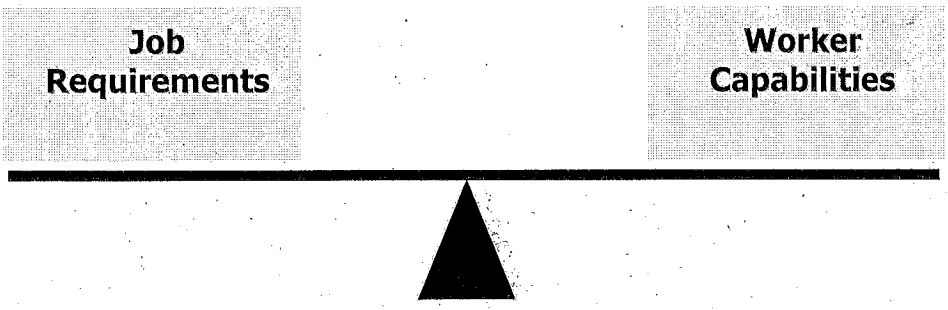
Ergonomics

Preventing Workplace Injuries Through Union Ergonomics Programs



Fitting the job – to the worker!

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What is Ergonomics?

"The science of fitting the job to the worker, rather than the worker to the job."

The term "ergonomics" comes from combining two Greek words – "ergo" which means (work) and "nomics" which means (laws). Today we use the term ergonomics to describe the science of designing workplaces, tools and tasks in a way that best matches the physiological, anatomical and psychological characteristics and capabilities of the worker.

The goal of ergonomics is to eliminate or reduce a variety of workplace injuries (i.e., injuries to the muscles, tendons, joints, nerves and soft tissue) caused by unsafe workplace design and work practices. Ergonomics refers to the design of tools and equipment, the design of workstations, and the design of jobs – covering everything from physical design and engineering to how work is organized (e.g. staffing levels, the pace of work, work load, the repetitiveness of work, the amount of rest periods and training).

The History of Ergonomics

Science has been aware of the connection between work and musculoskeletal injuries for centuries. In fact, Bernardino Ramazinni, an Italian doctor sometimes referred to as the *father of occupational medicine*, first wrote about work-related complaints in a supplement to his publication, "De Morbis Artificum" (Disease of Workers), in 1713. Wojciech Jastrzebowski created the word "ergonomics" in his 1857 science narrative called "Based on the Truths Drawn from the Science of Nature."

During the industrialization era of the early 1900s, occupational science was used to improve worker productivity – often at the expense of workers' health and safety. Frederick W. Taylor is best known for his "one best way" approach to scientifically managing work processes to dramatically increase worker productivity and efficiency. Frank and Lillian Galbreth used time motion analysis and the standardization of tools, work processes and materials to reduce the number of motions in bricklaying from 18 to 4.5 allowing bricklayers to increase their pace of laying bricks from 120 to 350 per hour. Again, the effect of the increased pace on the bricklayer's body was not considered.

Interest in reducing the physical effects of work and equipment on the human body grew out of the military during World War II. Design studies were conducted attempting to fit military equipment to the size and physical capability of soldiers. After the war, the focus shifted to include concern for worker safety, as well as, productivity. The science broadened to involve both human factors (such as, decision making, organization design and human perception relative to design) and physical factors (such as, force required to lift, vibration and reaches).

In the 1970s and 1980s studies began to link the workplace and the development of cumulative trauma disorders. Changes in work design in the 1980s and 1990s and better reporting and diagnosis capabilities, led to an explosion of cumulative trauma disorders. In 1990, the U.S. Occupational Safety and Health Administration (OSHA) created the Meatpackers Industry

Standard, a specific and enforceable ergonomics standard for the meatpacking industry. OSHA also began taking enforcement actions in high risk industries under OSHA's "general duty" clause (discussed later) that required employers to fix job hazards causing ergonomic injuries, conducted extensive training and outreach, hired professional ergonomists at OSHA, and took preliminary steps towards issuing a mandatory ergonomics standard.

In January 2001 and after ten years of research and preparation, OSHA issued the first multi-industry mandatory ergonomics standard. The standard included specific and enforceable rules for workplaces designed to reduce the number and severity of work-related musculoskeletal disorders experienced by workers in a number of industries and occupations. The U.S. Congress, however, repealed this standard in March of 2001 under the Congressional Review Act. President Bush signed the repeal measure on March 20, 2001.[1]

Since repeal of the mandatory ergonomics standard, OSHA has adopted a new plan for creating series of voluntary ergonomic guidelines; selected enforcement under the "general duty" clause; continuation of compliance assistance activities; and establishment of a U.S. Department of Labor advisory committee on research needs.

Despite the repeal of the OSHA ergonomics standard, two states: California and Washington State have issued their own ergonomic standards to prevent work-related musculoskeletal disorders, as have three Provinces of Canada including: Alberta, British Columbia, and Saskatchewan. Since 1990, the European Community has mandated ergonomic protections for manual handling and computer use and is now developing requirements to cover a broader array of ergonomic hazards that cause injuries.

The regulation and prevention of ergonomic hazards will continue to be a debated policy topic at the state, national and international levels for years to come.

Worker-Related Musculoskeletal Disorders – *New name for an old pain*

Ergonomics has become the primary tool used to prevent and reduce "work-related musculoskeletal disorders" or "WRMSDs". The most common WRMSDs are those of the shoulder, wrists, hands, back, and knees. In these cases something about the work causes damage to the nerves, muscles, joints, tendons, ligaments, and blood vessels in the affected area. Ergonomic injuries may be caused by sudden events or by years of bending, twisting, and heavy lifting.

[1] Note that even if this ergonomics standard had remained law, it did not include a standard for several industries including the construction industry.

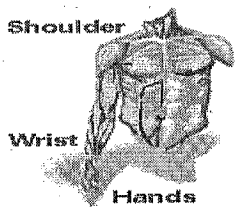
Group Exercise 1 (Body Mapping):

- Draw a large outline of a human body (front and back sides) on a flip chart or dry erase board.
- Each participant is to draw a red [X] on the figure where they have suffered an ergonomic injury (such as, pain in the back, shoulder or wrist areas).
- Each participant is to draw a blue [X] on the figure where they have felt work-related stress or tension.
- Report back to the class by describing the range of Work Related Musculoskeletal disorders and stresses experienced by the group. Are there any similarities or differences between occupations/trades, age groups, etc.?

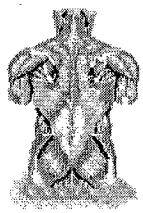
Taken from Smart Mark – Ergonomics Training Guide produced by the Center to Protect Worker Rights, 2001

Put an [X] where you hurt.

Does your job make you hurt?

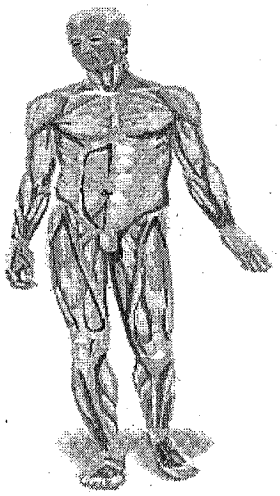


Upper Body



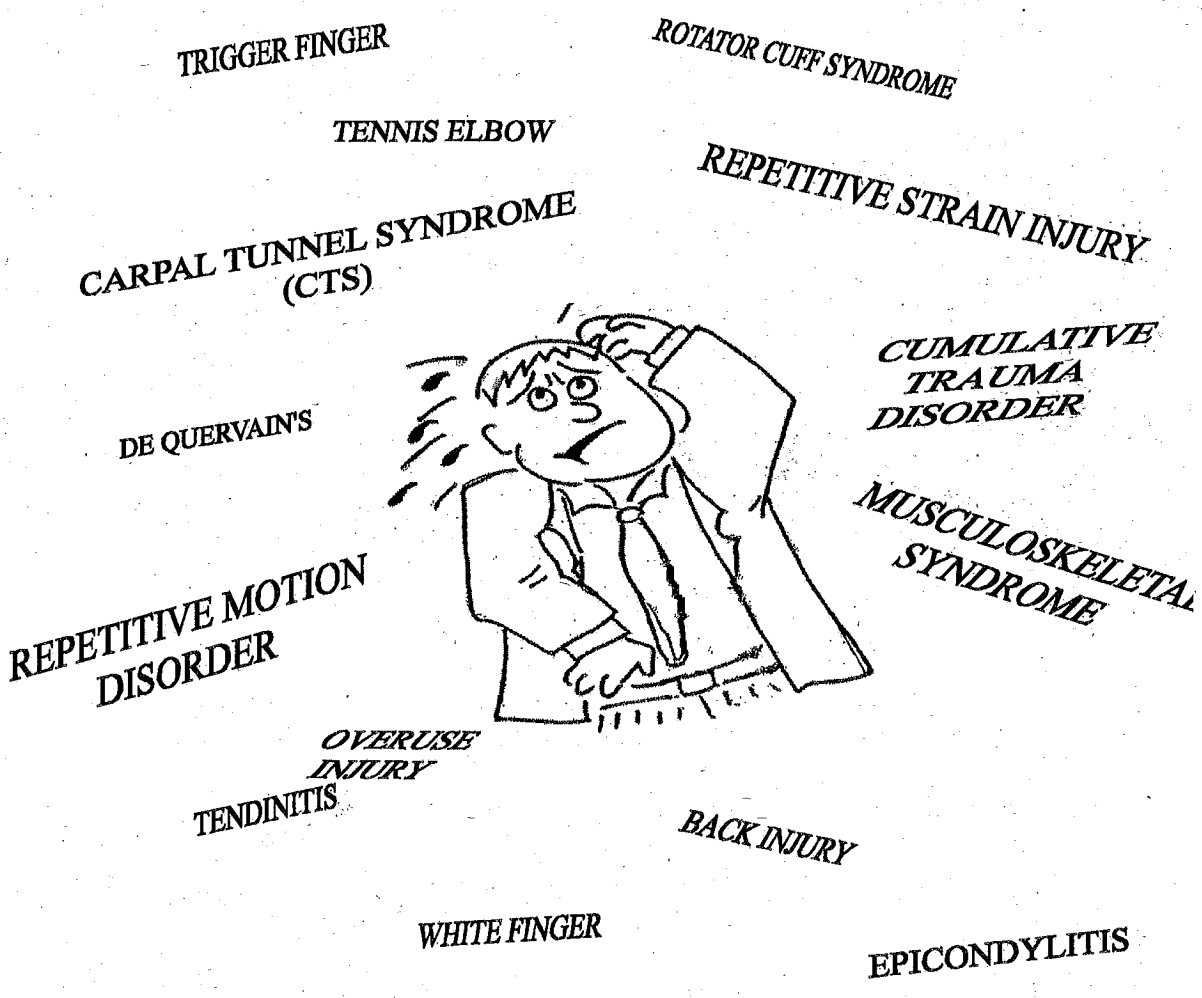
Back

Lower Body



Ergonomic injuries may be caused by sudden events or by years of bending, twisting, and heavy lifting.

Note: This type of body mapping exercise is also an effective way for unions to gain insight into the ergonomic hazards experienced by their members. Body mapping exercising like this help identify patterns of diseases and injuries, create symptom surveys which can be used to document illnesses and injuries, identify workplace hazards, involves and educates members in recognizing common problems, and can foster communication about health and safety problems within a multilingual workforce. Body mapping exercises like this can be used at union meetings!



Medical Terminology for Musculoskeletal Disorders

Have you been diagnosed with any of these conditions?

How did your job contribute to the development of the disorder?

Common Work-Related Musculoskeletal Disorders

Other expressions used to describe WRMSDs include:

- Repetitive Strain Injuries
- Cumulative Trauma Injuries
- Overuse Injuries
- Repetitive Motion Disorder

Below is a listing of specific musculoskeletal disorders by the part of the body they affect.[2] This list may not include every injury that exists.

HAND, WRIST, AND ARM

Carpal Tunnel Syndrome	Compression of the median nerve of the hand and wrist in the tunnel through the carpal bones of the wrist. May cause tingling, burning, numbness, clumsiness or weakness in the hand. Symptoms are often worse at night.
deQuervain's Disease	An inflammation of the tendon and sheath at the base of the thumb.
Digital Neuritis	Inflammation of the nerves in the finger, which is caused by repeated contact or continuous pressure.
Ganglionic Cyst	A bump under the skin caused by small pockets of synovial fluid under a tendon sheath.
Hypothenar Hammer Syndrome	Injury of blood vessels at the base of the palm resulting in reduced blood flow to the hand. Associated with repeated blows or using the heel of the hand as a hammer.
Raynaud's Syndrome	Also known as "White Finger." Blood vessels in the hands close causing skin to turn pale and cold, numb and tingly; loss of sensation and control in fingers and hands. The most common cause of this disorder is prolonged use of vibrating tools and exposure to cold or a combination of both.
Trigger finger	Swollen tendon becomes locked in tendon sheath causing finger to lock in place or jerk and snap when attempting to use it.

ELBOW AND SHOULDER

Epicondylitis	Inflammation of tendons that attach forearm muscles to the elbow bone. Lateral epicondylitis (tennis elbow) involves tendons attaching muscles on the back of the forearm to the outer elbow.

[2] Taken from Introduction to Ergonomics, George Meany Center – National Labor College, May 2003.

	Medial epicondylitis (golfer's elbow) involves tendons attaching muscles on the palmar side of the forearm to the inner elbow. May cause pain and swelling.
Radial Tunnel Syndrome	A compression of the radial nerve in the forearm.
Rotator Cuff Tendinitis	An inflammation of the tendons of the shoulder. Sometimes called Rotator Cuff Syndrome
Thoracic Outlet Syndrome	Compression of the nerves and blood vessels between the neck and the shoulder. Causes numbness of the fingers, weakness of the arm, and a feeling that the arm is "going to sleep."

NECK AND BACK

Degenerative Disc Disease	Breakdown or weakening of the tough outer tissue surrounding a spinal disc. May result in bulging or leaking of the gel-like substance inside the disc, causing compression of spinal nerves. Degenerative disc disease in the lower back may cause tingling, burning, numbness or weakness in the legs and feet.
Herniated Disc	The rupturing or bulging out of a spinal disc.
Lumbar Disc Damage	Damage to the discs between the lumbar (lower) vertebrae (bones) in the back.
Neurovascular Compression Syndrome	Compression of the nerves and blood vessels in the shoulders.

LEGS

Patellar Synovitis	Also known as "water on the knee." An inflammation of the lubricating liquid deep in the knee.
Phlebitis	Varicose veins and related blood vessel disorders that result from constant standing.
Plantar Fascitis	Inflammation of the thick connective tissue in the arch of the foot.
Subpatellar Bursitis	An inflammation of the flat, moveable bone at the front of the knee.
Trochanteric Bursitis	An inflammation of the bursa at the hip that results from constant standing or bearing heavy weights.

INJURIES THAT MAY AFFECT VARIOUS PARTS OF THE BODY

Bursitis	Inflammation of a bursa. Common locations are the shoulder, elbow and knee.

Ligament Sprain	The tearing or stretching of a ligament.
Myositis	Inflammation of the muscle tissue.
Sprain	Tearing or rupture of ligaments caused by twisting a joint beyond its normal range of motion.
Strain	Tearing of tendon fibers caused by stretching or high force muscle exertions.
Tendinitis	Inflammation of a tendon. May cause pain, swelling and loss of mobility.
Tenosynovitis	Inflammation of the tendon sheaths.

Common Symptoms of WRMSDs – Have you had any of these symptoms?

- Pain
- Stiffness
- Numbness
- Tingling
- Burning
- Limitation of motion
- Soft tissue swilling

If you have, you may have suffered a work-related musculoskeletal disorder.

WRMSDs do not have to happen! Equipment, machinery, tools and jobs can be changed to eliminate the hazards that cause these injuries.

Pain does <u>not</u> have to be **"just part of the job"!**

Work-Related Musculoskeletal Disorders are a Serious Problem

Every year in the United States, almost 2 million workers suffer back and repetitive strain injuries. Each day, at least 5,000 workers suffer injuries from ergonomic hazards on the job.

In a 2001 study, the National Academy of Sciences and Institute of Medicine reported finding strong scientific evidence showing that exposure to ergonomic hazards in the workplace causes musculoskeletal disorders, saying that:

> *"The panel's review of the research literature in epidemiology, biomechanics, tissue mechanobiology, and workplace intervention strategies has identified a rich and consistent pattern of evidence that supports a relationship between the workplace and the occurrence of MSDs (musculoskeletal disorders) of the low back and upper extremities."*[3]

Other scientific groups including the American College of Occupational and Environmental Medicine, the American Industrial Hygiene Association, the American Public Health Association, the American Association of Occupational Health Nurses, and hundreds of other individual medical and health experts are all on record supporting the view that the scientific evidence on WRMSDs is sound and that there is a clear connection between workplace ergonomic hazards and WRMSDs.

Yet despite this body of scientific evidence, every year almost 2 million workers in the United States suffer painful and debilitating WRMSDs. According to the Bureau of Labor Statistics, each year 600,000 workers suffer serious workplace injuries caused by repetitive motion and overexertion that require them to miss time from work. A National Academy of Sciences study found that these injuries cost the U.S. economy between $45 and $54 billion annually.

Unfortunately WRMSDs are on the rise in several industries including meatpacking, poultry processing, bakery products, numerous textile and garment industries, grocery stores, building services, computer processing services and hospitals.[4]

Women in the United States are more likely to suffer from a WRMSD than are men. According to the Bureau of Labor Statistics, women suffer two-thirds of all reported carpal tunnel syndrome (CTS) cases and 61% of reported tendonitis cases[5] even though women comprise less than one-half the workforce and only account for one-third of all reported workplace injuries.

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[3] Musculoskeletal Disorders and the Workplace, National Academy of Sciences and Institute of Medicine, 2001, p. ES-3.

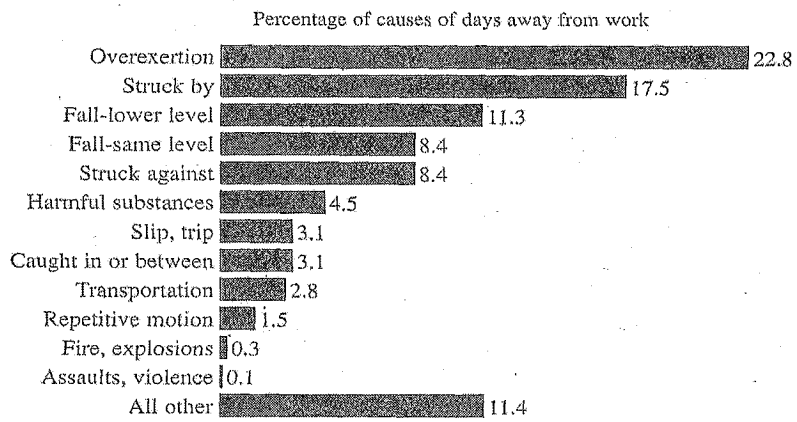
[4] For 1998 to 1999, the Bureau of Labor Statistics reported increases in the rate of lost workday injuries involving WRMSDs in about half of the industry sectors.

[5] Based on 1999 BLS data.

A Very Big Problem For The Construction Industry

Construction and building trades-workers experience more injuries due to strains and sprains than any other job-related injuries, particularly injuries to the hands, wrists, arms and shoulder. Strains and sprains of the upper- and lower-extremities (including the lower back, knees and hips) develop slowly over time, as a result of an accumulation of many traumas to the muscles, joints, tendons, ligaments and nerves.

33b. Distribution of causes of injuries and illnesses in the construction industry resulting in days away from work, 1994

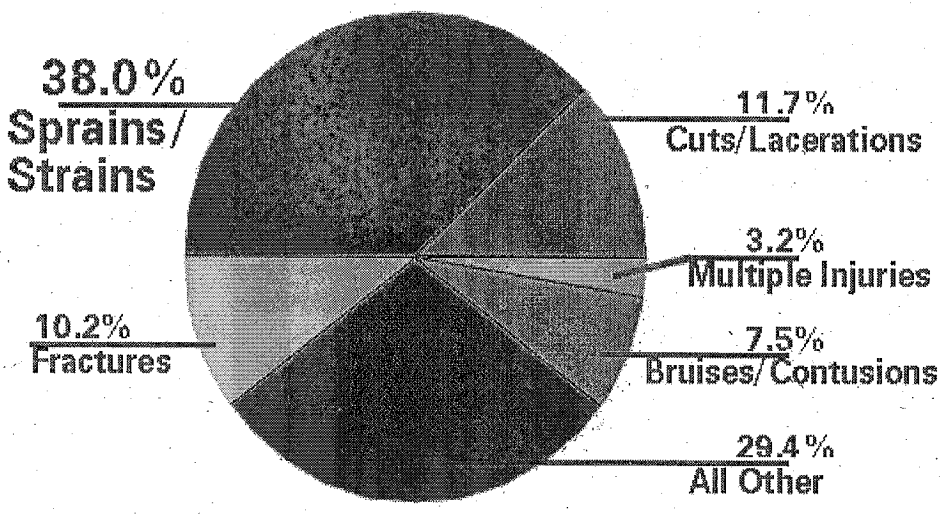


Sprains and Strain Injuries are Higher in Construction

The injury rate for sprain and strain injuries in the construction industry are higher than all other industries (other than transportation) and of the sprains and strains commonly experienced, many are WRMSDs.

Sprains and sprains represent almost 38 percent of all lost workday injuries in construction each year, and produce almost half of all compensation claims.[6] It is estimated that about one out of two injuries in construction is WRMSD-related. What this means is that construction workers have a 1 in 50 chance each year of losing work time as a result of a strain or sprain injury.

[6] Schneider, S.P., Musculoskeletal Injuries in Construction: A Review of the Literature, Applied Occupational and Environmental Hygiene, 2001, 16(11), p. 1056-1064.



Ergonomic injuries are the leading type of lost day injury in construction.

Adapted from Smart Mark – Ergonomics Training Guide, Center to Protect Worker Rights, 2001.

Unfortunately, workers do not realize (nor does the industry consider) that many "aches and pains" of construction work are the result of repeated, cumulative traumas to the muscles, bones and joints of the lower back, knees, shoulder, arms, hands and neck. As a result, a worker's ability to recognize the factors that may lead to injury on the job may also be impaired. Not knowing about ergonomic risks at the job-site can be a barrier to preventing the consequences: increased risk of developing severe, chronic and disabling WRMSDs such as carpal tunnel syndrome (CTS).

Which Workers are Most at Risk of Becoming Injured"?

Some trades workers commonly develop CTS, such as **rebar ironworkers** who do a lot of twisting and tying and rotations of the wrist; and **electricians** who do terminations all day moving their fingers and wrists. **Carpenters** experience a mixed bag of WRMSDs, including shoulder rotation injuries, elbow injuries, wrist injuries from hammering and sawing and continually moving the right and left parts of the body. **Laborers** serve as another example - they experience arm and hand disorders like Raynaud's Disease, "white finger" or other arm-wrist injuries from tamping, working with chipping guns, and jack-hammering.

The Aches and Pains of Work – not just "part of the job".

Construction workers need to have fitness and stamina because of the physical exertion and effort required to do the job. So, it comes as no surprise that aches and pains are looked at as part of the territory and that they're unavoidable. However, they are avoidable!

So, many workers work with and through the pain. But, in reality many of those aches and pains from the job can be, and should be prevented. The reason why is because the aches and pains actually may be signs that the body is being harmed by accumulated traumas or injuries.

Forty percent (40%) of construction workers in a recent survey said that "working while hurt" is a major problem. Working while hurt reduces productivity; and continuing to work while hurt will result in disabling injuries that can end a career. Many laborers end up retiring by the age of 55 because they just can't do the work anymore. Many can't enjoy their retirement because of their disabilities.[7]

Two Basic Elements of Ergonomic Hazard Control

1. Identify the risk factors
2. Identify ways to eliminate or reduce those risk factors

The two basic elements of ergonomic hazard control are to first identify those things that put workers at risk of being injured and then identify way to eliminate or reduce exposure to those risks. "Ergonomic risk factors" (discussed below), can be identified by carefully observing a work activity and by involving those directly involved in the work. Once the risk factors are identified, then the process shifts to finding ways to eliminate or reduce the risk. Eliminating risk factors can be accomplished through a variety of methods including: engineering controls (i.e. redesigning work areas, changing the materials used, and selecting redesigned tools and equipment); administrative controls (i.e. changing work schedules, adding rest periods, changing job rotations and improved housekeeping and maintenance); work practice controls (i.e. worker controlled pace, reducing worker fatigue, staffing, training and modified work procedures).

[7] Id.

Ergonomic Risk Factors

Identification of ergonomic hazards is based on ergonomic "risk factors" which are conditions of a job process, workstation, or method that contributes to the risk of becoming injured and developing a WRMSD. The goal of an ergonomics program is to eliminate or significantly reduce the prevalence of risk factors so as to reduce the risk of becoming injured.

The idea is similar to what we've learned with other diseases and injuries. For example, medical experts have identified a number of risk factors that increase your chances of contracting lung cancer (e.g. smoking and exposure to air pollution). Eliminate the risk factors (i.e. quit smoking or eliminate air pollution) and you reduce the likelihood of contracting lung cancer. Similarly, an effective lockout/tagout procedure reduces the risk of a worker being injured on a defective and dangerous piece of equipment. If you're unable to operate defective equipment, you won't be injured by it. The idea is to eliminate the things that expose workers to potential injuries. The same basic concept applies to ergonomic hazards.

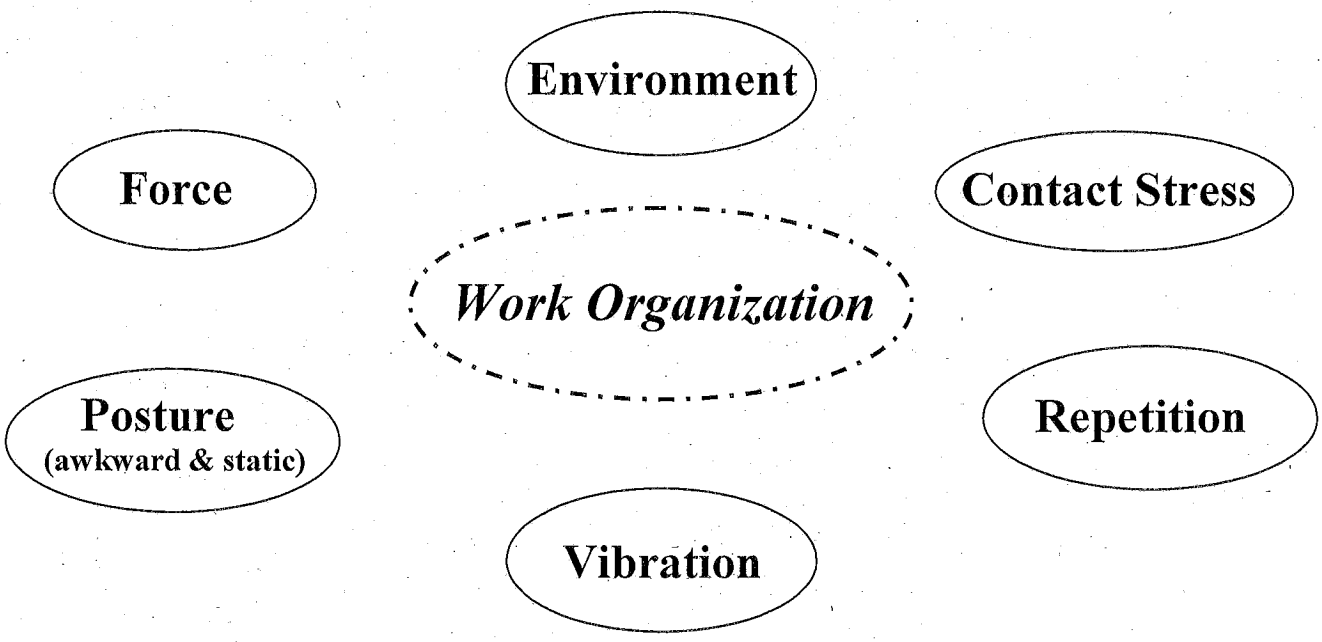
There are many risk factors in the workplace for WRMSDs. Scientists use their own words to describe these risk factors. However, the term used to categorize these risk factors is far less important than the concepts behind the term. Still these categories can be helpful to organize the ideas surrounding ergonomic risk factors, as well as, pointing to what needs to be fixed. ***Contact stress, environment, force, posture (awkward & static), repetition, vibration and work organization*** are the common terms used by scientists and others to describe and categorize ergonomic risk factors.

- **Contact stress:** Work that concentrates force on a small area of the body, putting pressure on those tissues and resulting in damage to the tissues. Examples include: pressure from a tool handle or edge digging into the soft tissue of the palm of the hand; someone working on their knees; or the force felt on the hand and arm when hammering.
- **Environment:** Any characteristic of the workers surrounding that may contribute to the development of a WRMSD, such as, temperature, humidity, noise, lighting and clothes. Examples include: working in the cold can cause stiffness and soreness or cause a worker to maintain an awkward position while working; and poor lighting can cause a worker to move closer to equipment (stretching the neck) for better visibility.
- **Force:** The amount of pressure needed to perform a work task. This force puts pressure on the body and can lead to damage of body parts or tissues. Pushing, pulling, pounding, lifting, holding and manually moving objects requires the body to exert physical force. Even typing on a keyboard requires force, as do countless other manual work tasks. Examples: lifting heavy objects or pounding a nail.
- **Posture (awkward & static):** Awkward posture is working in an unnatural position such as when working with your arms over your head or when bending, twisting or reaching to perform a work task. Awkward postures can compress nerves, irritate tendons or restrict blood flow to an area of the body. Static posture is working in one position for a long period of time, such as constant standing or sitting. Static posture can also restrict blood flow and damage muscle.

- **Repetition:** Repetition is repeating the same work motion over and over, without adequate rest in the form of regular breaks. Repetition relates to both the frequency and duration of a work task. Repetition over uses the same muscles, tendons and soft tissues causing these areas to become irritated which increases pressure on nerves. Repetition is well known to cause permanent injuries to workers. Frequent stretching is a signal that work repetition is causing damage. Examples: performing the same task on an assembly line all day, working on a computer for long periods of time, tying rebar for extended periods of time and/or terminating electrical wires for several hours at a time.
- **Vibration:** Vibration is physical exposure to the rapid motion generated by tools, equipment and machinery. Vibration can damage nerves often causing numbness and/or a tingling sensation. Many power tools create vibration that over time can injure the body.
- **Work Organization:** The social aspects of work that organize how things are done, by whom, with what, how often, how long, etc. This includes a variety of working conditions, such as: pace of work, workload, job tasks, work rotation, hours of work, staffing levels, attendance policies, production quotas, deadlines, number and length of rest breaks, and supervision. Work organization can increase workers' exposure to any or all of the other risk factors and dramatically increase the prevalence of WRMSDs.

We must identify risk factors so that they can be eliminated – that's the primary goal of an ergonomics program. Care must be taken to not simply trade one risk factor for another, that's why workers must be directly involved in identifying risk factors and crafting the solutions for eliminating them. Tools, equipment, workstations and jobs can be redesigned in ways that eliminate or reduce all "risk factors". In so doing, the likelihood of developing a WRMSD is also reduced or eliminated.

Risk Factors for Work-Related Musculoskeletal Disorders



Risk factors are conditions of a job process, workstation, or work method that contributes to the risk of becoming injured and developing a WRMSD. Think of them as working conditions that cause wear and tear on your body. Any one (of the above) risk factors or a combination of risk factors can cause WRMSDs. Work organization is in the middle, because it can aggravate the affects of all the other risk factors. Well-designed changes in work organization can also lead to the most dramatic improvements for workers.

Group Exercise 2:

In a small group, discuss the types of work activities that make workers' bodies hurt – based on your own jobs or trade. Select one of those work activities for the exercise. Now have one person in your group act out doing the job – use any props that are available. The group should observe the person acting out the work and think about how the particular job would make worker's body hurt or otherwise injure them.

Part 1

While observing, each person should write on a post-it note what it is that the person is doing that could cause pain. Record one comment per post-it note.

Now each person in the group is to place their post-it notes on the appropriate place on the body diagram (provided). In other words, put the post-it note at the location of the pain on the body. What does this exercise tell you about the job? Prepare to report back to the class.

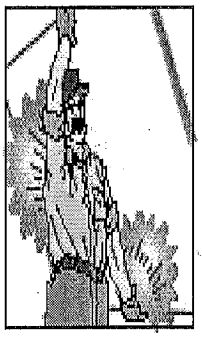
Part 2

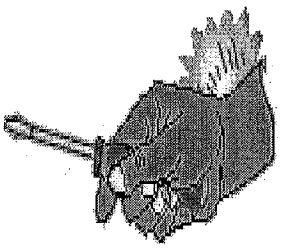
Discuss what "risk factors" (see page above) cause each of the areas of pain your group has identified. On the body diagram, write all the applicable risk factors next to the body area that's in pain. Discuss how the risk factors cause the pain. Prepare to report back to the class.

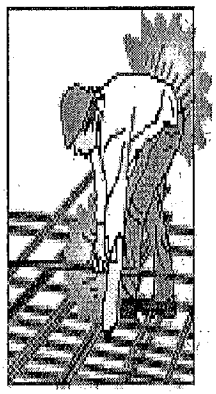
Common Construction Work Activities that Expose Workers to Ergonomic Risk Factors

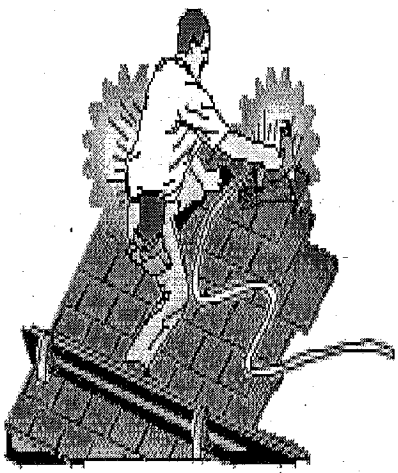
These are common problems to look for:

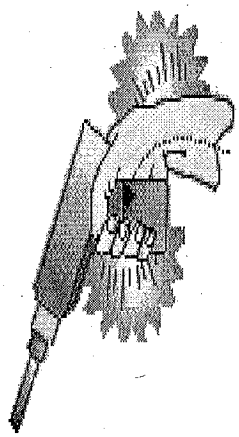
- λWorking overhead?
- λKneeling all day?
- λReaching to pick up loads?
- λTwisting while lifting?
- λBending over to the floor?
- λWorking with wrist bent?
- λWorking with power tools?
- λWorking in the heat/cold?
- λOther_____?

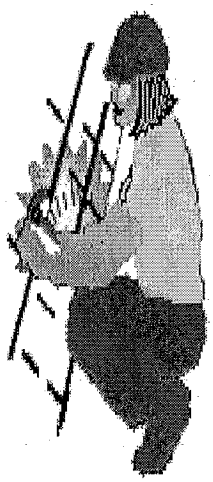










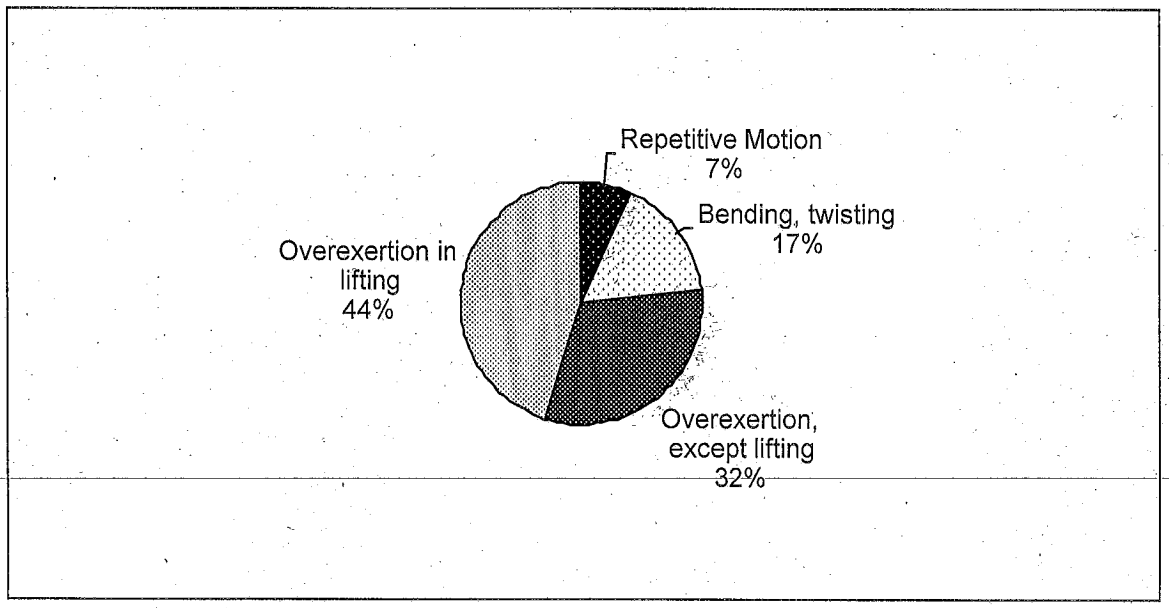


Workers in the construction industry are at risk of developing any number of debilitating WRMSDs (of the lower back, knees, elbows, wrists, hands, and shoulder, for example) because the activities they perform expose the workers to a host of risk factors; and these "risky" activities are often repeated over long periods of time.

WRMSD symptoms that can be linked to physical risk factors in the construction industry.

Area Injured	General Work Activity	Risk Factors*
Low Back	Stooping, Heavy Lifting	Posture, force, work org.
Upper Back	Stooping, Heavy Lifting	Posture, force, work org
Hands	Working Above Shoulders	Posture, force, work org
Neck	Hands Above Shoulders, Stooping	Posture, force, work org
Shoulder	Hands Above Shoulders, Stooping, Heavy Lifting	Posture, force, work org
Elbow	Heavy Lifting, Hands Above Shoulders, Stooping	Force, posture, work org
Hand/Wrist	Heavy Lifting, Stooping, Hands Above Shoulders, Repeated/Prolonged Turning or Twisting of Tools, Forceful Gripping of Tools, Gripping Power Tools	Force, posture, repetition, contact stress, vibration, work org
Hip	Stooping, Heavy Lifting	Posture, force, work org
Knee	Kneeling, Heavy Lifting, Hands Above Shoulders	Contact stress, force, posture, work org
Ankle/Foot	Heavy Lifting	Force, posture, work org

*Environment – cold and heat could also be a factor for any of the above.



***Distribution of risk factors for musculoskeletal disorders with days away from work in construction, 1999. (Rounded to nearest whole value)** Taken from Construction Chart Book, The Center to Protect Worker Rights, 2002.

Lifting is the most common cause of injury amongst the building and construction trades, and is related to the large amounts of manual materials handling and the physical nature of the work. Injuries of the lower back affect more construction workers than any other WRMSD injury. Over 30% of construction occupations were rated as "heavy" or "very heavy", compared with only about 9% of non-construction occupations. "Heavy" or "very heavy" jobs require lifting more than 100 pounds occasionally, 50-100 pounds occasionally or frequently, 25-50 pounds frequently or over 10 pounds constantly. As such construction workers are more likely to suffer sprain and strain injuries rather than cumulative trauma injuries – though both are possible.

The type of injuries common to a trade depends largely on the type of work common to the trade. Roofers, floor layers and sheet metal workers have the highest prevalence of knee injuries due to frequent work on the knees.[8] Construction workers at greatest risk of ergonomic injury are laborers, carpenters, drywall installers and roofers.[9]

Masons

On the average brickmasons, blockmasons, and stonemasons have held about 158,000 jobs. Yet, from 1994 to 1998, the masonry trade averaged a WRMSD incidence rate greater than one and a half times the overall construction average (Bureau of Labor Statistics).

The cumulative effects of frequent and awkward lifting may explain the high number of cases of low back injuries among masons - 81.3%.[10] In a Canadian study, masonry workers were found to bend forward more than a thousand times per shift, yet the lifting of blocks alone added only to 30-60 minutes to the total work time.[11]

The Washington based International Union of Bricklayers and Allied Craftsworkers did a survey in 2000 among its masonry members and found that the most common types of injuries include back injuries— primarily ruptured or herniated disks, dislocations, back strains, pulled muscles, and cuts and lacerations. The leading causes named were bending, climbing, crawling, reaching or twisting, falling from a scaffold and overexertion due to lifting.[12]

In addition to lifting there are also the factors of improper ergonomically designed mortar board heights, too large trowels, constricted spaces, production rate, and the very frequent slips and falls on wet surfaces. Interesting to note that the survey found top major concerns of masons identified were: scaffolding and dust, followed by being injured by a saw, and falling objects.

Solutions to alleviate the strain have been recommended since as early as 1911, and the same solutions are still being recommended today such as adjustable scaffolding, and packet systems to carry materials.

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[8] Id.

[9] Scheider, Scott P., "Ergonomics in the Construction Industry." The Occupational Ergonomics Handbook. Ed. Waldemar Karwowski and William Marras, Boca Raton: CRC Press, LLC, 1999.

[10] Stino, R.M., Impact of Spatial Factors on Bricklaying Ergonomics, University of Michigan, (1998).

[11] Marks, N., Musculoskeletal Injuries in the Mason Trades, Construction Safety Magazine, 1999, p. 10(3).

[12] (IUBAC), International Union of Bricklayers and Allied Craftsworkers Survey, 2000: Washington.

Laborers in Concrete Work

Many laborers are involved concrete form-work that also involves very heavy manual handling of forms and moving heavy wet viscous concrete. Laborers also do concrete reinforcement work that requires a lot of manual handling of heavy iron rods (rebar) and then tying the rods together at ground level. Researchers who have studied this work show injury rates four [4] times higher among the concrete reinforcement workers as compared to injuries in painters.[13]

Highway Construction Workers

Highway construction also requires a lot of manual handling, often of concrete forms for slurry walls or for moving underground utilities, a tunnel ceiling module assembly and installation, slurry wall construction, jacking/receiving pit construction, building of guide walls, placement of soldier piles, and cut and cover operations. This work leads to high rates of lower back injuries.

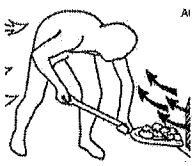
Laborers and Materials Handing - Paving, Scaffolding, and Shoveling

Laborers perform a lot of the manual handling on construction sites, and do a lot of paving work involving heavy manual materials handling at ground level. Manual handling and overexertion *are the most common causes* of a large percentage of construction laborer injuries, and places workers particularly at high risk of back injuries.

A study of low-back strain found that ergonomic problems were a major source of disability and early retirement among these construction workers. Many laborers are also being trained to build and use scaffolding, and are doing scaffold erection, one of the most difficult ergonomic tasks in construction.

Scaffold erectors have very high rates of back and shoulder problems from manually handling awkward scaffold frames and pieces overhead during erection and dismantling.

Shoveling is an important task for laborers who often dig trenches and shovel materials such as sand for mortar. Shoveling has long been recognized as hazardous to the back because of the awkward postures required and weight lifted.



Review of the Important Points About WRMSDs:

Well known –

The risk factors present in construction that cause WRMSDs:

• manual lifting (force); • (repetitive) use of hands tools (contact stress); • working in awkward (postures) (e.g., overhead or floor level); • exposure to (vibration), whole body and arm, from power equipment; • temperature extremes (environment); • fatigue from the pace of the work (work organization); and • stress from production demands (work organization).

[13] Schneider, S.P., Summary of Ergonomic Problems and Solutions Among Construction Laborers, 2003, Laborers' Health & Safety Fund of North America: Washington, D.C.

Well known –

The disabling health effects of working with these risk factors, to name a few:

• low back pain; • tendonitis; • bursitis; • carpal tunnel syndrome; • epicondylitis; • rotator cuff syndrome; • trigger finger; • thoracic outlet syndrome; • carpet layers' knee; and • degenerative disc disease.

Well known –

The solution for preventing WRMSDs is *remove the risk factors at the workplace (or at least minimizing the risks)* - It's the same for all forms of work.

What's not well known –

How to accomplish this goal for many situations in the actual work site. But, some techniques and equipment have been developed, including:

- Using material handling vehicles
- Using carrying handles (for drywall, for example)
- Changing work postures
- Using scissor lifts for overhead work
- Changing tool and equipment design
- Better organizing of the work
- Training in ergonomics for workers, supervisors, and personal protective equipment

There are organizations that have developed innovative ways to incorporate and implement these work strategies and have had varying results. From the experiences of these organization plus the contributions of various labor and labor advocacy groups, ergonomists, researchers, engineers, safety and health professionals, and trades workers themselves, some strides have been made. But, more is needed to make a difference across the board of construction trades. Integrating ergonomics into construction projects, as a process from the start to the finish is a very powerful measure. In particular because the solutions can be developed and support by all persons involved in the project.

Integration of the ergonomics process that involves all personnel does help decrease the number and severity of injuries to the lower back and other WRMSDs, and that long-term results in both worker health and related costs can be expected.

Eliminating/Reducing Ergonomic Risk Factors

There are three basic types of controls used to eliminate or reduce ergonomic risks.

1. *Engineering controls*

Involves changing the workplace to fit the worker, including modifying, redesigning or replacing:

- Workstations and work areas,
- Materials/objects/containers design and handling,
- Tool selection, and
- Equipment

2. *Administrative controls*

Involves changing the way work is structured, such as:

- Work scheduling,
- Job rotation,
- Rest breaks,
- Staffing levels, and
- Proper maintenance and housekeeping

3. *Work practices controls*

Involves changing the way work is performed and organized:

- Worker-controlled pace and organization to reduce fatigue and exposure to risk factors, and
- Modified work procedures and practices to ensure that neutral working posture and safe work techniques are used

It may be necessary to think in terms of short-term/temporary and long-term/permanent solutions to ergonomic problems.

Common Things to Look at in Order to Eliminate/Reduce Exposure to Physical Risk Factors

Workstation design

- ✓ Workstations should be designed to eliminate reaching, stretching, bending and other awkward postures.
- ✓ The design should take into account the individual size and physical characteristics of the worker.
- ✓ Workstations and equipment should be adjustable.

Equipment and tools

- ✓ Equipment and tools should be carefully designed with the worker in mind and for the job being performed.
- ✓ Offer right-handed and left-handed options that allow all workers to use comfortably.
- ✓ The edge of tools should be padded to reduce pressure on soft tissues.
- ✓ Overhead supports or lift stands should be used to support heavy tools and equipment while in operation.
- ✓ Tool handle extensions should be used to reduce the need to stretch and reach.
- ✓ Vibration can be eliminated by using better-designed tools or (in some cases) by dampening or cushioning the handles.
- ✓ Ensuring that tools are properly maintained (e.g. sharpened knives, drill bits and lubricated and repaired cartwheels) will reduce forces that can cause WRMSDs.

Material handling and lifting

- ✓ Find ways to eliminate the need for manual handling and lifting as much as possible.
- ✓ Store materials on raised platforms (above the knee and below the shoulder) to reduce the degree of lifting.
- ✓ Using mechanical lifting equipment (e.g. fork lifts, hoists, jacks, lift tables, and other devises) can reduce forceful exertion.
- ✓ Use mechanical equipment to move heavy materials (e.g. moving carts, dollies, lift tables and etc.)
- ✓ Have materials delivered directly to where they are needed to reduce the amount of handling (i.e. design building construction to include a safe delivery access hatch on each floor of the building so that materials can be mechanically hoisted to each floor).
- ✓ Select containers that have well designed handles and cutouts for hands.
- ✓ Apply weight labels on materials, boxes and equipment so that workers will know how heavy the object is before they handle them.
- ✓ Ensure that there is sufficient staffing available to assist in lifting an object – sometimes its necessary to hove two or three workers lift an object rather than one.

Changing How Work is Organized

Work Problem	Possible Work Organization Factors Leading to WRMSDs
Excessive workload, pace and job stress	Machine driven pacing, insufficient staffing, compensation system (piece rate or some incentive systems), production quotas, insufficient rest periods, excessive supervision, excessive work hours and overtime and poorly designed shift schedules and job rotations
Injured workers continue to work	Ineffective medical management programs, "no fault" attendance policies that penalize injured workers, disciplinary policies that discourage workers from reporting injuries, lack of "light/restricted duty" opportunities, restrictive workers' compensation policies, and inadequate worker education on early detection of injuries
Ergonomic solutions are ineffective	Safety program places too much emphasis on worker behavior without addressing engineering and work organization issues, lack of commitment on either the part of management or union, inadequate worker training and education, worker solutions are not implemented, and lack of follow up and support

List other work organization factors that may cause ergonomic hazards at your workplace:

Watch Out for Quick Fixes

Over the years a number of so-called "ergonomic" innovations have been marketed and later found to be ineffective. These gimmicky approaches do nothing to prevent crippling disorders and have little basis in science, and may actually do more harm than good. Whenever an ergonomic solution is introduced, unions must closely scrutinized the innovations to ensure that they are indeed a serious effort aimed at preventing WRMSDs. Some of examples of ergonomic gimmicks include:

- **Back belts** – In January 2001, the National Institute for Occupational Safety and Health (NIOSH) found no evidence that back belts reduce back injuries or strain after a two-year study of retail workers who lift or move merchandise.

- **Wrist splints** – There is some evidence that workers with upper extremity WRMSDs could have their injuries made worse by wearing wrist splints while working.

- **Exercise programs** – There is little indication that exercise programs by themselves lead to a reduction in WRMSDs. A University of Michigan study concludes that: *"Fifteen minutes of stretching and strengthening exercises do not compensate for seven hours of static loading of the shoulder girdle or repetitive hand/wrist motions."* Exercise programs are not, if designed properly, a bad thing – especially since they may provide a welcome break from work, but they are no substitute for a comprehensive ergonomics program.

- **Vitamin B-6 and hot wax treatments** - OSHA reports that there is no valid scientific basis to conclude that such remedies are effective in preventing WRMSDs.

- **Job rotation (when poorly designed)** – rotating from one repetitive job to another repetitive job will not result in a reduction in WRMSDs; in fact, it can actually increase the rates of WRMSDs. Job rotation may be effective in reducing WRMSDs only in certain cases and only if the jobs involved in the rotation use different muscle groups – such as rotating from a rebar tying to a service job.

- **Screenings/Vibrometers** – some employers screen new hires and others with devices called "vibrometers" to determine whether the individual has or is likely to have carpal tunnel syndrome. There is no scientific evidence to show that these devices can detect the early symptoms of carpal tunnel syndrome or predict the likelihood that someone will develop the condition.

Ergonomic Job Design and Worker/Union Involvement

Workers and the unions that represent them have important and essential roles to play in designing control measures that effectively eliminate or reduce ergonomic hazards in the work place. Workers understand their jobs better than anyone else, and unions understand the full impact of design changes on workplace organization.

There is no technical reason that all jobs cannot be redesigned to eliminate or significantly reduce worker exposure to ergonomic risk factors. WRMSDs can be effectively wiped-out as a significant workplace problem when workers have the means to change their work environments.

Group Exercise 3:

Select a work activity for the exercise – select one that causes pain. Now have one person in your group act out doing the job – use any props that are available. The group should observe the person acting out the work and think about how to redesign the job in ways that would eliminate or reduce the risk of musculoskeletal injuries. Discuss all the ideas generated by the group. Select one physical redesign idea and one workplace organization redesign idea. Each design solution should meet the following criteria:

- Eliminates or significantly reduces worker exposure to ergonomic risk factors (identify the risk factors eliminated),
- Accepted by workers as a viable solution,
- Improves the overall working conditions for workers,
- Does not create new hazards, and
- A reasonable case can be made to management to adopt the change.

Act out the redesigned work activity.

Remember, ergonomics is about fixing the job, not the worker!

Prepare to demonstrate/explain your ideas and reasoning to the class.

Union Ergonomic Strategies

One of the labor movement's most basic "union values" is standing for the right to a safe and healthy workplace. Many union constitutions, bylaws and collective bargaining agreements reflect this value by including specific references to safety and health. For example, like many unions the International Union of Bricklayers and Allied Craftworkers' constitution contains the following union "objective":

"...Promoting the health, welfare and safety of BAC members and their families..." Taken from the BAC International Union Constitution

Many collective bargaining agreements contain general language like this:

"...No worker shall be required to work any job they believe to be unsafe..." Taken from an IBEW collective bargaining agreement

Values to action

To give the union value of safety and health on the job meaning, ***unions must take action!*** The strategies used by unions to combat ergonomic hazards are very similar to strategies unions have used for years to combat other types of workplace safety and health hazards. However, ergonomic solutions must continue to evolve as the nature of work changes and the scientific research advances. Still unions can benefit from the experiences gained in promoting safety and health with other types of workplace hazards.

Common Union Strategies Used to Promote Safety and Health on the Job:

- Develop a safety and health action plan
- Bargaining safety and health protections
- Documentation – hazard and injury identification
- Grievances or labor/management appeals
- OSHA inspections/complaints/compliance
- Joint safety and health committees
- Education, training and worker/member involvement
- Other_____?

An Action Plan for Locals

1. Find out if there is a problem in your workplace. Start a union ergonomics committee involving members on the health and safety committee and your executive board.

2. Collect information to convince management that workers are exposed to risk factors that have caused, or will eventually cause, disability and other problems due to WRMSDs. This can include using job checklists, reviewing records of injuries and illnesses by work area to identify high risk tasks, and surveying the members to identify the most fatiguing, repetitive or uncomfortable jobs.

3. Identify weaknesses in current employer programs or policies to address the problem. Review employer heath and safety booklets, written policies and required work practices, such as guidelines for lifting, tool use and valve turning. To what extent do they focus on worker behavior and avoid looking at workplace design? Are ergonomic problems considered during accident investigations? For example, if a worker strains her shoulder turning a tough valve, do investigators measure the force required to turn the valve and compare the results to published guidelines? Do they consider valve location and access?

4. Present your plan to management. Push the employer (or joint employers) to set up a comprehensive ergonomics control program with union/worker involvement in identifying and solving problems. See the following page for the elements to include in a program.

5. Determine which problems to work on first. Start with a problem that the members agree is important, affects the most people, presents a clear hazard, and is fairly straightforward and inexpensive to solve. Solving easier problems first helps build support for your committee's work. Engendering worker enthusiasm and commitment can make it easier to solve big problems later.

6. Keep the members involved. Involve them in your research of problems, through use of surveys and interviews. Use unit safety meetings to give an overview of ergonomics and then brainstorm to identity problems on that unit.

Components of a Union-Management Ergonomics Plan and Agreement

Local unions in manufacturing have negotiated agreements to establish joint programs to address ergonomic programs for several years. Other union sectors can look to these agreements as models and tailor them to fit their own specific industry or trade.

The written agreement should cover the following areas.

Establish an ergonomics program for each bargaining unit/area covering seven elements:

- a joint committee,
- job analysis to identify problems,
- hazard control,
- different levels of training depending on responsibility,
- eliminate employer policies that discourage the reporting of symptoms, injuries, illnesses or hazards,
- medical management, and
- evaluation and follow-up

1. Worker/Union involvement through a joint ergonomics committee that provides an equal number of union and management representatives. The union selects its own representatives, and serves as co-chair. The committee must have a plan that includes meeting monthly, receiving special ergonomics training, and having access to information and qualified experts.

Tests of Union Equality in Joint Committees

1. Do union members have a practice of meeting separately; bring up agenda items and planning strategy before meetings?
2. Do the union and the employer have an equal number of representatives?
3. Does the union have sole right to appoint its representatives?
4. Do the chair and secretaryship rotate?
5. Do committee functions include: frequent unannounced safety walk-arounds? Investigation of accidents?
6. Who makes up the agenda and approves the minutes?
7. Is it easy to get the minutes accurately corrected?
8. What happens if there is a tie vote?
9. Does operating management take action on committee recommendations?
10. Does the committee have access to all employer data it needs?
11. Do union safety committee members receive lost-time pay for their work time safety and health activities?

2. Current jobs are analyzed by teams of bargaining unit employees, supervisors and engineers and other needed experts to identify and evaluate problem areas. Includes analyzing worker injury and illness records and using surveys and checklists to identify possible high-risk tasks. Next, risks are evaluated on-site, taking measurements for force, awkward postures, etc as needed. The high-risk jobs are identified and the team develops ways to improve the job. Timetables are then set for corrective actions.

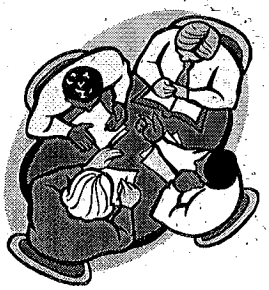
3. Hazard Control: implementing corrective action
Management agrees to correct hazards within six months of job analysis, using principles of job redesign. Job is then evaluated to make sure interventions are working.

4. Worker training covers general awareness of symptoms of repeated trauma injuries and illnesses, understanding of job risk factors, importance of early medical treatment, and overview of ergonomics and the plant ergonomic control program. Team members and plant-wide committee members receive more in-depth training.

5. Eliminate programs, policies or practices that discourage the reporting of symptoms, injuries, illnesses, or hazards
To have a serious program, there can be no policy or practice that discourages employees from reporting symptoms, injuries, illnesses or hazards. No fault disciplinary policies that threaten and deliver discipline when injuries are reported puts undue pressure on employees not to report symptoms and injuries. Safety incentive programs that reward employees when injuries are not reported also discourages reporting. Without the ability of employees to freely report symptoms and injuries, any ergonomics program is likely to fail.

6. Medical program is designed to provide early detection and treatment of job-related ergonomic problems and is conducted by medical staff trained in ergonomics. Employees are encouraged to report early symptoms of repeated trauma injuries; a nondiscrimination clause and procedure for handling job restrictions is included. Problems reported by workers and information from periodic worksite walk-throughs by medical staff are used to trigger job analysis.

7. Evaluation of the program. Additional provisions cover ergonomic audits to document whether corrected jobs have in fact reduced ergonomic risk factors, recordkeeping and sharing information with committee members, reporting the findings of audits with other facilities in the employer organization, and outlining a procedure for resolving disputes.



Negotiating an Ergonomics Program or Policy[14]

In General:

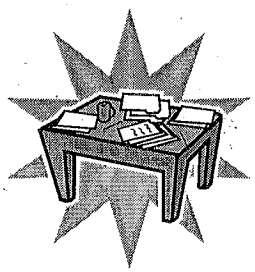
Many parties, both in labor and management, recognize the importance of an having an ergonomics program or policy—employees' health is protected, and employers may reap

[14] From BNA's Collective Bargaining Negotiations and Contracts.

financial benefits from improved productivity, decreased absenteeism, and lower health care and workers' compensation costs.

How parties address ergonomics in collective bargaining agreements varies widely. Ergonomics is a safety and health issue, which the National Labor Relations Board has determined is a **mandatory subject of bargaining**. However, the Occupational Safety and Health Act charges employers with providing a safe and healthful workplace. In light of these two mandates, some parties opt for contract language allowing the employer to establish safety rules, including those covering ergonomics, subject to the union's right to file grievances over new or changed rules. Some parties choose to form a joint committee to advise management on ergonomic issues, while others formulate a comprehensive ergonomics policy.

Bargaining Approaches/Arguments at the Table



Base your arguments on these principles and issues:

1. Every worker has the right to a safe and healthy workplace and ergonomics programs help to realize this right.
2. Ergonomics programs protect employer investment in "human capital" (investments in training of current employees, knowledge and job skill which comes with longevity, etc.).
3. Older and valuable skilled employees may be more susceptible to musculoskeletal disorders – an ergonomics program will help to keep these workers on the job.
4. Ergonomic programs have been shown to improve worker efficiency and productivity. Ergonomically sound work processes are very often more efficient from an engineering standpoint.
5. Effective ergonomics programs have been shown to decrease absenteeism.
6. Ergonomics programs can lower health care and workers compensation costs with healthier employees.
7. Ergonomics programs reduce turnover.
8. Ergonomics programs that emphasize worker/union involvement improve employee morale and quality of work life.
9. Initial costs can be quickly recouped by savings noted above; additionally, many costs of changing work design are very small.
10. Many employers are installing ergonomic programs (see if you can determine if competitive employers are doing this).
11. Public relations plus—become known as a model responsible employer; makes it easier to attract new employees.
12. Ergonomics work can be a joint "win-win" labor management effort.

Documentation - Collect Information to Back Up Your Concerns

- **OSHA 300 logs** – the new OSHA 300 log no longer includes a separate listing of musculoskeletal disorders, but WRMSDs remain reportable when they result in days away from work, transfer to another job, restricted work, or medical treatment beyond first aid.[15]
- **Workers' compensation records** – employers are required to report any lost time injuries to the state workers' compensation division. These reports can be obtained directly from the employer or can be obtained pursuant to a freedom of information request with the state agency in charge of administering workers' compensation. Workers' compensation records can be used to ascertain the costs of WRMSDs. Typically these costs are broken down into two areas: medical costs (may include rehabilitation costs) and disability costs (any payments made directly to the worker for lost work time and payments made for settlement of a permanent injury).
- **Review health and welfare fund claims utilization data** – both employer health plans and joint (Taft-Hartley) health and welfare funds will keep detailed medical and health insurance data called "claims utilization data". Claims utilization data shows the amount of insurance claims paid out by the insurance plan for health claims and can be broken down by type of medical expense. So for example, you could find out how many claims were paid for treatment of carpel tunnel syndrome. The information can be "sanitized" meaning that the names of the individuals filing the claims are not revealed to protect medical privacy.
- **Payroll records or "shop reports"** – payroll records are useful for obtaining information on the number of hours worked (information needed to calculate incidence rates), but seldom tell much about WRMSDs or risk factors. Payroll records may indicate which classifications are off work more – which may (or may not) stem from WRMSDs.
- **Employee surveys, observation, photographs and video recording** – surveys can be used to obtain information from workers about the extent and location of their aches and pains, as well as, identifying job tasks that cause the aches and pains. Direct observation can be used (by a union safety representative or steward) to observe demonstrations of the motions used by the worker, which can help lead to solutions. Photographs and videotaping can be used to educate members on work practices and to help identify risk factors and solutions.
- **Collect testimony** – anecdotal testimony of workers affected by WRMSDs can often provide powerful and compelling examples of why action is needed. Using "real life" examples is often one of the most effective tools available to convince employers that the problem is real and needs to be addressed.
- **Get examples (and costs) of control measures used by other employers or trades** – there are many examples of lowering medical costs, improving productivity and preventing injury through joint labor-management ergonomic programs. OSHA, NIOSH and other safety organizations cite examples.

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[15] Prior to adopting the OSHA 300 log in January 2002, employers were required to separately list musculoskeletal disorders. With the OSHA 300 log employers are still required to log musculoskeletal disorders when they result in days away from work, restricted work, transfer to another job, or medical treatment beyond first aid; however, they are reported and grouped with all other injuries and illnesses on the log. See 29 CFR §1904.12.

- **Safety and accident reports** – Accident reports and other records maintained by the employer typically record workplace accidents, rather than cumulative problems associated with many WRMSDs. As such safety and accident reports are usually not a good source of information for documenting WRMSDs.

Think of these bargaining tactics if you are not able to get a completely satisfactory ergonomics program at first:

- start incrementally, with general language which can be built on through practice,
- establish a joint ergonomics committee to develop, implement, and monitor the effectiveness of the ergonomics program,
- establish a general joint safety and health committee – or use one you already have – to work on ergonomics,
- begin with a pilot project, in one part of the workplace or with one group of workers, or for a limited period of time - then the pilot can be studied to discover impacts and advantages for both parties and hopefully expanded,
- commission a study, using an outside, jointly chosen consultant with a management commitment to address major issues discovered by the study,
- stress the fact that although the OSHA ergonomics standard is not in effect, the employer still has the general duty to provide a workplace free from recognized hazards which are causing or likely to cause serious physical harm - many ergonomics programs have been instituted through a settlement agreement as a result of a union OSHA complaint, and
- get the employer to agree to follow recommendations developed by established independent bodies your national union recommends.

Grievances and/or Labor-Management Appeals on Ergonomic Hazards

Look over your contract. Your contract's current language may be sufficient to grieve ergonomic hazards in the workplace. Is there any health and safety language? Unless there is language to the contrary, you have the right to grieve unsafe and unhealthful working conditions, since this is a mandatory bargaining item. In any case, you may grieve conditions that violate federal or state codes.

For example a "General Duty" clause makes the employer responsible to provide safe work and a safe workplace. A general duty clause is a catchall way to cover just about any health and safety problem. Other clauses dealing with the right to refuse unsafe work, personal protective equipment, and tool purchases may also be a basis for grieving ergonomic hazards.

Sample contract language:

General Duty
Occupational health and safety is the mutual concern of the Employer, the Union and employees. Employees or the Union shall report safety and health hazards of which they are aware to their supervisor. The Employer shall provide a safe and healthy workplace and shall,

comply with applicable federal, state and local safety laws, rules, and regulations. Nothing in this Agreement shall imply that the Union has assumed legal responsibility for the health and safety of employees.

Right to Refuse Unsafe Work (No Discrimination)
An employee acting in good faith has the right to refuse to work under conditions that the employee reasonably believes present an imminent danger of death or harm to the employee. The Employer shall not discipline or discriminate against an employee for a good faith refusal to perform assigned tasks if the employee has requested that the Employer correct the hazardous conditions but the conditions are not corrected, and the danger was one that a reasonable person under the circumstances would conclude is an imminent danger of death or serious harm. An employee who has refused in good faith to perform assigned tasks shall retain the right to continued employment and receive full compensation for the tasks that would have been performed.

Personal Protective Clothing and Equipment
Personal protective clothing and equipment shall be furnished and maintained by the Employer without cost to employees whenever such equipment is required as a condition of employment or is required by OSHA or other agency or is necessary to protect the safety of the employee.

Purchase of Tools
The employer shall provide all the necessary tools of the trade. The Employer shall ensure that all such tools are properly maintained and in good operating order to prevent harm or injury to the employee.

How could any of the above contract clauses be used as a valid basis to file a grievance (or labor-management appeal) on an ergonomic hazard?

What would you need to show to win the grievance?

What are the pros and cons of using the grievance approach to combat ergonomic hazards?

OSHA Compliance/Enforcement

Even though the OSHA's Ergonomics Standard was repealed, OSHA still requires employers to provide a workplace free from recognized hazards. OSHA continues to have the ability to inspect workplaces to identify the presence of workplace hazards, including ergonomic hazards, and use the General Duty Clause (Section 5(a)(1) of the Occupational Safety and Health Act) to cite and fine employers for ergonomic hazards. This section of the Act requires employers to provide work and workplaces that are free from ***recognized*** hazards. OSHA has cited employers for certain ergonomic hazards under the General Duty Clause and the repeal of the Ergonomics Standard (which did not apply to construction work) does not change OSHA's ability to issue citations for ergonomic hazards in the future.

There are, however, specific criteria for using the General Duty Clause to compel employers to correct ergonomic hazards. OSHA must consider the "incidence rate" of WRMSDs (the number of cases of WRMSDs per 100 employees) and the "severity rate" (number of lost work day cases of

WRMSDs per 100 employees) in a certain workplace. Documentation, therefore, is essential when OSHA compliance is sought.

Forming – or Strengthening -- a Safety and Health Committee

If you haven't already negotiated a joint safety and health committee, work to make it happen. If your union has already negotiated a committee, look for innovative ways to strengthen the committee and to expand its mission to specifically include eliminating/reducing ergonomic hazards. It's possible (in fact ideal) that your current committee work on eliminating and/or reducing ergonomic hazards.

Model Contract Clauses Creating a Joint Safety and Health Committee:

1. Joint union-management committee:
There shall be a joint labor-management health and safety committee. The committee shall be composed of an equal number of management and union representatives. The local union shall select the union representatives.

2. The joint committee shall perform the following functions:

a. Meet at least once every month at established dates.
b. Make periodic inspections of the workplace/jobsite at least once every month.
c. Make recommendations for the correction of unsafe or harmful conditions and the elimination of unsafe or harmful work practices.
d. Review and analyze all reports of injury or illness, investigate causes of same, and recommend rules and procedures for the prevention of accidents and disease and for the promotion of the health and safety of employees.
e. Promote health and safety education.
f. Accompany government inspectors and employer consultants on all surveys of the workplace/jobsite and participate in these inspections.
g. Investigate any worker exposure to potentially dangerous substances, fumes, noise, dust, etc.
h. Be notified by the employer of any proposed measurement of worker exposure to any potentially dangerous conditions and be involved in these measurement procedures.
i. Receive in writing the identification of any potentially toxic substance to which the workers are exposed together with all material safety data sheets.
j. Investigate ergonomic hazards in the workplace and recommend specific steps to eliminate those hazards.

3. The employer shall keep full and accurate minutes of all matters discussed at all meetings and provide union representatives with copies.

4. The employer shall pay union members of the committee at their regular rate for all time spent on committee business, including time spent in inspections, handling of safety problems, accompanying inspectors, and in meetings.

5. The employer agrees to provide the committee with adequate equipment and training for measuring noises, air contaminants, and other workplace hazards. Specifically, the employer shall pay all reasonable costs of training and lost time, when necessary, for the union committee members.

6. Committee recommendations and processes shall be considered an adjunct of, and subordinate to, the regular grievance procedure. All disputes and disagreements arising under the health and safety clauses of this contract, if not disposed of by the safety and health committee, shall be subject to the grievance procedure.

7. The committee may ask the advice, opinion and suggestions of experts and authorities on safety matters. The committee or union representatives thereof shall have the right to call to the plant such experts and authorities, as well as international representatives of the union; and they shall be permitted to make such examinations, investigations and recommendations as shall be reasonably connected with the purposes of the committee.

Legal rights your committee has under OSHA and the NLRA

- The right to any and all health and safety information, including monitoring and medical surveillance information.
- The right to statistical data on employee medical examinations, with individual names removed.
- The right to individual medical records, with signed permission of the individual.
- The right to bring a union expert onto the jobsite to conduct inspections and monitoring of hazards.
- The right to file OSH grievances under your contract (unless specifically waived).
- The right to file and follow up on OSHA complaints.
- The right to accompany the OSHA inspector on workplace inspections.

Education, Training and Worker/Member Involvement

Education and training programs should involve much more than teaching workers how to use a new tool, where personal protective equipment or about changing worker behavior. Effective programs educate workers as to the root causes of ergonomic hazards and empower them to take positive steps to eliminate those hazards. Education and training that is not followed by positive action will lead to frustration and cynicism.

Effective education and training programs exhibit many or all of the following characteristics:

- Designed jointly by the union and management and including training on fundamentals of ergonomics, risk factors and control measures for ergonomic hazards on the job, how to recognize the signs and symptoms of WRMSDs, and how to report symptoms and injuries,
- Management commitment to implementing reasonable controls measures identified by workers through the training,
- Training agenda is not dominated solely by employee behavioral issues – includes attention to engineering, administrative and work practice controls,
- Instructors chosen jointly by union and management,
- Program agenda is highly interactive and draws from the experiences of the participants,
- Group exercises designed to involve all workers from diverse backgrounds,
- Does not interfere with collective bargaining and union rights,
- May include union training independent of management to offer opportunities for open discussions with independent union strategies,
- Training on paid time,
- Supervisor and other key personnel receive ergonomic training.

Group Exercise 4:

Note: Small groups should include participants from the same workplace or trade.

Think about and discuss ergonomic hazards in your workplace or trade. Select one that you would like to improve following the program. Answer each of the following questions and prepare to explain your plans to the class.

1. What ergonomic problem/hazard would you like to fix and why?

2. What information do you already know about the problem that will help you solve it?

3. What other information will you need to collect and how will you collect it?

4. What solutions would you like to achieve? What is your goal?

   Short term solution(s)

   Longer term solution(s)

5. What barriers will you face trying to solve the problem?

6. How can you overcome these barriers? What strategies will you use?

7. Who else within your union can you involve in helping to solve the problem?

8. List five things that will need to get done in order to solve the problem – specific actions you and your union can take:

Task	Who	Resources Needed
1.		
2.		
3.		
4.		
5.		