BCCSA
BC Construction Safety Alliance

Essential Stretches

For Construction Workers

Training Implementation Manual

For MSI Prevention

Making Safety Simpler

www.bccsa.ca

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MSI PREVENTION EXERCISES

Why exercises?

A construction site is not a designed, engineered, permanent workplace that can be always set up ergonomically. Construction work is physically demanding and dynamic, so although many small ergonomics interventions can be done along the way to help avoid awkward postures and to make sure over-exertion from lifting, pushing, pulling and carrying does not occur, construction work remains a whole-body physically demanding job.

Exercise awareness is needed. Workers need to be taught the basics of body mechanics, and this can be achieved through showing them several different stretches/exercises that encourage safe ways of moving the body. The BCCSA developed 10 exercises that can be performed by any worker while at work on a construction site.

Construction work is like engaging in fitness or sports and from that perspective we need to keep in mind that as an athlete or fitness participant we warm up the body before beginning any exertion. In that sense a construction worker is like an "Industrial Athlete".

These exercises are only a starting point for musculoskeletal injury (MSI) prevention. Companies should take these exercises and their principles and incorporate into job specific advice to give workers awareness of what awkward postures, repetitive gripping and forceful exertions occur in their daily tasks and how to use these exercises preventively to minimize risk of injury.

Important Message to Workers

You need your body your whole life. It is easy to forget your number one tool is your body and your ability to work every day without gradually wearing down your body is part of being able to work. Just like being exposed to a little bit of excessive noise each day, it takes time to notice that hearing loss has developed – and then it is too late, the damage is done. In the same way, muscles, tendons, and other soft tissues that are overly stretched, compressed and strained each day can gradually develop into pain and injury. Pain and injury can lead to relying on pain killers and in the worst case, you could become addicted to strong pain medication.

You want to age wisely, excel at your craft, and have the opportunity to pass along your knowledge to a younger generation. If you are starting out, you need to develop habits with your body that will make it last for your entire career. If you are already well into a construction career, it is time to rebuild your engine so that is lasts for the long run.

This actually happened to Jean-Marc – ***Don't Let it Be You***

The company I worked for was a clean-up crew. The guy I was working for at the time was a heavy-set person and we had our safety meeting about what we were doing. The company liked to bring up different safety hazards every day at our tail gate meeting. That day we were doing a lot of lifting through-out the day. We were ripping down some drywall off the walls and the ceiling- they were about sixteen feet long by three feet wide. The drywall came off pretty easy but when it came to the ceiling my co-worker and I had to use a scaffold and unscrew each sheet and lower 30lb off the scaffold then move the scaffold to drop the next sheet and set it all in a separate pile.

So that morning we talked about lifting and the possibility of injuring your lower back. We all knew the process but during the day it was so repetitive at some point I saw my co-worker bent over and I asked - you okay? He told me that he never lifted that last one with his knees and felt sharp pain in his lower back. He had to relax to the end of the day and the next day he never showed up. It turned out he pulled his back muscles and was pretty much out of work for at least three weeks and then the job was done.

I still talk with him he tells me that his back still bothers him from that day. Moral of the story is repetitive work - people forget common tasks and try to cut corners.

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What About Ergonomics?

For MSI prevention WorkSafeBC expects that employers also implement engineering and administrative controls in addition to teaching workers exercises. Engineering controls such as mechanical lifting and carrying equipment, adjusting work to minimize awkward posture, selecting tools with comfort grip and reduced vibration are all mapped out in the **BCCSA Guide to Ergonomics Resources**.

Administrative controls are a key factor for MSI prevention in construction. Task rotation to limit exposure to long durations of known MSI risk and lifting policies and procedures that show and teach methods to reduce overexertion risk are critical controls.

All these solutions together are what is needed to tackle the MSI problem, and all these solutions together is what is needed to comply with the intent of the Ergonomics Requirements in the WorkSafeBC Occupational Health and Safety Regulation.

What is the purpose of the exercises?

The exercises are designed to be done on the job to warm up the body before work, or to prepare the body just prior to physical work, or as a micro-break. When consistently implemented, the exercises are designed to help prevent musculoskeletal injuries (MSIs) as a shift in culture occurs and MSIs are no longer accepted as part of working in construction.

Because there are known obstacles to implementing exercises on the job, the psycho-social factors at play are included in this manual.

Exercises can be done as a group warm-up

The BCCSA exercises can be used to warm up and prepare the body for work. They can be done as a group or individually. When done together in sequence it takes about 10 minutes.

The purpose of the warm-up is to raise the core body temperature, warm up the soft tissues, lubricate the joints and move through a normal range of motion. This helps the body be prepared for challenging postures, motions and exertions.

Many companies do not yet have a culture of doing warm-up exercises before work. This will be a cultural shift in construction – we need to find those who are already doing it and highlight those companies as leaders in safety culture so others will be motivated to follow suit.

Warm up before work:
https://www.youtube.com/watch?v=e3SwVzBtZWQ&t=7s

The exercises can also be done to interrupt periods of awkward posture, sustained postures or, repetitive motions. Each exercise is tagged with a description that indicates when it is appropriate to be performed if being used as a micro-break.

Exercises can be done just prior to performing a forceful exertion. Rather than at the very beginning of a shift it is a good idea to prime the body with a few stretches just prior to performing heavy work.

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Exercises can be done as a Micro-break

Definition of a Micro-break:

Stretch your muscles for five minutes every hour aiming to stretch in the opposite posture to relieve muscle tension and help reset the soft tissues to neutral length. This can also be ten 30-second stretches.

Although this may seem like a lot of time, many people will do this naturally in their work. Think about when you are working at the computer – every 20 minutes you bring your arms up or fold them behind your head and lean back onto your backrest. You are essentially balancing out the "computing" posture with the opposite posture – and it is even better if you stand up, but regardless, this is the idea with these BCCSA exercises. The exercise QR codes can be made into stickers and put on toolboxes, Knapp chests, stores racking, van doors, and - yes, even bathroom stall doors! For construction classification units that deal repeatedly with the same equipment, a QR code sticker can be placed on that equipment for a quick video tutorial that the employee can follow.

The exercises for the lower body can be done prior to performing a forceful exertion. For example, loosening the back and front of the hips before lifting equipment at any time in the workday is a key principle in biomechanics. So, in addition to performing exercises at the start-of-work, the hamstring, hip flexor and bumper stretches can be performed before you are about to do lifting, or work bent over or work overhead

The shoulders and hands exercises would not likely be used in micro-breaks. The hand exercise is designed to prepare the hands for gripping by stretching out the palmar fascia and oiling the small joints in the fingers. The shoulder exercise is designed to prepare the upper body by loosening the shoulders and is best done as a warm-up exercise – it is also one of the fast-moving exercises. Both shoulder and hand exercises are best done to warm-up the body before starting work – at the beginning of the shift and as well after returning from a break. These exercises are not designed to be done as a microbreak but could be done at any time just like any of the other exercises.

The method behind the exercises.

These are on-the-job stretches. This means that they can be done in standing in work clothes. This setting limits the selection of exercises, and some workers may have learned other exercises that are done in sitting or lying which are valid – but have not been included in the BCCSA exercise selection. Although called stretches, they are not designed to increase flexibility. Rather they are designed to loosen muscles and other soft tissues that cross the joints. Flexibility stretches are best performed sitting or lying down and are typically held for up to 30 seconds. These exercises have a different methodology called 'range of motion' stretching. It is essentially a stretch to warm-up your body by having you move slowly through your normal range of motion, and to loosen up your body.

What is Range of motion stretching? You stretch slowly through a range-of-motion, so you feel only a light stretch in the muscle and surrounding tissues. It is felt as a slight stretch, and you do not bounce or push hard into the stretch. You repeat the stretch motion slowly several times (rather than stretch and hold for longer periods). Also, you aim to feel that the tissues are releasing or stretching each time you move through the motion. If done well, the movement helps to train the body to move in alignment. When performed well you are building a groove in your movement pattern - this means that the movement is pulling symmetrically from the muscle attachment to the insertion points and helping to align your joints.

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Are these the only exercises that can be done?

No, in fact, there are many other good warm up exercises. These essential stretches cover all the major body joints and help you create both a micro-break stretch program and a warm-up program. The 10 exercises represent exercise best practices – but there are other exercises that could be done.

You are encouraged to add to or change out these exercises – especially if you have someone who is familiar with stretching. You do not have to be an exercise instructor to lead a good on-the-job warm up exercise program – many workers have experience with different stretches and letting workers contribute their expertise supports them in their safety leadership. This brings in autonomy for workers to participate to what otherwise may feel like a forced program.

Safety

If you are letting workers lead different exercises that is good – but one caution is that some workers may only be familiar with stretches or exercises traditionally done sitting or lying down and so obviously this is not the best idea for a group of people standing around at a worksite. Safety of the environment and site at which you are performing the stretches should be checked and there may be an opportunity to perform these stretches without the hardhat and safety glasses – but do a risk assessment and see what is safe.

The Exercises

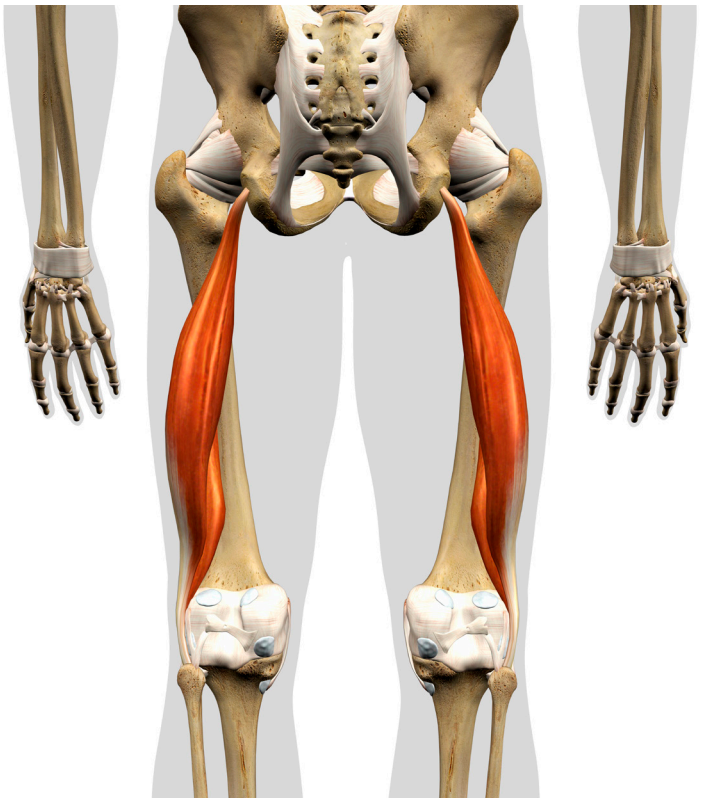
In the following you will find a link to the video, QR code and a brief description of the purpose and intended use of each of the exercises.

Included is a brief overview of the anatomy that can be used to add consideration of the injury prevention mechanism of each stretch.

Hamstring Stretch

https://youtu.be/FLWDrs0jqu8

Working bent over, or working in a crouching or squatting posture as well as sitting postures shortens the Hamstring muscles that run down the back of the leg. Keep your hips flexible by loosening the Hamstring muscles that cross the back of the hips. This enhances your ability to work without lower back discomfort. This stretch will allow you to move easier through the hips and help you avoid moving excessively through the spine.



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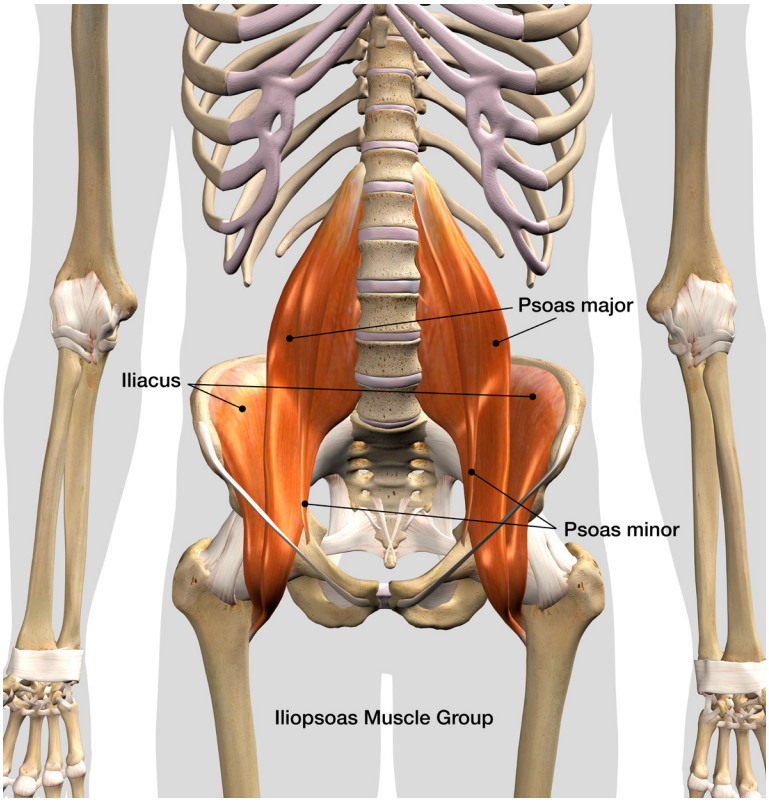
Hip Flexor Stretch

https://youtu.be/eBX_Do16R7o

Frequent or long periods working in a crouching or squatting posture as well as sitting postures shortens the Hip Flexor muscles that cross the front of the hips. If you need to be standing or reaching up or forward, then this stretch helps to loosen the front of the hip which removes strain on the lower back. Keep your hips flexors loose by stretching before beginning work or to interrupt and balance out awkward postures during work. This enhances your ability to work without discomfort.



Bumper Stretch

https://youtu.be/ITESeQBXm7A

This stretch is a combination of hamstring + hip flexor stretching and duplicates stretches #1 & #2. It is a preferable alternative if you are working near a knee-height, solid object that you can safely place your foot up on. Perform this stretch if you have a bumper or knee height object that you can place your foot up on being sure that you are in a safe location. This stretch will release the **front and back** of your hips. It will allow you to **move easier through the hips** and help you avoid moving excessively through the spine.

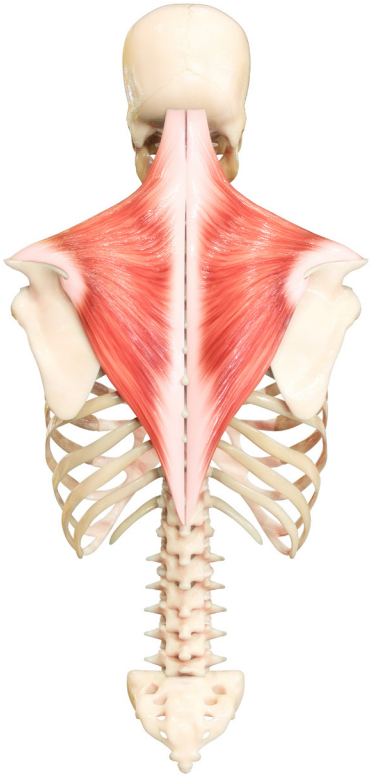
Upper Body (Shoulder) Warm-up

https://youtu.be/7XtmcBka1rQ

This is a dynamic exercise – it is all about loosening the top of the shoulders. To get the full effect of the exercise the backward-forward arm swing needs to be loose. Many people will lift their arms in the front when doing an arm swing, but this is not correct. Instead, the emphasis is on swinging the arm backwards and letting momentum carry the arm forward. The point of the exercises is to get the tops of the shoulders loosened and the shoulders should be lifting and lowering as the arms swing. There are two parts to this exercise, so after doing 20 fast arm swings, you slooooowwww down and do two side arm circles in each direction. The combination of both exercises will warm up the upper body large muscles surrounding the shoulders and shoulder blades

Most people carry tension in their upper trapezius and keep their shoulders locked, so the key to performing this exercise is to let the shoulders loosely raise and lower as you swing your arms backwards.

Working with your hands and arms can lead to tight shoulder muscles. This exercise is to loosen the muscles around the shoulder girdle and prepare your upper body for work. This exercise is best done as part of a warm-up or to interrupt any built-up tension in the shoulders during work.

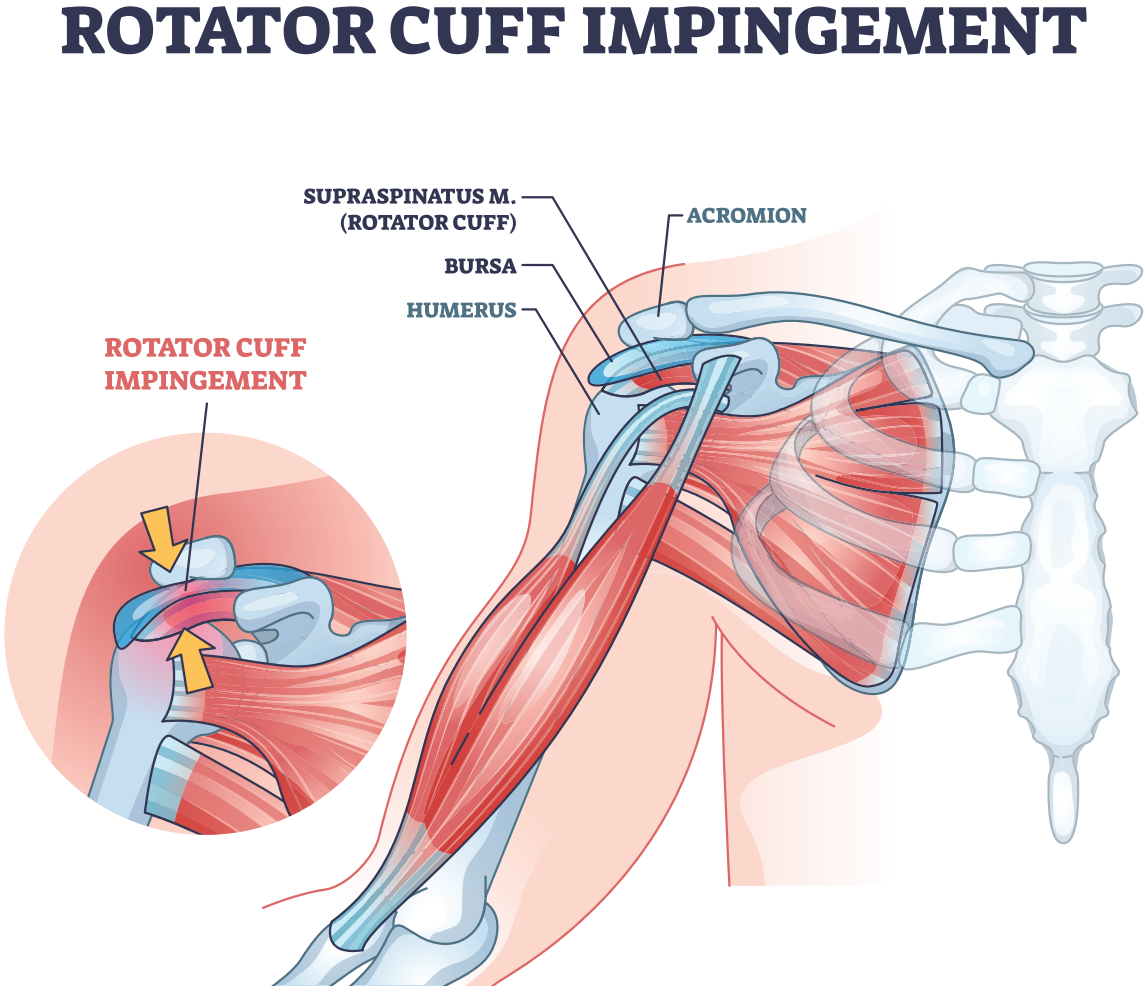


Upper Back Stretch

https://youtu.be/O-gDc7VE9Bk

If you have been standing and working with your arms forward or working overhead for long periods of time and you feel your upper back is tight, then this stretch will help to release upper back tension. This stretch works each arm individually and targets the back of the shoulders and shoulder blades. Keep your shoulder down when performing the stretch.

An alternative to this stretch would be to simply pull both arms forward with fingers lightly laced together and pull apart your shoulder blades.



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Chest Stretch

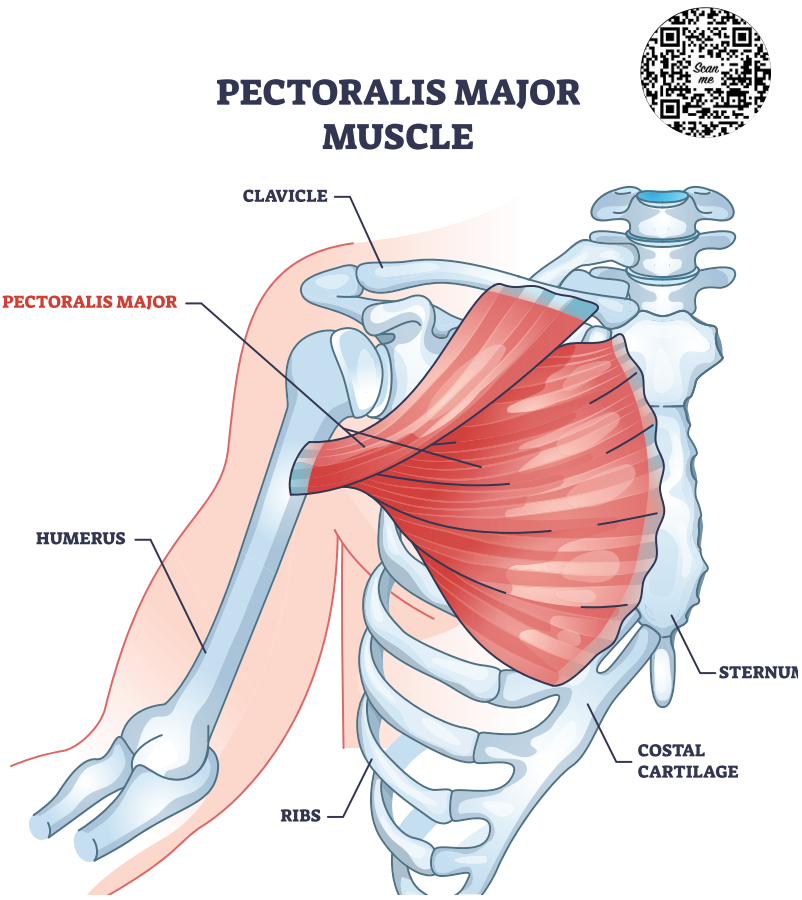
https://youtu.be/nNWfX6wrHrA

If you are working with your hands or with the arms raised in front of your body for a long period of time, then this stretch will help loosen the chest muscles. This stretch is to be done against a post, corner, doorway or other opening.

It is important to "play" with the angle of the arm height along the post, corner or doorway – it is important to feel the stretch comfortably and not insist on placing your arm to match exactly as shown in the video. The pectoral muscles fan out and therefore have many different angles – everyone will want to find the angle which is most beneficial to them and that does not feel like a strain on the front of the shoulder.

The big safety concern on performing this stretch is that the position of the arm puts the shoulder in a "dislocation" posture. This is NOT a problem for most people, but some people, likely those who have experienced repeated dislocations or who have known lax shoulder ligaments should not perform this exercise.

If there is no corner or wall to use at all, then simply bring your hands up to your ears (hands face forward) and stretch open your elbows out to the side. Here is a picture showing how to do this:



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Lower Back Muscle Release

https://youtu.be/l6nN5N9xVYo

If you have been standing or working overhead for long periods of time or your lower back is tight, then this stretch will help to release lower back tension. This stretch can also be done to help warm up the spine.

An alternative if rolling down and up is a concern for creating dizziness, is to stay standing upright. Pull the ribs backwards as you stretch the arms forward. Lift the shoulders and pull your stomach in and ribs back and round out the lower back. This is shown below:

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Reset Stretch

https://youtu.be/epoMsFW-xAo

Reset Stretch Modified

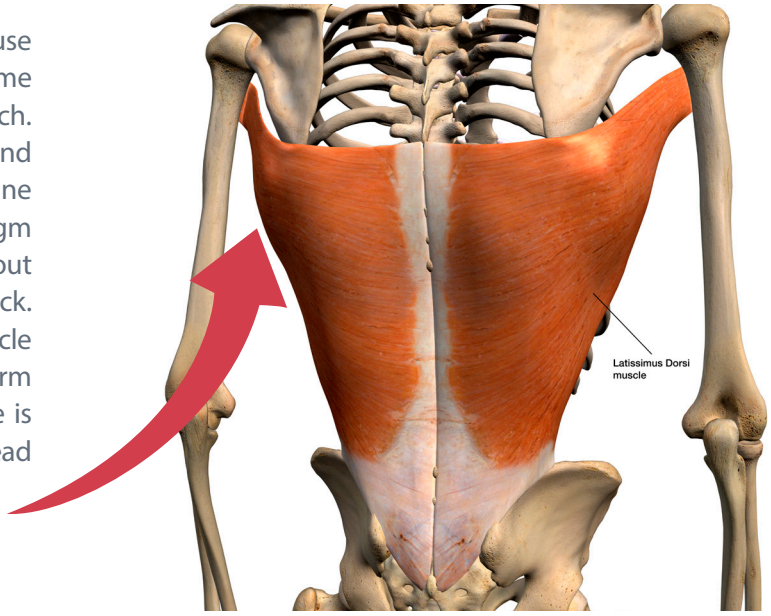
https://youtu.be/ywme3PhDXno

If you have been crouching, sitting, or bending forward for long periods of time, this stretch helps to reset your spine into neutral e.g. puts the spine into extension after having been a long period of time in flexion. Perform this stretch after sitting, before beginning work, or to interrupt flexion postures throughout the workday to prevent back discomfort.

This stretch is also good to balance out device use which can lead to "text-neck".

Avoid overstraining this area and creating bad posture by ensuring device use time is kept minimal.

There is a modification for this stretch, because despite the reset stretch being used widely some people experience discomfort doing this stretch. The modified version, which I personally prefer and perform myself, extends the spine and lifts the spine against gravity and encourages deep diaphragm breathing. The modified stretch will also pull out the latissimus dorsi muscle and help loosen the back. As shown here, the latissimus dorsi (lats) muscle attached the fascia in the lower back to the arm – so when arms are raised overhead, this muscle is stretched. When this muscle is too short it can lead to lower back discomfort.



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Hand Warm-up

https://youtu.be/RYw0TmopxC8

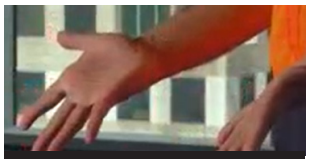
Working with your hands can lead to tight and cramped hand and forearm muscles. These exercises are designed to warm the muscles, glide the tendons and lubricate the small joints in the hand and fingers.

Begin the day with these hand warm up exercises or before beginning any type of hand intensive work.

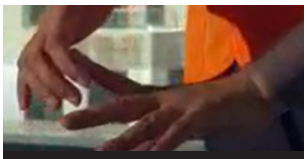
This is a dynamic set of 8 exercises focussed on warming up the hands. This means opening the palmar fascia, stretching the palm, as well as opening the fingers and lubricating the small joints of the fingers. Obviously, this needs to be done gently especially on the finger stretches. If someone pulls too hard, they can over stretch the finger joints, so paying attention to method as shown on the video is important.

1. HAND CIRCLES

2. FIST CLINCHES



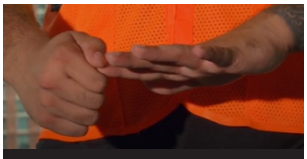
3. FINGER SPREAD



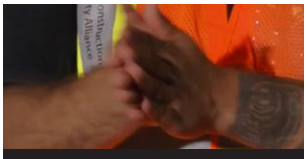
4. FINGER STRETCH

5. FINGER PRESS

6. PALM TOUCH



7. FINGER PINCH



8. PALM RUB

THE CHALLENGES IN IMPLEMENTING EXERCISES AT WORK

The Challenges of Group Warm-ups

The exercises can be performed one after the other to become a warm-up program. Many companies do not yet have a culture of doing warm-up exercises before work. This will be a cultural shift in construction – we need to find those who are already doing it and highlight those companies as leaders in safety culture so others will be motivated to follow suit.

One way to initiate a company that have hesitant workers is to roll out each exercise individually in a toolbox talk/safety meeting setting. We have the exercises mapped into eight different Toolbox talk resources with each exercise explained and a link & QR code to the video so that the video can be shown to the group or brought up on each individual worker's phone to tutor each person through the exercise.

Another way to initiate exercises at work is to use a safety meeting or longer toolbox talk to introduce the exercises and have everyone try them out. This effort would need to be repeated – perhaps done for one week every quarter. After a week of going through all the exercises together, the company can continue with a group exercise program or create an expectation for workers to continue them on their own. This will work for dispersed workforces. You enable this by providing workers with all the QR codes to view the videos as needed. Supervisors or team leaders should be encouraged to perform the exercises on their own, either before work, after work breaks, or as micro breaks. Be prepared to keep the discussion going – this should not be a one-shot arrow, rather an ongoing discussion point for real culture shifting to happen.

Finally, many companies already doing warm up programs have a leader take the initiative – so having someone volunteer to lead is another way to get this built into your culture. The volunteer can be a worker or a supervisor, safety leader or even a worker. In fact, safety leaders should reserve themselves as a resource and make sure the group is taking ownership of the exercise initiative. The volunteer would learn these exercises and mentor other operational safety leaders by coaching these exercises and making the atmosphere of exercising be the normal operating culture. Then you are creating many volunteers who feel confident to go back and lead the group or to encourage their small work groups. The volunteer should also get others to volunteer to lead one of the exercises or even all of them. For example, have the leader volunteer one or more workers each session and get them to select an exercise to lead it and everyone takes turns. It can be the BCCSA exercises – but chances are workers, who are often creative people, will demonstrate another exercise. This is great! Let the repertoire of exercises performed change and expand!

FIVE FACTORS THAT INFLUENCE AND MOTIVATE PEOPLE

Identify sources of influence

Who is admired and competent at your work? That is the person who will be your best person to champion and role model essential stretches for construction workers.

Not only do they need to be supportive of group stretching, individual stretching, and micro-breaks but they need to role model it – which mean they need to participate and lead stretches.

To sustain the stretching and change the culture, this person must make stretching part of the job.

Keep conditions and consequences positive and supportive

Doing stretches should not result in perceived disapproval from people of influence, especially the supervisor and higher ups. To motivate and sustain workers you need to keep conditions and consequences pleasant and supportive. If a 10-minute warm up stretch program makes the project manager unhappy, workers will pick up on that and it will not sustain. You need to take some time to figure out where group stretching will be done and if possible, make it a safe space so that workers can remove their hard hat and safety glasses when performing the exercises so that it is more comfortable.

Provide rewards

Positives can span a large range depending on the work culture and preferences, but some of the well-known rewards include both external rewards (gifts of some sort), social rewards (respect and praise given by those in authority and in position of influence), and internal rewards (making it a respectful and learning experience):

- Acknowledgement of effort
- Token gifts
- Recognition
- Privacy in learning
- Feedback
- Choice & control
- Meaningful experience
- Respect
- Personal interest, delight

Model desired behavior

People imitate those who have influence on them, especially people of influence, people who are looked up to and of course, those in authority over us.

It is essential that all levels of management participate in the stretches. Since the stretches are generic, even office workers will benefit and should be eager to participate.

Ensure self-efficacy

Self-efficacy is a person's belief in their ability to complete a task or achieve a goal.

People judge their ability to perform and that changes how they think, feel and behave. If someone does not participate you should consider, do they doubt their ability?

Consider a gradual introduction of different stretches over time and give lots of instruction and encouragement and do not pick out any imperfect performance. You will want to ensure their mastery and this takes time! Give people a chance to learn the move, practice it, and then you can start to give group tips and corrections to ensure workers have not drifted from good body mechanics.

Giving feedback is a skill and sometimes we must give negative feedback because we see a stretch not being performed correctly. When giving negative feedback, be task specific. For example say: "This will work better for you if you…"

When giving negative feedback, do not make it personal. Do not say "You did this wrong…"

10 STEP GROUP WARM-UP IMPLEMENTATION PLAN

The following lists 10 considerations for when implementing a stretching program in your workplace. It considers the factors that motivate people.

1. **Educate the workforce on the benefits of the exercise, involve the Joint Health and Safety Committee or Worker Safety Representative in developing the plan, and let everybody know the plan.**
2. **Participate in a BCCSA workshop to learn the exercises and consider asking around to see if anyone has experience with exercise and wants to help lead.**
3. **Coach exercise leaders until they master it – the BCCSA workshop is designed to get everyone well on their way to being able to lead exercises.**
4. **Get everyone participating (employees and managers).**
5. **Rewards efforts with token gifts.**
6. **Make the environment safe and keep exercise time pleasant - no backlash for participating.**
7. **Make sure participating does not stress anyone out for getting "behind" in their work.**
8. **If you have workers who are avoiding participating, give them private time to practice & master.**
9. **Give everyone a chance to shape the experience – whether you pick someone to pick an exercise to lead, let music be played, make sure you ask for feedback and follow through on little changes workers would like to see.**
10. **After time, refresh the exercise, select new leaders, change things up a little bit – but not too soon – give it plenty of time to become a habit.**