Occupational Health and Safety Council of Ontario (OHSCO)
MUSCULOSKELETAL DISORDERS PREVENTION SERIES

PART 2:

Resource Manual for the MSD Prevention Guideline for Ontario

MSD
MUSCULOSKELETAL DISORDERS

RESOURCE MANUAL

Disclaimer

The material contained in this manual is for information and reference purposes only and not intended as legal or professional advice. The adoption of the practices described in this manual may not meet the needs, requirements or obligations of individual workplaces.
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Acknowledgements

This document, the Resource Manual for the MSD Prevention Guideline for Ontario, is part 2 of the Occupational Health and Safety Council of Ontario's Musculoskeletal Disorders (MSD) Prevention Series. It was developed in partnership with the members of the Occupational Health and Safety Council of Ontario (OHSCO), with the support of the Centre of Research Expertise for the Prevention of Musculoskeletal Disorders (CRE-MSD), and in consultation with representatives from Ontario's labour organizations, employer associations and individual employers and workers.

Supporting organizations include:

- Construction Safety Association of Ontario
- Education Safety Association of Ontario
- Electrical & Utilities Safety Association
- Farm Safety Association
- Industrial Accident Prevention Association
- Institute for Work & Health
- Mines and Aggregates Safety and Health Association
- Municipal Health and Safety Association
- Occupational Health Clinics for Ontario Workers
- Ontario Forestry Safe Workplace Association
- Ontario Ministry of Labour
- Ontario Safety Association for Community and Healthcare
- Ontario Service Safety Alliance
- Pulp and Paper Health and Safety Association
- Transportation Health and Safety Association of Ontario
- Workers Health and Safety Centre
- Workplace Safety and Insurance Board (Ontario)

The support and participation of everyone who contributed to the development of this manual and its related documents is greatly appreciated. Graphics in this manual were created by the Canadian Centre for Occupational Health and Safety (www.ccohs.ca).

Scope of the Resource Manual

The Resource Manual for the MSD Prevention Guideline for Ontario is being made available through the partners of the Ontario health and safety system. Its primary purpose is to provide Ontario's employers and workers with more detailed information and advice on how to implement the generic framework for preventing musculoskeletal disorders that is described in the MSD Prevention Guideline for Ontario, part 1 of OHSCO's MSD Prevention Series.

A wide variety of health and safety experts and associations, employers, employer associations and unions were consulted in developing this manual. Experience in other jurisdictions was considered, as were the opinions and advice of international experts.

This manual refers to a number of tools, worksheets and surveys that can be used to help workplaces in their MSD prevention efforts. Examples of tools that may be useful can be found in the MSD Prevention Toolbox, part 3 of OHSCO's MSD Prevention Series. To obtain Part 1 or Part 3 of OHSCO's MSD Prevention Series contact one of Ontario's health and safety organizations (see Appendix for contact information).

The MSD prevention framework presented in the MSD Prevention Guideline for Ontario and the implementation steps described in this manual are consistent with best practices and effective approaches based on current information and experience. The framework and the specific implementation steps represent one way of addressing MSDs in a workplace. Other MSD prevention processes and programs that include worker training and involvement and a process to recognize, assess and control MSD hazards (including those that may have been established through a collective agreement) may be equally effective. Some of the implementation steps described in this manual may not be applicable to all workplaces.

The MSD prevention framework and the implementation steps described in this manual are consistent with the requirements for an effective health and safety program. Therefore, workplace MSD prevention efforts can and should be fully integrated into an existing health and safety program where possible and practical.

For workplaces that already have an MSD prevention program in place, this manual may be helpful when considering whether existing program elements can be modified or improved.

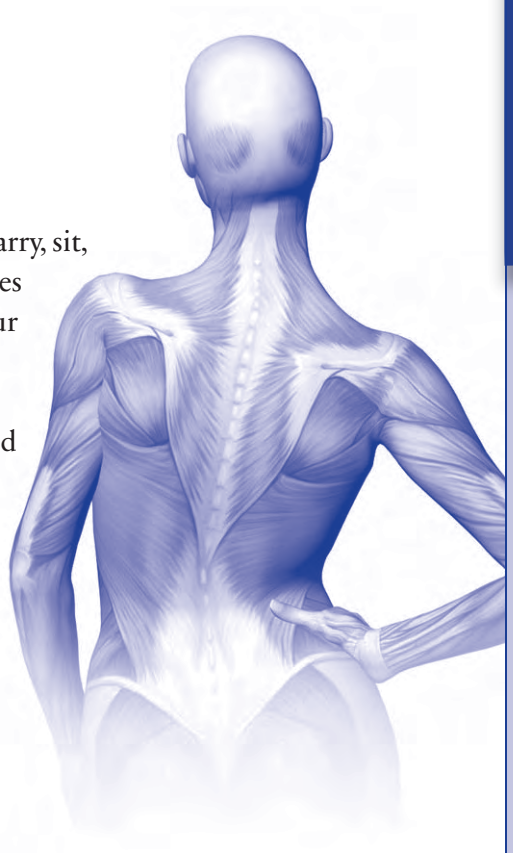
For workplaces that do not have an existing MSD prevention program, this manual will help when implementing an effective MSD prevention framework and/or integrating MSD prevention into the existing health and safety program.

The information in this manual is generic and not targeted at any specific type of workplace, industry sector or work task. Although the particular hazards, jobs and tasks present in different workplaces will vary, the hazards that can lead to MSD are the same for all workplaces.

The MSD Prevention Guideline for Ontario and this manual:

- do not describe all elements of an effective health and safety management system that should be implemented in all workplaces
- do not cover all of the legislated workplace health and safety requirements
- do not specifically apply to Early and Safe Return-to-Work programs
- do not address issues related to personal wellness, fitness, diet or lifestyle, and
- do not describe the full scope of workplace ergonomics.

Section 1: Introduction



Every day we use our muscles, tendons, ligaments and joints to lift, carry, sit, stand, walk, move and work in a variety of ways. However, sometimes these tasks or the way we do them can put too much demand on our bodies, causing pain and discomfort. In addition, it may lead to a more serious injury called a musculoskeletal disorder (MSD).

MSDs are the number one type of work-related lost-time injury reported to the Workplace Safety and Insurance Board (WSIB) in Ontario. They:

- cause pain and suffering for thousands of workers every year, and
- cost Ontario's workplaces hundreds of millions of dollars due to worker absence and lost productivity.

MSDs are strongly linked to known risk factors or hazards in the workplace.

Now is the time to take action on MSD hazards!

The Purpose of the Guideline and the Resource Manual

The MSD Prevention Guideline for Ontario describes a recommended framework for MSD prevention. This resource manual provides more detailed information and advice on how to implement that framework to prevent MSDs. Where possible, the framework can and should be integrated into your existing health and safety program and other business activities.

This manual also provides general information about MSDs, medical diagnoses that are classified as MSDs and why MSDs are a prevention priority for Ontario's health and safety system. Key workplace hazards that have been related to the development of MSDs are described with examples. While any work can expose people to MSD hazards, the hazards only become a problem when:

- the hazard level is too high
- the frequency of exposure to the hazard is too high, and/or
- the length of exposure to the hazard is too long.

Guidance is provided for doing an MSD risk assessment and for selecting and implementing controls to minimize the risk of MSD.

Target Audience for the Guideline

The MSD prevention guideline and this manual are intended for:

- workplace parties involved in health and safety, including:
  - managers
  - supervisors
  - Joint Health and Safety Committee (JHSC) members
  - health and safety representatives (H&S reps)
  - representatives of workplace union(s)
  - health and safety professionals, and
  - workers.
- unions, employer associations, health and safety professionals, health and safety associations, ergonomists, and others who may find the information useful when helping workplaces with MSD prevention.

What are Musculoskeletal Disorders?

MSD is an umbrella term for a number of injuries and disorders of the muscles, tendons, nerves, etc. Other terms that mean the same as MSD include:

- repetitive strain injury (RSI)
- cumulative trauma disorder (CTD)
- work-related musculoskeletal disorder (WMSD)
- musculoskeletal injury (MSI, MSK)
- occupational overuse syndrome (OOS), and
- sprain and strain.

DEFINITION OF MSD

MSDs are injuries and disorders of the musculoskeletal system. They may be caused or aggravated by various hazards or risk factors in the workplace.
The musculoskeletal system includes:

- muscles, tendons and tendon sheathes
- nerves
- bursa
- blood vessels
- joints/spinal discs, and
- ligaments.

MSDs do not include musculoskeletal injuries or disorders that are the direct result of a fall, struck by or against, caught in or on, vehicle collision, violence, etc.

Many body parts can be affected by MSDs. The back is the most common, but the shoulders, neck, elbows, hands and wrists are also frequently involved. MSD-related pain and discomfort have also been reported in the hips, knees, legs and feet.

A number of medical diagnoses are covered by the term MSD, including:

- back pain (many specific diagnoses)
- carpal tunnel syndrome (wrist/hand)
- epicondylitis (tennis or golfer's elbow)
- muscle strain
- rotator cuff disorder or syndrome (shoulder)
- tension neck syndrome
- tendonitis (anywhere in the body), and
- tenosynovitis (anywhere in the body).

While different body parts can be affected by these disorders, the symptoms of MSDs are similar no matter where they occur. The symptoms generally include:

- pain with or without movement
- swelling and tenderness
- reduced range of motion and/or stiffness, and
- tingling and/or numbness in nerve-related injuries or disorders.

Why are MSDs a Problem?

MSDs are a problem because:

- they can affect every aspect of a worker's life, and
- they are costly for workplaces.

MSDs are the number one type of lost-time claim reported to the WSIB, resulting in major direct and indirect costs for Ontario employers. From 1996 to 2004, the WSIB approved more than 382,000 MSD-related lost-time claims. These claims represented almost 27 million lost-time days from work and direct costs of more than $3.3 billion.

Ontario's employers are estimated to have paid more than $12 billion in direct and indirect costs for MSD-related lost-time claims reported between 1996 and 2004. Indirect costs include:

- overtime or replacement worker wages
- equipment modifications
- administration
- retraining, and
- lost productivity and reduced quality.

These statistics account for only lost-time claims. They underestimate the true size of the MSD problem in Ontario workplaces. Many

MSD FACTS

In Ontario, MSDs account for:

- 42% of all lost-time claims
- 42% of all lost-time claim costs, and
- 50% of all lost-time days.

(Averages for 1996–2004)

people continue to work in pain and discomfort. They may not file a WSIB claim but take personal sick time to go for medical help or until the pain subsides. Workers in pain are also likely to be less productive and their work quality may decrease.

Why do MSDs Occur in the Workplace?

The human body is an amazing machine. It can do a huge variety of difficult, complex and unique physical and mental tasks. In fact, human beings have to do many tasks because machines and technology cannot match our ability to think, reason, make decisions, feel, be precise and make judgements.

However, the human body is also limited in what it can do. MSDs occur where the *demands of the job exceed the capabilities* of the person doing the job.

Each person in a workplace is unique. This diversity in human beings shows up in many ways, including our:

- size and shape
- strength and endurance
- flexibility
- hearing
- eyesight
- knowledge and experience
- education, and
- skill.

These differences exist regardless of gender, age or ethnic group. Therefore, just because one person can perform a job task without suffering an MSD, it does not mean that everyone will be able to. Jobs should be designed for a variety of workers. They should take into account what we know about the variation in workers' size, strength, endurance, etc. If this is not done, some workers will have a greater risk of developing MSDs than others.

There is a strong link between exposure to certain physical factors or hazards in a workplace and the development of an MSD. There is also evidence that certain work organization factors are related to an increased risk of MSDs. These factors include:

- perceptions of high job demands or workloads
- monotonous job tasks
- perceptions of low job control
- a lack of clarity about job worth, importance or expectations
- low job satisfaction, and
- perceptions of low social support.

While these issues should be considered, they are beyond the scope of this manual. Therefore, methods for evaluating and controlling them are not addressed here. However, some of the elements presented in the framework may help to reduce the negative effects of certain work organization factors.

Does Ontario's *Occupational Health and Safety Act* Address MSDs?

The Occupational Health and Safety Act requires employers to:

- ensure that workers are made aware of the hazards associated with their jobs and workplaces
- implement controls to reduce the risk of injury due to these hazards, and
- take every reasonable precaution in the circumstances to protect a worker.

POINT TO REMEMBER

Controlling MSD hazards in a workplace is not only the right thing to do; **it is the law.**

MSD hazards must be treated the same as any other workplace hazard. This means that they need to be:

- recognized and identified
- assessed, and
- controlled.

All parties in a workplace have a role to play in preventing MSDs in the workplace. See **Section 3: Establish a Foundation for Success** for more information.

Is MSD Prevention Good for Ontario's Businesses and Employers?

An effective approach to MSD prevention can help employers compete in today's global marketplace. Preventing MSDs helps employers to:

- reduce costs
- increase productivity
- improve the quality of their products and services, and
- stimulate innovation.

The argument for preventing MSDs is persuasive even if you consider only the direct costs, let alone the costs when people are working in pain and discomfort or are absent. Some suggest that the costs associated with working in pain are much higher than those related to absenteeism due to MSDs. For MSD-related lost-time WSIB claims, time and money must be spent investigating, assessing and controlling the MSD hazards associated with a job task. Most likely, one or more jobs will have to be modified to accommodate injured workers.

In contrast, an effective MSD prevention program helps employers to retain their skilled and knowledgeable workers. This is particularly significant with an aging workforce. A well-implemented MSD prevention program is an opportunity to consider how the jobs are done. The resulting changes not only reduce the workers' exposure to MSD hazards but also help to improve

productivity and quality by finding better, smarter and more efficient ways to do the job.

A good MSD prevention program allows tasks to be done with less stress and strain. This may improve customer service, both internally and externally, and allow greater innovation in work processes and procedures.

See the **MSD Prevention Toolbox** for information on the cost–benefit of implementing MSD prevention strategies.

ERGONOMICS IS GOOD BUSINESS

"Ergonomic programs can substantially reduce workers' compensation costs, with savings of up to 60%–80% over a 4- to 5-year period."

— US General Accounting Office 1997

"Older workers have lower non-fatal injury rates. However, when they get hurt, they need more time off. Job characteristics such as high stress, repetitiveness and high physical demand are statistically related to early retirement."

— In Kowalski-Trakofler et al., 2005

"The ceiling lift project [at St. Joseph's General Hospital, Comox, BC] resulted in a 40% reduction in total claims cost, [an] 82% reduction in lift/transfer costs, [and an] 83% reduction in lost [time] hours [related to lift/transfer injuries]"

— Occupational Health & Safety Agency for Healthcare in BC 2002

What Comes Next?

Now is the time to take action. This resource manual provides details on how to integrate MSD prevention into your occupational health and safety program through the involvement of all the workplace parties: employers, supervisors, health and safety staff, workers, JHSC members or the health and safety representative and unions.

Section 2: MSD Prevention – *Part of Your Occupational Health and Safety Program*

MSD prevention does not have to be difficult or complex. All you really need is the knowledge and will to recognize, assess and control MSD hazards in the same way you would any other hazard in the workplace.

Figure 2.0 shows the steps in a framework to prevent MSDs. These steps should be familiar to you, since they are the same ones used when dealing with any hazard or health and safety issue. This section briefly describes each step. Sections 3 to 9 provide more information as well as tools, worksheets and other similar resources for implementing these steps.

POINT TO REMEMBER

If you have an effective health and safety program, you already have a good foundation for preventing MSDs.

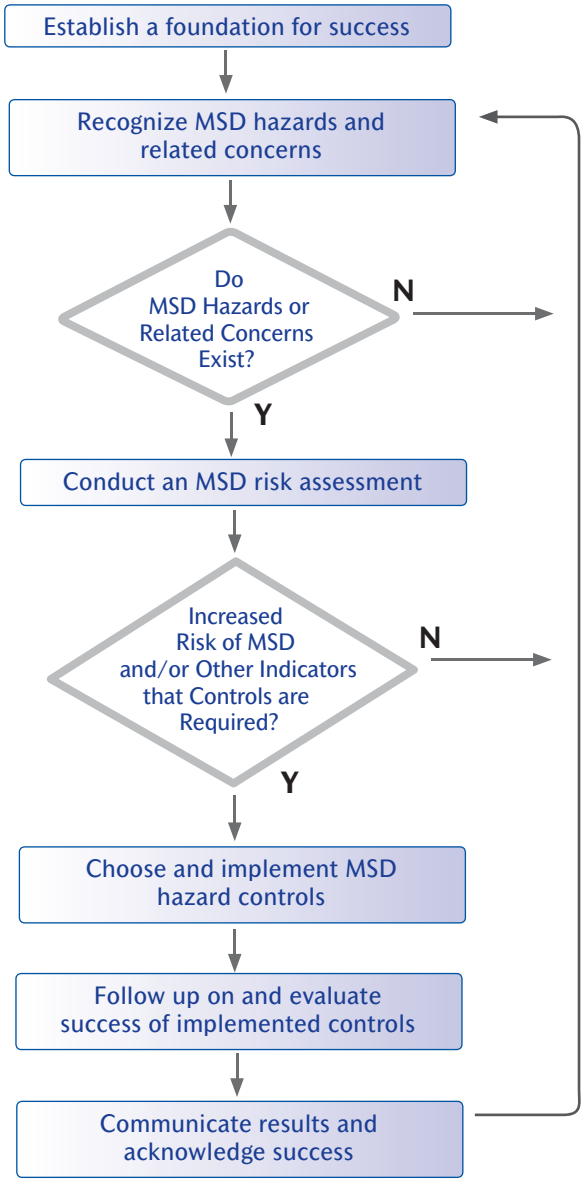


Figure 2.0: Steps in the MSD prevention framework

Steps in Implementing the MSD Prevention Framework

Establish a foundation for success (Section 3)

The essential keys to prevent MSDs in the workplace are:

- management commitment and support
- a documented MSD prevention process that is communicated to all workplace parties
- worker participation in the prevention process, and
- training on MSD prevention for all workplace parties.

Understand MSD Hazards (Section 4)

While not strictly part of the MSD prevention framework, it is important to understand what MSD hazards are before trying to recognize them in the workplace. Known workplace MSD hazards include:

- force
- fixed or awkward posture
- repetition
- contact stress
- vibration
- temperature
- work organization, and
- work methods.

Recognize MSD hazards and related concerns (Section 5)

Workplaces are encouraged to set up a process for recognizing jobs with MSD hazards even if no MSDs, worker concerns, or reports of discomfort have been recorded. This can be done by asking workers, during workplace inspections or with a formal hazard identification tool.

On the other hand, workplaces already have a great deal of information that can help them to recognize jobs that likely have MSD hazards. A regular review of accident/injury data, accident investigation reports, human resources related data, and production and/or service-related data can identify those jobs where MSDs already exist or where MSD hazards are causing other problems. Asking workers to fill out discomfort surveys is another excellent way to collect information that can help to identify jobs that need further attention.

Conduct an MSD risk assessment (Section 6)

Risk assessment methods allow you to make a simple or, if required, an in-depth assessment of the level of risk to the workers who perform jobs with recognized MSD hazards.

Choose and implement MSD hazard controls (Section 7)

The goal of the MSD prevention program is to implement controls for the MSD hazards when workers are at an increased risk of developing MSDs. A variety of approaches, suggestions and ideas can be used to reduce the risk for workers.

Follow up on and Evaluate the Success of Implemented Controls (Section 8)

Implementing controls for MSD hazards is not the end of the MSD prevention process. The processes of identifying hazards and introducing controls and the success of these controls should be evaluated.

Communicate results and acknowledge success (Section 9)

Communication tools are important for keeping everyone involved in the program up to date: the controls, results and successes of the MSD prevention efforts need to be publicized.

Go Back to Recognize MSD Hazards and Related Concerns (Section 5)

MSD prevention is an ongoing process. After implementing controls for MSD hazards, go back and look for other opportunities for improvement. Repeat the steps with other priority jobs or identify new jobs that require action.

Section 3: Establish a Foundation for Success

The key steps in establishing a foundation for successful MSD prevention are shown in Figure 3.0. Among the most important steps are management commitment and worker participation.

POINT TO REMEMBER

Preventing MSDs not only reduces worker pain and suffering, it also leads to improved overall business performance. Building a foundation will help to ensure that you get maximum return on your investment.

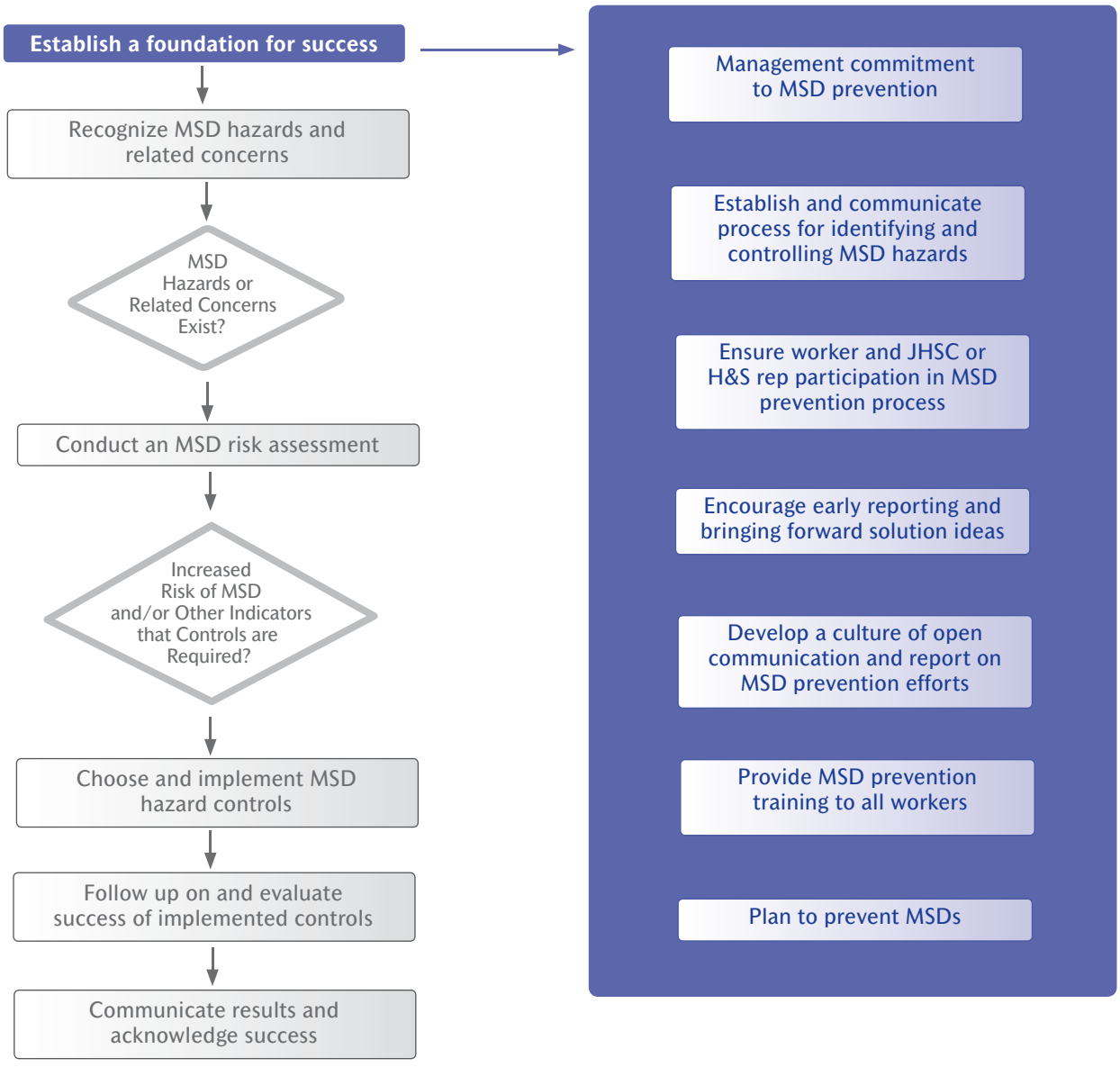


Figure 3.0: Establish a foundation for success

Look at the checklist below. Do you already have a solid foundation for MSD prevention? If not, see the information following the checklist for more details on establishing or improving your foundation for success.

DO YOU ALREADY HAVE A FOUNDATION FOR SUCCESS?

- ☑ Are owners, employers, managers and front-line supervisors aware that they must do everything reasonable in the circumstances to protect their workers from MSD hazards?
- ☑ Have all managers, front-line supervisors and workers been trained to recognize MSD hazards?
- ☑ Is there a well-communicated process for workers to report problems that could lead to MSDs?
- ☑ Are workers encouraged by the employer and their supervisors to report problems that could lead to MSDs?
- ☑ Are front-line supervisors looking out for conditions or work practices that could lead to MSDs?
- ☑ Have all workers been informed of MSD hazards related to their work and how to avoid them?
- ☑ Do monthly inspections by the employer and/or JHSC look for MSD hazards (e.g., awkward postures, excessive force, high rates of repetition)?
- ☑ Are reports of MSD-related pain or discomfort investigated to the same standard as other safety hazards?
- ☑ Are workers provided with and trained how to use equipment that helps to reduce the risk of MSDs?
- ☑ Are reports of MSD-related pain and discomfort and any implemented controls or solutions recorded and kept?
- ☑ Are injury or first aid statistics reviewed each month for trends that need to be investigated to prevent MSDs in your workplace?

Management Commitment to MSD Prevention

Commitment begins with the chief executive officer and the senior managers and is critical for any successful MSD prevention effort. It needs to be clearly communicated and visibly demonstrated. Effective management commitment to MSD prevention can be shown by:

- integrating MSD prevention into existing health and safety activities and business processes
- developing an MSD prevention policy, procedure or statement, in conjunction with the JHSC or H&S rep
- communicating this policy, procedure or statement to all workers
- defining the roles of employers, managers, supervisors, JHSC or H&S reps, and workers in preventing MSDs (See **MSD Prevention Roles**)

- integrating MSD prevention into everyone's day-to-day work
- working with the JHSC or H&S rep to ensure that work tasks and processes are designed to control MSD hazards
- encouraging open discussion and learning from mistakes and successes
- reviewing reports of MSD hazards and taking corrective action, and
- reporting on progress of MSD prevention efforts.

See the **MSD Prevention Toolbox** for:

- the "5-steps" to managing MSD prevention and
- a sample MSD prevention policy, procedure and program

MSD PREVENTION ROLES

Ontario's *Occupational Health and Safety Act* is based on the internal responsibility system. This means everyone has a role to play in maintaining a healthy and safe workplace. Employers, supervisors, workers and the JHSC or the H&S rep must work together to prevent injuries and illnesses. Some suggested MSD prevention roles are listed below.

Employers and managers should:

- incorporate MSD prevention into their health and safety policy and program
- review the health and safety program to include or strengthen MSD prevention activities
- make sure that workers and JHSC members or the H&S rep are trained how to recognize, assess and eliminate or control MSD hazards
- ensure that supervisors know what to do if they recognize MSD hazards or if a worker raises a concern
- ensure that MSD hazards related to poor design of tools, equipment, workstations or work practices are identified and any associated risks are controlled
- make sure that new equipment is designed and installed to reduce exposure to MSD hazards, and
- ensure that workers have the equipment and training they need to reduce their exposure to MSD hazards.

Supervisors should:

- ensure that everyone under their supervision is aware of MSD hazards on the job and is trained to do his or her job safely
- look for MSD hazards during workplace inspections, job task analyses and discussions with workers, and when reviewing injury reports
- reinforce proper working techniques and use of equipment and personal protective equipment (PPE)
- encourage and support workers taking scheduled breaks
- check that workers have adjusted their workstations to suit themselves and their work, and provide help as needed
- support workers when they have questions or concerns
- be aware of MSD warning signs and indicators, and
- take action on reported MSD hazards and concerns, and follow up with workers.

See page 14 for Worker and JHSC/H&S rep roles

MSD PREVENTION ROLES

Workers should:

- report MSD hazards and concerns to their supervisors
- take scheduled breaks and take advantage of opportunities to change postures or relax muscles
- move around and occasionally change positions
- go to their supervisors with questions and concerns or to ask for additional training
- offer suggestions to improve working conditions to their supervisor, health and safety rep or the JHSC
- be aware of symptoms of MSDs and report them early if they occur
- ensure that they understand the information and instructions provided
- use proper working techniques
- use the equipment and tools provided to reduce exposure to MSD hazards, and
- know how to make adjustments to the workstation to suit themselves and the work they do, and to ask for help as needed.

JHSC members and health & safety reps should:

- get training on recognizing, assessing and controlling MSD hazards
- ensure that MSD hazards are included on inspection checklists
- actively look for MSD hazards
- discuss MSD-related concerns at JHSC meetings and with the employer and workers
- review training records to ensure that everyone in the workplace has received training on how to do their jobs safely and how to identify the MSD hazards in the workplace, and
- make recommendations to the employer on how to eliminate, control or reduce exposure to MSD hazards.

Establish and Communicate a Process for Identifying and Controlling MSD Hazards

To identify and control MSD hazards efficiently, processes and activities that target these hazards need to be established.

Some activities to consider include:

- creating an MSD Prevention Plan that outlines the objectives for, methods to be used in and expectations of any MSD prevention activities implemented in the workplace
- making all workers aware of how MSD hazards will be identified and controlled
- communicating the role of all workplace parties in MSD prevention efforts
- looking for MSD hazards during regular workplace inspections
- identifying MSD hazards when doing job task analysis
- reviewing reports of MSD concerns during JHSC meetings
- establishing a process for MSD risk assessment

- looking for MSD hazards when:
  - planning for or implementing new production processes
  - purchasing and installing new equipment, and
  - making changes to existing work processes.
- evaluating and reporting on the lessons learned from MSD prevention efforts.

Ensure Worker Participation in the MSD Prevention Process

Workers have first-hand knowledge of their tasks and how the design of their workstation, tools, equipment, etc., influences the way they do their jobs. They know when they are in pain and discomfort and usually have a good understanding of the causes. Workers also have very good practical ideas for reducing their exposure to MSD hazards.

You can ensure that workers take active roles in the MSD prevention process by:

- using their experience and knowledge to recognize and assess MSD hazards and to suggest effective solutions to manage and control them
- training them to recognize the signs and symptoms of MSDs and the work-related hazards that might contribute to them
- providing instruction on and support for the use of controls that have been implemented to reduce MSD risk (e.g., new equipment, work methods, tools)
- ensuring that they are involved in planning and implementing any change to the work task or job, and
- encouraging them to report MSD concerns to management and supporting them when they do.

Encourage Early Reporting and Bringing Solution Ideas Forward

To encourage early reporting of possible MSD hazards:

- employers should develop and communicate a process for workers to report problems that could lead to MSDs
- all managers and supervisors in a company should encourage all workers to report signs or symptoms of MSDs as soon as possible, and
- management needs to receive these reports positively and take action to ensure that the workers' pain or discomfort does not get worse.

Managers and supervisors should encourage workers to look for ways to reduce MSD hazards and bring forward ideas to improve the design or organization of a job, task, workstation, etc. These ideas may lead to fewer MSD hazards and better, more productive ways to do the job.

For innovation and creativity to flourish, you need to:

- be ready to learn from mistakes, and
- continue to encourage and recognize those who bring forward ideas for improvement.

Develop a Culture of Open Communication and Report on MSD Prevention Efforts

Your MSD prevention program will be more likely to succeed if your workplace culture supports open discussion about the hazards, and frequent communication with all workers about prevention efforts.

Such communication reinforces management's commitment to MSD prevention, and lets workers know that action is being taken to reduce MSD hazards.

Provide MSD Prevention Training to All Workers

Everyone in the workplace should receive training on MSD prevention. This will help all workers, supervisors and managers to understand and carry out their roles effectively.

MSD prevention training for workers should include:

- the signs and symptoms of MSDs
- how to report a concern in the workplace
- how to recognize MSD hazards
- who should receive reports of MSD hazards
- workplace policies and procedures for dealing with concerns related to MSDs, and
- what equipment, adjustments and procedures workers need to use or follow to reduce or eliminate their exposure to MSD hazards.

MSD prevention training for JHSC members, health and safety reps, supervisors and managers should include all of the content listed above for workers, plus:

- how to respond when workers report a concern, pain or discomfort
- how to recognize MSD hazards and use MSD hazard identification tools
- how to recognize indicators for MSD hazards
- how to analyze injury and incident reports for MSD trends and issues
- how to look for MSD hazards during workplace inspections, and
- how to eliminate or control MSD hazards in the workplace.

POINT TO REMEMBER

Train the workers who are directly involved in MSD prevention on how to use MSD hazard identification tools. This will allow them to be more involved in the MSD prevention activities that are related to their jobs.

Planning to Prevent MSDs

The process for choosing and implementing controls for MSD hazards presented above is designed to control hazards that are already present in the workplace, at a job or at a workstation.

It is better to prevent MSD hazards from existing in the first place. It is important to think about preventing these hazards before introducing a new work process, workstation, tool or piece of equipment into the workplace.

MSD hazards can often be eliminated at the planning, design, purchasing and installation stages. In most cases, it is less expensive to design MSD hazards out at the start than to add controls to manage them afterwards.

Planning Stage

You can help to eliminate MSD hazards while you are planning any new project, expansion, process or product line. Discuss how a new product, machine or tool is likely to affect workers. This process helps to focus attention on the need to ensure that MSD hazards are considered and addressed during the design stage.

Design Stage

The design stage involves architects, engineers, industrial designers and many others. They all should be aware of MSD hazards and how to eliminate them during this stage of the project. For example, it may be possible to avoid MSD hazards by considering:

- how the worker(s) will use and interact with the design
- the materials being used or produced, and
- how the design will operate and be maintained.

POINT TO REMEMBER

Preventing MSD hazards is less expensive and more effective than trying to control them later.

Steps to consider in the design stage include:

- ensuring that in-house engineers, maintenance personnel and designers are trained to address MSD hazards
- developing in-house design processes and standards that address MSD hazards at the design stage
- where practical, using mock-ups of new designs or testing different design options
- considering how the design will be used by all workers, whether they will work at or around it or be responsible for maintaining it, and
- liaising with other designers, manufacturers and suppliers to stay aware of new technology and alternative materials that will eliminate or reduce MSD hazards.

Purchasing Stage

Many workplaces purchase their equipment or workstations from a supplier and do little or no in-house design. These workplaces should consider establishing a review process that looks for MSD hazards when workstations, equipment, tools, materials, etc., are purchased for use by workers in the workplace.

This review process will be more effective if in-house purchasing department workers are trained how to consider MSD hazards or have access to someone who is. Any engineering or design specifications provided to the purchasing department should highlight factors that are important for MSD prevention. Finally, workplaces should consider developing in-house purchasing standards for frequently purchased items (e.g., tools, gloves, chairs, furniture) to ensure that MSD-related factors are considered in the purchasing process.

Other points to consider include:

- encouraging purchasers to make choices that minimize or eliminate MSD risk to the workers, even if they are slightly more expensive, and
- before introducing a new item, considering whether it is possible and practical to do one or more trials to:
  - evaluate its use, and
  - evaluate whether workers will be exposed to any MSD hazards during its use.

Installation Stage

A good design is one where the exposure to MSD hazards is minimized. However, it can be ruined if it isn't installed correctly. For example:

- if the installers put a component in a slightly different location (e.g., to cut costs on wiring), the new location may lead to awkward work postures for workers, or
- if the pieces of equipment in the new work area are put closer together to save space, this can lead to problems for both workers and maintenance staff.

If company workers are installing equipment, ensure that these workers have appropriate training on how to prevent MSD hazards and are given instructions that note any key issues that need to be considered during the installation. If an outside contractor is doing the installation, it is important to let the contractors know of key issues that need to be considered during the installation. Regular inspections and checks by workplace parties during the installation phase will help to ensure that equipment is being installed in a way that eliminates or reduces exposure to any MSD hazards.

Section 4: Understand MSD Hazards

Before moving on to "Recognize MSD Hazards and Related Concerns", it is important to understand what MSD hazards are.

Many jobs have MSD hazards that come from the job itself or the way it is done. These hazards increase the risk of developing an MSD.

Although a number of factors can increase MSD risk, the key hazards are:

- force
- fixed or awkward postures, and
- repetition.

POINT TO REMEMBER

For each job or task, look at all of the MSD hazards together. These hazards always interact. Therefore, it is important to consider how they interact to understand the MSD risk to the workers doing the job.

Force

Force is the amount of effort exerted by your muscles. All work tasks require the worker to exert some force. However, when a task requires a level of force that is too high for any particular muscle, it can damage the muscle or the related tendons, joints and other soft tissues.

You have to consider how much force is being exerted or how much weight is being handled. In addition, think about:

- how long you need to keep exerting it
- how many times you need to exert it in a given period, and
- the posture you are in when exerting the force.

Activities that often involve high force requirements include:

- lifting, lowering and carrying
- pushing or pulling, and
- gripping and manipulating objects.

POINT TO REMEMBER

The MSD risk associated with force increases as:

- the amount of force required increases
- the posture used gets more awkward
- the number and/or speed of repetitions increases, or
- the length of time the force is exerted between breaks increases.

In addition, don't forget: exerting a force (even at a low level) for a long time without a break (to rest and recover) can lead to pain and discomfort.

Fixed or Awkward Postures

Posture is another term for the position of your various body parts during any activity. For most joints, good posture is near the middle of the full range of motion. This is called the "neutral" posture.

POINT TO REMEMBER

The risk associated with awkward postures increases as:

- the joints move farther away from a neutral posture
- the muscles exert higher levels of force
- the number of times the posture is adopted increases, and
- the length of time the posture is held increases.

The farther a joint moves towards either end of its range of motion (i.e., the farther away from neutral), the more awkward the posture becomes. This puts more strain on the muscles, tendons and ligaments around the joint.

When you hold an awkward posture for a long time (i.e., if the posture is fixed), you may begin to feel pain and discomfort. This happens when the muscles get tired because lack of movement keeps them from getting enough blood flow to keep them supplied with energy.

Figures 4.1 to 4.7 show some common awkward postures.

Awkward shoulder postures

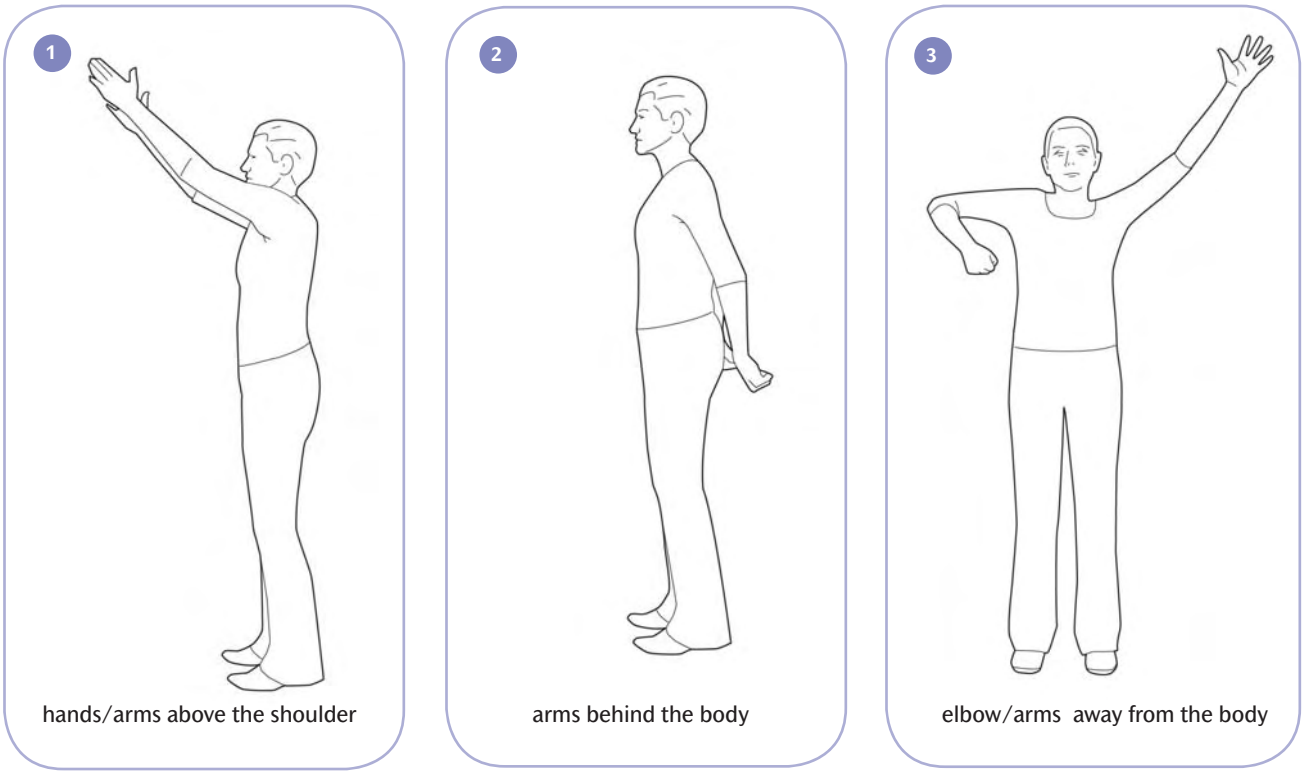


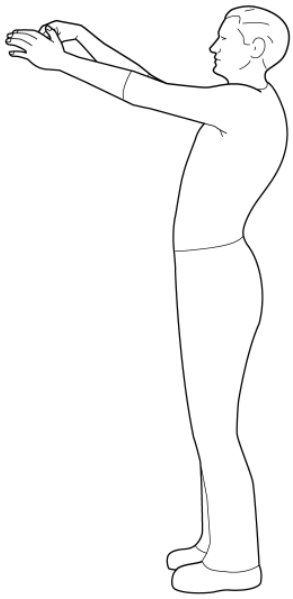
Figure 4.1: Awkward shoulder postures

Awkward back postures

1

Bending the back/trunk forward

2



Bending the back/trunk backward

3

Bending the back/trunk to one side

4

Twisting back/trunk

Figure 4.2: Awkward back postures

Awkward neck postures

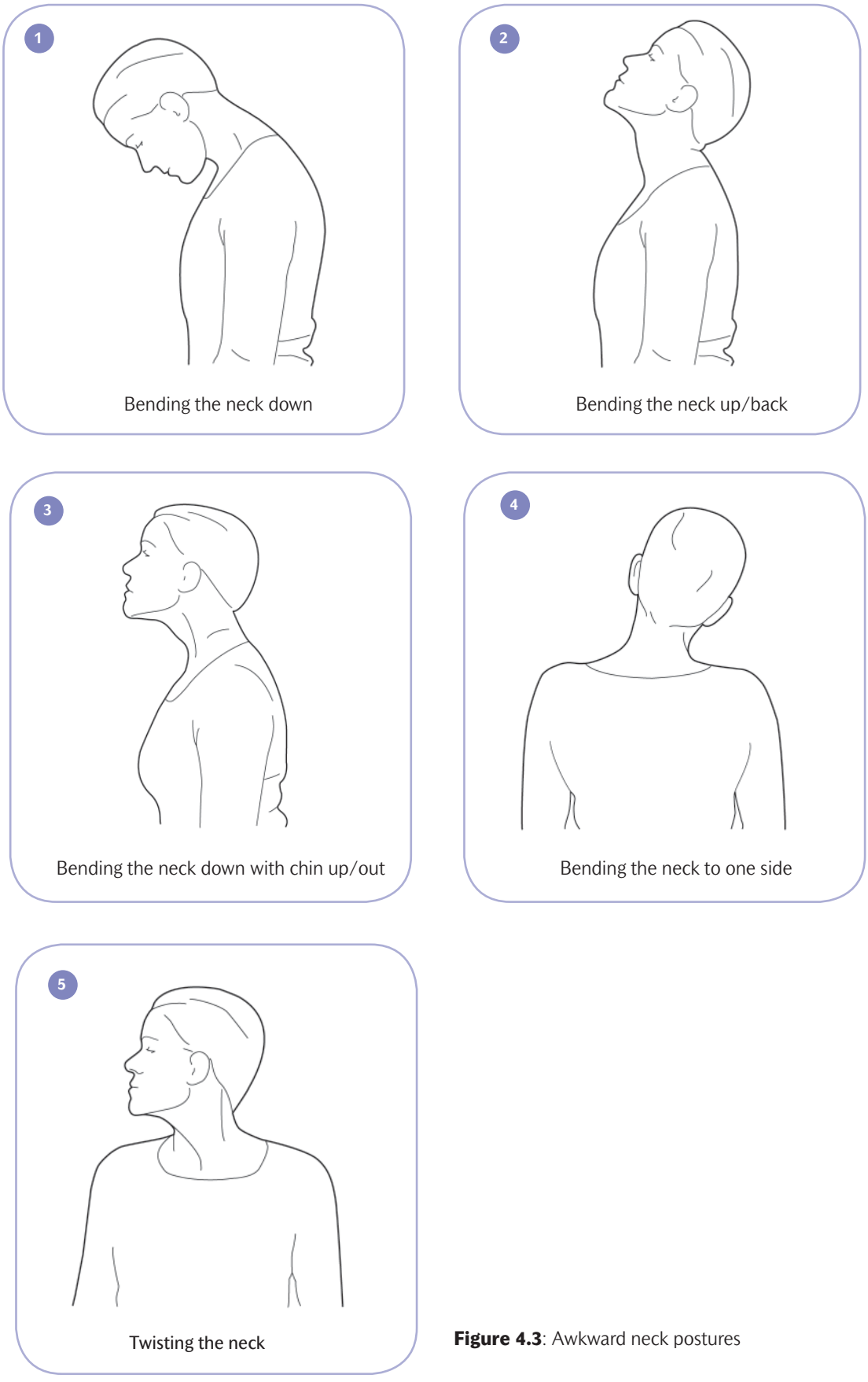


Figure 4.3: Awkward neck postures

Awkward wrist postures

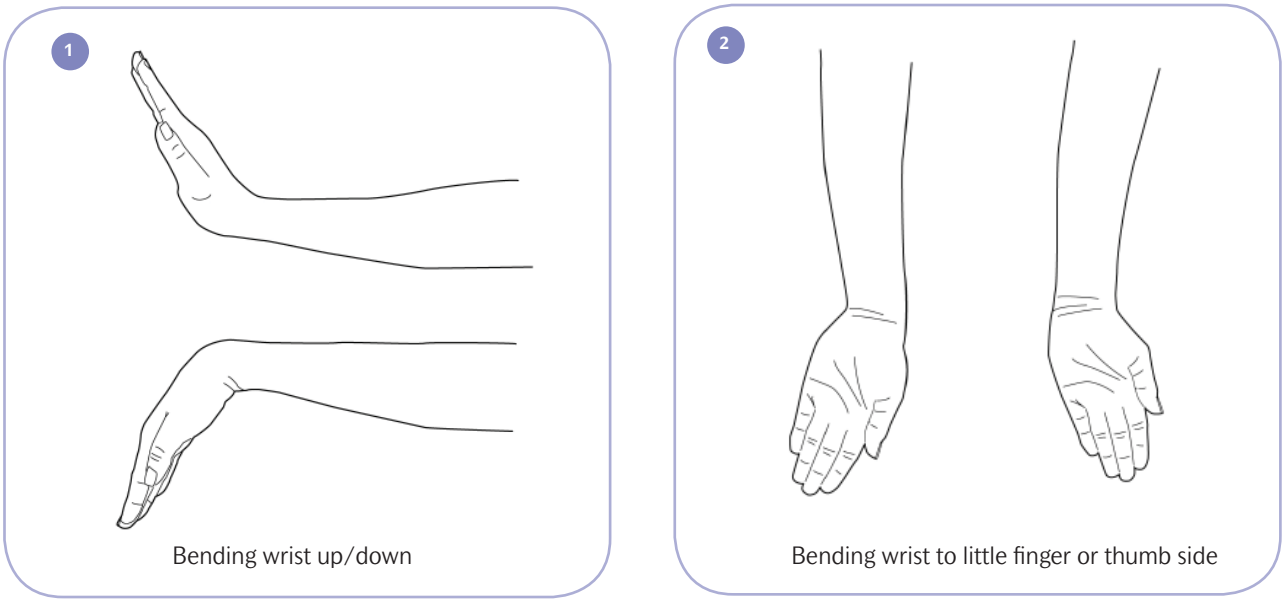


Figure 4.4: Awkward wrist postures

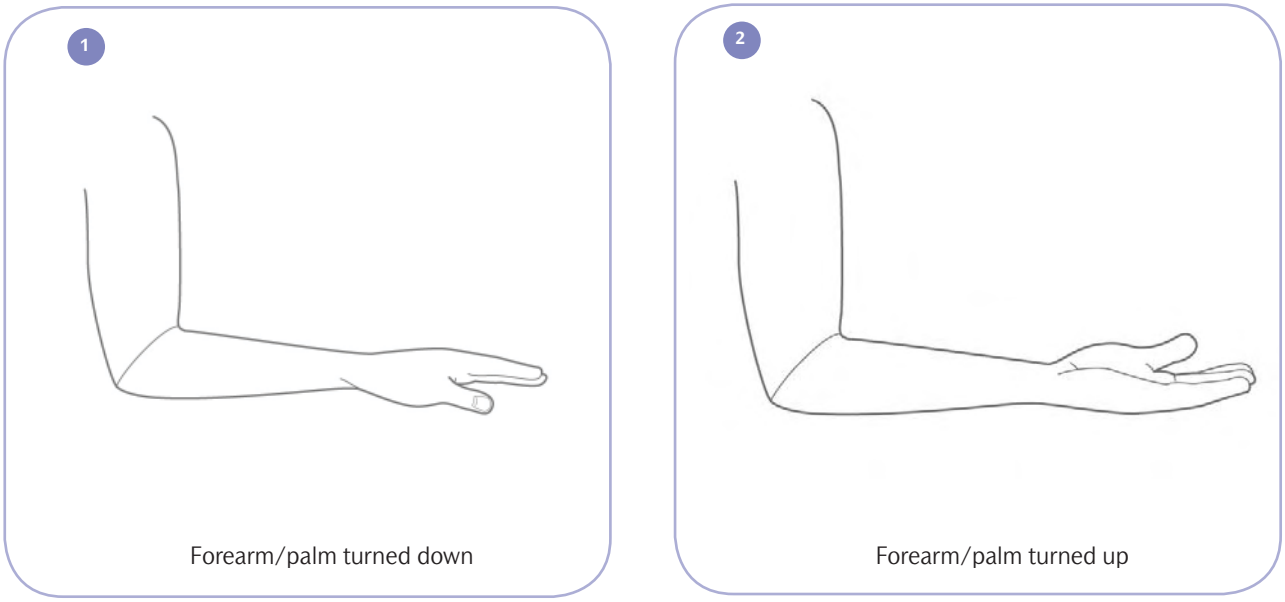


Figure 4.5: Awkward elbow/forearm postures

Figure 4.6: Kneeling

Figure 4.7: Squatting

EXAMPLES OF TASKS THAT REQUIRE AWKWARD POSTURES

Tasks that require awkward postures include:

- leaning sideways to reach into a low drawer while sitting
- bending down to work at a low level
- keyboarding on a desk that is too high
- reaching over your head (e.g., when painting a ceiling)
- reaching for objects behind your back
- bending your wrist when moving objects or keyboarding
- bending your neck down (e.g., looking at small components in poor light), and
- twisting your neck to view documents or the computer monitor.

In addition, don't forget: even if you use near-neutral postures, you can feel pain and discomfort if you stay in the same posture for too long.

Gripping

The type of grip that is used affects the level of MSD risk. Figures 4.8 and 4.9 show several types of grips workers may have to use.

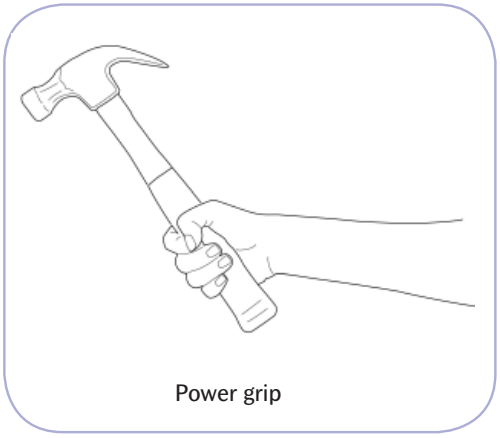
Ideally, all forceful gripping of objects and tools should be done with a power grip (see Figure 4.8). Such a grip allows the greatest force to be exerted with the least strain on your hand, wrist and forearm muscles.

Moderate force pinch grips have a higher risk of injury than moderate- and even high-force power grips. However, it may be impossible to do some jobs without using a pinch grip, such as when precision is required. In these cases, it is important to reduce the amount of force required as much as possible.

The risk when using a pinch grip can be low if a low level of force is used, but it increases as:

- the level of force exerted increases
- the length of time you need to hold the pinch grip increases, and
- the number and speed of pinch grips increase.

Most desirable grip



Power grip

Figure 4.8: Most desirable grip

Undesirable pinch grips

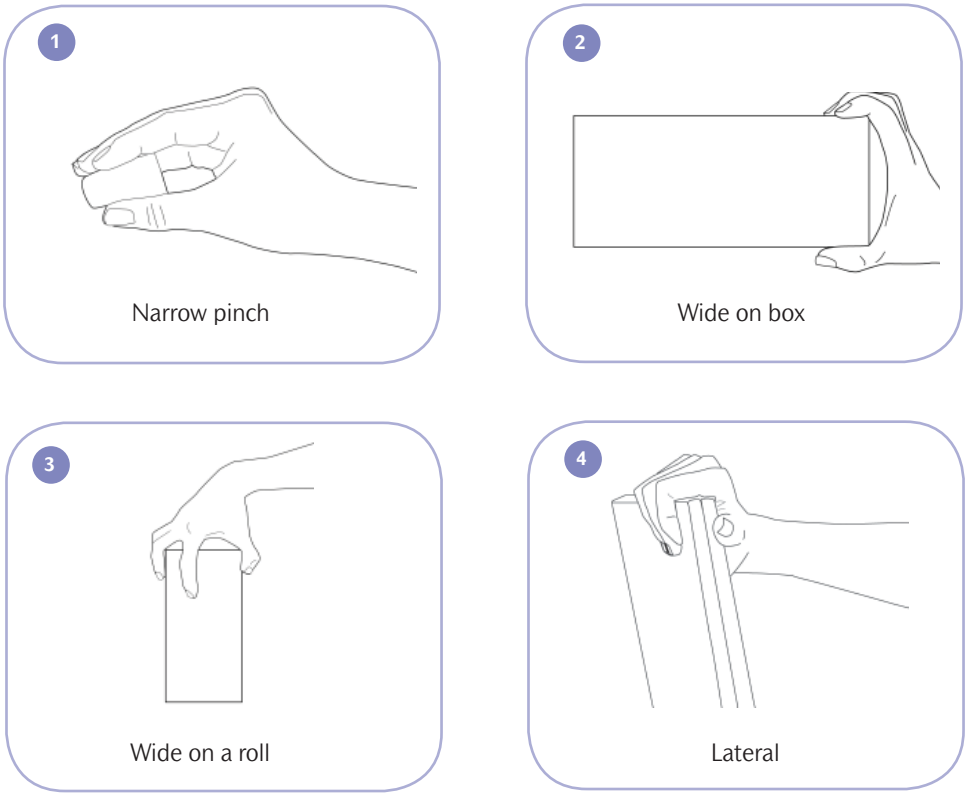


Figure 4.9: Undesirable pinch grips

FACTORS THAT INCREASE THE RISK OF MSD WHEN GRIPPING

Examples of factors that increase the risk of MSD when gripping include:

- handles or items that are too large or small
- objects that are slippery or irregularly shaped
- vibrating tools or objects
- heavy or bulky gloves, and
- cold hands.

Repetition

The risk of developing an MSD increases when you use the same muscles, tendons, joints, etc. repeatedly, with few breaks or chances for rest. Highly repetitive tasks can cause muscle fatigue, damage to other tissues, and, eventually, pain and discomfort. This can occur even if the level of force exerted is low and the work postures are satisfactory.

The MSD risk increases if the repetitive action also requires high force and/or an awkward posture.

In addition, don't forget: doing any task for too long without taking a break can also lead to pain and discomfort.

POINT TO REMEMBER

The MSD risk associated with repetition increases as:

- the number or speed of actions required increases
- the muscles being used have to exert higher levels of force
- the joints of the body move farther away from the neutral position, and
- the length of time the task is done without a break increases.

Contact Stress or Pressure and Repeated Impacts

Contact stress happens when contact between a body part (e.g., elbow, wrist) and a hard or sharp object puts pressure on the skin and the underlying tissues. The pressure can damage the skin and, over time, muscles, tendons and nerves. It may also compress and possibly damage blood vessels. Repeated impacts occur when using a body part to hit an object.

Examples of contact stress or pressure include:

- using hand tools with short handles that dig into your hand
- resting your wrist or elbow on the sharp edge of a work surface
- kneeling on a hard or uneven surface, and
- using your palm, foot or knee as a hammer.

Local or Hand/Arm Vibration

Vibration from hand tools and work pieces affects your hands. Depending on the level and frequency of the vibration and how long the vibrating tool is used, the vibration can contribute to nerve and circulation problems in your hands and fingers. Other factors to consider are how tightly the tool is gripped and whether your hands are cold.

Whole-body Vibration

If you stand, sit or lie on a surface that vibrates, the vibration can be transmitted to your entire body. Whole-body vibration exposure can contribute to back pain and performance problems. Whole-body vibration issues are most common with vehicle operators who drive off-road or over rough surfaces.

The risk of MSD due to whole-body vibration depends on:

- the level and frequency of the vibration
- the length of exposure to the vibration, and
- whether awkward postures of the back or neck are required during vibration exposure.

Cold Temperatures

Working in cold temperatures can increase your risk of MSD. This occurs because:

- your muscles do not work as efficiently when cold
- the flexibility of your muscles and tendons may be reduced if they are cold
- blood circulation in your hands and arms is reduced, and
- your sense of touch is decreased when your hands and fingers are cold.

All these situations can lead to increased effort and put more strain on the muscles and tendons. Cold can be an issue when the air temperature is low, or when working with cold objects. Examples include hand tools that have cold metal handles, pneumatic tools that direct cold exhaust onto fingers or hands, and frozen or refrigerated food.

Hot Work Environments

Working in a hot or humid environment puts more strain on your entire body by increasing body temperature and dehydration. This is mainly a concern for heat stress or heat stroke, but can also lead to increased muscle fatigue and errors in how work is done. Increased rest time is required to allow the muscles to recover and to maintain body temperature.

Work Organization

Work organization refers to the way a job is organized. Work organization factors relevant to MSD risk include:

- staffing levels
- workload schedule and job pacing
- monotonous tasks
- communication and feedback, and
- how much control workers have over how they do their jobs.

Evidence suggests that the rate of MSDs increases when:

- workers perceive their workload to be high
- communication is poor
- workers don't receive appropriate feedback, and
- workers feel they have little or no control over how they do their jobs.

Work Methods

Work method refers to the way a job is done (e.g., technique). Factors affecting work method include:

- physical and mental demands
- training
- feedback, and
- supervision.

Workers need to know how to do a job safely. They need to be trained to perform a job so that exposures to MSD hazards are minimized.

POINT TO REMEMBER

If a job is poorly designed and has a high level of MSD hazards, training probably isn't going to be enough to prevent exposure to MSD hazards and the resulting pain and discomfort.

Section 5: Recognize MSD Hazards and Related Concerns

This section provides information about how to recognize jobs with MSD hazards and jobs with existing MSDs and/or related concerns. Guidance is also provided on how to select and prioritize jobs for an MSD risk assessment (see Figure 5.0).

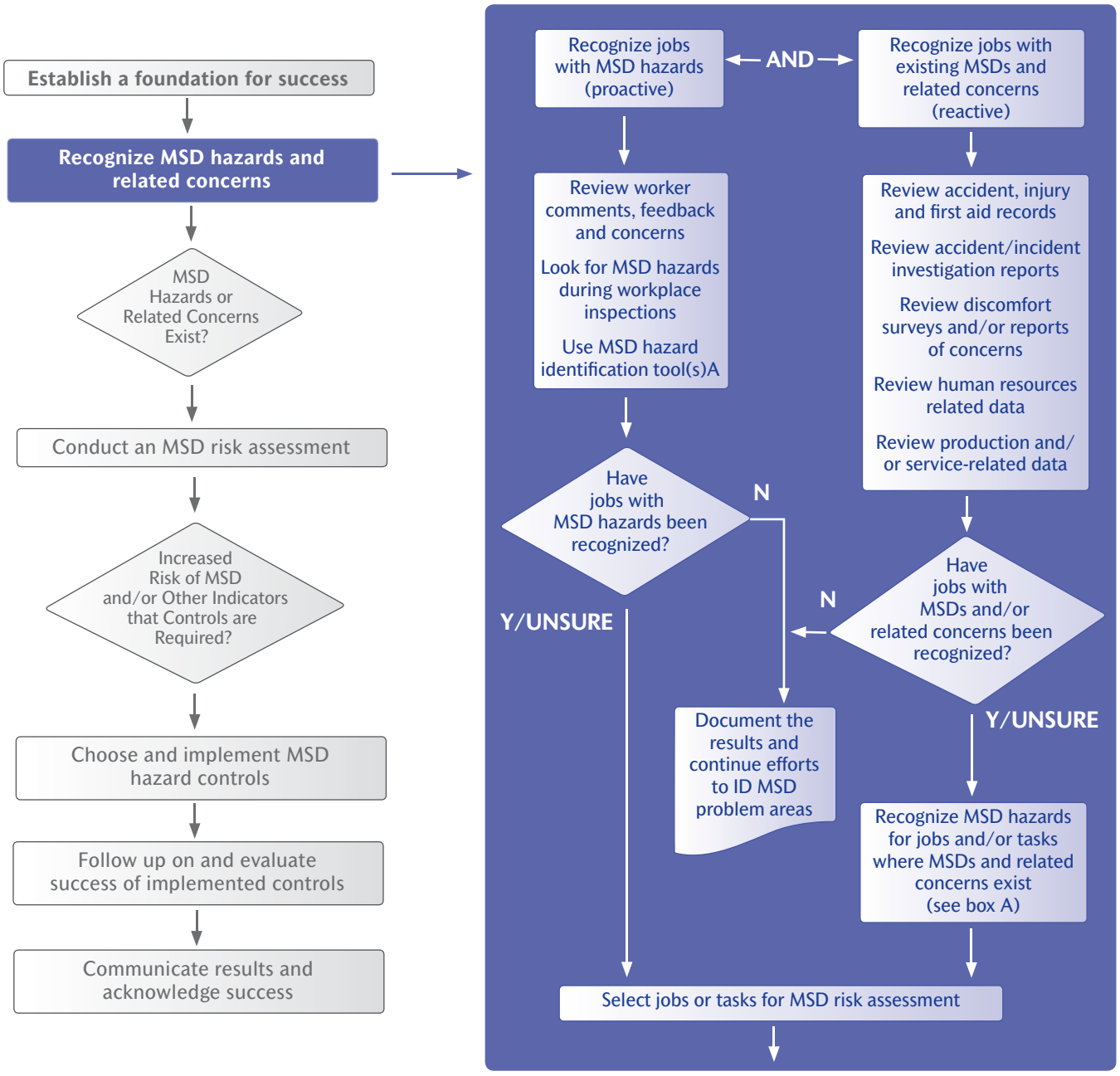


Figure 5.0: Recognize MSD hazards and related concerns

As shown in Figure 5.0, recognizing MSD hazards and related concerns should, ideally, be both proactive and reactive. Workplaces are encouraged to look for MSD hazards, even if the job or task has no history of MSDs, worker concerns, or reports of discomfort. While this may seem like a great deal of work, identifying and controlling MSD hazards before workers actually report an MSD, e.g. being proactive, can actually save you money, since you avoid all of the costs associated with an MSD related claim (administration, investigation, accommodation, overtime, possible WSIB surcharges, etc.)

Along with a proactive approach to MSD prevention workplaces should already be reviewing their accident/injury statistics and other sources of information on a regular basis. This review is done to identify jobs with existing MSDs and related concerns. The best thing about this reactive approach is that most workplaces already collect and review much of this information.

Again, workplaces should look to use both proactive and reactive approaches to help them identify jobs where MSD hazards exist. However, it is understood that when a workplace is just beginning their MSD prevention effort that they will want to focus on those jobs where MSDs have already occurred. And for many workplaces this is a good place to start; addressing jobs with MSDs first and then implementing a proactive MSD hazard identification process.

Recognize Jobs with MSD Hazards

In order to be most effective at recognizing jobs with MSD hazards, everyone in the workplace should be trained on how to recognize MSD hazards. This allows everyone to look for better ways to do their job or to identify changes that reduce the risk of MSDs.

Figure 5.1: Recognize MSD Hazards

Figure 5.1 shows three suggested activities that can be used to recognize jobs with MSD hazards. While all of these activities are valuable when looking for jobs with MSD hazards, some workplaces may decide to use only one or two of them before moving on to risk assessment and/or implementation of MSD hazard controls.

POINT TO REMEMBER

Use of MSD hazard identification tool(s), such as the example provided in the MSD Prevention Toolbox, is encouraged because they help to document the hazard identification process and may reveal MSD hazards that are not recognized by workers or during inspections!

Review Worker Comments, Feedback and Concerns

Workers should be a key source of information about job demands and MSD hazards. Many workplaces keep track of worker concerns and comments about job demands, tool and equipment design, workstation layouts, etc. This information may be gathered:

- during shift or crew meetings and noted in the supervisor's shift log
- during quality and production meetings
- through a worker suggestion box, or
- through direct reports to the supervisor, JHSC member or H&S rep, of on-site medical staff.

More formal methods can also be used to gather information directly from workers. Various types of surveys have been developed that can be used to gather information about:

- job demands and tasks that workers find difficult
- pain and discomfort, and
- general concerns related to workstations, tools or jobs and tasks.

The surveys help identify MSD hazards and how they relate to different job tasks and requirements.

See the **MSD Prevention Toolbox** for examples of a perceived exertion survey and a general worker feedback survey. Guidance on how to use these surveys is also provided.

Look for MSD Hazards during Workplace Inspections

Workplace inspections are an excellent opportunity to identify and report on MSD hazards in the workplace. While members of the JHSC typically do regular workplace inspections, managers, supervisors and/or workers often do additional inspections or workplace reviews. Anyone who does inspections should be trained to recognize MSD hazards.

Inspection forms and reports should be designed to prompt those doing the inspection to look for MSD hazards, and make it easy for them to record any that are identified.

See the **MSD Prevention Toolbox** for sample questions that can be included on a general workplace health and safety inspection form.

Use MSD Hazard Identification Tools (HITs)

The use of a formal MSD HIT or checklist is encouraged. These tools are useful for documenting the MSD hazard identification process. They can also reveal MSD hazards that are not identified by workers or during regular inspections.

MSD HITs are designed to screen jobs to find the ones likely to pose an increased risk of developing MSDs. They can be used:

- when the cause(s) of worker pain and discomfort are not easily recognized,
- to help ensure that common MSD hazards are not overlooked, and
- as part of a comprehensive, proactive review of MSD hazards in a workplace.

When an MSD HIT indicates that MSD hazards exist at a job or task, a more thorough risk assessment may be needed to determine whether workers performing the job or task are at an increased risk for MSDs.

POINT TO REMEMBER

Sometimes MSD hazards are not immediately obvious when watching a worker doing his/her job. Indicators of MSD-related problems include:

- reporting discomfort and/or soreness
- taking frequent breaks due to fatigue
- shaking or rubbing arms, hands, shoulders, or back due to discomfort
- making modifications to the workstations or equipment (e.g., padding tools/sharp edges)
- wearing protective products (e.g., wrist supports, back/tennis elbow braces)

These indicators are often easy to see and should trigger further action to identify if MSD hazards exist.

POINT TO REMEMBER

Ask a trained person for help if you have any questions about why, when or how to use any of the MSD HITs.

See the **MSD Prevention Toolbox** for examples of MSD HITs and guidance on how to use them. Information on who can help workplaces prevent MSDs is also provided.

Checking whether MSD Hazards Have Been Recognized

This is a decision point. If no MSD hazards have been recognized, you should document the work done so far, including the results from the MSD HITs, to show your due diligence.

If, however, MSD hazards have been recognized you should consider which jobs and/or tasks should be targeted for further action. To do this it is often useful to review other data related to the job and/or task MSD, e.g. the history of reported MSDs. Even if no MSDs have occurred other information, such as discomfort surveys results and/or production and service-related data, can be used to help select jobs for further action.

See 'Choosing Jobs and Tasks for Further Action' at the end of this section for more information on factors to consider when prioritizing jobs and/or tasks for MSD risk assessment.

See **Section 6: Conduct an MSD Risk Assessment** for more information.

Recognize Jobs with Known MSDs and Related Concerns

Figure 5.2 shows a number of recommended activities that are useful for recognizing jobs with existing MSDs and related concerns. Workplaces may decide to use one or more of these activities to help them identify jobs that have a history of reported MSDs and/or other concerns that can indicate that MSD hazards are present.

Figure 5.2: Recognize jobs with MSDs and related concerns

POINT TO REMEMBER

Don't wait for reports of MSDs in your workplace before you start to identify and control MSD hazards.

If jobs and/or tasks have a history of MSDs or other related concerns, workplaces should consider using the proactive activities described above to help them identify what MSD hazards are potentially causing the identified concerns.

Review Accident, Incident, Injury and First Aid Records

You should review your accident, incident, injury and first aid records regularly. Use these records to identify the departments, work areas, jobs and tasks implicated in these events. They show you the departments or jobs of workers who are reporting pain and discomfort or making MSD-related claims. Consider jobs with a history of MSD claims a priority for action.

However, remember that these records tell you about what has happened in the past. They do not predict what will happen in the future. For example, as you make changes through your MSD prevention activities, you will find that such information becomes less helpful.

Review Accident and Incident Investigation Reports

Pay attention to accident and incident investigation reports:

- investigate reports of muscle pain and discomfort and all MSD-related claims as you would any other injury or incident report

- make sure that those who are responsible for incident investigations are trained how to recognize MSD hazards, and
- design your investigation process to ask questions about and identify these hazards.

By reviewing these investigation reports regularly, you should be able to identify which jobs have MSD hazards, and which hazards are causing MSD claims.

Worker Suggestions and Reports of Concerns

Workers' reports and suggestions can help to identify actual and potential MSD hazards. All workers in the workplace should be:

- trained to identify and encouraged to report MSD hazards whenever they see them (e.g., in their own job, in any other job in the workplace), and
- aware of indicators that MSD hazards exist even if the hazards are not immediately obvious.

Workplaces are encouraged to document reports from workers about:

- pain and discomfort
- design of tools, equipment, workstations, etc.
- physically difficult or tiring tasks, and
- suggested changes or improvements to reduce exposure to MSD hazards.

Supervisors' Inspection Reports and Shift Notes

Supervisors can play a key role in helping to identify jobs, work tasks and workstations with MSD hazards. They should be looking for MSD hazards at all times, and especially when doing any type of inspection.

All supervisors should:

- be aware of indicators that MSD hazards exist even if the hazards are not immediately obvious
- document the presence of these indicators and speak to the workers about possible causes
- listen to, investigate, follow up on and document:
  - worker concerns about the design of a workstation, tools and a job or task, and
  - reports of pain and discomfort in workers.
- be trained to recognize and report on MSD hazards, and
- notify workers and the JSHC or H&S rep when MSD hazards are identified.

Review Discomfort Survey Results

Discomfort surveys are an excellent way to collect information about worker discomfort. These surveys are generally filled in anonymously and are not used to collect information about individual workers. Rather, they can provide managers, supervisors and the JHSC or H&S rep with excellent information about the overall level of discomfort being experienced by workers in a particular area or department.

See the **MSD Prevention Toolbox** for an example of a discomfort survey. Guidance on how to use this survey is also provided.

Human Resources-related Data

Your human resources department has data that can help you to pinpoint where MSD hazards might exist. For example, look for:

- jobs, work areas or departments that have higher than normal rates of overtime or absenteeism:
  - absenteeism may increase when workers who are experiencing pain and discomfort take time off work but may not make an official report, and
  - more overtime might be worked because workers are less productive or they are off due to pain and discomfort, requiring other workers to fill in for them.
- data related to worker satisfaction such as:
  - jobs that are difficult to fill because of high physical demands, and
  - suggestions for improvements made by the workers.

Production- and Service-related Data

Reviewing production- and service-related data can help to identify jobs that have MSD hazards. Such jobs may also have sub-standard levels of efficiency, service delivery and production. Workers may also consider them to:

- be process bottlenecks
- have poor quality results, and
- have a higher incidence of errors.

Identifying and controlling these MSD hazards will help to improve the overall operational performance of the job, work area or department.

POINT TO REMEMBER

If you already have a process for improving production, quality and/or service levels (e.g., Lean, 5S, Kaizen), make sure that you consider MSD hazards when you:

- look for opportunities to improve, and
- make any changes to any job or workstation.

Checking whether Jobs with MSDs and/or Related Concerns Have Been Recognized

This is a decision point. If there are no jobs and/or tasks with a history of MSDs, and if no other related concerns have been recognized, you should document the work done so far to show your due diligence.

If, however, some jobs and/or tasks do have a history of MSDs, or other related concerns have been recognized you should take steps to identify any MSD hazards associated with these jobs and/or tasks. The 'proactive' activities described in the first part of this section can help you do that. It is important to remember that it is sometimes difficult to identify the root cause of an MSD or other concerns. So, even if no MSD hazards are identified when talking to workers, during inspections or using a formal MSD hazard identification tool, jobs with a history of MSDs should be considered for further action.

See **Section 6: Conduct an MSD Risk Assessment** for more information.

Choosing Jobs and Tasks for Further Action

The information and data you have collected and reviewed will help you to select the jobs and tasks that are a priority for further action. Each workplace has to decide how to choose which jobs and tasks are a priority.

Generally speaking, jobs and tasks that might be considered to be a higher priority for further action include those that have:

- MSDs present
- recognized MSD hazards
- reports of worker discomfort or concerns
- reports of concerns by supervisors or the JHSC
- higher than average rates of overtime, absenteeism, worker dissatisfaction, etc., and/or
- productivity and/or quality problems.

See the **MSD Prevention Toolbox** for a sample prioritization method and worksheet.
If you have recognized MSD hazards or related concerns, move on to **Section 6: Conduct an MSD Risk Assessment.**

Section 6: Conduct an MSD Risk Assessment

Once jobs with MSD hazards have been identified, you need a clear understanding of the job elements or workstation-design factors that are creating these hazards.

The risk assessment process (see Figure 6.0) can help to define the source of the MSD hazards problem clearly, which in turn allows for solutions that target the root cause of the problem. Using this process can help you to:

- prevent similar MSD-related problems in the future, and
- ensure that solutions don't create new and unexpected problems.

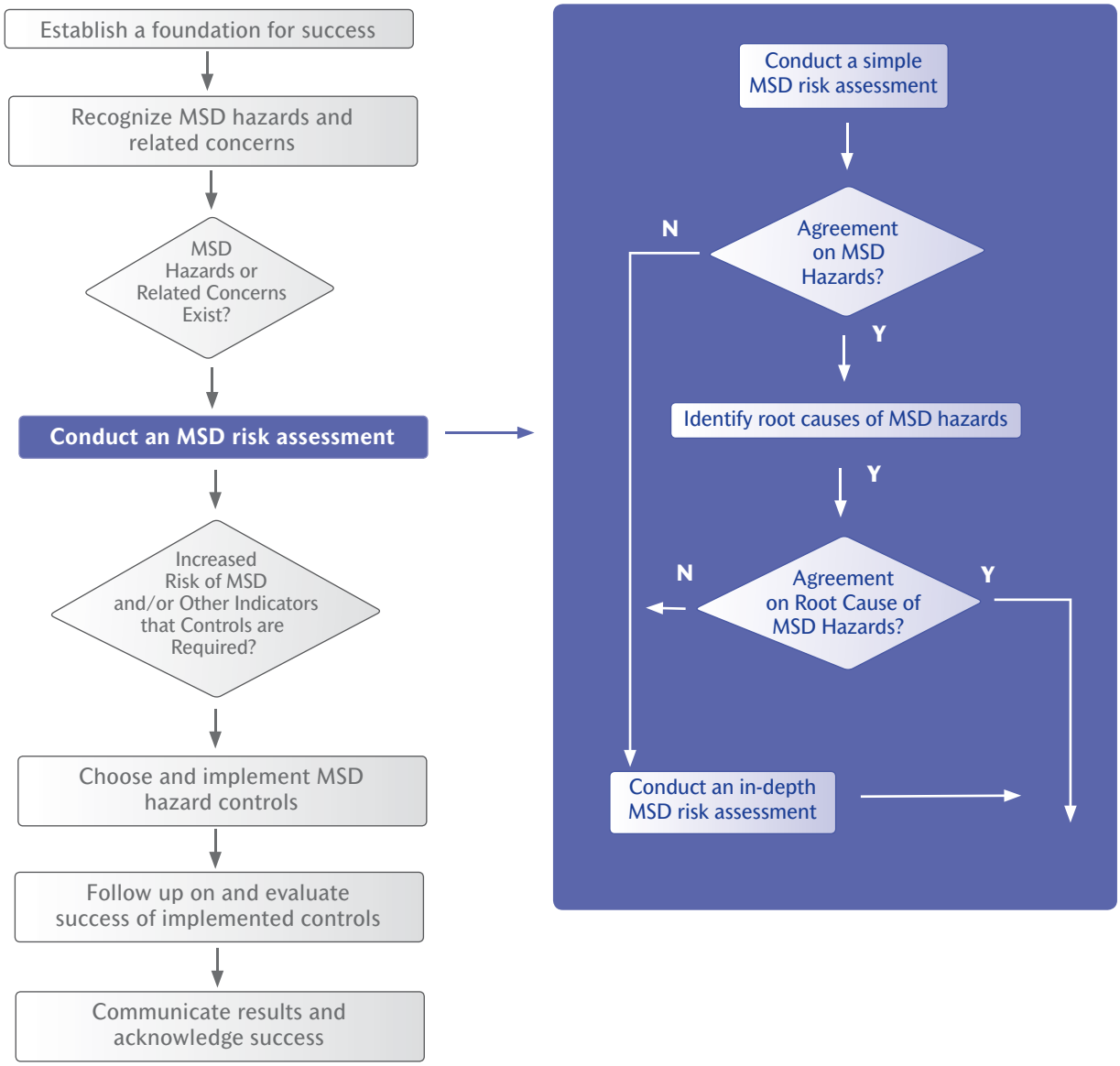


Figure 6.0: Conduct an MSD Risk Assessment

Solving MSD problems does not have to be difficult or complicated. Many problems are obvious once you start looking for them, and their solutions can be just as obvious. When there is agreement on the root causes of the obvious MSD hazards, further risk assessment may not be required. At that point it may make sense to move on to choosing a control for the identified hazards. If the root causes do not appear to be obvious, an in-depth risk assessment may be called for.

This section describes 2 related assessment approaches:

- a simple risk assessment approach, and
- a more in-depth, quantitative risk assessment.

A Simple MSD Risk Assessment

A simple risk assessment is largely based on workers' opinions and experiences to assess the risk related to the MSD hazards of a job, task, workstation, etc.

This approach is effective if:

- the MSD hazards are very clearly understood, and
- there is agreement on the root cause of these hazards.

The people doing a job often know which aspects of it:

- cause them the most pain and discomfort, and
- are most demanding and difficult.

They likely know what the MSD hazards are and what causes them; and they may have a clear idea of one or more solutions that can help to reduce or solve the associated problems.

However, because even the most experienced worker can fail to recognize some important MSD hazards, workplaces are encouraged to use an MSD hazard identification tool to make sure that all MSD hazards are identified and not just those that are the most obvious.

Figure 6.1 shows the steps you should take for this initial, simple risk assessment.

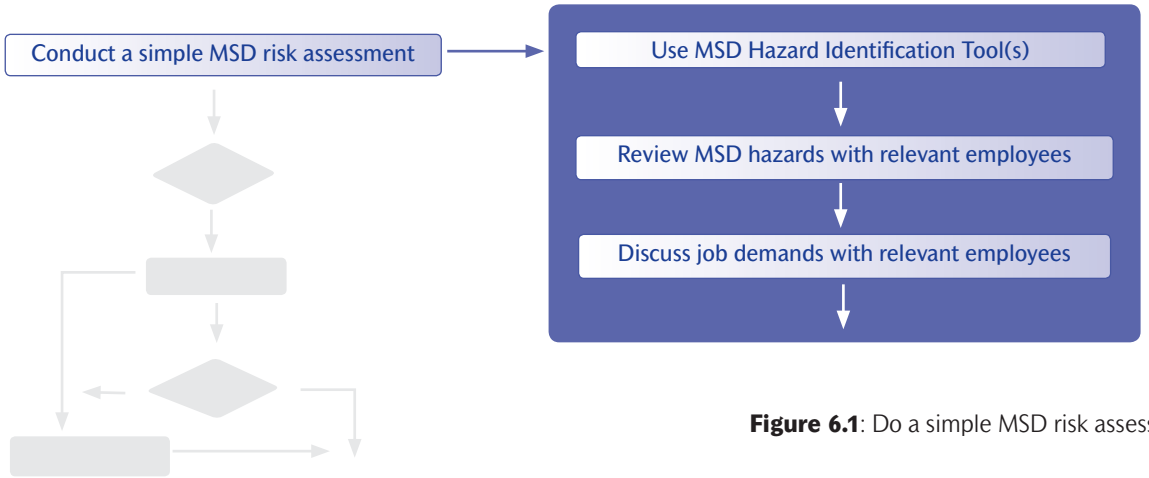


Figure 6.1: Do a simple MSD risk assessment

Use MSD Hazard Identification Tool(s)

If an MSD HIT was not used in the MSD hazard recognition step, it is recommended that the workplace use a HIT to help ensure that any MSD hazards not recognized by the workers are documented. See the **MSD Prevention Toolbox** for an example of a HIT.

Review Hazards with Appropriate Workers

Hold a meeting with workers who work on a specific job. Try to have both very experienced and inexperienced workers at this meeting. Newer workers may see and recognize issues that more experienced workers have become used to.

You should also invite the supervisors responsible for the job and a JHSC member or the H&S rep to the meeting. It may help to include representatives from maintenance, engineering and human resources.

At this meeting, workers should review all the available information including:

- a summary of reports of pain and discomfort
- an overview of worker concerns
- the type and number of MSD-related claims for the job or task
- concerns related to absenteeism and production levels, and
- the findings from the MSD HITs.

NOTE

This discussion will be more useful if the workers have been trained on how to see and identify MSD hazards. If your workers have not had such training, consider providing it before you begin.

Discuss Job Demands with Appropriate Workers

Have the workers discuss their job tasks and demands that relate to the identified MSD hazards. Where possible, it may help to use:

- a written job procedure as a guide or a description of the physical demands of the job, and
- photographs and video recordings of the workstation, job tasks, etc.

Encourage the workers to focus on the parts of the job that are physically difficult or contribute to their discomfort or pain. For each step in the job, ask the workers which actions or activities most likely contribute to the MSD problems.

Is Further Action Required?

This is a decision point. Before moving on, a decision should be made about whether further action is required.

No further action may be required for this job or task:

- if it has identified hazards but:
  - there is no history of workers reporting MSDs, or expressing concerns about pain and discomfort, and

- workers and the JHSC or H&S rep don't feel that the current job demands are a concern.

However, the workplace should continue to monitor the job or task. A more in-depth risk assessment may be called for if workers begin to express concerns about job demands, report pain or discomfort, and/or report MSDs.

POINT TO REMEMBER

If everyone agrees on the MSD hazards and their root causes, it may not be necessary to do an in-depth risk assessment. Instead, start to choose and implement MSD hazard controls.

Reach Agreement on MSD Hazards

This is a decision point. Once you have a list of job related activities or actions that are probably causing the MSD problems, or will likely do so in the future, check whether the workers at the meeting agree that these are the key hazards.

If there is no agreement, you will probably need to do a more in-depth assessment (see below).

Identify the Root Causes of the MSD Hazards

For each of the agreed-up hazards, have the workers brainstorm or discuss the root cause(s) of the hazard. Look at all the factors that can cause the hazard. Do this by considering if the hazard is related to process, equipment, materials, environment or human (PEMEH) aspects of the job.

See the **MSD Prevention Toolbox** for Tips for Eliminating and Controlling MSD hazards using PEMEH categories and Eliminating and Controlling MSD Hazards – Developing Solutions Worksheet Example to document potential controls.

Reach Agreement on the Root Causes of the MSD Hazards

This is another decision point. After you have determined the root causes of the hazards, check whether everyone believes that these are the true causes.

If there is agreement, it may not be necessary to do a more in-depth risk assessment. You can go to **Section 7: Choose and Implement MSD Hazard Controls**. If there is no agreement, you may need to do a more in-depth assessment (see below).

An In-depth MSD Risk Assessment

You should move on to a more in-depth, quantitative risk assessment if:

- the MSD hazards are not clearly understood, or
- there is no agreement on the root cause of these hazards.

The suggested steps for an in-depth MSD risk assessment are listed in Figure 6.2.

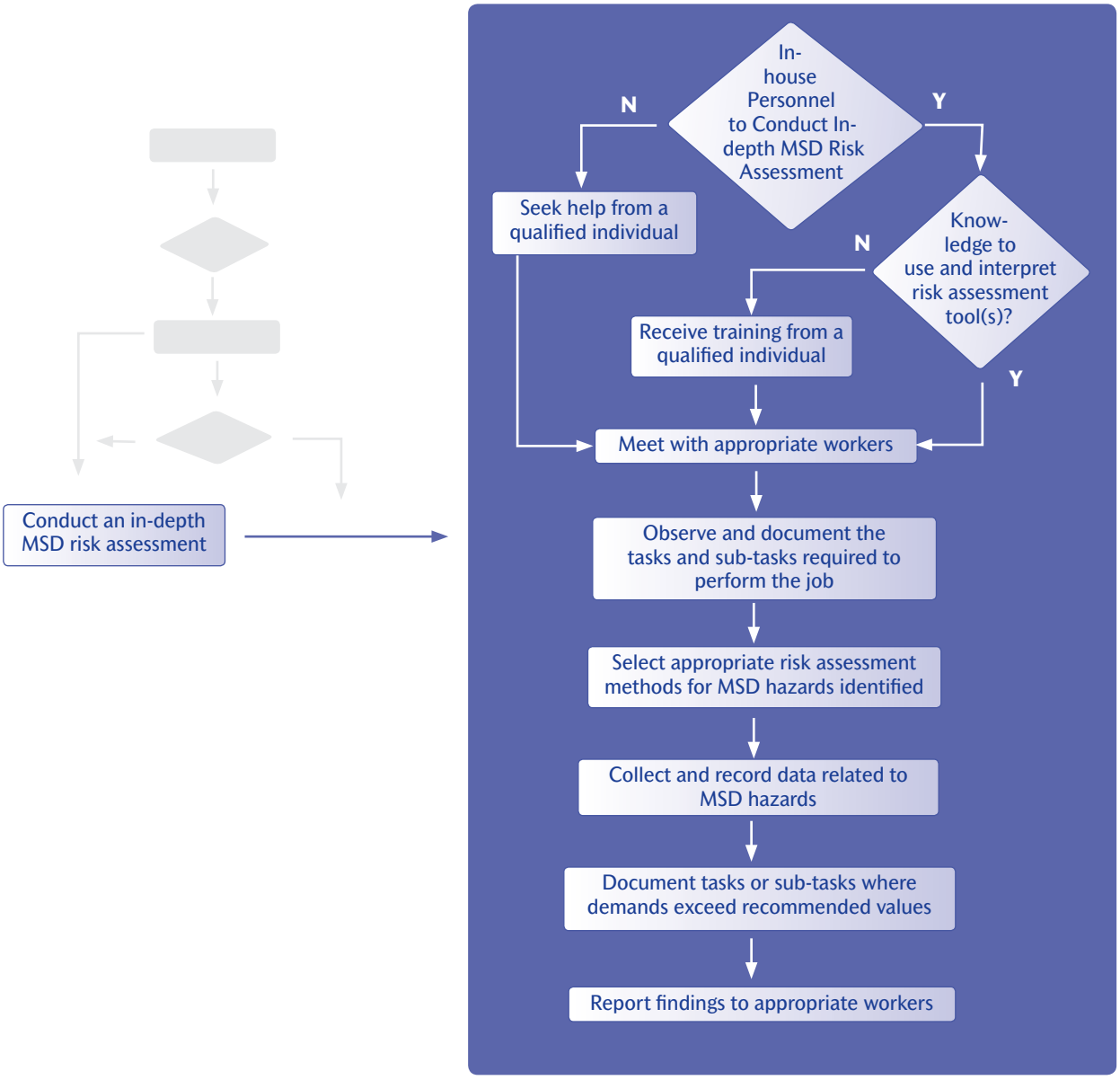


Figure 6.2: In-depth MSD risk assessment

Decide Who Should do the In-depth Risk Assessment

Here is another decision point. Once you decide to do a more in-depth, quantitative MSD risk assessment, you need to consider whether to:

- do it in-house, or
- get help from a qualified person from outside your organization.

This level of risk assessment requires more experience, training and knowledge. You may find that it is less costly and more efficient to seek help from a qualified person from outside the workplace.

If you decide to do the risk assessment in-house, it is important that those doing it be trained on how to use and interpret the risk assessment tools.

See the **MSD Prevention Toolbox** for information on things to consider when selecting a person to help you with your MSD prevention efforts.

Meet with the Appropriate Workers, Supervisors and Managers

Before doing a quantitative MSD risk assessment, you should meet with the workers who do the job or task being assessed. A member of the JHSC or the H&S rep should also be at this meeting. The workers need to know that:

- an assessment is going to be done
- why this is happening, and
- how the results of the assessment will be used.

Supervisors and managers for the work area or department should also be at this meeting. They should:

- show that they support the risk assessment process, and
- make a commitment to any changes needed to control the identified MSD risks.

Observe and Document the Tasks and Sub-tasks Required to do the Job

To find the root cause of an MSD hazard, you need a detailed understanding of how the job is done and all of the tasks and sub-tasks involved.

This is called a task analysis and description. It involves reviewing all of the tasks and the safe work or standard operating procedures that are part of the job. You must work closely with experienced workers to observe and document all of their tasks and sub-tasks, including those related to:

- equipment breakdowns, jams, shutdown and start-up, cleaning or maintenance, and
- non-routine but predictable tasks caused by schedule changes, seasonal variations and customer demands, etc.

If it is practical and allowed, make video recordings of tasks being performed. The video images can be slowed down and paused to help better identify work postures and used to show others job tasks where MSD hazards might exist. Other ideas to consider include:

- making a sketch of the work area or workstation to show movement paths of a worker, reaches, distances, heights, etc., and
- using existing documents such as job descriptions and procedures, standard operating procedures and physical demands descriptions to look for areas of concern.

POINT TO REMEMBER

If in-house staff have not been trained how to use and interpret the results of an MSD risk assessment method, get help from a qualified person.

Select Appropriate Risk Assessment Method

Once you have a good idea of all the tasks involved in the job, you should select an appropriate risk assessment method that reflects the MSD hazards identified. Various assessment methods are available to

evaluate the MSD risk, and it is important to select one that is appropriate for the specific type of MSD hazard and for the job or task being evaluated. For example, the Lifting Equation of the National Institute for Occupational Safety and Health (NIOSH) can be used to evaluate lifting and lowering tasks, but not the demands on the hands, wrists and/or arms due to repetitive assembly-line tasks.

See the **MSD Prevention Toolbox**, for guidance on selecting appropriate risk assessment tools.

POINT TO REMEMBER

Identifying the root cause of an MSD hazard is key to choosing effective controls.

No matter which method you decide to use, ensure that those using it have adequate training before applying it in the workplace. Some methods are relatively easy to use. With a little training, anyone in the workplace can learn to use and apply them. Other methods are more complex. They require sophisticated understanding of their uses, limitations and interpretation of findings. Such methods require a much higher level of training to learn their use and practical experience and guidance in interpreting their findings.

Collect Data Related to the Hazards

To assess the risk for MSDs you will need data about the demands of the job or task. The data needed will depend on the risk assessment method(s) selected in the previous step. Each risk assessment method will require specific data and information about the type of hazard being assessed.

MSD risk assessment methods may require you to collect some or all of the following data:

- the dimensions of the work area, including distances of required reaches
- load weight, size and location (for both picking up and putting down) for any lifting, lowering and carrying (whole body, 1- or 2-handed)
- forces used for any pushing, pulling, grasping, etc.
- work postures required (e.g., bending, reaching, twisting)
- the frequency of physical efforts (i.e., the number of times per minute, hour or shift)
- length of time a force is exerted or a posture is held
- production and service demands (i.e., per minute, hour or shift)
- contact stresses, local or whole-body vibration, work organization factors and work methods
- shift schedules and organization (i.e., length of shift, rotation, and number and length of breaks)
- environmental factors (e.g., noise, light, temperature, floor surface), and
- other information (e.g., required PPE, number of staff doing the task, types of assistive devices provided, drawings of the work area layout).

Digital photographs of key tasks can be used to document specific hazards and issues.

Document Tasks or Sub-tasks where Demands Exceed Recommended Values

The risk assessment should allow you to determine which of the identified MSD hazards exceed recommended values. For each task and sub-task, you should document:

- the MSD hazards associated with it
- any measures that help to define or describe the hazard
- which tool you used to assess the risk, and
- the results of the risk assessment.

You should then highlight any tasks and sub-tasks where the risk associated with the MSD hazard exceeds acceptable levels.

Note: workplaces are encouraged to establish 'standards' for what will be considered acceptable levels. These standards should be developed in consultation with the JHSC or H&S rep. and, if applicable, workplace union representatives. Workplace parties should seek the assistance of a qualified individual if they do not have the knowledge or experience to establish these standards.

Report the Findings to Appropriate Workers, Supervisors, Managers and the JHSC or H&S representative

Create a report detailing the MSD risk assessment process and present the findings to the appropriate workers, supervisors, managers and JHSC or H&S rep. Highlight all tasks and sub-tasks that have an increased risk of MSD and discuss what further action, if any, needs to be taken.

Is the Risk of MSD Increased?

Steps should be taken to select and implement controls for MSD hazards when:

- everyone agrees that the job or task exposes the workers to an increased risk of injury, or
- an in-depth risk assessment indicates that the MSD risk for workers is increased.

No further action may be required when:

- there is no indication that the job or task has an increased risk of MSD, and
- there is no history of MSD or reports of pain or discomfort for the job or task.

However, the workplace should continue to monitor the job or task.

If the in-depth risk assessment indicates that the risk of MSD for a job is acceptable but the job or task has a history of MSDs and/or reports of pain or discomfort, the workplace should consider:

- reviewing the risk assessment methods used to ensure that appropriate methods were chosen for the MSD hazards identified and/or reported MSDs
- whether accommodations to address individual needs are necessary or possible, and

- whether factors that were not addressed during the risk assessment may be contributing to the development of MSDs.

If the Risk of MSD is Increased, Identify Potential MSD Hazard Controls

Identifying potential controls for MSD hazards is not technically part of the MSD risk assessment process. It is included here as a reminder that risk assessment is only a means to an end, not the end.

The risk assessment provides you with greater understanding of the MSD hazards for a job and the level of risk associated with these hazards. But the reason for doing the risk assessment is to gain the information you need to take the next step. That step is making changes and modifications in the design of the job, tools, equipment, workstation, work organization, environment, etc. These changes are intended to reduce or eliminate the risk of MSD for the workers doing the job.

See **Section 7: Choose and Implement MSD Hazard Controls** for:

- more information on how to choose and implement controls for MSD hazards, and
- examples of control strategies for different MSD hazards.

See the **MSD Prevention Toolbox** for:

- a worksheet to help identify root causes for MSD hazards
- information on things to consider when selecting a person to help you with your MSD prevention efforts
- guidance on MSD risk assessment methods, including which methods are appropriate for which tasks and jobs, and where to find more information on these methods, and
- principles for choosing an MSD risk assessment method.

Section 7: Choose and Implement MSD Hazard Controls

You have identified and assessed the risks due to MSD hazards in your workplace. You did this so that you can put effective controls in place that decrease or eliminate workers' exposure to those hazards. The process for choosing and implementing controls for MSD hazards is outlined in Figure 7.0.

POINT TO REMEMBER

Identifying the root cause of an MSD hazard is key to choosing effective controls.

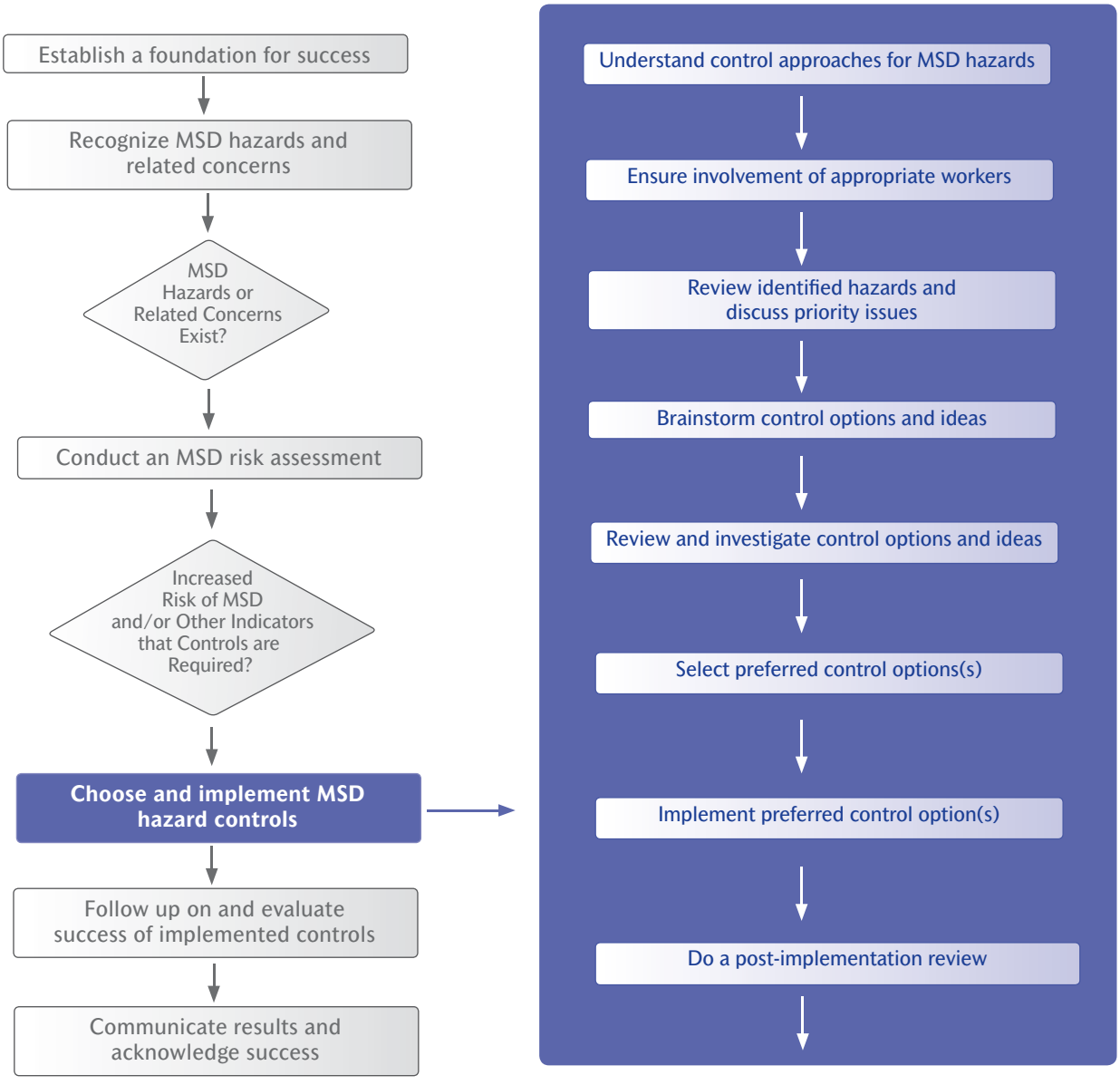


Figure 7.0: Choose and implement MSD hazard controls.

Effective controls for MSD hazards do not have to be elaborate or expensive. Often a simple change in a work process, workstation or tool is effective. If a more complex change is needed, it may be possible to implement it in stages. For example, you may be able to:

- make small changes to the design of a workstation or piece of equipment over time, and/or
- include changes to the way the job is organized or staffed until all the other controls are in place.

When the development or implementation of an MSD hazard control is going to be delayed, it is important to consider interim controls. These may not be the preferred or best solution, but they can reduce the risk in the short term.

Make sure that controls for MSD hazards do not create new hazards. You need to consider both the workers handling the controls and those who have to work in and around them (e.g., maintenance personnel, cleaners, suppliers).

The remainder of this section provides information about:

- the types of controls that can reduce workers' exposure to MSD hazards, and
- how to select and implement these controls.

Understand Control Approaches for MSD Hazards

Ideally, controls should be designed to eliminate a worker's exposure to the identified MSD hazards. There are 2 main controls for MSD hazards: engineering controls and administrative controls. In addition, you can use a combination of these types of controls.

Engineering Controls

Engineering controls reduce or eliminate the worker's exposure to MSD hazards by modifying the work or workplace. They include:

- modifying workstations
- providing new tools or equipment to reduce demands
- changing the tools or equipment used to do the work, and
- modifying the production process.

Specific examples of engineering control ideas and concepts include:

- changing the way materials, parts, people and products are transported (e.g., using mechanical assist devices to eliminate heavy lifting and carrying)
- changing the process or product to reduce exposure to MSD hazards (e.g., reorienting or redesigning equipment parts, workstatations or work areas to allow for easier access
- modifying containers, carts, bins or stands to improve work postures (e.g., cutting the sides out of deep bins, providing height-adjustable bin inserts)
- changing the design and/or layout of a workstation (e.g., using height-adjustable tables, relocating tools, materials or other items to reduce reaching)

- changing the way parts, tools, equipment and materials are manipulated (e.g., using fixtures to hold work pieces, suspending tools to reduce the weight and allow easier access)
- changing tool designs (e.g., "pistol" grips for knives to improve wrist postures, full hand squeeze-actuated triggers to replace finger-actuated triggers)
- changing materials and fasteners (e.g., lighter-weight materials to reduce lifting loads, Robertson screws instead of slotted screws)
- changing the layout of the work environment (e.g., removing physical and visual obstructions that cause awkward postures or static exertions), and
- adjusting the speed of production machines, conveyors, etc., to reduce repetitive motion risks and give workers more control of the work process.

Engineering controls are preferred over administrative controls because:

- when they are implemented correctly, they address the MSD hazards at their source
- they rely less on workers to choose safe work practices and not make errors, and
- they are often the most cost-effective solutions in the long term, because they tend to fix the problems at the source and do not require ongoing administrative efforts and costs.

POINT TO REMEMBER

The effectiveness of an engineering control is often specific to the task or workplace. Therefore, all controls and solutions should be carefully considered in terms of the specific job, task and work process.

Administrative Controls

Administrative controls are designed to reduce exposure of workers to MSD hazards by developing specific policies and procedures, changing work schedules, adjusting staffing levels, etc. They may also include efforts to develop and train workers to use work methods that reduce the risk of MSD.

Administrative controls change the way work is done. They do not change the physical work environment. Administrative controls do not eliminate hazards, but they can greatly reduce the risk of MSDs. For example, administrative controls can help until engineering controls can be adopted, and when engineering controls cannot be used for technical reasons.

POINT TO REMEMBER

Administrative controls may seem to cost less than engineering controls. However, their costs actually can be much higher in the long run!

In some cases, a combination of administrative and engineering controls provides the best solution.

Examples of administrative control ideas and concepts include:

- establishing policies and procedures about:
  - appropriate tool or equipment use
  - regular tool or equipment inspection, and
  - maintenance.
- rotating workers through several jobs with different physical demands to reduce the stress on limbs and body regions (job rotation)
- broadening or varying the job content (job enlargement)

- training workers to support job rotation and job enlargement strategies
- implementing appropriate work-hardening procedures for new workers
- scheduling more breaks to allow rest and recovery
- reducing shift length or the amount of overtime allowed
- training workers to recognize MSD hazards and to use work practices that can ease the demands or burden of tasks
- changing a lifting task from a 1-person lift to a 2-person lift
- training workers to use good body mechanics and adopt neutral work postures
- training workers to use good manual handling methods and techniques
- encouraging workers to rest muscles, relax and change their posture during brief pauses in the work cycle, and
- implementing warm-up and stretching exercises.

Administrative controls do not eliminate hazards. Therefore, management must ensure that the controls' practices and policies are followed. This may involve:

- developing weekly job-rotation schedules
- adjusting levels of staffing based on workload
- continuously training workers to allow job enlargement, and
- providing ongoing training and education.

Personal Protective Equipment (PPE)

Providing the workers with PPE cannot effectively control most MSD hazards. Some products may be useful for treatment or rehabilitation, but are of little or no benefit for MSD prevention. The following products are **not** recommended or effective at preventing MSDs:

- back belts, and
- wrist supports and splints.

These products do not reduce the risk of injury to workers. In some cases, they may increase it. There are some exceptions. Equipment that has been shown to be effective includes:

- well-designed "anti-vibration" gloves
- kneepads for kneeling work, and
- shock-absorbing insoles.

Involve Appropriate Workers

It is important to have all workers involved in MSD prevention efforts. This is especially relevant during discussions of hazard control ideas and options, and the process used to choose which control(s) to implement.

Make sure that employees who work at the job that is being improved are part of the control selection team. Others who should be involved include appropriate maintenance, supervisory and engineering staff, and member(s) of the JHSC or the H&S rep.

Review Identified Hazards and Discuss Priority Issues

The team considering which controls to implement needs a clear understanding of:

- the MSD hazards that exist for a job, and
- the results of any risk assessment methods used.

Review the identified MSD hazards and risk assessment results. Discuss the situation with the workers to determine which hazards are the highest priority for control. In most cases, the hazards with greatest risk will be seen as the high priorities for control. However, a hazard with less risk may be considered a higher priority if it leads to more frustration, work having to be re-done, jam-ups, etc.

Brainstorm Control Options and Ideas

Once the MSD hazards have been prioritized, it is time to generate options and ideas to effectively control exposure to them. A variety of techniques can be used to come up with a list of control options. Brainstorming is useful to identify as many options and ideas as the team can think of. Be open to innovative and unusual control options and ideas suggested by the team. Using or building on these ideas can often lead to better and more productive solutions for your workplace. The PEMEH categories (process, equipment, materials, environment, and human) can also be used when considering possible MSD hazard controls.

See the **MSD Prevention Toolbox** for Tips for Eliminating and Controlling MSD hazards using PEMEH categories and Eliminating and Controlling MSD Hazards – Developing Solutions Worksheet Example to document potential controls.

Techniques for identifying MSD hazard control options and ideas include:

- talking to staff who do similar work in other companies
- talking to suppliers of equipment and materials
- looking at catalogues, brochures, etc.
- contacting one of Ontario's health and safety associations (see Appendix)
- talking to labour organizations and/or employer associations
- attending trade shows and conferences
- searching the Internet, and
- posting questions on Internet safety discussion groups.

POINT TO REMEMBER

Consider a number of possible solutions. Consider testing several solutions on a small scale before deciding on which one to implement.

Review and Investigate Control Options and Ideas

After listing MSD hazard control options and ideas, take the time to review and investigate them. One control option may stand out to everyone involved as the best. If this occurs and everyone agrees, further review may not be needed. However, choosing what seems to be the obvious (i.e., often the easiest) option may lead to problems later on. Alternatively, it may cause you to miss a much better but less obvious option.

Before starting the review process, list the control options and ideas and assign one or more staff members to be responsible for reviewing each one. They will then bring their findings back to the rest of the team.

For each option and idea, consider and document some or all of the following:

- the likelihood that the control will eliminate or significantly reduce exposure to the hazard
- the effect of the control on other parts of the work process (both up- and downstream)
- any new issues or hazards the control might introduce at the workstation or in other areas of the workplace
- the cost to implement, use and maintain the control
- the practicality of the control:
  - is it easy to do, in use elsewhere, purchased off-the-shelf?
  - is significant design or redesign required?
- the effect of the control on productivity and/or quality
- the need to train workers
- the feelings and concerns expressed by appropriate workers, and
- other information:
  - from suppliers and manufacturers
  - from employers who have already implemented the control, and
  - in case studies or research papers.

All of these sources of information can be used to help identify which of the control options and ideas you should consider using. Once you have narrowed down the list, consider:

- using one or more of the ideas on a trial basis to evaluate its success, and
- creating a mock-up or prototype of a new workstation or work area layout to test how it will help reduce the workers' exposure to hazards.

Choose Your Preferred Control Option(s)

After reviewing your MSD hazard control options and ideas, you need to choose one control or a combination. This can be difficult if you have a large number of options and ideas to consider.

Compile all of the collected information in a format that allows the team members to easily compare the pros and cons of the various options. One option may stand out as the best (i.e., it is

low cost, easy to implement and eliminates the MSD hazard). However, it is often not this easy. A process for ranking and weighting the various review factors should be considered if a decision between different controls must be made.

Implement Your Preferred Control Option(s)

How you implement your preferred control is very important. Check that all of the workers who will be affected by the control know about the change. They need to know:

- what will happen
- why it is happening
- when it will happen, and
- what it will mean for them, in terms of new work methods, etc.

POINT TO REMEMBER

Simple, low-cost changes (e.g., changes in working height) can make a big difference. In addition, they are usually easy to implement.

The workers need to receive any training necessary to use the control effectively and efficiently. When you are installing a new control, it is important to:

- install the control correctly
- ensure that no new hazards are introduced
- consider whether a break-in period is needed to allow workers to get used to the control before the process speed or production expectations return to normal.

Do a Post-implementation Review

Immediately after a control is implemented, you should check to make sure that it is working as you expected and there are no surprises. Check that:

- the expectations of the workers involved in the project have been met
- the chosen solution was installed correctly
- all appropriate workers have been trained on how to use the control
- all appropriate workers can demonstrate how and when to use the control
- the concerns of maintenance personnel are addressed
- up- and downstream processes have been reviewed to ensure that no hazards or negative issues have been introduced
- no new hazards or concerns have been introduced, and
- initial feedback of appropriate workers is documented.

See the **MSD Prevention Toolbox** for:

- Eliminating/Controlling MSD Risks – Developing Solutions Worksheet
- Tips for Eliminating and Controlling MSD Hazards
- Questions to Consider When Choosing MSD Hazard Controls.

Section 8: Follow up on and Evaluate the Success of Implemented Controls

The post-implementation review is the first step in a good evaluation of any MSD prevention project. You should do this review as soon as possible after a control has been installed or implemented. Figure 8.0 shows the steps recommended to evaluate all MSD prevention projects.

POINT TO REMEMBER

Sometimes an evaluation suggests that the MSD hazard control is not fully successful. In this case, you may not have properly identified all of the MSD hazards. Return to Section 5 (Recognize MSD Hazards and Related Concerns).

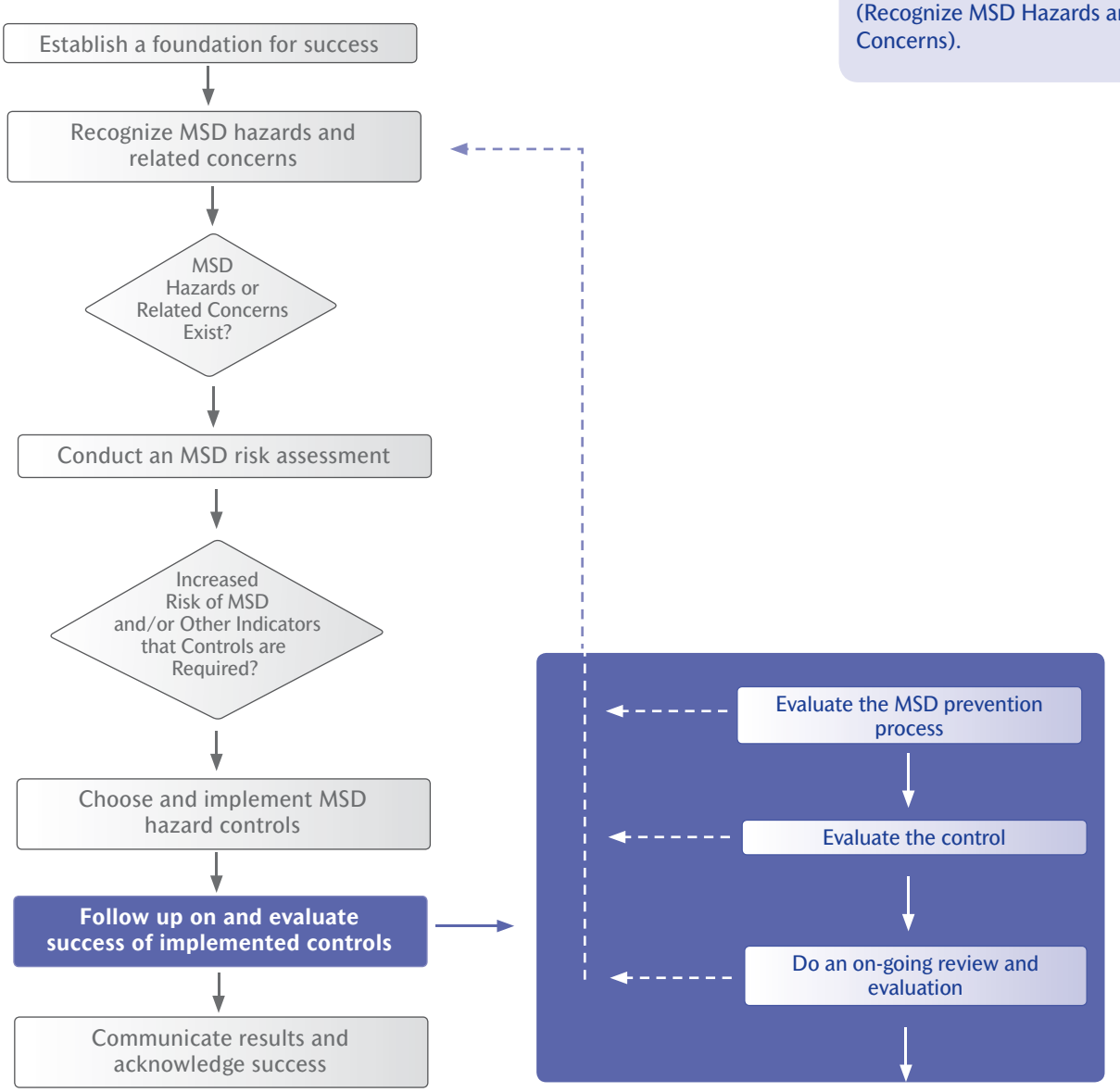


Figure 8.0: Follow up on and evaluate the success of implemented controls

Evaluate the Process

This part of the evaluation focuses on how well the MSD prevention process worked to control MSD hazards on a particular job or in a particular work area.

As soon as possible after implementing a control, you should ask the team that worked on the solution(s) to provide feedback on how well the process worked, and suggestions on how to improve the process.

Consider asking each team member the following:

- did you fully understand the purpose of the project?
- did you fully understand your role in the project?
- do you think that you received adequate training to take an active part in the project?
- did you feel that you had enough time to properly take part in this project?
- were the HITs easy to use and appropriate for this project?
- were the risk assessment methods used easy to understand and appropriate for this project?
- do you feel that you were given an opportunity to express your concerns and opinions?
- is your overall opinion of the MSD prevention project positive, neutral or negative?
- is there anything you think should be done differently to improve the process used in future MSD prevention projects?

Evaluate the Control

To evaluate the success of MSD hazard controls more formally, allow some time to pass. This will ensure that any small "bugs" with the control are corrected, and all workers have had a chance to use and adjust to the control.

Shortly after implementing the control, you should:

- observe and ask the workers and supervisors directly whether they are using the control and using it correctly
- use the MSD HITs to verify that the hazards continue to be controlled and that no new hazards have been introduced
- ask all appropriate workers for their feedback on the control:
  - is it easy to use?
  - does it make the task easier and less demanding?
  - does it speed up or slow down production?
  - is it reliable and easy to maintain?
  - are there any concerns or problems with the control?
  - has it led to any new problems?

Document the information collected during this evaluation and report it back to all appropriate workers. If concerns are noted, ask the project team to discuss them and suggest ways to alleviate them.

A more formal and in-depth evaluation should be done once the finalized control has been in use for a while (e.g., 3–6 months). By this time, the workers should have a very good idea of how the control works and the positive or negative things associated with its use.
During this evaluation, you should consider:

- using a formal survey to gather workers' opinions on the control
- asking workers for suggestions to improve the control
- surveying other appropriate workers about the control (e.g., maintenance, production, engineering, quality, supervisors), and
- collecting production and quality data.

See **MSD Prevention Toolbox** for an example of a survey that can be used to collect workers' opinions of the controls.

You could also re-use some of the surveys used during the hazard identification step (see **Section 5: Recognize MSD Hazards and Related Concerns**):

- postural discomfort
- workload or MSD hazard perception, and
- MSD HITs.

POINT TO REMEMBER

Which survey, checklist, HITs, etc., did you use during the initial assessment of the job or task? Use the same tool to evaluate it after implementing the control. This will allow you to compare the results.

Compare the information or data collected with what you found before the control was installed.

Bring the project team together to discuss and suggest new ways to correct any identified issues.

Do an Ongoing Review and Evaluation

Continue to review all the usual reports to look for problems or improvements on the job or in the work area where the control was implemented. Include regular JHSC or H&S rep inspection reports, and accident, injury, first aid, absenteeism, overtime, production and/or quality reports. This information is normally reviewed by the JHSC, the occupational health nurse, human resources, production and/or quality personnel.

Remember that MSDs may continue to be reported even after a control has been successfully implemented. Since it takes time to develop an MSD, new cases can result from exposures to hazards before the control was installed. Effective controls will prevent new MSD cases from starting and reduce the reports of signs and symptoms. Depending on the type of work done, the number of cases may not really drop until 1 to 2 years after a control has been implemented.

Section 9: Communicate Results and Acknowledge Success

Good communication is important in preventing MSDs. Even well designed and implemented controls can be less successful than they should be if the communicatjn is poor. Figure 9.0 outlines the key communication steps to consider for all such projects.

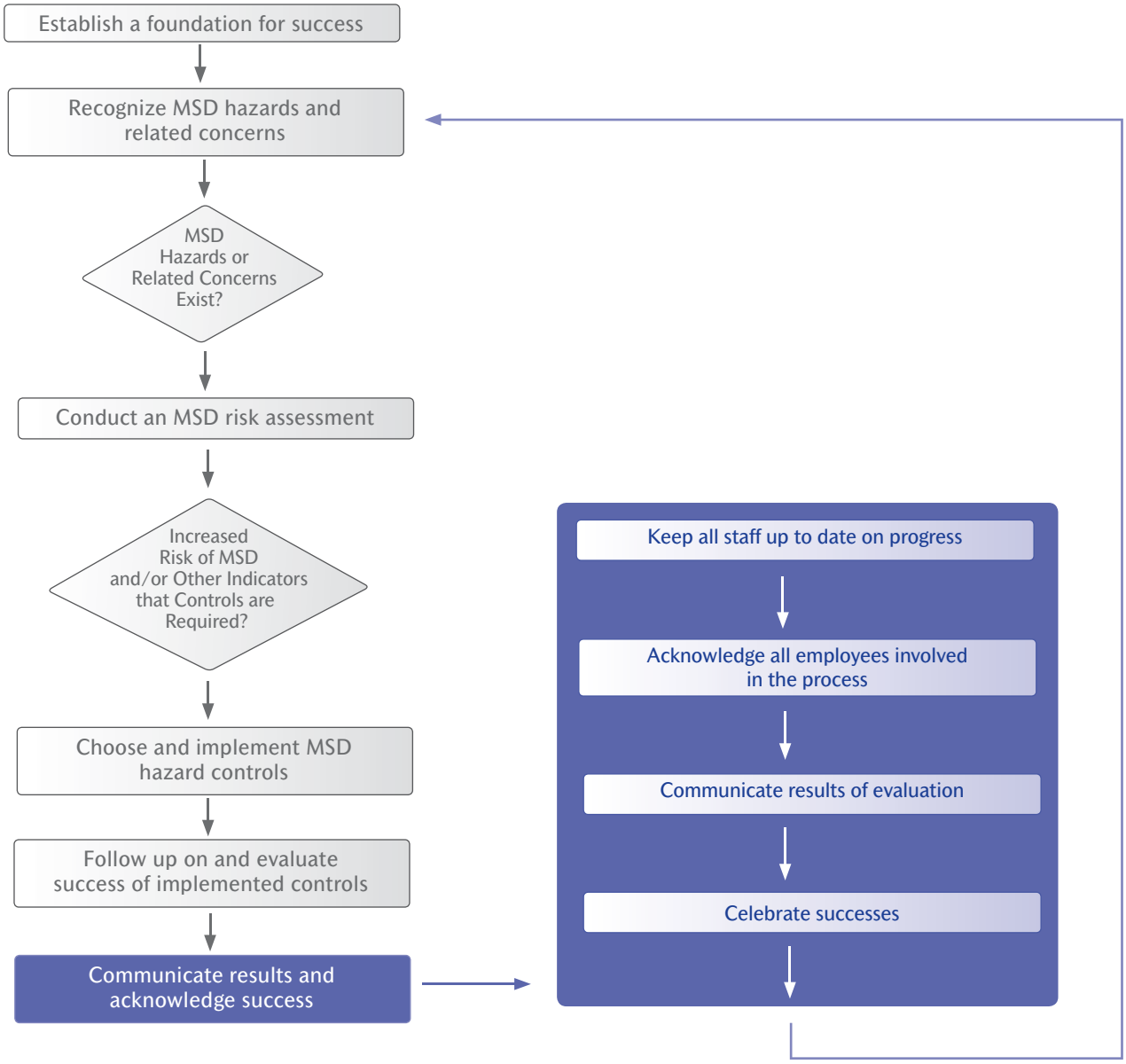


Figure 9.0: Communicate results and acknowledge successes

Keep All Workers Up to Date on Progress

Update all workers on the MSD prevention projects going on in the workplace. This will:

- show that MSD prevention is a priority for the workplace, and that real steps to address these hazards are being taken, and
- help to address any concerns of workers.

While all workers should be kept up to date, it is particularly important to ensure that the workers directly affected by the controls receive detailed information about how their jobs or work areas are affected. These workers may need more frequent and detailed updates to help manage their questions and concerns.

You can easily update workers by:

- discussing specific projects at regular crew or departmental meetings
- posting expected project timelines on departmental or work area bulletin boards
- posting updates on these bulletin boards and health and safety bulletin boards
- putting updates into workplace newsletters
- reviewing progress at JHSC and senior management meetings, and
- sending a broadcast email out to all workers.

Acknowledge Everyone Involved in the Process

When communicating information about any MSD prevention project, acknowledge everyone who was involved in the process. This recognition:

- shows these people that their participation and hard work are appreciated
- reinforces the commitment to MSD prevention, and
- motivates others to get involved in such efforts.

No matter how you recognize individuals for their work on MSD prevention, remember that:

- ideally, the recognition should be public and personal, and
- it can also be included and recorded in regular performance appraisals.

Communicate the Results of the Evaluation

After implementing and evaluating a control, you should let workers know the results of this evaluation. We suggest that you report the findings from all the evaluations.

When the outcome is successful, communicating the results of an evaluation reminds everyone that:

- changes have been made
- the workers' risk of MSD has been greatly reduced, and

- the success resulted from workers at all levels and departments working together to solve identified problems.

Letting workers know when a control is not considered successful is less easy but just as important. These outcomes should be acknowledged as learning opportunities. In addition, you can:

- indicate that you intend to continue looking for an effective control until success is found
- recognize the people who are working on the project, and
- offer continued support and resources to allow them to find a solution that will be a success.

Celebrate Successes

When a control does reduce exposure to MSD hazards and, possibly, improves other business performance measures, it is time to celebrate this success. The celebration can start by communicating the results of the evaluation (above). However, consider having a special celebration for your successful efforts. This will help to generate motivation and support for future MSD prevention efforts at all levels of the organization.

Appendices

MSD Prevention Glossary, Abbreviations and Acronyms

Resources

Selected Bibliography

Review Process

MSD Prevention Glossary, Abbreviations and Acronyms

Term	Definition
Administrative control	Work practices, work methods, policies and procedures established to reduce exposure to a work-related hazard (e.g., scheduling more breaks, job rotation, job enlargement).
Awkward posture	Any fixed or constrained body position that overloads muscles, tendons or joints. Generally, the more a joint deviates from the neutral position the more the posture is considered to be "awkward" and the greater the risk of injury.
Centre for Research Expertise for the Prevention of Musculoskeletal Disorders (CRE-MSD)	Funded by the WSIB of Ontario and the University of Waterloo, CRE-MSD conducts research to improve the understanding of and prevention of work-related musculoskeletal disorders.
Contact stress	Exposure of a body part to a hard or sharp surface or edge on a workstation or a hand tool (e.g., leaning forearms against the sharp edge of a desk).
Duration	The length of time a person performs a task or is exposed to a specific hazard without a rest period. Also, the amount of time during a shift a task is performed (e.g., 2 hours per shift).
Dynamic muscle work	Use of muscles to generate a force that causes the length of the muscle to change during the activity, resulting in motion around a joint.
Ergonomics	The scientific discipline concerned with understanding interactions between humans and other elements of a system (tools, equipment, products, tasks, environment) to optimize human well-being and overall system performance.
Force	The amount of effort exerted by your muscles.
Hazard	Any source of potential damage, harm or adverse health effects on something or someone under certain conditions at work.
Hazard identification tool (HIT)	A tool used to help identify MSD hazards in the workplace.
Health and safety representative (H&S reps)	A worker selected by the workers to represent them with the employer to resolve health and safety issues. They are required in workplaces with 5–19 workers.
Human (as used in the PEMEH process)	A human factor that can lead to an increased risk for workers performing specific jobs or tasks. To reduce the risk of MSD it is important to consider decisions made by humans, at all levels. For example, these decisions can result in: ■ poor workstation design ■ poor work organization ■ inadequate staffing levels ■ inadequate training, supervision and coaching ■ increased production pressures ■ differences in work methods or techniques ■ inappropriate responses to reports of MSD-related concerns, and ■ inconsistent use of equipment or controls that help to reduce MSD risk.

Internal responsibility system (IRS)	A health and safety philosophy based on the principle that every individual in the workplace is responsible for health and safety.
Institute for Work and Health (IWH)	An independent, not-for-profit research organization established in 1990 by the WSIB of Ontario. The Institute's mission is to research and promote: new ways to prevent workplace disability, improved treatment and optimal recovery and safe return to work
Joint health and safety committee (JHSC)	A forum where employer and worker representatives meet to identify and evaluate hazards and make recommendations to the employer on how to resolve them. A JHSC is legally required in most workplaces with 20 or more workers. Depending on the size of the workplace, at least 1 worker member and 1 management representative must receive additional training to become the "certified" members.
Musculoskeletal disorder (MSD)	Injuries and disorders of the musculoskeletal system. They may be caused or aggravated by various risk factors in the workplace. The musculoskeletal system includes muscles, tendons, tendon sheathes, nerves, bursa, blood vessels, joints and ligaments. MSDs do not include musculoskeletal injuries or disorders that are the direct result of a sudden, single event involving an external source (e.g., fall, vehicle accident, violence).
MSD-related concerns	Issues or concerns that may be related to MSD hazards and MSDs even if no formal reports of musculoskeletal disorders have been received from workers. These include: ■ unreported pain and discomfort ■ absenteeism due to unreported MSDs, and ■ lower productivity and quality due to poor workplace design, high job demands or worker pain and discomfort, etc.
National Institute for Occupational Safety and Health	The federal agency responsible for conducting research and making recommendations for the prevention of work-related injury and illness in the United States.
Neutral posture	The body position that minimizes stresses on the body. Typically the neutral posture will be near the mid-range of any joint's range of motion
Occupational Health and Safety Council of Ontario (OHSCO)	A group made up of senior representatives from the Ontario Ministry of Labour, WSIB, the Institute for Work & Health and all of Ontario's health and safety associations.
Process, equipment, materials, environment and human (PEMEH)	One way of categorizing the causes of hazards and/or looking at possible control options.
Personal protective equipment (PPE)	Hazard controls implemented at the worker such as head, eye or hearing protection.
Repetition	The number of similar exertions, actions or tasks performed in a specified amount of time.
Risk	The chance or probability that a person will be harmed or experience an adverse health effect if exposed to a hazard. It may also apply to situations with property or equipment loss.

Risk assessment	The in-depth examination of the hazard once it has been identified. It involves measurement and assessment of the exposure variables to quantify the probability that exposure to the hazard will result in an MSD. Exposure variables include frequency, duration and magnitude.
Root cause	Underlying cause; an identified reason for the presence of a defect or problem. It is the most basic reason, which, if eliminated, would prevent recurrence.
Static work	A task where the worker needs to generate force in the muscles but there is no movement of the limbs or body.
Training	Any activity, session, event, etc., designed to provide information and/or instruction to workers and to verify that workers have understood and are able to use the information and/or instruction. Examples include: ■ crew meeting sessions ■ safety talks ■ computer-based learning ■ on-the-job demonstration(s) ■ leader-led in-class sessions, and ■ the provision of written materials with follow-up to ensure understanding, etc.
Workplace parties	Persons who have a role to play in ensuring health and safety in a workplace. They include: ■ employer ■ managers ■ supervisors ■ workers ■ JHSC or H&S rep, and ■ where applicable, the union(s) representing workers in the workplace.
Workplace Safety and Insurance Board (WSIB)	An agency of the Ontario provincial government dedicated to the prevention of all workplace injuries, illnesses and fatalities. It oversees Ontario's workplace safety education and training system and administers Ontario's no-fault workplace insurance for employers and their workers.

Resources

Ontario Health and Safety Associations
(http://www.preventiondynamics.com)

Construction Safety Association of Ontario
PHONE: (416) 674-2726
1-800-781-2726
http://www.csao.org

Education Safety Association of Ontario
PHONE: (416) 250-8005
1-877-732-3726
http://www.esao.on.ca

Electrical & Utilities Safety Association
PHONE: (905) 625-0100
1-800-263-5024
http://www.eusa.on.ca

Farm Safety Association
PHONE: (519) 823-5600
1-800-361-8855
http://www.farmsafety.ca

Industrial Accident Prevention Association
PHONE: (905) 614-4272
1-800-406-4272
http://www.iapa.ca

Mines and Aggregates Safety and Health Association
PHONE: (705) 474-7233
http://www.masha.on.ca

Municipal Health and Safety Association
PHONE: (905) 890-2040
1-866-275-0045
http://www.mhsao.com

Occupational Health Clinics for Ontario Workers
Toronto Clinic
PHONE: (416) 510-8713
1-888-596-3800
http://www.ohcow.on.ca

Ontario Forestry Safe Workplace Association
PHONE: (705) 474-7233
http://www.ofswa.on.ca

Ontario Safety Association for Community and Healthcare
PHONE: (416) 250-7444
1-877-250-7444
http://www.osach.ca

Ontario Service Safety Alliance
PHONE: (905) 602-0674
1-800-525-2468
http://www.ossa.com

Pulp & Paper Health and Safety Association
PHONE: (705) 474-7233
http://www.pphsa.on.ca

Transportation Health and Safety Association of Ontario
PHONE: (416) 242-4771
1-800-263-5016
http://www.thsao.on.ca

Workers Health and Safety Centre (WHSC)
PHONE: (416) 441-1939
1-888-869-7950
http://www.whsc.on.ca

Ontario Resources

Centre of Research Expertise for the Prevention of Musculoskeletal Disorders (CRE-MSD)
http://www.cre-msd.uwaterloo.ca/

Institute for Work and Health (IWH)
http://www.iwh.on.ca/

Ministry of Labour
http://www.labour.gov.on.ca/

Prevention Practices Database
http://www.preventionpractices.com/

Workplace Safety and Insurance Board
http://www.wsib.on.ca

Canada Resources

Canadian Centre for Occupational Health and Safety
http://www.ccohs.ca/oshanswers

WorkSafe BC
http://www.worksafebc.com

International Resources

European Agency for Safety and Health
http://europe.osha.eu.int

Health and Safety Executive (HSE)
http://www.hse.gov.uk

National Institute for Occupational Safety and Health
http://www.cdc.gov/niosh/

US Department of Labor, Occupational Safety and Health Administration (OSHA)
http://www.osha.gov

Professional Ergonomics Associations

Association of Canadian Ergonomists
http://www.ace-ergocanada.ca

Ergonomics Society
http://www.ergonomics.org.uk

Human Factors and Ergonomics Society
http://www.hfes.org

International Ergonomics Association (IEA)
http://www.iea.cc

Other Professional Associations

Canadian Association of Occupational Therapists
http://www.caot.ca

Canadian Chiropractic Association
http://www.ccachiro.org

Canadian Kinesiology Alliance
http://www.cka.ca/

Canadian Occupational Health Nurses Association
http://www.cohna-aciist.ca

Canadian Physiotherapy Association
http://www.physiotherapy.ca

College of Chiropractors of Ontario
http://www.cco.on.ca

Occupational Hygiene Association of Ontario
http://www.ohao.org

Ontario Kinesiology Association
http://http://www.oka.on.ca/

Ontario Occupational Health Nurses Association
http://www.oohna.on.ca

Ontario Physiotherapy Association
http://www.opa.on.ca

Ontario Society for Occupational Therapists
http://www.osot.on.ca

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Review Process

The Resource Manual for the MSD Prevention Guideline for Ontario (the Manual) will be regularly reviewed and modified in order to provide Ontario workplaces with information on new research findings, assessment methods, control approaches, etc. The review process is described below:

1) The Manual will be formally reviewed by a technical committee appointed by OHSCO every five (5) years from the date of publication. The committee will consider all received requests for modifications and the current state of research related to MSD prevention. The technical committee will make a recommendation to OHSCO to re-affirm or update the Manual.

2) If the recommendation is to update the Manual, the technical committee will meet to consider the specific changes to be made.

3) The recommended changes will be presented to OSHCO for approval. Once approved by OHSCO the recommended changes will be distributed to external stakeholders for comment.

4) After the comment period, the technical committee will meet to review all comments received and submit a final version of the updated Manual to OSHCO.

5) An early review of the Manual may be considered if information regarding new and well-supported research findings is received, and if the new research findings suggest that information in the Manual is not providing Ontario workplaces with a reasonable approach to MSD prevention.

6) The Chair of OHSCO will ensure that all comments or requests for modifications are reviewed on an annual basis.

7) All requests for changes or modifications to the Manual should be sent to:

By Canada Post: Chair of OHSCO
c/o Branch Secretary
Best Practices Branch
Prevention Division
11th Floor, WSIB
200 Front Street W.
Toronto, ON, M5V 3J1

By Email: prevention@wsib.on.ca

Please put "MSD Prevention Guideline c/o Best Practices Branch" in the e-mail's subject field.

RESOURCE MANUAL