

**BUILDING
POWER**

**Steelworkers' District 3
Health and Safety Conference**



**It's Not Enough
To Be Sad**

**SECTION 1
ERGONOMICS**



WHAT'S AN MSI?

Musculoskeletal injuries (MSI) are disorders of muscles, bones, blood vessels, tendons, nerves and other soft tissues in the body. Musculoskeletal injuries are referred to in a variety of ways.

Expressions used to describe the range of disorders are:

- Carpal Tunnel Syndrome
- Trigger Finger
- de Quervains Syndrome
- Tendinitis
- Ganglion
- Tenosynovitis
- Epicondylitis (Tennis Elbow)
- Raynaud's Phenomenon (White Finger)
- Back injuries
- Tired neck syndrome

These injuries or diseases are seen in workers who:

- Maintain fixed positions;
- Perform repetitive movement of the limbs;
- Overload particular muscle groups;
- Apply pressure on body parts;
- Use forceful movement; and

Work with great speed along with repetitions.

Since 1717, numerous references have been made to various musculoskeletal injuries in the literature. Although there are repeated references to occupational factors, the literature is mainly concerned with diagnosis and

MSI has been identified for a very long time. Ramazzini (1717), commonly regarded as the father of modern occupational medicine, wrote:

“Various and manifold is the harvest of diseases reaped by certain workers from the crafts and trades that they pursue; all the profit that they get is fatal injury to their health...mostly from two causes. The first and most potent is the harmful character of the materials that they handle...the second cause I ascribe to certain violent and irregular motions and unnatural postures of the body, by reason of which the natural structure of the vital machine is so impaired that serious diseases gradually develop therefrom.”

treatment. Relatively little deals with prevention of musculoskeletal injuries.

BC and Saskatchewan are the only provincial jurisdictions which have ergonomic regulations. Our Ergonomics Regulation Campaign has been successful in putting the issue on the occupational health and safety legislative agenda across the country. Part 2 of the Canada Labour Code was changed to require employers to comply with ergonomics standards. The Newfoundland Task Force on Workers' Compensation recommended ergonomics regulations for that province (now called Newfoundland and Labrador). The Manitoba Task Force on Workplace Safety and Health made a similar recommendation. Our President and Secretary-Treasurer met with the Ontario Minister of Labour on February 28, 2001, International RSI Awareness Day, to impress upon him the need for ergonomic

regulations. Our petitions have received wide support among our membership with thousands of signatures collected. We will not rest until all provinces have ergonomics regulations, effectively enforced.

The recent focus of health and safety in workplaces has been on chemical hazards. While there is awareness and interest in controlling chemical hazards, little interest has been shown in musculoskeletal injuries.

The Workers' Compensation Boards for the Canadian provinces have been reporting that approximately 50 per cent of claims are related to soft tissue injuries. Though these statistics have no real faces attached to them, most Steelworker members and their families know someone who has been affected by repetitive strain injuries. We did not go to work to die or to be



maimed. We went to work to earn money in order to support our families and make the world a better place for our children.

An Invisible Problem

If musculoskeletal injuries are such a problem, why isn't more being done about it?

There are several reasons for inaction:

1. Lack of knowledge about musculoskeletal problems.

Workers, unions, management and the medical profession do not understand what causes some workers to be afflicted while others are not. Management has tended to "blame the worker" rather than the workplace and has downplayed the importance of working conditions.

2. Musculoskeletal injuries do not kill.

Most stricken workers do not die from musculoskeletal injuries. If a worker is diagnosed as having cancer from work-place hazards, emphasis is put on preventing anyone else from getting it. However, if a worker is diagnosed with Carpal Tunnel Syndrome or "Tennis Elbow" often little concern is shown.

3. Musculoskeletal injuries are difficult to diagnose or may have non-occupational causes.

It is hard to explain or prove to someone that you have back pain or that your fingers are numb. Pain is subjective and not easy for even doctors to diagnose.

Often workers in pain are accused of being lazy or malingerers. These diseases and injuries are invisible. If you cut off a finger or break your arm everyone can see the injury. Try telling your supervisor you have a bad back and your doctor says that you shouldn't be lifting heavy objects and watch his/her reaction. Also, it is sometimes difficult to show an occupational cause or contribution for your disablement.

4. Workers do not report aches or pains until it is too late.

Some workers do not recognize their aches and pains as being associated with their workplace, while others are just unwilling to complain. Some workers are coerced by supervision not to complain. Some are on piece work or quota systems. These systems give workers incentive to go faster or work harder, even if they are in pain. Others just have a "macho" attitude and think it a sign of weakness to complain about aches and pains.

SYMPTOMS AND TREATMENT

Pain is usually the main symptom of musculoskeletal injury. The pain commonly occurs in the hands, arms, shoulders, neck, back, legs and feet.

"One worker with symptoms is a cause of concern for all."

Many people also suffer from swelling, numbness, tingling, feeling of heaviness and tiredness in the affected area. Symptoms will vary from worker to worker. Some workers may be afflicted with more than one type of musculoskeletal injury and will have multiple symptoms.

Although symptoms overlap and vary from person to person, workers can use the following table as a guide when discussing the severity of symptoms associated with musculoskeletal injuries in their own work-place.



Stage I Symptoms

Pain is noticeable but more as a dull ache, which disappears with rest. Aching and fatigue in the affected limb during work hours, which settles at night and weekends.

Stage II Symptoms

Reduced capacity for work and performance of repetitive daily tasks. Recurrent aching and fatigue occurring shortly after work commences and continues after work ceases. Fatigue is often present due to intermittent night pain.

“The longer you work with pain, the slower the recovery and the greater the risk of permanent disability.”

Stage III Symptoms

Inability to perform less arduous tasks or light duties. Person's lifestyle is often affected by inability to perform daily tasks. Persistent aching and fatigue and weakness while at rest, plus pain with even non-repetitive movement.

Adapted from; Kemp, M., Repetitive Strain Injuries - A Need for Proper Management, People and Work, 10 (1) pp. 25 -28, 1984

Joint health and safety committee members and worker representatives need to ensure that any jobs causing Stage I Severity are investigated for the causes. Most management usually do nothing about musculoskeletal injuries until after a claim for compensation has been filed.

If we count the workers who experience pain during the work day, the number affected by musculoskeletal injuries is phenomenal. Remember, symptoms will only progress if the worker continues to work in pain.

What do You do if You Think You May Have a Work-Related Musculoskeletal Injury?

- Go to your own doctor or Workers' Clinic.
- At the first sign of Level I symptoms notify your JHSC worker representative or Steelworker compensation representative.
- To help in the diagnosis, you should describe your workplace and work practice in detail. You can seek a second opinion for confirmation of diagnosis.
- Claim for Workers' Compensation. You are entitled to claim for injuries or disease caused or arising out of your work. Make sure your doctor or chiropractor fills out the appropriate form (Doctor's first report) or the (Chiropractor's first report) and sends it to the Workers' Compensation Board. If you have concerns or questions contact your JHSC worker representative and/or Steelworker compensation representative.
- The best chance of returning to work is if the work conditions are changed. This will also prevent other workers who do the same job from incurring the injury.
- Your employer is supposed to accommodate you when you return to work after your injury (as provided by recent amendments to Workers' Compensation Act). If your employer tries to get rid of you after you've had a long period off work because of your injury, you should take appropriate action and contact your local union.

Treatment

Workers afflicted with MSI should be actively treated by their own personal physician or chiropractor. The treatment, usually prescribed, for



musculoskeletal injury is rest. The length of rest varies from doctor to doctor. Rest from work includes rest from household duties and other manual activities. Other treatments include:

- Splints, elastic bandages, neck braces;
- Cortisone injections;
- Physiotherapy, massage, and acupuncture;
- Vitamins, tranquilizers and pain killing tablets;
- Hot and cold compresses;
- Surgery.

Of course these treatments are at best remedial. And often, as is the case with surgery for instance, they simply don't work or provide only partial recovery – hence the added urgency for workplace solutions. Injured workers must not return to a job that has not changed. Prevention of MSI, through design or redesign is the most effective treatment.

Victims of MSI

More and more workers are falling victim to musculoskeletal injuries. Compensation statistics have been of some use in helping to identify specific occupations and industries that cause MSI. The nature of work plays a major role in determining which workers may be afflicted.

In general, high risk workers are employed in jobs having the following characteristics:

- Physically demanding;
- Highly repetitive;
- Excessive work rates;
- Awkward working positions;

- Poor workplace, tool and equipment design;
- Bonus and piece rate systems;
- Lack of job variation;
- Inadequate rest breaks;
- Compulsory overtime;
- Vibration.

More specifically, compensation studies have identified certain occupations and industries that have a high incidence of. Some of these are:

- Food processing industries (such as meats, poultry);
- Clerical - typing and data processing;
- Electronics components manufacturing;
- Musicians;
- Cashiers;
- Hospital workers (such as RNs, RNAs, orderlies, cleaning staff, etc.);
- Garment workers;
- Assembly line workers;
- Hairdressing/barbering;
- Cleaning industry (such as scrubbers, polishers).

Union Involvement

There are several reasons why Steelworkers, Joint Health and Safety Committee representatives and union leaders need to be involved in controlling musculoskeletal injuries in their workplaces.

Fewer Injuries/Diseases, Less Pain and Suffering:

Obviously this is the most important reason for action. Unions have “led the charge” for years to make workplaces safer and healthier for



their members. Participation by union representatives in training programs such as MSI will ensure someone in the workplace is aware of the hazards and is working to eliminate them.

Discrimination Against Workers:

Management harassment of injured or disabled workers has taken place in workplaces for years. For example, many union representatives have defended a fellow worker, whom management tried to fire because of a bad back. Instead of correcting the workplace hazard, some employers argue that workers are careless, are too old or are female and cannot handle the tougher, physical jobs. The unions need to communicate that management policies are responsible for them having to “pick up the slack” when one of their co-workers is injured. Too often management tries to blame the injured worker.

Workers' Compensation Appeals:

The Steelworkers represent their members at Workers' Compensation appeals. A limited number of musculoskeletal injury cases have been approved for compensation benefits. History tells us the onus will be on the worker to prove a causal relationship between the injury/disease and the workplace. Again the system seems to “blame the worker” for his/her injury rather than the workplace.

Psychological/Social Problems Associated with Musculoskeletal Injuries:

Musculoskeletal injuries affect many aspects of workers' lives. A worker suffering from MSI is not only unable to work, but will have difficulty doing household jobs, gardening and shopping, among other things. As well as coping with the physical and financial problems, the injured worker often has to deal with the fact that doctors, employers, workmates, friends, and relatives don't believe them. Steelworker

representatives understand this and form support groups for injured workers such as Employee Assistance Programs.

DESIGNING THE WORKPLACE TO “FIT THE WORKER”

Workers and their representatives need to have an understanding of basic workplace design principles. The section, “Designing the Workplace to Fit the Worker,” is not intended to overwhelm the participant with scientific terms. Although the subject matter is quite technical, the knowledge and skills obtained will be weapons Steelworkers can use in their battle to create better working conditions.

“The women had to pinch and twist the material together with their hands to run through a sewing machine. Surely we can redesign a feeder to hold the material so that workers don’t have to twist their wrists and hold their hands in such unnatural positions.”

*Clarence MacPherson
Executive Director
Workers Health and Safety Centre*

The collection of sciences used in designing the workplace is called “Ergonomics”. The word ergonomics comes from the Greek words “ergo” meaning work and “nomos” meaning law – in other words, the law of work. Ergonomics or Human Factors Engineering is the application of knowledge for the design of workplaces and jobs to fit working people.

Work design sciences may be used to support worker recommendations for changing the workplace. But they may also be used by management to resist change by proving scientifically there will be no adverse affect on the worker.

Workers have to be aware of both situations and develop their arguments for workplace design accordingly.

Ergonomics has assumed an important role, in recent years, when designing new workplaces and equipment. However, workers are still faced with many



poorly designed workplaces which contribute to both short and long term health problems.

All too often little thought is given to relating the task to human capabilities. Workers are either not consulted or their input is not considered.

The objective of occupational ergonomics is to ensure worker health, safety and well-being by eliminating workplace design-related problems. Steelworkers support this objective. The best approach to solving problems is to fit the job to the worker, not the worker to the job. With this basic principle in mind, we can work towards reducing or eliminating musculoskeletal injuries.

HUMAN/MACHINE SYSTEM

Ergonomics is based on five separate components that interrelated to form a human/machine system. This system operates like a clock with the worker in the centre.

Problems often arise when workers are expected to do tasks without the aid of machines, such as heavy physical work, or when worker input is not solicited. It is important that the job is matched to the capabilities and limitations of the workers.

The best approach when designing a workspace and/or job is to determine the tasks involved and carefully study the design prior to implementation. This has a major effect on how comfortably and efficiently workers will perform their tasks. With input from all parties concerned, especially the worker, problems can be eliminated before they begin.

To accomplish the objective of occupational ergonomics, preventing work-related ill health effects, consider the following:

- Characteristics of the workplace and environment;
- Design and use of tools and equipment;
- Level of physical and mental work required;
- Capabilities and limitations of the worker.

THE SCIENCES BEHIND ERGONOMICS

The general layout of the workplace is determined by the amount of space necessary for the operation, including workers and equipment. Often, the physical variations of people, their capabilities and limitations are not considered. Ergonomics evaluates such differences and uses three human biological sciences: anatomy (anthropometrics), physiology and psychology.

Anthropometry

One of the primary concerns of ergonomics is to develop dimensional data about body size. To determine this, data on height, girth, arm length, etc. must be gathered. The science of such measurement, a branch of anatomy, is called anthropometry. Anthropometric measurements are available from a number of sources (much of it from the military) and are used to determine how to make the workplace fit most of the potential workforce.



Physiology

Physiology is the science of how the body functions. When applied to workplace redesign, physiology involves a number of specialized disciplines; work physiology, biomechanics and environmental risks.

a) Work Physiology

Work physiology deals with ways to design work so that the requirements of a job don't cause muscular fatigue. The basics of work physiology are not difficult to understand. If you know the force exerted, the distance a worker must exert the force (i.e., how far they must push a cart), and the time, energy expenditure can be calculated.

There are two factors that influence the measurements made for energy expenditure – the variation in energy use in workers, and the type of work being performed. Further, there are two types of work – static and dynamic.

Static, or isometric work, occurs when muscles are tensed or contracted without moving. An example of static work is holding a box in front of you at arm's length. No movement occurs, but the task becomes intolerable. Engineers might argue that no work is being done because there is no movement. However, static work can physically stress the body by trying to maintain fixed and sometimes awkward postures.

Dynamic work, on the other hand, involves contraction and relaxation of muscles used for instance, when digging a trench or scrubbing a floor. Dynamic work provides momentary rest (muscles contract, rest, contract, rest). This encourages blood flow to provide the necessary oxygen and nutrients and remove the unwanted products of metabolism. Dynamic work is considered much less tiring than static work. For this

reason, one of the goals of ergonomics is to design equipment, procedures and workplaces to reduce static work.

WORKER ALERT!
Even dynamic work can cause MSI, if done for too long a period, at too fast a pace or with no rest periods.

b) Biomechanics

Biomechanics is the study of the applications of force by the body in tasks such as lifting or pushing. Biomechanical factors must be considered to reduce or limit the stress put on the musculoskeletal system.

c) Environmental Risk Factors

The work environment is no less important than the design of the workplace. It can also be a source of stress for workers. Environmental physiology studies physical conditions like noise, vibration, heat/cold and chemical contaminants. These environmental factors can have a huge impact on workers' health.

Psychology

Psychology is the study of human behaviour. Numerous conditions in the workplace can affect the behaviour of the worker:

- Design of controls and displays;
- Man/machine information exchange;
- Social and economic conditions of work such as stress, shift work, fatigue and accidents.



These circumstances can directly affect the workers' mental and emotional health.

Design of the workplace is the most effective technique to prevent musculoskeletal injuries. The sciences of workplace design, discussed in this section, are not mystical or hard to understand. In most cases, the principles have been known to workers for years. Ways of lessening the effect of poor workplace design were invented by workers through necessity and the natural desire to make their jobs easier.

Workers, with an understanding of these basic workplace design principles can strengthen their arguments for change. By utilizing what is currently known and what continues to be learned about workplace design and human factors, workers can ensure injuries and health problems are significantly reduced or eliminated. Keep this thought in mind, workers are the workplace experts. Steelworkers know their workplaces and workplace hazards better than anyone who visits occasionally.

Parts of the Body Affected

The upper extremities – the fingers, hand, wrist, forearm, elbow, upper arm, neck and shoulder – are used in nearly all physical work activities. This accounts for the high number of injuries to the upper body. These injuries or diseases usually occur over a long period of exposure and are referred to as chronic injuries or disease of the musculoskeletal system.

Symptoms of upper body musculo-skeletal injury include pain, swelling in the affected area, tingling sensations, numbness and even loss of involuntary functions (i.e., perspiration).

Workers must be encouraged to report any of the above symptoms to his/her health and safety rep as soon as possible.

Occupations prone to causing upper body musculoskeletal injury include:

- Painters
- Electricians
- VDT Operators
- Cashiers
- Auto assembly workers
- Mail sorters

Types Of Injuries/Disease

Many different musculoskeletal injuries of the upper body have been identified. They affect the tendons, nerves and circulatory system. Commonly reported musculoskeletal injuries or disease of the upper body include:

- Tendinitis
- Bursitis
- Tenosynovitis
- Ganglionic cysts
- de Quervain's disease
- Carpal tunnel syndrome
- White finger
- Cerbital tunnel syndrome (Telephone operators elbow)
- Trigger finger
- Pronator teres syndrome
- Radial tunnel syndrome
- Epicondylitis (Tennis Elbow)
- Bicipital tenosynovitis or bursitis
- Rotator cuff syndrome



- Thoracic outlet syndrome
- Chronic strains
- Myofascial disorders

Tendons

Tendons are leather-like tissues that transfer forces and movements from muscles to bones. Some of the tendons can be seen moving back and forth just below the palm and on the back of the hand, as the fist is opened and closed. Tendon injuries generally occur at or near the joints. The tendons become inflamed from rubbing on adjacent ligaments and bones.

Even though they are lubricated, both the tendons and the tendon sheaths can become irritated from repeated exertions in certain postures, and from mechanical stress. Common forms of irritation include the following:

Tendinitis: An inflammation of the tendon.

Tenosynovitis: An inflammation of the tendon sheaths.

Epicondylitis (Tennis Elbow): Inflammation of the tendons where they attach to the prominent bones at the sides of the elbow.

Tendon disorders can affect the hand, wrist, elbow and shoulder.

Nerves

The nerves provide sensory, motor (voluntary action) and automatic (involuntary action) functions in different areas of our bodies. Injury to a nerve results in impairment of nerve function in the area serviced by the nerve. The arm and hand are served by three major nerves: the ulnar,

median and radial nerves. These, like all nerves, have their origin in the spaces between the vertebrae of the spinal column.

It has been estimated that 25 per cent of all pressure sensitive nerve endings in the body are located in the pads of fingertips. Sensory feedback from the fingers is important to the ability to grasp and manipulate objects. Just enough force must be exerted.

With normal sensory function, approximately four pounds per square inch of pressure will be exerted on the handle of a hammer to keep it from slipping out of the hand. As much as 16 pounds per square inch may be exerted, without normal sensory function. This will make a task much more fatiguing and stressful. For example, working in cold environments and using gloves, can seriously affect worker performance.

Workers exposed to the repetition of movements such as carpenters, typists, assembly line workers and agricultural workers are also particularly liable to nerve injuries. Nerve disorders such as carpal tunnel syndrome, are associated with repeated or sustained work activities that expose the nerves to pressure from hard, sharp edges of work surfaces, tools or adjacent bones, ligaments and tendons.

Jobs requiring workers to hold their wrists in unnatural positions or use tools that are supported over the base of the palm (e.g., a screwdriver) can cause carpal tunnel syndrome. The workers who are affected include hairdressers (scissors), typists/VDT operators, supermarket cashiers and meat cutters. Victims of this disease lose strength in their hands and forearms. They may tend to drop things. Eventually surgery may be necessary to relieve compression on the nerve. However, if the person returns to the job which caused the problem, it will likely redevelop.

Two elbow disorders – Radial Tunnel Disorder and Pronator Teres Syndrome – occur when nerves are compressed between muscles in the forearm right below the elbow. Compression results when the forearm is



repeatedly rotated or with forceful movements. For example, this injury can happen when you use a manual screwdriver or tighten threaded components by hand. Electricians, assembly workers and instrument technicians in particular may be prone to these types of injuries. Meantime, Cubital Tunnel Syndrome (Telephone operators elbow) may occur from compression of the nerve when the elbow is supported on a hard work surface for extended periods of time.

Circulatory System

Repetitive work also causes damage to the circulatory system in the upper body. Blood vessels can be injured when exposed to prolonged cold or vibration.

White Finger or Raynaud's Disease is caused by vibration and is often seen in workers using jack hammers. The vibration causes reduced blood circulation to the fingertips. This condition results in pale, white skin, pain and loss of colour under the fingernails. White Finger impairs both the sense of touch and manual dexterity (the ability to manipulate objects with the hands).

Thoracic Outlet Syndrome affects the nerves and blood vessels of the neck and shoulder. Symptoms include numbness, tingling and burning sensations along the inner arm, forearm, hand and fingers. Serious damage to the tissues of the hand and arm can result if the condition goes untreated. Workers required to carry heavy loads with one hand or work with their arms overhead are particularly susceptible to this musculoskeletal injury. In general, jobs should be designed to keep the elbows in front of the body and at approximately waist height.

CONTROL OF UPPER BODY MUSCULOSKELETAL INJURIES

The basic concepts of “Principles of Control” can be used to control workplace hazards that cause musculoskeletal injuries. Remember that workplace health and safety is a problem of the workplace, and it is in the workplace that solutions must be found. In general, the controls must:

- Adequately control the hazard;
- Allow workers to do their jobs without undue discomfort or stress;
- Not create new hazards;
- Protect every worker who runs a risk of being exposed to the hazard.

The controls can be considered on the basis of where the control is actually applied:

- 1) At the source;
- 2) Along the path to the worker;
- 3) At the worker.

At the Source

Control at the source is by far the most effective means of control. By controlling at the source the hazard is totally eliminated from the workplace. Usually, control at the source involves a basic redesign of the work process or equipment. Job redesign on an assembly line could eliminate the need for the worker to stand for long hours while performing a task. Also, reservation attendants at an airline: the use of feeder belts from the check-in station to the main luggage conveyor completely eliminates the need for lifting luggage.



Along the Path

To prevent musculoskeletal injuries, control along the path to the worker is another effective means of control. The utilization of power assists, or fixtures to hold parts during assembly, are some common types of control along the path. A good example of controlling along the path is illustrated in a rubber grinding operation in a petro-chemical plant, for use in the production of high impact polystyrene. Workers were required to manually lift approximately 240 - 300 bales of rubber weighing 80 pounds each during their shift. A lifting device designed with a suction cup totally eliminated the need for the worker to lift the rubber bales. All the worker had to do was direct the lifting devices.

At the Worker

Controls applied at the worker – personal protective equipment and administrative controls – are the least satisfactory. Some personal protective equipment, if not carefully selected can actually cause serious injury to the worker. For example, a meat-cutter required to wear gloves to protect against cuts, often loses the “feel” of the knife and therefore tends to grip it tighter. This situation is worse if the worker is also required to work in a cold environment. The worker’s hand or wrist is likely to be injured because of the extra pressure required.

Administrative controls only attempt to control the worker rather than the actual hazard. Prescreening workers, job rotation, work breaks, teaching workers “how to lift” and eliminating “piece work and bonus systems” are examples of administrative controls. While some of these controls are desirable they are nonetheless remedial, failing to address the true cause of the problem and yet placing the onus of complying with prescribed controls on the worker.

Specific Upper Body Controls

Basic ways of controlling stresses to various parts of the upper body will be discussed in the following section. Worker or workplace representatives need to apply as many of these concepts as possible in their workplaces.

Hands and Wrists

Tools and equipment should be designed to keep hands and wrists from being placed in awkward positions.

Hand tools should be bent to conform to the natural contour of the hand so that the wrist can remain straight, or in a neutral position.

Bend the tool, not the wrist!

Grips on hand tools are another thing to consider. Handles should be designed to use the maximum strength capability of the hand using the “Power Grip”.

Handles should not be so large that it is difficult for workers to grasp or hold the tool. Consider all workers when looking at grips, as most hand tools are designed for larger, male hands. Grips should not be made too small either, or workers will have to strain just to hold onto the tool. “Your thumb and finger should slightly overlap around a closed grip,” is a good rule to follow when auditing the hand tools in your workplace for proper grip.

Tools, such as pinchers, should be designed so that the span of the tool when open is no more than 2 - 2.5”.



There should also be a means to return the tool to the open position, such as a spring. Handles should be designed to avoid putting pressure on any part of the hand or wrist. Sharp edges or tools whose handles are too short can result in pressure points causing damage to blood vessels and tendons.

Workers often “manufacture” their own controls to hand tools when they are inadequate or uncomfortable. The use of “cheaters” on pipewrenches or foam rubber padding taped to a paint scraper are not uncommon sights in workplaces. VDT workers sometimes use foam rubber or other cushioning material to pad the base of their palm when using a “mouse” for extended periods of time.

Workers need to be trained on using the right tool for the job. However, it has to be made available to the worker.

Workers should not have to come up with home-made remedies to alleviate discomfort caused by poorly designed tools and equipment. For instance, ordering hand tools with covers over the hand grips may result in substantially less hand and wrist disorders. Covers on hand grips can:

- Protect the hand from heat or cold;
- Reduce vibration;
- Reduce slipperiness, allowing a more relaxed grip.

Some pneumatic tools require the worker to turn them on using their index finger or thumb on a trigger. These tools need to be scrutinized closely. Many cases of “Trigger finger” (an injury to the tendon in the index finger) or thumb disorders have been seen in workers using such tools. Workers’ representatives must ensure:

- Triggers require little effort to pull;
- Tools are designed with handle length triggers ;
- Triggers use the “middle” rather than the “index” finger;

- Workers are given proper rest periods to allow their fingers and hands to recover.

If workers have to literally “peel their hands off the tool”, musculoskeletal injuries are only a matter of time.

Some hand tools can be designed using two handles instead of one, to stop the tool from turning in the worker’s hands and putting undesirable stress on the hand and the wrist.

Workers need to be aware that a wide variety of hand and wrist disorders can be caused by the use of hand tools.

However, even if the tool design is perfect for the job, it can still cause musculoskeletal injuries by being used too often or for extended periods of time.

Arms, Shoulders and Neck

Workers required to hold their arms above their shoulders for extended periods during the workday, will eventually end up with muscle fatigue and pain. Jobs using repetitive elbow and shoulder movements can cause a number of musculoskeletal injuries. The best way to rid the workplace of these types of disorders is to redesign the jobs that cause them.

When designing jobs to alleviate arm, shoulder and neck problems, keep in mind two basic principles:

- Keep arms low; and/or
- Keep elbows close to the body.



Some poorly designed hand tools can affect the arms, shoulders and neck, by making the worker use them in uncomfortable postures. Even “safety devices” that have been poorly installed on machines can make workers reach and stretch beyond safe limits just to operate the equipment.

Health and safety reps can recommend repositioning of jobs requiring workers to reach and hold arms and shoulders in poor postures. Production workers are often subjected to these types of conditions. When doing parts assembly, sawing boards or running threads on a piece of pipe, use vices or other fixtures to hold the material. Management shouldn't expect workers to work in pain day after day.

With the evolution of the “Computer Age,” more and more workers find themselves sitting in front of video display terminals for extended periods of time. Workers must realize the potential for injury to the musculo-skeletal system. Carpal tunnel syndrome, eyestrain, neck, back and shoulder problems are some of the injuries associated with this type of work. Adjustable keyboards, anti-glare screens, arm and hand rests and adjustable chairs are a few of the controls to consider.

All workers are different. Some are tall, others are short. Some “fit” the design of the workstation, others will not. A few basic principles can be followed:

- Provide space for the large worker;
- Provide moveable platforms for short workers;
- Ensure workstations and chairs are adjustable for height;
- Ensure equipment and tools are also adjustable;
- Accommodate right and left-handed workers.

Workers with upper body musculo-skeletal injuries are all too common in Ontario workplaces. We have discussed the types of upper body musculoskeletal injuries and the jobs or tasks that are likely to cause it. The

role of the health and safety rep is to ensure workers are aware of the injuries, their causes and the different methods of controlling these hazards. The reduction and eventual elimination of musculoskeletal injury can only begin with education.

In the next section, we will discuss musculoskeletal injuries of the back and lower body and examine methods of preventing them.

BACK AND LOWER BODY MUSCULOSKELETAL INJURIES

Introduction

Parts of the Body Affected

The lower body and back are also vulnerable to occupational injury or disease. In this section we will discuss injuries and disease located in the feet, ankles, lower legs, knees, thighs, hips, and the back.

The symptoms for musculo-skeletal injury (MSI) of the lower body are the same as the upper body. Some of these include aches, pains, swelling in the affected areas, tingling sensation, numbness and possibly shooting pains down the legs and buttocks in the case of the back.

Workers involved in jobs that require standing, sitting, lifting, bending, twisting, repetitive crouching, squatting, kneeling, constant flexion and extension of the foot, may be affected. Some occupations that have high incidence of lower body MSI are:

- Equipment mechanics



- Janitors
- Miners
- Floor/carpet layers
- Roofers
- Cement finishers
- Heavy equipment operators
- Press operators
- Seamstresses
- Nurses (caregivers)

Lower Body Injuries And Disease

If we review the previous section on the upper body, we know that musculoskeletal injuries affect tendons, nerves, and the circulatory system. Lower body injuries can be classified in a similar fashion. The back is a much more complex problem and will be discussed in a section of its own. Many different musculoskeletal injuries of the lower body have been identified. Some commonly reported musculoskeletal injuries or disease of the lower body are:

- Tendinitis
- Tenosynovitis
- Bursitis:
 - Housemaid's Knee
 - Beat Knee
 - Carpet Layer's Knee
- Ganglion
- Tarsal Tunnel Syndrome
- Varicose Veins
- Stasis ulcers

- Flat Feet
- Back injuries

Tendons

In the lower body, the tendons or tendon sheaths become inflamed from the constant rubbing of repetitive movements. This may result in Tendinitis or Tenosynovitis in the foot/ankle, knee/lower leg, hip or thigh. Ganglion cysts (the blister-like bumps containing synovial fluid) may develop on the foot/ankle or thigh. The bursa, located at the joints and containing a lubricating fluid, may become inflamed from repetitive use and cause bursitis of the ankle, knee or hip.

For instance, workers required to kneel for long periods are prone to injuries or bursitis of the knee. Bursitis of the knee is also called “Housemaid’s knee” in workers who scrub floors, “beat knee” in miners and “repetitive knee trauma” in carpet and floor layers are quite common. Carpet layers are not only subjected to kneeling positions, but use a tool for stretching carpet called a “knee kicker”. The carpet layer repeatedly slams his knee against the instrument to stretch the carpet. Carpet layers end up with a variety of knee problems.

Nerves

Repetitive Strain Disorders of the upper body are well documented. Nerve disorders such as Carpal Tunnel Syndrome are common. In the lower body though, there is a relatively unknown injury called Tarsal Tunnel Syndrome. As in Carpal Tunnel, the nerve becomes compressed within the narrow tunnel housing it.



Tarsal Tunnel symptoms are similar to other foot problems and therefore are often misdiagnosed. Symptoms include numbness or pain along the bottom of the foot and tingling toes. Pain at night is quite common as the blood flow to the feet decreases when lying down.

Dancers have also been diagnosed with Tarsal Tunnel Syndrome for years, but there are other workers who are highly susceptible to Tarsal Tunnel Syndrome:

- Roofers
- House painters
- Jockeys
- Assembly line workers
- Drummers
- Chauffeurs
- Truck and taxi drivers
- Postal workers
- Mail room and department store clerks

These occupations are prone to Tarsal Tunnel Syndrome as a result of standing for long periods of time on ladders, using foot pedals, standing\walking on cement floors and holding the foot and leg in awkward positions.

Circulatory System

Movement is essential for the normal functioning of the body. Blood returning from the legs is dependent on the pumping action of the heart. Unless movement occurs, blood can pool in the legs. The extra volume of blood in the veins of the legs can swell them, causing varicose veins. Pressure from this fluid can cause the ankles to swell, making the feet sore.

Over long periods of time it can sufficiently compress the skin so that ulcers result. These are commonly seen on the inside of the ankle, and are known as “stasis ulcers”.

The Back

Just about everyone has experienced some sort of pain associated with the back. Many people have pulled the muscles of their lower back from overexertion. The next day you can appreciate just how painful back injuries or disease can be. With just sore muscles, it is almost impossible to get out of bed and stand up straight. One can imagine how debilitating a more serious injury would be.

“I usually talk about this problem not as a back injury, but as a chronic disease process. That is an important thing to understand; it’s not that today, Thursday morning, I lift something and injure my back; this is a process that occurs over decades...”

*Dr. Linda Murray,
Chicago Department of Health*

Back injuries are the most common work-related injury. They accounted for 27 per cent of all Workers’ Compensation claims in Canada between 1980 and 1988. These injuries may be serious enough to restrict the workers from being able to do their jobs for extended periods of time. Often back injuries are very difficult to treat.

Workers, whose jobs require constant lifting, bending and twisting, may be afflicted. Workers who have to stand or sit for extended periods of time are also highly susceptible to problems of the back.

The spine is composed of a series of bones or vertebrae with a small cushion or disc between each vertebrae. Twisting or straining injuries to the back can cause part of this disc to protrude (slipped disc), putting pressure on the nerves coming from the spinal cord. Because the nerves supply sensation to the leg, pain is felt in the buttock and the leg as well as the back (commonly called sciatica). But not all back injuries result from a slipped disc. They may be caused by injuries to the vertebrae (producing



arthritis of the spine), or by years of working in uncomfortable postures with poorly designed machinery or equipment.

Our backs were not meant to lift heavy objects hour after hour, day after day, year after year. A worker may injure his back early in his working career only to have it recur time and time again. Worker representatives need to introduce proper design for jobs involving the back. This will eliminate the practice of workers being used as lifting devices.

Up to this point in time though, most governments and compensation boards have chosen to place the responsibility for reducing risk of back injury on the workers themselves. Popular myth has it that preselection of suitable workers, fitness programs or safe lifting techniques will ultimately ensure a healthy workforce. If workers' backs are then injured, it's their own fault. Either they didn't exercise enough or they didn't follow the safe lifting rules.

To begin, an examination of the literature should tell the myth-makers that pre-selection has no advantage. A 1984 study of low-back pain in industry concludes: "The selection of workers based solely on personal characteristics...does not appear to be warranted." Another looking into the incidence of back injuries in nurses states the case in stronger terms yet: "Clearly the personal characteristics of the employee are not the major influence on the relative risk of back injury in nursing personnel. It is the job that puts the workers at risk." Finally, the National Institute for Occupational Safety and Health (NIOSH) also comes to this conclusion.

The bottom line then – "Whether you're fat or short, have green teeth or not, it makes no difference," says Dr. Rosemary Marchant, an associate professor of occupational and environmental medicine at Nova Scotia's Dalhousie University. Dr. Marchant adds, the only characteristic that seems to hold out is whether or not you've had an injury before. But then this has nothing to do with reducing the primary risks of back injury.

The same can be said of fitness programs, although no one denies that fitness is all very well and good, as Dr. Marchant says, exercise routines are not the key to primary prevention. Rather they play more of a role in secondary prevention as therapy for workers already injured. Or as Dr. Rae Murray says: “They have a place (in primary prevention), but I think their place is last.”

Some of the newer programs on exercise and back care are fundamentally sound and boast many successes. They stress getting the worker back to work as soon as possible. But, again, the onus is on the worker to look after him/herself rather than designing the hazard out of the job. Keeping the worker in better physical condition may be a great idea and very healthy for the worker. However, even the most physically fit worker can be injured.

But perhaps the most widely accepted panacea for back injury prevention though, is that of safe lifting. But bending your knees, lifting the package between them, and then keeping your back straight isn't likely to help you if the load is three or four feet long and placed somewhere above your shoulders. Nor will safe lifting do you much good if you're an assembly line worker twisting, turning and picking up even the smallest of loads repeatedly, or an office worker sitting all day in an uncomfortable chair with a keyboard that's too high, or a truck driver, who studies have shown is three times more likely to suffer back trouble than the rest of the population, because the seat you sit in bounces and vibrates all day.

Nonetheless, even if your job does require lifting packages that will fit between the knees, who's to say they aren't too heavy. The Canadian Union of Public Employees maintains that the problem with correct lifting courses is that they fail to establish a maximum limit on how much should be lifted and how many times per shift.

Workers and their representatives must continually lobby for redesign of the jobs known to cause back problems rather than being content with “Back Education” programs.



Again, the problem is with the workplace not the worker. Sometimes with a little ingenuity and very little money, ways to avoid back problems can be engineered so that all workers on the job get the maximum benefit.

CONTROL OF BACK AND LOWER BODY MUSCULOSKELETAL INJURIES

Design Principles

The Back

Let's take a look at some design principles that can help alleviate some of the back problems in our workplaces.

Jobs should be designed to allow all workers to do their jobs with their backs straight. The following are eight examples.

1. A commonly recognized problem is lifting objects from the floor. However, lifting objects overhead is also hazardous. Build platforms to store objects off the floor (above knee height) to eliminate the need for stooping. But keep materials stored below shoulder height.
2. The further you hold an object from your body, the more pressure you put on your back. Work stations should be designed to minimize the distance between a lifted object and your body.
3. Provide shelves, supports, or roller conveyors on which objects can slide in order to eliminate unnecessary lifting.

4. Reaching down into a bin or carton is an example of poor workplace design. It is better to keep the bin off the floor and tilted to ease in loading and unloading. A powered assist can be installed to adjust the tilt angle. Also spring loaded bins can be used, which lift the parts up as they are being unloaded.
5. Pulling and pushing objects can also cause back injuries. Proper equipment design and maintenance can reduce these problems. In the illustration, the floor needs repair, the wheels should be larger, and a better handle provided.
6. Twisting, stretching or leaning with a heavy load may cause back problems. Jobs should be changed to eliminate these reaching motions.
 - Move the parts closer
 - Use a long tool or a “rake”
 - Provide a stepping stool for standing reaches
7. Change the work station to eliminate the need to work with a bent spine. Angle the workbench, not the back.
8. Many jobs have combinations of back hazards. For example, loading a machine from a bin on the floor combines sidestepping, twisting, low lifting and reaching. It is better to relocate the bin to minimize these movements.

From “Strains and Sprains - Your Aching Back”

Standing

Standing still too long can put excessive stress on the spine and back muscles, causing pain and even permanent damage to body tissues. It can



also cause the blood to pool in the lower body, which may result in circulation problems.

Another effect of standing or just being on your feet for extended periods of time is “flatfeet”. Many workers tend to lose the natural arch in their feet due to their own body weight. Most police officers who worked a “beat” for many years were nicknamed “flatfoots” because of this affliction.

Solutions include:

- Provide a foot rest (like the classical saloon “brass rail”) and stand with one foot up. This also lessens stress on the back. Change legs often.
- Provide mats and floor coverings. The harder and less giving the floor surface, the more stress this places on the body.
- Provide a stool or support where suitable.
- Provide opportunities to change positions, move around, or alternate between sitting and standing.

Sitting

Sitting is often preferable to standing in the workplace. However, workers must realize the actual compressive forces on the discs of the lower back are greater while sitting than standing. Consideration must be given to:

- Type of work being done;
- Size of each individual worker.

There is no such thing as a chair that is good for all jobs. Often workers prefer to alternate between sitting and standing positions.

Heights of Workbenches and Chairs

Poorly designed or mismatched chairs and workbenches may cause fatigue and discomfort, circulation problems and pressure on nerves.

All chairs and workbenches should be evaluated and adjusted for proper height.

Proper work height may depend on the nature of the job. Precision work (with the need to see closely) should be high. Work which requires heavy manipulation, pressure or lifting should be lower.

(Note: work height is not always bench height but height at which work is performed.)

Conveyor heights or other locations where materials are loaded or unloaded should be checked for optimal height.

All work surface heights should be appropriate to the job and the individual worker.

Kneeling

Many workers who have to do their jobs in kneeling, squatting or literally on “hands and knees” need to look at these jobs to see if they can be redesigned to “fit the worker.” Knee pads, small stools and actually raising the work to a better position should be considered. Workers on jobs where none of these solutions are feasible should take more rest breaks.



Whole Body Vibration

As in the upper body, the problems of vibration are also seen in the lower body. Complaints of physical ailments resulting from vibration and the arteries or veins it constricts are very common. Some of these complaints include:

- Interference with breathing;
- Pains in the chest and abdomen;
- Backache;
- Irritation in the intestines and bladder.

To reduce vibration:

- Use dampening materials to absorb vibration;
- Use “floating” seats on vehicles;
- Use ample work/rest schedules;
- Maintain equipment properly.

Heavy equipment operators and truck drivers are especially prone to lower body MSI. It is for this reason that many trucks and heavy construction equipment are fitted with seats that are able to dampen the vibrations.

In this section, we have discussed types of injuries, specific occupations that cause back and lower body MSI and some basic principles of job design and control. Although, lower body musculoskeletal injuries are not as well documented as the injuries and diseases of the upper body, many problems of the legs and feet are starting to be reported as industrial overuse injuries. Injuries and disease of the lower body may become more prevalent in the 1990's.

In the next section, we will discuss ways of making effective changes to the workplace, in order to prevent some of the musculoskeletal injuries to backs, the upper and lower body.

Workers have been instrumental in effecting changes to their workplace. Some Steelworker negotiating committees have incorporated crucial health and safety clauses (such as the right for representatives to shut down unsafe work) into contracts to ensure workers' rights. Worker reps have also introduced "Terms of Reference" – a set of operational guidelines – for their safety and health committees. Most of these strategies have resulted from union education programs.

For these and many other obvious reasons, worker representatives should be directly involved in health and safety education programs for workers.

Workers need to understand workplace health and safety issues and how to resolve them. Worker representatives need to develop strategies to ensure this happens.

BARRIERS

No matter who implements change to the workplace – workers, JHSC representatives, unions or management – they are going to face "resistance to change". Realizing there is this natural human resistance to change is an important first step.

What are some of the reasons people are unwilling to change? The main reason is fear of the unknown.

Workers and management don't know whether the changes are going to help or hinder. They will both say, "We've been doing it this way for years, and you're telling me something is wrong now." It is important to do your



research thoroughly. You may require the help of outside “experts” if the problem is particularly complex. Another way of proving to workers and management that the changes will work is by visiting other workplaces where similar changes have already been made.

Management may make workers think that costly changes to the workplace will result in the plant having to close or workers being laid off. The workers, pushing for change to correct a problem, can be made out to be the “bad” guys by management. If the economic timing is right, this type of management strategy is quite effective. Worker representatives must develop their arguments about the “costs” of injuries and disease to offset this situation. The solution to the problem you are researching may have already been developed in some other workplace. Communication with other worker representatives from similar industries may save a lot of time and effort.

Another strategy some management will use to downplay the importance of changing the workplace, is “victim blaming” – the worker is too old, the wrong sex or just doesn’t follow procedures. Remember, in many instances, management still thinks it is cheaper to hurt workers than it is to fix the workplace.

The key to knocking down these barriers is education. Workers and management must be educated in all aspects of occupational health and safety so that they can have truly meaningful consultation.

JHSC ACTION PLAN

Have you ever noticed a fellow worker holding his back, flexing his hands, rubbing his shoulders and arms? Do workers complain of aches or pains that may be work related? Are you constantly under pressure to work faster or for longer periods of time without rest breaks? If you have answered “yes”

to any of the above questions you should make sure a control program is implemented in your workplace before irreversible damage is done.

CONTROL PROGRAM FOR MUSCULOSKELETAL INJURIES

A proper plan to obtain effective change is paramount. Unions, management, JHSC representatives and workers must recognize musculoskeletal injuries as a serious workplace problem. Every worker must learn to identify jobs or tasks which could eventually cause injuries or diseases. Worker representatives must strive to ensure every worker goes home from work injury and disease free.

“The problem is the workplace, not the worker.”

JHSC Involvement

The focus for any health and safety program is the Joint Health and Safety Committee. Worker representatives on JHSCs have to be knowledgeable in all aspects of occupational health and safety such as:

- 1) Legislation (i.e., Occupational Health and Safety legislation and regulations);
- 2) Industrial hygiene;
- 3) Safety engineering;
- 4) Auditing and investigation techniques.

Several courses are offered through the union. These courses will assist worker representatives in the performance of their duties. If the worker



representatives in your workplace have not had these courses, contact your Steelworker Staff Representative. Your District Health and Safety coordinator, District or Provincial Committee member or National Health and Safety Committee member may also be helpful in helping you get some health and safety training.

When addressing MSI, again, the JHSC should be the focal point of the control program. Because the workload of JHSCs is ever increasing, some workplaces have actually developed ergonomic sub-committees of the JHSC.

A control program should include:

- Provisions for worker training;
- Worker health survey;
- Individual job analysis; and
- A program for restricted workers.

A reporting system for worker concerns to the JHSC worker representatives must also be in place. Workers must feel confident concerns are being addressed quickly. Workers stop using the JHSC when there is inaction on a legitimate concern or a feeling that concerns are not being rectified to their satisfaction.

Training

Training is an integral part of any preventative strategy. The target group ideally should include:

- Workers;
- Union representatives;

- Supervisors and managers;
- Staff responsible for purchasing technology and equipment .

The training should include:

- An explanation of musculoskeletal injuries including parts of the body affected, causes, symptoms and treatment;
- Workplace design principles;
- Performing risk assessments;
- Strategies for prevention.

JHSCs are sometimes unsuccessful in convincing management of the need for training programs. If this is the case, the Steelworkers should negotiate training concerning musculoskeletal injuries for all workers. They must ensure workers are trained in all aspects of their immediate job, including the methods and procedures that are to be used to prevent musculoskeletal injuries.

Analysis of Health Records

Worker health patterns have to be analyzed to identify problem areas in the workplace and to evaluate the overall effectiveness of the program. Data from Workers' Compensation records, medical logs, First Aid logs, safety reports and other sources, should be examined. Worker representatives must be very critical of all employer kept health records. Most employer's statistics make the company look as good as possible to keep their WCB assessments down. The number of musculoskeletal injuries, the amount of loss time and any symptoms should be noted. This information will prove invaluable when approaching management for funds to implement change to the workplace.



Another useful tool when approaching management for funding is the identification of costs associated with musculoskeletal injuries. Don't forget to include:

- Workers' Compensation Costs (i.e., increase because of accidents, payments for permanently disabled worker, accommodation to the job if worker returns, etc.).
- Overtime to cover the injured worker.
- Training of new worker or returning worker if he/she cannot return to old job.
- Lost production time.
- Lost time due to accident/injury/disease investigation and funds required to implement changes to the job suggested by the Government Inspector or JHSC.

Job Analysis

Each job/task that has potential to cause musculoskeletal injuries should be evaluated thoroughly. The analysis should examine factors such as:

- Workplace, tool and equipment design;
- Working positions;
- Vibration;
- Repetitive movements;
- Training of workers, supervision;
- Work rates;
- Bonus and piece rate systems;
- Monitoring of work rate by supervision, computers, etc.;
- Rest breaks;
- Job variation;

- Degree of control by the worker over the work process;
- Compulsory overtime;
- Maintenance of equipment.

A systematic method of data collection should be used by the worker representatives. In the next few sections a suggested method for job/task analysis will be discussed.

Talking to Workers

Contact with the workers on the job or area to be reviewed should be the top priority. Workers must not feel intimidated by the process, otherwise they may resist any changes that are made. Health and Safety reps must insist on input from all individuals working on a job – after all, they are the experts.

They will also be the people affected by any changes that are implemented. If workers and supervision are trained in basic principles of control and the reasons that changes are needed these will be more readily accepted.

In order to survey the workers, a questionnaire about musculoskeletal injuries needs to be developed. A survey is the best way to find out if individual workers experience any problems. It is also an easy way to give all workers an opportunity for input.

Priorities for job evaluation can be set after reviewing the results of the MSI survey. Jobs or areas with the most symptoms should receive attention quickly.

The next step in the process is to talk to the worker while observing him/her doing the actual job. Find out what the actual thought process is behind the way the work is being performed. Workers always have reasons



for doing the job the way they do – more comfort, quicker, less effort. Jot down the basic steps to the job while you are observing. Huge amounts of useful data will be gathered in this way and will help you present arguments for the need for change to management.

Another thing to look for when observing workers is the use of homemade tools or variation to the workstation made by the workers themselves. Workers are very innovative and often design tools or gadgets that increase their comfort or ease of doing the job. Be sure to include workers in all aspects of the process. Before implementing any recommended changes check with workers doing the job to see if they agree. They will provide knowledgeable insight into new problems that may be created or offer suggestions for subtle variations. Don't underestimate the amount of expertise that exists in the workplace.

Checklists

One of the most powerful tools a worker representative can use is an audit “checklist.” The purpose of the checklist is to provide a comprehensive list of possible workplace hazards (i.e., equipment, tools, worker positions) when doing job/task analysis. By using the checklist worker representatives will be able to perform very thorough job analyses.

The checklist will assist the worker representative in looking at his/her own workplace. The person using the checklist should mark conditions that exist in the workplace, but should also be aware of conditions that may not be included.

Video Tapes

Before recommending the use of videotapes to analyze jobs in their workplaces, worker representatives should check with their own local or District or National office. Some unions have developed policies against using videos because some employers have used them against union members.

Although the pluses of videotaping seem to outweigh the negatives when assessing risk in the workplace, the negatives have to be dealt with as a top priority. Some workers will feel very self-conscious and nervous when working in front of a camera.

Several reasons for this type of anxiety could exist – fear of the unknown, fear of making a mistake, worker’s personality. Worker representatives have to realize that each situation will be unique. They will need to assure workers that the reason for the videotaping is to make the job better for the worker. It is not to be used for time studies by management, or to find out what the worker is doing wrong. The union must ensure this. The quickest way to lose support of the worker is to have one of them disciplined for something they did or did not do on a videotape.

Nonetheless, videotaping workers while performing their job can be a useful tool. Jobs can be broken down and analyzed by freeze-framing. It also gives the worker representative a “permanent look” at how the job is done. Videos can be used for future reference or reviewing at JHSC meetings to support a theory.

Videotapes can be analyzed for:

- Position of a body part (i.e., wrist, arms, back);
- Position of objects around the work station;
- Times to complete work cycles;



- Speed of the work being performed;
- Sequence of tasks;
- Use of hand tools.

For instance, it is much easier to use slow-motion or freeze-framing to determine if the wrist is in a bad position or to break down a job into a series of tasks, than it is to do it with the naked eye. Videotaping not only saves time and effort when reviewing jobs, but can be used as training tapes for workers and management later on.

Program for Restricted Workers

Worker representatives must realize that not all musculoskeletal injuries will be prevented. There will be cases of bad backs, tendinitis, Carpal Tunnel Syndrome and others reported each year. A plan for the management of such cases must be negotiated.

Worker representatives must actively participate in helping workers return to work. Meaningful light duty jobs must be negotiated. Workers, who are injured or diseased at work, must not return to the job that caused the MSI, if no adjustments have been made. Union representatives must ensure the job is redesigned for the benefit of all workers.

Many unions have set up company/union medical committees which handle the situations previously mentioned. It is very important for unions or worker representatives to keep in contact with injured workers when they are off work. Injured workers may be harassed by management, company doctors or the Workers' Compensation Board. The worker representatives should be aware of this. A formal system for reporting of all injuries/diseases to the union and JHSC worker representatives must be set up. Worker representatives and/or the union need to be aware of all cases of light duties, restricted work, and loss time.

LEGISLATION

Of course workers must also be aware of health and safety legislation that applies to the workplace. Workers must not assume that their employers are going to look after them. Workers would not run a stop sign or break any other law just because their boss said it was “OK”. However, many workers break the laws of the workplace daily, on the advice of so-called “competent” supervisors. Workers need to know and understand the law to make it work for them.

For instance, the “Right to Refuse unsafe work has been an effective tool for change when it comes to workplace practices, design and musculoskeletal injuries.

Rich Cyrenne, of United Electrical Workers, Local 550, refused unsafe work at Hamilton’s Camco Inc. He and others installing ill-fitting screws on a refrigerator line were well on their way to over-exertion. In response to Cyrene’s refusal, extra workers were added to the line for a few days, with better fitting screws arriving shortly thereafter. Further, as a result of several other design problems at Camco, and with the help of the Occupational Health Clinic for Ontario Workers, the Joint Health and Safety Committee began the process of redesigning the workplace with a full-scale review of its most hazardous areas.

Sheelagh MacDonald, of United Electrical Workers, Local 544, refused work at Plasticap in Richmond Hill on a job that considerably strained her back, shoulders and arms. Her refusal was initially overturned. But backed with some convincing evidence gathered by her union she successfully appealed the decision. A study of the job was done by the Special Studies Branch of the Ontario Ministry of Labour, orders were written and many changes implemented.



Three fork lift truck drivers, members of Canadian Auto Workers, Local 200, Windsor, refused to drive in reverse with their necks and spines twisted. In response the Ontario Ministry of Labour wrote orders prohibiting the frequent operation of fork lift trucks in reverse for prolonged periods of time.

Aside from the worker's right to refuse unsafe work, the employer has many duties which worker representatives must ensure management carries out. Some of these include:

- Duty to comply with regulations;
- Duty to provide information and to educate workers;
- Duty to appoint a competent supervisor;
- Duty to assist health and safety committee or representative;
- Duty to take every reasonable precaution;
- Duty respecting the use of agents;
- Duty to provide workers with written instructions when required by regulation;
- Duty to have a written occupational health and safety policy and a plan to implement that policy.

This is not a complete list.

With the incorporation of amendments into the Occupational Health and Safety legislation, more legislative pressure has been put on management to abide by the Act and its regulations. A "DUTY OF CARE" has been placed on corporations and boards of corporations to ensure minimum requirements of the law are fulfilled. Fines have increased as added incentive to comply.

Beyond these considerations though, political action is a strong tool. It can help get changes to existing legislation and promote the development of new regulations. Public Service Alliance of Canada was involved with the

Canadian Standards Association in developing rules for “good” chairs. The Canadian Union of Public Employees lead a nationwide campaign for the prevention of back injury.

“CUPE put employers, safety organizations and government on notice that halting this back injury epidemic is a major national priority for this union,” declares Colin Lambert, CUPE’s national Health and Safety Director in a document entitled “Back Injuries: Strategies for Prevention.” In this document CUPE sets out an absolute weight limit of 16 kg or 240 kg over any 15-minute period (no more than 16 kg a minute).

Regulations need to be developed concerning MSI. They must address:

- 1) Analysis of the workplace;
- 2) Educational and training requirements;
- 3) Labeling of weights for containers and persons to be lifted;
- 4) Maximum allowable weight limits—single and daily lifts;
- 5) Mandatory design standards for new workplaces.

All regulations should be reviewed on a regular basis to keep them up-to-date as jobs and technologies change.

Workers and their representatives have played a major role in changing their workplace health and safety policies. Using present health and safety legislation they have effected much workplace change. The more workers know about the law, the more they will be able to use it to their advantage.

Other pertinent pieces of legislation can also be used to effect change, legislation like the Human Rights Code, the Building Code and the Fire Marshall’s Act.

We must continue to press for change to legislation, by lobbying governments. Better legislation could make the job of total elimination of workplace injury and disease a reality.



COLLECTIVE BARGAINING

Workers must remember that occupational health and safety laws are a minimum. Collective bargaining can be used to improve upon the basic requirements of the legislation and to open up new policy areas for union attention and action. Training, in specific job procedures and general health and safety methods, should be incorporated into the contract. This ensures that all workers will receive some basic health and safety education. Most workers, including management, have never had any formal training in health and safety.

Unions must include provisions for injured or diseased workers. Union/Company medical committees are common in many workplaces.

Unions must also have specific policies on the number of hours workers can be scheduled for. Many employers cover jobs with overtime rather than hiring more workers. Worker fatigue can contribute to workplace injury and disease. Not having enough time away from work to recover from workplace exposures can be dangerous to your health.

Some unions have negotiated education and training funds paid for by the company.

The Energy and Chemical Workers Union has been successful at negotiating a health, safety and industrial relations training fund. The company puts an amount of money into a fund administered by the national union. They receive the benefit of training packages, videos and conferences developed and organized through fund monies.

RESOURCES

Information on health and safety in the workplace has grown considerably in recent years. Excellent sources of information, accessible to workers include:

- 1) District and national offices.
- 2) Labour councils.
- 3) Federations of Labour.
- 4) Canadian Labour Congress.
- 5) Workers Health and Safety Centre.
- 6) Ontario Health Clinics for Ontario Workers.
- 7) Canadian Centre for Occupational Health and Safety.
- 9) Ministry of Labour.

These organizations provide a number of services including:

- Representatives are capable of providing answers and advice to workers who enquire about workplace hazards; their rights and responsibilities under health and safety legislation; and a multitude of other health and safety concerns.
- Health and safety training courses supported by worker instructors and videos.
- Newsletters and magazines.
- Doctors and nurses who try to figure out if an illness or injury is caused by an unhealthy workplace.
- Provision of facts and supporting medical evidence to encourage the Workers' Compensation systems to allow a greater number of occupational illnesses and injuries for compensation.



CONCLUSION

Worker representatives must be well prepared in their debates with management, concerning the need for change. Workers must not be made to feel that injuries they have sustained from the workplace, are somehow their fault.

Worker representatives must know how to research workplace problems. Continual probing into workplace injuries eventually reveals the true causes. Worker representatives must not allow management to make quick decisions about causes of injuries.

Worker representatives have to continue to strive to make their workplaces injury and disease free.