

An Ergonomics Guide for Hospital Laundries



O H S A H
Occupational Health
and Safety Agency
for Healthcare in BC

About OHSAH

The Occupational Health and Safety Agency for Healthcare in BC (OHSAH), initiated in an Accord between healthcare employers and union representatives, was incorporated on July 5, 1999. OHSAH's board of directors consists of representatives from employer and union organizations, including:

- Health Employers Association of BC (HEABC)
- Hospital Employees' Union (HEU)
- Health Sciences Association of British Columbia (HSA)
- British Columbia Nurses' Union (BCNU)
- BC Government and Service Employees' Union (BCGEU)

Our mission

OHSAH's mission is to:

- work with all members of the healthcare community to develop guidelines and programs designed to promote better health and safety practices and safe early return to work
- promote pilot programs and facilitate the sharing of best practices
- develop new measures to assess the effectiveness of health and safety programs and innovations in healthcare

For more information, contact:

Occupational Health and Safety Agency for Healthcare in BC (OHSAH)

301 – 1195 West Broadway

Vancouver, BC V6H 3X5

Tel: (604) 775-4034

1 800 359-6612, toll-free

Fax: (604) 775-4031

Web: www.ohsah.bc.ca



An Ergonomics Guide for Hospital Laundries





© 2003 Occupational Health and Safety Agency for Healthcare in British Columbia (OHSAH). All rights reserved. OHSAH encourages the copying, reproduction, and distribution of sections of this document to promote musculoskeletal injury prevention in hospital laundries, provided that OHSAH is acknowledged. However, no part of this publication may be copied, reproduced, or distributed for profit or other commercial enterprise, nor may any part be incorporated into any other publication, without written permission of OHSAH.

2003 edition

National Library of Canada Cataloguing in Publication Data

Main entry under title:

An ergonomics guide for hospital laundries. — 2003 ed.—

Irregular.

Includes bibliographical references: p.

ISSN 1705-3293 = Ergonomics guide for hospital laundries

1. Hospital laundries — Safety measures. 2. Hospital laundries — British Columbia — Safety measures. 3. Laundry industry — Safety measures. I. Occupational Health and Safety Agency for Healthcare in British Columbia.

RA975.5.L3E73

363.11'96481

C2003-960016-5



Acknowledgments

OHSAH is grateful to everyone who contributed to the development of *An Ergonomics Guide for Hospital Laundries* through focus-group meetings or through other input, feedback, and recommendations.

BC handbook review participants

- BC Healthcare MSIP Advisors Group
 - Peter Bamford Director, Workplace Health and Safety, Northern Health Authority
 - Clemens Braun MSIP Program Advisor, Providence Health Care
 - Darren Buckler Regional Safety Officer, Vancouver Island Health Authority
 - Michael Colussi Manager, Occupational Health and Safety Services, Vancouver Island Health Authority
 - Linda Gould Regional Safety Officer, Vancouver Island Health Authority
 - Stacy Grant Workplace Health and Safety Advisor, Interior Health Authority
 - Bruce Hendry Manager, Regional Laundry, Victoria General Hospital
 - Stephanie Hennessy Director, Occupational Health and Safety Services, Providence Health Care
 - Industry Services
Department Prevention Division, Workers' Compensation Board of BC
 - Ken Kamsteeg Regional Safety Officer, Vancouver Island Health Authority
 - Brian Kossey Safety and Ergonomic Advisor, Vancouver Island Health Authority
 - Judi Murakami Regional Safety Officer, Vancouver Island Health Authority
 - Barb Purdy MSIP Program Advisor, Northern Health Authority
 - Ana Rahmat Health and Safety Advisory Committee, Hospital Employees' Union
 - Dan Robinson Robinson Ergonomics Inc.
 - Lance Stone Workplace Health and Safety Advisor, Interior Health Authority
 - Heather Straight MSIP Program Advisor, Vancouver Coastal Health Authority
 - Carole Taylor Director, Workplace Health and Safety, Interior Health Authority
 - VGH MSIP Team Vancouver General Hospital
 - Judy Village Ergonomist, Judy Village and Associates, UBC
 - Lisa Wherry Workplace Health and Safety Advisor, Interior Health Authority
 - Natasha White MSIP Advisor, BC Children and Women's Health Centre
- 



Special thanks

- Eagle Park Health Care Facility, Qualicum
- Pleasant View Care Home, Mission
- Royal Arch Masonic Home, Vancouver
- Campbell River Hospital, Campbell River
- St. Joseph's General Hospital, Comox
- St. Paul's Hospital, Vancouver
- Menno Hospital, Abbotsford
- Cedarview Lodge, North Vancouver
- Kiwanis Care Centre, North Vancouver
- Lions Gate Hospital, North Vancouver
- Nanaimo Regional General Hospital, Nanaimo

Thanks also to the Workers' Compensation Board of BC for permission to use source material from WCB publications.

OHSAH contributors

- Chris Engst Ergonomics Program Manager
- Aaron Miller Ergonomics Project Coordinator
- Rick Hall Ergonomist
- Annalee Yassi Executive Director



Who should read this guide

An Ergonomics Guide for Hospital Laundries is for anyone who needs practical information on how to make a hospital laundry room a safer place to work. This guide will help you work through the ergonomics process, detecting MSI risks and implementing effective control measures to prevent injury in your hospital laundry facility.

Many of the recommendations in this guide have been developed and implemented successfully in collaboration with laundry workers. You can photocopy and use material from the appendices (checklists, tools, and templates) as working copies at your facility.

Laundry statistics

- In 1999, back injuries resulting from overexertion accounted for more than 60% of all Workers' Compensation Board (WCB) claims in BC.
- From 1995 to 1999, the WCB paid out \$3,666,260 for laundry-specific healthcare claims.
- From 1995 to 1999, laundry workers had 577 disability claims of strains or tendinitis-related injury. Of those claims, 491 were caused by overexertion, repetitive motions, and awkward postures.



What's inside

This guide is divided into five parts:

Part 1: Introduction summarizes key points and defines a few terms.

Part 2: Musculoskeletal Injury (MSI) provides information on MSI, including common signs and symptoms, stages, risk factors, and how to determine if there is a risk of MSI in your laundry department.

Part 3: General Laundry Controls describes laundry controls for general risk factors, including force, repetition, awkward postures, static postures, and contact stress.

Part 4: Controls for Specific Laundry Tasks describes risk factors and controls for specific laundry tasks. It includes sections on laundry bins, laundry bags, sorting dirty laundry, washing and drying, folding laundry, laundry carts, storage shelves, laundry chutes, bagless laundry systems, and environmental hazards.

Part 5: Implementation and Evaluation provides information on implementing and evaluating a successful MSI program in your laundry department.

This guide also contains **Appendices**, including a signs and symptoms survey, a risk factor identification checklist, a summary of WCB ergonomics requirements, an implementation guideline, a stretching routine, and a reference list.

The information in this guide is based on:

- ergonomics risk assessments done in laundry facilities throughout BC
- published material from other occupational health and safety agencies
- peer-reviewed literature



Contents

Who should read this guide v
 What's inside vi

Part 1: Introduction

Key points 2
 Terms 3

Part 2: Musculoskeletal injury (MSI)

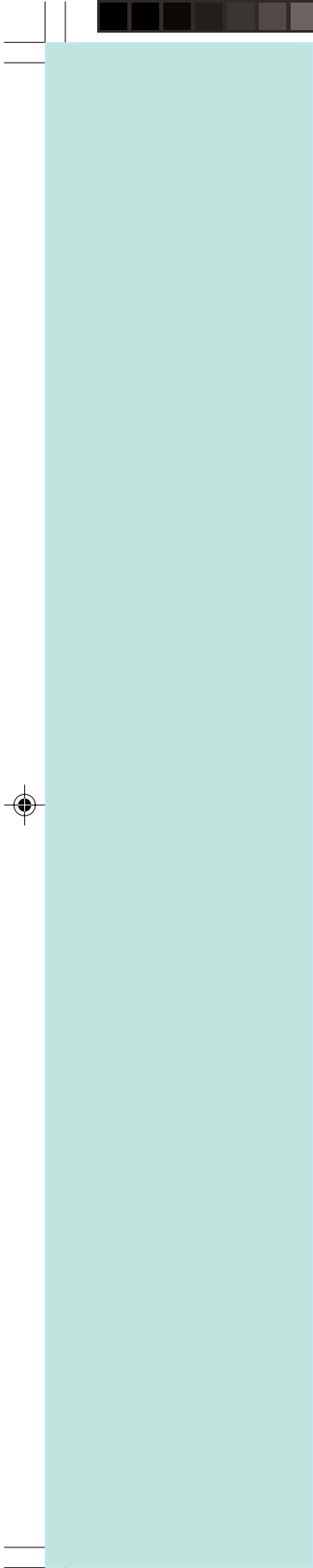
Common signs and symptoms of MSI 6
 Stages of MSI 7
 Understanding MSI risk factors 8
 Is there a risk of MSI in your laundry department? 10

Part 3: General laundry controls

Force 14
 Repetition 16
 Awkward postures 18
 Static postures 19
 Contact stress 20

Part 4: Controls for specific laundry tasks

Laundry bins 22
 Laundry bags 25
 Sorting dirty laundry 28
 Washing and drying 31
 Folding laundry 33
 Laundry carts 36
 Storage shelves 39
 Laundry chutes 40
 Bagless laundry systems 41
 Environmental hazards 42



Part 5: Implementation and evaluation

Implementation	46
Evaluation	47

Appendices

Appendix I: Signs and symptoms survey	50
Appendix II: Risk factor identification checklist	51
Appendix III: WCB ergonomic requirements	53
Appendix IV: Implementation guideline	56
Appendix V: Stretching routine	58
Appendix VI: References	59





Introduction

1

This part includes the following sections:

- Key points
- Terms





Key points

Here is a summary of the key points that are covered in more detail throughout this guide:

- *Ergonomics* is designing jobs to fit workers to minimize the risk of injury.
- Basic ergonomics risk factors include force, repetition, awkward postures, static postures, contact stress, and long duration.
- *Musculoskeletal injury (MSI)* includes injuries or disorders of the muscles, tendons, ligaments, joints, nerves, blood vessels or related soft tissue, including sprains, strains or inflammation that may be caused or aggravated by work.
- Common signs and symptoms of MSI include redness, swelling, pain, tenderness, tingling, weakness, and clumsiness.
- Risk factors may be present in a number of different tasks, including:
 - ~ picking up dirty laundry
 - ~ sorting laundry
 - ~ inserting and removing laundry from washers and dryers
 - ~ folding laundry
 - ~ delivering clean laundry
- It is important to identify high-risk tasks and the risk factors associated with those tasks.
- Identifying problems and solutions is half of the process; implementing solutions is the other half.
- Reduce as many of the risk factors within a task as possible.
- Solutions can be simple and inexpensive; they do not have to be elaborate or costly.
- Consider a solution's effects on other risk factors and other parts of the body.
- Evaluation and worker consultation is important to ensure that implemented control measures work and have a positive impact on laundry department workers.



Terms

Ergonomics

Ergonomics is the science that plans and designs tasks to fit workers. Ergonomics deals with human characteristics, expectations, and behaviours in the design of the tasks people use in their work and everyday lives.

Ergonomics risk factors

Workstations, work areas, tools, and machines and appliances are often designed without considering the people who will be using them. This can lead to problems such as improper work surface heights, awkward working postures, and poorly fitting tool handles. Such problems are termed *ergonomics risk factors* because they can cause injury.

Musculoskeletal injury (MSI)

The Occupational Health and Safety Regulation defines *musculoskeletal injury (MSI)* as “an injury or disorder of the muscles, tendons, ligaments, joints, nerves, blood vessels or related soft tissue including a sprain, strain and inflammation, that may be caused or aggravated by work.” Work-related MSIs can make normal work routines uncomfortable and even painful. This can lead to stress or dissatisfaction at work, reduced productivity, the inability to perform some or all work duties, and even difficulty with activities at home.

Laundry work generally involves pushing, pulling, folding, lifting, and carrying materials (manual materials handling) and can result in short-term or long-term injuries.



Short-term injuries

Short-term injuries are injuries that occur suddenly. Examples of incidents that could cause short-term injuries include:

- falling in a laundry room while carrying a heavy bag of laundry
- accidentally hitting an elbow on a washer door when pulling out wet laundry

Long-term injuries

Long-term injuries are injuries that usually develop gradually. Examples of long-term injuries include:

- chronic back pain resulting from manual materials handling
- shoulder tendinitis resulting from continual repetitive use

The worst-case scenario is an injury that leaves the worker unable to perform his or her everyday duties and tasks, both at the workplace and elsewhere.



Musculoskeletal injury (MSI)

2

This part provides information on musculoskeletal injuries (MSIs). It includes the following sections:

- Common signs and symptoms of MSI
- Stages of MSI
- Understanding MSI risk factors
- Is there a risk of MSI in your laundry department?

Common signs and symptoms of MSI

Knowing the common signs and symptoms of MSI can help prevent injuries. *Signs* are things you can see, such as swelling or redness. *Symptoms* are things you can feel but cannot see, such as numbness, tingling, or pain.

Table 2.1 Typical MSI signs

Sign	Description or observation
Redness	Does the skin look red?
Swelling	Does the area look swollen?
Loss of full, normal joint movement	Can you move the joint as you normally would? Your normal full range of motion may result in discomfort or pain. For example, rotate your shoulder in a circular motion. Do you think you would be able to do this if you had a shoulder injury?

Table 2.2 Typical MSI symptoms

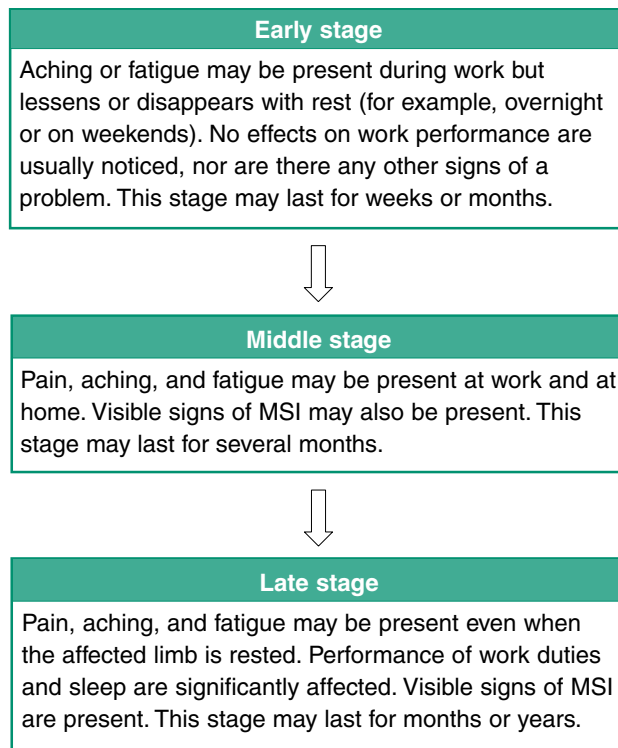
Symptom	Description or observation
Pain (shooting, dull, or sharp)	Pain, the most common feeling, may be present or may occur when you try to use the injured body part.
Tenderness	Is the area painful or sensitive to touch?
Heat or burning	The injured area may feel warmer than normal. You may feel a burning sensation.
Tingling, pins and needles, or numbness	You may feel a tingling sensation along the injured area. You may also lose feeling at or around the injured area.
Heaviness	Sometimes it feels as if the injured body part weighs more than normal.
Clumsiness or weakness	Are you dropping items frequently? Do you find it difficult to grasp or hold onto objects? Is it hard to hold onto things that are normally easy for you?



Stages of MSI

Recognizing the signs and symptoms of a developing MSI is a key step in preventing injury. MSI signs and symptoms tend to follow the stages described in Table 2.3.

Table 2.3 Stages of MSI



Remember:
Early detection and reporting is crucial.

Some MSIs can progress from early to late stages within a week. If you feel early signs and symptoms of MSI, you must fill out an injury or incident report form and report your injury to your supervisor immediately. For a signs and symptoms survey, see Appendix I.



Understanding MSI risk factors

Power grips vs. pinch grips

A power grip involves the entire hand. A pinch grip uses the fingertips only. A power grip provides more force and requires less effort. For illustrations of a power grip and a pinch grip, see page 33.

Understanding risk factors and identifying where they might occur can help prevent MSI. It is important to consider how often you are exposed to a strenuous task and the duration of each exposure. If a task presents more than one risk factor, the risk level increases greatly. This section describes the following risk factors:

- force
- repetition
- awkward postures
- static postures
- contact stress
- long duration

Part 3 describes general controls for each of these risk factors (except long duration).

Force

Physical effort that places a high load on the muscles, tendons, ligaments, and joints increases the body's energy demands and the possibility of injury. For example, lifting heavy laundry bags requires forceful exertion, especially if the laundry is wet and the bag is large.

Repetition

Repetitive tasks are tasks that use the same muscle groups repeatedly for more than three hours total per shift. Muscles and tendons do not have enough time to rest, which leads to fatigue and possibly muscle damage. For example, folding laundry can be a repetitive task when performed continuously with little or inadequate rest.



Awkward postures

Awkward postures occur when the body has to work in a position that is not “natural.” For example, placing linen on high overhead shelves places the shoulders in an awkward posture.

Static postures

Static postures are body positions held without movement for more than 20 seconds. Muscles tire quickly in static postures because blood flow is restricted. For example, leaning over a low folding table puts the low back in a static bent position.

Contact stress

Contact stress occurs when body parts come into contact with hard or sharp objects. Contact stress can result in injury to nerves and tissues beneath the skin. For example, leaning against folding tables can cause contact stress on the upper thighs and kneeling can cause contact stress on the knees.

Long duration

Continuous work is a risk because the muscles do not have time to rest. A long duration of exposure to a risk factor increases the risk of injury.



Is there a risk of MSI in your laundry department?

Follow this seven-step ergonomics process to prevent MSI risks in your laundry department.

Step 1. Consultation

Consult with your joint health and safety committee or worker health and safety representative during each step of your MSI prevention program.

Step 2. Education

Educate workers about risk factors, MSI signs and symptoms, and potential health effects.

Step 3. Risk identification

Identify the tasks that pose a risk of MSI and identify the risk factors associated with those tasks.

Step 4. Risk assessment

Assess risk factors identified in Step 3 to determine the degree of risk to workers. Consult with affected workers and a representative sample of other workers who perform similar tasks.

Step 5. Risk control

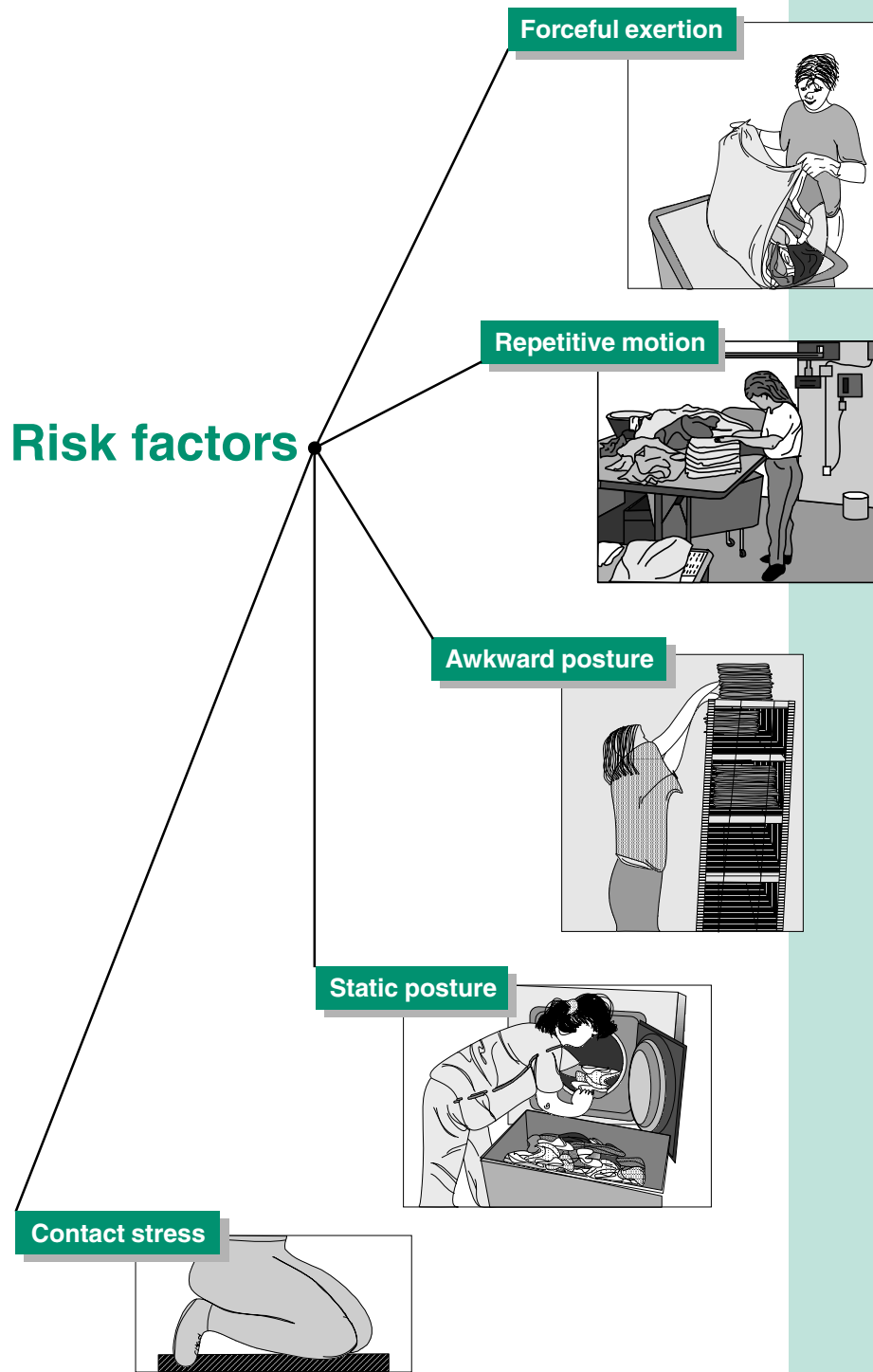
Implement control measures to eliminate or minimize the risk factors.

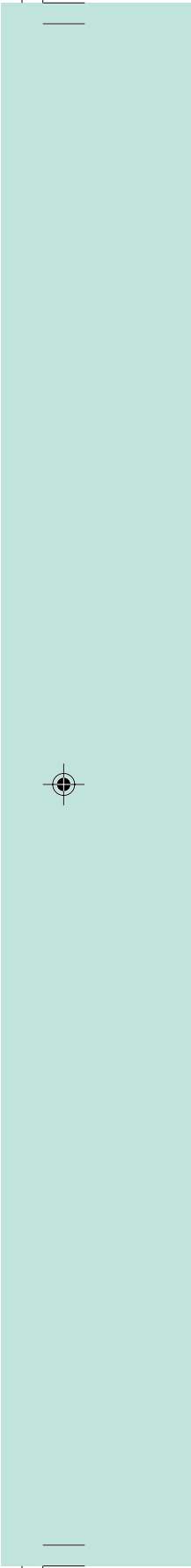
Step 6. Training

Once control measures are in place, train workers to use the control measures to make their jobs safer.

Step 7. Evaluation

Evaluate control measures at least once a year to determine their effectiveness at minimizing the risk of MSI.







General laundry controls

3

This part provides information on MSI controls for your laundry department. It includes the following sections:

- Force
- Repetition
- Awkward postures
- Static postures
- Contact stress



Force

Good body mechanics can help lessen the force necessary to carry out tasks, which will reduce the risk of MSI.

Lifting, lowering, and carrying loads

Consider the following recommendations for lifting, lowering, and carrying loads:

- Before lifting, test the load to determine if it is light enough to lift.
- Plan your route before lifting and carrying the load.
- Keep your arms and the load as close to your body as possible.
- Avoid tasks below mid-thigh height and above shoulder height. Instead, use a mechanical lift or lower a shelf.
- Instead of carrying one heavy load, separate it into smaller, lighter packages and make multiple trips or use a cart or trolley.
- When handling a heavy or unbalanced load, stand rather than sit.
- Hold the load with a firm power grip.
- Tighten your stomach and trunk muscles and breathe out as you lift.
- Bend with your knees and let your legs and hips do most of the work. Do not arch your back.
- Work with your feet shoulder width apart to widen your stance.
- Point your toes in the direction you are reaching to avoid twisting.



Pushing and pulling

Consider the following recommendations for pushing and pulling:

- Ensure that handles are between waist and shoulder height.
- Keep your upper arms against your rib cage with your elbows in. Keep your hands at or slightly above waist level. Keep your feet shoulder width apart.
- Take small steps when turning corners to avoid twisting your back.
- Make two smaller, lighter trips rather than one large, heavy trip.
- Bend your knees and move the load by shifting your weight. For example, with one leg in front of the other, bend your knees and move the load by shifting your weight from your back leg to your front.
- Ensure that good visibility is possible without awkward motions such as twisting or stretching. If your vision is blocked when pushing from the back, move to the front corner of the cart to push.
- Push whenever possible. Pushing is generally safer than pulling.



Repetition

Minimizing repetitive motions will help reduce the risk of MSI. Consider the following recommendations:

- Use mechanical or automated devices (for example, folding machines) to assist with highly repetitive tasks.
- Alternate working positions to avoid overusing any single muscle or group of muscles.
- Combine or eliminate tasks to decrease the number of times laundry is handled.

Other prevention methods include job rotation, stretching, and rest breaks and micro-pauses.

Job rotation

In laundry rooms the same body parts are used for many tasks. Rotating workers through different tasks or duties helps vary postures, reduce exposure to stressful tasks, and prevent boredom. Consider the following job-rotation recommendations:

- Vary different tasks such as folding, delivery, pickup, and sorting throughout the day.
- Alternate between standing and sitting-standing positions (using sit-stand stools).

Stretching

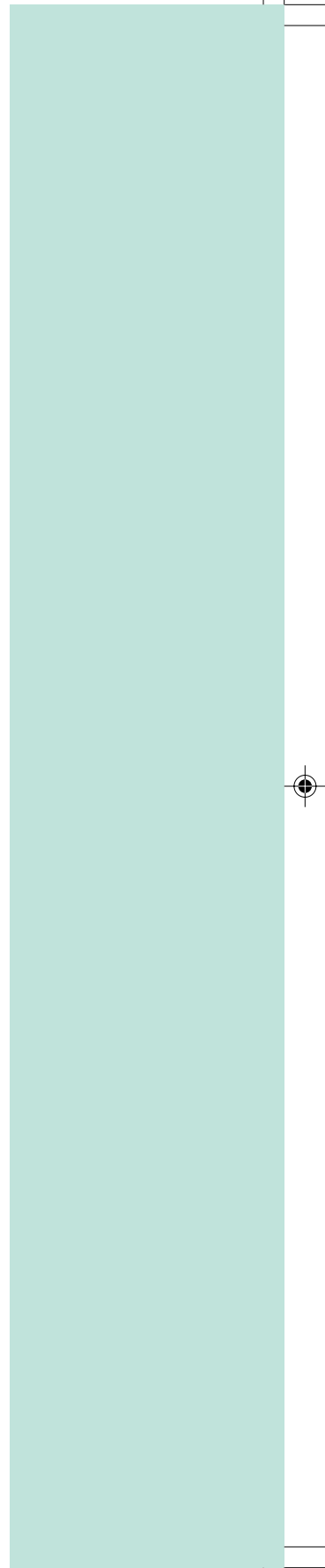
Stretching circulates blood through the muscles, develops flexibility, and increases body awareness. For a stretching routine, see Appendix V or look for the OHSAH stretching poster, which should be displayed in your department. Consider the following stretching recommendations:

- Before beginning a stretching routine, consult with a physiotherapist, occupational therapist, or qualified personal trainer.
- Stretch for 5–10 minutes before starting work to warm up your muscles.
- Hold each stretch for 30 seconds without bouncing.



Rest breaks and micro-pauses

Take rest or pause breaks to prevent fatigue and to give your muscles a chance to recover. Take frequent micro-pauses of 10–15 seconds. During micro-pauses, change your posture and stretch briefly. A micro-pause stretch is shorter in duration than a normal stretch but is still beneficial.





Awkward postures

Good body mechanics can help minimize awkward postures, which will reduce the risk of MSI. Consider the following recommendations to minimize awkward postures:

- Move your body closer to the object or move the object closer to you.
- Keep your elbows as close to your body as possible.
- If the work area is too high, lower the work area or stand on a platform, footstool, or ladder (as long as it does not create a tripping or falling hazard).
- Sit on a stool or chair rather than squatting, kneeling, or bending over while you work.



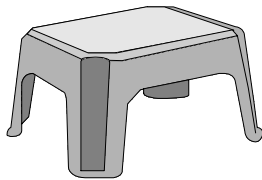
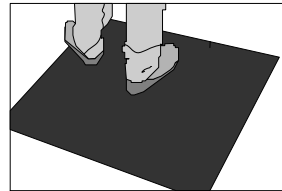


Static postures

Reducing the stress associated with static postures can help reduce the risk of MSI.

Anti-fatigue matting

Anti-fatigue matting provides a softer surface to stand on. Place anti-fatigue matting in areas where workers stand for long periods, such as at folding stations.



Footstools

Footstools or footbars allow workers to raise one foot up, which helps shift body weight and provides partial relief from lower-body stress that may result from standing. It is beneficial to vary your postures often.



Contact stress

Consider the following recommendations to minimize contact stress:

- Add padding to sharp edges or metal edges (for example, on carts and bins without handles) to reduce contact stress on your hands.
- Use protective equipment such as padded gloves or knee pads.
- Avoid leaning against sharp edges or metal edges.



Controls for specific laundry tasks

4

This part describes potential issues and solutions that may be applicable to your laundry department. Choose the solutions that best fit your facility's needs. A risk factor identification checklist is included in Appendix II to help determine which areas of your laundry department pose a risk of MSI. This part includes the following sections:

- Laundry bins
- Laundry bags
- Sorting dirty laundry
- Washing and drying
- Folding laundry
- Laundry carts
- Storage shelves
- Laundry chutes
- Bagless laundry systems
- Environmental hazards



Laundry bins

Laundry bins are used to transport laundry into and out of the laundry room and inside the laundry room itself.

Risk factors

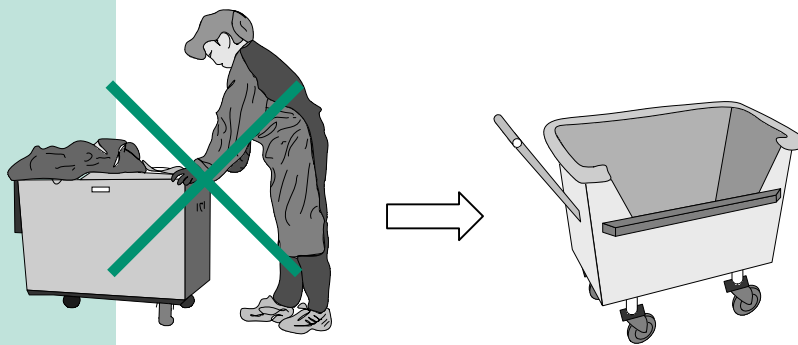
- awkward trunk postures to push bins
- forceful pushing, pulling, and manoeuvring
- awkward trunk postures to lift laundry out of bins
- forceful gripping and pulling to lift laundry out of bins

Controls

Modified bins

- Lower one side of the bin to reduce awkward bending when pulling out laundry.
- Smooth the plastic edges of the bin to decrease contact stress.
- Attach a handle to the rear of the bin to allow for easier pushing.
- Use large castors and wheels to raise the bin height and make pushing easier.

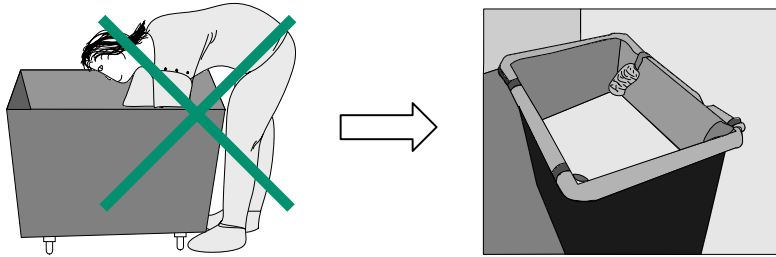
Tip:
The lighter the bin, the less force required to push.





Spring-loaded bottoms

Insert spring-loaded bottoms into regular plastic bins to force laundry upward as the amount of laundry decreases. This reduces bending at the waist.



Tip:

Buy the spring loader to fit the bin. Cover it with a sheet so laundry cannot get caught in it. Do not forget to clean the sheet on a regular basis.

False bottoms

False-bottomed bins are less expensive than spring-loaded bins and serve the same purpose: to reduce bending at the waist. Unlike spring-loaded bottoms, however, false bottoms limit the amount of laundry that can be loaded into the bin because they raise the bottom of the bin. (See the illustration of a false-bottomed basket at the bottom of 25.)

Regular wheel and castor maintenance

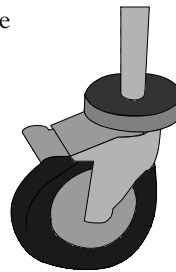
Regular maintenance includes cleaning and lubricating. Ensure that wheels and castors are cleaned regularly. Wheels and castors can get dirty and start to stick, making pushing and steering difficult.

Castors can have two types of bearings:

- Sealed precision ball bearings roll easily and require little maintenance.
- Roller bearings are common but require regular lubricating.

Harder or softer wheels are available:

- Harder wheels (for example, nylon) roll easily on hard, smooth surfaces but are more difficult to roll over floor cracks or elevator gaps.
- Softer wheels (for example, rubber or polyurethane) roll more easily on rough surfaces but are harder to push on hard, smooth surfaces.



Tip:

Tag equipment that does not work “Out of service” and report it immediately to your supervisor or maintenance person. Such equipment should be repaired before being used again.



Tip:

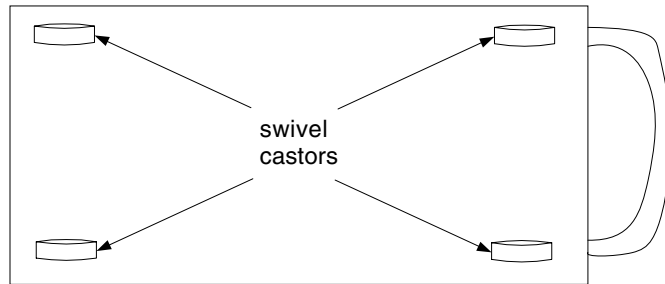
If possible, fit carts with three swivel castors and one lockable directional castor. Lock the directional castor for long-distance pushing and unlock it in tighter areas. Purchase castors that are locked by foot rather than by hand.

Castor configurations

Laundry carts are typically long, narrow, and tall, making it difficult to steer them through hallways and around obstacles. Choose the best castor arrangement for your situation.

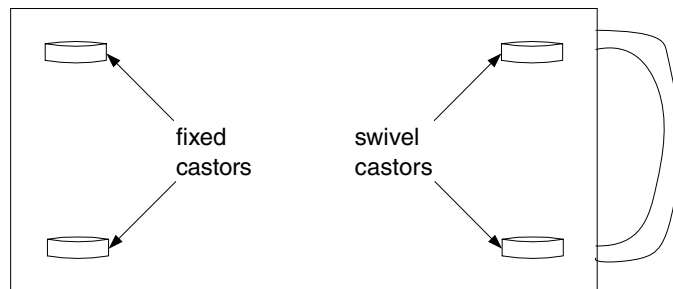
Busy or small spaces — Use four swivel castors

Swivel castors provide the most steering freedom and are best in busy or small spaces. Carts with four swivel castors, however, are not very good for long distances. They are more difficult to keep moving in a straight line and tend to swivel off in one direction if not held steady.



Long-distance pushing — Use two fixed castors and two swivel castors

A configuration of two fixed castors and two swivel castors is best for long distances because workers can push from behind and steer easily. However, these carts are not as easy to steer in busy or small spaces.





Laundry bags

Laundry bags are often overfull and heavy to lift, creating an even larger problem when lots of bags need to be transported at once.

Workers are encouraged not to overfill laundry bags but this does not solve some problems. For example, wet laundry is much heavier than dry laundry. A combination of strategies is necessary.



Risk factors

- forceful lifting and gripping of laundry bags
- awkward postures to carry and transfer bags

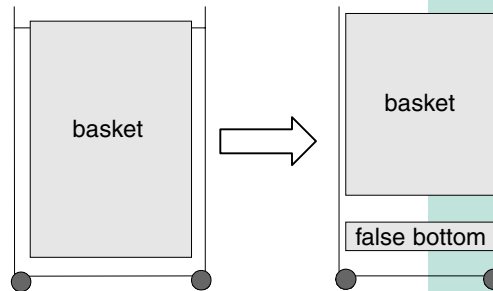
Controls

Smaller laundry bags

Use smaller laundry bags to limit the amount of laundry in each bag and decrease bag weight.

False bottoms in laundry baskets

Use false bottoms in laundry baskets to limit basket capacity. Bags will appear full to workers filling false-bottomed baskets, but when bags are removed the laundry will drop to the bottom of the bags, leaving the bags only partially full. The extra bag material at the top also allows for a stronger power grip when lifting.





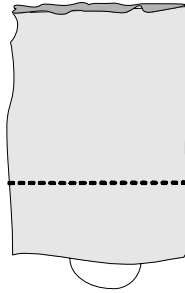
Tip:

Sew handles onto the bottom of bags to improve grip when dumping the contents. Do not add handles to bags that travel in laundry chutes — they might get caught in the chutes.

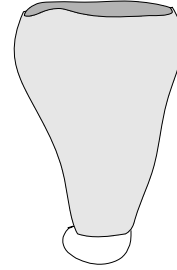
Modified laundry bags

Resize large laundry bags to reduce their weight when full.

Sew laundry bags shut one-third of the way from the bottom. The bag will look normal but hold one-third less laundry.



Sew laundry bags into a cone shape so they will hold less laundry.



Plastic bag system

Use plastic laundry bags that can be ripped open to sort the contents without lifting the bag. The plastic is then recycled.

Note: Plastic bags must still be handled and usually lifted to transfer them to sorting areas. This system also presents initial start-up costs.

Policies on overstuffing

Develop a written policy to restrict the amount of laundry in each bag. Workers and management should agree on a maximum load size or weight before the policy is written and enforced. Policies must be made available to and communicated to all workers and should be easily and clearly understood. Policies should also clarify the employer’s commitment to providing a healthy and safe workplace.

Ensure that it will be possible to implement the policy. For example, are there enough linen hampers and are they being emptied often enough?

Tip:

Develop reminder signs. Policies only work if workers remember them. Make “Do not overstuff” signs and place them on baskets in all housekeeping areas.



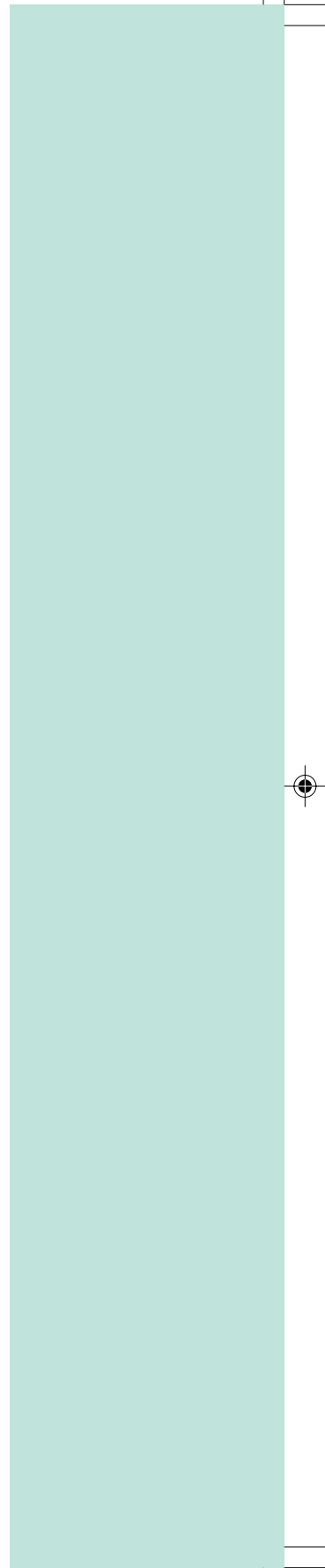
More frequent collection of dirty laundry

When dirty laundry flow is highest, collect the laundry more often.

Remember the following recommendations:

- Always use both hands when lifting filled laundry bags. If this is not feasible (for example, when leaning to grab a bag), use one arm to support your body by holding onto the bin and the other arm to lift the bag.
- Avoid lifting laundry off the ground whenever possible.
- Wear gloves that fit properly. For more information on gloves, see “Personal protective equipment,” on page 28.
- Take extra caution when lifting wet kitchen rags or wet soiled laundry. Wet laundry is much heavier than dry laundry.

For more information on safe body mechanics when lifting, see “Lifting, lowering, and carrying loads,” on page 14.





Sorting dirty laundry



Sorting large volumes of laundry can be physically demanding. Workers empty bags and then sort the laundry for washing.

Risk factors

- repetitive motions
- forceful gripping
- awkward trunk, shoulder, elbow, and wrist use
- prolonged standing in one spot



Controls

Personal protective equipment

Wear gloves to prevent infection. Ensure that gloves fit properly — your hands will get tired more quickly if the gloves are too large. Wear reusable gloves that will not puncture easily under disposable gloves.

Tip: If you are allergic to latex, refer to the Latex Search Database on the OHSAH Web site (www.ohsah.bc.ca) for more information on latex-free products.



Do not sort on the floor

Never sort laundry on the floor. This causes awkward bending and unnecessary lifting work. If this task is repeated, the risk of MSI increases even more.

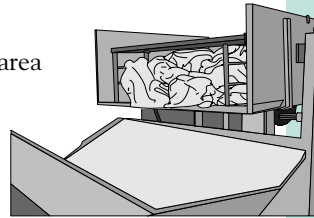


Sorting tables

Sort laundry on sorting tables. This prevents bending and lifting. Ensure that tables have a large enough working space and are cleaned regularly.

Mechanical dumpers

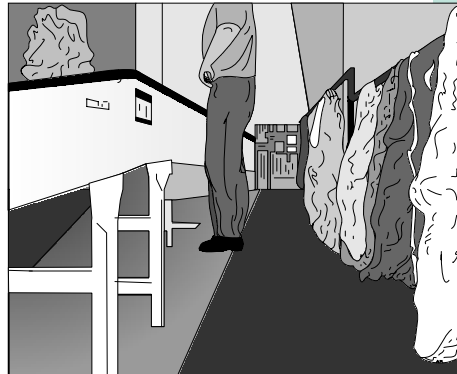
Use a mechanical dumper in the linen collection area to eliminate the need to lift and carry heavy linen bags. Situate the dumper at the start of the sorting belt to move laundry toward the washing and drying area.

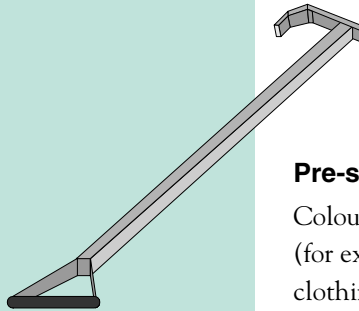


Sorting belts

Use sorting belts in larger-scale laundry departments that have heavy volumes of laundry. Follow these recommendations for sorting belts:

- Use a narrow sorting belt to minimize awkward postures.
- Ensure that the belt height is appropriate for workers.
- Ensure that the foot space under the belt allows workers to get close to the work area.
- Use anti-fatigue matting to minimize leg and back fatigue.
- Where there is more than one sorter, rotate workers to different jobs to prevent muscle fatigue.



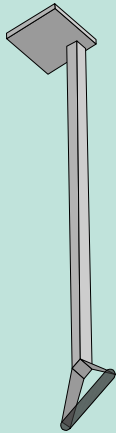


Laundry rakes

Use laundry rakes to move linens that are difficult to reach or hard to pull by hand.

Pre-sorting laundry

Colour code laundry at the end of the sorting belt or before it is washed (for example, use one coloured bag for bedding linens and another for clothing). From there, colour-coded bags can be put in bins or mechanical bags for transport to the washing and drying area. This cuts down on the need for sorting laundry in the laundry room. Many facilities are successfully using colour-coded bags.



Reduce the number of washing categories

Reduce the number of washing categories to minimize unnecessary sorting. (Laundry is sometimes separated into categories and then combined again in the same wash.) To do so, ensure that bins are close together and organized according to the distribution of laundry. Examine the number of laundry categories in your laundry to determine if they are all needed.

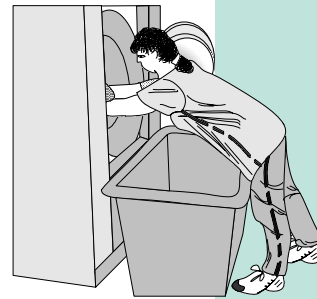




Washing and drying

Washers and dryers vary in size but generally take loads of up to 34 kg (75 lb.) Two or three pairs of washers and dryers are common in most small facilities. Workers manually load the laundry into machines, a physically demanding task because the machines often run for entire shifts.

Machines that are not raised off the floor often have openings lower than waist height. Loading and unloading usually involves reaching, bending, twisting, and pushing and pulling the laundry. Workers naturally place laundry bins directly in front of the open machine doors, which forces them to lean over bins or twist sideways to add or remove laundry.



Risk factors

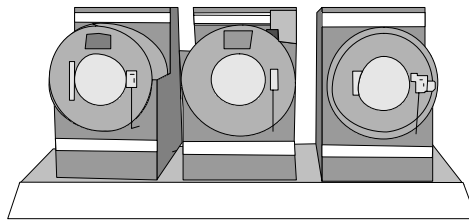
- awkward trunk and shoulder postures to access washers and dryers
- awkward trunk postures to reach over bins
- forceful gripping and effort to pull laundry out of machines



Controls — General

Raise machines off the floor

Raise machines off the floor so washer doors are higher, making loading and unloading easier. The washers in the illustration are on a riser that is 10 cm (4 in.) high.



Tip:

The bottom of machine doors should be at waist height for the shortest workers.

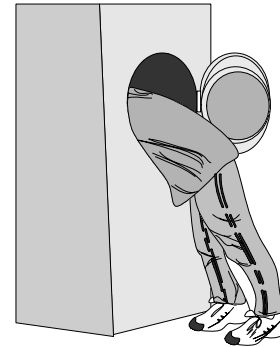


Place laundry bins to the side of the machine door

Place laundry bins a little to the side of washer or dryer doors so there is room to stand directly in front of the machines. This will prevent twisting the body and reaching or bending over laundry bins.

Controls — Deep machines

Washers and dryers can be deep, forcing workers to reach far into the machines. Ensure that laundry machines are no deeper than 69 cm (27 in.) to prevent awkward reaching and bending.



Remember the following recommendations:

- Stand directly in front of the machine, with the bin to one side.
- Turn using your feet (do not twist at the trunk or knees) to grab loads of laundry.

For more information on safe body mechanics, see “Lifting, lowering, and carrying loads,” on page 14.

Use specialized tools

Use tools such as laundry rakes to avoid excessive reaching for laundry that is deep in a machine and hard to reach.

Limit load sizes

Avoid overloading washers. The work required to untangle and pull out wet laundry increases with every piece of laundry added to a load. Use laundry bins that hold the same amount of laundry as the washing machine load size. This will make it easy to recognize that the size of the load cannot be more than the size of the bin.



Folding laundry

Folding laundry is demanding because it can take up a large part of a worker's shift, is highly repetitive, and can lead to awkward and static postures.



Risk factors

- repetitive motions
- awkward neck, shoulder, elbow, wrist, and low back postures
- forceful pinch grips
- long periods of standing on hard floors



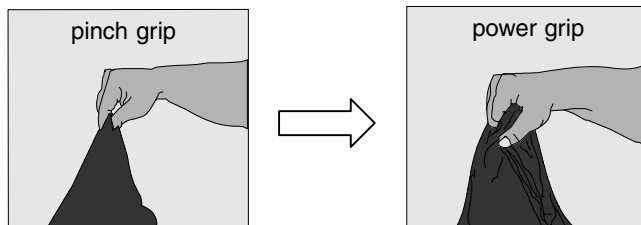
Controls

Decrease repetition

Use job rotation for laundry folding. Schedule laundry delivery to break up long periods of standing and folding. Workers should change the sizes of laundry pieces and the types of laundry they are folding (for example, switch from linens to towels) to provide some rest and variety in folding movements. For general recommendations for repetitive tasks, see "Repetition," on page 16.

Use power grips rather than pinch grips

Grasp the edges of laundry with your entire hand (a power grip) instead of just your fingers (a pinch grip). To do this, grasp larger portions of laundry pieces and bundle them up in your hand.



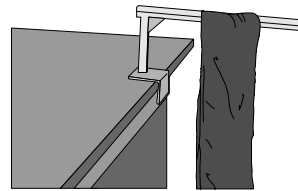


Adjustable folding tables

Set folding tables 5–15 cm (2–6 in.) below elbow height. Adjust folding tables for different worker heights. If the tables cannot be adjusted, raise them to fit tall workers and provide a safe raised platform for shorter workers. Another option is to have folding tables with adjustable sides. When opened, the adjustable sides increase the working area of the table and hold larger pieces of laundry, making the folding process much easier.

Folding arms

Use folding arms when folding sheets or other linens, instead of using your arm to hold the items while folding.

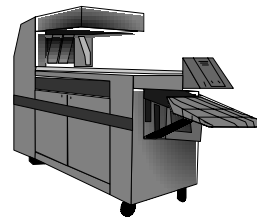


Tip: Folding large pieces

When folding large pieces of laundry, keep your arms lower to the ground and drape the bottom of the laundry piece into a clean laundry bin. Avoid holding laundry high in the air with your arms wide out. Chances are, no matter how high you hold the larger pieces, they will still be touching the ground.

Small-piece laundry folders

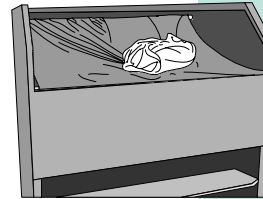
Use automated folding machines to reduce repetitive and awkward folding postures. The machines are programmed to automatically perform various folds and can be purchased in many different sizes. They do, however, take up floor space.





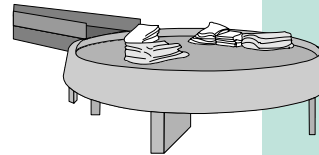
Roll-up carts

Use roll-up carts when folding laundry to keep the laundry higher and closer to the worker. Roll-up carts contain a sheet attached at the rear of the cart to a roller that is positioned slightly higher than the front of the cart. As the rear roller turns, the centre of the sheet raises and the load in the cart tilts forward so the linen resting on the sheet moves upward and forward.



Turntables

Use a turntable in the folding area to store folded linen that is being transferred from incoming conveyors before being loaded onto storage carts. Turntables allow for storage of more items than linear conveyors or sorting belts do.





Laundry carts

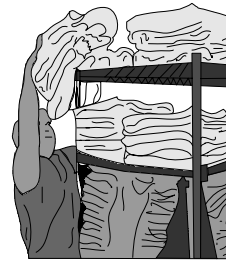
Laundry carts are used to transport clean laundry to departments throughout a facility. The number of carts and the size and style of carts can vary greatly.

Linen carts

Linen carts are usually large, tall, and heavy, making them difficult to push and steer. The high shelves also require awkward reaching.

Tip:

Fill up the middle shelves. The space between shelves is often more than enough for the amount of laundry placed on them. Lower high shelves that cannot be reached easily.



Personals carts

Personals carts are carts that are used to transport residents' clothing. They usually have a combination of shelves, hanger racks, and separate slots for each resident's laundry. Personals carts can be large, heavy, and difficult to push and steer. Workers are often forced to use awkward postures to access clothing.





Clothing racks

Clothing racks are used to hold hanging clothing in facilities where large quantities of clothing are kept on hangers. Clothing racks are often tall, to allow clothing to hang without touching the floor.

Risk factors

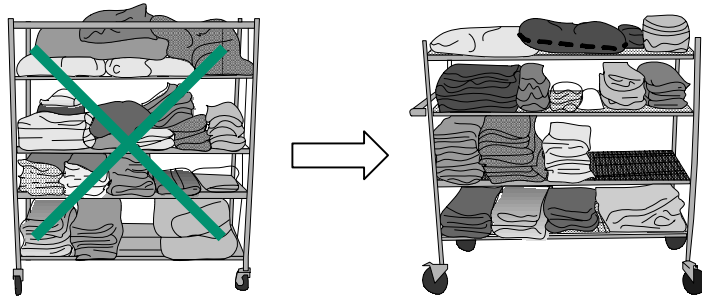
- forceful exertions when pushing or pulling carts
- limited visibility when carts are higher than eye level
- awkward reaching to hang clothes

Controls

Cart modifications

The following cart modifications will help reduce awkward postures, reduce pushing forces, and improve steering and pushing:

- Reduce the cart's height.
- Attach a handle to the rear.
- Use new castors.

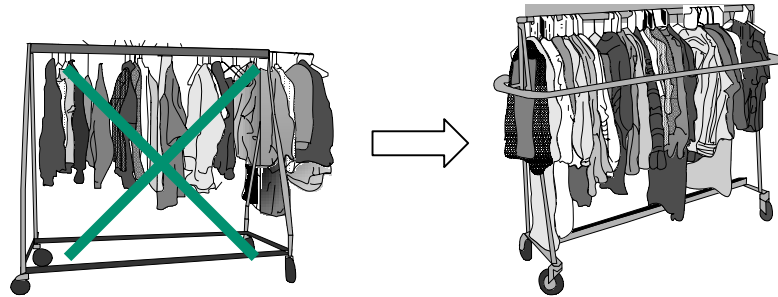


For information on wheel and castor maintenance for laundry carts, see “Regular wheel and castor maintenance,” on page 23.



Rack modifications

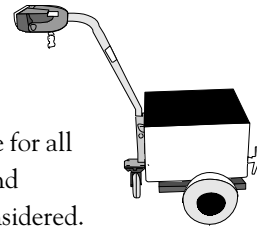
Lowering clothing racks and attaching a handle across the length of one side will reduce awkward reaching and provide workers with better steering control.



Motorized push-pullers

A motorized push-puller attaches to the front of a laundry cart and has a hand-operated control to pull the cart. Motorized push-pullers increase visibility because the worker can stand in front of the cart. They are an option in situations where heavy carts cannot be modified.

Note: Motorized push-pullers are not suitable for all facilities. They require extra hallway space and steering room, and purchase costs must be considered.





Storage shelves

Housekeeping storage shelves are designed for maximum storage capacity rather than ergonomics. Shelves are often too high to reach without using awkward postures.

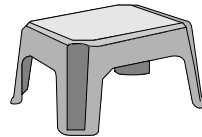


Risk factors

- awkward reaching up to high shelves
- awkward bending down to low shelves

Controls

- Place lighter and smaller items on higher shelves and frequently used items on middle shelves.
- Avoid using the highest and lowest shelves.
- Use footstools or stepladders to access high shelves in housekeeping storage rooms. Ensure that footstools and stepladders are sturdy and do not create a tripping hazard.





Laundry chutes

Some facilities use laundry chutes to move laundry to the basement. Large bins are usually placed at the bottom of the chutes to catch laundry bags, which workers then transfer to the laundry room. Laundry chutes are an easy way to move laundry from higher floors to laundry rooms.



Disadvantages

- Access doors to the chutes are sometimes difficult to open.
- Laundry bags often overflow the bins at the bottom of the chute.
- Chutes can create hygiene concerns because contaminated laundry contacts the chute walls.
- Bags can get caught inside chutes, causing congestion in the system and inconvenience.

Controls

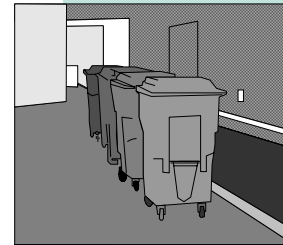
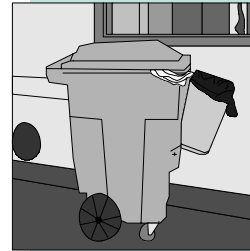
- Build access doors so they stay open for 1–3 seconds, or incorporate a magnetic holder, so workers can use both hands to insert bags. Note: This recommendation may not be feasible if fire regulations do not allow it.
- Fit rubber caps around access door edges to prevent scrapes and cuts.
- Lock bins in place underneath chutes to prevent them from moving.
- Do not use excessively large or tall bins.
- Check and empty bins regularly to prevent overflow.
- Ensure that when a chute door on one floor is open, other chute doors are not accessible at the same time.



Bagless laundry systems

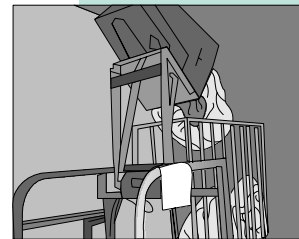
A regional hospital might go through 100,000–750,000 bags of laundry every year, with each bag weighing 7–16 kg (15–35 lb.). Bagless laundry systems lower the risk of injury by eliminating the need to lift and carry heavy linen bags.

Traditional linen laundry bags and chutes are replaced by *totes* (plastic garbage cans with lids and wheels) and mechanical dumpers. When laundry workers collect dirty laundry, they replace full totes with empty ones and push the full totes to the laundry department. Workers can connect totes like a train and move them using a motorized push-puller (see “Motorized push-pullers,” on page 38). A mechanical dumper is used to transfer laundry from totes to metal carts.



Implementation tips

- Keep in mind that totes, though taller, require roughly the same amount of floor space that linen bag holders do.
- Test the overall system and try the available tote sizes on one or two units before implementing the system throughout the facility. Totes come in three sizes: 35, 60, and 90 gal. (the 90-gal. tote is equivalent to approximately two and a half full cloth linen bags).
- Ensure that workers use proper techniques for pushing totes (for example, do not manually push or pull more than one tote at a time).
- Clean the totes periodically to prevent contamination and odour buildup. Purchase bins with drainage holes and plugs so that water will drain during cleaning.
- Use odour eliminators to absorb odours from soiled linen.
- Ensure that bins used in isolated rooms are adequately labelled or colour coded.
- Open lids before handling linen to prevent lid contamination.
- Ensure that ample room and minimum height clearance are available in a centralized laundry area for the dumper installation.





Environmental hazards

Loud noise

Washers and dryers in all types of facilities can be noisy, especially if they are not regularly maintained.

Controls

- Test noise levels to determine if workers need hearing protection.
- If necessary, ensure that workers use earplugs and earmuffs to protect their hearing.
- During noisy cycles, assign workers to tasks outside of the laundry room (for example, making laundry deliveries).

Heat stress

Laundry rooms can get uncomfortably hot in the summer. Many laundry departments are small and have little air movement other than the air coming through a hallway door and one or two windows.

Controls

Educate workers on the signs and symptoms of heat stress. Signs and symptoms of heat stress include:

- heavy sweating or dehydration
- nausea or dizziness
- headaches
- weakness or fatigue
- loss of coordination or impaired judgment

Workers should drink a large glass of water before entering a hot environment and drink a glass of water every 20 minutes that they work in the hot area. Workers should not wait until they feel thirsty before drinking; they may be dehydrated before they feel symptoms.



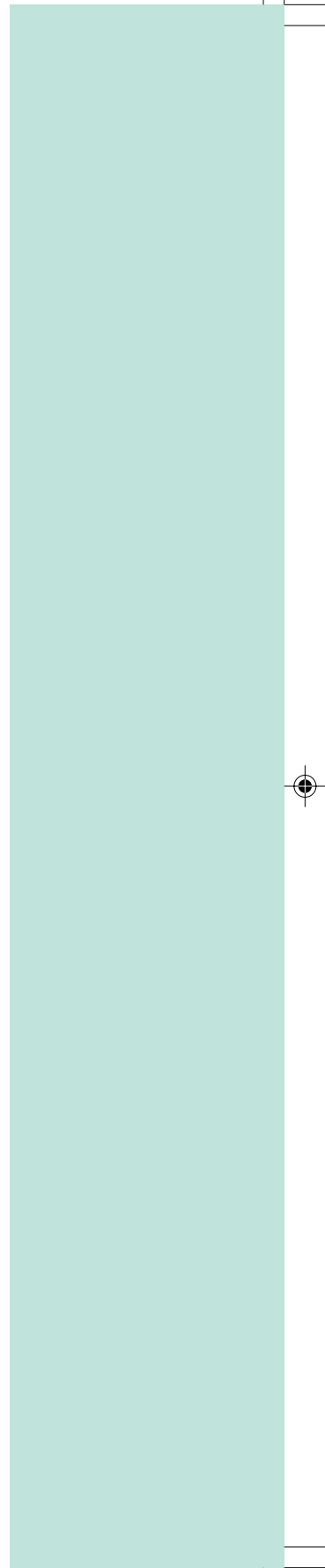
Use fans and open doors to improve airflow. Air conditioning allows workers to control the room temperature.

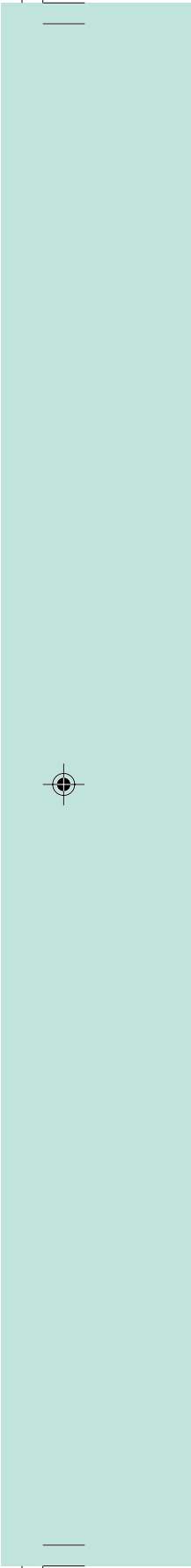
Static shocks

Static shocks can result from frequently handling laundry out of dryers. Static shocks can be painful and make laundry work uncomfortable to perform.

Controls

- Use anti-static matting to help eliminate static electricity. Anti-static mats plug into standard wall sockets and also incorporate anti-fatigue material.
- Place insulated rubber handles on metal racks to help prevent static shocks when handling laundry carts.







Implementation and evaluation

5

This part provides information on implementing and evaluating control measures in your laundry department. It includes the following sections:

- Implementation
- Evaluation



Implementation

After you have identified the potential risk factors and appropriate control measures for your laundry department, the next step is to implement those control measures. Implementation consists of two basic steps: creating a working group and completing an implementation guideline.

Create a working group

Create a working group to oversee the implementation process. Include the following individuals:

- management
- employees
- maintenance workers
- a safety professional (for example, an ergonomist, occupational health and safety consultant, MSI prevention coordinator, occupational therapist, or physiotherapist)

Complete an implementation guideline

Discuss the control-measure options and come to a consensus about which measures should be implemented. Write down all the control measures you want to implement (see the implementation guideline in Appendix IV). Include reasons for decisions, actual dates for implementation, and names of individuals who will oversee the implementation process.

Once your implementation guideline is finalized, give each working-group participant a copy. Post a copy in the laundry room for easy reference and check off control measures as they are implemented. If a recommendation is not in place by a specific deadline, you can be assured that at least one person will bring attention to it.

Tip:

To avoid roadblocks, involve everyone who will be affected by the control measures.



Evaluation

Evaluating the success of an implementation is important and can be done with minimal effort. Evaluations allow you to see what works and what does not. An evaluation consists of the following four steps.

Step 1. Determine what you are trying to evaluate

Has the risk of MSI decreased as a result of implemented controls?

Step 2. Evaluate if the risk of MSI has decreased

Use one or more of the following three tools to evaluate if the risk of MSI has decreased.

Tool 1: Signs and symptoms survey

A signs and symptoms survey (see Appendix I) helps determine if workers are currently experiencing signs and symptoms of MSI. Make copies and survey workers before implementing risk controls, then survey them again three months after the changes have been put in place. Signs and symptoms should decrease with the new control measures.

Tool 2: Interviews

Interviews allow for open discussion and can provide more information than surveys. Set up individual meetings with workers. Let workers know that you are evaluating the controls, not them.

Tool 3: Incident reports

Analyze incident report forms, going back 1–3 years before any changes were made, and again 1–3 years afterwards. How often did incidents occur in the past? Did they decrease after changes were made? Use this tool in combination with one of the other two tools. Workers may still have signs or symptoms even though few incidents are, or have been, reported.



Make MSI
reduction a
continuous,
ongoing practice.

Step 3. Compile your results

Keep your results and the ergonomics assessment for future reference.

Step 4. Understand the results

Determine whether your controls were helpful and if any new procedures or new equipment that was implemented is being used. If the new control measures were not effective, review the risks and develop new solutions. Gather the working group together immediately and try another control or modify the current controls.



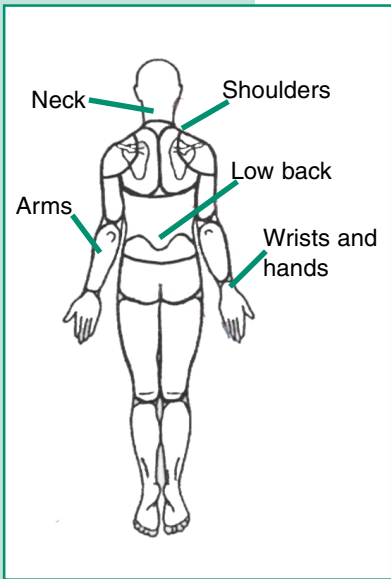
Appendices

This section provides additional information that will help you improve health and safety in your laundry department. It includes the following appendices:

- Appendix I: Signs and symptoms survey
- Appendix II: Risk factor identification checklist
- Appendix III: WCB ergonomics requirements
- Appendix IV: Implementation guideline
- Appendix V: Stretching routine
- Appendix VI: References



Appendix I: Signs and symptoms survey



Date: _____

Department: _____

Job or task: _____

Comments: _____

Thinking back over your last week of work, please rate your average level of discomfort for each of the following body parts. Circle a number on the scale from 0 to 5 to represent your discomfort for each body part. The number 0 represents no discomfort, while 5 represents extreme discomfort.

1. Neck

No discomfort 0 1 2 3 4 5 Extreme discomfort

2. Shoulders

No discomfort 0 1 2 3 4 5 Extreme discomfort

3. Low back

No discomfort 0 1 2 3 4 5 Extreme discomfort

4. Arms

No discomfort 0 1 2 3 4 5 Extreme discomfort

5. Wrists and hands

No discomfort 0 1 2 3 4 5 Extreme discomfort



Appendix II: Risk factor identification checklist

Use this checklist to identify potential risk factors for MSI in your laundry department. Before filling out the checklist, familiarize yourself with the tasks performed in the department. Checking “Yes” for items indicates that potential risk factors may be present.

Observer: _____

Date: _____

Potential risk factor	Yes	No	N/A
<i>Laundry bins</i>			
Do workers bend excessively at the trunk to push laundry bins?			
Do workers bend excessively at the trunk to reach laundry at the bottom of bins?			
Do workers push laundry bins over long distances (greater than 60 m [195 ft.]?)			
Do the bins have poor handles or are handles non-existent?			
Are the bins difficult to manoeuvre?			
Are the bins difficult to push?			
<i>Laundry bags</i>			
Are laundry bags heavy to lift (are they heavier than 11 kg [25 lb.]?)			
Are bags overstuffed on a regular basis?			
Do workers have difficulty removing laundry from bags?			
Do workers use awkward postures to lift and transfer bags?			
<i>Sorting dirty laundry</i>			
Are the gloves used to handle dirty laundry poor-fitting or non-existent?			
Do workers sort dirty laundry directly on the floor?			
Do workers use awkward trunk, shoulder, elbow, or wrist postures to sort laundry?			
Do workers use pinch grips to grasp laundry?			
Do workers sort laundry into many categories and then combine the categories later?			



Potential risk factor	Yes	No	N/A
<i>Washing and drying</i>			
Do workers bend excessively at the waist to load or unload washers and dryers?			
Do workers use forceful exertion to push laundry into machines?			
Do workers use forceful exertion to pull laundry out of machines?			
Do workers reach excessively into machines to remove laundry?			
Do workers reach over bins to access washers or dryers?			
<i>Folding laundry</i>			
Do workers fold laundry repetitively for more than three hours per shift?			
Do workers use awkward neck, shoulder, elbow, wrist, or low back postures to fold laundry?			
Do workers use pinch grips to hold laundry when folding?			
Is the folding table non-existent or at a poor working height? It should be 5–15 cm (2–6 in.) below elbow height.			
<i>Laundry carts</i>			
Do workers reach excessively to access high shelves on carts?			
Do workers bend excessively at the waist to access low shelves on carts?			
Do workers use awkward postures to push or pull carts?			
Are carts difficult to manoeuvre?			
Are carts difficult to push?			
Is visibility limited or reduced when operating carts?			
<i>Environmental hazards</i>			
Are workers required to stand continuously for more than three hours during a shift?			
Is the laundry room extremely noisy?			
Is the temperature in the laundry room extremely hot?			
Do workers experience frequent or painful static shocks?			
Do workers use the palms of their hands like hammers to open sticky handles on machines?			
Is the laundry room cluttered or overfilled with laundry carts and bins?			



Appendix III: WCB ergonomics requirements

Under the authority of the *Workers Compensation Act*, the WCB has adopted and implemented ergonomics requirements, detailed in the Occupational Health and Safety Regulation, Sections 4.46 to 4.53 (reprinted in this appendix). These requirements represent the minimum standards that must be complied with at workplaces that fall under WCB jurisdiction and within the scope of the *Act*.

Ergonomics (MSI) requirements

The purpose of sections 4.46 to 4.53 is to eliminate or, if that is not practicable, minimize the risk of musculoskeletal injury to workers.

Note: The WCB provides publications to assist with implementing the Ergonomics (MSI) Requirements. *Preventing Musculoskeletal Injury (MSI): A Guide for Employers and Joint Committees* provides a seven-step process to assist with the application of the ergonomics requirements along with procedures to investigate incidents of MSI and a table of common control measures. *Understanding the Risks of Musculoskeletal Injury (MSI)* is intended to help employers with the requirements of section 4.51(1) to educate workers in risk identification, signs and symptoms of MSI, and their potential health effects.

4.46 Definition

In sections 4.47 to 4.53 (the Ergonomics (MSI) Requirements)

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

4.47 Risk identification

The employer must identify factors in the workplace that may expose workers to a risk of musculoskeletal injury (MSI).



4.48 Risk assessment

When factors that may expose workers to a risk of MSI have been identified, the employer must ensure that the risk to workers is assessed.


4.49 Risk factors

The following factors must be considered, where applicable, in the identification and assessment of the risk of MSI:

- (a) the physical demands of work activities, including
 - (i) force required,
 - (ii) repetition,
 - (iii) duration,
 - (iv) work postures, and
 - (v) local contact stresses;
- (b) aspects of the layout and condition of the workplace or workstation, including
 - (i) working reaches,
 - (ii) working heights,
 - (iii) seating, and
 - (iv) floor surfaces;
- (c) the characteristics of objects handled, including
 - (i) size and shape,
 - (ii) load condition and weight distribution, and
 - (iii) container, tool and equipment handles;
- (d) the environmental conditions, including cold temperature;
- (e) the following characteristics of the organization of work:
 - (i) work-recovery cycles;
 - (ii) task variability;
 - (iii) work rate.

4.50 Risk control

- (1) The employer must eliminate or, if that is not practicable, minimize the risk of MSI to workers.

- 
- (2) Personal protective equipment may only be used as a substitute for engineering or administrative controls if it is used in circumstances in which those controls are not practicable.
 - (3) The employer must, without delay, implement interim control measures when the introduction of permanent control measures will be delayed.

4.51 Education and training

- (1) The employer must ensure that a worker who may be exposed to a risk of MSI is educated in risk identification related to the work, including the recognition of early signs and symptoms of MSIs and their potential health effects.
- (2) The employer must ensure that a worker to be assigned to work which requires specific measures to control the risk of MSI is trained in the use of those measures, including, where applicable, work procedures, mechanical aids and personal protective equipment.

4.52 Evaluation

- (1) The employer must monitor the effectiveness of the measures taken to comply with the Ergonomics (MSI) Requirements and ensure they are reviewed at least annually.
- (2) When the monitoring required by subsection (1) identifies deficiencies, they must be corrected without undue delay.

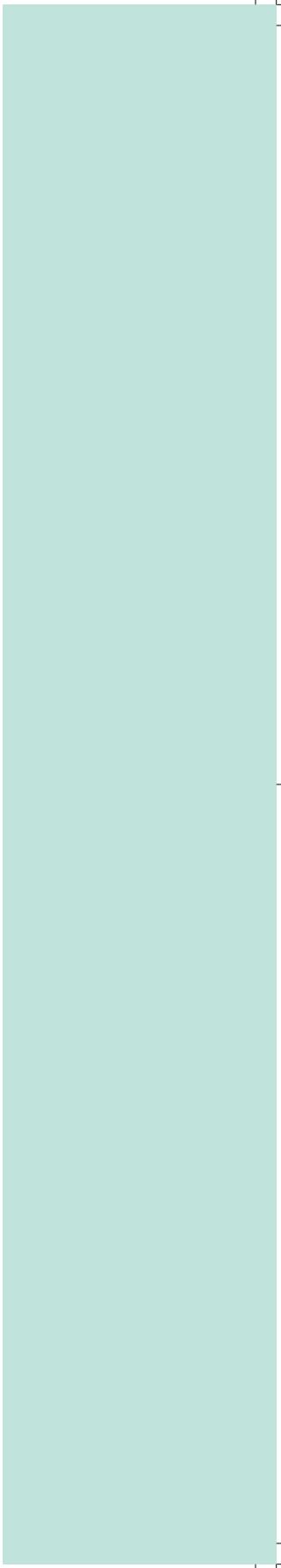
4.53 Consultation

- (1) The employer must consult with the joint committee or the worker health and safety representative, as applicable, with respect to the following when they are required by the Ergonomics (MSI) Requirements:
 - (a) risk identification, assessment and control;
 - (b) the content and provision of worker education and training;
 - (c) the evaluation of the compliance measures taken.
- (2) The employer must, when performing a risk assessment, consult with
 - (a) workers with signs or symptoms of MSI, and
 - (b) a representative sample of the workers who are required to carry out the work being assessed.



Who is responsible for implementing the controls?

Comments





Appendix V: Stretching routine

STRETCH IT OUT!

Hold each stretch for 15-20 seconds

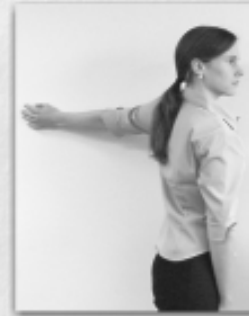
Regular stretching can help to reduce muscle tension and risk of injury. Perform each stretch slowly and without bouncing. If you feel pain, stop the stretch and consult your physician.



Side of Neck



Back of Neck



Chest



Shoulder



Triceps



Forearm & Wrist



Calf



Front of Thigh



Back of Thigh

Designed by Stephanie Parks



Appendix VI: References

- Barrie, D. 1994. How hospital linen and laundry services are provided. *Journal of Hospital Infection* 27 (3): 219–35.
- Battie, M. C., and S. J. Bigos. 1991. Industrial back pain complaints: A broader perspective. *Orthopedic Clinic North America* 22 (2): 273–82.
- Bergamasco, R., C. Girola, et al. 1998. Guidelines for designing jobs featuring repetitive tasks. *Ergonomics* 41 (9): 1364–83.
- Bernard, B. 1997. *Musculoskeletal disorders (MSDs) and workplace factors: A critical review of epidemiologic evidence for work-related musculoskeletal disorders of the neck, upper extremity, and low back*. Cincinnati: NIOSH Publication No. 97-141.
- Canadian Centre for Occupational Health and Safety. OSH answers: Ergonomics. <www.ccohs.ca/oshanswers/ergonomics/> (November 27, 2002).
- Chaffin, D. B., and G. B. Anderson. 1984. *Occupational biomechanics*. Toronto: John Wiley and Sons. 437.
- Chaffin, D. B., and J. A. Ashton-Miller. 1991. Biomechanical aspects of low-back pain in the older worker. *Experimental Aging Research* 17 (3): 177–87.
- De Looze, M. P., K. van Greuning, et al. 2000. Force direction and physical load in dynamic pushing and pulling. *Ergonomics* 43 (3): 377–90.
- Evanoff, B. A. *Ergonomic training for workers and supervisors*. St. Louis, MO: Washington University School of Medicine.
- Greico, A., G. Molteni, G. De Vito, and N. Sian. 1998. Epidemiology of musculoskeletal disorders due to biomechanical overload. *Ergonomics* 41 (9): 1253–60.



Health Care Health and Safety Association of Ontario (HCHSA). 1998. *Ergonomic guidelines for laundry workers, supervisors and managers*. Toronto: HCHSA 2.

Hoozemans, M. J., A. J. van der Beek, et al. 1998. Pushing and pulling in relation to musculoskeletal disorders: A review of risk factors. *Ergonomics* 41 (6): 757–81.

Johnson, G. 2001. Laundry totes take weight off workers. *WorkSafe Magazine* 2 (1): 16.

Lawson, J., and J. Potiki. 1994. Research report: Development of ergonomic guidelines for manually handled trolleys in the health industry. Unpublished.

Marras, W. S. 2000. Occupational low back disorder causation and control. *Ergonomics* 43 (7): 880–902.

Nemecek, J., and J. Buchberger. 1987. Occupational health-related organization of work in large laundry facilities. *Soz Praventivmed* 32 (4–5): 261–63.

Newlands, T. 2002. *The world without linen bags*. Nanaimo: Nanaimo Regional General Hospital.

Occupational Health and Safety Agency for Healthcare (OHSAH). 2001. *Musculoskeletal injury prevention program*. Vancouver: OHSAH.

Silverstein, B. A., L. J. Fine, and T. J. Armstrong. 1987. Occupational factors and carpal tunnel syndrome. *American Journal of Industrial Medicine* 11 (3): 343–58.

Snook, S. H., and V. M. Ciriello. 1991. The design of manual handling tasks: Revised tables for maximum acceptable weights and forces. *Ergonomics* 34 (9): 1197–1213.

Snook, S. H., D. R. Vaillancourt, V. M. Ciriello, and B. S. Webster. 1995. Psychophysical studies of repetitive wrist flexion and extension. *Ergonomics* 38 (7): 1488–1507.



- Village, J. 2001. *Evaluation of an ergonomic intervention at three hospital laundries*. North Vancouver: Judy Village and Associates.
- . 2001. *Minimizing musculoskeletal injuries in hospital workers*. North Vancouver: Judy Village and Associates.
- Wands, S. E., and A. Yassi. 1992. Let's talk back: A program to empower laundry workers. *American Journal of Industrial Medicine* 22 (5): 703–9.
- Wands, S. E., and A. Yassi. 1993. Modernization of a laundry processing plant: Is it really an improvement? *Applied Ergonomics* 24 (6): 387–96.
- Workers' Compensation Board (WCB) of BC. 1999. Occupational Health and Safety Regulation (BC Regulation 296/97, as amended by BC Regulation 185/99). Vancouver: WCB of BC. <www.healthandsafetycentre.org>.
- . 2000. *Health care industry: Focus report on occupational injury and disease*. Vancouver: WCB of BC.

