

**Ergonomics**

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BCMSA

Ergonomics Program

**Table of Contents**

PURPOSE 1

POLICY 1

SCOPE 1

DEFINITIONS 1

RESPONSIBILITIES 1

Employer 1

Managers 1

Supervisors 1

Workers 2

JHS Committee (or Worker Health and Safety Representative) 2

Purchasing 2

PROGRAM DETAILS 3

Program Overview 3

Implementation and Maintenance of Ergonomic Program 3

Step One: Consultation 3

Step Two: Education for Creating and Monitoring MSI Awareness 4

Step Three: Risk Factor Identification 5

Step Four: Risk Factor Assessment 8

Step Five: Risk Control 8

Step Six: Training 19

Step Seven: Evaluation 19

Investigation Procedure for MSI Reports 20

Purchasing Guidelines for Computer Workstations 21

EDUCATION AND TRAINING REQUIREMENTS 22

Goal 22

Objectives 22

Summary of Education 22

Summary of Training 22

PROGRAM MAINTENANCE 23

DOCUMENTATION 23

APPENDICES 1

Appendix A – MSI Awareness 2

Appendix B – Record of Worker MSI Education and Training 4

Appendix C – Computer Workstation Risk Factor Identification 5

Appendix D – Computer Workstation Setup 9

Appendix E – Work Zones for a Computer Workstation 10

Appendix F – Worker Report Form for Reporting an MSI 11

Appendix G – Monthly Statistics of MSI Reports 12

Appendix H – Evaluation of Monthly Statistics of MSI Reports 15

Appendix I – MSI Risk Factor Identification Worksheet 16

Appendix J – List of Priority Jobs/Tasks for Risk Factor Assessment 19

Appendix K – MSI Risk Factor Assessment Worksheet 20

Appendix L – Guidelines for Lighting and Glare Control 56

Appendix M – Diagrammatic Representation of Controlling the Effects of Glare in the Office 58

Appendix N – Program Compliance Evaluation Form 59

Appendix O – Summary of Program Compliance Evaluation Form 67

Appendix P – Risk Control Evaluation Form 69

Appendix Q – MSI Accident/Incident Investigation Form 70

Appendix R – Purchasing Guidelines for Ergonomic Office Equipment 71

# PURPOSE

Implementation and maintenance of this Ergonomics Program is intended to eliminate or where not practicable, minimize workers’ exposure to the risk of musculoskeletal injury (MSI) in the workplace.

# POLICY

[Organization] will maintain an Ergonomics Program to ensure the well being of all workers when work practices and/or exposure to risk factors may cause or aggravate injuries or disorders to the muscles, tendons, ligaments, joints, nerves, blood vessels or soft tissue.

The Ergonomics Program is one component of [Organization’s]Occupational Health and Safety Program. It is a joint effort between management and workers and is created to achieve compliance with WCB OHS Ergonomics (MSI) Regulations.

# SCOPE

This program applies to all persons working in a workplace environment under the jurisdiction of [Organization] who may be exposed to the risk of musculoskeletal injuries.

# DEFINITIONS

|  |  |
| --- | --- |
| **Administrative Controls** | Methods of changing the way that work in a job is assigned or scheduled in order to reduce exposure to MSI. |
| **Assess** | A WorkSafeBC requirement to determine the level of risk of injury due to a risk factor. |
| **Computer Workstation** | The work area of an individual that contains their equipment to enable them to perform their job when using a computer. This includes desk, chair, computer/monitor, telephone etc. |
| **Consultation** | To seek participation and input from the JHS Committee or Worker Health and Safety Representative, as applicable, and take into consideration their input in decision-making. |
| **Contact Stress**  **(MSI risk factor)** | Risk of injury occurring when a hard object comes in contact with a small area of the body such as using the palm of the hand as a hammer. |
| **Duration**  **(MSI risk factor)** | Duration refers to the total time in a day that the worker is exposed to the risk factors (It does not refer to the duration of the work activity that includes the risk factor). When duration is associated with repetition or frequency, it refers to duration per day of the repetitious task. |
| **Engineering Controls** | Physical changes to a job that reduce MSI hazards e.g. redesigning workstations, automation, use of lifts, tools etc. |
| **Ergonomics** | The science and practice of designing jobs or workplaces to match the capabilities and limitations of the human body with the intent to minimize injury, and to improve safety, comfort and effectiveness. |
| **Grip Force**  **(MSI risk factor)** | The amount of pressure exerted by a worker on a load, such as gripping an unsupported object. |
| **Lift/Lower Force**  **(MSI risk factor)** | The amount of forceful exertion involved in lifting or lowering an object. |
| **Manual Material Handling** | The physical process of handling an object such as pulling, pushing, lifting and lowering. |
| **Mechanical Aid** | A piece of equipment that supports the object to be handled and eliminates the need to hold or carry it (i.e., overhead strap for a grinder at a workbench). |
| **Musculoskeletal Injury**  **(MSI)** | An injury or disorder of the muscles, tendons, ligaments, joints, nerves, blood vessels or related soft tissue including a sprain, strain and inflammation, that may be caused or aggravated by work. |
| **Posture**  **(MSI risk factor)** | The position that a worker assumes to do a task. Awkward postures include repeated or prolonged reaching, twisting, bending, kneeling, squatting, working overhead with hands or arms, or holding fixed positions. |
| **Primary Work Zone** | The areas of a workstation that are within easy reach (up to 30cm/12inches from the operator) where objects used frequently or for long periods are placed. |
| **Repetition** | Using the same body part over and over to perform a task such as using a paint brush, prolonged keyboarding. |
| **Representative Sample of Workers** | In addition to workers with signs and symptoms, a cross section of workers considering differences in age, shift schedule, gender, size (height and weight) and work location (climatic conditions can vary considerably, and clothing or icy surfaces may result in different levels of risk for similar tasks). The size of the sample will depend on how many differences there are in the group. |

|  |  |
| --- | --- |
| **Risk Assessor** | A person knowledgeable in conducting risk factor identification and assessment that identifies and assesses factors that may expose a worker to the risk of MSI. This means persons conducting risk factor identification and/or assessment are able to:   * Explain risk factors listed in the WCB OHS Regulation * Apply risk assessment parameters (magnitude, duration, exposure pattern) to risk factors * Apply risk control principles (engineering, administrative, PPE) to reduce exposure to risk factors |
| **Risk Factor** | A factor that medical and scientific research indicates may cause or contribute to a disorder. Risk factors may create hazards individually or in combination with other factors. Recognized risk factors include force, duration, repetition, contact stress and posture. |
| **Secondary Work Zone** | The areas of the workstation where items are placed that are used occasionally or for short periods only. Usually 30 to 50cm (12 to 20inches) from the body. |
| **Signs and Symptoms of MSI** | A sign of MSI is a visible change such as swelling or redness. A symptom of MSI is something felt such as pain, numbness or tingling. Both signs and symptoms of MSI may appear gradually over time or may appear suddenly. |
| **Sprain** | An injury (pull or tear) of a ligament in the body. Ligaments attach bone to bone. |
| **Strain** | An injury (pull or tear) of a muscle or tendon in the body. Tendons attach muscle to bone. |
| **Task Variability** | Performing various tasks that require different postures, movements and forces. Frequency and duration of postures, movements and forces also vary. |
| **Whole Body Vibration** | A situation in which vibration from the work environment affects the whole body, such as working on a catwalk attached to a gravel crusher. |
| **Work-Recovery Cycles** | The length of active work time in relation to rest time throughout the entire shift. |

# 

# RESPONSIBILITIES

## Employer

* Implement an Ergonomics Program to reduce workers’ risk of exposure to MSI in the workplace.
* Provide resources to implement the requirements of the Ergonomics Program.
* Identify factors in the workplace that may expose workers to a risk of musculoskeletal injury.
* Eliminate, or if elimination is not practicable minimize, workers’ risk of exposure to MSI.
* Ensure that the person conducting an ergonomics risk assessment consults with the JHS Committee with respect to:
* Risk identification
* Assessment and control
* Content of the program
* Provision of worker education and training
* Evaluation of the compliance measures taken
* When conducting a risk assessment, ensure that the assessor consults with workers who have signs and symptoms of MSI, and a representative sample of workers who are required to carry out the work being assessed.

## Managers

* Ensure that identified risk factors are assessed.
* Immediately implement interim control measures when the introduction of permanent control measures will be delayed.
* Ensure that the effectiveness of the measures taken to comply with the Ergonomics Requirements are monitored and reviewed annually.
* When monitoring identifies deficiencies, ensure they are corrected without delay.

## Supervisors

* Ensure that workers who may be at risk of exposure to MSI are educated in risk identification related to their work, including the recognition of early signs and symptoms of musculoskeletal injuries and their potential health effects.
* Ensure that workers are not assigned to activities where a reported or observed physical impairment may create an undue risk to the worker or anyone else.
* Ensure that a worker to be assigned to work that requires specific measures to control the risk of exposure to MSI is trained in the use of those measures.
* Ensure that workers are instructed in the correct use, maintenance and limitations of personal protective equipment used for reducing risk of exposure to MSI.
* Investigate, in cooperation with the JHS Committee (or Worker Health and Safety Representative) reports of signs and symptoms of MSI related to work practices.

## Workers

* Follow appropriate safe work procedures to ensure proper set up of work areas and to ensure tasks are performed safely to prevent injuries.
* Report signs and symptoms of MSI that are suspected of being related to work practices.
* Report any physical impairment to supervisor if it may affect ability to safely perform assigned work.

## JHS Committee (or Worker Health and Safety Representative)

* Evaluate workplace conditions with workers and supervisors to determine the appropriate workstation setup.
* Review, in conjunction with the employer, the effectiveness of measures taken to comply with Ergonomic regulations annually or when deficiencies in the control measures are reported.
* Attend and cooperate in investigations and workplace inspections to deal with worker reports of MSI.

## Purchasing

* Ensure that all tools, equipment or machines that are being supplied are safe when used in accordance with the directions that are provided with the goods.
* Provide directions respecting the safe use of any tool, equipment or machine that is being supplied to the workplace.
* If the supplier has responsibility under a leasing agreement to maintain any tool, equipment or machine, ensure that it is maintained in a safe condition.

# PROGRAM DETAILS

## Program Overview

The Ergonomics Program has been developed to meet the Ergonomics (MSI) Requirements in accordance with WCB OHS Regulation Part 4.46 – 4.53.

Ergonomics is a factor in every job or task performed in the workplace, ranging from working at a computer workstation to collecting garbage, shoveling, lifting boxes and cutting grass. Therefore this program has widespread implications for all workers operating under the jurisdiction of [Organization].

## Implementation and Maintenance of Ergonomic Program

To facilitate implementation of the program and to maintain compliance with the Regulation, this program has been modeled on the 7-Step Compliance Process developed by the WorkSafeBC.

The seven steps are as follows:

1. Consultation
2. Education
3. Risk Factor Identification
4. Risk Factor Assessment (when required)
5. Risk Factor Control
6. Training
7. Evaluation

Each step is discussed under separate program headings. Implementation of each step must be done in the order that it appears in the program. If a step is missed, the program will be less effective in reducing the risk of exposure to MSI and compliance with the WorkSafeBC OHS Regulation may not be complete.

### Step One: Consultation

[Organization] will ensure that the JHS Committee or Worker Health and Safety Representative is consulted when the following steps of the Ergonomics Program are being implemented:

* Risk factor identification
* Risk factor assessment
* Risk factor control
* Content and provision of worker education
* Provision of worker training
* Evaluation of compliance measures taken

[Organization]will obtain input from the JHS Committee or Worker Health and Safety Representative regarding the above ergonomic concerns and will consider this input when making decisions.

When performing a risk assessment, [Organization]will also consult with workers with signs or symptoms of MSI and a representative sample of the workers who are required to carry out the work being assessed.

[Organization]will keep records of consultation with JHS Committee members, affected workers and representative sample of workers. Records will include minutes of JHS Committee meeting agenda, where applicable.

### Step Two: Education for Creating and Monitoring MSI Awareness

Education requirements are a separate component from training requirements in this Ergonomic Program. The following criteria will be included in ergonomics education:

1. [Organization]will educate all workers who are exposed to a risk of MSI in risk factor identification relating to their work. This will include the early signs and symptoms of MSIs and their potential health effects to the worker. Refer to **Appendix A (MSI Awareness)** for information on signs and symptoms of MSI.
2. Workers will be educated on setting up their workstations appropriately.
3. Follow-up educational sessions will be provided to workers by [insert name or job position]to ensure that workers’ knowledge is up-to-date.
4. Education will be provided without undue delay to workers who are new to their job.
5. Supervisors, JHS Committee members, ergonomic risk assessors, purchasers, construction trades and persons responsible for implementing, maintaining and evaluating the Ergonomics Program will be provided with education relating to the exposure to risks of MSI and signs and symptoms of MSI.
6. Records of education provided to workers will be documented by [insert name or job position]and kept [insert location]. Refer to **Appendix B (Record of Worker MSI Education and Training)** for documentation to be used to keep records.

#### Educator Qualifications

Persons providing education to workers will be knowledgeable about the type of work being performed and will be familiar with:

* Risk factors, as listed in the ergonomic regulations, including the physical demands of work activities, aspects of layout and condition of workplace or workstation, characteristics of objects handled, environmental conditions and organization of work.
* Application of risk assessment parameters including magnitude, duration and exposure pattern to risk factors.
* Application of appropriate risk control measures to reduce risk of exposure to MSI relevant to the job involved.

### Step Three: Risk Factor Identification

The purpose of risk factor identification is to identify factors in the workplace that may expose workers to a risk of MSI. Ergonomic risk factors include:

* Physical Demands including:
* Force
* Repetition
* Duration
* Work Postures
* Local Contact Stress
* Aspects of layout and condition of workplace/workstation including:
* Working reaches
* Working heights
* Seating/floor surfaces
* Characteristics of objects handled including:
* Size and shape
* Load condition and weight distribution
* Container, tool and equipment handles
* Environmental conditions including:
* Temperature
* Lighting and glare
* Vibration
* Characteristics of organization of work including:
* Work recovery cycles
* Task variability
* Work rate

#### When to Perform a Risk Factor Identification

Risk factors should be identified during normal workplace inspections. Risk factor identification will also be required when one or more of the following applies:

* On established tasks where a worker expresses concern about a risk of MSI in their job/tasks.
* When new tasks/jobs or new equipment are introduced into the workplace.
* As a result of a worker suffering an MSI injury requiring medical referral.

The risk factor identification process has been divided into two categories:

1. Risk Factor Identification for a Computer Workstation, and
2. Risk Factor Identification for Manual Material Handling Jobs/Tasks

#### 1. Risk Factor Identification for a Computer Workstation

This section of the risk factor identification is specific only to the layout of a computer workstation.

[Insert name or job position]will use the specifications recommended by WorkSafeBC and detailed in **Appendix C (Computer Workstation Risk Factor Identification),** **Appendix D (Computer Workstation Setup)** and **Appendix E (Work Zones for a Computer Workstation),** to determine whether the computer operator is at risk of exposure to an MSI.

**Note:** There is no requirement to complete **Appendix I (MSI Risk Factor Identification Worksheet)** when conducting risk factor identification on a computer workstation. The “repetition” and “awkward posture” risk factors are addressed in the Computer Workstation Risk Factor Identification.

Usually, a risk assessment will not be required following completion of computer workstation risk factor identification. This is because the risk controls that are required to correct any identified risk factor will be obvious and easily implemented. For example, if the height of the monitor is found to be too low causing the operator to bend his/her neck excessively, the solution will be to raise the monitor screen thereby reducing the degree of strain on the operator’s neck.

The specifications listed in **Appendix I** focus on areas of concern that, if left uncorrected, may result in injury through working with awkward postures, excessive reaching and inappropriate working heights. While they serve as useful guidelines, the ultimate standard is individual comfort (especially over time) and therefore, final adjustments will be tempered by individual workers’ preference.

**Note:** If a risk assessment is not required, [Insert name or job position]will consult with the JHS Committee (or the Worker Health and Safety Representative) and the affected worker at the risk identification step prior to implementation of risk controls.

#### 2. Risk Factor Identification for Manual Material Handling Jobs

[Organization]will identify risk factors for all tasks/jobs that involve manual handling of objects/materials. Table 1belowprovides categories of jobs performed by workers within [Organization]in which manual material handling may be involved.

|  |  |
| --- | --- |
| **Table 1** | |
| Garbage collection | Forestry and Urban forestry activities |
| Delivery services | Police and Fire Service Activities |
| Road/Highway maintenance | Vehicle servicing |
| Building maintenance | Storekeeping/warehouse operations |
| Parks maintenance | Construction – building or utilities |

**Stage 1: Prioritize Tasks/Jobs**

The first stage of the risk factor identification is to identify those jobs/tasks that expose workers to a high risk of MSI. [Insert name or job position]will develop a list of high-risk jobs, in decreasing order of risk, to determine which jobs/tasks receive attention first. The following documentation will be reviewed when prioritizing jobs/tasks:

* Work related injuries and reports noting the jobs / tasks that are associated with MSI injuries.
* Worker MSI Report Forms. Refer to **Appendix F (Worker Report Form for Reporting an MSI).**
* MSI statistics. Refer to **Appendix G (Monthly Statistics of MSI Reports)** for this information and **Appendix H (Evaluation of Monthly Statistics of MSI Reports).**
* First Aid treatment book.
* Previous risk factor assessments and documentation of risk controls that were implemented as a result of the assessments. Establish whether the risk controls achieved an acceptable outcome.

**Stage 2: Walk-Through Survey**

Using the worksheet located in **Appendix I (MSI Risk Factor Identification Worksheet)**, [insert name or job position]will identify additional risk factors in the workplace that may expose workers to a risk of MSI in addition to those identified during the prioritizing process.

Once the above documentation has been reviewed and information gathered, create a list of jobs/tasks in decreasing order of risk. Document results on the form located in **Appendix J (List of Priority Jobs/Tasks for Risk Factor Assessment)**.This list will be used during the risk factor assessment.

### Step Four: Risk Factor Assessment

#### When to Perform a Risk Factor Assessment

[Organization] will perform a risk factor assessment when:

* Risk factors have been identified during the risk factor identification process.
* An MSI report is received and the risk factors have not yet been assessed.
* Risk factors are observed during workplace inspections and observations of current work methods.
* Workers are absent from work with an MSI.

Some situations may not require a specific risk assessment, where the risk control is obvious and effective, i.e., risk identification may lead directly to risk control.

#### Conducting a Risk Factor Assessment

[Organization] will conduct an assessment on those factors identified during the risk factor identification process to determine the degree of risk to the worker of exposure to MSI while performing manual work.

The worker will be instructed to perform all aspects of the job or task. [Insert name or job position] will make observations of the worker’s body to identify movements including forces, repetition, duration, static and awkward postures, contact stress and vibration. Notes for risk controls that may be required are added as the assessment worksheet is completed. All boxes on the worksheet must be completed, writing “n/a” or “not applicable” where appropriate.

The form located in **Appendix K (MSI Risk Factor Assessment Worksheet)** will be used to document results.

**Note:** Therisk assessment in this program does not address work processes relating to pulling or pushing. Contact the local WorkSafeBC officefor advice on MSI prevention relating to pushing/pulling tasks and effects of whole body vibration.

### Step Five: Risk Control

If a task or job has an identifiable MSI risk factor, controls will be implemented and safe work practices established to reduce a worker’s risk of exposure to MSI. Step 5: Risk Control is divided into four sections:

1. Organization of Work as a Means of Risk Control
2. Monitoring Environmental Conditions as a Means of Risk Control
3. Risk Controls for Office Tasks (non-computer related)
4. Risk Controls for Non-office Activities

#### Organization of Work as a Means of Risk Control

Effective organization of work will help to improve efficiency and reduce workers’ exposure to risk factors of MSI. [Organization] will address the following aspects of jobs (i.e., work recovery cycles) to ensure that tasks are performed with a minimal exposure risk to MSI. Ideas and suggestions for re-organizing or re-designing workers’ jobs should be discussed with [insert name or position here]and decisions will be in agreement with collective agreements and[Organization] policy on rest breaks.

##### Work-Recovery Cycle

Short breaks are required when performing repetitive tasks. These breaks will be long enough for the worker to change their posture. These are known as micro breaks, i.e. varying from 20 seconds to 2 minutes depending on the task. These breaks are not regarded as breaks required by Employment Standards and collective agreements.

##### Task Variability

When tasks are performed that involve completion over an extended period of time, an occasional change in task will be encouraged to gain the benefits of changing posture, reducing duration, force and repetition. For example, in the office this may include making telephone calls, photocopying or dealing with mail between periods of computer work. It is important that the change of tasks allows for a variation of muscle and joint use. This ensures appropriate resting of the affected areas. Bench work may be combined with other activities to reduce static postures.

##### Work Rate

The rate at which the worker performs the task will be considered to be ergonomically appropriate when attention is paid to work recovery cycles and task variability.

#### Monitoring Environmental Conditions as a Means of Risk Control

##### Effects of Temperature (Indoors)

A thermal environment that is either too hot or too cold may result in an increased risk of exposure to MSI or may aggravate a pre-existing MSI. In an office environment the desirable ambient temperature is between 21°C (70°F) and 26°C (79°).

##### Effects of Temperature (Outdoors)

Working in a cold environment may increase workers’ risk of exposure to MSI, particularly of the hands and fingers. When working with cold or numbed hands, workers are more likely to misjudge the amount of force required to perform the work and may use too much force. Keeping hands warm may require gloves. This may cause workers to grip hand tools more forcefully, resulting in added stress to the hands and wrists.

In addition, poor fitting gloves will cause improper griping that may result in an increased risk of MSI.

If a task or occupation involves working in a cold environment, a cold stress risk assessment will be conducted by [insert name or position here]in addition to the ergonomic assessment. For further information pertaining to cold stress risk assessments and working in a cold environment, refer to [Organization’s] Cold Stress Program.

At the other extreme, working in a hot environment may reduce a worker’s capacity to do heavy physical work. In this situation, cardiac output needed to keep the body’s temperature from rising too high limits the amount of blood that can deliver oxygen to the muscles. Fatigue buildup may be experienced more readily in these situations. For further information on working in hot environments and heat stress assessments, refer to [Organization’s] Heat Stress Program.

##### Effects of Lighting and Glare (Indoors)

Poor lighting in the office may result in workers adopting awkward postures and movements in order to do their work, contributing to muscle soreness and fatigue. Too much or too little light over a computer workstation contributes to eyestrain resulting in increased tension in the neck, shoulders and back. For methods to improve lighting, visibility and to reduce the impact of glare in the office refer to **Appendix L (Guidelines for Lighting and Glare Control)** and **Appendix M** **(Diagrammatic Representation of Controlling the Effects of Glare in the Office).**

##### Effects of Vibration

Workers may be exposed to hand-arm vibration while using certain hand tools, increasing the risk of exposure to MSI. Exposure to too much vibration may cause the loss of feeling in the hands and arms. As a result, the amount of force required to control tools may be overestimated. To reduce the impact of vibration on exposure to MSI, these guidelines will be followed when using vibrating hand tools:

* [Insert name or position here]must be informed if any tool or process produces high levels of vibration so that the risk can be properly assessed. [Insert name or position here]may include vibration risks in the ergonomic risk assessment.
* Warm gloves and extra clothing will be worn, if practicable, when working in the cold to maintain adequate blood flow.
* The appropriate tool will be selected for the job. Making do with the wrong tools can cause more vibration or require excessive grip force.
* A minimum handgrip, consistent with safe operation of the tool or process, will be used.
* Long periods of using equipment without a break will be avoided.
* Tools will be maintained in good working order. [Insert name or position here]must be informed if tools are in need of repair.
* Workers will be advised to seek medical advice at the first sign of vibration-induced disorders as referenced in the Investigation Procedures for MSI, Step 2.

##### Effects of Noise

There is some evidence supporting the theory that noise may increase the impact upon exposure to MSI. If noise is a concern at the worksite, refer to [Organization’s] Occupational Noise and Hearing Conservation Program for further information and criteria on performing specific noise risk assessments.

#### Risk Controls for Office Tasks (Non-Computer Related)

[Organization] will ensure that the office work environment will be designed to minimize workers’ exposure to the risk of MSI. Where a task identified as being hazardous cannot be eliminated and different work practices cannot be substituted, engineered and administrative controls will be implemented to reduce exposure to the risk of MSI. These are discussed below.

##### Telecommunications

Where there is high usage of telephone or the job is dedicated to telephone work, a headset or speakerphone will be made available. Cradling the phone between the ear and shoulder is discouraged as it can increase the risk of MSI injury.

Where workers use the telephone less frequently, it will be placed within the secondary work zone, on the operator’s desk (within 30 to 50cm of the body). Refer to **Appendix E (Work Zones for a Computer Workstation).**

##### Filing Cabinets / Shelves

The following list provides an overview of potential problems and solutions associated with filing:

* Tightly packed files may contribute to muscle soreness due to holding awkward postures. Clear labeling and regular purging of files will help in reducing overcrowding. Where overcrowding of files is a problem, an archive of files will be established.
* For access to lower drawers/shelves, workers will be trained in how to avoid bending at the waist by using the legs to squat or adopt a kneeling position.
* Instability of a cabinet when more than one drawer is open at a time may result in the whole cabinet falling onto the worker. [Organization] will ensure that filing cabinets and shelves are level and attached to either the wall or the floor to avoid instability. Heavy materials will be stored in the lower drawers.
* When purchasing new filing cabinets, priority will be given to cabinets where only one drawer can be opened at a time.

##### Handcarts

To reduce the risks associated with lifting and carrying large and heavy materials within areas of the building [Organization] will provide handcarts. Where bundles of files are being transported, a handcart will be used to reduce the strain of this task.

##### Stationary Implements

Staplers and Staple Removers: The occasional use of staplers does not present an MSI hazard. Where a stapler is being used regularly, electric staplers will be made available to prevent excessive compression forces to the palm of the hand. Where thick documents are to be stapled, a suitable stapler will be selected for the task. If the task requires stapling for prolonged periods of time, [Organization] will ensure that the work table / bench is at an appropriate height to enable the worker to perform the task without having to work with elevated shoulders or bent posture.

Letter Openers: The use of letter openers will not be problematic unless used repetitively over long periods of time. In this case, [Organization] will provide a letter opener with a larger handle that will afford the operator a more effective grip on the opener and require less gripping force.

Hole Punch: Hole punching devices will be matched to the thickness of the documents being processed. Longer lever arms will enable thicker documents to be punched with less force required by the operator. Tasks involving hole punching will be performed at a standing height to maximize the downward forces of the arm and shoulder. [Organization] will provide electric hole punches for high volume work tasks.

When permanent risk control measures are not immediately available, [Organization] will implement an interim risk control strategy until such a time that a permanent risk control measure is available.

#### Risk Controls for Non-Office-Related Activities

Where a task identified as being hazardous cannot be eliminated and different work practices cannot be substituted or engineered, administrative controls will be implemented to reduce exposure to the risk of MSI. Common risk controls relating to the following risk factors are listed in Table 2:

* Repetition
* Contact Stress
* Awkward Posture
* Grip Force
* Lift/Lower Force
* Push/Pull Force

**Table 2**

| **Risk Factor** | **Common Risk Control Options** | |
| --- | --- | --- |
| **Repetition** | Eliminate highly repetitious tasks through engineering controls such as mechanization (e.g., power tools) or automation. If that is not practicable:   * Combine or eliminate some parts of work (e.g., job rotation or job enhancement) * Incorporate flexibility over pace (e.g., ability to take rest breaks and micro-pauses) * Use good work techniques (e.g., avoid unnecessary repetitions when processing tax payment) | |
| **Contact Stress** | Eliminate or minimize exposure to local contact stress:   * Change or modify equipment (e.g., use a long-handled screwdriver to prevent the butt from digging into palm) * Change or modify work area to prevent sharp edges from digging into skin (e.g., pad sharp or metal edges) * Minimize contact stress by improving the handle design of objects being handled * Improve or change work practice: * Avoid resting or leaning against sharp edges * Avoid using a body part (e.g., hand or knee) as a hammer * Use personal protective equipment (e.g., use kneepads while kneeling or use padded gloves when lifting heavy objects by narrow plastic strapping) | |
| **Awkward Posture** | Eliminate or minimize awkward postures by:   * Adjusting work heights * Minimizing reach distances * Changing orientation of work * Changing layout of workstation * Using adjustable or angled tools and equipment, turntables, conveyers, tilted and spring-loaded surfaces * Employing proper work practices   Changing the effective height of the worker by using work platforms or recessed flooring can also be used to minimize some exposures to awkward postures, as long as they do not pose tripping or other safety hazards. |
| **Trunk** | Minimize awkward postures of the trunk:   * Minimize forward bending by increasing the work height or moving objects closer (e.g., use turntables; improve layout of workspace) * Minimize side bending by reducing the reach distance or moving objects in front of the worker (e.g., improve layout of workspace; move feet) * Minimize twisting by reducing reach distance or moving objects in front of worker (e.g. improve layout of workspace; move feet) |
| **Shoulder** | Minimize awkward posture of the shoulder:   * Minimize reaching forward by reducing the reach distance or lowering the work height * Minimize reaching sideways by reducing the reach distance, lowering the work height, or moving objects in front of the body * Minimize reaching behind by moving objects to the front of the worker * Minimize reaching across the body by moving feet or transferring objects from one hand to another |
| **Wrist and Forearm** | Minimize awkward posture of the wrist by:   * selecting the required tools with appropriate handles   Minimize forearm rotation by:   * using power tools or mechanical turners |
| **Knee** | Minimize squatting and kneeling by raising the work. |
| **Sitting** | Minimize exposure to risk factors while sitting by:   * selecting and using an appropriate chair that is adjusted to provide good back support, maintain comfortable and correct posture, and minimize contact stress * Provide tilted sit-stand stool to take weight off the feet and legs while maintaining mobility |
| **Standing** | Minimize the effects of static standing on hard surfaces by providing anti-fatigue matting.  Minimize the effects from standing and operating foot pedals by providing a means to sit or sit/stand. |
| **GRIP FORCE** | Eliminate the need to manually grasp or handle objects through engineering controls. If that is not practicable, consider the following options to minimize risk:   * Maintain a straight wrist (neutral position) through: * Improved design of handles (e.g., bent instead of straight handles) * Improved design of workstation (e.g., parts containers that are tilted instead of flat; use of in-line tools) * Improved work practice (conscious effort to keep wrist straight) * Use power grip to grasp through: * Improved design of objects (e.g., boxes with cut-outs to permit power grip; adding handles to objects) |
| **Common Risk Control Options**  Improved layout of workstation:   * Position of objects (e.g., objects positioned to permit easy access) * Improved work practice (e.g., conscious effort to avoid pinch grip) |
| **VIBRATION** | Avoid strong/hard grasping of vibrating objects through:   * Improved design of tools (select and use tools with built-in vibration-dampening sleeve) * Improved work practice (conscious effort not to grasp too hard) * Use of PPE (good-fitting vibration-dampening gloves) |
| **COLD TEMPERATURES** | Avoid handling objects with cold surface temperature through:   * Improved work practice (e.g., at the end of the day, store the next day’s supplies inside instead of keeping them outside where they will be cold by morning) * Improved work procedure (e.g., avoid skin contact by using tools or utensils for grasping; periodic use of warm water to warm hands) * Use of PPE (suitable gloves) |
| **SLIPPERY OBJECTS** | Improve grip while handling slippery objects by using friction-enhanced good-fitting gloves.  **Gloves** - Provide various sized gloves to ensure a proper fit for all workers. |
| **lift / lower force** | Eliminate the need to manually lift, lower, or carry objects through engineering controls such as hoists, pallet jacks, carts, and conveyers. If that is not practicable, consider the following options to minimize risk:   * Restrict manual handling of animate objects (people and animals) to workers who are trained in safe work procedures and are proficient in using them * Use only established safe work procedures while handling large, odd-shaped, heavy, unbalanced objects or objects with a shifting center of gravity (such as liquids). |
| **Common Risk Control Options**   * Minimize the distance of the load from the worker (e.g., use turntables; move worker close to the object; don’t place obstructions close to the object) * Avoid tasks below knuckle height (e.g., use scissor lifts, pallet jacks) * Avoid tasks above shoulder height (e.g., limit shelf heights; improve storage practice, raise worker) * Avoid stooped or twisted positions (e.g., provide unrestricted work space; use proper work practice) * Minimize carrying distance (e.g., have a well-designed work flow) * Avoid handling heavy or unbalanced objects while sitting down⎯stand so that stronger muscles are used to perform physically demanding tasks * Avoid handling more than 4.5 kilograms (10 pounds) while sitting down |
| **PUSH / PULL**  **FORCE** | Eliminate the need to manually push or pull objects by using engineering controls such as conveyers, hoists, and gravity-feed systems. If that is not practicable, minimize risks by appropriate use of carts:   * Use carts that are well-designed and appropriate to the task: * Handle can be grasped between waist and shoulder height (e.g., vertical handles that can accommodate workers of different heights) * Load can be secured on the cart if necessary (e.g. belts or clamps provided) * Wheel size is appropriate for the floor surface and weight carried * Moving parts are maintained (preventive maintenance) * The worker has good visibility when pushing the cart * Use in an unrestricted area: * Worker is able to push and not be forced to pull the cart * Worker can assume a comfortable position to initiate and maintain movement of load * Worker is not forced to assume awkward postures because of restricted work space or poor visibility * Use in areas with proper flooring: * Clean floor (e.g., no debris or clutter on floor; good housekeeping) * Non-sloping and non-slippery floor * No thick, plush or shag carpet |

##### Safe Lifting Practices

Currently there is no “one-best” lifting method for all lifts, for all people. Instead, general guidelines have been developed over the years to promote safe lifting. [Organization] will use the following guidelines when lifting is required in the workplace. In addition to these guidelines, refer to the “lifting procedure” in the WorkSafeBC *Back Talk* booklet for further information.

##### Lifting Preparation

In field operations, every worker and supervisor is expected to consider the following questions prior to starting the lift:

* Can the load be slid instead of lifted?
* Can the load be split into several smaller loads?
* Is the load height located inside workers’ “safe lifting zone”, i.e. between the knees and shoulders?
* Is the worker able to reach the object without twisting or stretching?
* Is equipment required to help move the object, i.e. hand forks, forklifts, dolly?
* Have muscles been stretched or warmed up before lifting?
* Is there a danger of workers’ feet slipping?
* Has a pathway been cleared before moving the item?

##### Lifting Practices

The following practices apply to all lifts:

* If the load is heavy, the worker will ask for help if needed, rather than lift the load alone.
* Objects will be lifted comfortably, not necessarily taking the quickest or easiest way.
* Unnecessary bending will be avoided. If objects have to be picked up again later, they will be placed in locations other than the floor, where practicable.
* Unnecessary twisting will be avoided. Sufficient room will be given, when lifting, to allow feet to move so as not to have to twist at the waist.
* Reaching out will be avoided. Objects will be handled close to the body. Long reaches to pick up an object will be avoided.
* The lift will be made gradually, slowly, smoothly and without jerking.
* The worker will obtain a good grip of the object using both hands.
* When setting the object down, the standard lifting procedure will be reversed.

##### Guidelines for Working in Standing Positions/Floor Surfaces

* Work will be organized so the worker has some choice about working position and an opportunity to change position frequently.
* Whenever possible, a chair or sit/stand stool will be provided.
* The work surface height of a standing workstation will be optimal for the worker:
* Precision work:work surface height will be 2-4 inches (5-10cm) above elbow height. This allows for forearm support to reduce static loads in the shoulders
* Light Work: work surface height will be 4-6 inches (10-15cm) below elbow height to allow for space for tools and materials
* Heavy work: work surface height will be 6-16 inches (15-40cm) below elbow height to allow for muscular advantage for the upper extremity
* Bending at the waist will be avoided when standing while working. When standing for a prolonged time, a low footstool will be provided for alternate resting of the legs and for altering posture.
* Careful attention will be paid to footwear when work requires standing on unyielding surfaces e.g. concrete. Footwear will provide adequate arch, heel support and cushioning to improve comfort.
* When the work environment permits, a floor covering will be installed e.g., anti-fatigue mats, wood or carpet.

### Step Six: Training

[Organization] will:

* Train workers in the use of specific measures to control the risk of MSI, including, where applicable, mechanical aids and PPE.
* Train workers on new work procedures or practices as a measure to control the risk of MSI, as applicable.
* Provide supervision for workers to ensure that training provided is put into practice.
* Maintain a record of worker training on MSI using the form in **Appendix B (Record of Worker Education and Training for MSI).**

### Step Seven: Evaluation

[Organization] will perform three types of evaluation:

1. Evaluation of Compliance with Ergonomic (MSI) Requirements.
2. Evaluation of Effectiveness of Risk Controls (Short-term).
3. Evaluation of Effectiveness of Risk Controls (Long-term).

#### Evaluation of Compliance with Ergonomics (MSI) Requirements

[Insert name or position here]will complete an annual evaluation of the measures taken by [Organization] to comply with the Ergonomics (MSI) Requirements. The forms located in **Appendix N (Program Compliance Evaluation Form)** and **Appendix O (Summary of Program Compliance Evaluation Form)** may be used to facilitate the evaluation of program compliance.The evaluation will be conducted in consultation with the JHS Committee or Worker Health and Safety Representative, as applicable.

#### Evaluation of Effectiveness of Risk Controls (Short Term)

Once risk factors have been identified and assessed and controls have been implemented to reduce exposure, [insert name or position here]will monitor the effects of the risk controls to determine their effectiveness. The form found in **Appendix** **P (Risk Control Evaluation Form)** may be used to record information about the pattern and severity of MSI symptoms that are experienced by workers after implementation of risk controls.

A risk control evaluation will be performed as soon as practicable after controls have been implemented.

If the risk controls have had no positive effect or have been harmful, [Organization] will conduct a further investigation to determine what further action may be taken to reduce risk of exposure.

When deficiencies are identified, [insert name or position here]will ensure that the deficiencies are corrected without undue delay.

#### Evaluation of Effectiveness of Risk Controls (Long Term)

[Organization] will conduct an annual review of the effectiveness of the Ergonomics Program. The review process will be conducted by [insert name or position here]in consultation with the JHS Committee or the Worker Health and Safety Representative, as applicable, using the forms located in **Appendix G (Monthly Statistics of MSI Reports)** and **Appendix H (Evaluation of Monthly Statistics of MSI Reports).** Results of the review will be forwarded to senior management of [Organization].

The data recorded in the Monthly Statistics of MSI-Related Reports will provide information on the trends of MSI in the workplace. The data that has been collected will be analyzed to determine whether there is evidence of:

* A decrease in the number and severity of MSIs, i.e., lost days, light duties
* An increase in the number of jobs and tasks in which MSI hazards have been controlled
* A decrease in the number of jobs posing MSI hazards to employees
* Any other measures that demonstrate program effectiveness

Information gained from the data analysis will help to evaluate whether the risk control measures being implemented are effective over time. This data will also serve to determine whether the training that the workers receive is appropriate.

**Note**: Deficiencies identified during this evaluation will be corrected without delay.

## Investigation Procedure for MSI Reports

MSI investigations will be conducted as a result of a report of a work-related non-traumatic disorder. Excluded from ergonomic investigations will be injuries resulting from slips, trips, falls or being struck by or caught in objects.

When a work-related MSI report is received, [insert name or position here] will conduct an investigation, in consultation with the JHS Committee or Worker Health and Safety Representative.

Step 1: Worker will report to his/her supervisor and be given a formlocated in **Appendix F (Worker Report Form for Reporting an MSI).**

Step 2: Worker will report to the First Aid Attendant and submit the completed Worker Report Form to his/her supervisor. Referral to medical aid will be at the discretion of the First Aid Attendant and [Organization] policy. The worker will maintain his/her rights to seek medical aid at all times.

Step 3: [Insert name or position here]will complete an incident investigation. When a worker seeks medical attention or the incident becomes a lost time incident, [Organization]will use the standard form for “Investigating an Incident and Near Miss” located at [insert department/location here]**.** This will be usedin conjunction with the form located in **Appendix Q** **(Addendum to Accident/Incident Investigation Form)** that addresses contributory factors.

Step 4: Any deficiencies found during the investigation will be corrected as soon as possible. If permanent risk controls cannot be implemented, an interim control measure will be implemented until such a permanent measure is available.

Step 5: A follow-up assessment will be conducted within 21 days to determine whether the risk controls are effective.

Step 6: A statistical record of the MSI will be completed using the form in **Appendix G (Monthly Statistics of MSI Reports).**

## Purchasing Guidelines for Computer Workstations

Purchasing correct furniture and equipment will help to reduce workers’ exposure to the risk of MSI. Furniture that is adaptable will enable modifications to be made to the workstation thus ensuring that heights, angles, reaches etc., are appropriate to each individual. Refer to **Appendix R (Purchasing Guidelines for Ergonomic Office Equipment)** for further information on purchasing.

# EDUCATION AND TRAINING REQUIREMENTS

## Goal

The goal of education and training is to ensure that all workers are aware of the Ergonomics Program and how it affects them.

## Objectives

As a result of education and training all workers will:

* Understand the Ergonomics Program and its components.
* Understand the regulatory requirements surrounding hazard identification and risk assessment.
* Understand when consultation with workers and with the JHS Committee or Worker Representative is required.
* Know how to design a safe work environment to minimize exposure to the risk of MSI.
* Be educated in the recognition of early signs and symptoms of MSI and their potential health effects.
* Know the requirements for the use of mechanical aids when performing manual handling tasks in the workplace.
* Understand the procedure relating to reporting of MSI.
* Be aware of the need for compliance evaluation.

## Summary of Education

* Signs and symptoms of MSI and the potential health effects of injury on the worker

## Summary of Training

* Definition of MSI and terms used in ergonomics.
* Regulations that apply to ergonomics.
* Responsibilities of the organization, managers, supervisors, workers and suppliers.
* Requirements for risk factor identification.
* Requirements for risk factor assessment.
* Procedures for implementation of risk controls.
* Procedures for risk control evaluations.
* Requirements for worker training.
* Procedures for compliance evaluations.
* Procedures for evaluations of risk control effectiveness.

# PROGRAM MAINTENANCE

This program requires a process for the ongoing monitoring of work practices and the effectiveness of risk control measures. It requires:

* Risk factor identification and assessment of tasks that may expose workers to a risk of MSI.

* Risk factor identification and assessment of new work tasks/equipment being implemented in the workplace.
* Risk factor identification for newly hired workers prior to commencing their duties.
* Education on MSI for workers.
* Education and training for new workers.
* Training in measures to control the risk of exposure to MSI.
* Review of work procedures when a worker reports signs or symptoms of work related MSI.
* Review of work procedures when a worker reports new risks of exposure to MSI.
* Evaluation of effectiveness of the Ergonomics Program.
* Evaluation of compliance with the Ergonomics (MSI) requirements.

# DOCUMENTATION

Documentation for this program includes:

* Records of Worker Education on MSI
* Monthly Statistics for MSI Reports
* Evaluation of Monthly Statistics of MSI Reports
* MSI Risk Factor Identification Worksheet
* MSI Risk Factor Assessment Worksheet
* Record of Worker Training on Risk Control Measures
* Program Compliance Evaluation Form
* Summary of Program Compliance Evaluation
* Effectiveness of Risk Control Evaluation Form
* Addendum to Incident and Near-Miss Investigation Form

# APPENDICES

Appendix A – MSI Awareness

Appendix B – Record of Worker MSI Education and Training

Appendix C – Computer Workstation Risk Factor Identification

Appendix D – Computer Workstation Setup

Appendix E – Work Zones for Computer Workstations

Appendix F – Worker Report Form for Reporting an MSI

Appendix G – Monthly Statistics of MSI Reports

Appendix H – Evaluation of Monthly Statistics of MSI Reports

Appendix I – MSI Risk Factor Identification Worksheet

Appendix J - List of Priority Jobs/Tasks for Risk Factor Assessment

Appendix K – MSI Risk Factor Assessment Worksheet

Appendix L – Guidelines for Lighting and Glare Control

Appendix M – Diagrammatic Representation of Controlling the Effects of Glare in the Office

Appendix N – Program Compliance Evaluation Form

Appendix O – Summary of Program Compliance Evaluation

Appendix P – Risk Control Evaluation Form

Appendix Q – MSI Accident / Incident Investigation Form

Appendix R – Purchasing Guidelines for Ergonomic Office Equipment

## Appendix A – MSI Awareness

#### What is Musculoskeletal Injury (MSI)?

An MSI is an injury or disorder of the muscles, tendons, ligaments, joints, nerves, blood vessels or related soft tissue including a sprain, strain and inflammation, that may be caused or aggravated by work.

These may be injuries that have developed gradually over a period of time (resulting from chronic activities such as keyboarding, using a mouse, and continually painting with a brush) or may occur suddenly (resulting from acute activity such as overexertion when performing a single manual lift). Excluded from MSIs are injuries resulting from slips, trips, falls or being struck by or caught in objects.

#### Signs of MSI may include the following:

* Swelling
* Redness
* Skin color change
* Difficulty moving a particular body part

#### Symptoms of MSI may include the following:

* Pain
* Joint stiffness
* Muscle tightness
* Muscle weakness
* A feeling of “pins and needles”
* Numbness
* A general feeling of tiredness
* A burning feeling

Musculoskeletal Injury (MSI) may progress in stages:

* Early
* Intermediate
* Late

**Early Stage:** The body aches and feels tired at work but symptoms disappear during time away from work. The injury does not interfere with the ability to work. Usually the injury will heal completely if dealt with properly at this early stage.

**Intermediate Stage:** The injured area aches and feels weak near start of work, until well after work has ended. Work is more difficult to do. The injury may possibly heal completely if dealt with properly.

**Late Stage:** The injured area aches and feels weak even at rest. Sleep is affected. Even light duties are very difficult. The injury may not heal completely but effects can be eased if dealt with properly.

Not everyone goes through these stages in the same way. In fact, it may be difficult to say exactly when one stage ends and the next begins. The first pain is a signal that the muscles and tendons should rest and recover. Otherwise, an injury can become longstanding and sometimes irreversible. The earlier people recognize symptoms, the quicker they should respond to them.

There is strong evidence that the greater the intensity, duration and frequency of exposure to physical risk factors at work, the greater the risk of having an MSI. There is also strong evidence that reductions in exposure will reduce the development of MSIs. The efforts required to reduce the incidence of MSI need not be complicated or costly. In addition, they can result in other benefits such as increased productivity, improved employee morale, decreased absenteeism and better product quality.

**Examples of MSI include:**

* Tendonitis (inflammatory condition affecting tendons in any part of the body)
* Tenosynovitis (inflammation and swelling of a tendon sheath, usually affecting the wrist. Often caused by repetitive movements.
* Bursitis (inflammation a fluid-filled sac of fibrous tissue, known as a bursa)
* Carpal Tunnel Syndrome (condition affecting the wrist)
* Epicondylitis (condition affecting the elbow)

#### Clarification of Terminology Associated with MSI

The term MSI is commonly used in British Columbia. However it is helpful to know the terminology used within North America to avoid confusion when reading literature. The following terms have the same meaning as MSI in BC:

* RSI – Repetitive Strain Injury
* CTD – Cumulative Traumatic Disorder
* WMSD – Work Related Musculoskeletal Disorder
* ASTD – Activity Related Soft Tissue Disorder

## 

## Appendix B – Record of Worker MSI Education and Training

This form must be completed for each worker who is at risk of exposure to the risk of MSI. The worker should initial Column 4 to verify that education and training has been provided and that it has been understood.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name of Worker:** |  | | |
| **Job Position & Work Location:** | |  | |
| **Date of Follow-up Education/Training Session:** | | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 1. Content of Education/Training | 2. Date of Completion | **3. Supervisor’s Signature** | **4. Initials of Worker** |
| Early signs and symptoms relating to worker’s job |  |  |  |
| Potential health effects of MSI |  |  |  |
| Set up of workstation (if applicable) |  |  |  |
| Training on new work procedures to control risk of MSI |  |  |  |
| Supervision provided to ensure that training is put into practice |  |  |  |
| Risk Factors relating to job |  |  |  |
| Understanding of applicable risk control procedures |  |  |  |

## Appendix C – Computer Workstation Risk Factor Identification

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Date:** |  | | | **Time:** | |  | |
| **Completed By:** | |  | |  | | |  |
| **Job Title or Task:** | | |  | **Location of Work Activity:** | | |  |
|  | | | |  |  | | |

Read the following instructions fully before conducting the hazard identification process.

1. Complete section on job title/task, date/time, location of work activity and name of person completing the worksheet.
2. Observe a representative sample of workers performing the work activity to be assessed when appropriate.
3. Ask the worker to adopt their “usual” work posture at their workstation. Record your observations of the worker’s posture in Part A: Assessment of Worker Posture. Add any additional comments made by the worker at this time.
4. If all your observations have the “Yes” box checked and the worker has no negative comments pertaining to their workstation or comfort, skip Part “B” and go directly to Part C: Work Environment Assessment.
5. If your initial observations have one or more “No” boxes checked, complete Part B: Detailed Measurements of Posture/Workstation.
6. Some questions may be answered simply “Yes” or “No” in which case the appropriate Yes/No box should be checked.
7. If the question requires a measurement, complete the Yes/No boxes as appropriate. If the “No” box is checked, record the measurement of posture or workstation in the “Before Changes” column. Make the appropriate adjustment in accordance with WorkSafeBC specifications then record the new measurement in the “After Changes” column.
8. Complete Part C: Work Environment.
9. As an aid, use this form in conjunction with the diagram of a workstation assessment located in Appendix D.

|  |  |  |
| --- | --- | --- |
| part A: OBSERVATION OF Worker Posture | | |
| **Yes** | **No** | **Check Posture** |
|  |  | When using keyboard or input device are forearms horizontal with 90-110° angle at elbow? |
|  |  | Are shoulders and upper arms relaxed? |
|  |  | Are wrists in a straight position when using the keyboard or input device? |
|  |  | When looking at the screen, is the head upright i.e., not bent forward or backward? |
|  |  | Is the lower back supported by the curved part of the chair backrest? |
|  |  | When seated, are thighs resting horizontally with a 90-110° angle at the hips? |
|  |  | Are the feet fully supported by the floor or a footrest? |
| **Worker Comments:** | | |

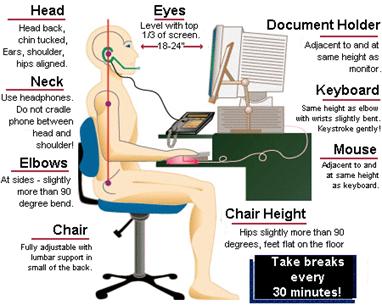
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| part B: Detailed Measurements of Posture and Workstation | | | | |
| **Yes** | **No** | **Specifications** | **Before Changes** | **After Changes** |
| Desk Specifications | | | | |
|  |  | Is desk height adjustable? | **Not applicable** | **Not applicable** |
| Chair Specifications | | | | |
|  |  | Is the chair adjustable? | **Not applicable** | **Not applicable** |
|  |  | Does the chair have a padded, rounded front edge? | **Not applicable** | **Not applicable** |
|  |  | Are the hips sitting at an angle of 90°-110°? |  |  |
|  |  | Is the seat height within 38–52cm (15-20 inches) from the floor? |  |  |
|  |  | When sitting, do the worker’s feet touch the floor comfortably? | **Not applicable** | **Not applicable** |
|  |  | Is there sufficient knee clearance of 8–15cm (3-6inches) between thighs and desk? |  |  |
|  |  | Does the chair have an adjustable backrest? | **Not applicable** | **Not applicable** |
|  |  | Does the backrest provide lower back support? | **Not applicable** | **Not applicable** |
|  |  | If chair has armrests, can the chair be positioned at a comfortable typing or viewing distance from the screen? | **Not applicable** | **Not applicable** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **part B: Detailed Measurements of Posture and Workstation (continued)** | | | | |
| **Yes** | **No** | **Specifications** | **Before Changes** | **After Changes** |
|  |  | Does the chair have 5 castors? | **Not applicable** | **Not applicable** |
|  |  | Can the seat of the chair be tilted? | **Not applicable** | **Not applicable** |
| Foot Rest Specifications **Note:** the correct height of the footrest is the distance that the feet are off the floor after having adjusted the seat to the correct height. | | | | |
|  |  | Does worker use a footrest? | **Not applicable** | **Not applicable** |
|  |  | Does footrest have non-slip surface? | **Not applicable** | **Not applicable** |
|  |  | Does the footrest support both feet when the heels are 12cm (5 inches) apart? | **Not applicable** | **Not applicable** |
|  |  | Can the footrest be adjusted between angles of 10 – 20°? | **Not applicable** | **Not applicable** |
|  |  | Is the footrest stable when feet are resting on it? | **Not applicable** | **Not applicable** |
| Monitor Specifications | | | | |
|  |  | Is the worker sitting between 33 – 70cm (13-28inches) from the monitor screen? |  |  |
|  |  | Is the top line of text on the monitor screen at eye level? |  |  |
|  |  | Are glare and reflections avoided? | **Not applicable** | **Not applicable** |
|  |  | Does the monitor have brightness and contrast controls? | **Not applicable** | **Not applicable** |
| Keyboard/Mouse Specifications | | | | |
|  |  | Are forearms held horizontally, with 90° – 110° angle at elbow? |  |  |
|  |  | Are wrists in a neutral position when typing? | **Not applicable** | **Not applicable** |
|  |  | Is the mouse at same height as keyboard? | **Not applicable** | **Not applicable** |
|  |  | Is the document holder placed appropriately on the workstation? |  |  |
|  |  | Are keying actions performed with minimal force? | **Not applicable** | **Not applicable** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| part C: Work Environment | | | | | | |
| Yes | No | Specifications | | Before Changes | | After Changes |
| Work Zone Specifications | | | | | | |
|  |  | Are frequently used items placed appropriately in the primary zone (up to 30cm/12inches from the body)? |  | |  | |
|  |  | Are occasional use items placed appropriately in the secondary work zone (30-50cm/12-20inches from the body)? |  | |  | |
| Floor Surface Specifications | | | | | | |
|  |  | Does the floor surface allow easy movement of the chair? | **Not applicable** | | **Not applicable** | |
| Temperature Specifications | | | | | | |
|  |  | Is the ambient temperature between 21°C (70°F) and 26°C (79°F)? | |  | |  |
| Lighting and Glare | | | | | | |
|  |  | Does the level of light make it easy to see monitor screen without squinting or straining? | | **Not applicable** | | **Not applicable** |
|  |  | Is the screen free of reflected glare? | | **Not applicable** | | **Not applicable** |
|  |  | Is the monitor positioned so that line of sight is parallel to the window? | | **Not applicable** | | **Not applicable** |
|  |  | Have the brightness and contrast controls on the monitor been adjusted to make it easier to see the screen? | | **Not applicable** | | **Not applicable** |
|  |  | Are walls, floors and work surfaces a matte (dull) finish and free of distracting images or lights? | | **Not applicable** | | **Not applicable** |
|  |  | Is task lighting on the writing surface to the left, if worker is right-handed (or to right if worker is left-handed) to avoid shadows on documents and reflected glare? | | **Not applicable** | | **Not applicable** |
| **Organization of Work and Job Design** | | | | | | |
|  |  | Does worker take regular breaks away from the computer throughout the day? | | **Not applicable** | | **Not applicable** |
|  |  | Does worker take micro pauses when working on the computer? (breaks of up to 10-20 seconds) | | **Not applicable** | | **Not applicable** |
|  |  | Do work activities vary regularly to permit change of posture? | | **Not applicable** | | **Not applicable** |
|  |  | Are work activities paced over the entire shift? | | **Not applicable** | | **Not applicable** |
|  |  | Does worker stretch and move muscles regularly? | | **Not applicable** | | **Not applicable** |

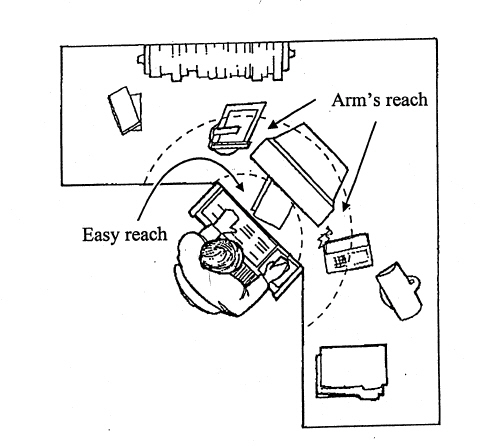
**Information Note:** Conventional practice holds that there is such a thing as a “correct posture”. However, in reality, posture change is documented to be as important as posture correctness, especially with regard to the intervertebral discs in the spine. Posture change helps to pump disc fluid back into the discs thereby relieving some stress from the discs.

## Appendix D – Computer Workstation Setup



## 

## Appendix E – Work Zones for a Computer Workstation



**Primary Work Zone**

Objects/items are placed within the primary work zone (up to 30cm/12inches from the body) for easy reach. These items are used frequently.

**Secondary Work Zone**

Objects/items are placed within the secondary work zone (30 – 50cm/12-20inches from the body) that are used only occasionally.

## 

## Appendix F – Worker Report Form for Reporting an MSI

This form should be completed in addition to an Injury / Incident Report

|  |  |  |  |
| --- | --- | --- | --- |
| **Worker’s Name** |  | **File #** |  |
| **Position/Title** |  | **Date of Report** |  |
| **Work Location** |  | **Job Description** |  |

**Signs and Symptoms:**

|  |  |  |  |
| --- | --- | --- | --- |
| Briefly describe the signs and/or symptoms that you are experiencing: | |  | |
|  | | | |
|  | | | |
| In your opinion, what is causing the problems that you are experiencing? | | |  |
|  | | | |
|  | | | |
| Have you reported this problem to the First Aid Attendant? |  | | |

|  |  |  |  |
| --- | --- | --- | --- |
| Have you consulted a physician concerning the problems that you are experiencing? | |  | |
| If so, when? |  | | |
| Has an Accident Investigation been completed? (Give date of Investigation) | | |  |
|  | | | |

**Timing Patterns:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| When did you first experience the problems? | | | |  | | |
| When are the signs/symptoms generally worse? | | | | |  | |
|  | | | | | | |
| Do they go away? If so, when? | | |  | | |
|  | | | | | |
|  | | | | | |
| **Other Information:** | |  | | | |
|  | | | | | |
| **Signature:** |  | | | | |

## 

## Appendix G – Monthly Statistics of MSI Reports

#### Instructions

* Complete this 3 page document at the end of each calendar month
* In Column A list the injured body area recorded in each of the MSI reports received throughout the month
* In Column B list the task/job that the worker performs
* Complete Columns C, D, E and F as appropriate

|  |  |  |  |
| --- | --- | --- | --- |
| **Name of Person Completing this Form:** | |  | |
| **Job Title/Position:** |  | | |
|  |  | |  |
| **Month** | **Date of Completion** | | **Signature of Person Completing Form** |
| January |  | |  |
| February |  | |  |
| March |  | |  |
| April |  | |  |
| May |  | |  |
| June |  | |  |
| July |  | |  |
| August |  | |  |
| September |  | |  |
| October |  | |  |
| November |  | |  |
| December |  | |  |

| **MSI Report** | **Column A** | **Column B** | **Column A** | **Column B** | **Column A** | **Column B** | **Column C** | **Column D** | **Column E** | **Column F** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Neck/**  **Shoulders/**  **Upper Back** | **Job/**  **Task** | **Lower Back** | **Job/**  **Task** | **Arm**  **Wrist**  **Hand** | **Job/**  **Task** | **Reports Referred to Medical Aid** | **Lost Work Days through MSI** | **Temporary Job Transfers through MSI** | **Permanent Job Transfers through MSI** |
| January |  |  |  |  |  |  |  |  |  |  |
| February |  |  |  |  |  |  |  |  |  |  |
| March |  |  |  |  |  |  |  |  |  |  |
| April |  |  |  |  |  |  |  |  |  |  |
| May |  |  |  |  |  |  |  |  |  |  |
| June |  |  |  |  |  |  |  |  |  |  |
| July |  |  |  |  |  |  |  |  |  |  |
| August |  |  |  |  |  |  |  |  |  |  |
| September |  |  |  |  |  |  |  |  |  |  |
| October |  |  |  |  |  |  |  |  |  |  |
| November |  |  |  |  |  |  |  |  |  |  |
| December |  |  |  |  |  |  |  |  |  |  |

## 

## 

## Appendix H – Evaluation of Monthly Statistics of MSI Reports

This document will facilitate the evaluation of the effectiveness of the Ergonomics Program. Using the information from the statistics recorded in Appendix G, complete this summary form and forward it to [insert name or job position].

|  |  |
| --- | --- |
| Department: | Address/Location of Department: |
| Person Responsible for Recording Statistics:  Position held: | |
| List departments submitting MSI Reports: | |
| What job/task(s) are most commonly associated with Worker MSI reports? | |
| How many MSI Reports are associated with this task/job over the 12-month period? | |
| Do the statistics relating to MSI Reports show a trend in:   * Increasing number of MSI Reports received from Jan to Dec * Decreasing number of MSI Reports received from Jan to Dec * No change in number of MSI Reports received from Jan to Dec     Give details: | |
| Is there any month that shows an unexpected rise in number or MSI reports received?  [ ] Yes [ ] No If yes, is there an obvious reason for the increase?  (i.e., breakdown of mechanical lifting aids, unexpected increase in work demands etc.) | |
| Signature of Person submitting this Form: | |

## 

## Appendix I – MSI Risk Factor Identification Worksheet

|  |  |
| --- | --- |
| Date: | Job Title or Task: |
| Completed by: | Signature: |

**The Ergonomic (MSI) Regulation Sections 4.46 to 4.53** require the identification of factors in the workplace that may expose workers to a risk of MSI. This worksheet will assist in identifying factors that pose a risk of MSI. If a risk is identified, at least a “moderate” risk of MSI exists and merits assessment to determine if it is a “high” risk. Exposures not identified by this worksheet would be considered “low risk” and may not merit assessment and control.

|  |  |  |
| --- | --- | --- |
| CONTACT STRESS | **If any of the following criteria are present, mark the assessment box** | **🞏 Perform Contact**  **Stress Risk Assessment** |
| **1** | * Worker uses one of the following as a hammer more than 10 times per hour and for more than 2 hours total per day\*\* * hand (heel/base of palm) or, * knee   (An extremely severe contact stress usually results in a traumatic injury such as bruising and therefore is not considered an MSI risk factor). | Notes |
| **REPETITION** | **If any of the following criteria are present, mark the assessment box** | **🞏 Perform Repetition Risk Assessment** |
| **1** | * Worker repeats the same motion with the neck, shoulders, elbows, wrists or hands every few seconds with little or no variation for more than 2 hours total per day (excluding keying activities) | Notes |
| **2** | * Worker performs intensive keying more than 4 hours total per day |

\*\*Note: Total time is determined by measuring the cumulative duration of a task, and considering whether the risk factor in question is a significant part of that task.

Appendix I - MSI Risk Factor Identification Worksheet (continued)

|  |  |  |
| --- | --- | --- |
| **FORCE** | **For the purposes of MSI risk identification, force can be classified as grip force, or lift/lower force** | |
| **Grip Force** | **If any of the following criteria are present, mark the assessment box** | **🞏 Perform Grip Force Risk Assessment** |
| **Pinch Grip\***  C:\My Documents\My Pictures\Work Pics\Pinch Grip.jpg | * Pinch gripping an unsupported object(s) weighing 1kg (2lbs) or more per hand for more than 2 hours total per day   OR   * Pinch gripping with a force of 2kg (4lbs) or more per hand for more than 2 hours total per day | Notes |
| **Power Grip\*\***  C:\My Documents\My Pictures\Work Pics\Full hand Grip.jpg | * Power gripping an unsupported object(s) weighing 5kg (10lbs) or more per hand for more than 2 hours total per day   OR   * Power gripping with a force of 5kg (10lbs) or more for more than 2 hours total per day |
| **Lift / Lower Force** | If any of the following criteria are present, mark the assessment box | **🞏Perform Lift/Lower**  **Assessment** |
| **1** | * Lifting objects weighing more than 75lbs once per day | Notes |
| **2** | * Lifting objects weighing more than 25kg (55lbs) more than 10 times per hour, more than 2 hours total per day |
| **3** | * Lifting objects weighing more than 5kg (10lbs) if done more than twice per minute, more than 2 hours total per day |
| **4** | * Lifting objects weighing more than 11kg (25lbs) more than 25 times per day and * Above the shoulders, or * Below the knees, or * At arms length from the body |

\* Note: A pinch grip occurs when the force application is primarily between the fingers and thumb.

\*\* Note: A power grip occurs when the force is primarily between the fingers and the palm.

Appendix I - MSI Risk Factor Identification Worksheet (continued)

|  |  |  |
| --- | --- | --- |
| AWKWARD POSTURE | **If any of the following criteria are present, mark the assessment box** | **🞏 Perform Awkward**  **Posture Assessment** |
| **Neck** | Worker performs any minimum joint deviations:   * Working with the neck bent more than 30° in any direction for more than 2 hours total per day   Side Backward Forward  (circle the appropriate movements) | Notes |
| **Shoulder**  **Back** | * Working with the hand(s) above the head more than 2 hours total per day * Working with the elbow(s) above the shoulder more than 2 hours total per day |
| * Working with the back bent more than 30° in any direction for more than 2 hours total per day   Forward Side Backward Twisted  (circle the appropriate movements) |
| **Knees** | * Worker squats/kneels for more than 2 hours total per day   C:\My Documents\My Pictures\Work Pics\Kneeling Awkward.jpg |
| **VIBRATION** | **If any of the following criteria are present, mark the assessment box** | **🞏 Perform Vibration Assessment** |
| **1** | * Use high vibration tools (impact wrenches, carpet strippers, chainsaws, jack hammers, scalers, riveting hammers) for more than 30 minutes total per day | **Notes** |
| **2** | * Use moderate vibration hand tools (grinders, sanders, jigsaws) that typically have moderate vibration levels more than 2 hours total per day |

## Appendix J – List of Priority Jobs/Tasks for Risk Factor Assessment

Make a list of jobs and/or tasks, in decreasing order of risk for exposure to MSI.

|  |  |
| --- | --- |
| **Job/Task** | **Work Location/Department** |
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## 

## Appendix K – MSI Risk Factor Assessment Worksheet

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Date:** |  | | **Job Title or Task**: |  | |
| **Completed by:** | |  | | **Signature:** |  |

This worksheet will be used to determine if the risk(s) identified in the Risk Identification Worksheet pose a “high” or “moderate” risk.

**INSTRUCTIONS**

1. Document the job title or task, date and name of person(s) completing the worksheet. Risk assessment will be performed by [insert name or job position]who knows the work process, the MSI risk factors, and the principles of risk assessment and control.
2. Complete the “Risk Factor Summary-Moderate Risk” below using the information you gathered from the Risk Factor Identification Worksheet. These risk factors are considered to pose at least a “moderate” risk of MSI.
3. Perform “Risk Factor Assessment” only on these factors.
4. Observe and consult with a representative sample of workers and those workers with signs and symptoms of MSI.
5. Reading across the page under each risk factor, determine if all of the conditions in that row are present in the work activities.
6. If all conditions are present, place a mark in the box  to indicate that a “high” risk of MSI exists.
7. Make appropriate notes to clarify specific details.
8. Complete the “High Risk” column of the Risk Factor Summary Table below.

**INTERPRETATION OF RESULTS**

The risk factors in the “high risk” column require controls to be implemented without undue delay. Controls should eliminate, or if that is not practicable, minimize the risk of MSI to workers. If the risk remains “moderate,” controls may be merited to minimize the risk of MSI.

|  |  |  |
| --- | --- | --- |
| **RISK FACTOR SUMMARY TABLE** | | |
| **RISK FACTOR** | **“MODERATE RISK” - Risk Factors identified from Risk Identification Worksheet** | **“HIGH RISK” - Risk Factors Identified from Risk Assessment Worksheet** |
| **Contact Stress** |  |  |
| **Repetition** |  |  |
| **Grip Force** |  |  |
| **Lift/Lower Force** |  |  |
| **Awkward Postures** |  |  |
| **Vibration** |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | **Risk Factor Assessment - Page 2 of 5** | | |
| **Contact Stress Risk Assessment** | | | | | | |
| **Body** **Part** | **Physical Risk Factor** | | **Duration** | | **Visual Aid** | **Mark**  **to indicate a High Risk of Exposure to MSI** |
| Hands | Using the hand (heel/base of palm)as a hammer more than once per minute | | More than 2 hours total per day\* | | Hand contact stress |  |
| **Knees** | Using the knee as a hammer more than once per minute | | More than 2 hours total per day | | Kneel Contact stress |  |
| **Repetition Risk Assessment** | | | | | | |
| **Body** **Part** | | **Physical Risk Factor** | **Combined With** | | **Duration** | **Mark**  **to indicate a High Risk of Exposure to MSI** |
| **Neck**  **Shoulders**  **Elbows**  **Wrists**  **Hands** | | Using the same motion with little or no variation every few seconds (excluding keying activities) | No other risk factors | | More than 6 hours total per day | * Neck * Shoulders * Elbows * Wrists * Fingers |
| **Wrists**  **Hands** | | Using the same motion with little or no variation every few seconds (excluding keying activities) | Wrists bent in:  ≥ 30° flexion, or  ≥ 45°extension, or  ≥ 30° ulnar deviation, or  **and**  High, forceful hand(s) exertions | | More than 2 hours total per day |  |
| Intensive keying  Keying with the hands or fingers in a rapid, steady motion with few opportunities for temporary work pauses | Awkward wrist posture:  ≥ 30° flexion, or  ≥ 45°extension, or  ≥ 30° ulnar deviation | | More than 4 hours total per day |  |
| No other risk factors | | More than 7 hours total |  |

\*Note: Total time is determined by measuring the cumulative duration of a task, and considering whether the risk factor in question is a significant part of that task.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | | | **Risk Factor Assessment - Page 3 of 5** | | |
| **Grip Force Risk Assessment** | | | | | | |
| **Body** **Part** | **Physical Risk Factor** | **Combined With** | **Duration** | | **Visual Aid** | **Check**  **to indicate a High Risk of MSI** |
| **Arms**  **Wrists**  **Hands** | Pinch gripping **\*** an unsupported (one-handed) object(s):   * Weighing 1kg (2lbs) or more per hand   OR   * Pinch gripping with a force of 2kg (4lbs) or more per hand (comparable to pinching half a stack of photo-copy paper) | Highly repetitive motion | More than 3 hours total per day | |  |  |
| Wrists bent in:   * 30° flexion, or * 45°extension   or   * 30° ulnar deviation   Circle the appropriate movements | More than 3 hours total per day | | Awkward Wrists |  |
| No other risk factors | More than 4 hours total per day | | Pinch Grip |  |
| **Arms**  **Wrists**  **Hands** | Power gripping\*\* an unsupported object(s)   * Weighing 5kg (10lbs) or more per hand   OR   * Power gripping with a force of 5kg (10lbs) or more per hand (comparable to clamping light duty automotive jumper cables onto a battery) | Highly repetitive motion | More than 3 hours total per day | |  |  |
| Wrists bent in:  ≥ 30° flexion, or  ≥ 45°extension, or  ≥ 30° ulnar deviation  circle the appropriate movements | More than 3 hours total per day | |  |  |
| No other risk factors | More than 4 hours per day | | Full hand Grip |  |

**\*Note:** A pinch grip occurs when the force application is primarily between the fingers and thumb.

**\*\*Note:** A power grip occurs when the force is primarily between the fingers and palm.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | **Risk Factor Assessment - Page 4 of 5** | | |
| **Lift / Lower Force Risk Assessment – To Determine High Risk** | | | | | | |
| **STEP 1: Find the actual weight of the object being lifted.**  **Actual weight** = \_\_\_\_\_\_\_\_\_\_\_\_  **STEP 2: Determine the Unadjusted Weight Limit**  Determine where the worker’s hands are at the beginning of the lift/lower. Mark that spot on the diagram below. The number in that box is the **Unadjusted Weight Limit.**  **Lifting Forces Risks** | | **How Many Lifts per Minute?** | **For How Many Hours per Day?** | | | |
| **1 hr or less** | | **1 hr to 2 hrs** | **2 hrs or more** |
| 1 lift every 2-5mins | 1.0 | | 0.95 | 0.85 |
| 1 lift every minute | 0.95 | | 0.9 | 0.75 |
| 2-3 lifts every minute | 0.9 | | 0.85 | 0.65 |
| 4-5 lifts every minute | 0.85 | | 0.7 | 0.45 |
| 6-7 lifts every minute | 0.75 | | 0.5 | 0.25 |
| 8-9 lifts every minute | 0.6 | | 0.35 | 0.15 |
| 10+ lifts every minute | 0.3 | | 0.2 | 0.0 |
| **Note**: For lifting performed less than once every five minutes,  use 1.0  Limit Reduction Modifier = \_\_\_\_\_\_\_\_\_\_\_\_  **STEP 4: Calculate the Weight Limit**  Start by copying the Unadjusted Weight Limit from Step 2.  Unadjusted Weight Limit (Step 2) = \_\_\_\_\_\_\_\_\_\_\_\_  If the worker twists more than 45 degrees while lifting, reduce the Unadjusted Weight Limit by multiplying by 0.85. Otherwise, use the Unadjusted Weight Limit.  **Twisting Adjustment = \_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Adjusted Weight Limit = \_\_\_\_\_\_\_\_\_\_\_\_**  Multiply the Adjusted Weight Limit by the Limit Reduction Modifier from Step 3 to get the **Weight Limit.**  **Weight Limit = \_\_\_\_\_\_\_\_\_\_\_\_**  **STEP 5: Is This A Hazard?**   * Compare the Actual Weight lifted from Step 1 to the calculated Weight Limit in Step 4. * If the Actual Weight in Step 1 is greater than the Weight Limit in Step 4, then the lift is “high risk” and requires controls without undue delay. * If the Actual Weight is below the Weight Limit, the risk is “moderate”. Moderate risk lifts may still require controls. | | | | |
| **Unadjusted Weight Limit = \_\_\_\_\_\_**  **STEP 3**: **Find the Limit Reduction Modifier**  Find out how many times the worker lifts per minute and the total number of hours per day spent lifting. Use this information to look up the **Limit Reduction Modifier** in the table at top right. | |
| **Note:** If the job involves lifts of objects with a number of different weights and/or from a number of different locations, use Steps 1 through 5 above to:   1. Analyze the two worst case lifts – the heaviest object lifted and the lift done in the most awkward posture. 2. Analyze the most commonly performed lift. In Step 3 use the frequency and duration for all of the lifting done in a typical workday. | | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | **Risk Factor Assessment - Page 5 of 5** | | |
| **Awkward Posture Risk Assessment** | | | | | |
| **Body** **Part** | **Physical Risk Factor** | **Duration** | | **Visual Aid** | **Mark**  **to indicate a High Risk of MSI** |
| Knees | Squatting | More than 4 hours total per day | | Squatting awkward |  |
| Kneeling | More than 4 hours total per day | | Kneeling Awkward |  |
| **Shoulders** | Working with the hand(s) above the head or the elbow(s) above the shoulder(s) | More than 4 hours total per day | | Awkward Shoulders |  |
| Repetitively raising the hand(s) above the head or the elbow(s) above the shoulder(s) more than once per minute | More than 4 hours total per day | |  |
| **Neck** | Working with the neck bent more than 45° (without support, or the ability to vary posture) | More than 4 hours total per day | | Bent neck |  |
| **Back** | Working with the back bent forward more than 30° (without support, or the ability to vary posture) | More than 4 hours total per day | | Back 30deg |  |
| Working with the back bent forward more than 45° (without support, or the ability to vary posture) | More than 2 hours total per day | | Back 45deg |  |

Use this worksheet to determine if a “high” risk of MSI from hand-arm vibration exists. Document the assessment results on page 2.

**Step 1:** Determine whether you have the expertise to measure vibration. If not, consider hiring an external consultant.

**Step 2:** If you have the expertise to conduct vibration measurements, find the vibration value for the tool. (Get it from the manufacturer, or you may measure the vibration yourself). The vibration value will be in units of meters per second squared (m/s2). On the graph below find the point on the left side that is equal to the vibration value.

**Step 2:** Determine how many total hours per day the worker is using the tool and find that point on the bottom of the graph.

**Step 3:** Trace a line from each of these two points until they cross.

**Step 4:** If that point lies in the “High Risk” area above the upper curve, then the vibration exposure is “high risk” and requires controls without undue delay. The vibration must be reduced below the high risk level or to the degree technologically and economically feasible. If the point lies between the two curves in the “Caution” area, then the job is of “moderate risk” and may merit controls to minimize the risk of MSI. If it falls in the “Low” area below the bottom curve, then no further steps are required.

**Example:**

An impact wrench with a

vibration value of 12 m/s2

is used for 2 ½ hours total

per day. The exposure level

is in the High Risk area.

The vibration must be

reduced below the high

level or to the degree

technologically and

economically feasible.

Note: The caution limit curve (bottom) is based on an 8-hour energy-equivalent frequency-weighted acceleration value of 2.5 m/s2. The high risk limit curve (top) is based on an 8-hour energy-equivalent frequency-weighted acceleration value of 5 m/s2.

## Appendix L – Guidelines for Lighting and Glare Control

This appendix may be used in conjunction with the diagram located in **Appendix M (Diagrammatic Representation of Controlling the Effects of Glare in the Office)**.

The ability to see well when using a computer is dependent upon several environmental factors:

* The amount of light
* The difference in brightness between the monitor and the immediate surrounding area
* Presence of glare

#### Amount of Light

There are various means of altering the lighting in an office to help to achieve optimal work conditions. The following lists examples of altering levels of illumination:

* Provide additional lighting, such as a lamp on a movable arm
* Improve the layout of existing lights by lowering or raising them or changing their position in the work area
* Increase or decrease the number of lights
* Change the diffusers or reflectors on existing lights
* Change the lights to improve light levels or improve color perception
* Clean lights and light fittings regularly

#### Brightness Levels

When setting up a computer workstation, be aware of direct glare. Direct glare involves light being shone directly into the eyes, e.g. looking out a bright window, looking at a bright monitor screen or task lights shining directly into the visual path. When setting up a computer workstation, ensure that the monitor is placed so that the worker is not directly looking at the monitor and out the window at the same time.

Adjust the brightness controls on the monitor to achieve a comfortable level of screen brightness.

#### Glare Control

**Workstation Position**

To avoid glare from windows, position the computer workstation so that when the worker faces the monitor, he/she is sitting beside or parallel to the window.

**Overhead Lighting**

In addition to making workstation adjustments, overhead lighting may be reduced to reduce glare. Installation of dimmer switches will lower light levels and diffusers will direct light vertically, reducing the angled light rays. However, it is not possible to use dimmer switches with fluorescent lights. Consult with[insert name and position here] to make these alterations.

**Task Lighting**

When light levels are low, illuminate the hard copy on which you are working at the computer. Use a desk lamp to provide additional light. To illuminate the writing surface, place the lamp on the left of the worker if right handed. This stops the lamp from casting shadows from the hand and pen on the paper. Vice versa for left handed workers.

**Anti-Glare Screens**

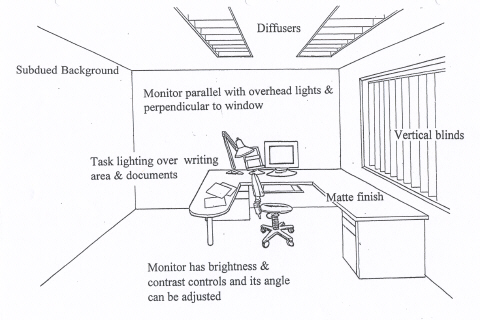
Where the source of the glare cannot be removed, install an anti-glare screen on the computer monitor. Use a glass anti-glare screen or filters rather than nylon mesh screens. Clean the anti-glare screen regularly.

**Walls and Finishes**

Where practicable, coat walls, floors and furniture with a matte (dull) finish. Overhead lighting and desk lamps are reflected off light-colored, shiny surfaces contributing to the source of glare problems.

## 

## Appendix M – Diagrammatic Representation of Controlling the Effects of Glare in the Office



## Appendix N – Program Compliance Evaluation Form

The intent of the Ergonomics program is to eliminate, or where that is not practicable, minimize risk of musculoskeletal injury (MSI) to workers. This document evaluates compliance with the WCB OHS Regulation for Ergonomics (MSI) Requirements.

**Note**: If you wish to evaluate the effectiveness of the Ergonomic Program, refer to **Appendix G (Monthly Statistics of MSI Reports)** and **Appendix H (Evaluation of Monthly Statistics of MSI Reports).**

#### Instructions:

* Complete the attending personnel information.
* Review your current work practices and procedures and compare them with those listed in the column headed “Compliance Elements”. All “Compliance Elements” must be in existence or in operation in order for **[Organization]** to be in compliance with WCB Ergonomics (MSI) Requirements.
* “Person Responsible” should be the person of **[Organization]** who has responsibility for the compliance element.
* “Date” should be the date of the planned action on the compliance element or the current date of the inspection if the evaluating officer is satisfied that the element has been/is being complied with.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Department being Evaluated:** | |  | | | | |
| **Address / Location** |  | | | | | |
| **Evaluator Name:** |  | | | **Signature** |  | |
| **Position of Evaluator:** |  | | |  |  | |
| **Date of Evaluation:** |  | | **Date of Previous Evaluation:** | | |  |
|  |  | |  | | |  |

|  |  |
| --- | --- |
| **Names of Others in Attendance/Job Position** | **Signature of Attendance** |
| #1: |  |
| #2: |  |
| #3: |  |
| #4: |  |
| #5: |  |

Step 1 – Consultation - Regulation Section 4.53(1)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Compliance Steps | **Compliance Elements** | **√**  **×** | **Comments** | **Person Responsible** | **Date** |
| [Organization] will consult with the JHS Committee or the Worker H&S representative during each step of the compliance process. | Requirement:  [Organization] to consult with the JHS Committee or the Worker Health & Safety Representative on risk identification, assessment and control, the content and provision of worker education and training, and the evaluation of compliance measures taken.  Compliance indicators:   1. Formal system for consultation exists.  * Review JHS Committee meeting agenda. * Review JHS Committee meeting minutes. * Other pertinent documents.  1. Interview of randomly selected JHS Committee members to validate consultation on MSI compliance initiatives.   Consultation means to seek input from the JHS Committee, and take into consideration their input into decisions. |  |  |  |  |

Step 2 - Education - Regulation Section 4.51(1)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Compliance Steps | **Compliance Elements** | **√**  **×** | **Comments** | **Person Responsible** | **Date** |
| [Organization] will ensure that worker(s) exposed to a risk of MSI are educated in risk identification, recognition of early signs & symptoms of MSI and potential health effects. | Requirements:   1. All workers exposed to a risk of MSI educated in risk identification related to the work, including the early signs and symptoms of MSIs and their potential health effects. 2. [Organization] to consult with JHS Committee or Worker H&S Representative on the content and provision of education. (OHS Reg. Section 4.53 (1)(b)). Use elements in Step 1 to verify.   Compliance indicators:   1. Education material content is adequate and accurate. It includes  * Risk factors related to work * Signs and symptoms of MSI * Potential health effects of MSI  1. Records of education kept. 2. Periodic follow-up education to maintain worker knowledge current. 3. Education to those workers new at a job without undue delay. 4. Education delivery incorporates process to validate comprehension by workers. Can workers answer these questions:  * What are some early signs and symptoms of MSI? * Who would you report these signs and symptoms to? * What are the risk factors for MSI that you have in your job?  1. Persons providing education knowledgeable about the type of work involved and on the education contents. They are able to:  * Explain risk factors listed in the regulation * Apply risk assessment parameters (magnitude, duration, exposure pattern) to risk factors * Apply risk control principles (engineering, administrative, PPE) to reduce risk   (JHS Committee members, Worker H&S Representative, Supervisors and others who may conduct risk identification, assessment, training, evaluation or recommend/implement controls are at least educated and trained to the above standard.) |  |  |  |  |

Step 3 - Risk Factor Identification – Regulation Section 4.47

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Compliance Steps** | **Compliance Elements** | **√**  **×** | **Comments** | **Person Responsible** | **Date** |
| [Organization] will identify factors (from **Section 4.49**) that may expose workers to a risk of MSI.  It is impractical to identify factors associated with all jobs in one step. A reasonable approach is to prepare a list of high-risk jobs in decreasing order of risk using claims data, FA records, etc. and prepare an action plan. | Requirement:   1. Risk factors in the workplace that may expose workers to a risk of MSI have been (or, are being) identified. 2. [Organization] to consult with JHS on risk identification. (OHS Reg. Section 4.53(1)(a)). Use elements in Step 1 to verify.   Compliance indicators:   1. List of jobs that require risk identification has been compiled, prioritized and an acceptable progress schedule established and adhered to.  * Jobs/tasks listed for risk identification is complete * Rationale used for prioritizing is valid. (Injury records, FA records and worker surveys are valid examples) * Risk identification is progressing according to acceptable schedule  1. Checklists/tools used for risk identification meet minimum acceptable standard.  * All risk factors listed in Regulation Section 4.49 are included  1. Knowledgeable persons conduct risk identification. (Refer to Step 2 for details) 2. Completed risk identification documents are readily available for review. 3. Risk identification completed meets acceptable standard.  * If necessary verify through random review of select tasks  1. Verify that risk identification is also initiated by the following triggers:  * When a worker reports signs and symptoms of MSI to the supervisor (usually meaning the worker has reported to first aid with an MSI as well) * When risk factors are observed in a job – during workplace inspections and observations of current work methods * When worker(s) off with MSI * When there is new job or a process has changed |  |  |  |  |

Step 4 - Risk Assessment - Regulation Section 4.48

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Compliance**  **Steps** | **Compliance Elements** | **√**  **×** | **Comments** | **Person Responsible** | **Date** |
| [Organization] will ensure that risk to workers is assessed when factors that may expose workers to a risk of MSI have been identified.  Some situations may not require a specific risk assessment, where the risk control is obvious and effective. (I.e., risk identification can lead directly to risk control). In that case, consultation as specified in **Section 4.53(2)** must be done at the risk factor identification step prior to risk control. | **Requirements:**   1. Risk to workers has been (or, is being) assessed where factors that expose workers to a risk of MSI have been identified. (OHS Reg. Section 4.48) 2. Risk assessment process incorporates consultations with workers having signs or symptoms of MSI and with workers who are required to carry out the work being assessed. (OHS Reg. Section 4.53(2)) 3. [Organization] to consult with JHS on risk assessment. (OHS Reg. Section 4.53(1)(a)). Refer to compliance elements in Step 1 for verification.   **Compliance indicators:**   1. Risk to workers is assessed following risk identification, unless risk identification can directly lead to corrective controls that are obvious and effective. 2. Risk is assessed using an acceptable method.  * Risk assessment method incorporates assessment parameters (magnitude, duration, exposure pattern)  1. Knowledgeable persons conduct risk assessment. (Refer to Step 2.) 2. Risk assessment completed meets acceptable standard.  * If necessary, verify through random review of select tasks  1. Risk assessment documents completed are readily available. 2. If only a representative sample of workers who are required to carry out the task being assessed are consulted with, verify the rationale used in selecting the representative sample is acceptable.  * Incorporates representative samples from different gender, age, size/stature etc. groups |  |  |  |  |

Step 5 -Risk Control - Section 4.50(1)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Compliance**  **Steps** | **Compliance Elements** | **√**  **×** | **Comments** | **Person Responsible** | **Date** |
| [Organization] must eliminate or if that is not practicable minimize the risk of MSI to workers.  **Section 4.50(2)** states that personal protective equipment (PPE) may be used as a substitute for engineering or administrative controls only in circumstances in which those controls are not practicable.  **Section 4.50(3)** states that when permanent control measures can not be introduced immediately, interim control measures must be implemented without delay. | Requirements:  Risk controls implemented to eliminate or, if that is not practicable, minimize the risk of MSI to workers. (OHS Reg. Section 4.50(1))  PPE used as a substitute for engineering or administrative controls only in circumstances where these controls are not practicable. (OHS Reg. Section 4.50(2))  Interim control measures implemented without delay when the introduction of permanent controls will be delayed. (OHS Reg. Section 4.50(3))  [Organization] to consult with JHS on risk controls selected and implemented. (OHS Reg. Section 4.53(1)(a)). Refer to compliance elements in Step 1 for verification.  Compliance Indicators:   1. Risk control(s) is implemented where risk assessment reveals a risk to the worker. 2. Engineering and administrative controls are given priority for implementation over use of PPE. 3. Controls implemented result in one or a combination of the following:  * Eliminate exposure * Reduce magnitude of exposure * Reduce duration of exposure * Improve exposure pattern  1. System in place and used to verify control implemented has produced desired outcome and has not introduced new risk to workers.  * Evaluate effectiveness of control over short-term (worker feedback) and long-term (injury trend)  1. Records of controls implemented are readily available and verify that selection, implementation and follow-up are done as per requirements.  * Randomly select and review.  1. Interim controls are implemented if permanent controls cannot be implemented without delay   Compliance plan states time frames expected for implementation of permanent controls. |  |  |  |  |

Step 6 – Training - Regulation Section 4.51(2)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Compliance**  **Steps** | **Compliance Elements** | **√**  **×** | **Comments** | **Person Responsible** | **Date** |
| [Organization] will ensure that a worker to be assigned to work which requires specific measures to control the risk of MSI is trained in the use of those measures including work procedures, mechanical aids and personal protective equipment (PPE) | **Requirements:**  Workers assigned to work that requires specific measures to control the risk of MSI are trained in the use of these measures, including, where applicable, work procedures, mechanical aids and PPE (OHS Reg. Section 4.51(2)).  [Organization] to consult with JHS or Worker Rep on the content and provision of training. (OHS Reg. Section 4.53(1)(b)). Refer to compliance elements in Step 1 for verification.  **Compliance Indicators**   1. Workers are trained in risk controls implemented.  * Mechanical aids or other engineering controls * New work procedures as established by employer * New work practice as established by employer * Use of PPE  1. Training delivery incorporates process to validate comprehension  * Records of training readily available  1. Follow-up (supervision) to ensure training provided is put into practice 2. System for follow-up training as required |  |  |  |  |

Step 7– Evaluation - Regulation - Section 4.52

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Compliance**  **Steps** | **Compliance Elements** | **√**  **×** | **Comments** | **Person Responsible** | **Date** |
| [Organization] will:   1. Monitor the effectiveness of measures taken to comply with the MSI requirements and ensure they are reviewed at least annually. 2. When deficiencies are identified, they must be corrected without undue delay. | **Requirements:**  Effectiveness of measures taken to comply with the Ergonomics (MSI) Requirements is reviewed at least annually. (OHS Reg. Section 4.52(1)).  Deficiencies identified during evaluation must be corrected without undue delay. (OHS Reg. Section 4.52(2)).  [Organization] to consult with JHS on the evaluation of compliance measures taken. (OHS Reg. Section 4.53(1)(c)). Refer to compliance elements in Step 1 for verification.  Compliance Indicators:   1. Methods/tools have been established to monitor effectiveness of the 7-step compliance process. Acceptable methods include worker surveys, review of injury and FA trends.  * Method selected for use in evaluation is valid  1. Evaluation to verify the overall effectiveness of the performance based Ergonomics (MSI) Requirements done at least annually.  * Review documentation to validate process  1. Evaluation to verify the effectiveness and impact of risk controls implemented must be done shortly after implementation of the control measures.  * Evaluation will usually involve feed back from workers using the risk controls  1. Deficiencies identified during evaluations are corrected without undue delay.  * Review documentation |  |  |  |  |

## 

## Appendix O – Summary of Program Compliance Evaluation Form

**Instructions**

This document may be used to summarize the information gathered and recorded on the Program Compliance Evaluation Form.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Address / Location being Evaluated** |  | | | | |
|  | | | | |
| **Evaluator Name:** |  | | **Signature** |  | |
| **Position of Evaluator:** |  | |  |  | |
| **Date of Evaluation:** |  | **Date of Previous Evaluation:** | | |  |
|  |  |  | | |  |

|  |  |
| --- | --- |
| **Names of Others in Attendance/Job Position:** | **Signature of Attendance:** |
| #1: |  |
| #2: |  |
| #3: |  |
| #4: |  |
| #5: |  |

|  |  |  |
| --- | --- | --- |
| **Steps for Developing and Maintaining**  **a MSI Compliance Process** | **OHS Reg. Section** | [Organization’s] **Actions**  **to Meet Requirements** |
| **Step 1 – Consultation** | **4.53** |  |
| 1. Consultation framework is in place (JHS Committee involved in the process and effective communication with committees and OHS staff). |
| **Step 2 - Education** | **4.51(1)**  **4.53(1)(b)** |  |
| 1. Educate JHS Committee(s), Supervisors, FAA’s or others who will be responsible for performing ergonomics risk factor identification, assessment or MSI accident investigations. 2. Educate workers about risk factors, signs and symptoms and health effects of MSIs and risk factors related to their work. 3. Keep records. |
| **Step 3 – Risk (Factor) Identification** | **4.47**  **4.49**  **4.53(1)(a)** |  |
| 1. Develop a plan to perform ergonomic job assessments by reviewing injury statistics, first aid records (including MSIs,) worker surveys etc. 2. Prioritize jobs/tasks to be assessed and provide time line. 3. Beginning with highest priority job, conduct risk factor identification. 4. Consider factors listed in 4.49. 5. Ensure consultation with workers, JHS Committee or Worker H&S Representative is happening. 6. Document risk factor identification process. 7. Investigate MSIs. |
| **Step 4 – Risk (Factor) Assessment** | **4.48**  **4.49**  **4.53(1)(a)**  **4.53(2)(a)(b)** |  |
| 1. Employer is assessing (quantifying or measuring) identified risk factors (Risk Factor Assessment). 2. Consultation with the JHS Committee or Worker H&S Representative and workers is occurring. 3. Risk factor assessment is documented. Records are maintained. |
| **Step 5 – Risk (Factor) Control** | **4.50(1)(2)(3)**  **4.53(1)(a)** |  |
| 1. Risk controls are put in place to eliminate or minimize the risk of MSI to workers. |
| **Step 6 - Training** | **4.51(2)**  **4.53(1)(b)** |  |
| 1. Training completed where required as part of a controls measure (i.e., work procedure changes, new equipment). 2. Consultation with JHS Committee or Worker H&S Representative is occurring. 3. Training is documented. Records are kept. |
| **Step 7 – Evaluation** | **4.52** |  |
| 1. Annually evaluate all aspects of MSI compliance including all of the above steps. 2. Evaluate effectiveness of controls and correct deficiencies without undue delay. |

**Note:** Only directly applicable Regulation sections are referenced.

## Appendix P – Risk Control Evaluation Form

#### Instructions

Complete this 2 page Risk Control Evaluation Form as part of the procedure following notification of a worker’s concern regarding the nature of their job. A Risk Factor Identification and Assessment must have been performed within a reasonable time frame prior to the completion of this Evaluation Form.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Worker’s Name:** |  | | | **Department** |  | |
| **Job / Task Description:** |  | | |  |  | |
| **Date of Evaluation:** |  | | **Date of Original Evaluation:** | | |  |
| **Nature of worker’s concern:** | |  | | | | |
|  | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date of Implementation of Risk Controls: | Date of Risk Control Evaluation: | | | |
| Is this the First Evaluation for this Worker’s Concern?   * Yes * No | If no, give Dates of Previous Evaluations: | | | |
| Name of Person Conducting Evaluation: | Signature of Person Conducting Evaluation: | | | |
| Others in Attendance:  #1 | Signature of Others in Attendance:  #1 | | | |
| #2 | #2 | | | |
| Has the worker experienced a reduction in signs and symptoms of MSI since the implementation of control measures? | | * Yes | | * No |
| If no, give a brief description of present signs and symptoms and their effect upon the worker. | | | | |
| Does the worker feel it takes less effort to do the same job/task? | | * Yes | | * No |
| Were the risk controls implemented as a temporary or permanent measure? | * Temporary | | * Permanent | |
| If temporary, when are they to be made permanent? (Give date and brief description of permanent measures to be implemented) | | | | |
| Is another Risk Control Implementation Evaluation required? | | * Yes | | * No |
| If yes, when? | | | | |
| Is medical referral required? | | * Yes | | * No |
| If yes, give date of proposed Incident Investigation and attach copy. | | | | |

## Appendix Q – MSI Accident/Incident Investigation Form

This form should be attached to the standard form for accident/incident investigations.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Injured Worker: Last Name | | First Name | | Occupation/Job Title | | |
| Department | Address | | Tel # | | Date of Report | |
| When were MSI signs and symptoms first noticed? | | | | | | |
| What were the signs and symptoms? | | | | | | |
| Has an MSI Risk Factor Assessment been completed for this work? | | | | If yes, date: | | |
| Were specific risk control measures in place to reduce the risk of MSI?  Describe briefly: | | | | | | |
| Has the worker been trained in the use of the specific measures put in place? | | | | * Yes | | * No |
| Has the worker been educated in identifying risk of exposure to MSI specific to his/her job? | | | | * Yes | | * No |
| Has the worker been educated on signs and symptoms of MSI? | | | | * Yes | | * No |
| Has the worker been educated on the potential health effects of MSI? | | | | * Yes | | * No |
| Were there risk factors of force, repetition, awkward posture, contact stress and duration?  If yes, list risk factors: | | | | * Yes | | * No |
| Were reaching heights, reaches, seating or floor surfaces contributory?  If yes, give details: | | | | * Yes | | * No |
| Were the size, shape, weight or containers of objects handled contributory?  If yes, give details: | | | | * Yes | | * No |
| Was temperature a factor? | | | | * Yes | | * No |
| Were work recovery cycles, task variability or work rate contributory? If yes, give details: | | | | * Yes | | * No |
| Has the worker been educated in identifying risk of exposure to MSI? | | | | * Yes | | * No |
| If so, was the education effective? | | | | * Yes | | * No |
| Must the education be improved?  If yes, give details: | | | | * Yes | | * No |

## Appendix R – Purchasing Guidelines for Ergonomic Office Equipment

**Introduction**

The decision to purchase new equipment and furniture for computer workstations is very important. This purchase should be viewed as a long-term investment that will impact the health and safety of staff for many years to come. Guidelines for purchasing equipment and furniture for computer workstations can help to improve the health and safety of the user for many years to come and ensure that limited resources are spent wisely.

These guidelines are provided to assist organizations in purchasing equipment and furniture for computer workstations that is cost effective and will positively contribute to the long-term health and safety of staff. These guidelines will look at the following list of the most commonly purchased equipment and furniture for computer workstations:

1. Chairs
2. Keyboard Trays
3. Desks

**Chairs**

Good seating provides stable body support in a dynamic posture and comfort over a period of time. The main considerations when purchasing a chair are:

|  |  |
| --- | --- |
| chair_1 | * it does not restrict blood in the lower limbs * it is easy to maintain and change posture * support for the spine is provided * the surface has a sufficient level of friction to avoid sliding off the seat * the surface is permeable, and * the chair must be adjustable for overall height, back height and tilt, and seat pan tilt |

|  |  |
| --- | --- |
| **Seat Height**  chair adjustment - a_seatheig2 | Users should be able to sit with their feet comfortably on the floor or footrest without undue pressure on the underside of the thighs. The thigh-to-torso angle should not be less than 90°.   * The seat should be the height of the user’s knee plus the thickness of the footwear he/she is using; * The chair height should be adjustable within a range of 15" - 20". |
| **Seat Depth**  chair adjustment - seatdept2 | Seat depth is the maximum depth from the seat front to the backrest. Some chairs offer adjustable seat pans and/or backrests. These are ideal for chairs used by more than one person.  Users should be able to sit in the chair without undue pressure against the back of the knees, their back properly supported by the backrest, and with adequate buttock and thigh support. |
| **Seat Width** | Seat width is the width across the hips. Proper seat width is crucial in ensuring that the worker has the flexibility to adjust his/her posture to relieve postural loading.   * The seat cushion should not be less than 18 inches wide; * The seat should be wider than the hip breadth of the user with allowance for movement and clothing; * The seat width should not limit the ability to comfortably use the armrests (where provided). |
| **Seat Pan Angle**  chair adjustment - forwardt2 | The angle of the seat pan should allow the user to support their feet on the floor or footrest. Seat pan angles should not cause the user’s torso-to-thigh angle to be less than 90°. Forward seat pan angles should not cause users to shift excessive weight to their feet or experience the sensation of sliding out of the chair. |

**Back Support**

|  |  |  |
| --- | --- | --- |
| chair adjustment - position1b | chair adjustment - position2b | chair adjustment - position3b |

The backrest must be capable of providing support to the back of the worker in all sitting postures.

In most cases 'off-the-floor' chairs will fit most people. However, in instances where a person is taller or shorter, different size seat pans can and should be ordered. Also, adjustable seat pans are available and should be considered when the chair is to be used by more than one person. In all cases:

|  |  |  |  |
| --- | --- | --- | --- |
| chair adjustment - backheig2 | Backrest height must be adjustable | chair adjustment - backangl2 | The backrest angle must be adjustable |

**Backrest Height**

The ultimate test for fit is highly posture dependent. All backrests should provide adequate lumbar support and buttocks clearance. For tasks requiring upper body mobility, the backrest should provide adequate back support, but not interfere with the user’s movement (typically these backs should not be higher than the bottom of the user’s shoulder blades). For users who prefer reclining postures, or more upper back support, the back height should provide support for the shoulder blades.

**Backrest Width**

The width of the backrest should provide adequate support for the curvature of the user’s back without causing localized pressure points.

**Backrest Lumbar Support**

The height and shape of the lumbar support should coincide with the lumbar curve (“the small”) of the user’s back. The support should be firm, but not cause localized pressure points.

**Armrests**

Armrests provide support for the muscles of the neck and shoulders and provide opportunities for rest when work is interrupted. Armrest support also reduces static loading of the shoulder and upper arm muscles when working with a mouse.

The height of the armrest should allow users to sit in a variety of postures while supporting their forearms and/or elbows in a manner that avoids lifting the shoulders (armrests too high) or leaning to the side to reach the armrest (armrests too low).

Armrests are preferred but not required. However, when they are provided, they should:

* be height adjustable;
* be width adjustable;
* allow users to sit close enough to the work surface to perform their tasks while maintaining contact with the backrest. The armrests should have a minimum   
  set -back of 6 inches from the front edge of the seat;
* not restrict posture.

**Casters**

* Casters are designed for either hard surfaces or for carpeted floors.
* Casters with low resistance, i.e. designed for carpeted floors, cannot be used safely on a hard floor surface. Note that, if chairs are purchased with casters designed for carpet and the worker places a plastic matting over the carpet, the casters may need to be changed.
* The work chair must not travel unintentionally when occupied or unoccupied.
* The chair must not move away easily when unoccupied.

**Keyboard and Mouse**

**DRAFT**

**Sept. 20/01**

The proper height and location of the keyboard and mouse is critical for maintaining comfortable hand, arm and shoulder postures without wrist misalignment. The following criteria must be followed when purchasing keyboard/mouse equipment and/or setting up a computer work station:

The keyboard and the mouse must be located so that the height allows the worker to key with the upper arms hanging relaxed from the shoulders and the elbows at roughly right angles (90° or greater), and to allow the wrists to be straight while keying.

**Keyboard / mouse trays must be provided** unless the primary work surface (desk-top) is the correct keyboard/mouse height for a worker and the workstation is used by only one worker.

When keyboard/mouse trays are provided they must:

* accommodate both the keyboard and the mouseat the same level and as close together as possible;
* be adjustable- it should be capable of being adjusted downward at least 4 inches from the primary work surface height;
* be capable of being tilted down and away from the user slightly (negative tilt).

The mouse must be located so that the arms are positioned close to the body (see drawings below). For some right handed workers, the numbers keypad forces the right arm using the mouse to be positioned sideways, away from the body. If this is the case and the worker experiences pain or discomfort from this position, there are three possible solutions:

1. Switch the mouse to the left hand;
2. If the keypad numbers are seldom used, a keyboard without the number keypad can be purchased;
3. Provide a mouse bridge that sits over the numbers keypad. Note that this raises the mouse slightly, which may cause some shoulder soreness in some workers but has generally been found to be very effective.

|  |  |  |
| --- | --- | --- |
| mouse1 - correct placement  **Correct** Mouse Position  Mouse placed close to body | mouse2 - incorrect placement  **Incorrect** Mouse Position  Mouse too far from body | mouse3 - inline wrist  **Correct** wrist alignment  mouse4  **Incorrect** wrist alignment |

#### Desks

Computer desks are another important component of a computer workstation. Whether you are purchasing a new desk or recycling an old one it should have the following features to help avoid some ergonomic risk factors:

* Should be between 71 to 76cm (28 to 30 inches) high
* No obstructions for knees, legs, shins, thighs
* Holes for computer wire management
* Enough room for a keyboard tray which can accommodate a keyboard and mouse side by side
* Enough work surface depth so that monitor can be moved to about an arms length away from the user