exercise side.

#### **Fact 4**

##### *The body functions as a total chain reaction*

Upper and lower extremities can both be flexibility drivers of the body. As a result stretching must incorporate active contractions of both the upper and lower extremities to create optimal lengthening.

Band stretching requires total body involvement by actively integrating both upper and lower extremities during each repetition.

*“There is nothing isolated about playing baseball”*

#### **Fact 5**

*The role of the low back is to provide stability and a small degree of mobility...  
Not the other way around*

The low back provides the kinetic chain with about 10% of the total movement needed to do most functional activities. Therefore, its primary function is geared more towards dynamic stability rather than mobility. However, due to a relatively rigid thoracic spine and often seen inflexible hip joints, the low back is caught in the middle with nowhere to hide. As a result, the low back becomes the primary area for movement which is not a healthy functional strategy. This is probably why 95% of the population (baseball included) will experience low back pain and injury sometime in their lifetime or career.

Interestingly most flexibility training promotes the low back to be aggressively lengthened which results in “hypermobility” rather than functional flexibility. Hypermobility in a low back that is being asked to take part in explosively swing a bat, repeatedly throw a ball or sprint on demand, is not a health long term situation.

Effective lengthening of the ankles, hips, and thoracic spine will only result from effective stabilization of the lumbar spine during the actual stretching exercise.

Do to the integrated nature and staggered postures used with resistance band stretching, the inner core or lower abdominals reflexively become a highly active stabilizer of the lumbar spine on every stretch.

### **Fact 6**

*Muscles are elastic and multi-planer creatures that need lengthened accordingly*

Muscles and to lesser extent ligaments and tendons are elastic which means they can gradually accommodate and lengthen. Stretching with a rigid strap or having a partner forcefully lengthen out soft tissues does not allow for an optimal accommodated lengthening.

Resistance bands allow for gradual accommodation to occur due to their elastic “muscle like” construction. As muscle tension lessens, resistance bands take up the “slack” gradually therefore decreasing the reflex inhibition seen with other forms of assisted stretching. Muscles do not want to be forced into a range motion and subsequently respond much better to a slow active lengthening.

Also due to the positions used during the band stretching routines, muscles can easily be taken into all 3 planes of motion. This is important because tightness in one plane it will automatically inhibit lengthening in the other 2 planes. This in turn can lead to hypermobility in one plane if all planes are not being actively challenged.

# **What Creates Inflexibility and Lose of Joint Range of Motion**

Movement is complex and therefore attempting to identify “why” muscle and joint related soft tissues become restricted also can be somewhat complex. Unfortunately stretching is not always the answer and at times can be contradictory to improving functional flexibility and mobility.

Keep in mind that muscles are not just attached to tendons but can be influenced by nerve, fascia and ligamentous soft tissue as well. Even though they are all characterized as soft tissues, how each of these tissues responds to stretching can be significantly different.

**Muscle Inflexibility or soft tissue stiffness can occur in as:**

## 1. Structural Stiffness

With structural stiffness the muscle and surrounding soft tissues simply are stiff and lack passive elasticity. This type of inflexibility responds very well to dynamic resistance band stretching. The band's passive overpressure in conjunction with an active muscle lengthening will create an optimal lengthening response.

## 2. Neurotension Tightness

Neurotension restrictions occur as a result of nerve tissue being restricted and not sliding well within the neurotube. This inflexibility is very prevalent and often is confused with structural inflexibility. However addressed with static long hold stretching the nerve tissue will become aggravated quickly which is why traditional stretching does not work well and why band stretching's repeated contraction are far more successful at resolving this type of inflexibility

Rhythmical movement that causes the nerve to glide into and out of the restricted barrier is the best way to address this form of tightness without irritating the nerve tissue.

## 3. Poor neuromuscular control, balance and stabilization

Neuromuscular control or balance deficits can quickly lead to poor active and passive lengthening. If an individual is not able to stabilize or balance (maintaining their center of gravity over their base of support) themselves as they reach or lunge, they will reflexively avoid going into those ranges of movement. If they never enter into those ranges they eventually lose that lengthening

capability by becoming structurally tight. This is often the case in our aging population or our middle school athletes that are quickly being asked to grow into their body.

Secondly, if neuromuscular control and stabilization are deficient, individuals will decrease speed or decelerate earlier to decrease momentum in hopes of avoiding injury. This results in decrease performance as it relates to higher speed activities like running, swinging a bat, or throwing in baseball.

Addressing this form of flexibility is best done by performing simple active-assisted band drills where the band assists at controlling deceleration forces associated with momentum, gravity and ground reaction.

#### 4. Myofascial barriers

Myofascial tightness can also create inflexibility. The facial covering that surrounds all muscles can become stiff and restricted with long term exercise. Due to the crisscross construction of fascia, it does not respond to active or passive lengthening but instead response far better to compression with mild lengthening.

Myofascial inflexibility will block improvement of type 1 and type 2 inflexibility scenarios discussed above and will not respond well to band stretching. Therefore performing mobilization of fascia by using foam rolls will need to be done first to lengthen out facial restrictions before allowing athletes to effectively institute a band flexibility program.

#### Summary

Obviously, inflexibility can be a combination, and often is a result of all 4 scenarios. Band stretching performed on a daily basis will effectively address 3 of the 4 scenarios which make up what is probably at least 80% of all inflexibility deficits.

## Ways to increase Flexibility

There are essentially 3 ways to length out soft tissue.

1. Passively
2. Actively
3. Active-Assisted

**Passive lengthening** requires some form of manufactured over pressure force. When the overpressure force exceeds the soft tissue barriers, tissues are gradually taken into a greater length with repeated stretching. Initially the length achieved will be more of an “elastic” change which means over time the tissues will return back to their original length. However performed repeated on a daily bases, tissue will eventually develop “plastic” changes and will begin to remain at a more permanent lengthened state.

**Active lengthening** is a result of agonist (assisting) muscles contracting and causing opposing or antagonistic muscles to be lengthened. Active lengthening can also occur when the drivers of function (gravity, momentum and ground reaction forces) create dynamic lengthening. This form of lengthening is greatly influenced by how much neuromuscular stability and muscle strength is available. If either strength or neuromuscular stability are lacking, the body will be inhibited from moving into a greater functional range of motion. Muscles that over time are not asked to reach, lunge, rotate, or actively lengthen outside their center of gravity will tighten to the point where the muscles are no longer strong enough to push through the soft tissue stiffness. In this case, now the soft tissue barrier has exceeded the active strength of the opposing muscles and creates a passive lengthening issue.

**Active-Assisted lengthening** occurs when an external influence, like a band, helps assist with stabilizing the body so active movements that are outside the center of gravity and will actively length the body can be performed.

Resistance bands can easily function as an assistive device when actively training functional movements like lunges, crawling, squatting, or reaching. Bands can actually help slow down momentum and effectively reduce gravity which in turn allows the body to exaggerate movement patterns.

## **Band Flexibility Training for Youth**

By no means is this manual going to attempt to embark on all the variables that influence pre-adolescent flexibility. Instead I hope to provide you with guidelines based on experience and theories of how to utilize bands as a means of assisting with improving flexibility in the pre-adolescent athlete and specifically baseball.

It has been shown by research that as we age, reflex responses slow down. As a young person between the ages 10-15, reflex response time is fast. As a result of this neuromuscular hypersensitivity, young people typically do not tolerate aggressive passive overpressure stretching with resistance bands.

As a child matures, neuromuscular control increases, and reflex response time decreases. This change in development and improved reflex control opens up the door for young athletes to begin using resistance bands as a dynamic stretching tool. This change in development appears to occur at or around the age of 13 to 16 years of age.

Keep in mind that accelerated bone growth in our youth often exceeds and stresses muscle length until normal soft tissue length is reestablished. Growth spurts, for boys especially, can occur throughout middle school and the early high school years. As young individuals progress through these very radical changes neuromuscular control will be greatly altered and the ability to effectively control the band for stretching is also decreased. Therefore, early on, active or active-assisted training may be a more effective option for improving flexibility rather than going through the passive overpressure band stretching series of exercises.

### **Guidelines for Youth Band Flexibility Training**

Below are some simple guidelines to assist with implementing a safe and effective band stretching program as part of a young athlete conditioning program.

1. Avoid incorporating any band overpressure stretching until a young athlete can demonstrate optimal body control reaching as they perform movements of squatting, lunging, and crawling. These movements done correctly with optimal control, with or without band assistance, appear to be a better way to develop functional flexibility during the pre-adolescence years.
2. Implementing an active or active-assisted band program initially with young athletes will create better body control and stabilization. These are key factors in development that must occur before an effective overpressure band stretching program can be successfully implemented.

3. Always begin band stretching with a small red band and progress to the locked out posture before moving into a higher level resistance band. Young athletes need to be able to feel they can dominate the band, as opposed to having the band dominate them, to be successful.
4. Emphasis should be on rhythm and control initially with band stretching exercises. Muscles will inhibit movement and not allow optimal lengthening to occur if poor neurological control and too much speed are demonstrated.
5. Do not incorporate all stretching exercises at one time. Begin with anterior and anterior medial movements first. These are typically the most restricted and easiest to master. Once movement quality is mastered with these exercises incorporate the anterior lateral and medial rotational stretches next.
6. Do not incorporate the posterior stretching series with youth until all anterior planes are controlled and mastered. Due to typically poor trunk stabilization, the posterior stretches create significant low back hypermobility if trunk stabilization is lacking. Anterior hip and thigh structures are best lengthened with active or active-assisted exercises at this age.
7. Always incorporate some type of functional movement retraining sequence immediately after band stretching to insure good neuromuscular reeducation of the newly increased range of motion.
8. Females typically need more emphasis on stability rather than mobility. Therefore teaching quality movement with or without the band assisting may be far more effective at developing functional flexibility with this population.
9. Closely monitor the stabilization leg during all band stretching drills. It is often the opposite side that will compensate early on with band stretching. Emphasize maintaining good non-stretching foot contact against the wall, as well as a straight line body position, to avoid low back compensation.

# Flexibility and the Spine

For years the spine and especially the low back were often thought of as needing extensive stretching. Interestingly when treating the low back in the physical therapy clinic, I often find that leaving the low back alone and attacking the flexibility of the hip, ankle and thoracic spine can often lead to relieving low back pain.

## Joint by Joint Range of Motion Facts

When we begin to evaluate the actual anatomical range of motion of different joints it becomes obvious where we need to focus our flexibility training.

- The low back has 35 degrees of sidebending, 30 degrees of extension, and less than 30 degrees of rotation available
- The hip has 40 degrees of extension, over 85 degrees of total rotation, and 80 degrees of total frontal plane side-bending which is classified as abduction and adduction
- The ankle has about 55 degrees of frontal plane abduction or adduction which is often referred to as pronation – supination. Normal sagittal plane dorsiflexion is 20 degrees with Plantarflexion being at least 50 degrees or more.
- The shoulder has 200+ degrees of frontal plane motion referred to as abduction-adduction, 240 total degrees of sagittal plane flexion and extension and over 130 degrees of total rotation.
- The thoracic spine provides minimal sidebending or rotation due to the ribcage attachments but can provide some degree of flexion and extension

Based on this information it becomes evident that the hip and shoulder are going to provide the greatest opportunity for functional range of motion in life, athletics and baseball. Interestingly these are also the regions in the clinic that are typically restricted and lead to hypermobility of the low back.

## Is the functional role of the spine Stability or Mobility???

We know that functional movement is driven by momentum, gravity and ground reaction forces typically in a bottom up direction. Therefore the ankle, knee and hip will be asked to move first.

With regards to baseball movements of throwing, swinging or reaching, the movement is driven from both the top down and bottom up. Subsequently, the shoulder and scapula also become involved in initiating movement along with the lower torso.

Functionally the low back, specifically the lumbar spine or lumbo-sacral junction, is an area of transition where movement forces can crossover from the right to left side of the body or from lower to upper torso. In essence the low back is what provides the communication link between the upper extremities and the lower extremities as it relates to performing total body integrated or reciprocal movements like throwing or swinging a baseball bat.

As a result the low back becomes a targeted area for movement “compensation” if other regions like the hip are not mobile. “Compensation” essentially means that if a specific joint cannot perform or supply the needed functional range of motion, the body will automatically search out other joints to supply it.

*The body, as it relates to functional movement, will always follow the path of least resistance and do whatever it takes to get the intended movement accomplished.*

As a result of this phenomenon, it is not uncommon for the low back to have to “compensate” for a lack of range of motion or flexibility in the hip, ankle, thoracic spine or scapula, especially in functional ground-based activities like running, swinging or throwing. Over time this repeated compensatory movement pattern creates structures of the low back to break down and become inflamed which eventually leads to low back pain.

Often the immediate response to low back pain is to stretch the low back. However in 90% of all low back pain cases, the low back is the “VICTIM” not the Criminal. Stretching of the low back leads to increased hypermobility and further structural damage.

*Bottom line... Don't stretch your low back.... Make the ankle, hip, and scapula do their job*

It is critical that as athletes implement a band stretching program, they remain aware of and learn how the body will compensate. As we proceed through each stretch on the DVD we will identify areas of common compensation and how to correct them.

# Guidelines for Band Stretching

## Choosing the correct band size

A starter band for stretching should be either a red (small) or black (medium) level band. Using too strong of a band creates “neuromuscular inhibition” by over stimulating the stretch reflex and creating too much resistance to dynamically push against.

As individuals begin to demonstrate good quality control with the stretching exercises and can lock out the upper torso, allow them to move up to a heavier band. Typically, after about 2 weeks of stretching you are able to move up to the next level of band.

## Stretching Tempo

All dynamic stretching movement should be rhythmical and controlled. Incorporating a 3 to 1 active stretch to rest cadence with a 2 second sustained press at the end of each repetition to ensure reaching end range seems to be optimal. Don't try to press against the band quickly. Emphasis should be on a controlled “pressing with the heel of the foot” versus pointing the toe. This brings in the gastroc-soleus complex into play and helps address neurotension issues.

As athletes become stronger with the stretching exercises, ballistic forms of stretching like *pulling*, *straight leg swinging*, or *end range pulsating* can be added. This will incorporate more of a 1 to 1 cadence with no sustained contraction at end range.

## Stretching Exercise Sequence

Sequence of stretching will vary based on individual. The best recommendation is to stretch “easiest to most difficult”. We have found that stretching into the planes of motion that can be controlled best and provide the least amount of soft tissue restrictions, should be performed first before progressing into the more challenging restricted planes.

Keep in mind the body is a kinetic chain, by actively lengthening out the less restricted planes of motion first will naturally increase the mobility in the more challenging planes. Also by doing it this way, athletes improve neuromuscular control which allows for better relaxation in subsequent more challenging planes.

## **Pain with Stretching**

If muscles are tight they are going to need to gradually be challenged end range and beyond if greater flexibility and plastic changes are going to occur. Athletes may sense a great deal of stretching and burning behind the knee initially when first begin the anterior plane series. Most of this is a result of neurotension tightness and muscle inhibition to stretch. It typically is within the tendon which means the Golgi Tendon receptors are slowly accommodating to the new exercise. By maintaining a consistent stretching regime each day, this burning sensation will dissipate after about 2 weeks.

With the posterior stretches, a majority of the pain initially is felt at the knee cap. This is typically a result of quadricep inhibition to stretch and IT Band tightness. Definitely utilizing a red or black band initially with these stretches and emphasizing letting the knee straighten as active posterior pressing occurs will help reduce this. As this dissipates the athlete will be able to increase band tension and emphasize greater quadricep lengthening with greater knee flexion with hip extension.

Ultimately as neuromuscular control improves you will need to push with greater force which means muscle stretch pain at end range will increase. Once again, this will dissipate as greater “plastic” changes occur. Muscle stretch pain is normal during exercise but pain that continues post stretching is pathological and should be addressed with exercise modification.

Post stretching soreness immediately after a stretching session or the next day should not occur. In the beginning stages of implementation, an athlete could feel slightly fatigued, not painful after a stretching session. Typically DOMS (Delayed Onset of Muscle Soreness) should not occur the next day. If a significant level of post muscle soreness does exist after 24 hours, athletes need to decrease intensity and frequency until the body adapts appropriately.

## **Frequency of stretching**

Band stretching can and should be done every day, especially if flexibility deficits are significant. Following a protocol that institutes an easy day followed by an aggressive day allows muscles to respond and recover effectively. Also adding additional stretching into days when more ballistic training, like sprinting and additional swinging are going to occur may be a good strategy.

Pre-game stretching should be done but intensity can and should be decreased.

## **When to stretch**

Traditional stretching protocols suggest always doing a general warm-up before an aggressive stretching session. This approach is highly recommended for beginner band stretching. It allows the reflex response time to be decreased while creating an increase in core temperature. Both of these will improve an athlete's success with implementing a band stretching program.

As the body becomes more acclimated to band stretching, it is fine to start immediately with the band as long as the athlete starts out with easy band stretching before progressing into the more aggressive and advanced over pressure stretching.

*Post workout stretching* is also very effective and is recommended. Post workout stretching should emphasize less aggressive stretching with the goal being to simply length out and restore full range of motion post workout. Foam rolling in conjunction with band stretching is also a great post workout muscle recover strategy.

## **Stretching an Arthritic Joint**

Obviously joint surface structural integrity has a strong influence on flexibility and stretching tolerance. The key to stretching an arthritic joint is to initially stretch in the planes of motion that are pain free. Muscle stretch is anticipated, but when the primary pain is within the joint itself, modifications must be made.

Remember, it is possible to gain flexibility in planes of movement without stretching in those planes. Muscles are 3 dimensional and therefore all planes of motion are interrelated.

## **Low Back Pain and stretching**

This was obviously discussed in depth in the spine section of this manual. The key here is to not stretch in planes that create low back pain.

Remember the low back should not be asked to hyperextend or excessively rotate. The low back provides enough anatomical motion to protect itself but not make up for deficits in the hip, ankle or shoulder complex. Make sure you are challenging these regions to move first and leave the back alone.



## Ankle Mobilization Set-up

Along with the hip, the ankle probably plays the greatest role in maintaining good quality movement without developing compensation in surrounding joints.

### Band Set-Up Position for Ankle Mobilization



The band should be positioned, wrapped and locked on around the “ball” of the foot not the “arch”. This will create a better lever arm which will allow for greater force production and passive lengthening.

Placing the band around the body is optional.

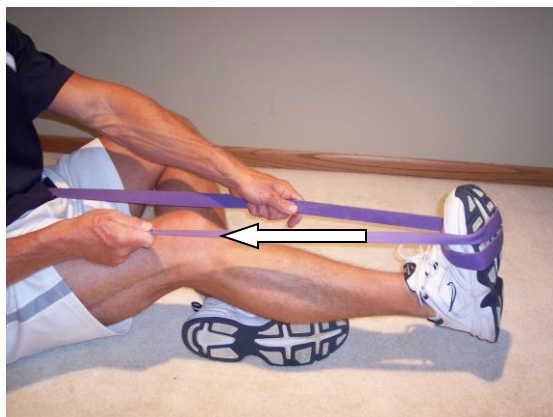
All ankle stretches are named based on where the band is passively moving the ankle.

## Dorsiflexion Stretch



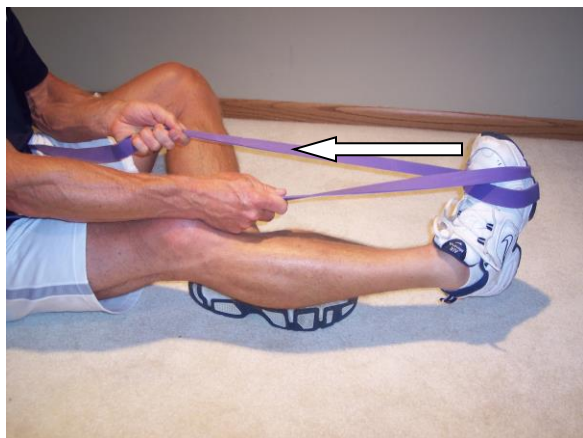
<b>Purpose</b>	Mobilize Talocrual Joint (True Ankle Joint) and lengthen out Gastroc-soleus complex in the saggital plane
<b>Set-up</b>	<ul style="list-style-type: none"> <li>• Sitting down place band around your waist</li> <li>• Place band around the ball of the forefoot as discussed</li> <li>• Wrap band around one additional time to secure on foot</li> <li>• Place opposite foot under the calf of the stretching leg to clear calcaneous</li> <li>• Pull back on both sides of the band until ankle is fully dorsiflexed</li> </ul>
<b>Cues</b>	Perform rhythmical active plantar flexion through the full range of motion 10 times and than increase tension and before repeating 10 additional reps. Allow band to fully dorsiflex the ankle on each rep
<b>Compensation</b>	<ol style="list-style-type: none"> <li>1. Not going through full range of motion</li> <li>2. Not having stretching heel off the ground</li> <li>3. Not taking advantage of band tension and allowing ankle to full dorsiflex passively</li> <li>4. Allowing the knee to compensate by rotating</li> </ol>

## **Eversion Stretch**



<b>Purpose</b>	Mobilize Subtalar Joint and lengthen out medial ankle compartment soft tissues while strengthening medial compartment muscles
<b>Set-up</b>	<ul style="list-style-type: none"> <li>• Sitting down place band around your waist</li> <li>• Place band around the ball of the forefoot as discussed</li> <li>• Wrap the band around the foot one additional time and secure</li> <li>• Place opposite foot under the calf of the stretched leg</li> <li>• Pull back on the “outside” band - rotating the forefoot laterally</li> </ul>
<b>Cues</b>	<ol style="list-style-type: none"> <li>1. Press firmly with the outside of the forefoot at the little toe trying to roll the down and in before letting the band passively pull the foot up and out.</li> <li>2. Keep knee stable with patella facing upward</li> <li>3. Emphasize strict ankle movement medially and laterally</li> <li>4. Go through the full range of motion 10 times and then increase tension on the outer band and repeat 10 more reps</li> </ol>
<b>Compensation</b>	<ol style="list-style-type: none"> <li>1. Not going through full range of motion</li> <li>2. Not having heel off the ground</li> <li>3. Not taking advantage of band tension and allowing ankle to fully evert after active inversion contraction</li> <li>4. Not controlling the knee</li> </ol>

## Inversion Stretch



<b>Purpose</b>	Mobilize Subtalar Joint and lengthen out lateral compartment soft tissues while strengthening the lateral compartment muscles
<b>Set-up</b>	<ul style="list-style-type: none"> <li>• Sitting down place band around your waist</li> <li>• Place band around the ball of the forefoot as discussed</li> <li>• Wrap the band around one additional time and secure</li> <li>• Place opposite foot under the calf of the stretched leg</li> <li>• Pull back on the inside band passively pulling forefoot medially causing the bottom of the foot to face medially</li> </ul>
<b>Cues</b>	<ol style="list-style-type: none"> <li>1. Press firmly into the band with the lateral aspect of the forefoot (little toe side) while turning the foot out and up</li> <li>2. Keep knee calm and patella facing upward</li> <li>3. Emphasize strict ankle movement laterally and medially</li> <li>4. Go through the full range of motion 10 times and then increase tension on the inside band and repeat 10 more reps</li> </ol>
<b>Compensation</b>	<ol style="list-style-type: none"> <li>1. Not going through full range of motion</li> <li>2. Not having heel off the ground</li> <li>3. Not taking advantage of band tension and allowing ankle to fully invert medially</li> <li>4. Not controlling the knee</li> </ol>

## Achilles Stretch



<b>Purpose</b>	Mobilize Talocrual Joint and lengthen out posterior soft tissues at the distal ankle including primarily the Soleus and Achilles tendon structures
<b>Set-up</b>	<ul style="list-style-type: none"> <li>• Sitting down place band around your waist</li> <li>• Place band around the ball of the forefoot as discussed</li> <li>• Wrap the band around one additional time and secure</li> <li>• Place opposite foot under the calf of the stretched leg</li> <li>• Pull back on both sides of the band equally until ankle is fully dorsiflexed</li> </ul>
<b>Cues</b>	Perform rhythmical plantar flexion presses through the full range of motion 10 times and then increase tension before repeating 10 additional reps. Allow band to fully dorsiflex the ankle on return
<b>Compensation</b>	<ol style="list-style-type: none"> <li>1. Not going through full range of motion</li> <li>2. Not having heel off the ground</li> <li>3. Not taking advantage of band tension and allowing ankle to fully dorsiflex</li> <li>4. Not controlling the knee</li> </ol>

## **Band Attachment and Set-up for Hip Stretching Series**

Now it is time to begin lengthening and mobilizing the hip. As already noted the hip is often a great place for the body to hide deficits or restrictions. With traditional stretching these deficits go unnoticed because they do not emphasize stretching in all planes of motion.

When doing the hip stretching series it helps to visualize the face of a clock. The head is 12:00 with movements to the right side being occurring between 8:00 to 12:00 and movements to the left being between 4:00 and 12:00. There will be no stretching motion that goes between 8:00 to 4:00.

The goal is to work all ranges of the upper half of the clock with all of the anterior stretching exercises.

### **Why Lock out**

The upper extremity “Locked Out” position is designed to decrease opposite side rotation towards the stretching side. By locking out the opposite arm (example being the right side) it neuromuscularly recruits the trunk and scapular muscles on that side to stabilize and maintain good postural alignment.

Keep in mind that often the greatest compensation occurs away from the side of actual side being stretched.



### **Keeping the opposite foot against the wall**

In function while one foot is flying through the air the opposite foot is firmly planted on the ground. This is why it becomes important to keep the non-stretching foot neutral and against a solid surface like the wall.

Along with simulating weight-bearing, this also creates greater same side stretching by eliminating compensation through the low back or opposite side hip.

All hip stretches are name based on the direction the band is passively moving the lower extremity.

## Band Attachment to Foot and Hands



### Description

1. Wrap band around "arch" of foot
2. Wrap band around the "arch" one additional time to lock band onto the foot
3. Place opposite foot firmly onto the wall with knee straight
4. Reach up onto the band approximately 6 inches down from the foot
5. Pull elbows down to the ground at shoulder height letting knee bend to your chest
6. Let head relax back if possible

### \*\*\* Note \*\*\*

This will be hard and somewhat exhausting. Take your time and focus on pressing maximally and going into ranges of motion that are restricted. Go where you can't go not where you can.

## Anterior Hip Stretch



<b>Purpose</b>	Lengthening out the mid hamstring, gluteal, gastroc-soleus, and posterior hip capsule on band leg and the hip flexor and anterior hip capsule on contralateral side
<b>Set-up</b>	Utilize initial set-up as outlined above
<b>Cues</b>	<ol style="list-style-type: none"> <li>1. Always Hold elbows relatively close to the floor</li> <li>2. Rhythmically press the heel towards the ceiling straightening knee as much as possible</li> <li>3. Make sure you maximize full range of motion on each rep</li> <li>4. Perform 10-15 rhythmical reps, trying to increase range on each rep (You should only experience pain of stretch during contraction and no muscle tension when you release contraction)</li> <li>5. Keep amplitude of knee movement small. Only release leg back until tension is off the soft tissues than repeat</li> <li>6. Once first set is complete reset grasp 2 inches off of the foot and repeat 10 to 15 more reps.</li> </ol>
<b>Compensation</b>	<ol style="list-style-type: none"> <li>1. Not pressing into full range of motion</li> <li>2. Not pressing with heel</li> <li>3. Not keeping band tight and elbows near the floor</li> <li>4. Knee bowing in due to tight lateral structures</li> <li>5. Not keep opposite foot on wall and knee relatively flat on the floor</li> </ol>

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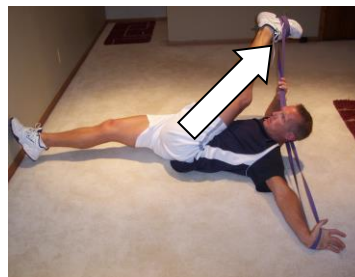
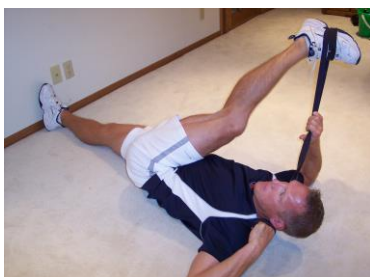
## Anterior-Lateral Hip Stretch



[Watch Video](#)

<b>Purpose</b>	<p>Lengthening out the medial hamstring, adductors, and medial hip capsule on band leg and hip flexor, adductors, medial hip capsule on contralateral side</p> <p>Lockout position also stretches ribcage and anterior chest on same side</p>
<b>Set-up</b>	<p>Left leg</p> <ul style="list-style-type: none"> <li>• Foot attachment as previously shown</li> <li>• Grasp band with left hand about 6 inches from foot with thumb underneath Pull elbow to the floor letting knee bend</li> <li>• Grasp end of band with right hand placing fingers through band with palm facing out and head resting on hand or band</li> </ul>
<b>Cues</b>	<ol style="list-style-type: none"> <li>1. Hold elbows relatively close to the floor at shoulder height</li> <li>2. Rhythmically press the heel laterally and upward trying to straightening the knee fully</li> <li>3. Make sure you maximize full range of motion on each rep</li> <li>4. Perform 10-15 rhythmical reps, trying to increase range on each rep (You may experience burning behind the medial aspect of the knee. This is neurotension tightness which will dissipate after approximately 2 weeks of routine stretching)</li> <li>5. Keep amplitude of knee movement short. Only release back until tension is off the muscle than repeat</li> <li>6. Once first set is complete reset grasp 2 inches off of foot – pull knee closer to axillary region and repeat 10 to 15 more reps</li> </ol>
<b>Compensation</b>	<ol style="list-style-type: none"> <li>1. Not pressing into full range of motion</li> <li>2. Not pressing with heel</li> <li>3. Not keeping band tight and elbows near floor</li> <li>4. Making sure you change up direction of pressing and stretching based on clock</li> <li>5. Keeping contralateral foot vertical on the wall and not bending contralateral knee</li> <li>6. Keeping shoulders and hips in line and not sidebending at the waist or through thoracic spine</li> </ol>

## Anterior-Medial Hip Stretch



[Watch Video](#)

<b>Purpose</b>	<p>Lengthening out the lateral hamstring, abductors, lateral and posterior hip capsule on band leg while maintaining good stabilization on contralateral side.</p> <p>Lockout position also stretches ribcage and anterior chest on same side</p>
<b>Set-up</b>	<p>Left leg</p> <ul style="list-style-type: none"> <li>• Using standard foot attachment as outlined</li> <li>• Grasp band with right hand using a thumb under grip about 6 inches off your foot</li> <li>• Grasp end of the band with right hand, putting fingers through band with palm facing out</li> <li>• Rest head onto hand or band</li> </ul>
<b>Cues</b>	<ol style="list-style-type: none"> <li>1. Hold elbow relatively close to the floor at shoulder height</li> <li>2. Rhythmically press the heel across your body and upward, trying to completely straighten the knee</li> <li>3. Make sure you maximize full range of motion on each rep</li> <li>4. Perform 10-15 rhythmical reps, trying to increase range on each rep (You may experience burning behind the lateral aspect of the knee and calf. This is neurotension tightness which will dissipate after approximately 2 weeks of consistent stretching.</li> <li>5. Keep amplitude of knee movement short. Only release back until tension is off the muscles than repeat</li> <li>6. Once first set is complete reset grasp 4 inches off of foot – pull knee closer to your chest region and repeat 10 to 15 more reps</li> </ol>
<b>Compensation</b>	<ol style="list-style-type: none"> <li>1. Not pressing into full range of motion</li> <li>2. Not pressing with heel</li> <li>3. Not keeping band tight and elbows near floor</li> <li>4. Making sure you change up direction of pressing and stretching</li> <li>5. Keeping contralateral foot vertical on the wall and not bending contralateral knee</li> <li>6. Keeping shoulders and hips in line and not bending at the waist or through the thoracic spine</li> </ol>

## Anterior-Medial Hip Rotation Stretch



Watch Video

<b>Purpose</b>	<p>Lengthening out the lateral hip rotators, posterior hip capsule on band leg while maintaining good stabilization on contralateral side.</p> <p>Lockout position also stretches ribcage and anterior chest on same side</p>
<b>Set-up</b>	<p>Grasp band 2 inches off the foot with knee flexed and foot place in a higher position relative to the torso</p>
<b>Cues</b>	<ol style="list-style-type: none"> <li>1. Pull the foot down towards the right shoulder trying to touch the elbow on the floor</li> <li>2. Hold for a 2-3 count and release before repeating</li> </ol> <p><i>**Note this is the only time the band is uses as an elastic “pulling” strap**</i></p>
<b>Compensation</b>	<ol style="list-style-type: none"> <li>1. Not pulling into a full range of motion with knee bending</li> <li>2. Keeping contralateral foot vertical on the wall and contralateral knee extended</li> <li>3. Keeping shoulders and hips in line and not sidebending at the waist</li> <li>4. Making sure you keep foot high at the start and pulling foot toward shoulder not hip</li> </ol>

## Posterior Hip Stretching



<b>Purpose</b>	Lengthening out the anterior hip capsule, hip flexor, quadriceps, and Latissimus Dorsi without low back compensation.
<b>Set-up</b>	<ul style="list-style-type: none"> <li>• Grasp the band and while allowing the leg to remain in neutral, press the band overhead and behind the head slightly locking out the elbows</li> <li>• Opposite leg should be at least 18-24 inches out in front, touching the wall firmly with the knee and hip flex approximately 75 to 90 degrees.</li> </ul> <p><i>*** You must be able to easily see the stabilizing knee and foot in front of you ***</i></p>
<b>Cues</b>	<ol style="list-style-type: none"> <li>1. Keeping the elbows locked out, press the Left leg back while maintaining pressure of the right foot against the wall</li> <li>2. When fully lengthened, allow band leg to return to neutral before repeating</li> </ol> <p><b>To increase Quadricep stretch...</b> Reach down on the band and reset grip before locking the arms out again. This will increase knee flexion which will increase quadricep stretch.</p>
<b>Compensation</b>	<ol style="list-style-type: none"> <li>1. Not keeping stabilizing leg well out in front</li> <li>2. Not locking arms out overhead and keeping them there during the stretch</li> <li>3. Not letting knee extend and straighten as the leg is actively pushed back</li> <li>4. Using too strong of band</li> <li>5. Allowing knee and thigh to rise up because of tight lateral thigh structures</li> <li>6. Not keeping contact on wall with stabilizing foot and subsequently hyperextending through low back</li> </ol>

[Watch Video](#)

## **Shoulder Stretching Series**

The shoulder stretching series once again incorporates a total body approach to dynamic stretching. However, with most traditionally shoulder stretching the emphasis is on stretching the shoulder on the body with no distraction of the shoulder joint occurring. With band stretching the body will stretch on the shoulder with simultaneous distraction also occurring at the shoulder joint.

### **Moving your Body on the Shoulder versus the Shoulder on the Body**

When it comes to throwing, reaching and swinging, which are the primary functional movements of the upper torso, it requires the lower torso to set the body in motion or stabilize while the upper extremities move. Very rarely in function does the shoulder complex stretch or lengthen without the lower torso involved in some fashion as the initiator of movement as seen in throwing or as a stabilizer of movement as seen with swinging.

That said, all shoulder band stretching is done in weight-bearing with the stretching planes adjusted by altering the base of support.

### **Why distraction??**

The shoulder joint is a “loosely constructed” joint designed for mobility first and stability second. Muscles play a significant role in maintaining optimal shoulder mobility and stability versus what is seen with other deeper and more stable joints, like the hip or ankle, where stability is build into the joint design.

Band distraction creates a “suctioning effect” that increases joint stability by increasing interarticular pressure. This stabilization in turn than allows the shoulder to lengthen out surrounding musculature without compromising shoulder joint stability.

### **Weight shifting drives the stretch**

As with the hip stretching, active muscle contraction drove the stretch which again will be the case with the shoulder. However with the shoulder the active movement will come through lower torso weight shifting versus through the upper torso actually contracting. As a result this will be a more traditional passive stretch.

This distraction approach allows the shoulder muscles to relax and lengthen more effectively because the stretch is occurring from the bottom up, thus allowing the shoulder muscles to relax. The bottom up approach allows the body to move on the shoulder versus the shoulder moving on the body. The body moving on the shoulder allows for a much safer and more relaxing stretch with far less risk of creating hypermobility within the shoulder.

*\*\*\*Remember the low back loves to compensate so getting it involved first decreases the likelihood of it compensating\*\*\*\**

It could be argued that upper torso stretching is slightly more passive in nature. However, functionally the shoulder often follows the lead of the lower extremities. This is definitely the case in baseball when it comes to hitting and throwing.

### **Planes of Stretch**

There will be 3 primary planes stretched in the shoulder:

1. Anterior
2. Anterior Medial
3. Anterior Lateral

Each plane will also have transverse or rotational options added in.

Most individuals want to pull on the band when performing this series of stretches. Instead allow the arm to completely relax, distract and lengthen based on where the lower torso is taking it.

*Let the lower torso and the band do the work!!!*

To help quantify each stretch I will provide the starting position and then discuss different positions or movements options

### **Last 2 comments before we get into the stretches....**

**#1** Remember to view the stretches as movements not muscles being lengthened. This is why we don't name each stretch by a muscle but rather by a movement direction relative to midline. By thinking of it this way, it becomes easier to relate the stretching to functional positions and movements rather than to isolated muscles.

*The body is an integrated kinetic chain not isolated parts!! Stretch the kinetic chain out and you will have greater success with flexibility training.*

**#2** Stretching the shoulder should not elicit pain only a stretching sensation. Keep in mind that If pain is experienced anywhere except in the region being lengthened, there may be an underlying shoulder pathology that needs further medical attention.

Address this issue by first stretching only in the planes that create the appropriate sensation. Once these motions are lengthened out, recheck the painful plane positions to see if pain still exists. If you do not see improvement or less pain in these movements within 2-3 weeks or 7-8 stretching sessions, consult with a physical therapist or a qualified medical professional.

## General Shoulder Flexibility Set-up

To prepare to stretch the shoulder with the band place the hand through the band and make sure the band is literally gripping the wrist.

Note: There should be no need for an aggressive grasping of the band. Grasping the band will create stretch inhibition by exciting the deltoid. Let the wrist absorb the band tension not the grip.

The band attachment site can be positioned at multiple heights depending to avoid shoulder impingement. Assuming we are stretching a relatively healthy shoulder, we suggest placing the band at door height or higher. This will provide the opportunity to length the shoulder out in an overhead position which typically where additional stretching is needed.



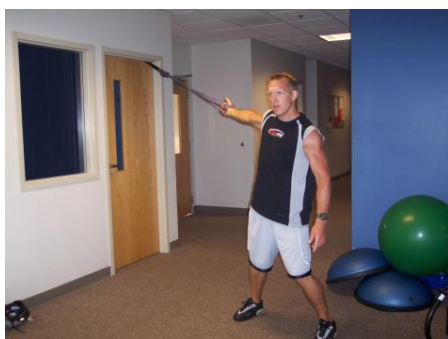
Our recommendation is to first attach the band to a solid bar structure like a squat rack or pull-up bar and utilize a door jamb as a secondary alternative.

If it becomes necessary to attach the band into a door jam or a surface with an edge, utilizing a Band Utility Strap to avoid damage to the band.

\*\*\*\* If you have unstable or questionable door jambs, attach the band to the hinge side of the door for added protection against the door accidentally opening up while stretching \*\*\*



## Anterior-Lateral Shoulder



<b>Purpose</b>	Lengthen the shoulder out in a frontal and transverse plane which will mobilize the anterior shoulder, anterior ipsilateral ribcage, anterior-medial hip, and shoulder external or internal rotation in the transverse-frontal plane which will represent shoulder horizontal abduction and rotation.
<b>Set-up</b>	<ul style="list-style-type: none"> <li>• Band-wrist attachment as noted above</li> <li>• Open hip stance (wide as possible)</li> </ul>
<b>Cues</b>	<ol style="list-style-type: none"> <li>1. Shift weight and lunge onto lead leg slowly. Make sure hips and legs are loaded</li> <li>2. Once tension is felt in the anterior shoulder, slowly rotate away from band attachment</li> <li>3. Once additional muscle length tension is felt through the anterior trunk and anterior shoulder, add in the following optional movements: <ul style="list-style-type: none"> <li>• Arm rotation</li> <li>• Lateral Swaying</li> <li>• Greater hip flexion</li> <li>• Rotate more away from the band attachment</li> </ul> </li> <li>4. Feel free to move in and out of the stretch. Do not hold for more than 2 to 3 seconds before releasing tension</li> <li>5. May also note stretching through the scapular region</li> </ol>
<b>Compensation</b>	<ol style="list-style-type: none"> <li>1. Unbalanced base of support results in poor lengthening. (Support Free hand on a chair or solid surface for balance assist)</li> <li>2. Pulling on band versus relaxing arm and moving the body on the shoulder</li> <li>3. Over stretching the band or using too light of a band (2 yard stretch recommendation)</li> <li>4. Tight anterior medial hip structures limit staggered stance length</li> </ol>

[Watch Video](#)

## **Anterior-Medial Shoulder**



[Watch Video](#)

<b>Purpose</b>	Lengthen out in a frontal and transverse plane the posterior shoulder, posterior-lateral ipsilateral ribcage, and shoulder internal rotation in the transverse-frontal plane which will represent shoulder horizontal adduction and rotation.
<b>Set-up</b>	<ul style="list-style-type: none"> <li>• Band-wrist attachment as noted above</li> <li>• Closed hip stance (feet wide apart as possible)</li> </ul>
<b>Cues</b>	<ol style="list-style-type: none"> <li>1. Shift weight and lunge onto lead leg slowly. Make sure hips and legs are loaded</li> <li>2. Once tension is felt in the posterior shoulder, slowly rotate away from band attachment creating a posterior shoulder stretch</li> <li>3. Once additional muscle length tension is felt through the posterior shoulder and scapula region, add in the following optional movements: <ul style="list-style-type: none"> <li>• Arm rotation</li> <li>• Lateral Swaying</li> <li>• Greater hip flexion by bending forward</li> <li>• Rotate more away from the band attachment</li> </ul> </li> <li>4. Feel free to move in and out of stretch. Do not hold for more than 2 to 3 seconds</li> <li>5. While in a more bent over position feel free to slowly rotate the stretched side of the torso upward towards the ceiling</li> </ol>
<b>Compensation</b>	<ol style="list-style-type: none"> <li>1. Unbalanced base of support results in poor lengthening. (Support Free hand on a chair or solid surface for balance assist)</li> <li>2. Pulling on band versus relaxing arm and moving the body on the shoulder</li> <li>3. Over stretching the band or using to light of a band (2 yard stretch recommendation)</li> <li>4. Tight hip structures limit staggered stance length</li> <li>5. Anterior-medial impingement pain due to tight posterior rotator cuff muscles and joint inflammation</li> </ol>

## **Bilateral Anterior-Lateral Shoulder**



<b>Purpose</b>	<p>Lengthen out in a sagittal plane the anterior shoulder and anterior ribcage. This will represent shoulder horizontal abduction, rotation and adduction</p> <p>NOTE: This also becomes a good shoulder stabilization drill due to it being more of a shoulder compressive influence versus a distraction influence</p>
<b>Set-up</b>	<ul style="list-style-type: none"><li>• Grasping band behind back and stretching band out laterally</li><li>• Staggered hip stance (wide as possible)</li></ul>
<b>Cues</b>	<ol style="list-style-type: none"><li>1. Perform simple bilateral flys allowing shoulders to stretch posteriorly</li><li>2. Incorporate frontal plane length by shifting weight while reaching overhead laterally</li><li>3. Feel free to move in and out of the stretch. Do not hold for more than 2 to 3 seconds</li><li>4. May also note tightness through the scapular region</li></ol>
<b>Compensation</b>	<ol style="list-style-type: none"><li>1. Unbalanced base of support results in poor lengthening. (Support Free hand on a chair or solid surface for balance assist)</li><li>2. Too strong of band and not able to maintain good press out</li><li>3. Tight anterior medial hip structures limit staggered stance length</li></ol>

## **Bilateral Anterior**



<b>Purpose</b>	Lengthen out in a sagittal plane the posterior shoulder and the posterior-lateral ribcage. This will functionally represent bilateral shoulder flexion.
<b>Set-up</b>	<ul style="list-style-type: none"> <li>• Same as unilateral but performing it bilaterally</li> <li>• Staggered stance (wide as possible)</li> </ul>
<b>Cues</b>	<ol style="list-style-type: none"> <li>1. Weight shift and lunge onto back leg slowly. Make sure hips and legs are loaded</li> <li>2. Once tension is felt in the posterior shoulder and ribcage, slowly rotate away from band attachment or towards ceiling</li> <li>3. Once additional muscle length tension is felt through the posterior shoulder and scapula region, add in the following optional movements: <ul style="list-style-type: none"> <li>• Arm rotation</li> <li>• Lateral Swaying</li> <li>• Greater hip flexion by bending forward</li> <li>• Rotate more away from the band attachment</li> </ul> </li> <li>4. Feel free to move in and out of stretch. Do not hold for more than 2 to 3 seconds</li> </ol>
<b>Compensation</b>	<ol style="list-style-type: none"> <li>1. Unbalanced base of support results in poor lengthening. (Support Free hand on a chair or solid surface for balance assist)</li> <li>2. Pulling on band versus relaxing arms and moving the body on the shoulder</li> <li>3. Over stretching the band or using too light of a band (2 yard stretch recommendation)</li> <li>4. Tight hip structures limit staggered stance length</li> <li>5. Superior shoulder impingement pain due to tight posterior muscles is felt</li> </ol>

[Watch Unilateral Version](#)

# **Active-Assisted Mobility Training**

Improving functional flexibility does not just occur by continually providing passive overpressure to the restricted soft tissues. Functionally flexibility also requires neuromuscular control to make passive mobility, useable mobility.

To improve and train the active portion of functional flexibility a simple assisted lunge – reach matrix works very well. However, to really extend movement thresholds, we will use a resistance band to assist with deceleration control by unloading the system thus allowing for an exaggerate step.

## **The History of Band Active-Assisted training**

Active-Assisted exercises were initially created to help retrain physical therapy patient's functional weight-bearing control after lower torso or low back surgery and injury. Ultimately people who did not move very well before surgery developed awesome active movement post surgery. This occurred primarily because they did not have adequate strength or neuromuscular control to deal with the forces created by gravity and momentum. Unloading the movement system provided them the ability to feel what normalized movement felt like without having to produce the necessary deceleration forces needed to deal with gravity, momentum and ground reaction forces.

Knowing that 95% of all injuries are a result of poor deceleration control, it became obvious why people could not actively lengthen out.

## **Testing the theory**

The next step was to test this theory out with an adult fitness population.

Guess what??

Using assisted band training quickly turned a normal population of individuals into better runners while developing much better integrated upper and lower torso strength. With the ability to now load the kinetic chain more effectively and create longer lever arms, the body was able to increase power output.

All as a result of band active-assisted functional movement retraining people were not just getting more flexible, they were getting stronger and more powerful.

## **How to incorporate band active-assisted training into your training programs**

Active-assisted reach training is best incorporated into the warm-up after completing the dynamic band stretching program. This will not only create active lengthening but will neurologically reeducate the body to control the newly developed range of motion created with the dynamic over pressure band stretching.

For those *individuals who lack stability* and are inflexible as a result of poor neuromuscular control, going through band assisted training first and bypass the dynamic stretching is recommended. Develop stability and better quality movement first before implementing passive over pressure.

*Also, for young athletes,* active-assisted training is the best way to develop functional flexibility. Remember the neuromuscular reflex response system is highly sensitive in kids. Performing simple assisted ground based lunges will be an easier way to teach good movement skills.

## **Can Active-Assisted training without dynamic stretching improve flexibility??**

The answer is “NO” if structural length and creating plastic soft tissue changes is necessary. The active-assisted exercises will be very easy and relaxing but this series of exercise will not provide the needed over pressure necessary to optimally increase length and joint range of motion.

## **Band Set-up**

The band set-up for the active-assisted lunge series is very simple. All that is needed is 1 band hooked to a stable surface or connection site. Since lunge reaches only require approximately 1 to 1.5 yards of movement a single band should work fine.

## **Exercise Sets, Reps and Frequency**

We recommend doing 1 set of 5 reps per exercise if reeducate after dynamic stretching is the goal. If doing it to pre-stretch or for neuromuscular retraining without dynamic stretching, we recommend 7-10 reps.

Active-assisted training is most effective if done before a workout. Since it incorporates both upper and lower torso integrated movements, it provides a total body dynamic warm-up regardless what the training session plan is for that day.

## **Using a simple 5 foot piece of PVC**

A simple 5-foot piece of PVC pipe, a wood dowel or baseball bat works effectively at enhancing upper torso movement quality and integration. By holding onto the dowel, it forces the upper extremities to become reciprocal which is difficult for most athletes or individuals who do not have good trunk integration. Also, it automatically creates integrated trunk and thoracic spine rotation which is a key movement when it comes to swinging and throwing.

## **What is a good lunge??**

All active-assisted lunges are one step drills. Keep in mind that a good lunge is when the individual can go out and “get back home” without performing secondary steps or having to short step the return.

If balance is frequently lost, decreasing the step length will provide better control.

## Active-Assisted Exercises

### Anterior Lunge with Overhead Reach



#### Purpose

1. Open up and length out the anterior hip structures of the trail leg
2. Turn on hip stabilizer of the front leg
3. Coordinate upper and lower torso movements in the sagittal plane
4. Increase total body extension on the back leg side
5. Increase shoulder flexion

### Anterior Lunge with Overhead Lateral Reach



#### Purpose

1. Lengthen out the lateral trunk in conjunction with the anterior hip
2. Activate hip stabilization in the frontal and sagittal planes
3. Increase anterior-lateral hip mobility of the trail leg
4. Increase shoulder adduction mobility

### Anterior Lunge with Rotational Reach



#### Purpose

1. Lengthen out trunk rotation in conjunction with the anterior hip without compensating through the lumbar spine
2. Activate hip stabilization in both the transverse and sagittal planes
3. Increase anterior-rotational hip mobility of the trail leg
4. Increase posterior rotator cuff mobility

## **Lateral Lunge with Unilateral Rotational Reach Towards**



### **Purpose**

1. Increase hip frontal plane mobility of trail leg
2. Increase hip frontal plane stabilization of the lead leg
3. Lengthen out lead leg hip rotation
4. Activate trunk stabilizers in a front-rotational plane
5. Increase thoracic spine rotation with extension

### **Lateral Lunge with Bilateral Rotational Reach Away**



#### **Purpose**

1. Increase trail leg frontal plane mobility with opposite trunk rotation
2. Increase lead leg hip frontal plane stabilization
3. Increase thoracic spine rotation
4. Increase posterior rotator cuff mobility of trail arm

## **Crossover Lunge with Forward Reach**



### **Purpose**

1. Increase hip rotational mobility in the lead leg
2. Increase transverse plane hip stabilization
3. Increase thoracic spine rotation with hip rotation

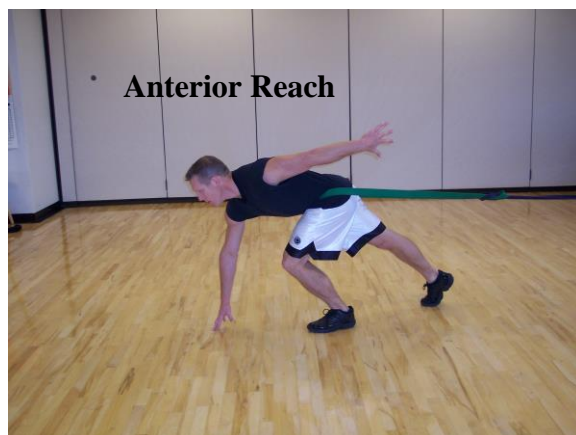
### **Posterior Lunge with Overhead Reach**



#### **Purpose**

1. Open up and length out the anterior hip structures of the lead leg
2. Activate trunk stabilizers
3. Coordinate upper and lower torso movements in the sagittal plane
4. Increase total body extension of the trail leg side with greater posterior directed momentum
5. Increase thoracic spine extension
6. Increase shoulder flexion

## **Assisted Locomotion Drills**



### **Purpose**

1. Improve movement quality for multi-plane locomotion
2. Activate key muscles for multi-plane locomotion
3. Length out the body as a kinetic chain using functionally based movements of locomotion

## **Attention Baseball Parents, Coaches and Athletes**

Before 1997, I would never have given resistance bands a chance to be part of my personal or professionally designed training programs. However the changes and benefits I have personally gained as well as the changes I have seen using resistance bands in my patients, athletes and fitness clients have been amazing.

*Do I think you should only use resistance bands for your baseball training??*

No of course not. You need to create multiple training options for your athletes and bands are one of those options that I feel is unmatched by another training tool.

*Do I think you need resistance band training in your baseball workouts??*

Yes I do but not because it's my business but because of how the body functions. Resistance bands are the only tool that can create enhanced performance in the areas of flexibility, agility, power and functional strength in way that other tools cannot.

*Where do you start using bands??*

I think using them for flexibility training is your first step. A 5 day per week band stretching program has proven to show results within 3 weeks. Once this is seen, bringing bands into your strength and speed program should be next.

*What age can band flexibility training begin??*

Bands are like any other training tool. Used appropriately, they can be implemented with young athletes as early as 5<sup>th</sup> grade. My suggestion is to let the young athlete experiment using small bands for simple controlled strength training. If they show an interest, I would then progress them with a simple "First Step Speed" program. All training at young ages should be done for short periods of 10 to 15 minutes sessions to avoid over fatigue and lose of focus.

Don't be fooled by the simplicity and the past myths about resistance band training. Their durability, force production and versatility will blow you away and definitely provide you a training edge.

*Getting BETTER with BANDS*  
Dave Schmitz (The Band Man)

