

Reference Guidelines for Safe Patient Handling

OHSAH



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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, with its Board of Directors consisting of top representatives from union and employer organizations.

OHSAH's Mission

- 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.
- To promote pilot programs and facilitate the sharing of best practices.
- To develop new measures to assess the effectiveness of programs and innovations in this area.

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INTRODUCTION

In 1998, the overall injury rate for workers in the BC healthcare industry was higher than the provincial average for all industries combined (7.4 vs. 4.8 time-loss claims accepted / 100 full-time workers). This resulted in a total of 376,500 days lost from work and a total claims cost of \$39.3 million in the healthcare sector alone. (Workers' Compensation Board of BC, Healthcare Industry Focus Report on Occupational Injury and Disease, 2000).

Between 1994 and 1998, overexertion in patient* handling (e.g. lifting and transferring) was the most common cause of injury, representing 38% of all claims. (see Figure i.1)

(*This text will use 'patient' as a generic term throughout the Guidelines when referring to *patient*, *resident*, or *client*.)

Figure 1. Accident types in the BC healthcare industry from 1994 to 1998.

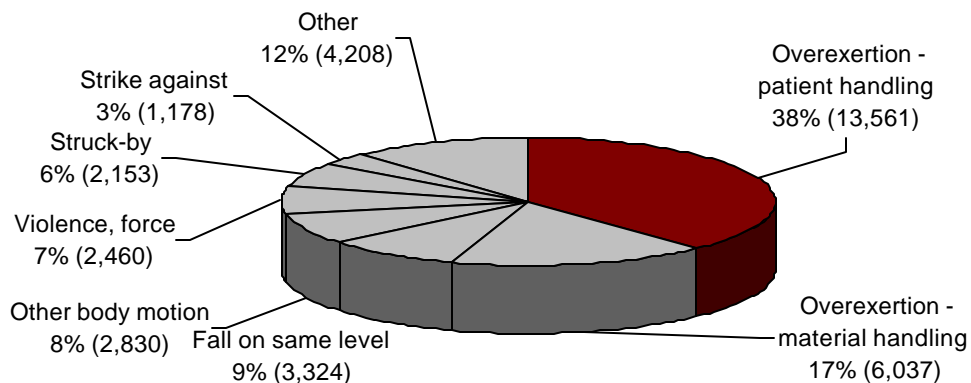


Chart from the Workers' Compensation Board of BC, Healthcare Industry Focus Report on Occupational Injury and Disease, 2000.

About the *Guidelines*

The *Reference Guidelines for Safe Patient Handling* have been developed, upon employer and worker request, as an aid to reduce the high rate of injury in the healthcare industry. The intent is to provide evidence-based guidelines on how to prevent MSIs while handling patients. Evidence-based recommendations for safe patient handling are provided. The techniques and recommendations were developed after thorough review of world knowledge and practical experience.

The *Guidelines* are intended to be used as a reference source for reviewing, enhancing or developing patient handling procedures. The contents reflect research information available at the time of writing. (OHSAH will endeavour to update them as new findings become available.) In addition, the *Guidelines* may be used to help establish a workplace *musculoskeletal injury prevention* (MSIP) program. The *Guidelines* are intended for the use of MSIP coordinators, occupational health and safety professionals, joint occupational health and safety committee members and others who are involved in the review, evaluation and implementation of patient handling related MSIP activities. As supplements, OHSAH is developing *Handbooks* for use by caregivers.

(It should be noted that MSIP programs in the healthcare sector are much broader in scope - the *Guidelines* focus primarily on patient handling.)

GOALS AND OBJECTIVES

- To provide a current literature review on risk factors and appropriate control measures with respect to safe patient handling;
- To identify organizational considerations (such as training, policies and procedures) for establishing safe patient handling programs;
- To review legal and regulatory requirements and responsibilities within the context of MSI prevention and safe patient handling practices;
- To briefly review basic biomechanics principles and early signs and symptoms of common patient handling MSIs;
- To provide practical guidance in the identification, assessment and control of risk factors associated with patient handling; and
- To provide guidelines for safe patient handling for twenty selected tasks.

DEFINITIONS (applicable to this document)

Ergonomics	In simple terms, ergonomics is the science that plans and designs for human use – designing the job to fit the workers. It deals with the consideration of human characteristics, expectations, and behaviours in the design of the things people use in their work and everyday lives.
Ergonomic factors	Factors which relate to the interaction of a worker with the work environment.
Musculoskeletal injury (MSI)	An injury or disorder of the muscles, tendons, joints, nerves, blood vessels or related soft tissue, including a sprain, strain or inflammation.
Ergonomic risk assessment	After an MSI hazard has been identified, the level of risk is assessed in a systematic fashion.
Incident	An accident or other occurrence that resulted in, or had the potential for causing an injury or disease and/or some other type of loss.
Patient handling	Any handling of the individual receiving care. (The term 'patient' is used generically to represent the individual receiving care; some organizations use 'resident' or 'client'.)
Task	A distinct work activity to accomplish a specific purpose. One or more elements can comprise a task. Several tasks can comprise a job.
Task analysis	An analysis that involves the breakdown of a job into its physical and psychological demands. Tasks are assessed by looking at exposure duration and frequency; physical functions such as pushing, pulling, lifting and reaching; detailed information of weights, distances, etc.; decision-making requirements; and the type of environment the tasks are performed in. Any equipment used to perform tasks is also assessed with respect to its effectiveness and appropriateness. Hazard classes (chemical, physical, biological, ergonomic and psycho-social) and associated risk factors in the work environment are analyzed.

Patient Handling Tasks:

<i>Lifting</i>	Supporting the entire weight of the patient when moving from one surface to another.
<i>Repositioning</i>	Changing the position of a patient on the same surface
<i>Transferring</i>	When the patient is able to bear some weight during a movement from one surface to another, through at least one upper or lower limb. (The upper limb or arm would be used in a chair-to-chair transfer, for example.)

Section 1: Background

RISK OF MUSCULOSKELETAL INJURIES AMONG HEALTHCARE WORKERS

The high risk of MSIs among healthcare workers is well-documented. High prevalence rates of MSIs among healthcare workers have been reported (21, 27,73, 84, 86). A review of the epidemiological literature found that average point prevalence for back pain among nursing personnel was approximately 17%, with average annual prevalence ranging from 40-50%, and lifetime prevalence from 35-81% (4). Lifetime prevalence rates for low back pain have been reported as even higher than 80% (21). It has been suggested that true rates may be even higher than those observed in the literature since MSIs may not be reported to supervisors in all cases (40,86). High incidence rates of MSIs among healthcare workers have been reported (72), with rates exceeding those found in the general (51) and non-healthcare-related working populations (57).

Compensation claims data reflect these findings. MSI compensation rates are higher among some healthcare personnel compared to other occupational groups traditionally considered to be high-risk, such as construction workers, loggers, and truck drivers (43). In British Columbia (BC), the healthcare industry represents one of the highest claim industry groups, with nursing and nursing assistant occupations representing the majority of all healthcare industry claims (87).

MSIS AND PATIENT HANDLING

Patient handling is a significant risk factor for MSIs among healthcare personnel, representing the major cause of overexertion accident claims among BC healthcare workers (87). Healthcare workers with MSIs commonly report their injuries occurring as a result of patient-handling (36,39,51,56,86,88), and patient handling

tasks are rated as more stressful to the back than non-patient handling tasks, both through rankings of perceived stress by healthcare workers and through biomechanical studies (64). According to a review by Jensen, the prevalence rate for back injuries among healthcare workers who more frequently handle patients is about 3.7 times that of those who infrequently handle patients (42).

Studies examining the biomechanical loads of healthcare workers during patient handling find that patient handling tasks often exceed the permissible limit set by NIOSH and others (30,46,54,77,91). Among types of patient handling tasks, repositioning patients in bed (39,51,86), and lifting/transferring patients (17,21,33,36,84) are generally perceived as the most stressful, or are the most common causes of patient-handling related injuries. A recent biomechanical study assessing several patient handling tasks also found that risks for low-back injury were particularly high during transferring and repositioning of patients in bed (54). For further information, refer to Appendix 1 for a synopsis of findings from biomechanical studies.

- ***Physical factors: manual lifting and poor posture***

Frequent (59,78,100) and heavy (44) lifting have been identified as risk factors for MSIs among healthcare workers. In a study comparing occupational lifting between nursing aides and warehouse workers, it was suggested that nursing aides have more lifts of long duration in awkward postures, more carrying, more exertion of horizontal forces, and a greater frequency of unexpected rapid lifts as compared to warehouse workers; it was suggested that such lifting factors placed the nursing aides at greater risk for MSIs (52).

Biomechanical analysis suggests that many nursing postures are poor (90), and working with poor posture (e.g. in stooped, bent or twisted positions) has been listed as a risk factor for MSIs among healthcare workers (6,15,84,101).

- ***Environmental and work organizational factors***

Environmental risk factors for accidents among healthcare workers may include slippery floors and unsuitable temperature (21), low-level lighting (such as during night shifts on hospital wards), obstacles, uneven floors and excessive noise. Cramped or cluttered working conditions are risk factors, in that caregivers may be forced to work in awkward positions (17), or may be prevented from using mechanical handling aids (17,56). Non-availability of appropriate equipment has also been listed as a reason for not using mechanical aids (17). Working with unsuitable bed heights may represent a risk factor for MSIs during some patient handling tasks (21,23,65).

- ***Staffing levels and shifts***

Staff shortages have been listed as a major reason for not lifting properly (39,86) and reported difficulty in taking a day off of work even when in poor physical condition was a significant risk factor for MSIs among nursing personnel (21). In a study comparing two hospitals with different work organizations, MSI rates were higher among nursing staff at the hospital with much lower staff-to-patient ratios (49). As well, increased severity of MSIs has been observed during evening shifts (31) and increased numbers of MSIs at the beginning of day shifts (33), likely reflecting increased patient handling demands during these periods (33).

- ***Training in patient-handling techniques***

Among healthcare workers injured in a large Canadian hospital, 52% listed a training-related factor as the primary cause of injury. Workers noted that not knowing how to deal with unforeseen circumstances was a major cause of accidents and that lack of knowledge about how to use equipment, rather than lack of equipment availability, was a significant problem (81). Lack of training in lifting techniques has also been shown to be a major contributor to the accident process within hospitals (17) and poor patient handling skill is shown to be a risk factor for back injuries (79).

Results from studies examining the impact of training programs, however, have been inconsistent (40). Following training in patient handling techniques and ergonomics, there is evidence to suggest that healthcare workers make fewer biomechanical errors (16) and are more likely to use the new techniques (47), though this has not been observed in all studies (75). A relationship between training in patient-handling skills and ergonomics and a decrease in injury rates has also not been clearly demonstrated (47,78), leading some experts to believe that, while important, training in proper body mechanics and patient handling procedures should not be relied upon as the only component of a back injury prevention program (40).

Other Factors

- ***Patient-related factors***

Factors related to the patient, such as the level of physical, cognitive and behavioural functioning, can be risk factors for MSIs to healthcare workers. Poor balance in patients due to factors including poor vision, muscle weakness, unstable gait, medications, alcohol, unsafe footwear, and environmental hazards can cause patient falls (105); healthcare workers are at higher risk for MSIs when patients fall unexpectedly or are uncooperative (17,21). Accord-

ing to Lagerstrom, “Nursing work in close contact with patients often involves both heavy loads and unfavourable body positions. It often includes elements such as “save the patient” situations, those in which the patient’s legs give way or the patient is about to fall out of a bed or off a chair, for example. Such situations can cause uncontrollable loads on nursing staff, loads which can irrefutably be assumed to give rise to injuries to the back and other parts of the body.” (48).

- **Caregiver-related factors**

Psychosocial factors such as low mood, depression, and stress have been associated with increased risks for MSIs among healthcare workers (5,72). Having a sense of overload at work, low job satisfaction, low social support at work, increased job strain, or high psychological demands have also been reported as risk factors for MSIs (45,59,102). It has been suggested that work technique could be affected when healthcare workers perceive high job strain and high exertion, thus leading to an increased load on the musculoskeletal system (45). According to a review by Lagerstrom, however, “[there do not appear to be any] studies that show that work organizational or psychosocial factors, as such, cause low-back problems....these factors can be of significance to the consequence and maintenance of low-back problems, by affecting, for example the perception of pain and the tendency to report illness. Factors in nursing work which might have significance for this connection are staff density and job satisfaction.” (48).

In addition to psychosocial factors, misunderstanding or lack of communication between the healthcare worker and the patient can contribute to accidents (17). As well, history of back problems is a strong risk factor for future low-back problems (48,72,78), while the evidence for a relationship between lifestyle factors and MSIs is not conclusive (48).

ORGANIZATIONAL RECOMMENDATIONS

- ***Mechanical lifting equipment and no-manual lifting policies***

The need for mechanical lifting devices has been emphasized in order to decrease MSI risks to healthcare workers during patient handling (52,54). Studies examining the effectiveness of using mechanical lifting equipment compared to baseline manual methods have found decreases in bio-mechanical stress to the worker (83), decreased perceived exertion (69) and increased resident security and comfort (32). It has been demonstrated, however, that not all lifting equipment is equally effective in decreasing risks to healthcare workers (35,83,103,104). Attention to four variables; the patient, the attendant, the task and the environment; is deemed essential in determining the right approach to equipment design and selection (1).

Some facilities and organizations have also adopted no manual lifting policies (99). As defined by the Royal College of Nursing, “The aim is to eliminate hazardous manual lifting in all but exceptional or life-threatening situations. Patients should be encouraged to assist in their own transfers, and handling aids must be used whenever they can reduce the risk of injury. Handling patients manually may continue only if it does not involve lifting most or all of the patient’s weight. Care must also be taken when supporting a patient, and pushing and pulling should be kept at a minimum. Staff should assess the capabilities of a patient to decide on which, if any, handling aids are suitable.” (92)

- ***Management commitment and a comprehensive approach to MSI prevention***

The need for a comprehensive approach to MSI prevention in healthcare has been emphasized (17,89,104,106). Preventive measures should target simultaneously the organization of the work, the workplace, and the nurses’ skill (17). While availability

of appropriate equipment, proper training and policies that promote compliance are essential, attention must be paid to staffing and work organizational factors that also drive injuries (106).

The importance of management commitment, active safety leadership and employee involvement in ensuring the success of a safety program has been well-documented. Injury rates are found to be lower in facilities where there is empowerment in the workforce, and where top management takes an active role in health and safety (107). There is also evidence that ergonomic intervention strategies with the best chance of success for reducing MSIs involve an overall strategy of identifying and dealing with risk factors relevant for the individual at risk, with the active support and involvement of the individual at risk and other stakeholders in the organization (108).

An effective ergonomics program for healthcare organizations should include (93):

- Management involvement, demonstrated through personal concern for employee safety and health by prioritizing the elimination of ergonomic risk factors;
- The responsible implementation of a policy that places safety and health on the same level of importance as service. This policy requires management to integrate patient/resident care with employee safety and health to assure that this protection is part of the daily activity within each facility;
- Commitment to assigning and communicating responsibilities so that all managers, supervisors and employees know what is expected of them;
- Commitment to providing adequate authority and resources to all responsible parties so that assigned responsibilities can be met, and to ensuring that each manager, supervisor, and employee is accountable for carrying out assigned responsibilities;
- Established procedures that allow employees to bring suggestions or concerns to management without fear of reprisal;
- A procedure that encourages prompt and accurate reporting of potential MSIs by employees so that they can be evaluated and, if warranted, treated;
- Safety and health committees that receive information on problem areas, prioritize activities, and evaluate the effectiveness of the program(s) in place;
- Ergonomic teams or monitors with the required skills to identify and analyze jobs for ergonomic stress and work with employees on the development, implementation and evaluation of controls;
- Hazard identification, prevention and control (through selection of appropriate equipment, training in proper work techniques, monitoring, and administrative controls aimed at reducing the duration, frequency and severity of exposure to ergonomic stressors)
- Implementation of a medical management system (addressing injury and illness record-keeping, early recognition and reporting, treatment, return-to-work, systematic monitoring, and adequate staffing and facilities).

IN SUMMARY:

- The incidence of MSIs is higher for 'hands on' healthcare workers than for occupational groups traditionally considered at high risk. In 1998 the overall injury rate for workers in the British Columbia healthcare industry was higher than the provincial average for all other industries combined.
- Overexertion due to patient handling activities has been implicated as a major cause of MSIs. Manual lifting, working in awkward postures, carrying, pushing and pulling forces, and unexpected rapid changes have been identified as major risk factors.
- Studies examining biomechanical loads on caregivers during patient handling tasks have identified that loads often exceed the permissible limit set by NIOSH. (The 1991 revised equation recommends the weight limit for lifting to be 23 kg or 51 lbs under ideal conditions, where the maximum allowable compressive force on L5/S1 is 3,400 N and maximum energy expenditure rate is 3.5 Kcal/min). Healthcare workers are usually faced with less than ideal conditions and regularly perform movements (e.g. lowering) that the NIOSH equation does not account for.
- In addition to peak forces during single events, cumulative loading has been identified as a causative factor leading to more chronic MSI conditions. Inappropriate use of equipment may increase cumulative loading. Training is therefore needed.
- Replacement of manual patient handling with mechanical options - lifting and transferring aids - is widely recommended as a means of reducing MSIs. The introduction of devices such as friction-reducing sliding sheets to replace manual repositioning of patients in bed would also likely decrease risk of MSIs, although this is less well-documented.
- In addition to factors related directly to patient handling tasks, other risk factors include factors in the environment or workspace, factors related to inadequate equipment, to caregiver training, to insufficient staff, and organizational factors related to lack of or inappropriate policies and procedures. This suggests the need for a multi-factorial approach to eliminating and minimizing risks incurred in patient handling.

Section 2:

Organizational considerations: Workplace MSIP programs for safe patient handling.

This section outlines MSIP program components, placing patient handling within the context of an overall MSIP program. Equipment selection and maintenance are covered in detail, as are the requirements for education, training, incident reporting, investigation and follow-up. The assessment of MSIP program effectiveness, through incident and injury tracking processes and a formal MSIP program evaluation, are also reviewed.

Employer commitment and active safety leadership

Employer commitment and visible leadership are essential to an effective safety program (Orr 1997; Westgaard and Winkel 1997; Yassi et al. 1995). Components of managerial commitment and active safety leadership (Orr 1997) include:

- developing and disseminating clear policies and procedures that place health and safety on the same level of importance as service;
- establishing systems of accountability;
- outlining roles and responsibilities, and communicating them to all managers, supervisors, and employees;
- showing commitment to providing adequate authority and resources to all responsible parties so that assigned responsibilities can be met;
- working in a safe manner at all times;
- establishing procedures that allow employees to bring suggestions or concerns to management, without fear of reprisal;
- promoting prompt and accurate reporting of injuries so that they can be evaluated and, if necessary, treated;
- supporting the activities of the joint OH&S committee, reviewing and responding to its recommendations and requests promptly and expeditiously.

The basic principles of MSIP programs and the overall OH&S program use the same approaches to hazard identification,

assessment, and control, and include policies, procedures, investigations, record keeping and program evaluations. Refer to Appendix 2 for a review of legal and regulatory requirements for MSIP prevention in British Columbia (BC), and for excerpts from the Workers' Compensation Act of BC (The Act) that detail the responsibilities of all levels of the healthcare organization.

Workplace MSIP program

The goal of the MSIP program is to identify and assess ergonomic hazards, to provide control measures (engineering, administrative and personal) and to implement proactive approaches to risk avoidance. Effective MSIP programs prevent or minimize the potential for MSIs. A comprehensive MSIP program also contains tools and direction for effective incident reporting, investigations, and evaluation of implemented control measures and the overall program (please refer to 'MSIP Program Evaluation' in Section 2.8, and the OHSAA *Musculoskeletal Injury Prevention Program Implementation Guide* - hereafter referred to as the '*Implementation Guide*', available from OHSAA upon request.). OHSAA recommends that each healthcare organization develop a comprehensive MSIP program, including the elements noted in Table 2.1 regarding patient handling.

Task analysis

When evaluating procedures, work organization, physical and psychological demands of the work on caregivers, and environment and equipment, the MSIP program relies heavily on task analysis to gather information on the inter-relationships of the risk factors for MSIs. Figure 2.1 provides a brief overview of the task analysis process. Refer to Appendix 3.1 for a patient handling risk identification worksheet - a helpful tool for simple risk assessments, and Appendix 3.2 for a sample worksheet.

Table 2.1 The MSIP program at a glance

<p>A. Workplace MSIP program policies should include:</p> <ol style="list-style-type: none"> 1. Organization's commitment statement 2. Definition of key words and concepts 3. Roles and responsibilities: <ul style="list-style-type: none"> ▪ employer ▪ managers ▪ supervisors ▪ workers ▪ physicians ▪ joint occupational health and safety committee or worker health and safety representative ▪ OH&S department or responsible OH&S professionals 4. Commitment to education and training 5. Commitment to MSIP program evaluations <p>B. MSIP program working group needs:</p> <ol style="list-style-type: none"> 1. Terms of reference 2. Appropriate education and training <p>C. Risk assessment should be conducted to prioritize areas needing attention. Assessment should include:</p> <ol style="list-style-type: none"> 1. Gathering and reviewing of background information and injury records 2. Worker input: <ul style="list-style-type: none"> ▪ Interviews/discussions ▪ Workplace inspections for MSI hazards and risk factors ▪ Questionnaires, if appropriate 3. Task analysis – identifying and assessing MSI risk factors of various job tasks 4. Recommendations and action plan 	<p>D. MSI risk controls should include:</p> <ol style="list-style-type: none"> 1. Elimination or minimizing of MSI risks through control measures 2. Implementation of purchasing controls and product/equipment evaluation protocols 3. Implementation of preventive maintenance and cleaning programs 4. Development and implementation of MSIP procedures 5. Education and training <ul style="list-style-type: none"> ▪ Core program - including recognition of risk factors (ergonomics awareness, basic task analysis and control measures) ▪ Risk specific program components (e.g. patient handling policies & procedures) ▪ Training records 6. Consultation 7. Health and medical monitoring 8. Hazard reporting - early detection and reporting of signs and symptoms of MSI 9. Review of implemented control measures – appropriateness and effectiveness in eliminating or reducing risk factors <p>E. Post-incident procedures</p> <ol style="list-style-type: none"> 1. Controlling the incident scene 2. Incident reporting 3. Obtaining first aid/medical aid 4. Establishing compensation claims 5. Investigating incidents and follow-up 6. Early intervention, return-to-work programs, and accommodations <p>F. Records and statistics</p> <p>G. MSIP program evaluation</p>
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Development of policies and procedures

The occupational health and safety program needs to include appropriate written instructions that are easily accessible and available for review by all workers. The workplace MSIP policy should include the following basic components:

- Organization's commitment statement
- Definitions of key words and concepts
- Roles and responsibilities of all levels of the organization with respect to patient handling and the prevention of musculoskeletal injuries

- Outline of the core education, training and risk-specific training programs on patient handling
- Reference to when, how and by whom the MSIP related policies and procedures are evaluated. (It should be noted that the WCB of BC requires the employer to monitor the effectiveness of the measures taken to comply with the ergonomics (MSI) requirements, and to ensure that they are reviewed at least annually.)

Written patient handling procedures provide instructions and direction for caregivers in order to ensure that patient handling tasks are performed safely and consistently.

Figure 2.1. Task analysis at a glance

1. Break the work assignment duties into tasks	identify the main tasks that make up the work assignment duties.
2. Break tasks into steps	list and describe steps.
3. Identify potential hazards within each step	for each step, write down potential health and safety hazards that may pose a risk for MSI or other type of incident.
4. Evaluate the risks	for all identified hazards, evaluate the degree/level of risk.
5. Evaluate the necessity of each step	evaluate if there might be a better way of performing some of the steps, perhaps eliminating unnecessary steps or improving their effectiveness.
6. Identify hazard/risk controls	identify changes or procedures that can eliminate or minimise potential for ergonomic hazards.
7. Implement and evaluate the controls	once the controls are implemented, evaluate them to ensure their effectiveness and that new hazards/risks have not been created.

Thorough and timely patient assessments (by an individual or a team) are crucial to eliminating or minimizing potential for MSI incidents. Well researched and effective procedures ensure that MSI risks are eliminated or at least minimized.

In addition to general policy and procedures, each patient care sub-sector (and various units in a facility) should have policies and procedures that are specific to their needs and work environment. A suggested list of departmental policies and procedures for acute, long term and community care sub-sectors (adapted from the Healthcare Health & Safety Association of Ontario, 1998) follows.

ACUTE AND LONG TERM CARE:

Nursing

- When, how and by whom the initial patient assessment will be done
- Who is responsible for updating the procedures, care plans, pictogram stickers and bedside assessment cards, in-

cluding the process to be followed when patient status changes (Goodridge and Laurila 1997; Thompson 1996)

- Frequency and scheduling of patient re-assessments and care conferences
- Communication of re-assessment results to all relevant healthcare providers
- Communication of safe patient handling techniques between departments, and during transfers to other healthcare sub-sectors (e.g. hospital to long term care or hospital to home)
- Risk identification, assessment, and control procedures
- Guidelines in the use of transfer, repositioning, and lifting devices
- Procedures for safe repositioning, transferring, and lifting tasks, including appropriate procedures for dealing with violent patients
- Orientation, training and re-training programs – content, duration and training records and when they take place
- Inspections of work environment and equipment

- Preventive maintenance and washing schedule for all patient handling equipment
- Supervising / monitoring safe patient handling techniques
- Reporting of early signs of MSI and incidents
- Investigation of MSI concerns and incidents and ensuring that follow-up takes place
- Role in the evaluation and purchasing of equipment
- Safe patient handling during emergencies and evacuation

Diagnostic imaging (acute only)

Staff in this department may be the first care providers to assess the most appropriate and safe patient transfer/lift procedure. In addition, staff in diagnostic imaging departments may work in a very cramped environment where implementation of control measures may need to take more innovative approaches. Procedures are frequently the same as those listed under *Nursing*.

Rehabilitation

Rehabilitation staff may have the overall responsibility for the workplace MSIP program. Procedures are frequently the same as those listed under *Nursing*.

- Policy and procedures on involvement of rehabilitation staff in patient assessments
- Role in formal and informal training and education of staff
- Role in the evaluation and purchasing of equipment

Activity/recreation

Some procedures are similar to those listed under *Nursing*.

Morgue (acute only)

- Guidelines in the use of transfer, repositioning and lifting devices
- Procedures in safe repositioning, transferring and lifting tasks
- Orientation, training and re-training programs – content, duration and training records
- Inspections of work environment and equipment
- Preventive maintenance and washing

schedule for all handling equipment

- Supervising / monitoring of safe handling techniques
- Reporting of early signs of MSI and incidents
- Investigation of MSI concerns and incidents and ensuring that follow-up takes place

Maintenance

Factors specific to direct patient handling follow. Further MSIP program requirements for maintenance can be found in the *MSIP Implementation Guide*.

- Preventive maintenance schedule for patient handling equipment
- Role in the evaluation and purchasing of equipment
- Reporting equipment failures

Housekeeping

Shared components of patient handling specifically may vary from workplace to workplace. The common elements with direct patient handling follow. Further MSIP program requirements for housekeeping, can be found in the *MSIP Implementation Guide*

- Washing schedule for patient handling equipment
- Performing housekeeping tasks around patient handling equipment
- Role in the evaluation and purchasing of equipment

Purchasing

Purchasing controls to ensure appropriate staff involvement in evaluating patient handling equipment and decision making prior to purchasing the equipment

COMMUNITY CARE

Caregivers in the community sub-sector, particularly in home care, are exposed to a number of risk factors that are not found in acute and long term care settings. The policies and procedures on patient handling need to reflect the nature of the challenges and risk factors found in these 'uncontrolled' work environments. Of particular importance is effective communication between the various healthcare sub-sectors, to ensure that necessary patient

assessment (care-plan) documents, including patient handling guidelines, are forwarded when a patient is transferred or discharged (e.g. hospital to community care at home). Policies and procedures should include:

- When, how and by whom the initial patient assessment was/will be done
- Who is responsible for updating the procedures and care-plans, pictogram stickers and bedside assessment cards, including process to be followed when patient status changes
- Frequency and scheduling of re-assessments of patient and care conferences
- Communication of new and re-assessment results to all relevant health-care providers
- Communication of safe patient handling techniques during transfers (e.g. from hospital to home)
- Risk identification, assessment and control procedures
- How and where to get necessary patient handling equipment or whom to contact
- Guidelines in the use of transferring, repositioning and lifting devices
- Procedures in the safe repositioning, transferring and lifting tasks, including appropriate procedures for dealing with violent patients
- Orientation, training and re-training programs – content, duration and training records
- Inspections of work environment and equipment
- Who is responsible for preventive and regular maintenance and washing of patient handling equipment
- Supervising/monitoring safe patient handling techniques
- How to report early signs and symptoms of MSI and incidents
- Who is responsible for investigation of MSI concerns, incidents and follow-up
- Role in the evaluation of equipment
- Safe patient handling during emergencies and evacuation

Equipment selection and maintenance

In selecting equipment, it is essential to pay attention to four variables: the patient, the caregiver, the task and the environment (Bell 1987). Factors to consider when selecting equipment include the level of patient acuity, patient and caregiver size/weight, the work environment layout, and the level of comfort and satisfaction with the equipment in both personnel and the patient. Heavy patients may require special equipment with higher load capacity. Consideration should be given to having at least one set of equipment available for handling very heavy patients.

(While numerous types of equipment are recommended in the literature, we emphasize that OHSAH is not endorsing any particular brands. A database link to a list of manufacturers of various patient handling devices can be viewed through the OHSAH webpage (www.ohsah.bc.ca, - select 'HEALNet', select 'Equipment Database', select 'Detailed Manufacturer Information'). We would also like to stress *proper* use, education, training, and regular maintenance of equipment.)

The MSIP program needs to outline regular inspection of premises, equipment, work methods and work practices, at appropriate intervals, to ensure that prompt action is taken to correct any hazardous conditions. It is also important to ensure that equipment is inspected in accordance with the manufacturer's recommendations.

Table 2.1 provides brief descriptions of generic patient handling devices and associated references. Please refer to Appendix 4.1 for a sample equipment inventory form, to Appendix 4.2 for factors to be considered when evaluating equipment needs and suitability for purchasing, and to Appendices 4.3 to 4.6 for other tools that can be used when evaluating equipment.

Table 2.2. Patient handling devices*

DEVICE	DESCRIPTION	REFERENCES
Mechanical total body lift	A piece of equipment used to lift a patient. It is used when the patient is unable to bear weight or is unable to consistently bear weight. It supports the entire weight of the patient when moving from one surface to another. The lift may have manual, hydraulic or electric controls, and may be a floor lift or an overhead lift with a ceiling track system. Portable track lifts are also available, though more expensive, and are excellent for use by caregivers in home settings.	Blue 1996; Garg et al., 1991a; Garg et al., 1991b; Holliday et al., 1994; Jenson 1990; Laflin and Aja 1995; Ljungberg et al., 1989; Smedley et al., 1997; Ulin et al., 1997; Varcin-Coad and Barrett 1998.
Mechanical transfer aid	A standing transfer aid is used where the patient is able to bear weight through at least one leg, is able to hold the frame with at least one hand, and is able to cooperate and follow directions. The aid may have manual or electric controls.	Corlett et al., 1994; Daynard et al., 2000; Engkvist et al., 1998; Roth et al., 1993.
Transfer belt	A belt worn at waist level by a patient, it provides a secure grip when moving patients. The belt is often fastened by a buckle or by Velcro fasteners.	Caregivers of Ontario Safety and Health Association 1992; Daynard et al., 2000; Garg et al., 1991a; Garg et al., 1991b; Goodridge and Laurila 1997; Jenson 1990; Laflin and Aja 1995; Owen and Garg 1991; Owen and Garg 1993.
Walking/gait belt	A type of transfer belt used to provide a secure grip when walking patients. Walking/gait belts usually have handles, which may be soft or rigid.	Garg et al., 1991a; Garg et al., 1991b; Jenson 1990; Owen and Garg 1991.
Transfer pole	A floor-to-ceiling pole. More commonly used in extended care facilities and homes. The pole provides additional assistance to a patient moving from sitting to standing. Poles are available with an attached pivoting and locking hand rail, some of which fit hospital and standard beds.	Cooper and Stewart 1997.
Soaker or bed pad	A reusable water resistant padded sheet placed under a patient. Pads are usually made out of fabric and are available in varying sizes. Also known as a pique, or soaker pads. Bed pads are frequently used as an aid for repositioning a patient in bed.	Caregivers of Ontario Safety and Health Association 1992; Sewell 1999.
Pelvic lift device (hip lifter)	Inflatable hip lifter positioned under the hips to allow the insertion and removal of a special bed pan.	Owen et al., 1995

*Preventive maintenance and appropriate use, under BC WCB Regulation as well as in accordance with manufacturer's specifications for the equipment, is essential for its effective and safe functioning. In addition, any other applicable standards such as Canadian Standards Association (CSA) Standard (Z323.5-98) for Mechanical /Electromechanical Lifting Devices for Persons must be complied with.

Friction reducing equipment	<p>Low friction equipment used to aid in moving and positioning a patient.</p> <p>Transfer board Used to slide a patient from one level surface to another. Usually tapered at either end to assist the transfer. Some models have moving sliding sections. Require full patient cooperation.</p> <p>Supine transfer board/slider board A solid large board with a slippery surface used to reposition in bed, or to transfer a person in the supine position from one level surface to another e.g. bed to trolley, bed to stretcher.</p> <p>Sliding sheet A low friction fabric sheet used to reposition in bed or to slide a person lying supine from one level surface to another e.g. bed to stretcher. Some sliding sheets have hand loops.</p> <p>Roller A low friction fabric used to slide a patient. The roller resembles a sleeping bag open at both ends and can be used to reposition a patient in bed e.g. boosts.</p>	<p>Bohannon 1999; Caregivers of Ontario Safety and Health Association 1992; Cohen 1998; Crescimbeni 1997; Goodridge and Laurila 1997; Holliday et al., 1994; Jenson 1990; Marras et al., 1999; Robertson 1997; Sewell 1999; Zelenka et al., 1996.</p>
Grab bar	<p>Bars that are usually wall mounted or designed to fit standard tubs. Designed to provide safety usually in the bathroom and toilet areas.</p>	<p>Adams et al., 1999</p>
Raised toilet seat	<p>Plastic seat used on top of porcelain toilet bowl rim (toilet bowl seat is lifted to a raised position) to decrease the distance and amount of physical effort needed to lower or raise patients to/from toilet.</p>	<p>Owen & Garg 1993</p>
Shower or commode chair	<p>Portable commode - and shower chair- in-one, designed to fit in shower and over toilet. Some models have wheels/casters for transporting the patient. May be available in height adjustable and recliner models, with power controls.</p>	<p>Collins & Owen, 1996, Garg & Owen, 1992 Owen & Garg, 1993</p>
Commode	<p>Toileting aid designed to fit over toilet or at bedside. Seat acts as a toilet seat that has a pail (if not left over the toilet), splashguard and lid. Often available with adjustable toilet seats and arms rests.</p>	<p>Adams et al., 1999 Jensen 1990</p>
Shower cart or stretcher	<p>A cart/stretcher with a waterproof top designed for changing, undressing, bathing, and dressing a recumbent patient. Available in different lengths, should have a soft mattress and adjustable side supports.</p>	<p>Adams et al., 1999</p>
Trapeze or monkey bar	<p>An overhead attachment usually fixed to the head of the bed to allow patients to support themselves during lying to sitting movements.</p>	<p>Corlett et al., 1994; Crescimbeni 1997.</p>
Bed ladder	<p>A ladder pull up attached to the foot of the bed. A patient uses the ladder to pull themselves up from lying to sitting position.</p>	<p>Corlett et al., 1994.</p>
Adjustable bed	<p>To reduce the strain of patient handling, beds with wheels, brakes, and height adjustments are ideal. For patients cared for at home, height-adjustable hospital type beds with brakes can be available on loan. Beds should be positioned to allow sufficient space for easy access.</p>	<p>Bell 1987; Gagnon et al., 1987a; Pheasant 1987.</p>
Stretcher	<p>Height adjustable stretchers are available with manual or hydraulic controls. Stretchers should be easily moved through doorways, corridors, and particularly around corners and have an adequate braking system.</p>	<p>Bell 1987.</p>

Education and training

Effective workplace education and training programs are essential to reducing or preventing the incidence of MSIs. In addition, the MSIP program should outline a component of supervision to ensure safe work performance. Management and supervisors need to provide strong support and commitment towards workplace education and training programs in order for training to be successful in reducing MSIs, and workers must practice and demonstrate the necessary skills during work activities.

The basic MSIP education and training requirements for new and transferred employees include:

- education in risk identification, including recognition of early signs and symptoms and the potential health effects of MSIs.
- training in the use of appropriate MSI risk control measures, including (where applicable) work procedures, use and selection of mechanical aids and personal protective equipment.

Please refer to Appendix 5 for a review of anatomy, biomechanics, MSIs, and working with good body mechanics.

Training programs for patient handling should include an overview of the following MSIP program points:

- the employer's patient handling policies and procedures
- roles and responsibilities
- principles of ergonomics and good body mechanics (Videman et al., 1989)
- recognition and reporting of early signs of MSIs
- risk identification and assessment
- implementation and evaluation of MSI control measures
- training in patient handling techniques
- training in appropriate assessment on when and how to use mechanical aids
- patient handling during emergencies (Engkvist et al., 1998; Videman et al., 1989)

- stretching techniques to be used before, during and after shifts (Blue 1996)
- stress reduction techniques and fitness programs (Lagerstrom et al 1998; Linton et al., 1989)
- reporting of incidents, incident investigations and follow-up
- MSIP program evaluation process

Nurses often report that availability of mechanical equipment is less of a problem than the **ability to assess the necessity for and the level of confidence in using them** (Moody et al., 1996; Yassi et al., 1995)

Training programs should be conducted in the actual work environment whenever possible (and where applicable) in order to encourage staff participation, and to give trainees hands-on experience (Yassi et al., 1995). Feedback during training sessions should be encouraged (Yassi et al., 1995), as well as demonstration of the learned skills, by the trainee, during and/or at the end of training.

Worker education and training on MSI prevention must take place before performing patient handling tasks.

It is recommended that **re-training be conducted at least annually** (based on OHSAH Best Practices survey), as well as for new or transferred staff, especially in the use of available mechanical equipment (Garrett et al 1992) and in recognizing risk factors. All caregivers should receive equal levels of training e.g. night staff should receive the same level of training as day staff (Moody et al., 1996).

The **length of training** sessions may vary, depending on the level of training that staff have received previously, and on how much change is being introduced. The U.K. Royal College of Nursing and the U.K. Chartered Society of Physiotherapy recommend a minimum of three to five days of orientation, soon followed by a review day, and then annual refreshers.

Training records, providing the outline and contents of the program, instructor details, and a list of participants - including job titles and departments/worksites, - should be kept of all education sessions. Please refer to Appendix 6 for a sample education / training record.

Reporting, investigating and follow-up of hazard and incident reporting

HAZARD REPORTING

Care providers must be trained to identify and report actual and potential hazards in the work environment (e.g. faulty equipment, cramped workspace, incompatibility of equipment) and hazards to the performance of their duties. To make hazard reporting convenient, the employer must:

- provide appropriate forms (e.g. hazard communication reports, maintenance requisition forms/books);
- institute a system for consistent review of the forms; and
- assign responsibility for action and ensure timely completion of and feedback on the implementation of corrective measures.

INJURY/OCCUPATIONAL DISEASE REPORTING

To ensure prompt intervention, a worker needs to report an injury or disabling occupational disease *as soon as possible*, to the employer or the employer's representative (usually the supervisor and/or the designated first aid attendant). Use of the appropriate incident report form designed for the workplace, or form 6A – *Worker's Report of Injury or Occupational Disease to Employer* (WCB prescribed form) will provide details to the employer.

In British Columbia, upon receiving notification of an incident, the employer must report it to the WCB within three days of the injury's occurrence. WCB requires the employer to use WCB *Form 7 – Employer's Report of Injury or Occupational Disease*, or to file a report electronically. The forms used for incident reporting and investigation at the workplace should allow effective injury tracking, including causes and resulting

occupational injuries.

INCIDENT INVESTIGATION

Incident reporting and investigation identify causes of MSIs as well as other types of injuries and occupational diseases. It is not possible to prevent incidents without knowledge of their causes. If recommended corrective actions are implemented, the potential for future incidents can be eliminated or minimized. This opportunity for MSIP program improvement is lost if incidents are not reported and investigated promptly.

Thorough investigations include:

- Prevention, or minimizing of the potential for a future recurrence of the same or similar incident by examining all factors involved, determining the causes and taking steps to prevent recurrence;
- demonstration of supervisory and management concern and commitment for workers' health and safety;
- meeting legal requirements;
- identification and assessment of risk factors related to environment, equipment, systems, work organization, personnel, patients and procedures; and
- recommending corrective actions.

Every workplace must have clear policies and procedures, on incident reporting, the appropriate forms, and the steps needed to initiate an investigation and follow-up action.

The requirements for incident reporting and investigation stated in The Act, (*Part 3 – Division 10 – Accident Reporting and Investigation, Sections 172-177*) detail that an investigation must be done when:

- an incident resulted in a worker requiring medical treatment; or
- an incident did not involve injury to a worker, or involved only minor injury not requiring medical treatment, but had a potential for causing serious injury.

The employer is also required to perform a risk assessment when factors that may expose workers to a risk of MSI have been identified (WCB OH&S Regulation 4.48). The risk assessment is often initiated in re-

sponse to a worker's signs or symptoms of MSIs. In addition to consulting with the Joint OH&S Committee, the employer must also consult with the worker(s) involved.

WHO SHOULD INVESTIGATE?

The *Terms of Reference* for the workplace Joint OH&S Committee as well as the policies and procedures on incident reporting and investigation need to clearly establish where the responsibilities lie for investigation of incidents.

In general, the investigation should be conducted by persons knowledgeable about the type of work involved. This might often be the worker's supervisor or manager. When possible, investigators must include one worker representative and one employer representative of the Joint OH&S Committee. At many workplaces, the worker representative involved in the investigation would be the union-elected representative for the worker affected.

GOAL OF AN INVESTIGATION

The goal of an investigation is to determine the cause or causes of the incident, to identify any unsafe conditions, acts or procedures that contributed in some way to the incident and to ensure that corrective action is taken.

INVESTIGATION REPORT

The WCB OH&S Regulation Section 3.4 requires that the contents of the incident investigation report include:

- a. the place, date and time of the incident,
- b. the names and job titles of persons injured in the incident,
- c. the names of witnesses,
- d. a brief description of the incident,
- e. a statement of the sequence of events which preceded the incident,
- f. identification of any unsafe conditions, acts or procedures that contributed in any manner to the incident
- g. recommended corrective actions to prevent similar incidents, and
- h. the names of the persons who investigated the incident.

Record keeping - incident and injury tracking

An effective OH&S program ensures the maintenance of accurate records and statistics. The information recorded in the various documents can be used to evaluate the effectiveness of the program and to decide priorities for future actions.

The following is a list of important records and statistics that each healthcare workplace should have:

INJURY-RELATED RECORDS:

- first aid records (Form 7A - First Aid attendant's report, treatment book)
- medical aid records
- files of WCB Form 7 - Employer's Report of Injury or Occupational Disease
- injury and disease statistics - indicating causes and resulting injuries/diseases
- records of incident investigations - identifying root causes, providing recommendations, and assigning responsibility for implementing corrective measures.

OTHER RECORDS:

- inventory lists of assistive devices/equipment
- preventive maintenance schedules (e.g. mechanical lifting devices, wheeled stock, beds, IV poles etc.) and maintenance records
- inspection records and reports
- equipment inspection and service records
- staff MSIP education and training records
- policies and written safe work procedures
- joint OH&S and MSIP committee minutes of working group meetings
- task analysis reports
- hazard reports (if in use)
- WCB inspection forms and orders
- exposure monitoring and survey reports
- records of evaluation of interventions
- WCB claim cost statements
- program evaluations

Occupational injury and disease tracking is used to calculate injury rates (e.g. the number of time-loss injuries per 100 full-time

equivalent workers) and to analyze trends of occupational injuries and illnesses and their causes. The WCB OH&S Regulation (Section 3.3 ff) requires an employer to maintain records and statistics for this purpose.

Records and statistics are effective tools for the joint OH&S committee or the worker representative to monitor injury and illness in the workplace. The OH&S committee members must be provided with a monthly report at their meetings, as well as an annual summary report, with which to review the rates and trends of injuries and illnesses. Records and statistics can then be used to:

- “collect and analyze data on the causes of injury so that specific control measures can be taken;
- identify specific work locations, departments, occupations and tasks (such as patient repositioning) where there is a high risk of injury and/or illness, to allow prevention efforts to be made in those areas;
- provide employers, managers, health and safety representatives and joint OH&S committees with the factual information needed to objectively evaluate health and safety programs; and
- measure the progress and effectiveness of incident, injury and illness prevention efforts.” (WCB, February 2000-revised)

Depending on the size and complexity of a healthcare organization, there may be a need for different types of statistical analysis. In general, however, most injury and illness statistics calculate *frequency* – providing an indication of how often all or certain types of injuries and illnesses occur, and *severity* – providing an indication of how serious the injuries and illnesses are (e.g. the number of days lost per time-loss injury)

Basic injury and illness statistics can be calculated with reference to information provided in the WCB’s “Joint Occupational Health and Safety Committee Workbook” (revised February 2000). The WCB

system compiles data reported on WCB Form 7 (Employer’s Report of Injury or Occupational Disease), Form 7A (First Aid Attendant’s Report) and incident investigation reports electronically, via ‘Employer-Connect’ or ‘AIRS’. The WCB injury reporting system is then used by some workplaces to generate statistical reports.

To make the record keeping, data analysis and calculation of statistics meaningful, an organization needs to summarize and group the information in a format that can be used to decide on action priorities and to implement control measures. Please refer to the OHSAH website (www.ohsah.bc.ca) for injury tracking tools and Appendix 7 for a sample incident report form.

MSIP program evaluation

The workplace MSIP program policy needs to state when, how and by whom the MSIP program, policies and procedures, will be evaluated. The WCB of BC requires ergonomics (MSI) requirements to be reviewed at least annually (OH&S Regulation 4.52).

The objectives of the MSIP program evaluation are:

- to provide the organization with a comprehensive assessment of its MSIP program;
- to recognize improved performance and achievement;
- to point out areas requiring attention and improvement;
- to recommend actions for improvement
- to provide an action plan for implementing recommended improvements.

A systematic MSIP program review evaluates the effectiveness of this critical component of an OH&S program.

Please refer to Appendix 8 for a sample MSIP program evaluation questionnaire.

Section 3:

Patient Handling: Risk Identification, Assessment and Control:

In handling patients, it is important to identify potential hazards first. Hazards include any object or condition that may present a risk of injury or occupational disease. Identifying and assessing potential risk factors is important to determining the best patient handling technique, the required assistive devices, and the number of staff needed for the task. This section provides an overview of the hierarchy of hazard controls, and then outlines risk identification, assessment and control in Figure 3.1.

Hazard control and hierarchy

ELIMINATION:

Elimination of hazards and the risks they pose to caregivers is the most desirable way of preventing MSIs, and/or degradation of equipment or the environment. Examples include removing an electric cord from the floor to eliminate a potential tripping hazard, or pulling a stretcher out of service for maintenance of a seized wheel.

If a hazard cannot be eliminated, then it must be controlled so as to minimize the possibility of adverse effects. The potential ergonomic risks in patient handling must be controlled through the best possible means. Through a task analysis and a review of work organization (work flow, workload etc.) the employer may be able to identify the changes needed, including any steps that can be eliminated through changes in routine scheduling and patient caseload.

ENGINEERING CONTROLS:

When patient handling related hazards cannot be eliminated, controlling risk through engineering design and/or modifications to the environment and/or devices is ideal. The physical demands of the work must be reduced through appropriate ergonomic design of the workspace, and through availability of necessary patient handling equipment and assistive devices. An engineering control in patient lifting might include a lift (e.g. ceiling lift), if the task is currently performed without a lift or with a lifting de-

vice not as appropriate to the task. For more information on patient handling equipment, please refer to *Equipment selection and maintenance* in Section 2 of the *Reference Guidelines*.

ADMINISTRATION CONTROLS:

Appropriate administrative controls are important to the MSIP program and key to eliminating and reducing ergonomic hazards. Controls include training, supervision, planning, organizing, staffing and coordination. Examples of administrative controls include:

- MSIP policies and procedures;
- providing education and training;
- provision of appropriate patient handling equipment;
- implementing purchasing controls and staff involvement in equipment evaluation processes;
- scheduling of tasks – rotation of workers through high and low workload assignments;
- staffing – availability of assistance;
- properly designed ‘return to work programs’ and ‘accommodation processes’ for injured and disabled caregivers – the health status of a co-worker may affect physical demands on others; ensure sufficient resources and pre-planning
- adequate staffing to ensure rest breaks; and
- efficient workflow design to decrease the number of physical tasks (e.g. perform a comprehensive task analysis to gather recommendations for better work flow).

PERSONAL CONTROLS:

When hazard elimination, engineering controls and/or administrative controls are not feasible or effective, personal controls must be relied on. Because it is not possible to eliminate all physically demanding patient handling tasks, education and training in safe patient handling techniques, appropriate supervision, and adherence to established safe patient handling procedures are essential.

Exercises that serve to strengthen and condition the abdominal and back muscles and other supporting muscle groups have been shown to be helpful in reducing lower back injuries (Gundewall et al., 1993; Owen and Damron 1984). Regular exercise promotes strength, flexibility and cardiovascular fitness, enhancing the physical well-being of the caregiver and thus reducing the potential for MSIs.

Well-structured, non-slip footwear is critical. Proper shoes may also protect and reduce the chance of foot injuries. Personal protective equipment is limited to footwear.

5-step process in patient handling

Prior to performing any patient handling task, it is critical to identify potential risk factors and to perform a patient assessment. Risk identification, assessment and control are broken into a five step process as outlined in Figure 3.1. Factors related to the environment, to organization, to the patient, and to the caregiver must be taken into account. Specific considerations are outlined in the tables following.

Figure 3.1 Risk identification, assessment, and control in patient handling

Step 1.	Identifying and assessing potential risk factors:
Environment:	flooring, obstacles, space, equipment, potentially confusing wall/floor patterns, distance to be moved, lighting, noise, temperature
Organization:	education and training, availability of assistance, workload, work flow
Equipment:	availability, cleanliness and condition, appropriateness to task, compatibility with environment, adequate caregiver training in equipment use, patient comfort and safety levels
Caregiver:	skills, education & training, fitness and physical capabilities, medical & emotional status, clothing and accessories, physical force, posture, repetition, duration, contact stress, psychosocial stresses
Patient:	care plan (checklist, pictogram) available with current handling procedures, communication level, cognitive status, behavioural and emotional status (history of violence or other current risk factors), medical status, physical and sensory status, clothing, assistive devices, ability to assist
Step 2.	Deciding on the appropriate patient handling technique:
	<p>Check care plan (refer to care plan section) & history of previous incidents</p> <p>Consider risk assessment results & match with care plan</p> <p>Consider facility patient handling policies and procedures</p> <p>Determine appropriate patient handling technique:</p> <ul style="list-style-type: none"> • safe and comfortable for patient • provides maximum patient independence • causes minimal biomechanical load on caregiver(s) with maximal safety (good body mechanics, appropriate equipment, and appropriate number of staff)
Step 3.	Preparing for the patient handling task:
	<p>Preparing the environment</p> <p>Preparing the assistant(s)</p> <p>Preparing the equipment</p> <p>Preparing the care giver</p> <p>Preparing the patient</p>
Step 4.	Performing the patient handling task.
Step 5.	Evaluating the completed patient handling task.

Identification of risks in the environment

A number of environmental risk factors can place healthcare workers at risk for injury during patient handling tasks (see Table 3.1). It is important to assess environmental risk factors prior to proceeding with any patient handling tasks (Ferguson, 1970). Frequency and the severity of conditions affecting the task need to be recognized in the assessment.

Table 3.1. Assessment of patient care environment

RISK FACTORS	RISK ASSESSMENT
Flooring	<ul style="list-style-type: none"> ▪ Check for slippery or uneven floors (i.e. wet, carpeted, recently waxed, with stairs, etc.) and ramps with greater than 10 degree grade. Slippery floors can cause slips and falls ▪ Scatter rugs and torn carpets present a tripping hazard
Obstacles and tripping hazards	<ul style="list-style-type: none"> ▪ Check for obstacles (e.g. wires, cords, equipment, furniture, toys) from the origin to the destination of the patient move. Obstacles represent a tripping hazard for the worker and/or patient and can obstruct movement of equipment. ▪ The entire route should be assessed for potential obstacles and congestion.
Space	<ul style="list-style-type: none"> ▪ Check the amount of space available: <ul style="list-style-type: none"> ▪ Small or cluttered workspace ▪ Range of movement - avoiding stooped, bent or twisted posture to complete the task ▪ Equipment should be easily movable from the origin to the destination of the move, doorways should be wide enough to allow ease of movement. ▪ Cramped working postures (such as having to lean over a patient due to space constraints) are substantial sources of static muscular strain that can lead to fatigue and injury (Blue 1996) ▪ Sufficient and functional storage space is critical as well.
Accessible medical & electrical outlets	<ul style="list-style-type: none"> ▪ Centrally located (within functional reach) bedside medical and electrical outlets
Patterns on walls or floor	<ul style="list-style-type: none"> ▪ Check for patterns on the walls or floor that may confuse the patient. Some patients with visual or cognitive deficits may become confused when faced with patterns or colours – this could lead to confusion or panic in the patient, possibly placing the caregiver at risk.
Distance to be traveled	<ul style="list-style-type: none"> ▪ Check the distance to be traveled. Some weight-bearing patients may become quickly fatigued and may not be able to travel long distances unassisted.
Other environmental factors: lighting, noise and temperature	<ul style="list-style-type: none"> ▪ Consider temperature, lighting levels, and noise: <ul style="list-style-type: none"> ▪ Low lighting levels may affect a caregiver's ability to avoid obstacles or otherwise prepare for the move, while lack of visual cues for the patient can lead to confusion or inability to assist. ▪ Excessive noise levels can affect the caregiver's ability to communicate with the patient. ▪ Uncomfortable temperature levels can affect the mental or physical status of the caregiver or patient and thus place the caregiver at risk.

Identification of risks from organizational factors

It is critical to note that organizational factors are taken into account when assessing a caregiver's optimal ability to provide safe and efficient care to a patient. These factors include:

- provision of education and training;
- availability of sufficient assistance to perform the patient handling task;
- workload; and
- task scheduling.

Identification of risks relating to equipment

Many different types of patient handling equipment and devices exist. It is important to assess whether the equipment and devices are appropriate for the task, readily available, and in good working order. Factors to consider include:

- functioning bed and wheelchair brakes
- adjustable bed height. Height of the bed has important consequences for the working posture of the caregiver. For heavy handling tasks, a working level between knuckle height and elbow height is recommended, while hip height is ideal for lifting and repositioning tasks. For more delicate manipulative tasks where visual requirements are important and elbows should be supported a level slightly above elbow height is recommended (Pheasant 1987).
- bed rails that can be lowered properly
- armrest(s) and/or foot rests on wheelchairs that can be displaced or removed
- removable toilet rails
- toilet seat at appropriate height
- properly functioning bath lifts and other lifting equipment
- all attachments (e.g. slings, hoists) are compatible with the available equipment
- tub, shower, toilet areas have grab bars

Please refer to Appendix 4.2 for factors indicating problems regarding purchase evaluations.

Healthcare provider's self-assessment

This assessment relates the demands of the patient handling tasks to the caregiver's own skills, capabilities, and other possible limitations. See Table 3.2.

Table 3.2 Healthcare provider's self-assessment

RISK FACTORS	RISK ASSESSMENT
Skills, education and training	Training in performing the patient handling task, including operation of the equipment, and ability with respect to patient factors, equipment and environment.
Medical & emotional status	Conditions affecting strength, endurance, judgement.. e.g. pregnancy, recent illness, medication that could affect mental or physical status. Symptoms such as drowsiness or decreased alertness could significantly affect strength, judgement and ability to respond to unexpected events during a patient handling task (Harber 1985).
Physical capabilities & fitness for the task	The size of the patient and other caregivers is to be considered when assessing the caregiver's personal size (anthropometric measurements), and physical capability to perform the task. Muscle strength and level of fatigue can be affected by workload, time of day, time of shift, or frequent lifting, affecting endurance and ability.
Clothing and accessories	Check for loose clothing, tags, etc. that could become caught or fall off during a move, and ensure that good supportive non-slip footwear is worn.

Assessing the patient

Patient assessment is meant to decrease the patient handling-related MSI risk factors. Assessments are done on an ongoing basis and should, as a minimum, consist of a thorough initial assessment (intake), ongoing mini-assessments before every handling procedure, and periodic reviews of the most recent assessment and care plan. Reviews might take place during care conference time, or in response to a change in a patient's condition and risk factors. When a patient's condition changes due to deterioration or illness, a reassessment must be done and reflected in a revised care plan.

It is important to assess the communicative, cognitive, medical, physical, behavioural and emotional status of the patient prior to any move. Factors related to clothing and assistive devices should be assessed. It is also important to assess the patient's ability and willingness to assist, whether the patient's status may change during a move, and whether there might be any medical contraindications or physical characteristics that might put the patient and/or the caregiver at risk (Blue 1996; Ferguson 1970; MacKnight and Rockwood 1996; Owen and Garg 1991). Refer to Appendix 10 for a sample care plan form. Table 3.3 provides a summary of risk factors that should be taken into consideration.

Table 3.3 Summary of patient risk factors

HISTORY	COMMUNICATION	COGNITION	MEDICAL STATUS
<ul style="list-style-type: none"> ▪ care plan ▪ previous incidents & challenges 	<ul style="list-style-type: none"> ▪ hearing (aids) ▪ visual ▪ speech ▪ language barrier ▪ sign & body language ▪ communication aids ▪ comprehension 	<ul style="list-style-type: none"> ▪ memory ▪ judgement ▪ decision making ▪ concentration ▪ ability to follow directions 	<ul style="list-style-type: none"> ▪ pain & level of discomfort ▪ diagnosis ▪ recent surgery ▪ required medical devices and constraints (e.g. splints, tubes, lines etc.) ▪ medications ▪ fatigue and stamina (e.g. orthostatic hypotension) ▪ ability to assist
PHYSICAL STATUS		BEHAVIOURAL AND EMOTIONAL STATUS	CLOTHING AND ASSISTIVE DEVICES
<ul style="list-style-type: none"> ▪ weight, height and shape ▪ sitting & standing balance (static, dynamic) ▪ weight bearing & capability ▪ muscle strength ▪ muscle tone and spasms ▪ skin and skin tone ▪ range of motion (including contractures) ▪ co-ordination ▪ ability to assist <p>Sensory deficits:</p> <ul style="list-style-type: none"> ▪ sensation & body awareness ▪ hearing & vision 		<ul style="list-style-type: none"> ▪ anxiety ▪ fear ▪ confusion ▪ hostility, violent behaviour (current, recent), aggression ▪ depression ▪ agitation ▪ verbal or physical resistance ▪ unpredictability 	<ul style="list-style-type: none"> ▪ loose, slippery clothing & tags ▪ appropriate supportive, non-slip footwear ▪ assistive devices to aid movement

History

- Check care plan for:
 - Lifting/transferring requirements
 - Anticipated changes in medical status/level of energy (throughout the day); and
 - Other identified risk factors.
- Check details of any previous incidents & challenges (e.g. violent behaviour).

Assessing the patient's level of communication:

- Check patient's ability to hear and whether they are wearing hearing aids. Ask a simple open-ended question to check on ability to hear, respond and communicate.
- Check for patient's ability to see.
- Check for language barriers, - level of communication or understanding can be a significant barrier to following directions
- Be aware of a patient's unique body language, some patients may use more body language to communicate than others – any confusion about the patient's body language could place the worker at risk.

Assessing the patient's cognitive status:

Check for deficits in cognitive functioning (i.e. deficits in memory, judgement, decision making, concentration and ability to follow directions). A patient may appear willing to co-operate in a move, but be unable to clearly understand or remember the instructions or act with poor judgement during the move – placing the health care worker at significant risk.

Assessing the patient's medical status:

- Check the medical diagnosis of the patient:
 - It may indicate contraindications to certain types of moves (care plan should reflect such information)
 - It may indicate an inability to assist or co-operate.
- Check whether the patient is experiencing any pain or discomfort, as that may

indicate contraindications for certain types of moves, or may put the health-care worker at risk (i.e. if the patient reacts unexpectedly during the move due to pain) (Blue 1996).

- Check whether or not the patient requires any medical devices to move them. Patients who use visual or hearing aids or a walker will require them in order to assist effectively. Bulky equipment or equipment with cords/wires attached presents a tripping hazard.
- Check for medications the patient may be taking:
 - Any medications which alter a patient's physical or mental status could present a hazard to the health-care worker
 - Patients may change in response to medications through the day, therefore it is important to reassess a patient prior to each move.
- Check for patient's current fatigue level or potential for fatigue during move:
 - If patient is fatigued, their physical or mental status may be compromised
 - A patient may become fatigued at different times during the day, so it is important to assess a patient's level of fatigue prior to every move (Garrett et al., 1992)
 - Some patients may appear non-fatigued at the start of a move, but become fatigued during a move – it is important to consider potential for fatigue occurring during a move.

Assessing the patient's physical status:

- Check the patient's level of physical functioning. Factors to consider include:
 - sitting balance of the patient (particularly important for tasks involving sitting on the side of a bed, sitting up in bed, or sitting up in a chair or commode; also important to consider with some types of mechanical lifts):
 - consider both static and dynamic

- sitting balance
 - impaired sitting balance creates risk of falling, or slumping into a dangerous position (MacKnight and Rockwood 1996);
 - standing balance is important (for any manual transfer tasks, and for mechanical transfer tasks which require the patient to bear some weight), as impaired standing balance will increase the risk of falls during a transfer (MacKnight and Rockwood 1996);
 - ability to bear weight (i.e. through both arms and/or at least one leg)
 - ability to bear weight through arms may indicate that patient can assist with repositioning
 - ability to weight bear on at least one leg may indicate that a patient can assist in a transfer;
 - muscle strength and range of motion;
 - co-ordination, as patients with poor coordination may have difficulties with balance or difficulty with assisting.
- Check the patient's weight and height as heavier patients may put the healthcare worker at greater risk, particularly if there are concomitant problems such as poor sitting balance, poor standing balance, or other physical, medical, cognitive, or behavioural problems. Special equipment (capable of handle heavier loads) may be required for heavy patients and taller patients may require special adaptations to prevent injury and discomfort.
- When assessing the patient's sensory status, check for sensory deficits:
 - sensation and body awareness, as patients with poor sensation or body awareness may have trouble with balance or have difficulty assisting
 - visual deficits - patients may become confused, have problems with balance, or have difficulty assisting if they have visual deficits (e.g. difficulty distinguishing patterns or colours, poor depth perception, loss of visual field or acuity)
 - hearing deficits - partial or total

PHYSICAL TESTS TO ASSESS A PATIENT'S PHYSICAL ABILITY

Purpose: to identify patient's physical ability prior to transferring or moving the patient. The following tests can be performed by the caregiver:

1. **Bridging:** With the patient lying on his/her back, both knees flexed and feet flat on the bed, ask the patient to lift his / her buttocks off the bed (as if putting a bed pan in place).
2. **Straight leg raise:** With the patient lying on his/her back, ask the patient to straighten one leg and then raise the leg off of the bed, while keeping the knee straight. Check that the knee does not begin to bend. Repeat with other leg.
3. **Balance:** The patient sits on the edge of the bed, with feet supported on the floor, and side rails down. Stand facing the patient with your feet outside of their feet, with your hands at the patient's shoulders and your knees slightly bent.
 - Tell the patient what the next steps are before acting
 - Say "Don't let me push you over"
 - Gently push the patient with one hand while the other hand blocks the movement in case the patient overbalances.

hearing loss may cause difficulty with understanding instructions.

Assessing the patient's behavioural and emotional status:

Check for any abnormal behavioural or emotional states:

- Emotions and behaviours such as anxiety, fear, hostility, depression, agitation, and verbal or physical resistance may affect a patient's ability to cope with the move and may place the caregiver at significant risk (Yassi et al., 1995).

Other factors to assess include clothing and assistive devices:

- Check for loose clothing, tags, etc. that could become caught in equipment and thus affect equipment functioning.
- Check that clothing is appropriately fastened to prevent it from falling down or off during a move. This would constitute a potential hazard if it were to get caught and distract the patient from concentrating on the move, and would also violate the right to privacy and dignity.
- Check for clothing which is made of slippery or difficult-to-grip material.
- Check that shoes/slippers are well-fitting, - supportive, and not worn out on the soles, - to better secure the patient's standing or walking balance and thus reduce risk of falls.
- Check whether the patient has any assistive devices that would accompany him/her during the move (cane, walker, etc.)

Step 2. Deciding on the appropriate patient handling technique

Once all of the potential risk factors have been identified, the next step is to decide on the appropriate patient handling technique. This decision must take all the potential risk factors identified and assessed in Step 1 into account. If there is any doubt about which method to use, the safer option should always be followed. The selected patient handling technique should always allow the patient as much independence as possible, be safe and comfortable for the patient, and should be safe for and impose the least biomechanical load on the caregiver (using good body mechanics and appropriate equipment).

Step 3. Preparing for the patient handling task

Once the risk factors have been assessed and the appropriate patient handling technique selected, it is important to prepare the environment, assistant(s), equipment, caregiver, and patient prior to proceeding.

Preparing the environment:

- Remove all potential obstacles (equipment, wires, etc) en-route from origin to destination
- Adjust lighting level as required
- Reduce/control the level of noise.

Preparing the assistant(s):

- Explain to others assisting in the move exactly what they should do, and ensure that they have been trained in the task and use of the equipment.

Preparing the equipment:

- Obtain, position and prepare the appropriate equipment (e.g. adjust bed height, apply bed brakes, and remove bed railing, adjust chair footrests, etc.)
- Make sure all attachments are available and appropriate for the selected equipment and that equipment is functioning properly.

Preparing the caregiver:

- Remove or adjust loose clothing, tags, etc.
- Be absolutely clear about the plan for moving the patient.
- Never manually lift unless mechanical lifting is medically contraindicated.
 - Manual lifting places the caregiver at significant risk for MSIs
- Avoid one-person transfer and repositioning tasks – two-person assists are recommended.
 - High biomechanical loading on the spine may occur during one-person repositioning and transfer
 - Two person assists are particularly recommended when a patient is heavier, has any risk of falling or slumping, or when more than one task is involved (i.e. inserting a bed-pan)

- Whenever sliding a patient, minimize friction by having two smooth surfaces rubbing against each other. Use of friction-reducing devices can significantly reduce biomechanical loading on the spine and facilitates patient repositioning (Sewell 1999)
- Consider leaving slings under patients after lifts, particularly for heavy patients. Removing and replacing slings may place the caregiver at increased risk for MSIs – if equipment is available, consider leaving the sling under the patient (i.e. when patient is lifted to a chair), particularly for heavy patients.

Preparing the patient:

- Explain to the patient exactly what you will be doing and encourage the patient to assist as much as possible.
- Remove or adjust loose articles of clothing, and fasten clothing which could fall off during a move.
- Ensure that all medical devices accompanying the patient are prepared for the move (e.g. catheter, heart monitor, IV line and pole, etc.)
- Ensure that the patient has the appropriate aids in place (e.g. glasses, hearing aids, footwear, cane, crutches, etc.)
- If hearing aids are used, ensure they are in working order and are switched on.

Step 4. Performing the patient handling task

Once risk factors have been adequately assessed, the required assistance is available, the appropriate patient handling technique has been selected, and the preparation tasks have been done, the caregiver is ready to proceed with the patient handling task. Mentally rehearse the move before implementing it.

General precautions for patient handling tasks:

1. **Give a starting sign and then concentrate on maintaining good body mechanics throughout the move (Owen 1985):**
 - Avoid twisting or bending the spine (twisting and bending are risk factors for MSIs):
 - position your feet in the direction you are facing
 - turn your body in the direction of the move by taking small steps or pivoting with your feet
 - pivoting with the load helps to avoid bending and twisting (Gagnon et al., 1993)
 - keep your trunk / back straight
 - keep lower back neutral (lordotic)
 - avoid twisting the spine
 - keep your head in line with your shoulders
 - move your whole body in the direction of the move
 - use smooth movements - do not jerk.
2. **Maintain balance and stability (to avoid falls and movements due to poor posture):**
 - keep your feet shoulder-width apart and one foot a half-step forward to widen the base of support and thus improve balance and stability
 - bend your knees slightly to lower your centre of gravity and thus improve balance and stability
3. **Use both hands and arms to hold the patient closely.**
 - Keeping the patient closer reduces required exertion of strength and improves balance, thus decreasing risk of injury.
4. **Be sure you have assessed the situation for all potential risk factors before proceeding.**
5. **Always be prepared for the unexpected.**
6. **If something does not seem safe, reassess the situation.**
7. **If in doubt about a patient handling task, always choose the safer option.**

8. **The patient handling task should always be safe and comfortable for both the caregiver and the patient.**
 9. **Always encourage the patient to contribute as much as possible.**
 10. **Always explain what you will do, both with the patient and with your partner (if more than one person is assisting).**
 11. **Never hurry through a patient handling task.**
 12. **Always maintain good body mechanics throughout a patient handling task.**
 13. **Take small breaks during multiple-step patient handling tasks.**
 14. **Transfer patients over the shortest distance possible, in stages if necessary.**
 15. **Transfer patients towards their strongest side (in most cases).**
 16. **Never grasp the patient under the armpits – this can cause shoulder injury to the patient.**
 17. **Where possible, select a partner of similar height when performing a patient lift or transfer.**
- were proper body mechanics used).
 - If a selected patient handling technique was not appropriate for the patient involved, inform others who may also be working with the patient, ensure that the patient's care plan is reviewed for any necessary changes and updated as required. Communicate any care plan changes to all appropriate staff.
 - If necessary equipment was not available or functioning properly, inform supervisor or maintenance staff.

Step 5. Evaluating the completed patient handling task

Evaluate the patient handling task after it has been completed:

- Review the procedures used and identify any problems encountered, possible causes of the problems, and required changes (i.e. was the correct technique used, was the equipment appropriate and functioning properly, was the patient comfortable during the move,

Section 4:

Recommended Guidelines for Individual Tasks:

This section provides OHSAH-recommended guidelines for twenty selected patient handling tasks in acute, long term and home care settings. To reduce the risk of injury during all patient-handling tasks, caregivers should be trained in safe and effective techniques, and should utilize both good body mechanics and all appropriate equipment.

The basic criteria for these Guidelines are based on the following three principles:

1. **Unnecessary patient handling should be avoided: lifts or transfers should be done only when necessary**

2. **One person vs. two person handling:**
National and international research identifies one-person patient handling tasks as being of high risk for injury for both the patient and the staff. OHSAH, therefore, recommends using two persons for all but supervised and some minimal assistance patient-handling tasks. One-person patient handling tasks should only be undertaken following a thorough assessment that takes into account all potential ergonomic risk factors for MSIs.

3. **Manual lifting vs. lifting equipment:**
National and international research identifies manual lifting as a high risk for injury for both the patient and the staff. OHSAH, therefore, recommends using mechanical equipment unless medically contraindicated. NIOSH indicates that, under ideal conditions, the recommended weight limit for one person to lift is 23 kg. 'Ideal conditions' rarely exist with patient lifts and transfers. When mechanical lifting is medically contraindicated, it is vital to ensure sufficient staff.

The task-specific guidelines in this section are based on the following patient characteristics and levels of assistance required during patient handling tasks.

Patient Characteristics:

Patient unable to assist

When a patient may be willing to assist but is unable to do so due to some physical, behavioural or cognitive limitation(s).

Patient unwilling to assist

When a patient is physically or behaviourally resisting the move.

Inconsistent patient

When a patient's behavioural, cognitive or physical status is unpredictable or may alter during the move.

Levels of Lift/Transfer/Repositioning Tasks:

Independent

Patient does not require any assistance.

Supervised

Patient requires verbal reminders or assistance with equipment.

Semi-dependent (Minimal assist)

Patient requires minimal physical assistance during move.

Semi-dependent (Moderate assist)

Patient requires moderate physical assistance during move.

Dependent

Patient is unwilling and/or unable to assist and/or is inconsistent and/or is heavy, thus requiring total assistance during move.

Table 4.1.1 Sitting a patient up in bed

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES	COMMUNITY CARE GUIDELINES
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal reminders or assist with equipment as necessary.	Provide verbal reminders to client or assist with equipment as necessary.
3. Minimal assistance	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient to use monkey bar, bed ladder, etc ¹ ▪ Remember to engage knee controls (reduces pressure on client's lower back) ² ▪ Raise head of the bed ▪ Use more staff if necessary 	<p>Same instructions as for acute care.</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ If available, consider use of monkey bar, bed ladder, etc. by client ¹ ▪ Remember to support knees with pillow (important for reducing pressure on client's lower back) ² ▪ If in a hospital bed, consider raising the head of the bed ▪ Position for comfort ▪ Raise head of the bed
4. Moderate assistance	<p>Use 1 staff on each side of bed</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient to use monkey bar, bed ladder, etc ¹ ▪ Remember to engage knee controls (important for pressure reduction) ² ▪ Consider raising the head of the bed 	<p>Use 1 staff on each side of bed</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ If available, consider use of monkey bar, bed ladder, etc. by client ¹ ▪ Remember to support knees (important for reducing pressure in clients) ² ▪ Position for comfort ▪ If hospital bed, consider raising the head of the bed
5. Dependent	<p>Use mechanical lift ^{3, 4}</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Leave sling in place ▪ Use third staff to position pillows, etc. ▪ If a mechanical lift is medically contraindicated, or unavailable, ensure sufficient staff to avoid exceeding NIOSH safe weight limit 	<p>Use mechanical lift ^{3, 4}</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Leave sling in place ▪ Use third staff to position pillows, etc. ▪ If a mechanical lift is medically contraindicated, or unavailable, ensure sufficient staff to avoid exceeding NIOSH safe weight limit

(1) Corlett et al. ,1994. (2) Clinical Practice Guidelines 1992 (3) Marras et al., 1999. (4) Ulin et al.,1997.

Table 4.1.2 Turning a patient in bed

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES (Often a follow-up to repositioning a client to side of bed)	COMMUNITY CARE GUIDELINES (Often a follow-up to repositioning a client to side of bed)
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal cues or assist with equipment, as required.	Provide verbal reminders for client or assist with equipment, as required.
3. Minimal assistance	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist.</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Use soaker pads if available ^{1, 2} ▪ Cross patient/resident's ankles in the direction of the turn ▪ Use more staff as necessary 	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Use soaker pads if available ^{1, 2} ▪ Cross client's ankles in the direction of the turn ▪ Use more staff as necessary
4. Moderate assistance	<p>Use 2 or more staff ³</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Use bed pads if available ^{1, 2} ▪ Cross patient's ankles in the direction of the turn 	<p>Use 2 or more staff ³</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Use bed pads if available ^{1, 2} ▪ Cross client's ankles in the direction of the turn
5. Dependent	<p>Use mechanical lift ^{3, 4}</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Cross patient's ankles in the direction of the turn ▪ Use a sliding sheet and additional staff as necessary ▪ If a mechanical lift is medically contraindicated, or unavailable, ensure sufficient staff to avoid exceeding NIOSH safe weight limit 	<p>Use mechanical lift ^{3, 4}</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Cross client's ankles in the direction of the turn ▪ Consider using a sliding sheet and additional staff as necessary ▪ If a mechanical lift is unavailable or medically contraindicated ensure sufficient staff to avoid exceeding NIOSH safe weight limit

(1) Sewell 1999. (2) Caregivers of Ontario Safety and Health Association, 1992. (3) Marras et al., 1999. (4) Ulin et al., 1997.

Table 4.1.3 Repositioning a patient to side of bed

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES	COMMUNITY CARE GUIDELINES
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal reminders or assist with equipment as necessary.	Provide verbal reminders for client or assist with equipment as necessary.
3. Minimal assistance	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient/resident to assist ▪ Use friction-reducing equipment e.g. sliding sheets, sliding boards ^{1,2,3,4,5,6} ▪ If the patient/resident is light consider using a soaker pad and 2 staff 	<p>See instructions as for acute care.</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Use friction-reducing equipment e.g. sliding sheets, sliding boards ^{1,2,3,4,5,6} ▪ If unavailable, improvise e.g. garbage bags ▪ If client is light consider using a soaker pad and 2 staff
4. Moderate assistance	<p>Use 2 or more staff</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Use friction-reducing equipment e.g. sliding sheets, sliding boards ^{1,2,3,4,5,6} ▪ If patient is light consider using a soaker pad and 2 staff. ▪ As weight and/or dependence of patient increases, so should number of staff and slides 	<p>Use 2 or more staff</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Use friction-reducing equipment e.g. sliding sheets, sliding boards ^{1,2,3,4,5,6} ▪ If unavailable, improvise e.g. garbage bags ▪ If client is light use a soaker pad and 2 staff. ▪ As weight and/or dependence of client increases, so should number of staff and slides
5. Dependent	<p>Use mechanical lift or 2 or more staff and sliding sheets ^{7,8}</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Use friction reducing equipment e.g. sliding sheets ^{1,2,7} ▪ For heavy/large patient consider extra large sliding sheets ▪ Leave sliding sheet in place ▪ Use additional staff as necessary ▪ If a mechanical lift is medically contraindicated, or unavailable, ensure sufficient staff to avoid exceeding NIOSH safe weight limit 	<p>Use mechanical lift or 2 or more staff and sliding sheets ^{7,8}</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Use friction reducing equipment e.g. sliding sheets ^{1,2,7} ▪ If unavailable, improvise e.g. garbage bags ▪ For heavy/large clients consider extra large sliding sheets ▪ Leave sliding sheet in place ▪ If a mechanical lift is medically contraindicated or unavailable ensure sufficient staff to avoid exceeding NIOSH safe weight limit

(1) Bohannon 1999. (2) Crescimbeni 1997. (3) Jenson 1987. (4) Robertson 1997. (5) Sewell 1999. (6) Zelenka et al., 1996. (7) Marras et al., 1999. (8) Ulin et al., 1997.

Table 4.1.4 Boosting a patient up in bed

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES	COMMUNITY CARE GUIDELINES
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal reminders or assist with equipment as necessary.	Provide verbal reminders for client or assist with equipment as necessary.
3. Minimal assistance	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Use friction reduction equipment e.g. slide sheets ^{1,2} ▪ Encourage patient using monkey bar etc.³ ▪ Lower head of the bed to allow gravity to assist, or use the Trendelenburg position with an electric bed ▪ Use additional staff as required 	<p>See instructions as for acute care.</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Use friction reduction equipment e.g. slide sheets ^{1,2} ▪ If unavailable, improvise e.g. garbage bags ▪ If in hospital style bed, consider use of monkey bar etc. by client ³
4. Moderate assistance	<p>Use 2 or more staff ^{4,5}</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Use friction reduction equipment e.g. slide sheets ^{1,2} ▪ Use a soaker pad and 2 staff with a light patient, with heavier patient/residents use slider board or sheets and additional staff as required ▪ Consider patient using monkey bar etc ³ ▪ Consider lowering the head of the bed to allow gravity to assist, or use the Trendelenburg position with an electric bed 	<p>Use 2 or more staff ^{4,5}</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Use friction reducing equipment e.g. slide sheets ^{1,2} ▪ If unavailable, improvise e.g. garbage bags ▪ Use a soaker pad and 2 staff with light clients; with heavier clients use slider board or sheets and additional staff as required ▪ If hospital style bed, consider use of monkey poles etc. by client ³
5. Dependent	<p>Use 2 or more staff ⁶</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Use low friction material e.g. slide sheets, or mechanical lift ^{4,7} ▪ If a mechanical lift is medically contraindicated, or unavailable, ensure sufficient staff to avoid exceeding NIOSH safe weight limit 	<p>Use 2 or more staff ⁶</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Same as for acute and long term care.

(1) Jenson 1987. (2) Robertson 1997. (3) Corlett et al., 1994. (4) Marras et al., 1999. (5) Meyer and Muntaner 1998. (6) Daynard et al., 2000. (7) Ulin et al., 1997.

Table 4.1.5 Inserting a bedpan

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES	COMMUNITY CARE GUIDELINES
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal reminders or assist with equipment as necessary.	Provide verbal reminders for client or assist with equipment as necessary.
3. Minimal assistance	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Consider 2nd staff to position bed pan ▪ If available, encourage use of monkey bar by patient ¹ ▪ Consider providing stabilizing equipment (e.g. bed rails, hand blocks, etc.)¹ 	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Consider 2nd staff to position bed pan ▪ Consider providing stabilizing equipment for client (e.g. hand-blocks, etc) ¹ ▪ Offer pillows for support
4. Moderate assistance	<p>Use 2 staff ²</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Consider using pelvic lift device ³ ▪ Consider 3rd staff to position bed pan ▪ If available, encourage use of monkey bar by patient ¹ ▪ Consider providing stabilizing equipment (e.g. bed rails, hand-blocks, etc.)¹ 	<p>Use 2 staff ²</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Consider using pelvic lift device ³ ▪ Consider 3rd staff to position bed pan ▪ Consider providing stabilizing equipment for patient (e.g. hand-blocks, etc) ¹ ▪ Consider pillows for support
5. Dependent	<p>Use mechanical lift ⁴</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ If a mechanical lift is medically contraindicated, or unavailable, ensure sufficient staff to avoid exceeding NIOSH safe weight limit 	<p>Use mechanical lift ⁴</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Consider ceiling track lift ▪ If a mechanical lift is medically contraindicated, or unavailable ensure sufficient staff to avoid exceeding NIOSH safe weight limit

(1) Corlett et al., 1994. (2) Marras et al., 1999. (3) Owen et al., 1995. (4) Holliday et al., 1994.

Table 4.1.6 Sitting a patient up on side of bed

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES (This may be a follow-up to a previous repositioning technique)	COMMUNITY CARE GUIDELINES (This may be a follow-up to a previous repositioning technique)
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal reminders or assist with equipment as necessary.	Provide verbal reminders for client or assist with equipment as necessary.
3. Minimal assistance	Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist Key considerations: <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Have patient use monkey bar, rope ladder, etc ¹ ▪ Consider raising head of the bed. 	Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist Key considerations: <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ If in hospital style bed, use of monkey bar, rope ladder, etc. by client where available ¹ ▪ If in hospital style bed, raise head of the bed
4. Moderate assistance	Use 2 or more staff ² Key considerations: <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Have patient use monkey bar, rope ladder, etc ¹ ▪ Raise head of the bed ▪ Consider patient's sitting balance 	Use 2 or more staff ² Key considerations: <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ If hospital style bed, consider use of monkey bar, rope ladder, etc. by client where available ¹
5. Dependent	Use a mechanical lift ² Key considerations: <ul style="list-style-type: none"> ▪ If a mechanical lift is medically contraindicated, or unavailable, ensure sufficient staff to avoid exceeding NIOSH safe weight limit 	Use a mechanical lift ² Key considerations: <ul style="list-style-type: none"> ▪ If a mechanical lift is medically contraindicated, or unavailable, ensure sufficient staff to avoid exceeding NIOSH safe weight limit.

(1) Corlett et al., 1994. (2) Marras et al.,1999.

Table 4.2.1 Boosting patient up in low-back/high-back chair

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES	COMMUNITY CARE GUIDELINES
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal reminders or assist with equipment as necessary.	Provide verbal reminders for client or assist with equipment as necessary.
3. Minimal assistance	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ When repositioning legs, consider 2nd staff to push/slide, not lift, legs 	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ When repositioning legs, consider 2nd staff to push/slide, not lift, legs
4. Moderate assistance	<p>Use mechanical sit to stand or total body transfer aid, or 2 staff and transfer belt ¹</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient/resident to assist ▪ Use 3rd staff to push/slide, not lift, when repositioning legs ▪ Use a transfer belt and a sheet to assist 	<p>Use mechanical sit to stand or total body transfer aid, or 2 staff and transfer belt ¹</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Use 3rd staff to push/slide, not lift, when repositioning legs
5. Dependent	<p>Use mechanical lift and 2 staff ^{2, 3}</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Leave sling under patient ▪ If a mechanical lift is medically contraindicated, or unavailable, ensure sufficient staff to avoid exceeding NIOSH safe weight limit. 	<p>Use 2 staff and mechanical lift ^{2, 3}</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Leave sling under client ▪ If a mechanical lift is medically contraindicated, or unavailable ensure sufficient staff to avoid exceeding NIOSH safe weight limit

(1) Daynard et al., 2000. (2) Marras et al., 1999. (3) Varcin-Coad and Barrett 1998.

Table 4.2.2 Boosting patient up in recliner chair

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES	COMMUNITY CARE GUIDELINES
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal reminders or assist with equipment as necessary.	Provide verbal reminders for client or assist with equipment as necessary.
3. Minimal assistance	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk, 1 staff may assist.</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Use transfer/walking gait belt ^{1,2} ▪ Encourage patient to assist ▪ Consider weight of patient and use additional staff as needed 	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist.</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Use transfer/walking gait belt ^{1,2} ▪ Encourage client to assist ▪ Consider weight of client and use additional staff as needed. ▪ Consider mechanical lift
4. Moderate assistance	<p>Use 2 staff with transfer/gait belt ^{1, 2}</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Consider weight of patient ▪ Consider mechanical lift 	<p>Use 2 staff with transfer/walking gait belt ^{1, 2}</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Consider weight of client. ▪ Consider mechanical lift
5. Dependent	<p>Use a mechanical lift ¹</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Leave sling in place ▪ If a mechanical lift is medically contraindicated, or unavailable, ensure sufficient staff to avoid exceeding NIOSH safe weight limit 	<p>Use a mechanical lift ¹</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Leave sling in place ▪ If a mechanical lift is medically contraindicated, or unavailable ensure sufficient staff to avoid exceeding NIOSH safe weight limit

(1) Laflin and Aja 1995. (2) Owen and Garg 1993.

Table 4.3.1 Bed to/from chair/commode

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES	COMMUNITY CARE GUIDELINES
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal reminders or assist with equipment as necessary.	Provide verbal reminders for client or assist with equipment as necessary.
3. Minimal assistance	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Use transfer belts ¹ ▪ Consider sit to stand transfer aid ² 	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Use transfer belts ¹, or ▪ If available, consider sit to stand transfer aid ²
4. Moderate assistance	<p>Use mechanical sit to stand transfer aid ⁴, unless patient is reliable, light-weight, and consistent</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ If patient is reliable consider transfer belts ¹ 	<p>Use mechanical sit to stand transfer aid ⁴, unless patient is reliable, light-weight, and consistent</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ If client is reliable consider transfer belts ¹
5. Dependent	<p>Use mechanical lift ⁴</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ If a mechanical lift is medically contraindicated, or unavailable, ensure sufficient staff to avoid exceeding NIOSH safe weight limit 	<p>Use mechanical lift except in emergencies ⁴</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ If a mechanical lift is medically contraindicated, or unavailable consider only providing care to the client while in bed ▪ In emergencies ensure sufficient staff to avoid exceeding NIOSH safe weight limit

(1) Owen and Garg 1991. (2) Daynard et al., 2000. (3) Engkvist et al., 1998. (4) Ljungberg et al., 1989.

Table 4.3.2 Wheelchair to/from chair

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES	COMMUNITY CARE GUIDELINES
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal reminders or assist with equipment as necessary. Consider transfer board if arms of chair recess or can be removed ¹	Provide verbal reminders for client or assist with equipment as necessary. Consider transfer board if arms of chair recess or can be removed ¹
3. Minimal assistance	Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist Key considerations: <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Use transfer belt ▪ Use transfer board if arms of chair lower or can be removed ¹ 	Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist Key considerations: <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Use transfer belt ▪ Use transfer board if arms of chair lower or can be removed ¹
4. Moderate assistance	Use 2 staff Key considerations: <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Use transfer belt if patient is reliable, or ▪ Use sit to stand transfer aid 	Use 2 staff Key considerations: <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Use transfer belt if client is reliable, or ▪ If available, use sit to stand transfer aid
5. Dependent	Use mechanical lift ^{2, 3} Key considerations: <ul style="list-style-type: none"> ▪ If a mechanical lift is medically contraindicated, or unavailable, ensure sufficient staff to avoid exceeding NIOSH safe weight limit 	Use mechanical lift except in emergencies ^{2, 3} Key considerations: <ul style="list-style-type: none"> ▪ If a mechanical lift is medically contraindicated, or unavailable consider only providing care to the client while in bed

(1) Adams et al., 1999. (2) Blue 1996. (3) Ljungberg et al., 1989

Table 4.3.3 Bed to/ from stretcher, both with adjustable height

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES	COMMUNITY CARE GUIDELINES
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal reminders or assist with equipment as necessary.	Provide verbal reminders for client or assist with equipment as necessary.
3. Minimal assistance	Use friction reducing transfer device ^{1, 2} Use 3 staff Key considerations: <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ If available, consider patient using monkey bar ³ 	Use friction reducing transfer device ^{1, 2} Use 3 staff Key considerations: <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ If in hospital type bed, consider client using monkey bar ³
4. Moderate assistance	Use friction reducing transfer device ^{1, 2} Use a minimum 3 staff Key considerations: <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ If available, consider patient using monkey bar ³ 	Use friction reducing transfer device ^{1, 2} Use a minimum 3 staff Key considerations: <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ If in hospital type bed, consider client using monkey bar ³
5. Dependent	Use mechanical lift ^{4,5} , or friction reducing device and additional staff as needed (minimum 3) Key considerations: <ul style="list-style-type: none"> ▪ If a mechanical lift is medically contraindicated, or unavailable, ensure sufficient staff to avoid exceeding NIOSH safe weight limit 	Use mechanical lift ^{4, 5} , or friction reducing device and sufficient additional staff to avoid exceeding NIOSH safe weight limit

(1) Bohannon 1999. (2) Zelenka et al., 1996. (3) Crescimbeni 1997. (4) Blue 1996. (5) Ljungberg et al., 1989.

Table 4.3.4 Up from floor

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES (ASSESSMENT FOR INJURIES BY A QUALIFIED PERSON)	COMMUNITY CARE GUIDELINES
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	<ul style="list-style-type: none"> ▪ Provide verbal reminders or assist with equipment as necessary. ▪ Provide a chair for patient 	<ul style="list-style-type: none"> ▪ Provide reminders/cues for client or assist with equipment as necessary. ▪ Provide a chair for client
3. Minimal assistance	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Provide a chair for patient ▪ Use transfer belt - do not lift 	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Provide a chair for client ▪ Use transfer belt - do not lift
4. Moderate assistance	<p>Use mechanical lift</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Mechanical lift is the first choice unless contraindicated due to injury or medical condition ¹ 	<p>Use mechanical lift</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Provide a chair for client ▪ Mechanical lift is the first choice unless contraindicated due to injury or medical condition ¹ ▪ If a mechanical lift is unavailable or contraindicated call for assistance as per workplace procedure or 911
5. Dependent	<p>Mechanical lift is the first choice, unless contraindicated due to injury or medical condition¹</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Straight slings are available so that hip flexion can be eliminated ▪ If mechanical lift is contraindicated, ensure availability of sufficient staff to avoid exceeding NIOSH safe weight limit minimum six staff) ▪ In a long term care facility, consider calling 911 if additional assistance is required 	<p>Mechanical lift unless contraindicated due to injury or medical condition ¹</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ If a mechanical lift unavailable or contraindicated call for assistance as per workplace procedure or 911

(1) Smedley et al., 1997.

Table 4.3.5 Toileting

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES	COMMUNITY CARE GUIDELINES
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal reminders or assist with equipment as necessary.	Provide reminders/cues for resident or assist with equipment as necessary.
3. Minimal assistance	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist.</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Consider layout of bathroom ¹ ▪ Consider transferring to a commode in a more spacious area outside of bathroom ▪ Use transfer belt ¹ or consider sit to stand transfer aid 	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist.</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Consider layout of bathroom ¹ ▪ Consider transferring to a commode in a more spacious area and then wheeling to bathroom ▪ Use transfer belt ¹, or ▪ Consider sit to stand transfer aid
4. Moderate assistance	<p>Use 2 staff ^{1, 2, 3}</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Consider layout of bathroom ¹ or ▪ Consider transferring to a commode in a more spacious area outside of the bathroom ▪ Use transfer belt ¹, or consider sit to stand transfer aid 	<p>Use 2 staff ^{1, 2, 3}</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Consider layout of bathroom ¹ ▪ Consider transferring to a commode in a more spacious area and then wheeling to the bathroom ▪ Use transfer belt ¹, or ▪ Consider sit to stand transfer aid
5. Dependent	<p>Use mechanical lift ⁴</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Consider layout of bathroom ¹ ▪ Consider lifting to a commode in a more spacious area and then wheeling to the bathroom ▪ If a mechanical lift is medically contraindicated, or unavailable, ensure sufficient staff to avoid exceeding NIOSH safe weight limit 	<p>Use mechanical lift ⁴</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Consider layout of bathroom ¹ ▪ Consider lifting to a commode in a more spacious area and then wheeling to the bathroom ▪ If a mechanical lift is medically contraindicated ensure sufficient staff to avoid exceeding NIOSH safe weight limit

(1) Owen and Garg 1991. (2) Caska et al., 1988. (3) Owen et al., 1992. (4) Ljungberg et al., 1989.

Table 4.3.6 Car transfer

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES	COMMUNITY CARE GUIDELINES
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal reminders or assist with equipment as necessary.	Provide verbal reminders for client or assist with equipment as necessary.
3. Minimal assistance	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Consider patient's ability to assist ▪ Use a transfer belt ▪ Use assistive devices e.g. transfer board, sit to stand transfer aid (ensure compatibility with vehicle) ¹ 	<p>Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Consider client's ability to assist ▪ Use a transfer belt ▪ Use assistive devices e.g. transfer board, sit to stand transfer aid (ensure compatibility with vehicle) ¹
4. Moderate assistance	<p>Use 2 or more staff ¹</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Consider patient's sitting balance ▪ Consider patient's ability to assist ▪ Use a transfer belt ▪ Use assistive devices e.g. transfer board, sit to stand transfer aid (ensure compatibility with vehicle) ¹ 	<p>Use 2 or more staff ¹</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ Consider patient's sitting balance ▪ Consider patient's ability to assist ▪ Use a transfer belt ▪ Use assistive devices e.g. transfer board, sit to stand transfer aid (ensure compatibility with vehicle) ¹
5. Dependent	<ul style="list-style-type: none"> ▪ Consider wheelchair van with a mechanical lift, otherwise not recommended 	Consider wheelchair van with a mechanical lift otherwise not recommended

(1) Adams et al., 1999.

Table 4.3.7 Chair to/from tub - In all cases the bathtub needs a high friction base.

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES	COMMUNITY CARE GUIDELINES
1. Independent	Key considerations: <ul style="list-style-type: none"> ▪ Encourage independence ▪ Consider shower with shower chair and/or bath aids e.g. bath seat, bath board, grab bars, telephone shower head 	Encourage independence. Key considerations: Consider bath aids e.g. bath seats, bath boards
2. Supervised	Key considerations: <ul style="list-style-type: none"> ▪ Provide verbal reminders or assist with equipment as necessary ▪ Consider bath aids e.g. bath seats, bath boards, grab bars, telephone shower head 	Key considerations: <ul style="list-style-type: none"> ▪ Provide verbal reminders for client or assist with equipment as necessary. ▪ Consider bath aids e.g. bath seats, bath boards, grab bars, telephone shower head and shower chair
3. Minimal assistance	Where in-depth assessments indicate there is low risk 1 staff may assist Key considerations: <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Use transfer belt ¹ ▪ Consider shower with shower chair. ▪ Consider bath aids e.g. bath seats, bath boards, grab bars, telephone shower head and shower chair 	Where in-depth assessments indicate there is low risk 1 staff may assist Key considerations: Encourage client to assist Use transfer belt ¹ <ul style="list-style-type: none"> ▪ Consider shower with shower chair. ▪ Consider bath aids e.g. bath seats, bath boards, grab bars, telephone shower head
4. Moderate assistance	Use 2 staff ² Key considerations: <ul style="list-style-type: none"> ▪ Use tub with attached lift ³ or consider shower with shower chair, grab bars, telephone shower head. 	Use 2 staff ² Key considerations: <ul style="list-style-type: none"> ▪ Consider bath aids e.g. bath seats, bath boards ▪ Consider portable lift attached to side of tub ³ or ▪ Consider shower with shower chair, grab bars, telephone shower head
5. Dependent	Use a mechanical lift except in an emergency ¹ Key considerations: <ul style="list-style-type: none"> ▪ If a mechanical lift is medically contraindicated, or not available, tub bath is not recommended ▪ Consider shower stretcher ▪ Consider bed bath; for hair-washing use an inflatable basin ▪ In an emergency situation e.g. power outage or lift failure, to transfer patient/resident from tub, consider a non-electric lift, otherwise ensure availability of sufficient staff 	Use a mechanical lift except in an emergency ¹ Key considerations: <ul style="list-style-type: none"> ▪ Consider portable lift added to side of tub ³, or ▪ Consider shower stretcher ▪ If a mechanical lift is medically contraindicated or unavailable consider only providing care to the client while in bed ▪ In emergency call 911

(1) Garg et al., 1991b. (2) Caska et al., 1988. (3) Jenson 1987.

Table 4.4.1 Assisted walking

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES	COMMUNITY CARE GUIDELINES
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal reminders or assist with equipment as necessary.	Provide verbal reminders for client or assist with equipment as necessary.
3. Minimal assistance	Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist Key considerations: <ul style="list-style-type: none"> ▪ Use walking aids if applicable ▪ Use a transfer or walking gait belt ^{1, 2} 	Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist Key considerations: <ul style="list-style-type: none"> ▪ Use walking aids if applicable ▪ Use a transfer or walking gait belt ^{1, 2}
4. Moderate assistance	Use 2 staff Key considerations: <ul style="list-style-type: none"> ▪ Use walking aids if applicable ▪ Use a transfer or walking gait belt ^{1, 2} ▪ Consider mechanical ambulation aids 	Use 2 staff ³ Key considerations: <ul style="list-style-type: none"> ▪ Use walking aids if applicable ▪ Use a transfer or walking gait belt ^{1, 2}, or ▪ Consider mechanical ambulation aids
5. Dependent	▪ Not recommended	Not recommended

(1) Jenson 1987. (2) Owen and Garg 1991. (3) Engkvist et al., 1998.

Table 4.4.2 Lowering a patient to the floor

LEVEL OF REPOSITION	ACUTE AND LONGTERM GUIDELINES	COMMUNITY CARE GUIDELINES
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal reminders or assist with equipment as necessary.	Provide verbal reminders client or assist with equipment as necessary.
3. Minimal assistance	<p>Patient to wear a transfer belt for ambulation ¹</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ If patient is falling staff should never try to stop the fall or hold the patient in a standing position. Control the lowering to the floor ² 	<p>Client to wear transfer belt for ambulation ¹</p> <p>Key consideration:</p> <ul style="list-style-type: none"> ▪ If client is falling staff should never try to stop the fall or hold the client in a standing position. Control the lowering to the floor ²
4. Moderate assistance	<p>Patient to wear transfer belt for ambulation ¹</p> <p>Key considerations:</p> <ul style="list-style-type: none"> ▪ If patient is falling, never try to stop the fall or hold the patient in a standing position. Control the lowering to the floor ² 	<p>Client to wear transfer belt for ambulation ¹</p> <p>Key consideration:</p> <ul style="list-style-type: none"> ▪ If client is falling, staff should never try to stop the fall or hold the client in a standing position. Control the lowering to the floor ²
5. Dependent	<ul style="list-style-type: none"> ▪ If patient is falling, never try to suspend the fall or hold the patient in a standing position. Control the fall to the floor ² 	<ul style="list-style-type: none"> ▪ If client is falling, staff should never try to suspend the fall or hold the client in a standing position. Control the fall to the floor ²

(1) Jenson 1987. (2) Engkvist et al., 1998.

Table 4.4.3 Stairs

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES	COMMUNITY CARE GUIDELINES
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal reminders or assist with equipment as necessary.	Provide verbal reminders for client or assist with equipment as necessary.
3. Minimal assistance	Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist Key consideration: ▪ Patient should wear a transfer belt ¹	Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist Key consideration: ▪ Client should wear a transfer belt ¹
4. Moderate assistance	Use 2 staff Key consideration: ▪ Patient should wear a transfer belt ¹	Use 2 staff Key consideration: ▪ Client should wear a transfer belt when walking ¹
5. Dependent	Not applicable	Not applicable

(1) Jenson 1987.

Table 4.5.1 Washing and bathing

LEVEL OF REPOSITION	ACUTE AND LONGTERM CARE GUIDELINES	COMMUNITY CARE GUIDELINES
1. Independent	Encourage independence.	Encourage independence.
2. Supervised	Provide verbal reminders or assist with equipment as necessary. <ul style="list-style-type: none"> ▪ Consider step in or walk in shower 	Provide verbal reminders for client or assist with equipment as necessary. <ul style="list-style-type: none"> ▪ Consider walk in shower
3. Minimal assistance	Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk, 1 staff may assist Key considerations: <ul style="list-style-type: none"> ▪ Encourage patient to assist ▪ Consider bathroom design/layout, and floor condition: wet? slippery? ▪ Consider walk in shower or tub with seat/chair ▪ Consider bath aids e.g. grab bars ▪ Consider washing in bed or chair 	Research reports that one person patient handling is a high risk for injury. However, where in-depth assessments indicate there is low risk 1 staff may assist Key consideration: <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Consider bathroom design/layout, and floor condition: wet? slippery? ▪ Consider walk in shower with seat/chair ▪ Consider bath aids e.g. grab bars ▪ Consider bathroom location. Upstairs: can client climb up stairs?. If not, bed bath or strip wash
4. Moderate assistance	Use 2 staff Key considerations: <ul style="list-style-type: none"> ▪ Encourage patient/resident to assist ▪ Consider floor condition: wet? slippery? ▪ Consider walk in showers or tubs with seats/chair ▪ Consider using bath aids e.g. bath boards, bath seats/chair, grab bars ▪ Consider tubs with attached lifts ▪ Are tub heights adjustable? ▪ Consider washing in bed or chair 	Use 2 staff Key consideration: <ul style="list-style-type: none"> ▪ Encourage client to assist ▪ Consider bathroom design/layout, and floor condition: wet? slippery? ▪ Consider using bath aids e.g. bath boards, bath seats/chair, grab bars ▪ Consider shower with shower seat/chair ▪ If unavailable, wash in bed or chair
5. Dependent	<ul style="list-style-type: none"> ▪ Mechanical lift for bathing in tubs. If lift unavailable, or contraindicated, wash in bed or in chair 	Use mechanical lift for bathing in tub. If lift unavailable, or contraindicated, wash in bed or in chair Key consideration: <ul style="list-style-type: none"> ▪ Consider location of bathroom ▪ Consider floor condition: wet? slippery? ▪ Consider bathroom space. If insufficient space for lift and staff, wash in bed or in chair

Table 4.6.1 Operating table to/from stretcher

In some cases, a patient may be conscious during day surgery. Normally a patient would be unconscious or should be treated as unconscious for treatment purposes.

LEVEL OF REPOSITION	ACUTE CARE GUIDELINES
1. Independent	Independent transfer is suitable, otherwise treat as dependent Key considerations: <ul style="list-style-type: none"> ▪ Consider bed/table/stretchers with adjustable height ¹
2. Supervised	Provide verbal cues for patient or assist with equipment as necessary, otherwise treat as dependent Key considerations: <ul style="list-style-type: none"> ▪ Consider bed/table/stretchers with adjustable height ¹
3. Dependent	Use a specially designed lift for operating rooms with a stretcher sling when appropriate. If lift is medically contraindicated, use a sliding device with a minimum of 3 staff ² . Five staff are commonly used. Key considerations: <ul style="list-style-type: none"> ▪ Control the patient's airway/head ² ▪ Consider specially designed stretchers with mechanically movable mattresses ▪ Use bed/table with adjustable height ¹ ▪ Consider patient roller ³ ▪ If lift medically contraindicated, consider adjusting height of table/stretcher to allow downhill move (maximum 1½ inch) ¹ ▪ If a mechanical lift is medically contraindicated, or unavailable, ensure sufficient staff to avoid exceeding NIOSH safe weight limit

(1) Blue 1996. (2) Corlett et al., 1994. (3) Zelenka 1996.

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APPENDICES

APPENDIX 1 Synopsis of findings from biomechanics studies

Summary of studies of situations where patient handling tasks have exceeded NIOSH recommended guidelines include:*

- Patient handling tasks identified by nurses as being stressful to the back included transfer tasks; particularly toileting, transferring from chair to/from bed, lifting a patient in bed, and repositioning a patient in bed (Owen et al., 1992). Compressive forces at the L5/S1 disc for chair to/from bed and chair to/from toilet exceeded the NIOSH guidelines of 3400 N in this study (ranging from 3676 to 4877 N).
- Compressive forces at the L5/S1 disc for manually lifting a patient onto a scale chair averaged 4960 N as compared to 1258 N when the patient was pushed onto the scale in a wheelchair (Owen and Garg 1994).
- Study examined pull forces required to move supine subjects between adjacent surfaces using different devices and methods. Found that the use of friction-reducing devices was associated with reduced pull forces and that all methods highly correlated with patient weight (Grey et al. 1996).
- Study examined friction-reducing transfer devices for bed to stretcher transfers. Suggested that all healthcare workers should obtain assistance, whether mechanical or from fellow workers, when transferring patients (Zelenka et al., 1996).
- Repositioning a slumped person in a wheelchair: compared unassisted lift, vertically assisted lift, and horizontally assisted lift using 2 patient masses (65 and 75 kg). All exceeded NIOSH guidelines (though horizontally assisted was the lowest). (Varcin-Coad and Barrett 1998) Stressing the need for patient lift equipment.
- Lifting a 72 kg patient from a chair using three different techniques (i.e. with the hands, with the forearms behind a patient's back at shoulder level, and with a belt held at waist level) resulted in maximum compressive forces ranging from 3946 to 7216 N (Gagnon et al., 1986).
- In an intervention study examining the utilization of manual lifting versus using a walking belt for a number of tasks, the mean compressive force on the L5/S1 disc for all tasks using manual lifting was 4751 N, while the mean for all tasks using a walking belt was 1964 N (Garg and Owen 1992).
- Lifts from bed to/from recliner chair and lifts from wheelchair to bed using a crossed-arm technique all exceeded recommended compressive force guidelines (Laffin and Aja 1995).
- A study examining various lifting techniques found all to have substantial static compressive load (greater than 3315 N); only two-person transfers were evaluated (Winkelmolen et al., 1994).

*Note that only data regarding compressive forces are listed here, though many studies examined a range of biomechanics measures.

APPENDIX 2.1 Legal and regulatory requirements and responsibilities

This appendix provides an overview of the legislation and regulatory requirements and responsibilities that promote musculoskeletal injury prevention in British Columbia. With respect to MSIP, Workers' Compensation Board (WCB) of British Columbia, Ergonomics (MSI) Requirements along with other regulation sections that have the most critical impact on MSI prevention are highlighted, along with the detailed rights and responsibilities stated under the Workers' Compensation (WC) Act.

Healthcare providers and their employers must be familiar with the legislation (WC Act) and WCB of BC Occupational Health and Safety (OH&S) Regulation (see www.worksafebc.com for more details) in order to ensure that they know their rights and responsibilities, and that they take appropriate actions to eliminate or minimize risks for MSIs. In addition, appropriate standards such as those of the Canadian Standards Association (CSA), must be complied with (please refer to Section 2 of these Reference Guidelines).

A-2.1 The Workers' Compensation Act of British Columbia

The Workers' Compensation Act (The Act) of British Columbia is the legislation that authorizes the Workers' Compensation Board (WCB) of British Columbia to make and enforce regulations aimed at preventing occupational injuries and diseases.

The Act under Part 3, titled 'Occupational Health and Safety', explains the rights and responsibilities of employers, supervisors, employees and suppliers with respect to health and safety, as well as the joint committee and worker representative duties and functions. Detailed excerpts from the Act explaining the rights and responsibilities for the *employer, supervisors, workers, suppliers and the joint committee* can be found under Appendix 2.2 in these Guidelines, or in the *WCB OH&S Regulation Book 1: Core Requirements (Parts 1-4)* -

Excerpts from the Workers Compensation Act, pp. xiii-xvi.

Fundamental safety rights

The three fundamental safety rights that form the basis for protecting workers in British Columbia under The Act are:

- The right to know
- The right to participate
- The right to refuse unsafe work

For a more detailed discussion about these fundamental rights, within the context of MSIP, please refer to Figure A-2.1.

A-2.2 WCB Occupational Health and Safety Regulation

Under the authority of The Act, the WCB has adopted and implemented Ergonomics (MSI) Requirements under Sections 4.46 to 4.53 of the Occupational Health and Safety Regulation. The WCB's *Ergonomics (MSI) Requirements* represent the minimum standards that must be complied with at workplaces under WCB jurisdiction and within the scope of the *The Act*.

Figure A-2.1 MSI prevention and the fundamental rights under *The Act***The right to know**

- Healthcare workers have the right to know about the hazards to which they may be exposed in the course of their work.
- Employers are responsible for providing information and education about workplace hazards to their employees and the joint OH&S committee members.
- Employers must also ensure that workers who may be exposed to risks of MSIs are educated in risk identification related to the work, including the recognition of early signs and symptoms of MSIs and their potential health effects.
- The joint OH&S committee also has a duty to communicate recommendations and consult with employees and management on a wide range of safety issues, including MSIP and related activities.
- Minutes of the joint OH&S committee meetings must be made available to all its members, all employees (most commonly through posting), union offices for the represented bargaining units, and the WCB.
- Inspection reports and orders given by a WCB officer must be accessible to all employees in the area of concern. Hence all employees do have an opportunity to follow the OH&S committee activities at their workplace (e.g. discussions regarding staff training on safe patient handling).
- When performing a risk assessment to evaluate factors that may expose workers to a risk for MSIs, the employer must consult with workers who exhibit signs or symptoms of MSIs, in addition to a representative sample of the workers who are required to perform the work being assessed.
- The employer must also consult with the joint OH&S committee or the worker health and safety representative on MSI risk identification, assessment and control, worker education and training; and
- Evaluation of implemented MSI prevention measures.

The right to refuse unsafe work

- Workers can refuse, free from fear of discipline or retaliation, any work they have reasonable cause to believe to be unduly hazardous to the health and safety of any person by reporting the circumstances immediately to their supervisor or employer. For details on the process and required steps, please refer to WCB OH&S Regulation Sections 3.12-3.13.

The right to participate

- The right to participate ensures that employees have input into decisions that affect their occupational health and safety, a right that is commonly exercised through their OH&S representative or directly through their supervisor.

Table A-2.1 WCB Ergonomics (MSI) Requirements

The following is an excerpt from WCB OH&S Regulation that states Ergonomics (MSI) Requirements, its purpose being *to eliminate or, if that is not practicable, minimize the risk of MSIs to workers.*

SECTION	PART	CONTENT OF SECTION
Definition of “ <i>musculoskeletal injury</i> ” or “ <i>MSI</i> ”	4.46	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. From sections 4.47 to 4.53 (the Ergonomic (MSI) Requirements)
Risk identification	4.47	The employer must identify factors in the workplace that may expose workers to a risk of musculoskeletal injury (MSI).
Risk assessment	4.48	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.
Risk factors	4.49	The following risk factors must be considered, where applicable, in the identification and assessment of the risk of MSI: (a) the physical demands of work activities, including <ul style="list-style-type: none"> ▪ force required ▪ repetition ▪ duration ▪ work postures, and ▪ local contact stresses; (b) aspects of the layout and condition of the workplace or workstation, including <ul style="list-style-type: none"> ▪ working reaches, ▪ working heights, ▪ seating, and ▪ floor surfaces; (c) the characteristics of objects handled, including <ul style="list-style-type: none"> ▪ size and shape, ▪ load conditions and weight distribution, and ▪ container, tool and equipment handles; (d) the environmental conditions, including cold temperature; (e) the following characteristics of the organization of work: <ul style="list-style-type: none"> ▪ work-recovery cycles; ▪ task variability; ▪ work rate. Note: In work situations where a risk of MSI exists, typically only some factors from the list will be applicable. To assist, the WCB provides a risk factor identification chart in the publication <i>Identifying MSI Risk Factors</i> .
Risk control	4.50	(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 control measures when the introduction of permanent measures will be delayed.

SECTION	PART	CONTENT OF SECTION
Education & training	4.51	<p>(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.</p> <p>(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.</p> <p>Note: The WCB provides the pamphlet <i>Understanding the Risks of MSI</i> to assist with the application of section 4.51(1). Materials addressing other matters such as risk assessment and control are also available.</p>
Evaluation	4.52	<p>(1) The employer must monitor the effectiveness of the measures taken to comply with the Ergonomic (MSI) Requirements and ensure they are reviewed at least annually.</p> <p>(2) When the monitoring required by subsection 1 identifies deficiencies, they must be corrected without undue delay.</p>
Consultation	4.53	<p>(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:</p> <ul style="list-style-type: none"> (a) risk identification, assessment and control; (b) the content and provision of worker education and training; (c) the evaluation of compliance measures taken. <p>(2) The employer must, when performing a risk assessment, consult with</p> <ul style="list-style-type: none"> (a) workers with signs and symptoms of MSI, and (b) a representative sample of the workers who are required to carry out the work being assessed.

Many other sections of the *WCB OH&S Regulation* apply to MSI prevention, including:

Description of applicable WCB OH&S Regulation	Regulation Section
<ul style="list-style-type: none"> ▪ Education and supervision ▪ Workplace inspections ▪ Correction of unsafe conditions ▪ Refusal of unsafe work ▪ Occupational first aid ▪ Inspection of equipment ▪ Conformity to standards e.g. CSA ▪ Information on the rated capacity of equipment ▪ Inspection and maintenance records ▪ Accident reporting and investigation 	<p>3.3 (g) 3.3 (b), 3.5-3.8 3.9-3.11 3.12-3.13 Part 33 3.6 4.4 4.7-4.8 4.9 The Act, Part 3, Division 10, Sections 172-177</p>

A-2.2.1 Workplace inspections

Workplace inspections provide an important means of identifying and documenting hazards with respect to the environment, equipment, work organization, procedures and work methods (WCB OH&S Regulation 3.5-3.8). The following items are particularly important for inspections identifying ergonomic/MSI problems:

- inspecting equipment/devices available in the work environment, their accessibility, distribution, condition, and any observation of their use;
- assessing the design and layout of the work environment for actual and potential risks for MSIs;
- provision and accessibility of first aid services, supplies and equipment; and
- observation of activities during inspections and when conducting task analysis.

Regular planned inspections conducted by the Joint OH&S Committee (WCB Regulation 3.5–3.8; The Act: Section 140) are critical for inspecting for deficiencies, work methods and practices, and for recognizing improvements. Supervisors, as part of their regular duties, should conduct unplanned inspections while going about their work (The Act, Section 117).

Special planned inspections are critical for ensuring that patient handling equipment (e.g. ceiling mounted patient lifts) is inspected for possible damage and malfunction in accordance with the manufacturer's specifications, and in conformity with any required standards (WCB Regulation 3.6, 4.4, 4.7-4.8). Inspection of the equipment and review of maintenance records (WCB Regulation 4.9) must also be done as part of an incident investigation following malfunction and/or an injury (The Act, Part 3: Division 10).

Joint OH&S Committee members should participate, when feasible, in incident investigations and ensure that appropriate follow-up is done on implementation of

control measures (The Act, Sections 130(h) & 140).

WCB officers may conduct inspections involving the environment, equipment, work organization, procedures and work methods as part of a regular WCB inspection, in response to a complaint, or as part of an incident investigation (The Act, Part 3, Division 11).

A-2.2.2 Hazard reporting

For hazard reporting, please refer to Section 2 of these Reference Guidelines.

A-2.2.3 Correction of unsafe conditions

When harmful conditions are found in the course of an inspection or detected by a worker, they must be reported to a supervisor or the employer as soon as possible. The person receiving the report must investigate the reported unsafe condition or act and must ensure that any necessary corrective action is taken without delay.

A-2.2.4 Refusal of unsafe work

As was discussed in some detail under Figure A-2.1, *'a worker must not carry out or cause to be carried out any work process or... operate any equipment if that person has reasonable cause to believe that to do so would create an undue hazard'* (please refer to the WCB OH&S Regulation 3.12-3.13 for the exact wording and the process).

Upon receiving the report of refusal of unsafe work, the supervisor or employer must investigate. If the situation is not resolved to the worker's satisfaction, the worker can continue refusing the unsafe work, at which time she/he should contact her/his representative in the joint OH&S committee. If the situation is not resolved to the worker's satisfaction with the participation of the joint

OH&S committee representative(s), the supervisor/employer and any other necessary parties (e.g. OH&S Coordinator), the WCB needs to be contacted immediately at which time a WCB officer will investigate the matter.

APPENDIX 2.2**General duties of employers, workers and others (Source: WCB OH&S Regulation Book 1: Core Requirements (Parts 1-4) - Excerpts from the Workers Compensation Act, pp. xiii-xvi.)**

Safety in the workplace is a shared responsibility that must be accepted and followed by all as stated below:

Employer Duty

The Workers Compensation Act, Part 3, Division 3 (115) identifies the general duties of the employer:

“General duties of employers

115 (1) Every employer must

- (a) ensure the health and safety of
 - (ii) all workers working for that employer, and
 - (jj) any other workers present at a workplace at which that employer’s work is being carried out, and
 - (b) comply with this Part, the regulations and any applicable orders.
- (2) Without limiting subsection (1), an employer must
- (a) remedy any workplace conditions that are hazardous to the health or safety of the employer’s workers,
 - (b) ensure that the employer’s workers
 - (ii) are made aware of all known or reasonably foreseeable health and safety hazards to which they are likely to be exposed by their work,
 - (jj) comply with this Part, the regulations and any applicable orders, and
 - (kk) are made aware of their rights and duties under this Part and the regulations,
 - (c) establish occupational health and safety policies and programs in accordance with the regulations,
 - (d) provide and maintain in good condition protective equipment, devices and clothing as required by regulation and ensure that these are used by the employer’s workers,
 - (e) provide to the employer’s workers the information, instruction, training and supervision necessary to ensure the health and safety of those workers in carrying out their work and to ensure the health and safety of other workers at the workplace,
 - (f) make a copy of this act and the regulations readily available for review by the employer’s workers and, at each workplace where workers of the employer are regularly employed, post and keep posted a notice advising where the copy is available for review,
 - (g) consult and cooperate with the joint committees and worker health and safety representatives for workplaces of the employer, and
 - (h) cooperate with the board, officers of the board, and any other person carrying out a duty under this Part or the regulations.”

Supervisor Duty

The Workers Compensation Act, Part 3, Division 3 (117) identifies the general duties for supervisors,:

“General duties of supervisors

- 117** (1) Every supervisor must
- (a) ensure the health and safety of all workers under the direct supervision of the supervisor,
 - (b) be knowledgeable about this Part and those regulations applicable to the work being supervised, and
 - (c) comply with this Part, the regulations and any applicable orders.
- (2) Without limiting subsection (1), a supervisor must,
- (a) ensure that the workers under his or her direct supervision
 - (ii) are made aware of all known or reasonably foreseeable health or safety hazards in the area where they work, and
 - (jj) comply with this Part, the regulations and any applicable orders,
 - (b) consult and cooperate with the joint committee or worker health and safety representative for the workplace, and
 - (c) cooperate with the board, officers of the board and any other person carrying out a duty under this Part or the regulations.”

Employee Duty

Employees also have duties. These are identified in the Workers Compensation Act, Part 3, Division 3 (116),

“General duties of workers

- 116** (1) Every worker must
- (a) take reasonable care to protect the worker’s health and safety and the health and safety of other persons who may be affected by the worker’s acts or omissions at work, and
 - (b) comply with this Part, the regulations and any applicable orders.
- (2) Without limiting subsection (1), a worker must
- (a) carry out his or her work in accordance with established safe work procedures as required by this Part and the regulations,
 - (b) use or wear protective equipment, devices and clothing as required by the regulations,
 - (c) not engage in horseplay or similar conduct that may endanger the worker or any other person,
 - (d) ensure that the worker’s ability to work without risk to his or her health or safety, or to the health or safety of any other person, is not impaired by alcohol, drugs or other causes,
 - (e) report to the supervisor or employer
 - (ii) any contravention of this Part, the regulations or an applicable order of which the worker is aware, and
 - (jj) the absence of or defect in any protective equipment, device or clothing, or the existence of any other hazard, that the worker considers is likely to endanger the worker or any other person,
 - (f) cooperate with the joint committee or worker health and safety representative for the workplace, and

- (g) cooperate with the board, officers of the board and any other person carrying out a duty under this Part or the regulations.”

Suppliers Duty

The Workers Compensation Act, Part 3, Division 3 (120) identifies the general duties for suppliers:

“General duties of suppliers

120 Every supplier must

- (a) ensure that any tool, equipment, machine or device, or any biological, chemical or physical agent, supplied by the supplier is safe when used in accordance with the directions provided by the supplier and complies with this Part and the regulations,
- (b) provide directions respecting the safe use of any tool, equipment, machine or device, or any biological, chemical or physical agent, that is obtained from the supplier to be used at a workplace by workers,
- (c) ensure that any biological, chemical or physical agent supplied by the supplier is labeled in accordance with the applicable federal and provincial enactments,
- (d) if the supplier has responsibility under a leasing agreement to maintain any tool, equipment, machine, device or other thing, maintain it in safe condition and in compliance with this Part, the regulations and any applicable orders, and
- (e) comply with this Part, the regulations and any applicable orders.”

Joint Committee Duties and Functions

The Workers Compensation Act, Part 3, Division , Section 130 identifies the duties and functions for joint committees and worker representatives (Section 139)

“Duties and functions of joint committee

130 A joint committee has the following duties and functions in relation to its workplace:

- (a) to identify situations that may be unhealthy or unsafe for workers and advise on effective systems for responding to those situations,
- (b) to consider and expeditiously deal with complaints relating to the health and safety of workers,
- (c) to consult with workers and the employer on issues related to occupational health and safety and occupational environment,
- (d) to make recommendations to the employer and the workers for the improvement of the occupational health and safety and occupational environment of workers,
- (e) to make recommendations to the employer on educational programs promoting the health and safety of workers and compliance with this Part and the regulations and to monitor their effectiveness,
- (f) to advise the employer on programs and policies required under the regulations for the workplace and to monitor their effectiveness,
- (g) to advise the employer on proposed changes to the workplace or the work processes that may affect the health safety of workers,
- (h) to ensure that accident investigations and regular inspections are carried out as required by this Part and the regulations,
- (i) to participate in inspections, investigations and inquiries as provided in this Part and the regulations, and
- (j) to carry out any other duties and functions prescribed by regulation.”

APPENDX 3.1 Patient Handling Risk Identification Form**PATIENT HANDLING RISK IDENTIFICATION FORM**

Job title: _____ Duty/Tasks: _____

Area/department: _____

Date of assessment (d/m/yr): _____ Conducted by: _____

General Risk Factors & Tasks	Observations	Recommendations
Workspace Environment		
Equipment / device		
Assistance		
Pushing & pulling		
Repetitive motions/tasks		
Awkward tasks		
Posture (e.g. unsupported)		
Static position		
Forceful exertion		
Reaches		
Carrying		
<i>Combination of risk factors for identified tasks:</i>		
Lifting & transferring		
Repositioning		
Patient ambulation		
Washing & bathing		
Medical procedures (indicate):		

Adapted from Surrey Memorial Hospital's ErgoSense Program

APPENDX 3.2

Layout of a Task Analysis Worksheet

TASK ANALYSIS WORKSHEET

Job Title: _____ Department/Unit: _____

Date of Assessment (d/mo/yr): _____ Assessment Conducted By: _____

Attachments:

- Job Summary
- Job Duties List
- Floor Plan/Work Area Layout
- Job Description
- Workplace Sketch
- Basic Task Flow Diagram
- Other: _____

1. Duties (Specific Actions)	2. Tasks (Specific Activities)	3. Physical & Psychological Demands	4. Exposure Duration	5. Exposure Frequency	6. Static Workspace Features (work heights, reach distances, clearances, etc.)

TASK ANALYSIS WORKSHEET (Cont')

7. Environmental Conditions	8. Equipment Features/ Conditions	9. Dynamic Forces (weights, pushing, pulling)	10. Patient or Object Characteristics	11. Risk Factors	12. Ergonomic Intervention(s) / Solution(s)

APPENDIX 4.2 Considerations When Purchasing and Evaluating Equipment

Once a need for new equipment is identified, it is important to review current equipment/product inventory, identify the users and everyone affected by the purchasing decision, and where the equipment will be used.

The MSIP working group should be called together to discuss the purchasing need, ensuring that all those affected have an opportunity to contribute to the purchasing decision. Representation might include nursing, therapy, occupational health and safety, infection control, skin and wound care, housekeeping, maintenance, laundry and purchasing. A focus group/selected user area might then be identified to participate in pre-purchase evaluation and post-purchase review.

PRE PURCHASE ACTIVITIES:

○ REVIEW PATIENT HANDLING EQUIPMENT/MATERIALS INVENTORY

Review currently available equipment/materials and ensure that mistakes are avoided by identifying problems with existing equipment that is to be replaced or augmented.

○ IDENTIFY NEEDS OF PATIENTS AND STAFF:

Patient

- (a) Comfort
- (b) Support
- (c) Ease of entry/exit
- (d) Meeting identified assessment needs
- (e) Sufficient load capacity
- (f) Identify the number of patients affected by the equipment purchase
- (g) Identify the acuity of the patients affected by the equipment purchase.

Healthcare worker

- (a) Easy to adjust
- (b) Wide range of adjustments
- (c) Reach patients with ease
- (d) Easy to move
- (e) Eliminates/minimizes ergonomic hazard(s)
- (f) Training and education needs
- (g) Fits with other available equipment e.g. new floor lift does not cause further hazard if the legs do not fit under the bed
- (h) Information on down time if failures occur and back up equipment to use during maintenance/service
- (i) Access/storage within patient care area

Infection control

- (a) Ease of appropriate cleaning/disinfecting of equipment/material
- (b) Avoidance of cross contamination

Skin and wound care

- (a) Ease of appropriate cleaning/disinfecting of equipment/material
- (b) Avoidance of cross contamination
- (c) Issues of skin breakdown and wrinkling of materials
- (d) Allergies to materials (e.g. latex)

Housekeeping (see sample housekeeping evaluation sheet)

- (a) Easy to move
- (b) Easy to clean below and behind

- **IDENTIFY NEEDS OF PATIENTS AND STAFF, cont'd**
- (c) Easy to raise or lower
- (d) Accessible controls
- (e) Availability of appropriate/compatible cleaning products

Laundry

- (a) Integrity of material during laundering processes
- (b) Additional workload
- (c) Availability of appropriate/compatible laundering products
- (d) Material drying time and required methods

Maintenance (see sample maintenance evaluation sheet)

- (a) Easy access to parts
- (b) Availability of parts
- (c) Routine servicing
- (d) Sufficient preventive maintenance instructions
- (e) Information on outside maintenance support if failures occur, including speed at which assistance can be obtained

Purchasing (see sample evaluation sheet)

- (a) Procurement of product/equipment
- (b) Costing and tendering

○ **IDENTIFY AND ANALYZE ENVIRONMENT-RELATED REQUIREMENTS:**

Environment-Related Requirements

1. If the equipment is to be used between beds:
 - Identify the space available between the beds
 - Identify the space available around the beds
2. If the equipment is to be used in bathrooms/toilets:
 - Identify the space available in the bathroom/toilets and ease of entry/exit
3. If the equipment is mobile:
 - Identify the areas where it is expected to be used
 - Identify the width of doorways
 - Identify the corridor widths
 - Identify the flooring
4. If purchasing a lift:
 - Identify the number of times lifts and transfers are performed
 - Identify the types of lift and transfer procedures in use
 - Does the design of the building allow the mounting of ceiling track lifts?
 - Does the lift need to reach the floor?
 - Identify the necessary height range
 - Does it need to be compatible with existing bathtubs? Toilets? etc.
5. Infection control
 - If infection control guidelines prevent sharing of equipment/materials, more equipment/materials will be needed as it cannot be used between patients
 - Slings may not be shared between patients (e.g. with incontinence concerns, infection control)
6. Storage
 - Identify the available storage
 - Identify if the storage space is convenient and easily accessible

Equipment-Related Requirements

Identify the most important features the equipment should have - those the users consider necessary in order of importance e.g. height adjustable, power controls, ergonomically designed handles, larger wheels for maneuverability, in-house laundering capability etc.

1. Equipment evaluation (*See Appendix 4.65 Sample Mechanical Lift Evaluation Form*)
Models meeting the required criteria must be evaluated prior to purchase:
 - The equipment should be evaluated in the areas where it will be used
 - Involve all users in the evaluation e.g. nursing, housekeeping, maintenance
2. Costs (*See Appendix 4.3 Sample Cost Evaluation Sheet*)
 - Identify all pertinent costs
 - Identify the costs of additional, necessary accessories e.g. slings
 - Identify other pertinent costs: Training, Maintenance etc.
3. Education and training - in-services
 - The supplier should provide sufficient in-services to all users or a selected group of staff trainers prior to the on-site evaluation
 - In-services should include the normal operation of the equipment, the emergency operation of the equipment, and the maintenance/service of the equipment
4. Pre-purchase evaluation
 - Design evaluation forms: where applicable, use a rating scale e.g. 1-5, where 1 is 'very unsatisfactory', 5 is 'very satisfactory' 1-3, where 1 is 'poor', 2 is 'fair', 3 is 'good'
 - The evaluation form should include those criteria the users identified as being most important
 - The same form should be used to evaluate different models of the required equipment
 - The different models should be evaluated under the same conditions
 - As many users as possible to participate in the evaluation and complete the evaluation forms

*INFORMATION SOURCES

Refer to OHSAH website (*see Equipment Selection and Maintenance*). Contact other health-care organizations or agencies e.g. Ministry of Health, WCB, for their information and/or experience regarding available equipment and suppliers/manufacturers.

Review existing standards e.g. CSA Standard Z323.5 Mechanical/Electromechanical Lifting Devices for Persons.

POST-PURCHASE ACTIVITIES:

○ **EDUCATION AND TRAINING**

- Ensure all existing staff have adequate, up-to-date training and periodic refresher sessions
- Training must include the use and maintenance/service requirements of the equipment
- Participants should be able to demonstrate their skills
- Training should be hands-on
- Ensure all new staff attend training sessions
- Records must be kept of all training.

○ **PREVENTIVE MAINTENANCE & SERVICE**

The equipment needs to be maintained in accordance with manufacturer's specifications, with appropriate preventive maintenance and prompt service/repairs when problems are identified. (*See Appendix 4.4 Sample Maintenance Evaluation Form*)

○ POST-PURCHASE EVALUATION

Following the purchase and introduction of the equipment, complete a post-purchase evaluation. Once the equipment has been in place and in use, a review should be done to assess how it is working and whether or not it is effective in eliminating or minimizing ergonomic hazards.

Questions to ask in the post-purchase evaluation may include:

1. Is the equipment installed correctly?
2. Is the equipment appropriate to the needs and environment?
3. Do workers understand how the equipment works?
4. Are the workers comfortable using the equipment?
5. Do workers need further education?
6. Identify the benefits of the new equipment.

Factors indicating problems:

Specific factors to look for when evaluating the equipment for problems (adapted from 'State of California OSHA Consulting Service - A back injury prevention guide for health care providers'):

1. Faulty brakes
2. Takes too long or is hard to adjust
3. Casters/wheels do not roll easily
4. Too low/high
5. Does not have sufficient movement (reach/range)
6. Too heavy/wide/big
7. Controls/handles in awkward position
8. Handles missing
9. Storage of items too low/high/awkward/faraway/hard to find
10. Hard to steer
11. Design inappropriate/incompatible to patient condition or other equipment
12. Armrests/footrests not removable/adjustable
13. Items missing e.g. slings, IV, med. poles
14. Other

APPENDIX 4.3 Equipment Cost Evaluation Form

Cost Evaluation Form

Date: _____ Completed by (name): _____

Make: _____

Model: _____

Supplier: _____

Purchase Cost: \$ _____

Accessories:

_____	\$	_____
_____	\$	_____
_____	\$	_____
_____	\$	_____
_____	\$	_____
_____	\$	_____
_____	\$	_____
_____	\$	_____

Other costs:

Training	\$	_____
Maintenance	\$	_____
Spare parts	\$	_____

Comments

Suitable for purchase?

- Yes
- No

APPENDIX 4.6 Mechanical Lift Evaluation Form

Mechanical Lift Evaluation Form

Date: _____ Completed by (name): _____
 Make: _____
 Model: _____
 Supplier: _____

Slings	Yes	No
a) A variety of sling sizes available? If "yes", please specify		
b) A variety of sling types available? If "yes", please specify (e.g. lifting, repositioning, toileting, suitable for hip surgery patients...)		
c) Sufficient slings available?		
d) Slings easy to apply?		
e) Slings easy to remove?		
f) Is safe weight/load label on slings?		

Controls		
Power assisted <input type="checkbox"/> Hydraulic <input type="checkbox"/> Manual <input type="checkbox"/>	/	/
a) Easy to use?		
b) Clearly identified?		
c) Lifting movement smooth?		
d) Does the lift go low enough to lift from the floor?		
e) Can the lift clear the maximum height required?		
f) Does the lift allow 360- degree movement in the sling?		
g) Is the maximum weight limitation sufficient?		
h) Is weight overload protection (shut off) available?		

Staff		
Minimum number of staff needed to operate ()	/	/

Maneuverability		
a) Easy to maneuver in the following:	/	/
Doorways		
Corridors		
Tub-rooms		
Washrooms		
Bedrooms/bedside		

APPENDIX 5 Principles of Biomechanics

This appendix discusses the basic anatomy of the spine, principles of biomechanics, the types of MSIs commonly seen in care givers, and it provides techniques for working with good body mechanics.

To reduce the risk of injury during patient handling tasks it is important to practice safe body mechanics. Biomechanics is defined by Hall (1997) as the application of mechanical principles in the study of living organisms. Biomechanics can be used to explain how different forces act on the body and why it is important to use proper techniques when lifting, carrying, pushing and pulling during patient handling tasks.

The area of greatest MSI risk from patient handling is the lower back, which has important functions in giving support to the trunk when bearing weight (Trew and Everett 1997). Throughout the day, health-care workers are subjected to a combination of compressive, shear, bending, and torsional forces (Lindh 1989).

A-5.1 Anatomy

The vertebral column consists of 33 vertebrae separated into 5 distinct regions: 7 cervical vertebrae, 12 thoracic vertebrae, 5 lumbar vertebrae, 5 fused sacral vertebrae and 4-5 fused coccygeal vertebrae. Vertebrae are held together by ligaments that function to provide stability and allow movements of the vertebral column within a safe range of motion, absorbing forces during normal and traumatic stress (Bagchee and Bhattacharya 1996). The joint between the last lumbar vertebra and the first sacral vertebra (L5/S1) receives the greatest stress during lifting. The NIOSH equation specifies not to exceed 3400N of force to this joint when lifting.

The vertebral column contains four distinct curves: the cervical, thoracic, lumbar and sacral curves. Each vertebra is made up of a body and a vertebral arch which together

form a passageway for the spinal cord. The cervical vertebrae function to support and move the head. The thoracic vertebrae articulate with the ribs, which in turn make up the ribcage and also support the thorax, head, and neck. The large lumbar vertebrae are the foundation for attachments of muscles, and form a curve at the onset of walking in childhood. The sacrum, consisting of five fused vertebrae, and joins with the ilium of the hip bone to create the sacroiliac joint. The fused coccyx attached to the lower end of the sacrum is commonly referred to as the tailbone.

The vertebrae are designed to withstand certain compressive loads. They increase in size from top to bottom, the lumbar vertebrae being the biggest, and subject to the greatest compressive forces. Vertebrae are separated by intervertebral discs, their function to absorb forces and restrict excessive motion of the vertebrae. The discs are composed of two regions: a gelatinous mass (nucleus pulposus) in the centre region of the disc, which allows for even distribution of pressure throughout the entire disc, and a fibrocartilage (the annulus fibrosus) which encircles the nucleus pulposus (Lindh 1989). When the spine is loaded, the discs are under compression, storing energy and distributing the load (Lindh 1989). Constant stress applied to the intervertebral discs may contribute to the discs becoming thinner, drier, and less elastic, ultimately reducing their capability to withstand loads.

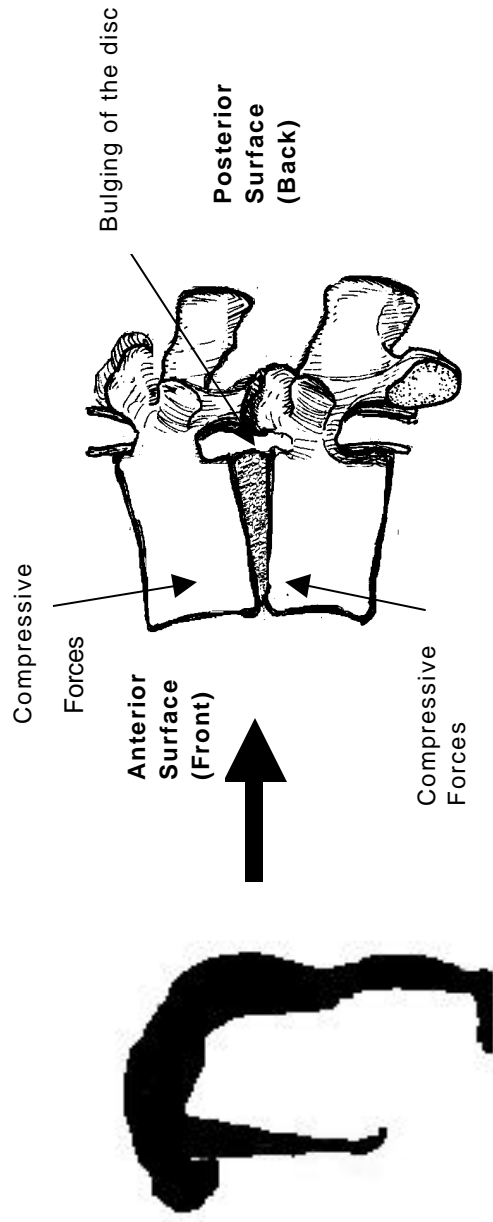


Figure A-5.1 Lateral view (side view) of two vertebrae. Bulging of the posterior portion of the disc occurs due to compressive forces at the anterior end of the disc during forward bending of the trunk

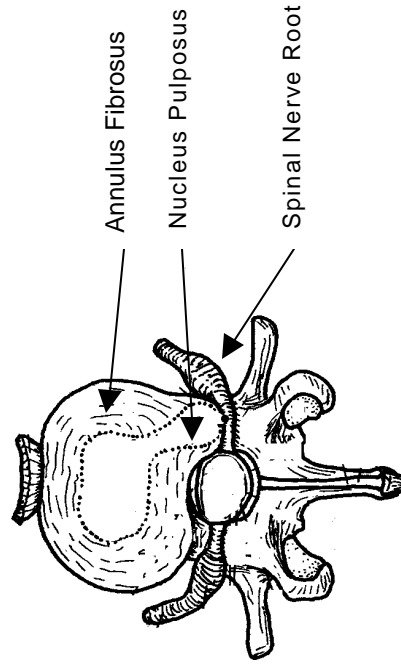


Figure A-5.2 Weakening of the disc can cause a bulging or protrusion of the nucleus pulposus, this can cause impingement of the spinal nerve root

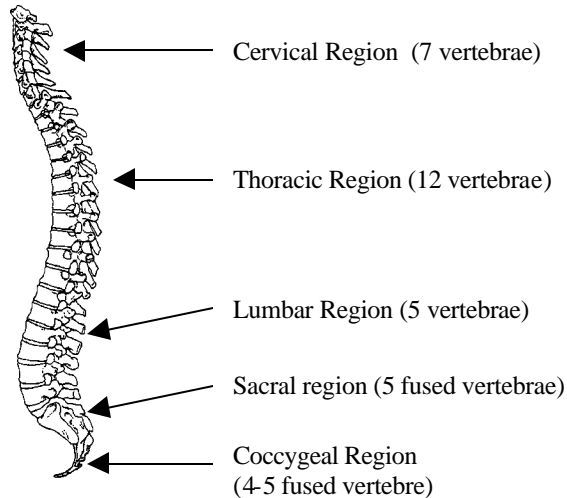


Figure A-5.3 Vertebral Column

A-5.2 Biomechanics

The human body moves under the influence of both internal and external forces (Trew and Everett 1997). Three types of levers (first, second and third class) can be used to describe the different loads that act on the body when lifting.

First-class levers (Figure A-5.4) are used to show force acting on the spine when lifting an external load, such as a box or patient. The first-class lever consists of a fulcrum in the middle of a lever arm, an imposed load on one end of the lever arm and a restorative load on the other end of the lever arm (Salvendy 1997). The imposed load may be an external weight, such as a patient being lifted by a healthcare worker, and the restorative force within the health care

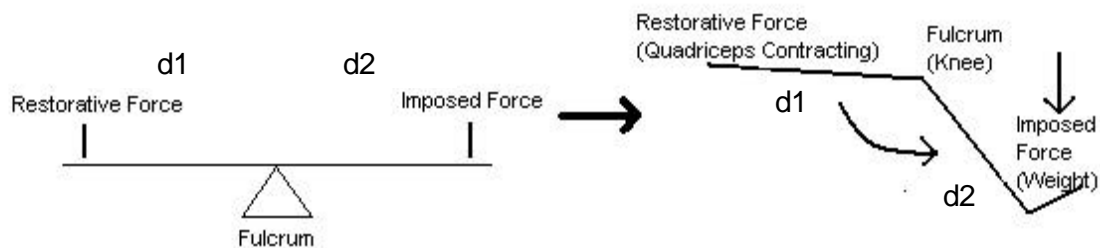
worker's body would be the lower back muscles contracting to extend the trunk while lifting (Salvendy 1997).

Figure A-5.4 demonstrates an example of a first-class lever. When performing knee extensions with a knee extension machine, the knee joint acts as the fulcrum, the restorative force is the quadriceps muscle contracting to extend the lower leg, and the weight acting against the lower leg is the imposed force. The lengths of d_1 and d_2 are also important because the resultant restorative force is dependent on them. For the lever to stay in equilibrium,

$$\text{Resultant Force} \times d_1 = \text{Imposed Force} \times d_2$$

From this equation it is evident how the restorative force is dependent on the lever (d_1 and d_2) lengths.

Figure A-5.4 First-Class Lever



Through examining the first-class lever model, one can see how an external force being held by the arms can place a large load on the spine, and how the resulting force can be substantially decreased by bringing the external load closer to the body. For further information on levers and the different forces that act on the spinal column, a good biomechanics textbook should be consulted.

Figures A-5.5 and A-5.6 demonstrate the internal forces for a given external load. In Figure A-5.5, a person is holding a mass of 18.2 kg (imposed load) at a distance of 1 metre (d2) from the spine (approximate distance between fulcrum inside a disc and outstretched arms holding an object), the external load acting on the spine is 178 N. Notice that d1 is the length between the fulcrum and the restorative force of the lower back muscles (0.05 metres). The internal load on the spine is equivalent to 3560 N, or 363 kg due to the geometric arrangement of the trunk (Hall 1997).

In Figure A-5.6, the same person is holding the external load only 0.5 metres away from the spine, much closer to the body. This same external force of 178 N only requires an exertion of an internal force of 1780 N or 182 kg, half the amount of force that the same weight places on the spine when held 1 metre away! Hence, it is crucial to hold materials as close to the body as possible when lifting and carrying because the force to be generated by the back muscles increases dramatically when the load moves away from the trunk. Lowering the force acting on the vertebral column helps to reduce stress on the spine and thus reduce the potential for MSI. It is important, therefore, to always remember to lift the lightest load possible, to keep the load as close to the body as possible, and to use proper lifting techniques.

Figure A-5.5 Holding an external force 1m away from the trunk

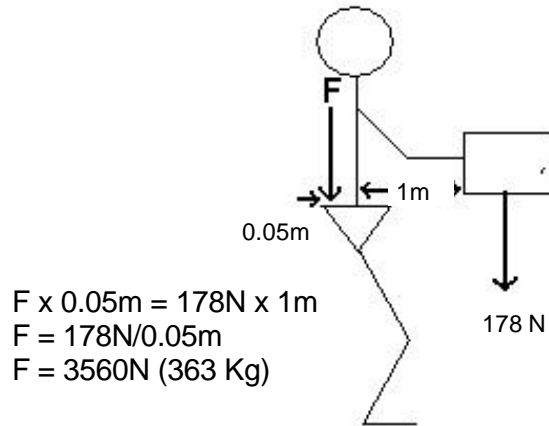
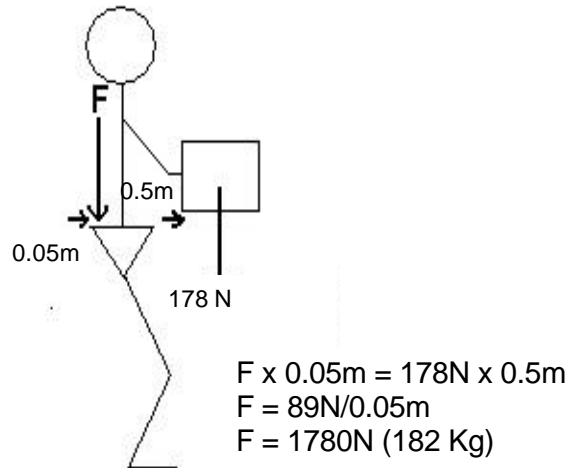


Figure A-5.6 Holding an external force 0.5m away from the trunk



A - 5.3 Musculoskeletal injuries

Musculoskeletal injuries (MSI) are defined in the WCB OH&S Regulation as, “*Injuries or disorders of the muscles, tendons, ligaments, joints, nerves, blood vessels or related soft tissue including a sprain, strain and inflammation, that may be caused or aggravated by work.*” These injuries may occur following a single incident, for example a fall, blow or cut, or develop over time. Joints, tendons, muscles and nerves can become injured from performing repetitive movements over long periods of time. Injuries that occur over time are identified as repetitive, or cumulative strain injuries. Table A-5.1 provides descriptions of common MSIs and their signs and symptoms.

Table A-5.1 Common MSIs

MSI TYPE	DESCRIPTION	SIGNS AND SYMPTOMS
SINGLE INCIDENTS:		
Contusion (or bruise)	A blow or crushing injury involving the connective tissue and muscle fibres, with rupture of blood vessels and haemorrhage	Bruising, pain, feeling of tightness, and swelling. The area may feel hot.
Sprain	An injury around joints, usually a sudden force consisting of partial tearing, or tearing of ligaments, with effusion of blood. Sprains occur during falls and unexpected movements causing sudden overstretching for example twisting an ankle when falling.	Acute inflammation, sudden pain that will subside and then reoccur, swelling and tenderness, bruising. Bruising and swelling may extend further from the site of the injury. There may be decreased range of motion.
REPETITIVE STRAINS:		
Strain	An injury caused by a continuous, gradual stretching through faulty posture of a joint, or a sudden exertion. A strain is an injury of the connective tissues, where the ligaments may be stretched. Commonly occur following patient handling and holding awkward postures. The back is particularly vulnerable to repetitive, or cumulative, strain. Bending, twisting or maintaining one position for too long can cause pain and fatigue.	Stiffness and loss of motion with pain, localized tenderness and swelling.
Bursitis	An inflammation of the bursa (a sac containing fluid) overlying a joint or bony prominence. Bursitis is sometimes mistaken for inflammation of the joint. Commonly occurs following repetitive movements, repetitive pressure on a bursa, and awkward reaches. Usually seen at the knee, wrist and elbow.	Swelling with pain over the joint.
Tendonitis	Tendons connect muscles to bones and are enclosed in sheaths to reduce friction. Repetitive movements of tendons sliding in their sheath cause inflammation at the junction of the tendon and muscle, or within the sheath. Commonly seen in hands, shoulders and fingers.	Pain and tenderness with redness.
Carpal Tunnel Syndrome	Compression of the median nerve between the carpal ligament and other structures within the carpal tunnel in the wrist. The volume of the tunnel contents can be increased by, for example, synovitis and recent fractures and injuries to the wrist, and repetitive use of the hands.	Pins and needles in the thumb side of the hand, tingling in the fingers, numbness especially at night. Weakness in the thumb muscles.

A-5.4 Working with good body mechanics

A-5.4.1 Maintaining balance and stability

A stable base of support when performing pushing, pulling, lifting or carrying tasks will reduce the risk of losing your balance and sustaining potential injury. Table A-5.2 provides direction on safe body mechanics for maintaining balance and stability.

Table A-5.2 Safe body mechanics for maintaining balance and stability

ACTIVITY	HOW TO DO IT
1. Widen your base of support.	<ul style="list-style-type: none"> ▪ Place your feet shoulder width apart ▪ One foot a half-step forward.
2. Lower your centre of gravity.	<ul style="list-style-type: none"> ▪ Bend your hips and knees slightly ▪ Use your leg muscles for loading activities.
3. Stabilize your spine.	<ul style="list-style-type: none"> ▪ Tighten your abdominal muscles ▪ Tighten your buttock muscles ▪ Maintain the natural curves of your spine.
4. Avoid twisting your spine and knees.	<ul style="list-style-type: none"> ▪ Trunk twisting is normal. Problems can occur, however, when it is done with a weight or if done repeatedly ▪ Trunk twisting with a load may carry the momentum further than you intend, leading to pulls and strains ▪ Point your toes in the direction you are reaching.
5. Keep your arms close to your body.	<ul style="list-style-type: none"> ▪ This provides better leverage and better control ▪ The further a weight is from you, the more force it takes for you to move the object ▪ You have more control over something held close, than over something held at arms length.

A-5.4.2 Lifting and carrying

Using safe body mechanics can reduce the risk of injuries when lifting and carrying (Ayoub and Mital 1989; Kroemer 1993). Use trolleys, carts or mechanical lifts when moving heavy loads over a distance. Table A-5.3 provides direction on safe body mechanics for lifting and carrying activities.

Table A-5.3. Safe body mechanics for lifting and carrying

ACTIVITY	HOW TO DO IT
1. Keep your arms close to your body.	<ul style="list-style-type: none"> ▪ Provides better leverage and control of the load ▪ A palms up position allows you to use the stronger biceps muscles rather than the smaller forearm muscles ▪ Avoid working with shoulders up to prevent from using neck and shoulder muscles rather than arm muscles.
2. Stabilize your lower back.	<ul style="list-style-type: none"> ▪ Tighten your abdominal and trunk muscles ▪ Bend your knees slightly ▪ Avoid twisting by pointing your toes in the direction your arms are reaching. Keep your shoulders level with the floor ▪ Maintain the natural curves of your spine ▪ Breathe out as you lift - don't hold your breath.
3. Use your legs.	<ul style="list-style-type: none"> ▪ Use your knees and hips to do the majority of the work. Your legs muscles are designed for loading ▪ Don't attempt to lift loads in front of the knees - try to initiate the lift between the feet.
4. Keep the load close to your body.	<ul style="list-style-type: none"> ▪ The load through your spine increases significantly the further a load is away from your spine.
5. Avoid twisting.	<ul style="list-style-type: none"> ▪ Point your toes in the direction your arms are reaching ▪ Avoid trunk movements by moving your upper and lower body in the same direction ▪ When changing direction, turn at your feet, not at your trunk.

A-5.4.3 Pushing and pulling

Use of safe body mechanics when pushing or pulling can reduce the potential for low and mid back injuries. Pushing is often safer than pulling, therefore whenever possible push materials when moving them (Hoozemans et al., 1998). Pushing is preferred over pulling because it is associated with a lower VO_2 (oxygen uptake) and heart rate (Hoozemans et al., 1998). Research from biomechanical models also shows that compressive forces at the low back, particularly the L1/S5 region, are lower for pushing than for pulling because the lever arm of the trunk flexors is much larger than the lever arm of the trunk extensors (Andres and Chaffin 1991; Gagnon et al., 1992; Kroemer 1974; Lee et al., 1991). Table A-5.4 provides direction on safe pulling and pushing tasks and precautions to take while engaged in these activities.

Table A - 5.4 Safe body mechanics for pushing and pulling

ACTION	INSTRUCTION
Pushing	<ul style="list-style-type: none"> ▪ Position upper arms against your ribcage, keep elbows in, place hands at or slightly above waist level ▪ Stagger your stance, with your feet shoulder width apart, one foot forward, one foot back ▪ Bend your knees. Move the load by shifting your weight onto your forward foot ▪ Avoid twisting your back by taking small steps when turning corners ▪ If your vision is blocked when pushing from the back consider pushing from the front corner of the load ▪ To stop suddenly, stabilize your arms and upper body, grasp the load, bend your knees and lower your hips in order to lower your center of gravity.
Pulling	<ul style="list-style-type: none"> ▪ Pulling is preferably done only over short distances, as one usually tends to twist when checking for obstacles ▪ Avoid pulling with one hand ▪ Before and during pulling movements, be aware of your surroundings to ensure you don't run into anything ▪ Grasp the load with both hands, keep your elbows and upper arms against your ribcage ▪ Stagger your stance, bend your knees, start moving the load by shifting your weight onto your back foot.
Precautions	<ul style="list-style-type: none"> ▪ Equipment should be cleaned and maintained regularly (preventive maintenance program schedule) ▪ Wheeled equipment should be in good working order, rolling and steering easily ▪ Any malfunctioning equipment should be tagged 'out of service', and not be used. The concern should be reported immediately to the supervisor or person responsible for maintenance, and the equipment should be repaired promptly ▪ Adjust work surfaces to a suitable height for the activity, where possible ▪ Consider using friction-reducing equipment.

A-5.4.4 Working in awkward positions

Tasks that involve kneeling, bending over, reaching horizontally and reaching above the head height are examples of working in awkward positions. These tasks can cause a higher risk for injury. Table A-5.5 provides direction on improving body mechanics in order to work more safely in awkward positions.

Table A - 5.5 Safer body mechanics when working in awkward positions

ACTION	INSTRUCTION
Avoid working in awkward positions	<p>If in a low work area (i.e. below work height)</p> <ul style="list-style-type: none"> ▪ Raise the work area if possible ▪ Sit on a stool/chair rather than squatting, kneeling or standing bent over your work ▪ Get as close to the object/patient as possible ▪ Keep your elbows as close to your body as possible. <p>If reaching horizontally:</p> <ul style="list-style-type: none"> ▪ Stand/sit as close to your work (patient) as possible ▪ Move as close as possible to your work (patient) ▪ Remember that the closer the work is to your body the less the forces on your lower back. <p>If in a high work area (i.e. above acceptable work height):</p> <ul style="list-style-type: none"> ▪ Lower the work area if possible ▪ Use a stool or ladder to stand on (be careful that it does not become a tripping hazard) ▪ Use a handle to increase your reach ▪ Use a handle with a pinch grip to increase reach.
If you cannot avoid working in awkward positions	<ul style="list-style-type: none"> ▪ Do not stay in awkward positions for a prolonged period ▪ Change your position frequently and move in the opposite direction ▪ Stretch regularly to minimize potential for injury.

A-5.4.5 Other considerations for reducing risk - stretching, relaxation and lifestyle

Stretching

Stretching exercises may help to develop flexibility, prevent injury (Blue 1996) and increase awareness of your body. Stretching is beneficial for reducing the risk of injury during physical activity at work and at play. It can reduce or eliminate unwanted muscle tension, and can restore or improve joint mobility. Stretching also improves blood circulation, the lubrication of joints, and helps to mentally prepare one for work. Relaxation techniques can reduce blood pressure, stress and tension. A general routine that combines stretches and relaxation will enhance well-being and job safety. Table A-5.6 on the following page provides a basic recommended schedule in relation to work activities.

Table A-5.6 Stretching schedule

BEFORE ACTIVITY	DURING ACTIVITY	AFTER ACTIVITY
<ul style="list-style-type: none"> ▪ Ask for a handout of some easy stretches. This may be available from your supervisor, physiotherapist, occupational therapist or local health centre ▪ Warm up your muscles before starting work, e.g. a five to ten minute walk or stair climb. Stretch the major muscle groups involved in your work activities before starting work ▪ Perform static stretches, not ballistic (bouncing) stretches ▪ Hold each stretch for 30 seconds 	<p>Do one or two different stretches during your work, ideally every hour, to promote blood flow to tired muscles and help prevent stiffness</p>	<ul style="list-style-type: none"> ▪ Repeat the major muscle group stretches done previously in your warm-up, but only do one repetition ▪ Cool down stretches should take approximately half as long as the warm up.

Relaxation

Relaxation is important for optimizing your performance (Blue 1996):

- Take scheduled breaks. Shift your focus to non-work-related topics; change your physical position. Make an effort to concentrate on fun topics.
- Take a deep breath, tense your muscles, hold for five to ten seconds, relax and breathe out.
- If you sit during your break, the pelvis should be in a neutral position. The spine should be supported along its natural curve, allowing muscle relaxation. The seat height should allow your knees to be level with, or higher than, your hips.

Lifestyle

Maintaining a healthy lifestyle (Bongers et al., 1993; Gundewall et al., 1993; Linton et al., 1999; Owen and Damron 1984) is important for maintaining good quality of life and for reducing MSI risks.

- Get enough sleep. Physicians recommend seven to eight hours of sleep each night for good health.
- Eat a balanced diet. Follow the Canadian Food Guide Recommendations.
- Exercise regularly. Exercise promotes healthy heart, lungs and muscles, helps control weight and relieve stress. Physicians recommend thirty minutes of cardiovascular exercise three or four times per week.
- Learn to relax. Engage in fun social activities on a regular basis.

APPENDIX 7 Incident Report Form

Incident Report Form

No. _____

Employee to fill out Sections A and B

Surname: _____ **Given Name(s):** _____ **Sex:** Male Female

Date of Birth: (d/mo/yr) _____ **SIN:** _____ **Employee No. :** _____ **Union:** _____

Facility or Site Where You Work: _____ **Health Services Area:** DVH EC DBH SC LPH
Job Title: _____ **Dept.:** _____ **Supervisor:** _____

Length of time in current position: (yrs) _____ **Status:** Full-Time Part-Time Casual **Phone (work):** _____

Mailing Address: _____ **Phone (home):** _____

Date of Incident: _____ **Time:** _____ **Shift Start Time:** _____ **Time Shift End:** _____
d/mo/yr (24 hrs) (24 hrs) (24 hrs)

Date Reported: _____ **Time Reported:** _____ **Reported To:** _____
d/mo/yr (24 hrs)

Number of hours worked in 24 hours preceding incident: _____
(hrs)

Day and length of rotation at time of injury: Day _____ of a _____ day rotation

Incident category (please check)

Location of Incident (bldg, floor, room#): _____ **Witness(es)** _____

Description of Incident/Injury/Illness These questions will be coded; so please ensure all relevant information is supplied. Please describe the nature of the injury (e.g. strain, cut, bruise, blood exposure, burn, etc.) and body part affected (e.g. back, shoulder, finger) (Use an additional page if necessary)

Cause of incident (e.g. lifting equipment, needlestick, fall, repetitive motion, patient weight)

SECTION B: DETAILS OF INCIDENT (cont'd)

How could this incident have been prevented?

Action Following Incident (check all that apply):

Remained at Work First Aid Occupational Health Unit Medical Aid
(saw/will see doctor) Lost time injury
(missed/will miss time beyond injury date)

Returned to Work _____ time _____
(d/mo/yr) (hrs)

Signature of Injured Employee _____ Date Report Completed _____ Time Report Completed _____

SECTION C: SUPERVISOR / MANAGER'S REPORT

List all factors contributing to this incident:

Equipment/Device:	Environment or condition:
Patient/Client:	Worker:
Public/Visitor:	Organizational/Administrative: <i>(Procedure, staffing, training, etc.)</i>

Additional comments or observations:

				Follow-up required	
	Yes	No	N/a	Yes	No
Is there a written safe work procedure for the activity involved?					
Has the employee received education and training relevant to the activity involved? If yes, date of training: _____					
For the patient-related incidents: was there an up-to-date patient assessment? was there an up-to-date care plan?					

Corrective measures recommended to prevent a reoccurrence of the same or similar incident (control measures):

Corrective action referred to: _____

To be completed by: (d/mo/yr) _____

Supervisor/Manager Name _____ Signature _____ Date _____ (d/mo/yr)

APPENDIX 8 MSIP Program Evaluation Questionnaire**MSIP Program Evaluation Questionnaire****Section A: Employee Information**

Job Title: _____
 Length of time in current position: (yrs) _____ Department: _____
 Date of Birth (d/mo/yr): _____
 Sex: Male: _____ Female: _____
 Status: Full-time _____ Part-time _____ Casual _____
 Hours/Shift: (24 hrs) _____ Rotating Shift: _____ Fixed Shift: _____

Section B: Musculoskeletal Injury Prevention Program (MSIP) Policy	Yes	No	I don't know
---	------------	-----------	---------------------

1. Does your workplace have a MSIP Policy? If 'yes',			
a) Is the policy easily accessible?			
b) Is the policy easy to understand?			
c) Does the policy identify goals and objectives?			
d) Are the responsibilities of the employer identified?			
e) Are the responsibilities of manager/supervisors identified?			
f) Are any department specific responsibilities identified?			
g) Are you aware of your responsibilities?			

Section C: Patient Assessment and Care Plans	Yes	No	I don't know
---	------------	-----------	---------------------

1. Is there a written policy for patient assessments?			
2. Is there a written procedure for patient assessments?			
3. If 'yes', does it clearly indicate who is responsible for:			
a) The assessment?			
b) The reassessments?			
c) When they should be done?			
d) Who is responsible for communicating details of the assessment/ reassessment to care staff?			
4. Is a standardized care plan in place?			
5. Is a care plan available? If 'yes',			
a) Is it useful/sufficiently detailed?			
b) Is it easy to understand?			
c) Is it provided for all patients?			
d) Is it easily available/accessible to all care staff?			

Section D: Written Safe Work Procedures	Yes	No	I don't know
--	------------	-----------	---------------------

1. Are there written procedures for:			
a) Patient lift and transfer tasks?			
b) Patient repositioning tasks?			

Section D: Written Safe Work Procedures cont'd	Yes	No	I don't know
c) Other patient handling tasks?			
d) Material handling tasks?			
e) Equipment handling tasks?			
2. Are the procedures for patient lifts and transfers:			
a) Easily available?			
b) Easy to understand?			
c) Sufficiently detailed?			
3. Are the procedures for patient repositioning tasks:			
a) Easily available?			
b) Easy to understand?			
c) Sufficiently detailed?			
4. Are the procedures for other patient handling tasks:			
a) Easily available?			
b) Easy to understand?			
c) Sufficiently detailed?			
5. Are the procedures for material handling:			
a) Easily available?			
b) Easy to understand?			
c) Sufficiently detailed?			
6. Are the procedures for equipment handling:			
a) Easily available?			
b) Easy to understand?			
c) Sufficiently detailed?			
Section E: Training and Education	Yes	No	I don't know
1. Have you attended a training/education sessions on: <i>(if 'yes' please include date of last session)</i>			
a) Patient lift and transfers?			
b) Patient repositioning?			
c) Safe material handling?			
d) Safe equipment handling?			
1.1 Does the patient lift and transfer education:			
a) Offer sufficient information?			
b) Include demonstrations?			
c) Include practice sessions?			
1.2 Does the patient repositioning education:			

Section E: Training and Education cont'd	Yes	No	I don't know
a) Offer sufficient information?			
b) Include demonstrations?			
c) Include practice sessions?			
1.3 Does the safe material handling education:			
a) Offer sufficient information?			
b) Include demonstrations?			
c) Include practice sessions?			
1.4 Does the safe equipment handling education:			
a) Offer sufficient information?			
b) Include demonstrations?			
c) Include practice sessions?			
2. Have you attended a training session in the following: (if 'yes' please include date of last session)			
a) Signs and symptoms of MSIs?			
b) MSI risk factors?			
c) Ergonomics?			
d) Body Mechanics?			
e) Other? _____			
2.1 Does the MSI signs and symptoms education offer sufficient information?			
2.2 Does the MSI risk factors education offer sufficient information?			
2.3. Does the ergonomics education:			
a) Offer sufficient information?			
b) Include demonstrations?			
c) Include practice sessions?			
2.4. Does the body mechanics education:			
a) Offer sufficient information?			
b) Include demonstrations?			
c) Include practice sessions?			
Section F: Supervision	Yes	No	I don't know
Does your supervisor:			
a) Promote safe work procedures?			
b) Encourage training in safe work procedures?			
c) Assist with safe work investigations?			

Section G: Inspections	Yes	No	I don't know
d) Investigate work related injuries/illnesses root causes?			
Is there a routine safety inspection of your work area by:			
a) The Joint Occupational health and safety committee?			
b) Supervisors?			
c) Maintenance workers?			
d) Workers?			
Are patient handling devices inspected for faults by:			
a) Supervisors?			
b) Maintenance workers?			
c) Workers?			
Is non-patient handling equipment inspected for faults by:			
a) Supervisors?			
b) Maintenance workers?			
c) Workers?			
4. Is there a procedure for reporting unsafe conditions?			
5. Do you report unsafe conditions?			
6. Are reported unsafe conditions investigated immediately?			
7. Are reported unsafe conditions corrected immediately?			
Is there a preventive maintenance program for patient handling equipment?			
Section H: Accidents/Incidents	Yes	No	I don't know
1. Does your facility have a designated first aid attendant (24 hours/day)?			
2. Does your workplace have an incident report form?			
Section I: Personal MSI Experience	Yes	No	I don't know
1. Have you had a work related musculoskeletal injury in the past 12 months? <i>If 'no', please go to Section J. If 'yes', was your MSI related to:</i>			
a) Equipment?			
b) Environment?			
c) Patient handling?			
d) Material handling?			
e) Worker related factors?			
f) Organizational factors?			

Section I: Personal MSI Experience cont'd

2. Body parts affected

- | | | | |
|------------------------------------|---|---|---|
| <input type="checkbox"/> Eyes | <input type="checkbox"/> Arms | <input type="checkbox"/> Trunk (chest, rib, abdomen, hip) | <input type="checkbox"/> Foot/toe(s) |
| <input type="checkbox"/> Mouth | <input type="checkbox"/> Hand/wrist/finger(s) | <input type="checkbox"/> Groin | <input type="checkbox"/> Multiple (2 or more parts) |
| <input type="checkbox"/> Head/face | <input type="checkbox"/> Upper back | <input type="checkbox"/> Upper/lower leg | <input type="checkbox"/> Back/neck/shoulder |
| <input type="checkbox"/> Ears | <input type="checkbox"/> Middle back | <input type="checkbox"/> Knee | <input type="checkbox"/> Other |
| <input type="checkbox"/> Neck | <input type="checkbox"/> Lower Back | <input type="checkbox"/> Ankle | |
| <input type="checkbox"/> Shoulder | <input type="checkbox"/> Buttock | | |

Section J: Comments

APPENDIX 9 Patient Assessment Checklist

COMMUNICATION	Yes	No
1. Does the care plan identify any limitations in the patient's ability to communicate?		
SIGHT		
1. Is the patient's vision good without glasses?		
If 'no', is the patient's vision good with glasses?		
HEARING		
1. Can the patient hear?		
2. If the patient cannot hear, can the patient hear with hearing aids?		
LANGUAGE AND SPEECH		
1. Is the patient able to understand spoken language?		
2. Is the patient able to communicate verbally?		
3. Does the patient have difficulties with speech? If 'yes', please comment		
4. Is the patient able to understand and communicate in English? If 'no', please comment		
5. Is the patient able to communicate non-verbally?		
If 'yes', please indicate type of communication:		
Body language?		
Sign language?		
Communication aids?		
6. Is the patient able to follow simple instructions?		
7. Does the patient understand demonstrations?		
COGNITION		
1. Does the care plan identify any limitations with patient's cognitive abilities?		
2. Does the patient know own name?		
3. Does the patient recognize family members?		
4. Does the patient know where he/she is?		
5. Is the patient aware of the time of day?		
6. Can the patient follow complex instructions?		
If 'no', can the patient follow simple instructions?		
7. Can the patient remember instructions?		
8. Is the patient capable of making decisions?		
9. Does the patient show sound judgment?		
10. Is the patient able to concentrate?		
11. Is the patient calm and relaxed?		

MEDICAL STATUS		Yes	No
1. Does the care plan identify the designated transfer? If 'yes', please state			
2. Does the care plan identify the medical diagnosis? If 'yes', please state			
3. Does the care plan identify the patient's weight? If 'yes', please state			
4. Does the care plan identify the patient's height? If 'yes', please state			
5. Is the patient pain free? If 'no', where is the pain?			
6. Does the patient take pain medication? If 'yes', please state			
7. Does the patient take other medication(s)? If 'yes', please state			
8. Does the patient use a prosthesis or orthotics? If 'yes', please indicate			
9. Does the patient use an aid?			
If 'yes', please indicate: Cane?			
Crutches?			
Walker?			
Sling?			
Splints?			
Hearing aids?			
Glasses?			
Other?			
10. Does the care plan identify the patient's exercise/activity tolerance? If 'yes', please comment			
PHYSICAL STATUS		Yes	No
1. Does the care plan identify limitations with patient's physical abilities?			
2. Can the patient weight bear through both legs?			
If 'no', through one leg?			
3. Can the patient weight bear through both arms?			
If 'no', through one arm?			
BALANCE		Yes	No
1. Can the patient sit unsupported? If 'no', comment			
2. Can the patient maintain sitting balance while changing position? If 'no', comment			

BALANCE cont'd	Yes	No
3. Can the patient stand unsupported? If 'no', comment		
4. Can the patient maintain standing balance while changing position? If 'no', comment		
5. Can the patient balance while walking? If 'no', comment		
RANGE OF MOTION	Yes	No
1. Does the patient have good range of motion? If 'no', please comment		
MUSCLE STRENGTH	Yes	No
1. Does the patient have good muscle strength? If 'no', please comment		
2. Does the patient have good muscle tone? If 'no', please comment		
CO-ORDINATION	Yes	No
1. Does the patient have good coordination? If 'no', please comment		
SKIN CONDITION	Yes	No
1. Does the patient have good skin condition? If 'no', please comment		
SENSORY STATUS	Yes	No
1. Does the patient have normal skin sensation? If 'no', please comment		
2. Is the patient aware of light touch?		
3. Is the patient aware of painful stimuli e.g. a pinprick?		
4. Is the patient aware of the position of his/her limbs?		
BEHAVIOURAL AND EMOTIONAL STATUS	Yes	No
1. Does the patient have any history of the following behaviors?		
Anxiety?		
Fear?		
Confusion?		
Hostility / aggression / violent behavior?		
Depression?		
Agitation?		
Verbal resistance?		
Physical resistance?		

Unpredictability?		
2. Does the patient presently demonstrate any of the following behaviors?		
Anxiety?		
Fear?		
Confusion?		
Hostility, aggression, violent behavior?		
Depression?		
Agitation?		
Verbal resistance		
Physical resistance?		
Unpredictability?		
CLOTHING AND ASSISTIVE DEVICES	Yes	No
1. Are the patient's clothes well-fitting?		
2. Are the patient's clothes well fastened?		
3. Are there any loose ties etc that could catch on obstacles?		
4. Are the patient's shoes well fitting?		
5. Are the patient's shoes supportive?		
6. Are the patient's shoes in good condition?		
7. Are the patient's shoes appropriate?		
8. Can the patient move without assistive devices?		
If 'no', does the patient use:		
Cane(s)?		
Walker?		
Crutch(es)?		
Brace(s)?		
Splint(s)?		
Other?		

APPENDIX 10 Care Plan

PATIENT CARE PLAN

NAME: _____

ROOM NO: _____

SPECIAL CONCERNS / LIMITATIONS	Cognitive: _____ Medical: _____ Physical: _____ Behavioural/Emotional: _____ Other: _____
COMMUNICATION	Hearing: _____ Communication Aids: Hearing Aid – Ear: <input type="checkbox"/> Lt. <input type="checkbox"/> Rt. Other: _____ Vision: _____ <input type="checkbox"/> Glasses Language: _____ Speech: _____ <input type="checkbox"/> Non-verbal
TRANSFERS	<input type="checkbox"/> Independent <input type="checkbox"/> Mod. Assist. <input type="checkbox"/> 1 Person <input type="checkbox"/> Supervised <input type="checkbox"/> Total Assistance <input type="checkbox"/> 2 Persons <input type="checkbox"/> Min. Assist. <input type="checkbox"/> Other _____
TRANSFER AIDE(S)	<input type="checkbox"/> Transfer Belt (Size: __) <input type="checkbox"/> Sliding Device _____ <input type="checkbox"/> Lift: _____ (Sling Size: __) <input type="checkbox"/> Other: _____ <input type="checkbox"/> Sit-to-Stand Device _____ (Sling Size: __)
SEATING SYSTEM	<input type="checkbox"/> Wheelchair: <input type="checkbox"/> Manual <input type="checkbox"/> Electric <input type="checkbox"/> Cushion(s) <input type="checkbox"/> Scooter <input type="checkbox"/> Gerichair <input type="checkbox"/> Other _____
WALKING	<input type="checkbox"/> Independent <input type="checkbox"/> 1 Person <input type="checkbox"/> 2 Persons <input type="checkbox"/> Walker <input type="checkbox"/> Cane <input type="checkbox"/> Walking Belt <input type="checkbox"/> Pushes Wheelchair <input type="checkbox"/> Other _____
BED, BEDSIDE SAFETY	<input type="checkbox"/> Bed: <input type="checkbox"/> Side Rails <input type="checkbox"/> Pads <input type="checkbox"/> Call Bell <input type="checkbox"/> Sensory <input type="checkbox"/> Seating System: _____ <input type="checkbox"/> Commode: _____
AM/PM GROOMING	<input type="checkbox"/> Independent <input type="checkbox"/> Wash Hands & Face _____ <input type="checkbox"/> Supervised <input type="checkbox"/> Comb Hair _____ <input type="checkbox"/> Partial Assistance <input type="checkbox"/> Shave _____ <input type="checkbox"/> Total Assistance <input type="checkbox"/> Dress/Undress _____ <input type="checkbox"/> Up for Breakfast

SAMPLE CARE PLAN cont'd

ORAL CARE	<input type="checkbox"/> Independent <input type="checkbox"/> Partial Assistance <input type="checkbox"/> Own Teeth <input type="checkbox"/> Supervised <input type="checkbox"/> Total Assistance <input type="checkbox"/> Dentures: U L P <input type="checkbox"/> Electric Toothbrush
TOILETING	<input type="checkbox"/> Independent <input type="checkbox"/> Toilet <input type="checkbox"/> Commode <input type="checkbox"/> Supervised <input type="checkbox"/> Raised Toilet Seat <input type="checkbox"/> Urinal <input type="checkbox"/> Partial Assistance <input type="checkbox"/> Colostomy <input type="checkbox"/> Bed Pan <input type="checkbox"/> Total Assistance <input type="checkbox"/> Catheterized (Details:_____) Toilet Routine:_____ Bowel Routine:_____
BATHING	<input type="checkbox"/> Independent Bath Day: <input type="checkbox"/> Shampoo <input type="checkbox"/> Hairdresser <input type="checkbox"/> Supervised <input type="checkbox"/> Tub <input type="checkbox"/> Shower <input type="checkbox"/> Partial Assistance <input type="checkbox"/> Trolley <input type="checkbox"/> Bed Bath <input type="checkbox"/> Total Assistance
MEALS	<input type="checkbox"/> Independent <input type="checkbox"/> Supervised <input type="checkbox"/> Partial Assistance <input type="checkbox"/> Total Assistance Breakfast: Lunch: Dinner: <input type="checkbox"/> Bed <input type="checkbox"/> Bed <input type="checkbox"/> Bed <input type="checkbox"/> Room, tray service <input type="checkbox"/> Room, tray service <input type="checkbox"/> Room, tray service <input type="checkbox"/> Dining Room <input type="checkbox"/> Dining Room <input type="checkbox"/> Dining Room Texture: <input type="checkbox"/> Regular <input type="checkbox"/> Cutup <input type="checkbox"/> Minced <input type="checkbox"/> Puree Special Diet: <input type="checkbox"/> No Salt Added <input type="checkbox"/> Diabetic <input type="checkbox"/> Other:_____ Supplements:_____ Snacks:_____
REST PERIODS & BED TIME	<input type="checkbox"/> Morning <input type="checkbox"/> Afternoon <input type="checkbox"/> Bed Time Time:_____ Time:_____ Time:_____
LAUNDRY	<input type="checkbox"/> Facility <input type="checkbox"/> Family/Companion <input type="checkbox"/> Other_____ Details_____
ACTIVITES	Preferred Activities/programs (Details): <input type="checkbox"/> AM Programs M T W TH F S S _____ <input type="checkbox"/> PM Programs M T W TH F S S _____ <input type="checkbox"/> Spiritual Services M T W TH F S S _____ Details_____
DATE OF ASSESSMENT (D/M/Y):_____ ASSESSED BY:_____ RECOMMENDED REVIEW DATE IF NO PRIOR CHANGE (D/M/Y):_____	

APPENDIX 11 Workplace Inspection Checklist

Department/area inspected: _____

Date: _____

Inspected by: _____

Item inspected	Yes	No	Comments including any recommended corrective action and any referrals	Date corrected
Floors				
Clean?				
Dry?				
Even surfaces?				
Uncluttered?				
Cleaned regularly?				
Hallways/corridors				
Clean?				
Dry?				
Even surfaces?				
Uncluttered?				
Space allows movement of equipment?				
Cleaned regularly?				
Work area				
Even surfaces?				
Uncluttered?				
Space allows movement of equipment?				
Allows for privacy when necessary?				
Cleaned regularly?				
Lighting				
Adequate				
Light fixtures in good working order?				
Easily accessible?				
Furniture				
Clean?				
In good working order?				
Fire exits				
Clearly marked?				
Unobstructed?				
Exit sign light bulbs in working order?				
Fire extinguishers				
Appropriate extinguishers available?				
Appropriate extinguishers accessible?				
Inspected?				
Date of inspection recorded?				
Staff aware of location?				

Workplace Inspection Checklist cont'd

Item inspected	Yes	No	Comments including any recommended corrective action and any referrals	Date corrected
Personal protective equipment				
Available?				
In use (if applicable)?				
Accessible?				
In good working order?				
Staff aware of location?				
Staff adequately trained in the use?				
Disposal for sharp equipment/objects				
Separate containers available?				
Clearly identified?				
Accessible?				
First aid				
Available?				
Accessible?				
Staff aware of location?				
Staffs know how to obtain first aid?				
Warning signs for hazards				
Available?				
In use (if applicable)?				
Accessible?				
Staff aware of location?				
Electrical plugs and sockets/cords				
In good working order?				
Sockets accessible?				
Electrical cords positioned to avoid trips/falls?				
WHMIS				
All controlled products labeled?				
MSDS binder accessible?				
MSDS up to date (less than 3 years)?				
Staff aware of location of MSDS binder?				
Staff familiar with the WHMIS program?				
Staffs have received WHMIS training?				
Emergency eye wash/shower				
Eye wash solution available?				
Appropriate washing procedures available?				
Staff use appropriate washing procedures?				
Staff				
Wear appropriate clothing?				
Wear appropriate footwear?				
Trained in the use of the available equipment?				
Trained in safe work practices?				
Follow designated procedures?				
Use the correct technique?				
Trained in fire and safety prevention?				
Know how to report unsafe conditions?				
Know how to report an injury?				
Know to whom to report an injury?				
Aware of the MSIP Program?				

Workplace Inspection Checklist cont'd

Item inspected	Yes	No	Comments including recommended corrective action and any referrals	Date corrected
Beds/stretchers				
Height adjustable?				
Brakes in place?				
Brakes in good working order?				
Side rails in place?				
Side rails in good working order?				
Wheels in good working order?				
Staff aware of location?				
Wheelchairs/commodes				
Appropriate chairs available?				
Appropriate chairs accessible?				
Brakes in good working order?				
Removable armrest?				
Removable footrests?				
Wheels in good working order?				
Other features in good working order?				
Staff aware of location?				
Other chairs				
Appropriate chairs available?				
Appropriate chairs accessible?				
Brakes in good working order?				
Removable armrest?				
Removable footrests?				
Wheel in good working order?				
Other features in good working order?				
Staff aware of location?				
Tubs				
Appropriate tub available?				
Tub easily accessible?				
Height adjustable?				
Equipped with a patient lift?				
In good working order?				
Patient mechanical lifts				
Appropriate lifts available?				
Appropriate lifts accessible?				
In good working order?				
Brakes in place?				
Brakes in good working order?				
Appropriate accessories available?				
Appropriate accessories accessible?				
Staff trained in the use?				
Staff aware of location?				

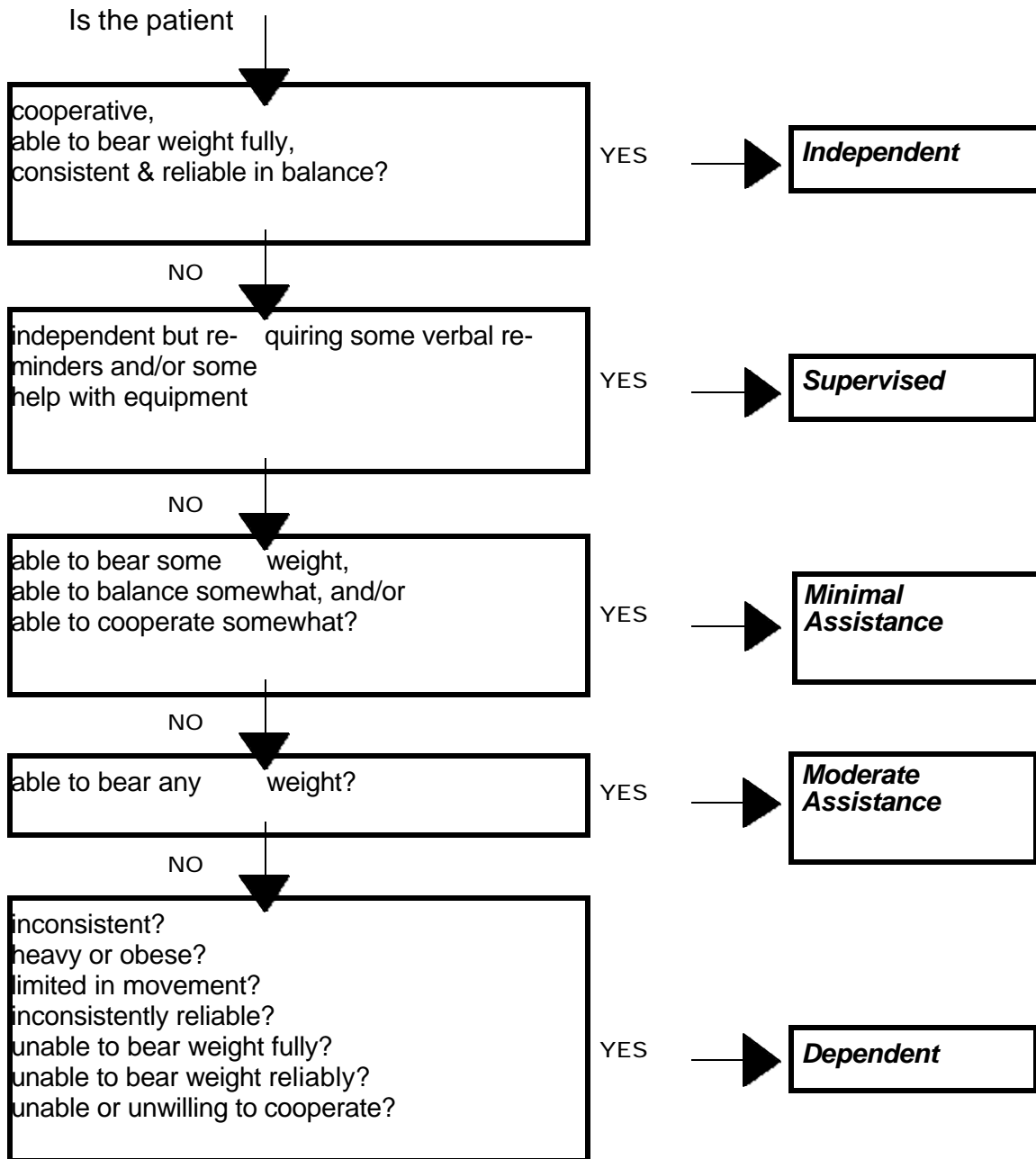
APPENDIX 12 Patient Handling Risk Assessment Form

PATIENT HANDLING RISK ASSESSMENT FORM		
Job title: _____ Duty/Tasks: _____		
Area/department: _____		
Date of assessment (d/m/yr): _____ Conducted by: _____		
General Risk Factors & Tasks	Observations	Recommendations
Workspace Environment		
Equipment / device		
Assistance		
Pushing & pulling		
Repetitive motions/ tasks		
Awkward tasks		
Posture (eg. unsupported)		
Static position		
Forceful exertion		
Reaches		
Carrying		
<i>Combination of risk factors for identified tasks:</i>		
Lifting & transferring		
Repositioning		
Patient ambulation		
Washing & bathing		
Medical procedures (indicate):		

Adapted from Surrey Memorial Hospital's ErgoSense Program

APPENDIX 13 Patient Transfer Assessment Flow-sheet

Assess the patient before you begin the task so that you know the patient's status before you begin. (See Appendix 9 for a thorough patient assessment checklist.)



Sample Education Module

1. Introduction

- The reason why the training is taking place

2. Body mechanics

- Stretching
- Relaxation
- Individual fitness
- Basic anatomy of the spine

3. Risk factors

- The way you move
- Legal requirements/regulations
- Institution's pertinent MSIP policies

4. Ergonomics

- How to avoid the unexpected
- Assessment of the area, equipment, load, task and worker

5. Pertinent techniques/procedures

- Demonstrations
- Practice sessions (if applicable)

6. Suggested handouts:

- Sheets of stretching exercises
- Pertinent MSIP policies e.g. safety, equipment repair