

Preparation for Prevention

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Spring in North Dakota brings anticipation for reprieve from cold and snow accumulation to a climate that is more amiable. However, it also brings some apprehension due to the potential for flooding. As a Guardsman and healthcare provider supporting the flood operations in 2009 and 2010 with the N.D. Air National Guard's 119th Medical Group, I observed numerous repetitive strain injuries — by far the most common ailment — from those sandbagging.

The highest rates were related to wrist and hand injuries from De Quervain's tendonitis. De Quervain's (pardon my French) is actually a tenosynovitis, involving the first extensor compartment of the hand and wrist. It usually causes soreness or a burning sensation between the wrist and thumb that is often accompanied by swelling. The high repetitive nature of sandbagging can increase the likelihood of developing this injury, especially in Soldiers and Airmen who are not conditioned specifically to the tasks and demands associated with sandbagging.

Specific stretching and strengthening exercise can decrease the rates for De Quervain's, as can braces and gloves. Being conscientious in how sandbags are lifted, carried and tossed also will help.

Before Sandbagging

Stretching Exercises

1. Hold your arm to the side with your elbow bent. Make a fist by curling your fingers over your thumb. Slowly bend your hand upward as far as you can and hold that position. Next, bend your hand downward and hold that position. Repeat as suggested above.
2. Rest your hand (palms up) on a table. Touch your little finger with your thumb and hold that position.
3. Grab your fingers and pull back on both your hand and fingers, holding that position for five seconds. Relax, then repeat. After you perform the three sets of 10 repetitions, bend your fingers in the other direction and hold them there.

Strength Exercises (start 4-6 weeks prior to event as preparation)

1. Squeeze a tennis or rubber ball for five seconds, then relax. Repeat this exercise for three sets of 10 repetitions like all of the others.
2. Hold a hammer or can of vegetables in your hand with your palm facing downward. Lift the hammer up as far as you can, then lower it. Repeat this movement and gradually use heavier objects as your wrist strength increases.
3. Place a large rubber band around your fingers and thumb. Slowly open your hand and expand the rubber band with your thumb and fingers. Hold that position and relax.
4. Also use light dumbbells and perform wrist curls and reverse wrist curls on the edge of bench or your knee. Your palm will be facing upward during wrist curls. Simply lift the weight up and then take it down with just your wrist. This strengthens the flexor muscles and tendons, those you use for gripping objects. Do reverse wrist curls the same way except with your palm facing downward. This exercise works the extensor muscles, the ones you used to expand the rubber band in the previous exercise.

Protective Wear & Supports

Gloves / Wrist Supports

Investment in an anti-fatigue glove with a detachable wrist support offers relief from stress and strain; maintains body heat for improved circulation; and helps to relieve hand fatigue and cramping.

Counterforce Bracing (CFB)

Sandbagging requires repetitive arm movement and the potential for tendon strain and inflammation that causes pain is fairly common. Lateral epicondylitis, or tennis elbow, is the most common repetitive strain injury of the elbow can occur in any sport or activity that requires repeated hand, wrist, and forearm twisting, extending, and flexing movements, such as filling, handling, and stacking sand bags. ⁽³⁾

These braces work by unloading some of the tension and force from the affected tendon by reducing the magnitude of muscle contraction that can occur. There are several advantages of a counterforce brace applied to the common extensor tendon attachment at the elbow. An improvised CFB made from prewrap and tape is inexpensive, easy to acquire, and easy to apply. CFB application can provide almost immediate relief from forearm pain as well, which is very important as the pain can be quite significant in these conditions. ⁽³⁾ CFB also allows the wearer's elbow to heal without constantly putting more strain on the tendon during sandbagging activities.

General Guidelines ⁽⁴⁾

Follow these guidelines to safely fill sandbags:

- Work in pairs. One person should hold the bag while the other shovels in the fill.
- The person holding the bag should stand with feet shoulder-width apart and knees bent.
- The person shoveling should keep feet wide apart. Place front foot close to shovel.
- Put weight on front foot and dig shovel into fill.
- Shift weight to rear foot. Keep load close to body.
- Turn feet instead of twisting. Release load into bag.
- Fill the bag 1/3 to 1/2 full.
- If tying the bag, tie at top of bag to allow fill to conform to shape.
- Bags should weigh no more than 15-20 kg.
- Alternate between tasks every 15-20 minutes to allow muscle groups to rest.

Lifting/Lowering Technique

Sandbags are heavy. Use appropriate techniques to put them in place.

- Feet should be shoulder-width apart and staggered so one foot is in front of the other.
- Bend the knees. Do not bend over at the waist.
- Keep the back straight and chin tucked in.
- Grip one hand around the neck of the bag. Place the other hand under the bag.
- Stand up using the leg muscles.
- Keep arms and elbows close to the body.
- When lowering the bag bend the knees not your back.

Carrying Technique

- Keep bag close to the body.
- Don't twist the back. To change direction, shift foot direction and turn the whole body.

References

1) Review of 119th Medical Group: NDANG Injury Surveillance (in support of flood operations.) 2009-2010.

2) The de Quervain's screening tool: validity and reliability of a measure to support clinical diagnosis and management. *Musculoskeletal Care*. 2008 Sep;6(3):168-80. Batteson R, Hammond A, Burke F, Sinha S.

3) The Immediate Effects of Tension of Counterforce Forearm Brace on Neuromuscular Performance of Wrist Extensor Muscles in Subjects With Lateral Humeral Epicondylitis. *J Orthop Sports Phys Ther* 2004;34:72-78. G.Y.F. Ng Cha..

4) Guidelines adapted from:

http://www.worksafebc.com/news_room/campaigns/flood_risk_and_response/assets/PDFs/Sandbagging%20safety%20sheet.pdf