MAINTAINING YOUR BODY
FOR THE LONG RUN

BY BRITTA ANN HERLITZ

Athletes like Nolan Ryan and Robert Parish are as uncommon in professional sports as an old carpenter is in construction. Due to the rigors of the trade, framers over 40 years old are especially rare. But as any carpenter knows after a hard day's work, all construction is hard on muscles, bones, and joints. Eventually the work catches up to you, and you either move into the office or apply for a job at the lumberyard. Or is there another alternative?

Recent medical advances offer today's builders a way to strengthen muscles, and reduce the frequency and severity of work-related injuries. This article reviews advice from medical experts on ways to prevent debilitating muscle, bone, and joint injuries, and looks at products designed to make your work easier and safer (see "Products That Spell Relief," below).

Medical experts recommend a two-fold approach to maintaining your body, and both parts are equally important. The first is *work hardening* — getting in shape to meet and exceed the physical demands of your job. Work hardening is analogous to sports training. It includes exercising to strengthen muscles you regularly use in your work, but it should go hand in hand with staying rested, eating well, and staying fit.

The second aspect is to coordinate proper *body mechanics* with the tasks at hand. This means using your body correctly when lifting, stooping, working overhead, and undergoing other work-related stresses.

Muscles, Bones, and Joints

"I was off my feet for three weeks with incredible lower back pain....I fell eight feet and broke my wrist....I am slowed down by a stiff, aching lower arm and numbness in my fingers." Such complaints are voiced so frequently among carpenters that they sound like the common cold to contractors.

The gradual wear-and-tear of muscles and joints accounts for most long-term debilitating injuries. According to Dr. Richard Paul Bonfiglio, medical director of the Bryn Mawr Rehabilitation Hospital in Malvern, Pa., the most common injuries in the construction trades are lower back and *cumulative trauma injuries* (see "Glossary of Aches and Pains," last page).

The Body Mechanics of Lifting

Anytime you lift a significant weight you risk lower back injury. If you move or lift something improperly, you can disturb the balance of the vertebrae. This can be quite severe, keeping you out of work for several days, weeks, or months.

To lift safely, Dr. Bonfiglio recommends the following:

- ***Warm-up.*** It is always a good idea to warm up for a few minutes before lifting. Some suggested exercises are included in Figure 1. "Be particularly careful when lifting at the end of the day, when your muscles are overtired," Dr. Bonfiglio warns.
- ***Test the weight.*** Remember that you can be injured if the object is lighter than you expect it to be, just as you can be injured if the object is heavier than you expect. By testing the weight of the object first, you give your back muscles time to contract and adjust to meet the demands of the task, thus taking the strain off the *intervertebral disks*.
- ***Keep your back straight.*** Stay as erect as possible when lifting — don't bend over at the waist or arch your back. When the body is bent over the load, the lower back becomes a fulcrum, supporting not only the weight of the body, but the weight of the load as well.
- ***Bend your knees.*** Keep your legs apart for good balance and bend your knees in a squat. Your leg muscles are stronger than your back muscles. By bending your knees you allow your leg muscles to do more of the lifting.
- ***Tighten your stomach muscles.*** Taught stomach muscles take some of the lifting strain off of your back. Also, exercise at home to strengthen the stomach muscles (see Figure 2).
- ***Keep the object close.*** Keeping the load as close to your body as possible minimizes the strain on your back. "By keeping the object close to your body, you are maintaining the optimal center of gravity," says Dr. Bonfiglio. "The closer the object is to your spine, the less force it exerts on your back." If the object has an awkward shape and is difficult to carry properly, get help.
- ***Talk about it.*** When you lift and carry with two or more people, make sure to coordinate the move before you execute it. Figure out where and how you are going to move, and when and where you will set the object down. An uncoordinated move often results in injury, particularly if one person lets go before he is supposed to, leaving another to support the entire weight alone for a split second.
- ***Correct for position.*** Don't go from a task that requires you to be bent over for a long time directly into lifting. Your muscles have no time to adjust. For example, if you've been installing a wood floor and need more flooring, before lifting and carrying the material back to the work area, place your hands on your buttocks and stretch gently backwards to allow your back muscles to adjust to the new task.

Use proper body mechanics when lifting loads on site. This carpenter is lifting properly by keeping his back straight, bending at the knees and waist, and holding the load close to his body.

Cumulative Trauma Injuries

Repetitive or improper tool use can result in cumulative (or repetitive) trauma injuries such as *carpal*

DAILY EXERCISE AND GOOD BODY MECHANICS CAN PREVENT ON-THE-JOB INJURIES TO MUSCLES, BONES, AND JOINTS

Lifting Warmup

Backbend
Stand and place your hands on your lower back. Lean your upper body back. Don't overarch your back. Hold for a count of five. Repeat.

Side Bend
Stand straight with your hands clasped behind your head. Bend to the side and pull your elbow directly overhead. Hold for a count of five. Return to a straight position for two counts, then bend to the other side, again holding for a count of five. Repeat.

Deep Squat
Stand with your knees slightly bent and your feet a shoulder's width apart. Keep your heels flat on the floor and slowly sink to a squat, as far down as your muscles will allow. Hold for a count of five, then slowly return to standing. Repeat.

Arm Stretch
Stand with your arms straight out from your sides. Move your arms in circles. Continue for 30 seconds. Rest, then repeat, moving arms in the opposite direction.

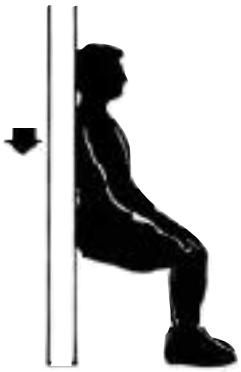
Figure 1. *Warm up a few minutes before lifting. Some suggested on-site exercises include backbends, for stretching your shoulder, back, and hip muscles; side bends, for stretching your side and back muscles; deep squats to loosen up back, hip, and leg muscles; and arm stretching to loosen shoulder and arm muscles.*

Back Strengthening Exercises

Partial Curl-Up
Lie down with both knees bent and your arms crossed on your chest. Keep your feet in the air. Tighten your stomach muscles, and slowly lift your shoulder blades off the floor. Hold, then slowly lie back down.

Hamstring Stretch
Lie on your back with your buttocks close to a door frame and your legs sticking through the opening. Raise one leg and rest it against the door casing, keeping your knee as straight as possible. Hold, then switch sides.

Hip Stretch
Kneel down. Raise one knee and move that foot forward so your leg is at a 90-degree angle. Tighten your stomach muscles. Lean forward, keeping your back straight. Hold, then switch sides.



Wall Slide
Stand against a wall with your feet slightly apart and about a foot away from the wall. Relax your shoulders. Slowly sink straight down till your legs are as close to 90 degrees as possible. Hold, then slowly slide back up.

Figure 2. *To avoid lower back problems, exercise daily at home. These exercises will strengthen the muscles that support your spine: the partial curl-up strengthens stomach muscles; the hamstring stretch lengthens thigh muscles; the hip stretch lengthens hip muscles; and the wall slide strengthens your thigh and buttock muscles. Whenever you exercise, stop if you feel unusual pain, stretch only to a comfortable point, and continue to breathe normally.*

Products That Spell Relief

Aching Feet

Most work boots don't give much anatomical support to the foot. So Footsply, a 110-year old orthopedic footwear company, developed the *Pedifix Heel Spur Cradle* to address the problem. The Heel absorbs shock, reducing the incidence of tired and sore heels. By providing support it increases comfort and lessens fatigue, thereby reducing injury.

The Heel Cradle comes in three sizes and fits any size boot. If foot problems persist, a specialist should be consulted immediately. For more information, contact Footsply, 4 Columbus Ave., Mt. Kisco, NY 10549; 914/241-0224.

Sore Knees

Kneecap erosion and tendon inflammation are recognized hazards of the building industry. Jumping, kneeling, and squatting all put undue strain on the knees. In order to alleviate some of the painful symptoms associated with

these knee disorders, Cho-Pat created the *Knee Strap*, which is designed to buttress the kneecap. According to the manufacturer, the Knee Strap supports and elevates the kneecap, preventing it from moving around and decreasing the opportunity for "kneecap erosion." For more information, contact Cho-Pat, P.O. Box 293, Hainesport, NJ 08036; 800/221-1601.

Tennis Elbow

To reduce the painful symptoms of tennis elbow, Bauerfeind USA designed the *Epitrain supports*. The Epitrain is a three-dimensional knitted-elastic elbow support that uses silicone rubber inserts to mas-

sage the sore area and relieve strain on either side of the elbow. The Epitrain comes in a variety of sizes and can be used as therapeutic support during activity or exercise therapy. Carpenters who believe they suffer from tennis elbow should ask their physicians about this product. For more information, contact Bauerfeind USA, 1590 North Roberts Rd., Suite 114, Kennesaw, GA 30144; 800/423-3405.

Keeping Warm

Sore, tired muscles are a problem for every carpenter, so *Pak-Heat* was designed to soothe tired muscles during activity. These pocket warmers offer portable relief from the cold without flame, fuel, or batteries. According to the manufacturer, this product provides hours of warmth, and can be used on the job to improve productivity and relieve the symptoms of muscular aches and pains as well as the discomforts of arthritis and rheumatism.

Regular-sized pouches fit into any shirt, jacket, or pants pocket. The mini size is small enough to fit into gloves or boots. For more information, contact EJW North America, 1031 Cambridge Sq., Suite D, Alpharetta, GA 30201; 404/664-9322.

Vibration Protection

Impact Mitts, distributed by AliMed, reduce shock to the hand when using vibrating tools, such as jackhammers, rotary hammers, or jitterbugs, that require pounding and impacting against a hard surface. Numbness, tingling, blanching, and other symptoms of "white finger" disease are reduced with the use of these mitts. The palm of the glove is lined with self-conforming foam and enclosed in leather. The tips of the Impact Mitts are open for finger exposure

to ensure normal sensation.

Impact Mitts are sold individually. Sizes range from small to extra large. For more information contact AliMed, 297 High St., Dedham, MA 02026; 617/329-2900.

Crew Information

One of the best ways to prevent injury is to understand your body and to use proper body mechanics. *Krames Communications*, a medical publishing company specializing in patient education,

offers a variety of concise, colorful, and easy-to-read booklets that help workers learn how to care for themselves. Available titles include "Safety Zone, Using Natural Limits to Protect Your Back," "Shoulder Owners Manual," "Back on Board Challenge — Recovering from a Back Injury," "Carpal Tunnel Syndrome — Relieving the Pressure in Your Wrist," and "On the Job Back Exercises." Free samples are offered to inquiring businesses. For more information write to Krames Communications, 1100 Grundy Lane, San Bruno, CA 94066; 415/742-0400.

— *B. H.*

tunnel syndrome, "tennis elbow," tendinitis, tensynovitis, "white finger," and *"trigger finger."*

Cumulative trauma disorders have a very subtle way of injuring a worker. Hammering or drilling, especially with a hammer drill, can produce imperceptible trauma for the worker. If the activity continues and the injury goes untreated, a worker can be debilitated for an extended period of time.

To prevent cumulative trauma disorders, Dr. Bonfiglio recommends keeping repetitive tasks to a minimum, resting the active body part periodically, and reducing the speed and force with which tasks are performed. This may require you to change your work habits. To minimize repetition, alternate tasks. For example, try nailing in each piece of blocking after it is cut, so you aren't hammering or cutting for long periods. Or switch hands, if possible. This, of course, is less efficient in the short term, but may ensure your vitality in the long run.

Carpal tunnel syndrome is one of the most common cumulative trauma injuries. The condition occurs when repetitive injuries cause a nerve passage in the wrist to swell, putting too much pressure on a nerve that runs through the wrist. Hammering, pushing a saw with the wrist bent, or twisting the wrist under pressure, such as when using a screwdriver, are all activities that can cause or aggravate this condition.

Pain, tingling, and numbness are the most common initial symptoms of carpal tunnel syndrome. Most often, the symptoms begin at night, frequently waking up the individual. Shaking or massaging the hand may alleviate the pain temporarily, but if ignored, symptoms progress to increased pain and weakened grip, often causing the individual to drop things.

As with other cumulative trauma disorders, minimizing repetitive motions is the best way to prevent carpal tunnel syndrome. In addition, Dr. Bonfiglio recommends keeping the afflicted area warm, relaxing your grip while you work, and making sure you use the whole hand to grasp an object. It is also necessary to keep your wrist in a neutral (straight) rather than flexed position.

If preventative measures fail, carpal tunnel syndrome is highly treatable when diagnosed early. Whenever you have any prolonged tingling, numbness, or pain in your wrist or palm, have it looked at immediately by a physician. Don't wait, thinking you're just tired from a long day. Once the symptoms of pain and tingling appear, the condition can worsen and permanent damage may occur.

For people who are active with their hands and wrists all day, a

Shoulder Strengthening Exercises

Pendulum Exercise
Holding the side of a table with your arm, bend over at the waist, and let your other arm hang straight down. Swing it back and forth like a pendulum, then in circles that start small and gradually grow larger. Do this for at least five minutes with each arm.

Weight Swinging
Holding a weight in your hand, swing your arm back and forth in progressively larger arcs. Your doctor will tell you what to use for a weight. Do at least 25 complete swings with each arm.

Pulley Exercise
Hang a pulley and run a 6-foot rope or cord through it. Holding one end in each hand with your arms extended in front of you, pull the rope toward you with one arm. This will raise the other arm. Raise it as high as you can. Repeat at least 25 times.

Figure 3. *These daily conditioning exercises are frequently recommended by physicians and physical therapists to rehabilitate an injured shoulder. To adapt these exercises for work hardening, exercise both shoulders and increase the time and number of repetitions for each one. Weights may also be incorporated, but check with a fitness expert before beginning any new routine. If you currently have shoulder problems, don't do any of these exercises without a doctor's or physical therapist's approval.*

physician may prescribe splints to wear at night for carpal tunnel syndrome. Splints take pressure away from the isolated joint, alleviating the pain and reducing the irritation to the affected nerve.

Other Stresses to the Body

The following activities are also high-risk:

Overhead work. Any activity that requires straining of the neck to look overhead or prolonged overhead reaching with the arms (for example, installing ceiling strapping or overhead drywall work) can cause a variety of wear-and-tear injuries. Commonly the shoulder is affected.

Your shoulder has a range of motion greater than any other joint in your body. It allows the arm to move into a wide variety of positions, thus greatly increasing the arm's usefulness. After age 25, many people get shoulder pain from the wear and tear of routine activities. By middle age, people who use their shoulders a lot at work are particularly prone to problems.

Each time the arm is held out from the body in any direction, the *rotator cuff* and the *bursa* in the shoulder are squeezed. Over a period of years, too much of this friction can wear down the tendon and the bursa, resulting in such shoulder injuries as *bursitis, tendinitis, calcific tendinitis, arthritis,* and *rotator cuff tears*.

The best way to prevent shoulder injuries is to stay in shape. Any kind of exercise that involves your shoulder — such as swimming, golf, tennis, and jumping rope — will help strengthen the shoulder. Consult your doctor or physical therapist about which exercises are best for you.

The shoulder exercises shown in Figure 3 are recommended frequently by physicians and physical therapists to rehabilitate an injured shoulder. These may easily be adapted to help maintain a strong, healthy shoulder, which will make it resistant to injury. However, don't do any of these exercises without your doctor's or physical therapist's approval. (Keep in mind that the cost for a physical therapist is usually covered by insurance, if one is prescribed by a doctor. Don't hesitate to consult a doctor about your fitness program.)

In addition, warm up before beginning a task and use proper body mechanics to avoid putting undue strain on any body part. Reduce reaching whenever possible by using the correct height ladder or scaffolding. Heat (a warm shower, a warm washcloth) relaxes muscles and tendons and increases blood flow to them. Always combine heat with gentle motion to ease inflammation. Heat should only be applied before an activity to keep muscles loose, or several hours after the time of work to ease aching muscles. Heat should not be used as a first aid remedy for a pull or strain. To treat this type of injury on site, apply a cold pack immediately. This constricts the blood vessels and decreases the swelling instantly. Then seek medical attention. The longer you wait, the harder it is to repair the damage.

Static positions. Staying in a static position for a long time — especially if the position is difficult to hold — can cause damage to a variety of body parts, especially the neck, back, and legs. Standing on a beam, maintaining a slightly crouched position, holding a sheet of drywall for a long time, or standing on a ladder are all high-risk positions that can cause muscle tightness, leading to a pull or sprain, especially if the muscle isn't relaxed or stretched first. In these positions muscle fatigue often sets in, as well. Tired muscles can cause a carpenter to fall, trip, or make other mistakes. Take breaks, Dr. Bonfiglio recommends. Don't go on to another activity if your muscles are overtired from balancing. Rest and stretch.

Stooping and kneeling. Lower back injuries are frequently associated with stooping. Again, try to take breaks and gently stretch out so that your muscles are not cramped in one position for hours on end.

Kneeling can cause bursitis around the knee and a roughening of the back side of the kneecap that causes pain and produces a "cracking" sound when a carpenter kneels. Using knee pads or kneeling on a scrap of rigid foam insulation or other soft surface will ease the wear and tear of extended kneeling.

Wearing a tool belt around the waist can cause an entrapment of a small nerve that leads to the outside of the thigh. When irritated, this nerve causes a burning sensation in the thigh that can be extremely uncomfortable. Wearing a tool belt can also cause bursitis. Both conditions usually go away once the carpenter stops wearing his tool belt.

If you have to wear a belt, try suspenders that fully support the weight, taking the load off your hips. Alternatively, pad the pouches where they rub your thigh. These measures may reduce the risk of bursitis or nerve entrapment. However, if you already suffer from these disorders, taking off your belt is the only cure.

Jumping can cause muscle *strains* and *sprains* in the knees, ankles, and back. Avoid jumping whenever you can. Use a ladder, even for short distances, and set up ramps or steps throughout the job site.

"If you must jump off of the back of a truck, for example, then grab on to part of the truck with both hands and use your arms as a pivot." says JoAnn Vizzari, acting director of Occupational Therapy at Columbia Presbyterian Medical Center, in New York City. "Jump by swinging your legs around and down so that your lower body isn't taking all of the force."

If this type of jump is not possible, remember to keep your joints flexible when you jump. Bend your knees, hips, and back so that you actually go down a little bit when you land.

Falling. "Obviously, the idea is to try to avoid falling entirely," says Vizzari. The most important thing is to assess the job site and see if there is anything that you can change to minimize your chances of falling.

According to Vizzari, when people fall, the first thing they do is put their hands out. "It's a primitive, protective response but it's incorrect."

If you know you are going to fall, lean into the fall and roll when you land rather than put pressure on your knees, hands, wrists, hips, or ankles. Learning to fall requires reconditioning your natural responses, and this often takes some training to do correctly. For this reason, tumbling exercises are often taught in junior high

Glossary of Aches and Pains

Arthritis: Inflammation of a joint. The most common form of arthritis, *osteoarthritis*, is a chronic condition marked by excessive erosion of the cartilage surface, and accompanied by gradual loss of function due to pain and stiffness in the affected joint. The cause remains unknown. Acute arthritis can be marked by pain, heat, redness, and swelling. Treatment includes rest, heat, anti-inflammatory and pain-relieving drugs, injection of corticosteroids into the joint areas, and, in severe cases, surgery.

Bursa: Small sacs, filled with thick fluid, that cushion tendons from bones.

Bursitis: An inflammation of the bursa. Often associated with overuse and improper conditioning.

Calcific Tendinitis: A calcium deposit that has ruptured into the bursa. This condition is usually accompanied by sudden, severe pain and can be caused by chronic inflammation.

Carpal Tunnel Syndrome (CTS): A common condition that interferes with the use of the hand. It is caused when repetitive motions, such as hammering, cause part of the wrist to swell, putting pressure on a nerve that runs through the wrist. Once the symptoms of pain and tingling appear, the condition frequently worsens and permanent nerve damage may occur. CTS is highly treatable if diagnosed early. Treatment may include rest, splints, drugs, physical therapy, and surgery.

Cartilage: The strong, smooth covering at the ends of bones where they meet to form a joint.

Cumulative Trauma: A wound or injury caused by continuous stress from a repetitive motion. The injury is not immediately apparent; symptoms develop over time.

Intervertebral Disks: Firm, circular fibers with a fluidlike center. They act as shock absorbers between the vertebrae of the spine.

Rotator Cuff: An arrangement of four muscles that help to hold the shoulder together.

Rotator Cuff Tear: Wear on the rotator cuff will eventually cause an ulceration and then a tear. When this happens, a clicking or popping is felt and often heard.

Strain: The stretching or tearing of a muscle or its tendon, resulting in sore, painful, and sometimes stiff muscles. With rest, strains will subside in two to three days, but symptoms may persist for months.

Sprain: The stretching or tearing of ligaments (fibrous bands that bind bones together in a joint), varying in degrees from being partially torn (stretched) to being completely torn (ruptured). Following a sprain, the joint may become inflamed, swollen, discolored, and extremely painful. Rest, elevation, and a restrictive bandage, splint, or cast are methods of treating these injuries. Surgical repair may be required in more severe cases in which the ligament or tendon has been torn completely.

Tendon: A fibrous cord of tissue that connects muscles to bones or cartilage.

Tendinitis: An inflammation of tendons and of tendon-muscle attachments frequently caused by repetitive motion. Symptoms include pain and swelling. Rest, splints, physical therapy, surgery, and drugs for pain and swelling are possible courses of treatment.

Tennis Elbow (*lateral epicondylitis*): An inflammation of the wrist and finger extensor muscles at the outer elbow. Often associated with overuse and repetitive motion in a cramped or awkward position.

Tensynovitis: Swelling of a tendon and its protective sheath. Often brought on by repetitive motion, pinching, pressure from a tool handle or continuous use of bent wrists. Symptoms are similar to those of tendinitis but include more pain and stiffness — possibly a click or a squeak with movement. Treatment may include rest, drugs, splints, physical therapy, and surgery.

Trauma: Any kind of wound or injury.

Trigger Finger: Tensynovitis caused by pressure from a tool. If affected, a bent finger may become stuck and then suddenly jerk open.

White Finger: A cumulative trauma disorder associated with the use of vibrating tools, such as jackhammers and jitterbugs. Symptoms include numbness, pale skin, a tingling sensation, and loss of muscle control. Cold may aggravate these symptoms. Often, people will notice improvement if they stop using the tools.

— *B. H.*

school in preparation for contact sports later on.

Fitness on the Job

Contractors wishing to avoid job-site injuries should consider instituting an on-site fitness program. According to Steve Auferoth, director of Employee Health and Fitness for the city of Eugene, Ore., a brief daily exercise routine can reduce the rate of on-the-job injuries significantly. This is sometimes recognized by insurance companies, resulting in automatic reductions on premiums. If not, the program may still reduce workers compensation claims, resulting in fewer increases.

To comply with insurance guidelines, it is usually necessary to call in a qualified health and fitness expert to assess the type of injuries that occur on the job and to determine an appropriate fitness routine. For more information on how to contact a qualified professional, see "Starting a Fitness Program," at right.

"We're not talking about a lot of time — ten minutes or less at the beginning of every day is usually enough to make a difference within six weeks," Auferoth said.

A significant difference was noted in Weyerhauser employees, for example, after the company implemented a ten-minute fitness program. In one glulam mill, the physical work — including lifting boards off a roller, tossing them into piles, and shaping them into glulam beams with heavy drills and air hammers — is similar to the work on a typical building site. Out of the mill's 100 employees, the 12 workers on the glue line accounted for 75% of all injuries — back strain and carpal tunnel syndrome topped the list. Eighteen months after the program began, the injury rate on the glue line decreased by 90% and the company was able to recoup the cost of the program in a short time.

"In the construction industry, despite the fact that the injury rate is so high, it has been difficult to make inroads with exercise and work-hardening programs because of the 'sissy' factor," said Rick Kruse, a Weyerhauser representative. "Builders are beginning to realize that there is nothing macho about being injured. Once they've been hurt and out of work, they will do whatever it takes to keep from getting injured again."

If your company doesn't have plans to start a job-site program, participate in some sort of daily workout. Try joining a gym where an exercise specialist can design a routine for you, or buy a home exercise video. And however you choose to exercise, do it regularly — that's the key to prevention. ■

Britta Ann Herlitz is a writer in New York City specializing in the coverage of orthopedic surgery and rehabilitative medicine.

Starting a Fitness Program

Interested in starting your own on-site fitness program? *The following agencies can give you assistance or put you in contact with a qualified health professional.*

American Academy of Physical Medicine and Rehabilitation
300 N. Michigan Ave., Suite 922
Chicago, IL 60602
312/922-9366

American College of Sports Medicine
P.O. Box 1440
Indianapolis, IN 46204
317/637-9200

Association for Fitness and Business
310 N. Alabama St., Suite A-100
Indianapolis, IN 46204
317/636-6621

Commission on Accreditation of Rehabilitation Facilities
101 N. Wilmot Rd., Suite 500
Tucson, AZ 85711
602/748-1212

National Strength and Conditioning Association
P.O. Box 81410
Lincoln, NE 68501
402/472-3000

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