IMPLEMENTATION OF A WORKPLACE SELF-MANAGEMENT PROGRAM TO REDUCE WORKER ABSENTEEISM

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IMPLEMENTATION OF A WORKPLACE SELF-MANAGEMENT PROGRAM TO REDUCE WORKER ABSENTEEISM

by

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Thesis Abstract:

Objective: Sedentary office workers are at a high risk of developing recurring musculoskeletal injuries that can lead to long-term disability subsequently resulting in increased workplace absenteeism. The objective of the study was to determine the efficacy of a 6-week self-management workplace program in reducing long-term absenteeism among office workers.

Methods: In collaboration with physiotherapists, occupational therapists, and a rheumatologist, a self-management program was designed using the guiding principles of the Arthritis Self Management Program and delivered as a 6-session course by a trained facilitator. Sedentary office workers obtained from three worksites were randomized into the intervention and non-intervention group. Baseline demographics and baseline absenteeism data were obtained for both groups. Absenteeism data were collected one year after intervention and evaluated for both the active and control group. Paired t-test was used to determine the efficacy of the program in reducing workplace absenteeism. Analysis of Covariance was used to evaluate absenteeism and other determinants of workplace absenteeism.

Results: A total of 146 participants completed the program with 86 receiving the self-management program (intervention). The baseline demographics of the participants in the intervention and control groups were similar with respect to age, sex, marital status, education level, musculoskeletal pain, helplessness, depressive symptoms, and baseline absenteeism (Year 2003). The evaluation of the primary outcome demonstrated that the intervention had no significant effect on overall absenteeism between the control and intervention group ($P=0.42$). Furthermore, workplace determinants including depression, previous musculoskeletal pain, and frequency of pain, did not influence worker absenteeism.

Conclusion: This one-year prospective study evaluated outcomes of a workplace self-management program designed to target office workers. Implementation of this new program showed it had no effect on workplace absenteeism.

Acknowledgements

Dedication:

I would like to dedicate this thesis to my mother and sister who have always supported my work.

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This would not have been possible without the continuous support, guidance and leadership of my supervisor, Dr. Proton Rahman, rheumatologist, epidemiologist, and associate professor within Faculty of Medicine. Through his outstanding supervision these past years, I have acquired a great deal of understanding, respect and interest for research in Epidemiology.

I would also like to thank Dr. Bill Bavington, Associate Professor within Community Health with research interests in prevention and control of communicable diseases, medical education, public health policy and practice, and Dr. Sean Murphy, Assistant Professor within Faculty of Medicine with current research in hyperparathyroidism in dialysis patients and anemia management in dialysis patients, for their patience and guidance through this process.

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I would like to extend a special thanks to our research team which includes psychiatrists, Dr. Tanis Adey, and Dr. Angela Penney for their input on

the *WSMP* protocol design and analysis, and especially our occupational therapist, Kim Doyle, and physiotherapist, Jill Seviour, for dedicating time to develop and deliver the *WSMP* program. I would also like to thank Andrea Kavanaugh, information technology specialist for designing the databases, Karim Marzouk, staff, for data entry, David Hallett, biostatistician for reviewing the statistical analysis, and Mark Wade for help with the submission process.

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Chapter 1

Thesis Overview

1.1 Thesis Overview

This thesis will be presented in six chapters. Chapter 1 gives an overview of the chapter contents along with the co-authorship statement.

The intent of chapter 2 is to provide an overview of musculoskeletal disorders and the role they play in chronic long term disability among the working masses. Detailed information regarding specific conditions present among sedentary office workers including carpal tunnel syndrome, repetitive strain injuries, and back and neck pain is provided. Moreover, a review of relevant literature regarding prevalence of these disorders as well as the associated costs to society is presented. Finally, the rationale for conducting this investigation is presented including a critical review of a previously validated educational intervention known as the Arthritis Self Management Program.

Chapter 3 includes the research hypothesis of this study. The exact testable questions consisting of the primary and secondary objectives regarding the investigation are specified.

Chapter 4 includes the methods which discuss the design selected to attempt to answer the research question. Sample recruitment, administration of the intervention program as well as an overview of intervention course content are included. To finish, a discussion of the outcome variable, sample size estimation and statistical analysis will be presented.

In chapter 5, the baseline description and response rates of study subjects are provided. The results of the analysis of both the primary and secondary outcomes along with level of statistical relevance are offered.

And finally, in chapter 6, discussion and implications of the results in terms of the outcomes are presented. Conclusions that may be reasonably drawn from the outcomes of the study along with associated strengths and weaknesses are provided. Direction for future studies is also included.

1.2 Co-Authorship Statement

i) Design and identification of the research proposal

Samra Mian and Dr. Proton Rahman (rheumatologist/epidemiologist) were responsible for the study design and identification of the research topic.

ii) Practical aspects of the research

The data collection for the study in this thesis was completed primarily by Samra Mian with assistance from Kim Doyle (Occupational Therapist), Jill Seviour (Physiotherapist), and Yvonne Tobin (Research Nurse). Data entry into Access database was completed by Karim Marzouk (Staff).

iii) Data analysis

Samra Mian completed the data and statistical analysis for the study in this thesis. David Hallet (Biostatistician) from University of Toronto was consulted to review the statistical methodology

iv) Manuscript preparation

Samra Mian completed the manuscript with relevant revisions made by Dr. Proton Rahman, Dr. Bill Bavington (Associate Professor), and Dr. Sean Murphy (Associate Professor).

Chapter 2

Background

2.1. Background

Diseases of the musculoskeletal (MSK) system are one of the most common human afflictions associated with long-term disability. These debilitating disorders can leave individuals disabled for weeks, months or even permanently. Arthritis and related MSK conditions are the leading cause of work disability in North America (American College of Rheumatology Subcommittee on Rheumatoid Arthritis, 2000) as well as other developed nations (Punnett & Wegman, 2004; Nielson & Mior, 2001). These disorders result in substantial management, discomfort, and cost. Work related upper extremity conditions have a longer treatment period thereby being a major cause of activity limitation and long-term disability within the working population (Baldwin, 2004; Main & Williams, 2002; Mantyselka et al, 2002). Moreover, these ailments have received mounting recognition over recent decades as a range of disorders associated with employment as being the leading cause of work absenteeism (Stewart et al, 2003; Badley et al, 1994; Lee, 1994). This may be due to the fact that workers who develop repeated MSK injuries continue to work at their regular jobs rather than dealing with the cause of their pain which in turn could interfere with their job demands or activities of daily life. Workers may be forced to relocate to positions that are low-risk for developing MSK pain or may eventually lead to early retirement.

Sedentary office workers with poor workstation design, continuous and repetitive computer work are at risk for developing MSK disorders (Juul-Kristensen & Jensen, 2005, Silanpaa et al, 2003). A significant portion of work

related absenteeism among office workers has been attributed to MSK disorders (Arnetz et al, 2003). MSK symptoms/diagnoses that are present within the working masses include repetitive strain injuries specifically soft tissue disorders, non-inflammatory joint disease, mechanical back or neck pain, and carpal tunnel syndrome.

In general, the working population is healthier than the non-working population. However, negative health outcomes are associated with various types of employment. Long-term disability due to chronic pain is a direct result from an interaction between disease, social and work characteristics, which can have deleterious effects on an individual's work, home, and leisure activities. Due to these functional limitations, psychological factors such as depression, anxiety, and loss of confidence can manifest (Kuch, 2001; Tarumi & Hagihara, 1999). In turn, these psychological factors combined with work characteristics can lead to MSK disorders. Existing literature supports the fact that psychological and social conditions along with physical workload play a key role in development of low back and neck/shoulder pain (Main & Williams, 2002; Waldstrom et al, 2002).

There is ample evidence illustrating the role general chronic pain has as a health concern in today's society (Linton, 2002; Pransky et al, 2002). Pain is a common reason for individuals to seek medical care, however, treating soft tissue MSK pain of uncertain origin is difficult (Foster et al, 2003). Due to the resulting disability, chronic pain is expensive. This expense exists in terms of sizeable socioeconomic impact due to increased health care costs, absenteeism, loss of productivity, and costs of disability benefits and compensation (Severeijns

et al, 2004).

Yelin and Callahan (1995) conducted a review of existing literature combined with estimates of data from the 1990-1992 National Health Interview Survey which showed that due to the aging population, individuals between the ages of 45-64 incur the largest share of direct and indirect costs of MSK conditions. Direct costs of MSK disorders accounted for nearly all of the healthcare costs ensuing in increased physician visits in addition to time per visit while indirect costs took account of lost workdays and lowered work efficiency. In 1990, The National Institute of Occupational Safety and Health (NIOSH) estimated that 15% to 20% of Americans were at risk for developing chronic MSK disorders (Melhorn et al, 2001). In Canada, sprains and strains made up 53 percent of work-related injuries and illnesses in 1994, displaying a marked increase of 38% since 1970s (Ranney, 1997).

However, Mustard et al (2003) reported that rates of workers compensation for lost time declined by approximately 50% in Ontario as well as in other North American jurisdictions. According to Ontario workers compensation system, 5500 chronic pain cases were reported in a given year however the total direct and indirect costs associated with these cases were found to be close to $330 million dollars (Ranney, 1997). The actuality that there are fewer reports of work-related injuries but escalating costs facilitates the claim that the increase in cost is a direct result of the injuries being more chronic and disabling. This is due to MSK disorders on average costing up to ten times as much as that of any other workplace injuries with two thirds of these related costs

attributable to indirect costs rather than medical cost (Webster & Snook, 1994).

Due to the substantial costs affiliated with MSK disorders, prevention programs have emerged as a high priority. With limited health care resources, targeting individuals at risk for developing work disability could allow one to potentially prevent the illness or disability rather than correcting after job loss. This could be accomplished by incorporating workplace health programs as a broader approach to promote health among employees within workplaces. Demands of the modern workplace associated with technological advances and increased productivity rates can contribute to different biomechanical, psychosocial conditions and individual workplace characteristics that can exacerbate work disabilities. Nicholas et al (2005) followed 169 office workers who completed pre and post self report questionnaires rating job stress, ergonomic factors, and work style, and showed that perceived ergonomic stressors and time working on a computer in addition to high risk work style were associated with workers reporting work related disorders.

In North America, even though severity of hazards is lower in offices than in factories, mining or construction, there are still significant health risks associated with specific physical working conditions such as the characteristics of video display terminals, surrounding work station, and positioning of lighting and work surfaces (Kliztman & Stellman, 1989). Employees are valuable resources for organizations and the economy, yet absenteeism and disability rates continue to increase. As there are a number of factors that contribute to work disabilities and disorders, health promotion programs are needed to

address these determinants both inside and outside the workplace. These workplace determinants include (*Adapted from Polanyi et al, 1995*):

1) Individual factors such as work characteristics, non-work demands, and personal resources.
2) Job factors in terms of pace and value of work, job stress, skills, and type of tasks.
3) Organizational factors with regards to terms of employment, working hours, decision making latitude, health and safety commitments and on-site tools.
4) External factors dealing with globalization, economic competition, drive to increase productivity, and large organizational structures leading to compromised working conditions.

A cause-effect relationship has not been established between workplace determinants and absenteeism in the workplace however, there is ample evidence to advocate that interventions, which specifically aspire to diminish workplace stressors, are capable of preventing MSK disorders (Allaire et al, 1996; Boutaugh et al, 2003; Damush et al, 2002; Keefe et al, 2000). By mitigating stressors such as heavy workloads and repetitive motion that act on the MSK system as well as illustrating imperative techniques to individuals so that they may gain knowledge regarding management of MSK pain and overall workplace wellness, disability can be prevented and absenteeism rates lowered. Brady & Sniezek (2003) indicated that a 15 % to 30 % improvement in arthritis symptoms could be attained through self-management interventions. These interventions differ from other programs in that they afford the necessary tools essential for

individuals to target their MSK pain thereby managing their condition and achieving an optimal quality of life. Currently, recommendations dealing with MSK pain entail non-steroidal anti inflammatory drugs, low stress aerobic activities, patient education and the gradual return to normal activities (American College of Rheumatology Ad Hoc Committee on Clinical Guidelines, 1996). However pharmacologic interventions, indicated amongst these recommendations, rarely eliminate pain due to the complexity and the subsequent psychological factors associated with pain (Baldwin, 2004). Furthermore, several studies have established that a patient's beliefs, pertaining to their ability to manipulate or influence their symptoms, are directly coupled to the level of pain and disability experienced (Boutaugh, 2003; Damush et al, 2003; Keefe et al, 2000; Lorig et al, 1986, 1998). The proposed educational intervention may possibly prevent MSK disability by promoting patient accountability for improving their health standing by enhancing MSK self management practices and increasing knowledge regarding workplace ergonomics in addition to workplace wellness.

2.2. Prevalence of Musculoskeletal disorders

Generally, the overall prevalence of MSK disorders within the working population fluctuates considerably between studies however it is clear that the prevalence is consistently high. Some reports indicate that at least 1 in 10 adults live with MSK pain most often located in the back, head and neck or joints (American College of Rheumatology Ad Hoc Committee on Clinical Guidelines, 1996) while others report about 1 in 4 are affected by chronic MSK pain (White &

Harth, 1999). Nielson and Mior (2001) reported that approximately 17% of the Canadian population experienced chronic pain with 15% claiming severe pain and 55% reporting moderate pain. Numerous surveys of working populations indicate prevalence of 20 to 30 % for upper extremity MSK disorders and the estimated number of people in Canada with disabling MSK disorders is more than double that for all cancers combined in the country (Lee, 1994). These disorders are common in every age group however there is a high prevalence among the elderly. Approximately, 15 % of North Americans are affected by arthritis or other MSK conditions and more than 40 % are aged 65 years or older. As well, despite the prevalence being the highest among those aged 65 years and older, there is a substantial amount of working aged individuals between the ages of 15 to 64 years who are impaired as a result of disabling MSK disease (Yelin et al, 2000).

Epidemiological data indicates that chronic pain has damaging consequences in terms of increased health care and disability costs (Arnetz et al, 2003; Yelin et al, 2000) as well as associated absenteeism costs and loss of productivity (Stewart et al, 2003; Yelin et al, 2000). A study conducted within the Dutch population reported that the prevalence of chronic low back pain increased from 12 % in the 20-29 age group to 21.1 % in the 50-59 age group. Negative consequences associated with these high incidence rates, existed in terms of increased health care costs, increased absenteeism, and loss of productivity (Severeijns et al, 2004). Other findings have indicated that a large number of workers will necessitate time off work, which can be attributed to some type of

MSK pain (Mantyselka et al, 2002; Yelin et al; 2000; Lefort et al 1998) and these disorders are the principal cause of increased health care visits among the working population (Punnett & Wegman, 2004; Lee, 1994; Yelin & Callahan, 1995). As well, these conditions result in diminished quality of life and in some cases an early retirement or permanent job loss if not appropriately treated or managed.

It is important to note that available prevalence and incidence data are in all probability underestimating the particular enormity of these disorders. Despite the fact that MSK conditions are prevalent, these disorders have a tendency to be underreported in the workplace. This may be due to ordinary work-related determinants such as individual pain thresholds, psychosocial stressors, employee/employer relationship and job-security. Moreover, difficulties involved with the diagnosis of MSK disorders further complicate the issue. All the same, it is clear that MSK disorders are prevalent and effective prevention initiatives are needed to lessen the burden.

2.3. Burden of musculoskeletal conditions within the work place

A high burden of economic and health cost exists within the workplace due to a high prevalence of MSK disease. Consequently, these conditions have become a major concern of employees, employers, health care professionals and governments. MSK conditions, which include back pain, cumulative trauma, and other common conditions, inflict a large annual cost burden on health care workers and government programs due to the negative impact these disorders have on employees. This is attributable to the fact that these disorders result in

extensive costs due to long-term disability, increased work absenteeism and decreased productivity. For example, MSK symptoms from the neck, shoulder, and upper and lower back which are widespread in many countries result in significant low labour force participation rates for those who report disability (Punnett & Wegman, 2004; Arnetz et al, 2003; Yelin et al, 2000). In fact, all illnesses or injuries impose both direct and indirect expenses on society, and MSK disorders are no different.

2.3.1. Direct costs

Direct costs of MSK impairments account for a significant portion of healthcare expenses in this nation. These costs are associated with resources consumed due to an illness such as medical expenditures, labour of health professionals, treatment and prevention of disease, building, equipment, and transportation as well as time required for medical treatment and recovery. Chronic MSK pain is among the most frequent explanation for visits to health care providers and necessitates more time per visit than any other type of health problem. MSK afflictions are responsible for 5 % of all hospital discharges, 10% of all hospital procedures and 9% of all physician visits (Lee, 1994). Due to psychosocial, work and family issues, there is a considerable need on behalf of patients to have greater than average contact with physicians to facilitate their treatment in order to cope with their pain. In 1994, Coyte et al (1998) estimated the total cost of MSK disorders and specified that the total cost of MSK conditions in Canada was approximately $9.2 billion dollars of which 29% of that total was due to direct medical costs. A review by Baldwin (2004) on workplace characteristics and the economic motivation associated with long-term disability

reported that according to the American Academy of Orthopedic Surgeons, the estimated economic impact of MSK pain to health care system in the USA in 1995 was $215 billion dollars with 41% accounting for direct medical costs. What's more is that these costs are continuing to rise and measures need to be taken to effectively combat this issue.

2.3.2 Indirect costs

In terms of indirect costs, it is not surprising that a large financial impact exists on society resulting from the broad range of MSK disorders. Indirect costs of an illness are associated with loss of potential output, at work or home, morbidity or premature mortality, and a decline in quality of life. The indirect costs affiliated with MSK disease within a workplace are the consequence of increased workplace absenteeism and lowered work productivity. Due to the aging population, the cost to society in terms of loss in earnings is escalating. Furthermore, the extent of losses is not only dependent on the injury itself but also to the severity of the particular condition. Persons, aged 45-64, incur the largest share of indirect costs with nearly three quarters of the total costs of MSK conditions due to lost wages. In 1992, the total cost of MSK and associated conditions in all age groups within the United States was $149.4 billion or the equivalent of 2.5% of the Gross National Product (GNP) with $77.1 billion of indirect costs due to lost wages (Yelin & Callahan, 1995). In view of this, it is unquestionable that MSK disorders are widespread with extremely high associated costs predominantly due to chronic disability.

2.4. Musculoskeletal Disorders

Patients seek medications and additional treatments for the purpose of alleviating pain and limiting damage while the cause remains unrecognized and thus untreated. It is accepted that managing MSK pain presents a significant problem for both clinicians and patients since no clear pathophysiological explanation exists for such afflictions (Foster et al, 2003). Therefore, from this perspective, it is important to gain more insight and increase knowledge regarding the factors that maintain the consequences of pain. Soft tissues are the most common sites of functional impairment of the MSK system. Furthermore, factors such as fatigue, stress, anger, and depression can lead to a shift in the normal posture or muscular activity thereby changing normal biomechanics resulting in damage (Ranney, 1997). Once this abnormality occurs, treatment must be obtained to restore the full range of motion of the damaged tissues.

Work-related MSK disorders can occur from repetitive stress to the body, which is encountered in the workplace in terms of job demands and work environment. Workplace factors generate fatigue and poor work performance leading to lowered productivity and quality thus creating a negative work environment. Moreover, these risk factors result in a variety of injuries of the muscles, tendons, ligaments, nerves, joints, and bones. Over time, this cumulative trauma to the MSK system can result in permanent damage to muscles tendons, bones, and nerves due to forceful exertions, vibrations, mechanical compression or sustained awkward positions. Specific chronic

conditions/diagnosis common to sedentary office workers include carpal tunnel syndrome, repetitive strain injuries, and back and neck pain.

2.4.1 Carpal Tunnel Syndrome

Carpal tunnel syndrome is the compression of the median nerve at the wrist. A band of fibrous tissue, the transverse carpal ligament that supports the joint surrounds the wrist and the compression of the nerve occurs (Nora et al, 2005). Carpal tunnel refers to a specified space that occurs between the fibrous band and the bone. The median nerve, which passes through the carpal tunnel, can be aggravated by any condition that applies pressure on this nerve such as forceful trauma, arthritis, and obesity (Olney, 2001). The consequence of such conditions is numbing and tingling of the thumb, index, and middle finger (Franzblau, & Werner, 1999). The number of carpal tunnel syndrome cases reported has increased considerably since 1975 and the prevalence of these conditions is shown to be higher among the employed (Stevens et al, 1988). A moderate risk factor for carpal tunnel syndrome consists of occupations demanding repetitive, forceful, or awkward hand or wrist movements however, this relationship remains controversial. A study by Silverstein et al (1987) conducted on employees performing highly repetitive jobs versus low repetition jobs reported that the prevalence of carpal tunnel syndrome among those performing highly repetitive, high force jobs was greater than individuals in low repetition, low force jobs.

2.4.2. Repetitive Strain Injuries

Repetitive strain injuries transpire from continual physical movements ensuing in damage to tendons, nerves, muscles, and other soft body tissues. The

harmful health effects of repetitive work, excessive force and extreme motion overtime can cause straining of the soft tissues resulting in inflammation of muscles and tendons. Due to the lack of adequate breaks as well as using repetitive excessive force, stress is placed on tendons and nerves in the hand, wrist, arms/shoulders and neck (Ranney, 1997). Over time, this constant stress can give way to injury. Accordingly, if this persists for an extended period of time, it can lead to permanent tissue damage, which may not be detectable and resulting long-term disability. Repetitive strain injuries can be severe and these conditions are far easier to prevent rather than to alleviate once the damage is done. Office workers develop repetitive strain injuries that may be the end result of some typical tasks they carry out such as the use of computer keyboards and mouse. There has been a significant rise in the use of computer stations in the office workplace that are associated with the increase of MSK disorders (Juul-kristensen & Jensen, 2005) however this rise is shown to be linked with the use of poorly designed ergonomic workstations rather than the duration of computer or mouse use. Sillanpaa et al (2003) looked at the effects of computer use on MSK disorders in the office environment and showed that in fact the ergonomic design of workstations, placing of mouse, postures of upper extremities and the handling of the mouse should be considered more than the daily use of computers.

In recent years, there has been increased awareness of MSK disease through current health promotion programs, occupational health and safety personal, and media sources such as programs sponsored by the Arthritis

Society that may be leading individuals to seek earlier diagnosis. Therefore, due to the social consciousness about these injuries being valid and a social issue, it may account for the epidemic in job-related repetitive strain injuries that is being observed.

2.4.3 Back and Neck Pain

Back pain may not have any known anatomical origin nevertheless it is a legitimate condition and necessitates high-quality treatment. It is projected that low back pain elicits the loss of 149 million workdays annually (Baldwin 2004). Specific estimates by Williams et al (1998) showed that 20% of workers who were still on sick leave at four months due to low back pain accounted for 60% of the health care costs. Common risk factors for developing back and neck pain include aging, obesity, physically demanding occupation, being sedentary, poor posture, and joint or bone disease (Punnett & Wegman, 2004). Aging can also result in wear and tear on the spine leading to neck and back pain. As well, jobs requiring repetitive bending and lifting have a high incidence of neck and lower back injury due the lack of sufficient rest breaks as well as proper body mechanics (Pransky et al, 2002). A prospective cohort study on 732 office workers in the Netherlands assessed risk factors associated with MSK disorders and found that trunk flexion as well as trunk rotation and lifting at work were significantly associated with the occurrence of sickness absence due to low back pain (Hoogendoorn et al, 2002). Sedentary positions, which are common among office workers, escalate the threat for developing injuries. Lifting and carrying objects for a prolonged period as well as standing or sitting improperly can result

in job-related injuries. Subsequently, it is important to provide information in self management programs that pertain to correct posture and body mechanics as this is necessary for prevention of MSK symptoms (Nadler, 2004).

2.5. Needs Assessment

There is a need to identify and prevent MSK disorders. These disorders result in excessive costs to society due to the consequent chronic disability. Therefore, there is a need to incorporate prevention programs that diminish long-term disability into the treatment strategy for these conditions. These programs target specific disorders to reduce chronic pain, which subsequently leads toward declining costs to society. A randomized controlled trial carried out by Minor et al (1989) looked at 120 patients with rheumatoid arthritis or osteoarthritis who voluntarily participated in an aerobic intervention versus a non-aerobic intervention and showed that people with arthritis actually benefited from programs that included both structured exercise as well as more broadly defined physical activity. Specifically, participants had significant improvement over the control group in aerobic capacity, 50-foot walking time, depression, anxiety, and physical activity after the 12-week exercise program. Additionally, in 1990, the National Institute of Occupational Safety and Health (NIOSH) stated there was an urgent need for the development of a national prevention strategy in an attempt to target arthritis and related MSK afflictions. As a result of the mounting appreciation for the severity and impact of arthritis on quality of life, community based programs have been developed by the Arthritis Foundation and others.

In 1999, the Center for Disease Control (CDC), the Association of State and Territorial Health Officials and the Arthritis Foundation led to the development of National Arthritis Action Plan (NAAP). NAAP guides the utilization of public health resources for a strategic plan to lessen the burden of arthritis within the United States (Boutaugh, 2003). The goals of NAAP consist of stressing the importance of primary, secondary and tertiary prevention with the intention of expanding scientific knowledge, seeking social equity and working through partnership.

Following the release of this strategic plan, the US congress appropriated additional funds in the fiscal year to the CDC to initiate a public health response to arthritis, which resulted in strengthening and fostering development of arthritis programs and to design interventions to reduce burden of MSK disease on society (Brady & Sniezek, 2003). Furthermore, this has extended into the clinical care setting in which there is a movement by physicians towards a population-based approach. To some extent, this is in response to the fact that the current delivery system is ill suited to meet the needs of patients living with these debilitating chronic diseases. Moreover, the American College of Rheumatology Guidelines for the initial evaluation of the adult patient with acute MSK symptoms (1996) stress self-management education as an integral part of treatment.

2.6 Target population

Numerous prevention and intervention strategies have been advanced to lessen the burden on individuals, health care organizations, and governments. However, to effectively decrease the prevalence of MSK disorders, a proposed

intervention needs to identify the "at risk" individuals early on as prevention of work disability might be more effective than correction after job loss. Within a workplace, the intervention must be focused on a "at risk" population consisting of sedentary office workers so as to improve and adapt their ergonomic work conditions, improve individual disease management and psychosocial wellbeing, and increase their overall awareness regarding workplace wellness.

Arnetz et al (2003) conducted a prospective controlled trial with 137 office workers who were placed either in an intervention or control group and showed that MSK disorders accounted for a significant portion of work-related absenteeism and that early workplace interventions resulted in a significant reduction in absenteeism and costs. From this perspective, it would prove to be instrumental to have early detection of individuals at risk of developing and maintaining their pain thereby making more use of health care services, sick leave and worker disability compensation. By applying cost-effective prevention and early intervention strategies to specific segments of the population that exhibit an increased risk for developing MSK disorders can make it a proactive approach rather than a reactive one.

2.7 Common trends among sedentary office workers

In order to establish a successful intervention that will result in positive behavioral changes within the target population, the characteristics of population itself must be identified. Current health and working behaviors of the sedentary office workers, and trends within this population must be distinguished. Epidemiologic evidence has shown that coping capabilities of employees plays a

fundamental role in terms of their health status (Waldenstrom et al, 2002; Lorig et al, 1985). Every individual has a variety of coping skills yet further exploration is required in order to outline a general but successful strategy aimed at implementing appropriate coping skills into everyday life to effectively reduce and prevent MSK disorders.

Chronic MSK injuries result from cumulative trauma due to performing stressful occupational tasks, over a continuous period of time. Most injuries reported in the workplace as an accidental event are in fact back problems that have evolved over a period of weeks or months (Baldwin, 2004). Typically, individuals fail to communicate their pain symptoms until they become chronic in nature and, if ignored for prolonged period of time, can develop a chronic disability. This disability affects their work life and interferes with job performance due to limitations in functional ability. Other factors can further aggravate job performance such as significant disruption in sleep, leading to fatigue, lower energy and increased risk for developing chronic injuries (Ranney, 1997). A poor lifestyle along with prolonged sleep deprivation can be lead to depression, which also interferes with ones quality of life thus affecting both their home and working environments (Lee, 1994). Therefore, there is a need to incorporate strategies into workplace interventions that specifically deal with these issues relating to the development of chronic pain.

Assessing the nature of the worker's own sense of personal responsibility in the development of their symptoms is vital since this can direct their specific management of chronic MSK disorders. In order to explain their pain symptoms,

some individuals tend to give greater emphasis to certain causative factors rather than others. For instance, they may accuse their employers for not providing them with sufficient pay thereby increasing their need to overproduce in order to make an adequate living. Workers may also blame their occupational setting for the development of their MSK impairments due to it being ergonomically inefficient. As a result, a significant amount of responsibility to repair the situation lies on the shoulders of the employer. A number of determinants on behalf of the employees themselves are overlooked such as an employee's personal health and risk factors. Low general health is related to poor recovery from chronic pain (Mantyselka et al, 2003). Factors such as smoking, obesity, age, and sedentary lifestyle are shown to cause the development of chronic MSK disorders (Neilson & Mior, 2001; Zeytinoglu et al, 2000). Therefore, designing successful interventions requires that the employee's personal responsibility must be emphasized along with addressing their workplace setting.

2.8 Intervention Rationale

Once a worker has sustained an injury, considerable time and persistence is demanded in terms of the treatment required. Additionally, any medical therapy may only be temporarily effective if that worker returns to an ergonomically stressful job without attaining suitable self-management coping skills. The best treatment for chronic MSK disorders is to continue usual daily activities however limiting heavy labour intensive work including occupational and household duties. However, employing other resources can be considered for instance hot/cold compresses for temporary pain relief, anti-inflammatory medication,

braces/splints, a physical or occupational therapist/nurse and much more. As well, it may be practical to reassign afflicted employees to different occupational duties in order to avoid physical or strenuous work, decrease the number of work hours and alternate or modify working conditions to deal with the specific impairments. Furthermore, by educating individuals about the resources available within their workplace, they can learn to effectively live with MSK disorders and prevent additional damage.

The longer an individual continues to work on the same job with an ailment, the slower their recovery and the greater the risk of chronic long-term disability. Moreover, injuries with a repeated MSK disorder can be elusive and are resistant to treatment, which interferes with worker's productivity, their activities of daily living, and over time the inability to return to their original jobs. The intervention addresses this issue concerning limitations in a worker's own activities and recreation in their daily life since these are the first to be sacrificed to maintain employment as well as manage their symptoms. Typical worker health problems are acknowledged as well as their typical reactions to these issues in order to provide the appropriate coping strategies to better manage their MSK pain and enhance their knowledge regarding workplace wellness. Finally, in order to bring about workplace changes, education is provided on cost-effective workplace modifications that are necessary in order to avoid MSK affliction.

Workplace educational programs can be essential in providing employees with the necessary tools required to correctly perform their jobs. Office

ergonomics intervention coupled with training on office workers have been shown to reduce musculoskeletal symptoms over the workday (Amick et al, 2003). Training encourages employees to be conscious of their workplace setup as well as maintain the use of everyday workplace resources to redesign their workstation in a manner that minimizes their risk of developing job-related MSK discomfort (Robertson & O'Neill, 2003). Workers also need to understand acceptable body mechanics and comprehend that poor body postures, inadequate rest pauses and repetitive motion can lead to the development of chronic long-term disorders. By administering the relevant information to office workers pertaining to strengthening exercises, stress management, ergonomics, goal setting and the importance of an active lifestyle as well as proper nutrition, individuals can have an overall improvement in their MSK status thus leading to an overall better quality of life.

2.9 Arthritis Self Management Program

The Arthritis Self-Management Program (ASMP), a validated program developed and evaluated by Lorig and colleagues at Stanford University in the late 1970s, has shown to decrease pain and depression, and increase exercise and pain management strategies (Lorig et al, 1985). The goal of ASMP was to provide individuals with the necessary tools to self manage their arthritis. Due to the complex nature of pain, disease-modifying anti-rheumatic drugs (DMARDS) and other pharmacologic interventions are rarely effective in eliminating pain. As well, there is evidence demonstrating that a patient's belief about their ability to control or influence their symptoms plays an important role on the level of chronic

pain and disability observed (Kuch, 2001). Three variation studies of the ASMP were conducted by Lorig et al (1998), in which they compared and evaluated the strengths and weaknesses of the program. They showed that the AMSP increased participant knowledge about arthritis and its management as well decreasing pain and depressive symptoms. However, the assumption was made that the improvements in pain and depression were due to changes in behaviors such as increased frequency in exercise and carrying out relaxation techniques. Since then, this assumption has been examined and no association was found in terms of individual change in behavior and health status. Rather, it seems that an individual's improved self-efficacy provided the predictor of their future behavior. Furthermore, a recent meta-analysis of 5 randomized control trials by Warsi et al (2003) showed that the ASMP resulted in small reductions in a patient's arthritis pain and disability.

The goal of the study was to modify the ASMP so that it may be implemented in a workplace environment with a strong self-efficacy component to motivate individuals to self manage their overall pain. This self-management program would also be designed to act as a primary prevention tool to target a population that may not necessarily have chronic disease. By doing so, a larger population of MSK pain sufferers would be captured with varying levels of disease severity, if any. The ASMP targets older populations, who already suffer from arthritis, to provide knowledge in terms of management, and coping strategies once disease is present. The "*Working Well*" Self Management Program (WSMP) is a modified program (Refer to Table 2-1) that targets office workers who are a younger

cohort that do not necessarily have any form of chronic MSK disorder however may be at risk for developing MSK conditions due to the nature of their work. These individuals are healthier and by enrolling in this program, self-efficacy and coping techniques along with self-management skills are provided to motivate participants to self-manage their pain.

Table 2-1: "*Working Well*" Self-management Program (WSMP)

Arthritis Self-Management Program	Working Well Self-Management Program
• Secondary and Tertiary Prevention • Population targeted: ➢ Arthritis Sufferers ➢ Pain symptoms present ➢ Older Participants • Not applicable to general population • Management of Inflammatory Arthritis (RA)	• Primary and Secondary Prevention • Population targeted: ➢ With or Without MSK pain ➢ Sedentary Office workers ➢ Younger participants • Applicable to healthier/general population • Prevention and management of MSK

❖ *Modified Program of the ASMP for sedentary office workers*

Chapter 3

Research Question

3.1 Research Hypothesis:

The hypothesize of this study is that the "Working Well" Self-Management Program (WSMP), a modified program of the ASMP which provides information on ergonomics, pain and stress management, exercise, nutrition, goal setting, proper body mechanics, and other resources, will increase knowledge concerning MSK pain self-management and workplace wellness and more importantly decrease absenteeism among sedentary office workers.

3.2. Testable questions:

The proposed research study will investigate the effects of implementing a simple 6-week workplace self-management program on sedentary office working with or without MSK pain.

- The primary objective was to evaluate the efficacy of a 6-week workplace self-management program in reducing workplace absenteeism one year after receiving the WSMP educational intervention.
- The secondary objectives were:

  1. To evaluate any determinants of absenteeism that influenced the number of lost days.
  2. To determine the efficacy of the workplace self management program in enhancing knowledge and awareness regarding management of workplace MSK pain and workplace wellness
  3. To identify parameters that influence acquirement of new knowledge.

Chapter 4

Methods

4.1. Design

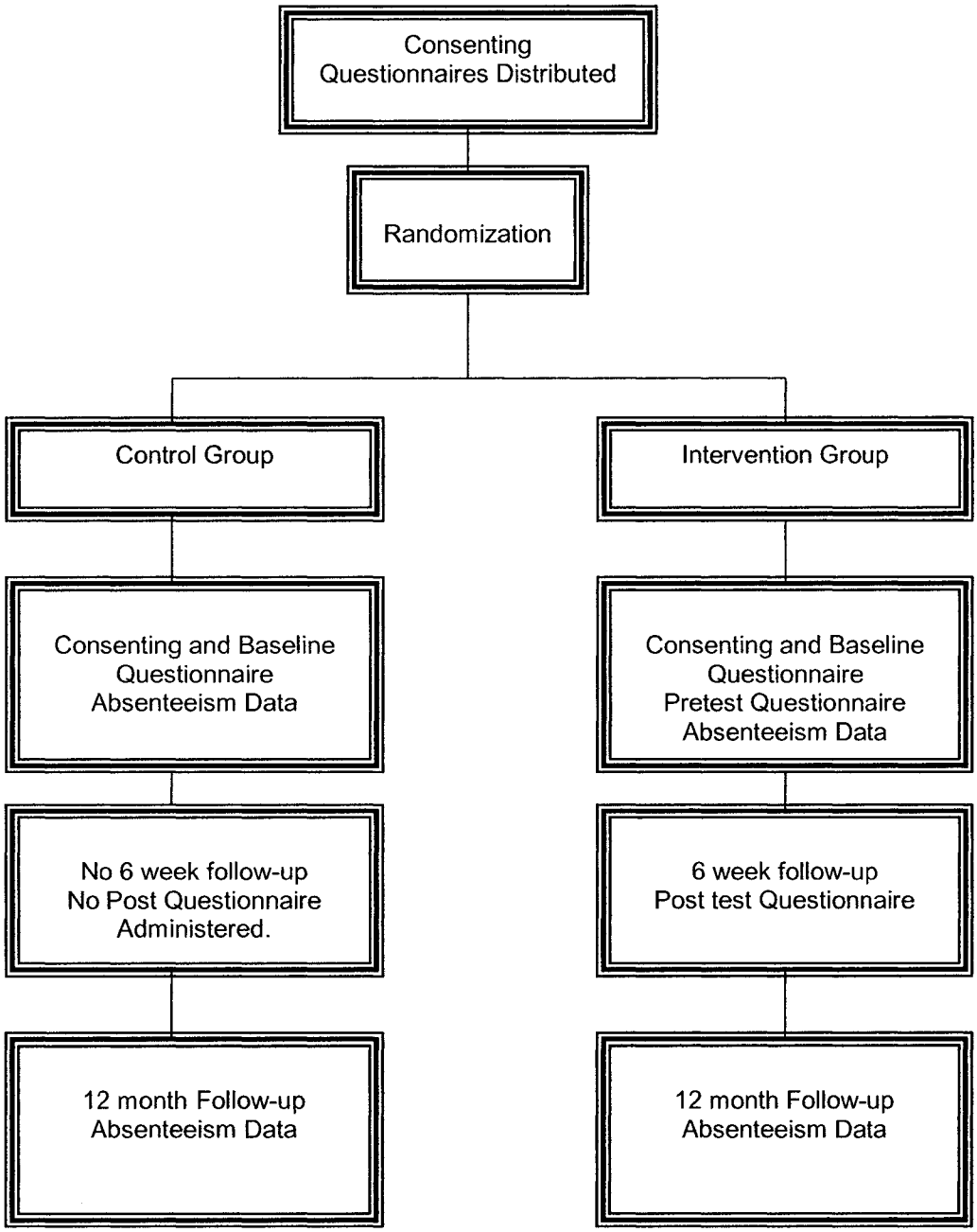
A single centered randomized controlled trial of a 6 week educational intervention was conducted. The study participants consisted of sedentary office workers who were recruited from various workplaces in the province of Newfoundland and Labrador. Three workplaces were contacted for the study (Atlantic Blue Cross Care, Newfoundland Hydro, and Memorial University). Those participants that were eligible and met the inclusion criteria were recruited into the study and randomly allocated to one of the two groups. Participants were randomized using a computer generated randomization list to either the intervention (*WSMP* Education program) group or control (Usual Care) group. Two facilitators (Physiotherapist and Occupational Therapist) with extensive expertise in self-management programs delivered and conducted the 6-week program. All participants (control group and intervention group) completed baseline questionnaires at study start date (2003).

Once the 6 week educational intervention was delivered to the participants, post questionnaires and program evaluation forms were administered to them. Only participants who concluded the educational sessions six weeks after study start date completed the required post questionnaires and evaluation forms. After one year, the final absenteeism data were collected for both the active and control group from all three worksites via the individual workplace databases available from the human resource department at each organization(Refer to Figure 4-1). Baseline absenteeism data for 2003 were also obtained from all three workplaces for each employee in both the intervention

and the control group.

All participants voluntarily signed a consent form once eligibility criteria were met in order to take part in the study. All ethics approval for carrying out the *WSMP* program and distributing recruitment material (posters, emails etc.) was obtained from Human Investigative Committee (HIC) of Memorial University (See Appendix C).

Figure 4-1: Sample Recruitment



4.2. Study Population

Inclusion Criteria were met in order for participants to be involved with the study. A total of 165 potential participants were recruited at random for a total pool of eligible participants. Enrollment of participants from each workplace included 84 individuals from Memorial University, 59 from Newfoundland Hydro, and 27 from Atlantic Blue Cross Care.

4.2.1. Recruitment

Inclusion Criteria:

- Signed informed Consent
- 18 years or older
- Capable of completing questionnaire independently
- Office worker employed a minimum of 35 hours per week
- Office workers sedentary for 50% or more of their work day

Exclusion Criteria:

- Planned extended leave for 6 weeks during intervention.

4.3. Working Well Self-management Program (WSMP)

4.3.1. Development of WSMP Intervention

The "Working Well" Self-management Program (*WSMP*) is a modified version of the ASMP program designed to be more applicable to individuals who are work in an office environment (Refer to Appendix A). This program was developed by the *WSMP* Scientific Committee which consisted of Jill Seviour (Physiotherapist), Kim Doyle (Occupational Therapist), Dr. Proton Rahman (rheumatologist/epidemiologist), Dr. Tanis Adey (Psychiatrist), and Dr. Angela

Penney (Psychiatrist).

It is an inexpensive, six-week workplace self-management education program delivered by our occupational therapist and physiotherapist who are also ASMP leader-trainers. The multi-component program is designed to increase knowledge in terms of MSK self-management, and workplace ergonomics and wellness. This program uses the same efficacy enhancing strategies of the ASMP utilized by Lorig et al (1985) which include self-contracting, modeling, reinterpretation of beliefs and symptoms, and persuasion. It achieves this by incorporating problem solving, communication, self-management and self-efficacy skills. Central aims of the ASMP program are to increase a participant's perception of arthritis self-efficacy, which is defined as a perceived ability to control, or manage various aspects of this disease (Barlow et al, 2000). Increased perceptions of self-efficacy are associated with better health status rather than changes in behavior (Lorig et al, 1998).

The content of the *WSMP* program differs significantly from the ASMP so that it pertains to the office workspace by targeting a population that could suffer from a variety of MSK disorders. The *WSMP* includes a significant segment that deals with the office environment, more specifically workplace ergonomics in order to encourage participants to identify and analyze jobs with ergonomic stress. It informs individuals of proper computer and workstation setup while providing cost-effective tools that can be incorporated from their existing workplace to correctly modify the working environment. In doing so, this will allow them to perform their work tasks efficiently.

Individuals are also encouraged to set appropriate goals in order to cope with their chronic pain. Pain sufferers need to understand the pain cycle and set appropriate goals in order to effectively manage their pain. By having a positive approach, individuals can have a proactive approach in their lives and achieve goals that they have set for themselves. Chronic pain patients have to learn to pace themselves since they cannot do all of their usual activities. By monitoring their behavior and evaluating the strategies currently used to complete their tasks, individuals can take charge of their behavior and maintain a better quality of life. This program relies on providing the necessary self-efficacy techniques to empower individuals to improve their health status by providing the proper awareness and self-management tools regarding MSK disease and workplace wellness. Therefore, this program acts a preventive tool in the treatment strategy of MSK disorders by providing the necessary tools and information needed to build awareness regarding MSK disease management within the workplace.

4.3.2. Program Delivery

The program leaders follow a standardized manual developed by the *WSMP* Scientific Committee to ensure consistency of content. Since the program is delivered via small group presentations within community settings, it gives participants the opportunity to benefit from group support and set personal goals. Personal goals serve to provide greater incentives for task accomplishment and there is evidence to suggest that group members can influence a reluctant participant to initiate a course of action (Keefe et al, 2000). The program also encourages participants to be able to practice good communication skills such as

giving and receiving feedback. It is important for individuals to feel empowered and by communicating their needs and wants, it allows them to take responsibility for achieving good health (Foster et al, 2003). Finally, by encouraging each other to incorporate exercise and relaxation techniques within their daily work life along with maintaining a healthy lifestyle including good nutrition, individuals may successfully manage their pain.

A total of 12 topics were included in the six sessions that were attended by participants (See Table 4-1 for course content overview). Participants were given handouts at the beginning of each session pertaining to the one-hour class as well as a homework workbook for activities to be carried out within the workplace and home environment. A multidisciplinary team including a rheumatologist/ epidemiologist, psychiatrists, and allied health professionals including a physiotherapist and an occupational therapist reviewed the "*Working Well*" course content. The course content was very descriptive for all 12 topics and graphics were included to demonstrate appropriate body postures to emphasize good body mechanics. Each class consisted of only 10-12 participants allowing for a more intimate setting for better communication between *WSMP* program trainers and participants as well as between the participants themselves. Participants were encouraged to carry out their homework exercises and discuss any problems they had in achieving the various tasks within their work and home environment.

Table 4-1: *WSMP* Course content overview

"Working Well" Topics	Sessions					
	1	2	3	4	5	6
Self-Help Principles	*	*	*	*	*	*
Ergonomics	*	*				
Pain Cycle	*					
Contracting/Feedback	*	*	*	*	*	*
Posture/Back Education		*				
Repetitive Strain Injuries		*	*			
Relaxation Techniques		*		*		
Exercise Principals		*	*	*	*	
Communication Skills			*			*
Sleep Hygiene					*	
Medication					*	
Nutrition					*	
Stress Management				*		
Treatment of Musculoskeletal Complaints		*			*	
Problem Solving				*		*
Depression						*
Assistive Devices						*

4.4. Procedure

Participants were recruited in the various worksites by advertising the *WSMP* program through the on-site Occupational Health worker or Human Resource worker. Advertisements included posters that contained information regarding the "*Working Well*" musculoskeletal self-management program. It provided facts on the information sessions that would be held in their workplace in the following weeks to learn more about involvement with this program. All posters were approved by the Memorial University Research Ethics Board (HIC). The posters were distributed via email or attached on notice boards around each office building. As well, some people heard about the program through "word of mouth". An information session was held at each work site for one hour to offer the necessary information concerning the program. All potential participants received a brief project description.

The principle investigator along with the research team attended each information session explaining that the program was a MSK wellness self-management program that was designed for sedentary office workers as a pilot project to help reduce the burden of MSK disorders in the workplace. Moreover, participants were made aware that by attending this *WSMP* program, they would be taking part in a one-year study. Furthermore, they were told that selection of participants to enter this program would be done by random selection. Participants were informed that absenteeism data would be obtained from their employers in order to evaluate the long term efficacy of this program. Once participants agreed to enter the study and met the eligibility criteria, a consent

form was signed and each individual completed a pre-questionnaire on-site. Pre-questionnaires were pre-coded with a study number and once the questionnaire was obtained, participants were randomly allocated to either the active (education *WSMP* intervention) or control group (usual care) via a computer generated randomization list.

4.4.1 Intervention Group

The research coordinator contacted participants that were randomized into the educational program group either by telephone or email. The coordinator provided them with information regarding the location and time of the program as well as which weekly session they were to attend. Each educational session was held during lunch hours in order to make it more accessible for the participants at each worksite. A small room equipped with a computer and projector was available at each site for delivery of the course via PowerPoint presentation. The *WSMP* program was conducted in small groups of 10-12 over a 4 month period. Each group attended 1-hour sessions for 6 weeks, and covered the 12 sessions of the *WSMP*. These groups were led by one of the two trained facilitators.

At the end of the 6-week intervention, participants in the intervention group were given a quantitative test to be complete on-site in order to assess their knowledge in terms of workplace wellness. Those who were not able to attend the last session of the program were mailed the post-questionnaires, which were returned within the week. These participants were contacted via telephone or email through the research coordinator to remind them to return these questionnaires within one week. Participants in the intervention group were

required to complete at least 4 out of the 6 sessions in order to continue in the study since the *WSMP* Scientific Committee (Refer to 4.3.1) using group consensus determined that attendance of at least 4 sessions would cover ample material in order for participants to benefit from the program.

Absenteeism data were obtained for both the control and the intervention group at the baseline study date (2003) once pre-questionnaires and consent was obtained. For all participants (intervention and control) absenteeism data were once again collected one-year (2004) from baseline study date. Absenteeism data were collected from the administrative databases of each work site for both the intervention and control groups.

4.4.2 Control Group

The control group received the same baseline information regarding the *WSMP* study and baseline questionnaires as the intervention group during the information sessions held at the three work sites. However, they were not part of the structured educational intervention nor were any worksite improvements or visits offered to this group by the research team. And finally, the control group did not receive or complete any post questionnaires. Absenteeism data were collected for this group at the start of the study (2003) and one year (2004) after the study was completed.

4.5. Data Collection

Demographic and sociodemographic data were collected at baseline and included date of birth, gender, educational level, and marital status. As well, at the start of the study, a number of relevant variables were included to assess the

effect of the *WSMP* program using questionnaires. Detailed information regarding MSK symptoms, social and work characteristics of the participants were obtained via a baseline questionnaire developed for the *WSMP* study.

Specifically, depressive symptoms and helplessness were included and evaluated in terms of the impact these factors had on this workplace program using validated questionnaires, which were revised and shortened by the *WSMP* Scientific Committee. To assess depression, a scale known as the Center for Epidemiologic Studies-Depression Scale (CES-D) was used. The CES-D is a validated tool that has been used in medical practice and research (Radloff, 1977). A consensus was reached to include three questions that best reflected depressive symptoms by the *WSMP* Subcommittee consisting of two psychiatrists and an epidemiologist/ rheumatologist. The Arthritis Helpless Index (AHI), which is designed to measure a patient's perception of loss of control with arthritis (Nicassio et al, 1985), was also incorporated into the baseline questionnaire to determine helplessness. Again the *WSMP* Subcommittee determined that two questions were valid and reliable to include into the baseline questionnaire.

4.5.1 Primary outcome

The primary outcome variable of this project consisted of absenteeism data, which was obtained via the administrative databases from all three workplaces. The data were collected for both the control and intervention group, at enrollment and one-year post study start date. A printout of all participants' workplace contact information and place of employment was forwarded by the

administrative staff to the respective workplace requesting absenteeism data at baseline start date (2003) and at the study end date, one year later (2004). The workplace human resource staff provided the research team with the employee absenteeism data via computerized printouts. These data were linked with each participant's pre-coded numbers and all identifying information was removed to preserve confidentiality. This data was provided to the data entry personal for entry into the database (Absenteeism Database) at baseline and then at one year follow-up. No identifying markers, besides study number were present to indicate the status of participants as being either in the intervention or the control group during data entry.

4.5.2 Secondary Outcome

The secondary outcome included analysis of specific, workplace determinants including previous MSK pain, helplessness and depression to determine if any had influence over absenteeism rates among sedentary office workers (Refer to Section 5.4.2).

In addition, a quantitative test, assessing participant knowledge in terms of necessary coping skills, ergonomics, and resources required to appropriately deal with a common workplace situation, was administered to the participants, six weeks after educational intervention was implemented. Only the intervention group received the *WSMP* program.

In marking the pre/post questionnaires the assessor was blinded to the outcome of this research. The *WSMP* Scientific Committee produced a standardized quantitative scoring method for analyzing the pre/post

questionnaires. A third party, to ensure no bias was present, was blinded to the status of the pre/post questionnaire and carried out this evaluation. The results of the data were entered into a separate database (knowledge database) by a data entry personal who was blinded to research project. These data were merged with the randomization database, including patient pre-code and randomization status to either active or control, and absenteeism database once data entry was completed and ready for analysis by principal investigator.

4.6 Statistical Analysis

4.6.1. Sample size

Workplace absenteeism one year subsequent to the intervention was selected as the primary outcome of the study. The sample size was calculated using the mean and standard deviation obtained from an existing workplace absenteeism database that was considered to be representative of workplaces included in the study. Absenteeism data was obtained from the Health Care Corporation of Newfoundland and Labrador administrative database for all health care staff. The average mean yearly absenteeism and corresponding standard deviation over the past 12 years was collected. The calculated mean of the representative workplace was determined to be 105.21 hours with a standard deviation of 8.40. A 20 % difference between the intervention group and the control group for workplace absenteeism was determined. With an $\alpha = 0.05$ and $\beta = 0.20$, a sample size of 35 patients per group was calculated for each group. A drop out of 30% was assumed and thus the sample size was calculated to be 46 within each group. As increasing the sample size would only further enhance

the power of study, additional cases and controls were recruited due to the enthusiasm of the sedentary workers to participate in the WSMP study.

4.6.2. Data Analysis

All data were checked, cleaned and analyzed using the Statistical Package for the Social Sciences (SPSS, 2003). Intervention and control group data were compared at baseline by assessing comparability of demographic and socieodemographic variables between groups. Paired t-test for continuous level data on absenteeism data was used to assess the comparability between the control and intervention group at baseline and at one year follow-up. And finally, Analysis of Covariance (ANCOVA) was used to look at association between the primary outcome, absenteeism, and determinants, including helplessness, depression, and MSK pain (dichotomous variables and continuous variables).

Paired t-tests for continuous level data on pre-test score and post-test score of knowledge was used to assess the comparability of groups at baseline and post intervention. Analysis of Variance (ANOVA) was conducted on demographic and pre/post variables to determine if any variables influenced a gain in new knowledge. Eight variables were analyzed which included age, sex, marital status, education level, depressive symptoms, previous ergonomic training, presence of MSK pain, and helplessness. An Alpha of 0.05 was the chosen level of significance for the outcome analysis.

Chapter 5

Results

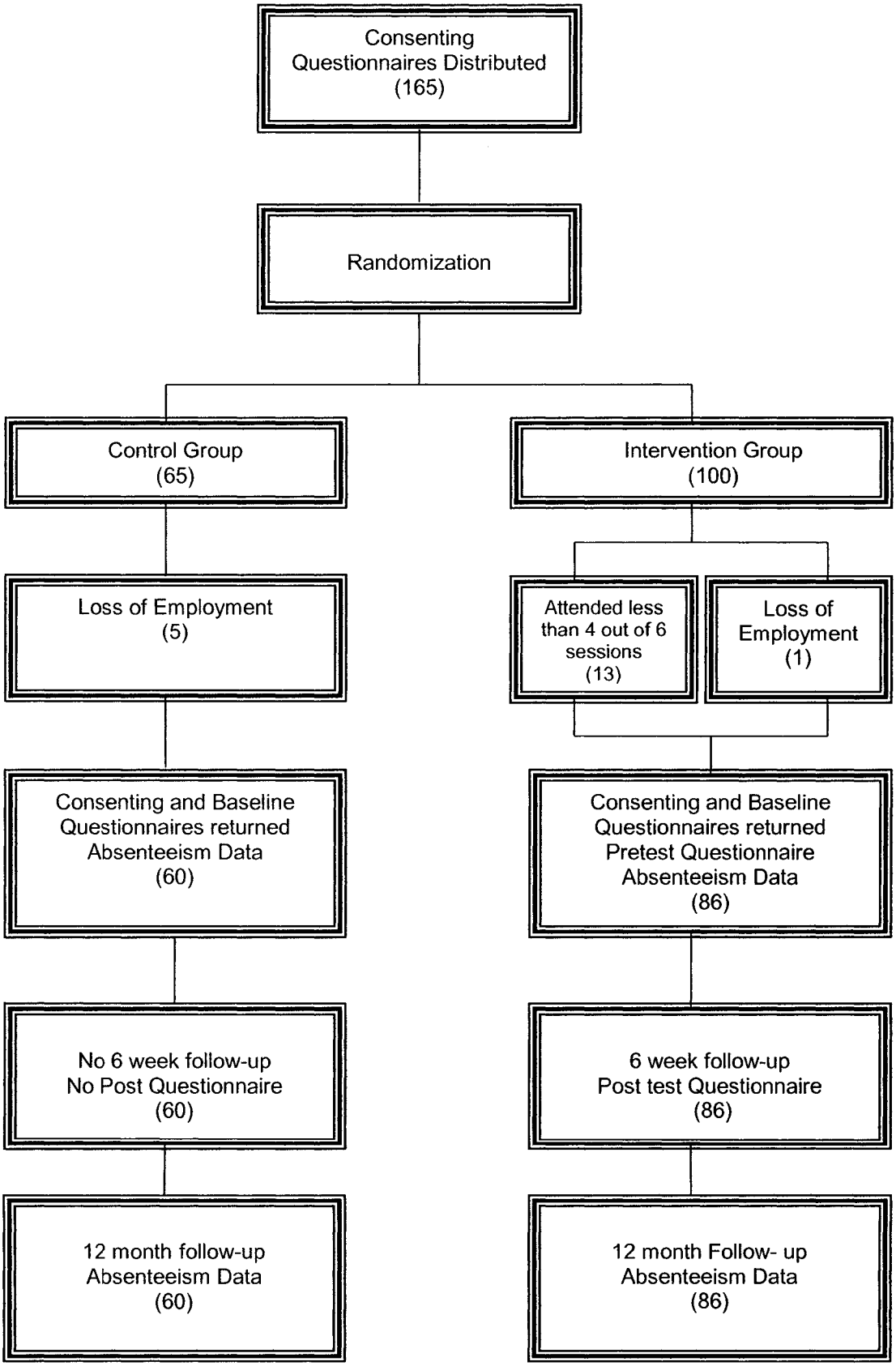
5.1 Recruitment

A total of 165 participants attended the initial information session held at each worksite. Once the participants were informed of the study and met the inclusion criteria, they were asked to complete baseline questionnaires and consenting forms. All 165 individuals were considered to be eligible to enter and take part in the study. Of these 165 participants who had completed baseline questionnaires and consenting forms, 100 were randomized into the intervention group and 65 participants were randomized to the control group.

5.2 Response Rates

Out of 100 participants in the intervention group, a total of 86 individuals were followed for one year. Six (5 in control, 1 in Active) individuals were lost to follow-up due to loss of employment. The other 13 individuals in the intervention group were lost to follow-up since they completed fewer than 4 out of the 6 educational sessions (Refer to Fig. 5.1).

Figure 5-1: Response rates for Sample Recruitment



5.3. Demographics

At baseline, the control and intervention group were comparable on most of the demographic variables included in the questionnaires. Demographic variables of the intervention group and control group are summarized and are presented in Table 5-1. Demographic analysis of the intervention group showed that 78.6% of individuals were female, 78.6 % of individuals were less than 50 years of age, 87.8 % had high school education or higher and 79.6% of individuals were either married or common law. For participants that were lost to follow-up, demographic data was analyzed to determine if any differences existed in this group. These data are presented in table 5-2. The overall prevalence of MSK disorders showed that 58.9% of all study participants (intervention group and usual care group) presented with some type of MSK pain. Of these 58.9% individuals suffering from MSK pain, it was reported that 1.8% had rheumatoid arthritis, 5.5 % had fibromyalgia, 6.7% had chronic pain, 7.3% had carpal tunnel syndrome, 15.8% had repetitive strain injury, and 17.6% had osteoarthritis (Refer to Table 5-3).

5.4. Outcome variables

5.4.1. Primary Outcome

Absenteeism data were assessed at baseline (2003) and showed a mean score of 55.8 (median 33.5, S.D. 93.0) lost hours for the intervention group and a mean score of 59.7 (median 41.6, S.D. 67.9) lost hours for the control group (Refer to Table 5-4). One-year post study start date (2004), absenteeism data were collected and evaluated for both the intervention group and the control

group. The one-year post intervention (2004) absenteeism mean score was 66.3 (Median 36.5, S.D. 84.7) lost hours and the one-year follow up control absenteeism mean score was 59.5 (Median 39.0, S.D. 70.0) lost hours (Refer to Table 5-5). The overall mean difference in absenteeism was 10.5 for the intervention group (median 3.1, S.D. 79.4) and -0.3 for the control group (median 1.0, S.D. 70.8) (Refer to Table 5-6). This was found to be statistically not significant (p=0.42). In an attempt to account for the outliers, medians were compared and still noted no significant difference between the intervention and control group. A visual representation of the workplace absenteeism for all participants at baseline and one year follow up is presented as a boxplot diagram in Figure 5-2.

5.4.2. Secondary Outcome

5.4.2.1 Determinants of Absenteeism

Finally, three workplace determinants including helplessness, depressive symptoms, and presence of MSK pain were assessed to determine if any influenced absenteeism rates among sedentary office workers. In terms of helplessness and depression among the intervention group, 22.6% had feelings of helplessness and 10.5% had depressive symptoms. In the intervention group, 60.5% reported some type of MSK pain. None of these workplace determinants were found to be significantly associated with absenteeism rates (Refer to Table 5-7).

5.4.2.2 Gain in Knowledge

In terms of knowledge assessed by pre/post test questionnaires, the pre test mean score was 5.63 (S.D. 3.38) and posttest mean score was 8.79 (S.D. 2.98). The overall mean change was 3.11 (S.D. 3.39), which was found to be statistically significant ($p<0.0001$) (Refer to Table 5-8). Eight explanatory parameters including age, sex, marital status, education level, depressive symptoms, previous ergonomic training, presence of MSK pain, and helplessness were analyzed and are summarized in Table 5-9. Evaluations of these parameters showed that the only factor that significantly influenced acquirement of new knowledge was previous ergonomic training ($p=0.034$).

Table 5-1: Demographic data for all participants randomized

	Control Group	*Active Group*
Number of Participants	60	86
% sex (females)	77.6 (N=50)	78.6 (N=68)
% age (that are less than 50 yrs)	75.8 (N=49)	78.6 (N=68)
% that exceed HS level	87.9 (N=57)	87.8 (N=76)
% married (includes CL*)	79.3 (N=51)	79.6 (N=69)
Baseline Mean Absenteeism (lost hours)	59.7	55.8

*Common Law

Table 5-2: Demographic data for all participants lost to follow-up

Demographics	***Lost to follow-up Group***	***P-Value***
Number of Participants	19	
% sex (females)	73.7 (N=14)	0.54
% age (that are less than 50 yrs)	73.7 (N=14)	0.55
% that exceed HS level	78.9 (N=15)	0.11
% married (includes CL*)	89.5 (N=17)	0.75

*Common Law

Table 5-3: Characterization of musculoskeletal pain in the workplace

Type of MSK pain	***Percent of individuals***
Rheumatoid Arthritis	1.8 %
Fibromyalgia	5.5%
Chronic Pain	6.7 %
Carpal Tunnel Syndrome	7.3%
Repetitive Strain Injury	15.8%
Osteoarthritis	17.6%

Table 5-4: Absenteeism data for 2003

	Year 2003	
	Control	***Active***
N	60	86
Mean (lost hrs)	59.7	55.8
Median (lost hrs)	41.6	33.5
St. Deviation	67.9	93.0

Table 5-5: Absenteeism data for 2004

	Year 2004	
	Control	***Active***
N	60	86
Mean (lost hrs)	59.5	66.3
Median (lost hrs)	39.0	36.5
Standard Deviation	70.0	84.7

Table 5-6: Change in Absenteeism from 2003 to 2004

	Absenteeism	
	Control	***Active***
N	60	86
Mean Difference (lost hours)	-0.3	10.5
Median Difference (lost hours)	1.0	3.1
Standard Deviation	70.8	79.4

P-value=0.42

Figure 5-2: Box plot Diagram of Absenteeism data (at baseline and follow up) for all participants randomized

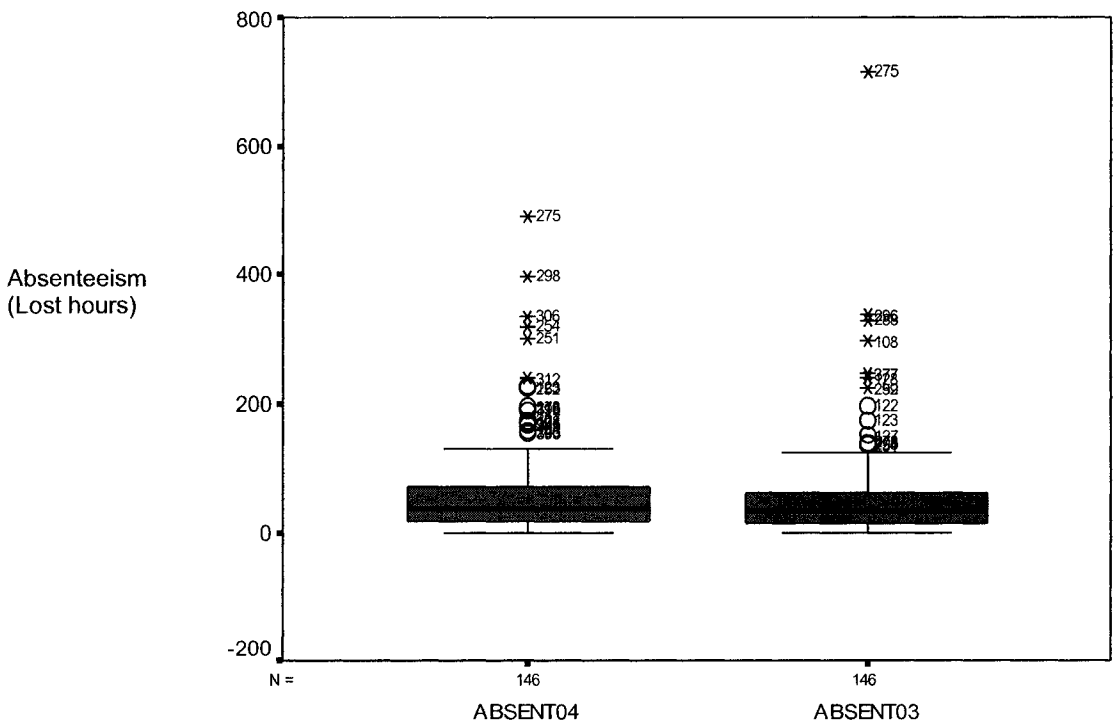


Table 5-7: Determinants of absenteeism for all participants randomized

	Control Group	***Active Group***	***P-Value***
Number of Participants	60	86	
% with MSK pain	56.7 (N=34)	60.5 (N=52)	0.065
% feeling Helpless	15.3 (N=10)	22.6 (N=20)	0.48
% Feeling Depressed	8.3 (N=6)	10.5 (N=9)	0.085

Table 5-8: Pre and post test scores for educational program to assess gain in new knowledge

	Mean	***S.D.***
Pretest Score	5.63	3.38
Post Test Score	8.79	2.98
Change	3.11	3.39
P-value	P<0.0001	

Table 5-9: Explanatory parameters predicting acquisition of new knowledge

Parameters	*P-value*
Age	**0.14**
Sex	**0.12**
Marital Status	**0.68**
Education Level	**0.43**
Depressive Symptoms	**0.68**
Previous Ergonomic Training	**0.034**
Presence of MSK pain	**0.80**
Helplessness	**0.42**

Chapter 6

Discussion

6.1 Discussion

The investigation tackled the important health and economic issue pertaining to workplace absenteeism. Previous literature cites that MSK discomfort is one of the major etiologies ensuing in workplace absenteeism and subsequent work place disability (Melhorn et al, 2001; Nielson & Mior, 2001; Lee, 1994). Accordingly, a workplace wellness program was designed and implemented to determine if this self-management program improved knowledge regarding MSK wellness among office workers and more importantly reduced workplace absenteeism. As reported by the findings of this one-year study, a high burden of MSK discomfort in sedentary office workers was observed as well as an increased knowledge acquired from the *WSMP* intervention. However, this gain in new knowledge did not translate into less time off work and as a result the study was unable to demonstrate that the *WSMP* program was effective in reducing worker absenteeism.

6.2. Incidence of MSK pain within the workplace

An interesting result that arose from this study was the high prevalence of MSK pain in the workplace. It was noted that 58.9% of sedentary office workers were suffering from MSK discomfort. However, the finding is not consistent with what has been previously mentioned in existing literature. A review by Lee (1994) of statistics from various studies within the United States and Canada, reported that, according to a Canadian health survey, 16% of the working population were affected with various types of arthritis or rheumatism, back, limb or joint disorders. The reported high frequency of MSK pain in this study may be due to a

referral bias. Firstly, all participants involved in this program were recruited by asking whether they would like to participate in the pilot study by the research team during the workplace information sessions. Furthermore, strategies to facilitate recruitment of sedentary office workers by the research team included poster advertisements placed within each worksite and institutional emailing lists which helped increase participation into the program by informing individuals of a workplace program that was designed for sedentary office workers to determine if it alleviated pain. Consequently, individuals suffering from MSK pain would be more likely to attend these information sessions.

A more generalizable worker population could have been included by mailing out questionnaires assessing MSK discomfort to all office workers at each locale. However, office workers who are suffering with greater pain or disability from their condition were more likely included as they are probably more motivated to attend behavior interventions such as this *WSMP* program designed to offer solutions to help manage their MSK symptoms. As pain is coupled with many health problems and limitation in normal function, it is one of the most frequent reasons for seeking medical attention in order to alleviate one's symptoms (Mantyselka et al, 2003). Hence, it is possible to reason that individuals with more intense pain or chronic pain complaints have a higher incidence of visiting specialists, increased use of medications, increase disability, and increased time off work (Severeijns et al, 2004).

Secondly, the study population targeted individuals who were sedentary office workers that were sitting for a minimum of 50 % of their workday.

Epidemiological evidence indicates that sedentary office workers are at a risk for developing MSK pain leading to long-term disability (Robertson & O'Neill, 2003; Stewart et al, 2003). As a result, a population that was more likely to present with MSK pain was included rather than a more generalizable office population.

And finally, the study population had a higher population of women (78.6%) than men, who participated in the *WSMP* study. There is evidence to indicate that women may be more likely than men to suffer from MSK disorders (Zeytinoglu et al, 2000). Ashbury (1995) examined rates of repetitive strain injuries and found that women had higher frequency rates and increased risk for developing these disorders. Moreover, it was reported that recovery time was much greater for women than for men resulting in increase absenteeism.

It is interesting to note the underlying etiologies of MSK pain even though this was self reported showed that in this population, 1.8% had rheumatoid arthritis, 5.5 % had fibromyalgia, 6.7% had chronic pain, 7.3% had carpal tunnel syndrome, 15.8% had repetitive strain injury, and 17.6% had osteoarthritis. As compared to the general population, there appears to be an increased incidence of non-inflammatory arthritis (repetitive strain, and chronic pain) and not of inflammatory arthritis (such as RA), who may be out of the workforce. This should be interpreted with some caution as the workers were not examined by a physician and may be unaware that they indeed are afflicted with inflammatory arthritis.

6.3 Gain in Knowledge

The short-term outcome consisted of evaluating the gain in new knowledge among office workers that was related to MSK wellness 6 weeks post intervention. This was obtained via a pre/post questionnaire designed to evaluate the knowledge of common workplace scenarios that can lead to MSK pain. The study noted that the *WSMP* program was effective in increasing new knowledge among sedentary office workers who are at risk for developing MSK disorders. The intervention group who received the *"WSMP"* educational program showed a significant gain in new knowledge when comparing post-intervention to pre-intervention ($p<0.0001$). This concurs with other reports indicating the benefits of self-management programs in increasing knowledge among participants (Robertson & O'Neill, 2003; Lorig et al, 1985,1998). This is particularly evident in the ASMP program, which is designed to increase knowledge regarding arthritis management among arthritis sufferers to subsequently lower their pain and disability (Lorig et al, 1998). Specifically the pre/post questionnaires showed that participants did increase their knowledge in terms of coping skills, proper workplace ergonomics, and disease management resources due to the *"Working Well"* self-management program.

In this study, a post questionnaire was not administered to the control group, however it was determined that there would not be a substantive change in this group over such a short period of time as they were given no further information regarding strategies to enhance workplace wellness. Additionally, a methodological limitation in obtaining the short-term outcome measure was that

the instrument (pre / post test) was not validated. However, the instrument was derived by consensus from the *WSMP* Scientific Committee comprising of a rheumatologist/epidemiologist, occupational therapist and physiotherapist who have extensive proficiency with MSK diseases, and self-management program delivery. These questionnaires were evaluated and scored quantitatively according to a scoring system developed by the research team. One reviewer, to maintain consistency, conducted the standardized marking of the scoring sheets, and was blinded with respect to the order of the tests. Moreover, to further enhance the reproducibility of the results, a certain proportion of the tests could have been re-read and then inter rater reliability assessed. However this was not done.

Once it was determined that the *WSMP* was effective in increasing new knowledge among sedentary office workers who participated in the intervention, parameters were identified that influenced who learnt best in the program. Therefore, baseline participant characteristics in the intervention group were analyzed to see which factors were associated with the gain of new knowledge. Eight explanatory parameters were selected to see which, if any, predicted acquirement of new knowledge. These parameters included age, sex, marital status, education level, depressive symptoms, previous ergonomic training, presence of MSK pain, and helplessness. Previous ergonomic training was negatively correlated with acquirement of new knowledge ($p=0.034$). Those participants that were naïve with regards to knowledge of MSK self-management and workplace wellness were more likely to have a significant gain in new

knowledge. Those workers who already had exposure to previous workplace wellness training may already have greater access to other resources for MSK self-management or workplace wellness, thus the WSMP program had less of an impact in these individuals. As a result, they may not be inclined to obtain any new information or may be uninterested with the material that was presented as was observed.

It is of interest that despite the convincing enhancement in knowledge, an overall decrease in absenteeism was not observed. This would suggest that knowledge gained could not solely be used as a surrogate for absenteeism. This is not unusual, as the ASMP has clearly shown to improve knowledge however this well established program has not consistently demonstrated a significant decrease in pain or disability.

6.4 Absenteeism

In terms of evaluating the primary outcome consisting of absenteeism data, the program had no influence in reducing worker absenteeism rates. Absenteeism data were obtained retrospectively for both the control and the intervention group from the worksite administrative databases. Prospectively, the data were collected again for participants in both groups from all three work site. The mean score showed a slight increase in the group that received the intervention, however this was not found to be statistically significant ($p=0.42$).

Specific workplace determinants that may possibly influence absenteeism were determined. Based on the existing literature, 3 determinants (MSK pain, depression, and helplessness) shown to have an influence on worker

absenteeism were selected.

Office workers often work in small, cramped areas with non-ergonomic office equipment increasing their exposures to physical risk factors leading to pain which has been shown to be strongly associated with development of chronic work disorders (Zeytinoglu et al. 2000). Additionally, depression is strongly related to a number of pain conditions including back pain and is one of the most prevalent psychological health problems in occupational settings (Stewart et al, 2003; Tarumi et al, 1999). And finally, a study of 155 patients affected with rheumatoid arthritis (RA) who were randomly selected from a tertiary care outpatient rheumatology clinic, conducted by Lorish et al (1991), demonstrated that high levels of helplessness were associated with high level of pain, and functional disability among patients suffering from RA.

However, in this study MSK pain, helplessness and depression were not found to be associated with overall absenteeism rates. As only a small proportion of the patients were noted to exhibit symptoms of self reported helplessness or depression, the study was not adequately powered to assess the impact of these variables. It is surprising to note that MSK pain did not result in higher absenteeism among participants, since much of the literature supports to the contrary (Mantyselka et al, 2002; Warsi et al, 2003; Punnett & Wegman, 2004) However, this may be due to the lack of statistical power in assessing the absenteeism data due to the large standard deviation observed in the analysis.

The rationale for why the intervention did not result in lowered absenteeism rates among office workers who received the WSMP intervention

include the selection of the target population, the program intervention itself, the manner in which the primary outcome was assessed and the complexity of the problem that being addressed. It is also conceivable to deduce that such a simple intervention is far too naive to impact a complex problem such as workplace absenteeism.

With respect to the choice of the population, the program was intended to target a generalizable working population that included individuals who may or may not be suffering from a variety of MSK ailments. As a result, it was designed to help prevent chronic pain as well as lessen pain after it is present. However, primary prevention interventions are harder to appraise due to the fact that they are not targeted to a specific outcome as are secondary and tertiary prevention. Primary interventions, which can be introduced at a number of different levels, have an ultimate goal of preventing the development of acute pain and thereby preventing chronic pain (Nielson & Mior, 2001). This self-management program was designed to reduce the number of MSK symptoms common among the working populace including repetitive strain injuries, mechanical back or neck pain, carpal tunnel syndrome, and non-inflammatory joint disease and in doing so prevent long term disability. Since participants self-reported their MSK symptoms, individuals who had inflammatory arthritis pain, may have been enrolled which was not addressed by the program. Furthermore, the exclusion criteria did not leave out individuals with Fibromyalgia, which is notably a complex condition to treat and for which to obtain a successful outcome.

With regards to the three workplaces, the exposure to previous ergonomic training differed as two of the workplaces were naive to the information included in the *WSMP* educational program whereas the other previously had a considerable amount of workplace wellness assets already incorporated into their workplace setting and available to their workers on-site. The primary resources available included an occupational health and safety worker, ergonomically designed workstation, on-site wellness information as well as the involvement of the arthritis society's workplace wellness modules. Secondly the absenteeism policy differed between the three sites. It is intuitive that those that have to be more accountable of their lost time may be less likely to be absent. And finally, worker "morale" present within one worksite due to significant lay offs during administration of the WSMP intervention may have contributed further to how well the intervention was received.

Pertaining to intervention itself, it is important to note that even though the *WSMP* was modeled after the validated ASMP, it was for all intents and purposes tailored to accommodate the workplace environment wherein individuals did not have to present with any type of pain. Time constraints were present in that the sessions were limited to one-hour sittings rather than the original two hours and the course content was presented in a didactic fashion rather than having a "hands on" approach. The program included an important component dealing with office ergonomics, which was delivered via power point presentations and a course manual, however it may have been more valuable to set up a worksite and permit individuals to learn hands on how to have an

ergonomically effective workstation. Furthermore, including a section that deals with self-contracting to reinforce behavioral changes over a longer time period would increase the likelihood of workers adhering to the beliefs of the *WSMP* program. It is also important to note that in the study a physiotherapist and occupational therapist delivered this program with substantial background in MSK disorders and effective self-management program delivery. Even though, Lorig et al (1986) suggests that lay leaders can teach self-management courses yielding similar results with regards to patients' knowledge of arthritis as those delivered by professionals, further assessment is required to determine whether an individual's gain in new knowledge is attributed to the standardized course content or the facilitators' specific characteristics. And finally, the *WSMP* is a 6-week program that utilizes one facilitator per session and can be delivered in the convenience of the working environment via a standardized protocol.

Finally, the primary outcome consisted of absenteeism data, which for the study purposes was tracked poorly due to the fact that the reporting systems already in place at each of the three venues were inadequate. This program is essentially designed to decrease absenteeism related to MSK discomfort. The study relied on each workplace to provide their absenteeism data as they defined it. Since three different work places were used, with each having its own procedure for collecting absenteeism details, it made it difficult to collect data that was specific to the outcome of the study. Absenteeism was defined as the number of hours missed from work due to sickness or illness. However, it was difficult to determine if these individuals missed time off work due to a legitimate

illness.

Furthermore, the program was designed to specifically target MSK symptoms and thereby improve worker absenteeism. However, it was difficult to conclude who missed work unequivocally due to MSK illness. Although, workers were expected to account for reasons they missed work, many participants did not appropriately complete the necessary paper work required by their workplace. As a result, there is a need to closely track absenteeism at various intervals in addition to strictly account for work loss, which in turn would significantly augment a future study.

And finally, it may be astute to take into account other variables that can evaluate the efficacy of the program along with absenteeism such as presenteeism or worker productivity. Therefore, instead of focusing on lost time due to absenteeism to evaluate work-related impact of pain, there is evidence to indicate that it may be more insightful to focus on the reduced performance while at work or lost productive time due to health conditions (Stewart et al, 2003).

6.5 Summary

The results of this study are encouraging in that there is a recognized need for establishing self-management practices within the working population to prevent and manage MSK pain due to the high prevalence of these disorders in this population. There is a requirement at present to provide evidence to employers and policy makers with regards to the burden of MSK disease that exists within the workplace and the importance of dealing with the impact of disabling work-related MSK diseases. In addition, the role of self-management

practices as an adjunct to medical and physical therapies for MSK disease is well established and recommended by the American College of Rheumatology Subcommittee on Rheumatoid Arthritis (2002). Furthermore, previous literature provides ample evidence that the use of educational interventions that affect individual beliefs and health behaviors by increasing knowledge is vital (Boutaugh, 2003; Roberston & O'Neill, 2003; Brady & Sniezek, 2000; Keefe et al, 2000). The program has shown to increase knowledge regarding MSK self-management and workplace wellness. However, there is a need to appropriately assess how this gain in knowledge translates into behavioral changes among individuals in order to diminish chronic long-term disability. And finally, cost effective implementation of these programs is necessary and such is the case with the *WSMP* which is delivered via a standardized protocol within a workplace setting making it a low cost option and thereby more accessible in a variety of community settings.

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APPENDIX A: WORKING WELL SELF-MANAGEMENT PROGRAM

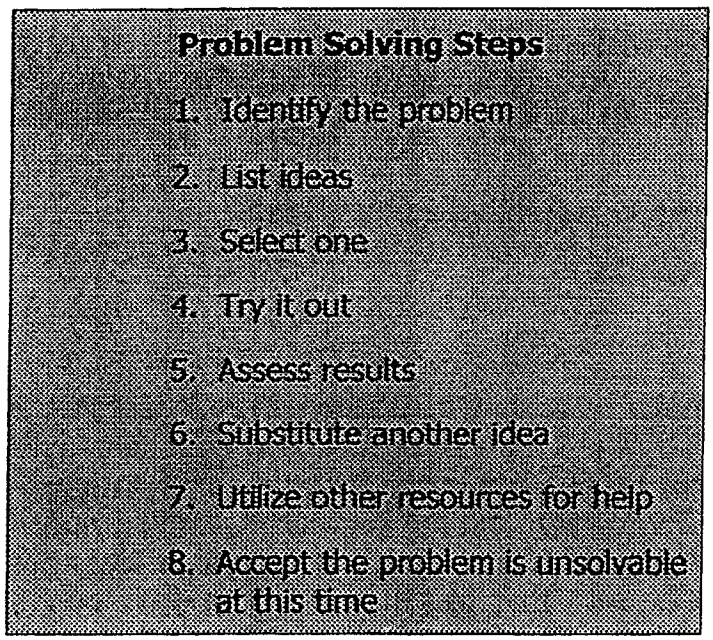
1.0 PROBLEM SOLVING IN THE WORKPLACE

Method: Lecturette/Discussion

1.1 Problem solving is a basic, but very important life skill that we have used during our contracting/feedback sessions and in previous activities such as identifying hassles. To further reinforce this skill and do some further practical problem solving in the workplace we will first review the process.

Problem solving steps:

- **Slide 1:**



- **Identify the problem.** This is the most difficult and most important step.
- **List ideas** To solve the problem.
- **Select one method** to try.
- **Assess the results**
- **Substitute** another idea if the first didn't work.
- **Utilize other resources.** Ask friends, family, professionals for ideas if your solutions don't work.
- **Accept that the problem may not be solvable** at the present time. If you followed all the other steps and have run out of solutions to try.

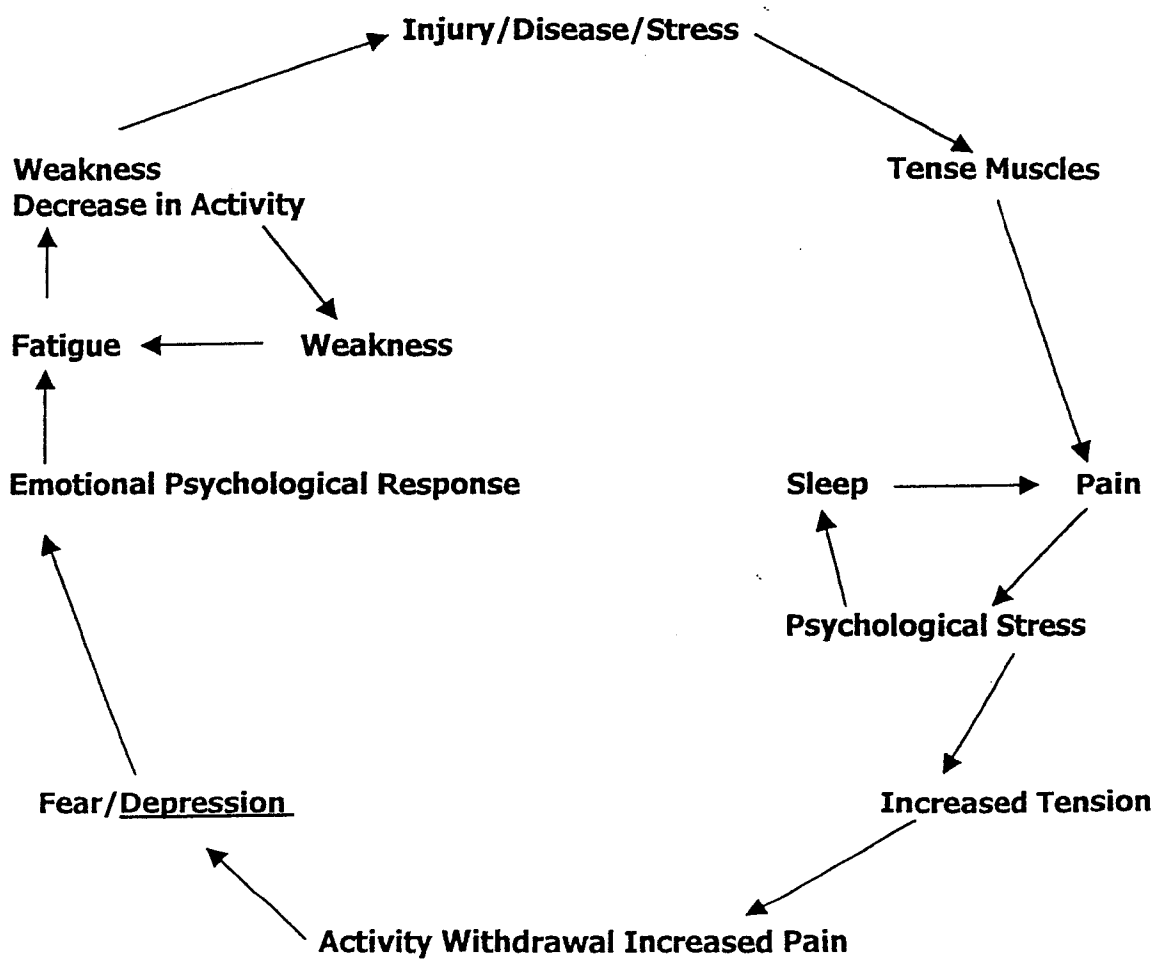
2.0 **DEPRESSION**

Method: Lecturette, Brainstorm (10 min)

2.1 Introduction: In Session 1 we reviewed the Pain Cycle and highlighted various factors, which influence our perception of pain. Depression was one of these factors. An injury or disease may result in physical symptoms, which are not pleasant. Disruptions in sleep and participation in daily activities can occur. Stress, anger, worry and fear can lead to depression. "Will I ever get better? What is going to happen next?"

Not only can depression result from prolonged stress or pain, but it can further aggravate physical symptoms.

- **Slide 2:**

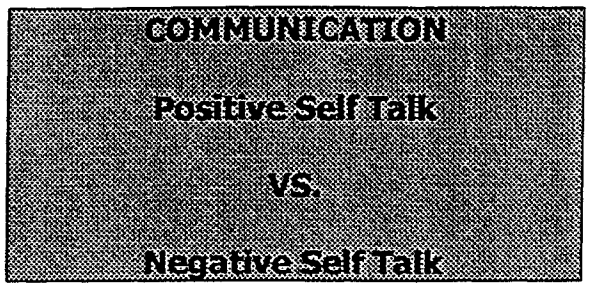


*e.g. – Carpal Tunnel Syndrome, or neck or back pain.

3.0 **Positive Self Talk (10 min)**
Method/Lecturette/Brainstorm/Discussion

3.1 In Session 3 we talked about assertive communications with others in the form of "**I messages**". Self-talk is what we say to ourselves.

- **Slide 3:**



Self-talk can be either positive or negative. (i.e., when we wake up in the morning we could say to ourselves "What a rotten day. I know my back is going to feel worse with this rain, drizzle and fog. I don't want to get out of bed, maybe I'll call in sick")
Versus.
"Oh my, another day of rain, drizzle and fog. I guess I'll start the day with a warm bath and some stretches and dress warmly today. Maybe I'll even wear something bright to cheer me up and I'll bring in a joke to my co-workers."

Negative Self-Talk – often irrational or exaggerated thoughts, leads to increased stress response, increased pain, depression and lower energy levels. (It perpetuates the pain cycle). It can also bring down other's moods if expressed out loud. (eg. roommate in residence who was so negative, no one wanted to be around her in the morning).

Think of how you feel being around positive versus negative people. When down, look for positive people with whom to associate.

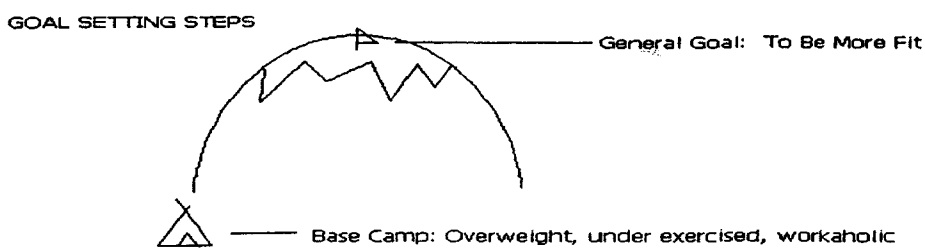
3.2 **Brainstorm**
Ask for a few examples of negative self-talk (write on board). Now ask participants to change these to positive talk statements. (Write on board beside examples)

4.0 **Feedback/Contracting**

First we will review our contracts from last week. In setting contracts for this week, please think about your long-term goals. You may want to have separate contracts for exercises versus working on posture or sleep habits versus eating habits. Don't try to work on too many things at once.

Remember, the goals may be lofty, but the objective should be reasonable and have realistic achievable steps.

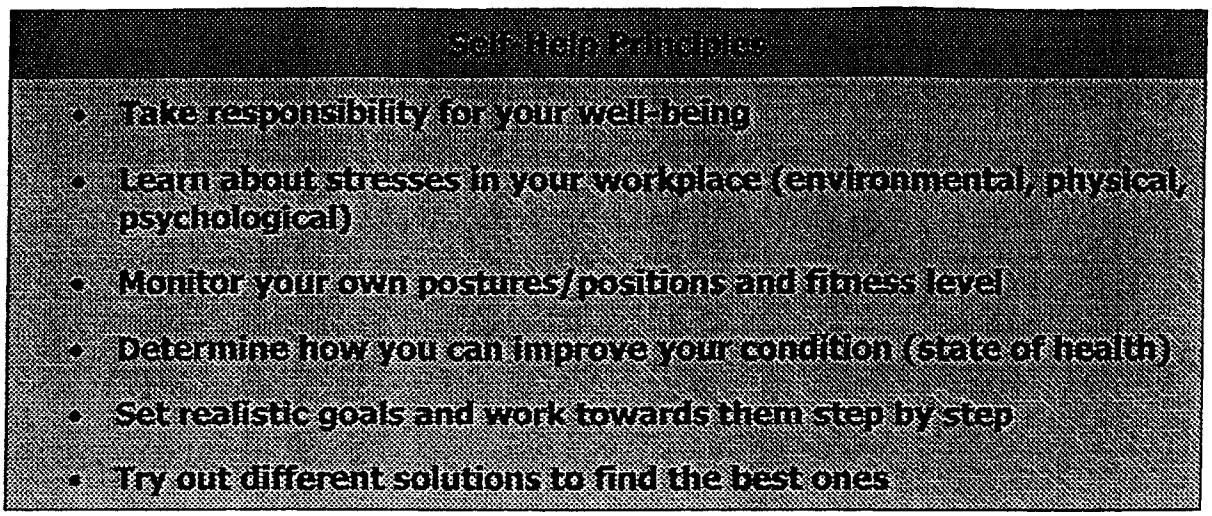
- **Slide 6**



5.0 **Closing**

5.1 Review Self-Help Principles

- **Slide 8:**



5.2 Remind participants that there will be a follow-up questionnaire.

5.3 Request that participants fill out an evaluation of the 6 sessions.

5.4 Hand in nametags.

5.5 Ensure your name is registered for today's session.

5.6 Slide 9 (Closing)

Thank you for you participation.

SIGNS OF DEPRESSION (Handout)

One of the common symptoms associated with musculoskeletal complaints such as pain, is often depression. The following are **Signs of Depression**:

- Loss of interest in friends or activities. Not being home to friends, perhaps not even answering the doorbell or telephone.
- Isolation. Not wanting to talk to anyone. Avoiding friends who you happen to meet in the street.
- Difficulty sleeping or changes in sleeping patterns. Interrupted sleep or sleeping more than usual. Often going to sleep easily, but awakening and being unable to return to sleep.
- Loss of interest in personal care and grooming.
- Change in eating habits. Either loss of interest in food or excessive eating.
- Unintentional weight gain. Either a gain or loss of more than 10 lbs. in a short period.
- A general feeling of unhappiness lasting longer than 6 weeks.
- Loss of interest in being held or having sex.
- Suicidal thoughts. (Wondering if it is all worth it)
- Frequent accidents. Watch for a pattern of increased carelessness, accidents while walking or driving, dropping things and so forth.
- Low self-esteem. A feeling of worthlessness. A negative image of your body, (wondering if it is all worth it).
- Emotional Labiality.
- Frequent arguments, anger and hostility. A tendency to blow up easily over minor matters or over things that never bothered you before. For some, this is how they express depression.
- Loss of energy, feeling tired all the time.
- Feeling confused and unable to concentrate.
- Inability to make decisions.

Select a method to try:

First we will try the document holder. We get it, position it, and assess the results. It works for one page, but a lot of reference documents might be a file folder. That didn't work, so we will try another option. How about a document holder that is positioned between the monitor and the keyboard? Make sure it has a wide lip on it. If that didn't work, and we didn't have any other ideas, we could utilize our other resources. Be sure that you utilize all of your resources before you go to Step 7.

There are many issues in the workplace that need problem solving to address the issue. These include:

- Physical environment - the environment is not suitable for one of many reasons e.g. There is not enough space.
- Communication with co-workers - how do you address a sensitive issue?
- Financial restraint - not enough funds to go around.
- Workload expectations - too much, too little!

Plan Outline: Session 1

How to use Goal Setting and Contracting to break the Pain Cycle and treat Musculoskeletal (MSK) complaints

1.0 Introduction, Program Overview (17 mins)

2.0 Pain Cycle (10 mins)

3.0 Factors in the Workplace that lead to Musculoskeletal (MSK) complaints (10 mins)

4.0 Goal Setting/Contracting

5.0 Closing

Homework: Complete Ergonomic Checklist

- **Use slide with program overview.**

Topics	Sessions					
	1	2	3	4	5	6
Self-Help Principles	*	*	*	*	*	*
Ergonomics	*	*				
Pain Cycle	*					
Contracting/Feedback	*	*	*	*	*	*
Posture/Back Education		*				
Repetitive Strain Injuries		*	*			
Relaxation Techniques		*		*		
Exercise Principals		*	*	*	*	
Communication Skills			*			*
Sleep Hygiene					*	
Medication					*	
Nutrition					*	
Stress Management				*		
Treatment of Musculoskeletal Complaints		*			*	
Problem Solving				*		*
Depression						*
Assistive Devices						*

Briefly review the program overview and relate this to participant's course objectives.

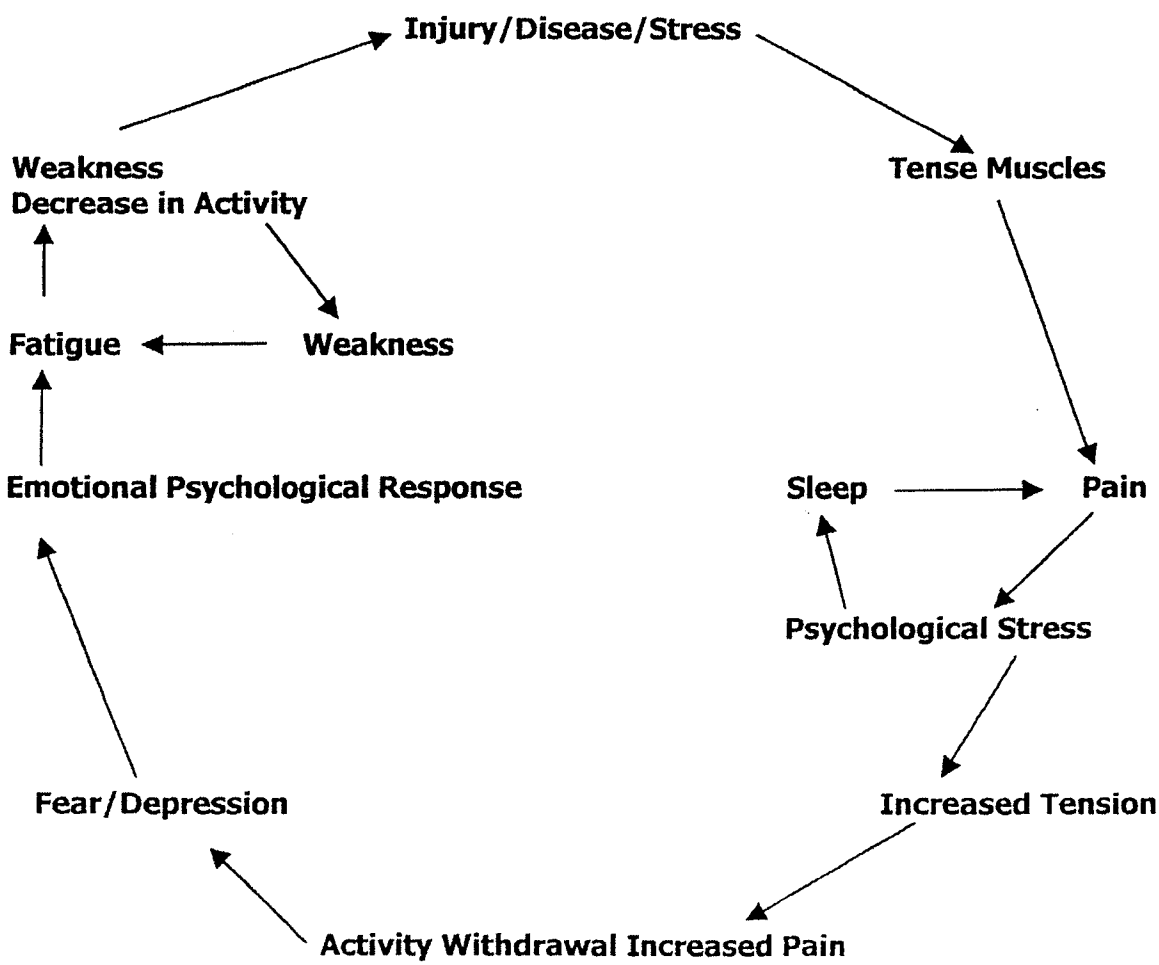
Explain that we will visit setting realistic goals a bit later this session. Participating in group discussions, practicing techniques, use of weekly contract diaries and homework, all help to improve self-management skills. As usual, what you put into the course will determine what you get out of it.

2.0 **Pain Cycle (10 min)**

Method: Lecturette

2.1 Pain is a signal from our bodies that we have sustained an insult to our body in the form of an injury, disease or stress. We can imagine pain as part of a cycle which can be drawn in many ways, but the message is the same. It shows how pain is influenced by many factors and in turn can influence one's general state of well being.

2.2 Show slide - pain cycle



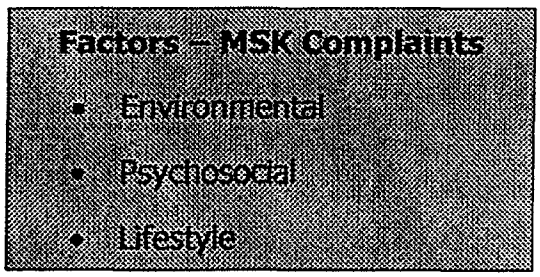
*e.g. – Carpal Tunnel Syndrome, or neck or back pain.

3.0 Factors in the Workplace that lead to Musculoskeletal Complaints

Method: Brainstorm/Discussion

3.1 Introduction:

As we learned from our review of the pain cycle, there are many factors that can contribute to musculoskeletal complaints, many of which are not physical stressors. We may find it useful to break them down into 3 categories i.e., environmental, psychosocial and lifestyle. The interaction of these factors is very complex. It is important to understand the impact of these factors on our musculoskeletal wellness to begin to make improvements.



3.2 Brainstorm:

Factors that can contribute to musculoskeletal complaints

NOTE: These factors can be personal or general examples. Record items under 3 categories as noted below.

Following the brainstorm, be sure these points are covered.

Record responses under 3 main headings:

Environmental

- Noise
- Space
- Physical Set-up
- Type of work (repetitive tasks)
- Pace of work
- Equipment/Resources
- Length of workday

Factors Contributing to Musculoskeletal Complaints (Handout)

As we learned from our review of the pain cycle, there are many factors that contribute to musculoskeletal complaints. The interaction of these factors is very complex. It is important to understand the impact of a variety of factors on our musculoskeletal complaints and how this affects our workplace wellness in order to begin to make improvements.

There are many factors that can impact on our contentment and health in the workplace.

Environmental factors are often the easiest to see objectively.

- Issues such as space, noise and physical set-up, can directly contribute to our physical comfort.

- Work, which is repetitive may be monotonous and lead to boredom. This type of work, however, may be relaxing and satisfying for another worker.

- The level of responsibility in a job may contribute to job stress. The hours of work and the general pace of work are also factors. Some work environments allow the worker to self-pace tasks. In other work environments the pace is directed by external factors.

- Equipment and availability of resources in the workplace, again has a great impact on productivity and motivation. Equipment, which is in good working order and well suited to complete the task at hand, decreases work stress. Poorly designed and maintained equipment or ill suited equipment can lead to frustration, awkward posturing and increase the physical demands of a position.

- Some jobs require a level of privacy or uninterrupted space for confidentiality or just for concentration.

There are many psychosocial factors in the workplace that greatly influence well being at work:

- The presence or absence of co-workers may in itself be stressful.

- Relationships with co-workers and management may be positive or negative.

- The nature of the work, for example, if required to deal with the public. This can be particularly demanding.

- Work autonomy, or an individual's level of independence and responsibility can be both very satisfying and at the same time stressful.

- Some employees enjoy their job and work environment, others are dissatisfied and work only as a necessity.

Goal Setting/Contracting (20 min)

Methods: Lecturette/Participation

4.0 One of the most important self-management skills is GOAL SETTING. Goals are things we would like to accomplish within 3 to 6 months or even a year or two. They are generally too big to work on all at once i.e.,

I want to participate in the tele 10 next year.

I want to have a totally organized work space in 3 months.

I want to lose 15 lbs. in 6 months.

I want to socialize more with family and friends.

4.1 Once we have set our general goals, these have to be broken down into smaller, more measurable "doable" steps or tasks.

- **Slides of Goal Setting**

4.2 Have each participant write down two goals for themselves on contract sheet provided, to improve general wellness.

4.3 The next step toward achieving our goals is to get started. This is done by deciding which step(s) we are going to work on this week and exactly <u>what</u> we are going to do. This is done by making a weekly <u>contract</u>.

4.4 Experience has shown that self-helpers who accomplish the most are the ones who set short-term realistic goals. Self-contracting is a very useful tool to define the steps and commit oneself to achieving these goals. Therefore, each class we will be asking each of you to make a contract for something you wish to accomplish. Keep in mind your general goals.

It might help to think of some of the factors, we discussed earlier, which influence your workplace wellness or pain cycle.

4.5 The rules of contracting are:

- **<u>Show slide</u>**

Rules of Contracting

1. **Choose something you want to do.**
2. **Be realistic, something you can accomplish within 1 week.**
3. **Specify:**
   - **a) What: you want to do (a behaviour, stop smoking, loose 10 lbs.)**
   - **b) When: time of day, days of week.**
   - **c) How much: number of reps, distance, pounds, minutes.**
   - **d) How often: i.e., 3 day/week, every coffee break.**
4. **Write it down – put it where you can see it, like on a fridge, bathroom mirror.**
5. **Check it daily, emphasize only "I will" not "I will try" will be accepted in writing the contract.**

Closing (3 min)

5.1 Review Homework Assignment e.g. Ergonomic Checklist to pinpoint some specific environmental stressors.

5.2 Ask participants to drop off their nametags and ensure their name has been registered.

5.3 Thank participants for coming and stay around for 15-minutes to answer any questions.

ERGONOMIC CHECKLIST FOR OFFICE WORKERS

Please check any items, which you feel, are issues in your work environment.

Items identified indicate a potential ergonomic risk factor.

COMPUTER:

__ Neck is rotated to one side to view monitor.

__ Neck is flexed or extended to view monitor.

__ Neck and shoulders are hunched, as arms reach up slightly to use keyboard.

__ Images on the screen are difficult to read often requiring squinting or leaning forward.

__ There is a lot of glare on the screen.

__ The mouse and keyboard are not positioned at the same height.

__ The keyboard is low requiring stooping forward slightly and reaching downwards to access the keys.

__ The wrists are in a flexed or extended position to access the computer.

__ The wrists dig into a sharp edge on the keyboard tray.

CHAIR:

__ Chair does not provide good low back support and/or support up to the shoulder blade level.

__ The seat does not support the thighs fully leaving 2" space behind the knees at the edge of the seat.

__ The chair does not slide easily on the floor.

__ The chair does not swivel.

__ The chair is not height adjustable from a seated position.

__ There are no armrests, or armrests are present, but are not the proper height.

WORK SURFACE:

__ There is a lack of space on the work surface to complete work tasks and house reference documents

__ There is not enough leg room to change leg position without standing up.

__ Accessing commonly used items requires over reaching.

__ The workstation is too high or too low requiring reaching up or down.

Weekly Contract Form

Goals:

1) _____

2) _____

In Writing a Contract, be sure it includes:

1. ***What*** you are going to do.
2. ***How*** much you are going to do.
3. ***When*** you are going to do it. (What time of day)
4. ***How*** many days a week you are going to do it.

For example: This week I will walk (**what**) around the block (**how much**) before lunch (**when**) three times (**how many**).

This week I will _____ (What)

_____ (How)

_____ (When)

_____(How many days)

How certain are you? _____ %

For each day you accomplish your Contract, put a checkmark:

Monday _____

Tuesday _____

Wednesday _____

Thursday _____

Friday _____

Saturday _____

Sunday _____

Signature: _____

SESSION 2

Office Ergonomics and Posture

Purpose:

- To review the principles of good posture.
- To introduce principles of office ergonomics.
- To provide participants with a postural measurement tool and ergonomic check list.
- Define RSI and discuss stages.
- To provide participants with the opportunity to practice progressive muscle relaxation as a pain management technique.

Objectives: By the end of the session, the group members will be able to:

- State the three normal spinal curves
- Demonstrate principles of good posture in standing, sitting, and lying.
- Identify basic ergonomic risk factors in the workplace using the postural measurement tool and ergonomic checklist.
- Define RSI and describe the stages.
- Practice progressive muscle relaxation as a pain management technique.
- Make a contract for the upcoming week.

Homework: List 5 ways to prevent Repetitive Strain Injuries (RSI.)

Materials:

General	Participant Handouts
PowerPoint projector, screen, and laser pointer	Ergonomic Checklist
Attendance sheet	Posture, Anatomy, Lifting
Easel, markers	Repetitive Strain Injury
Nametags	Mini Breaks (exercises)
Pens	Preventing and/or Treating RSI- homework
Folder for participants	Progressive Muscle Relaxation
Lunch	Postural Assessment Guide

SESSION 2

1.0 Posture (10 min)

Methods: Lecturette, Demonstration

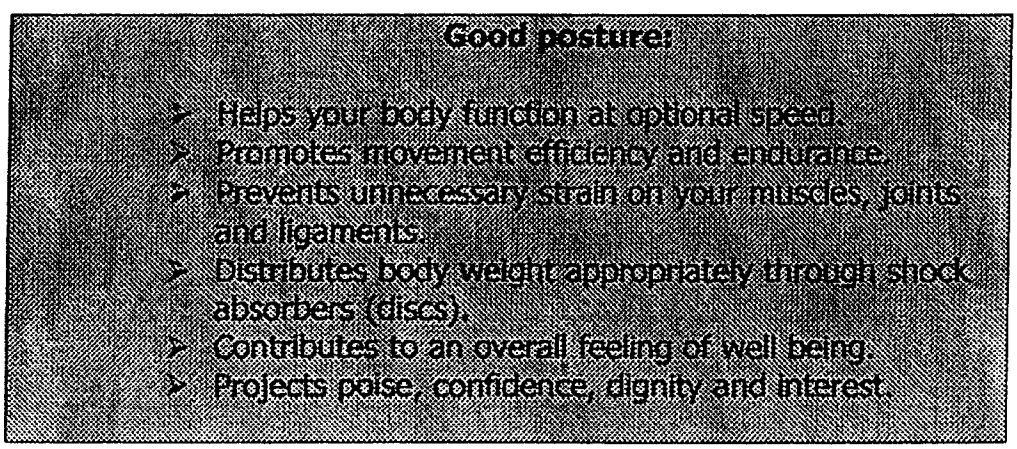
1.1 This session we will review some basic principles of good posture, why it is important, how to assess it, and how to maintain it.

1.2 Why work on your posture:
Most neck and back problems can not be attributed to a particular time or place, but have developed after months or years of cumulative effects of:

- Poor posture, faulty body mechanics.
- Stressful living and working habits.
- Loss of flexibility.
- General decline of physical fitness.

As such neck and back problems are seldom cured with treatment such as manipulation, medication, traction, braces or surgery. What you do to help yourself to decrease stresses is usually more important. This includes watching your posture during activities, as well as at rest.

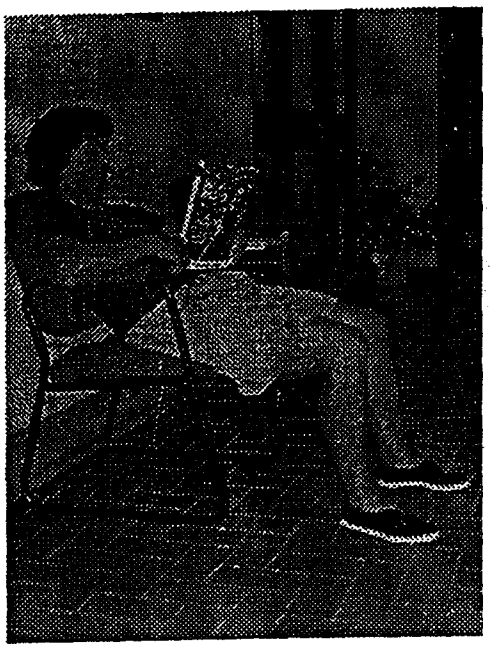
1.3 <u>Show Slide:</u>



1.4 What is Good Posture?
There are four areas of the spine:

- **<u>Show slide: Anatomy</u>**

➢ **Show slides on poor sitting postures**



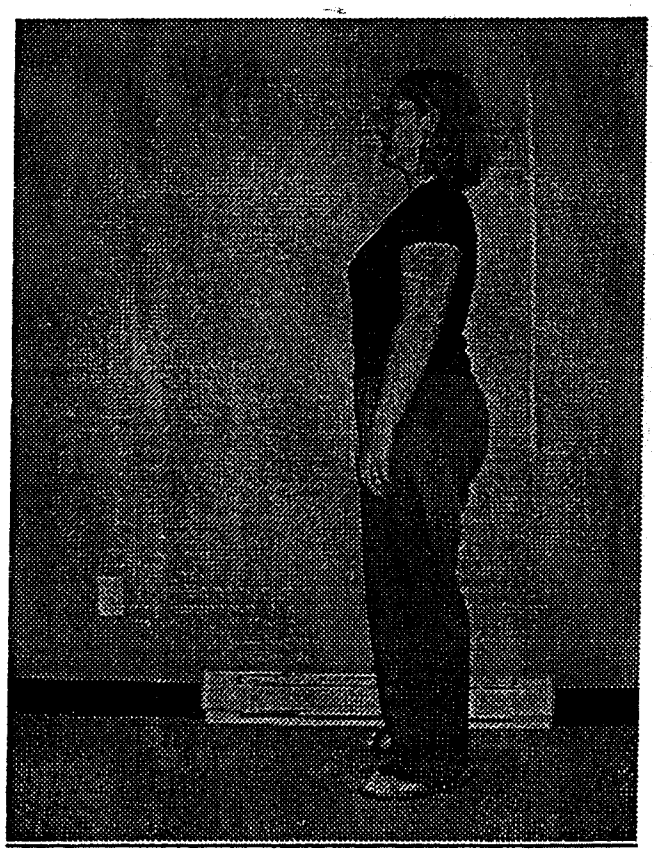
Postural Awareness

The curves of the spine allow for flexibility and help the spine in its role as a shock absorber. Good posture means keeping these natural curves in balanced alignment in standing, sitting and lying.

1.5 Standing:

If we look at the side view and imagine a plumb line dropped beside the body, that line should run through the ear, shoulder, hip, knee and ankle. Head should be tucked in and knees not locked. (See your handout)

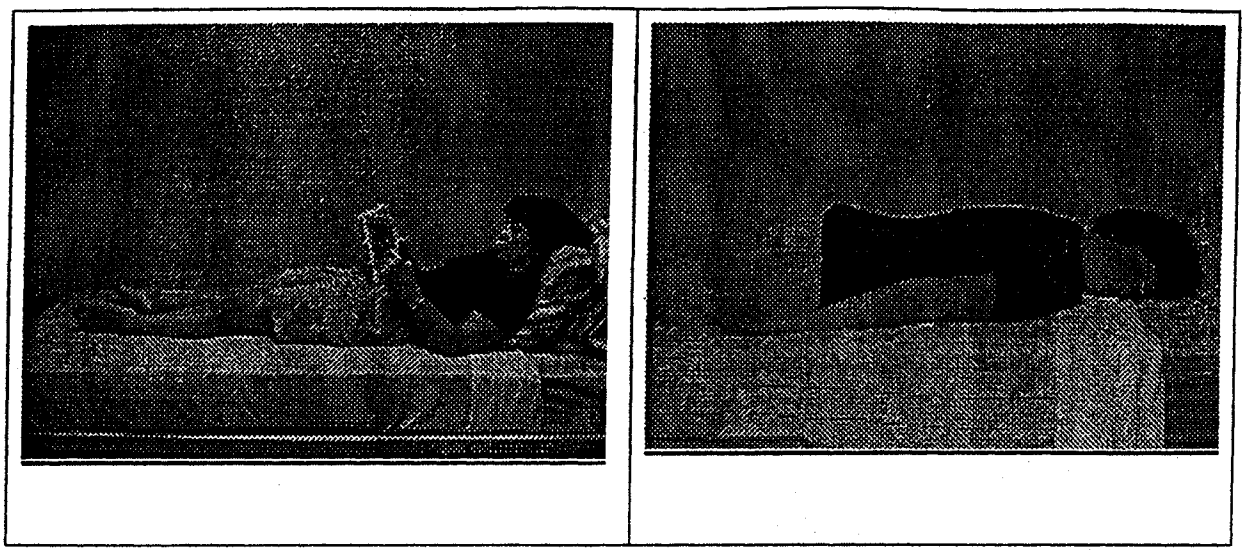
- **Slide 3: Standing Postures**



Sometimes it is necessary to support the natural curves with back supports, special pillows, mattresses, footstools or neck rests.

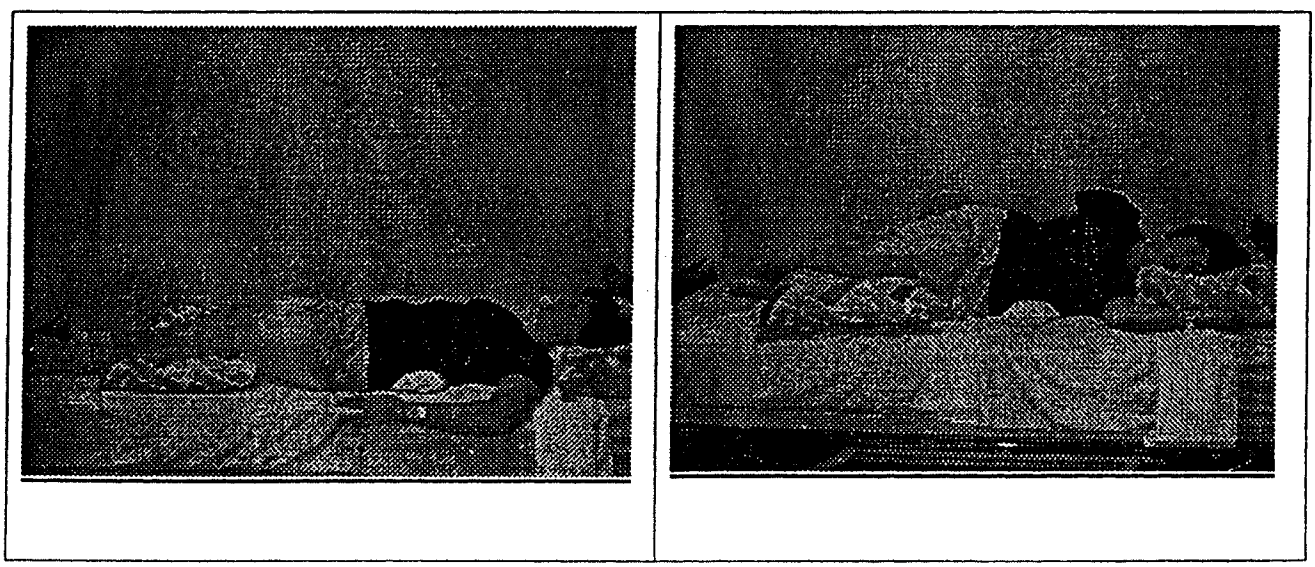
1.7 Lying:

- **Slide 5: Poor Lying**



Point out maintenance of proper curves from side a straight spine from front, proper use of pillows.

- **Slide 6: Good Lying**



1.9 Body Mechanics:

During activity, it is also very important to maintain proper posture to minimize wear and tear. You have a handout on proper lifting to review.

Slide 7: Lifting

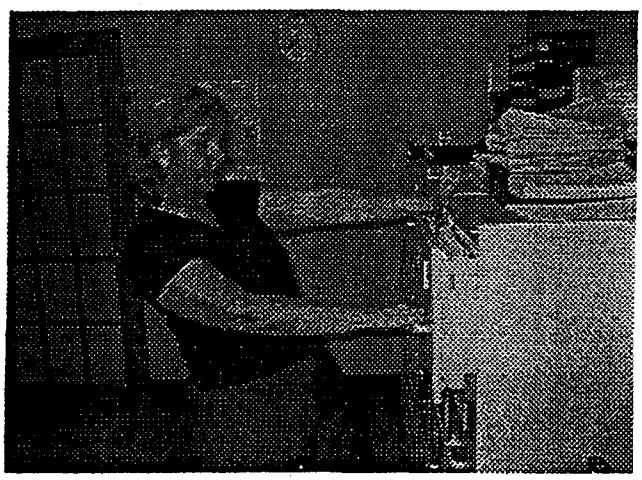
4 pictures illustrating proper lifting techniques to be added. Difficulty printing photos.

Proper Lifting

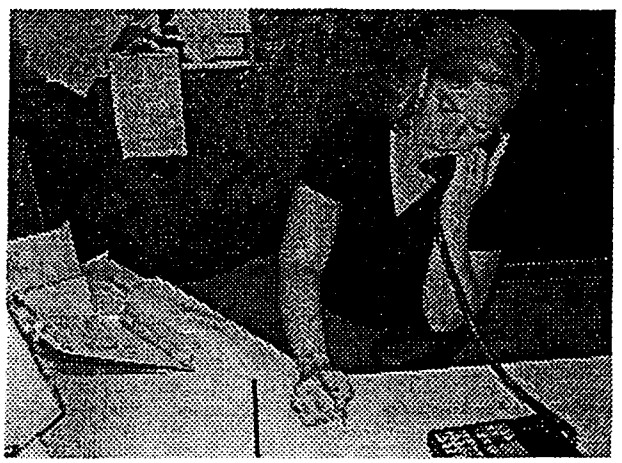
- Mentally prepare, plan, clear space.
- Face direction of lift, chin tucked in.
- Stride position.
- Feet shoulder width apart.
- Bend from hips and knees not back.
- Maintain spinal curves.
- Set stomach muscles.
- Keep load in close at chest level.
- Don't twist or bend sideways.
- Push if possible, not pull.
- Roll if possible, not lift.
- Get Help if needed.

Repeated Movements

Excessive Force



Awkward Posture



Prolonged Positioning

2.4 Stages of Repetitive Strain Injuries:

3 Stages of RSI

The 3 Stages of RSI
Early: Achy, tired, better when task is discontinued.
Intermediate: Symptoms worse, easier to aggravate, need to rest to settle.
Late: Symptoms more continuous, may not go with rest.

The 3 Stages of RSI

Early: The affected area of the body aches and feels tired or uncomfortable at work, but symptoms resolve with discontinuation of aggravating tasks. Symptoms do not continue beyond work day.

Intermediate: Symptoms are more easily aggravated and take a longer to settle with removal of aggravating tasks i.e. May extend beyond work day and impact on home activities.

Late: Symptoms are more continuous and tend to impact on both work and home tasks. Sleep may be affected. Chronic symptoms may result in psychological stress.

3.0 OFFICE ERGONOMICS

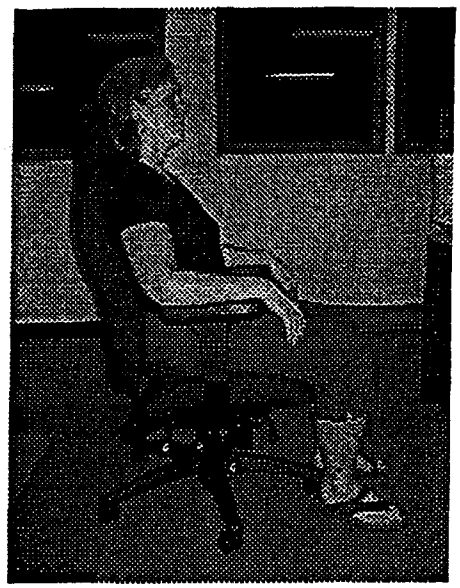
Method: Lecture

3.1 Introduction: Ergonomics is the science of matching work tasks and the work environment to the worker. If there is not a good match physical or psychological stress may occur. For the office environment it is important to consider the following"

Office Chairs: A chair with the proper dimensions and design to suit the worker and task is essential in maintaining good posture and positioning.

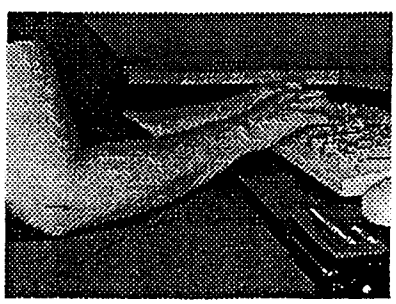
Basic Features:

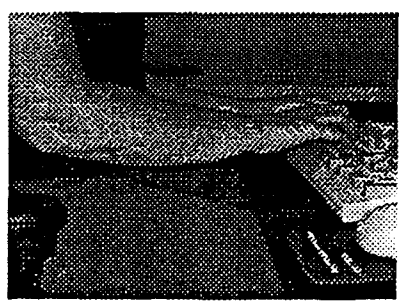
- Swivel base
- 5 wheels for stability
- Breathable fabric
- Rounded front edge
- Seat height adjustment
- Back angle adjustment
- Lumbar support
- Proper height arm rests

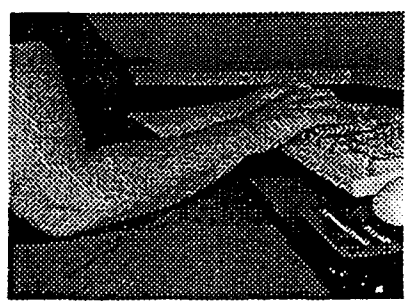


Adjusting your chair:

- Adjust backrest so it supports the hollow of your back or lumbar curve. Sit upright. Not pushed forward and not reclined.
- Adjust the chair height to the work surface – sitting, with the neck and shoulders relaxed – for computer work: elbow height. Slightly higher for reading and writing.







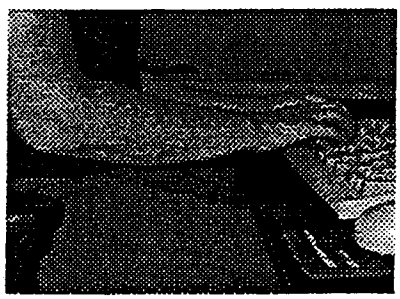
Computer Setup:

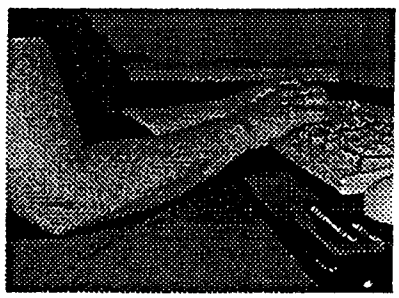
- The keyboard and monitor should be positioned directly in front of the worker.

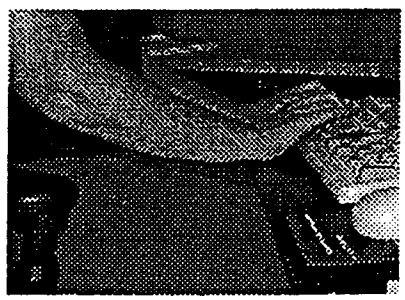
- The top of the screen should be at eye level with the neck in a neutral position. Slightly lower for bifocal users.

- Viewing distance 18-24" for a 14" screen. Further for a larger screen.

- Keyboard – elbow height







Work Surface Organization:

- Frequently used items within a comfortable reach i.e. Arms length without leaning forward
- Avoid clutter
- Minimize reaching overhead especially from a seated position i.e. Overhead shelves
- Ensure sufficient leg room under the desk
- Do not reach behind shoulder line
- Being organized eliminates the need to search and handle items unnecessarily.

Telephone Work:

- Positioned in close range if used frequently

- Avoid cradling the phone between the neck and shoulder

- Use a headset if frequently answering the phone and taking messages or accessing the computer while on the phone.

- A phone platform angles the phone to decrease reaching

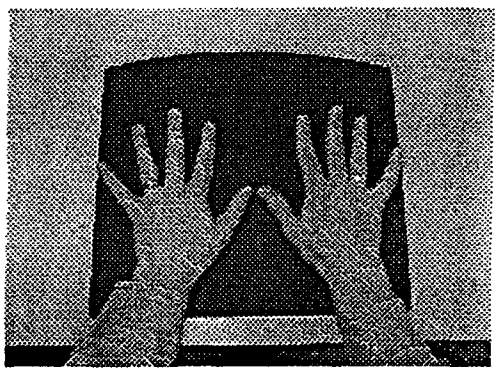
4.0 Relaxation Mini Stretch Break and Progressive Muscle Relaxation

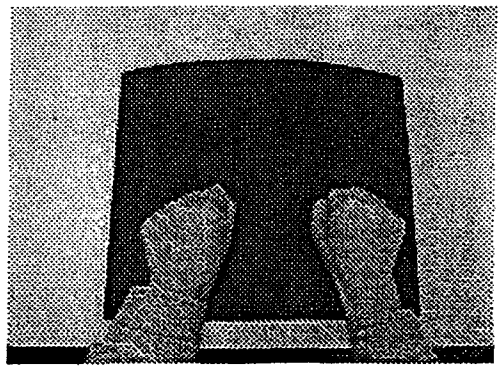
Method: Lecturette, Practice

4.1 Mini breaks

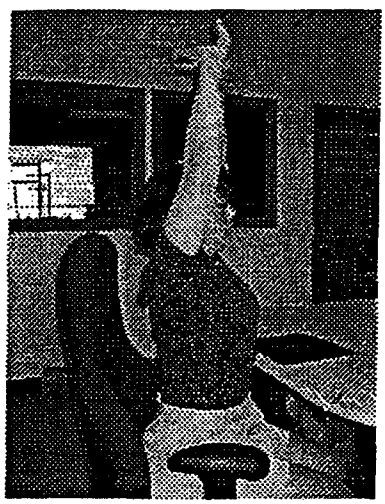
There are many possible stretching programs, which can help break up physical stresses in the day of an office worker. The key is to promote circulation, relax tense muscles and reverse static positions. We have given you one example of a mini break program, which can be interspersed throughout you day.

1. Hand Stretch (fingers full extended and apart, full fist).





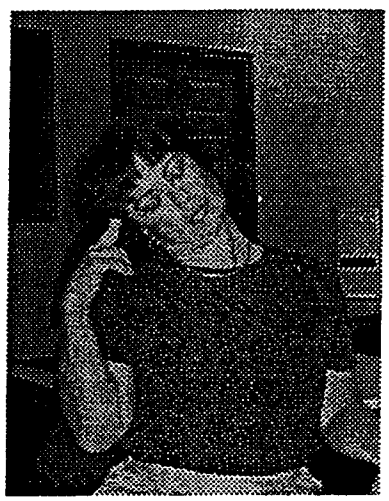
2. Hands overhead.



3. One arm behind neck (other arm).

8. Neck retraction, extension, rotation, flexion.






9. Trunk twist (right and left)

10. Trunk side bend (right and left)


4.2 Progressive Muscle Relaxation

Relaxation is a very effective way to break the pain cycle, but it is often a lot harder to do effectively than one might think. Sometimes when we rest, we really don't relax because our minds are racing and our body remains tense. Not all relaxation techniques work for everyone so it is a good idea to practice a few.

This one is called "Progressive Muscular Relaxation" and is especially good for people who carry around a certain level of muscle tension without even knowing it. The exercise helps you to feel the difference between tension and relaxation.

When beginning to practice relaxation skills, it is often best to set up and environment where you are comfortable, it is quiet, you won't be interrupted and lights are low. Breathing is very important in all relaxation exercises so we will practice this first.

Make yourself as comfortable as possible. Loosen ties, shoe laces, uncross ankles, legs and arms. Allow your body to feel completely supported by the surface beneath you. Close your eyes to close out unnecessary distractions.

Focus on your breathing, breathing in through your nose, drawing the air deep into your chest, causing your abdomen to rise. Slowly relax breathing out through pursed lips as if you were going to whistle. As you breathe out, let go of as much tension as possible, as if it is flowing away with your breath.

If you have difficulty breathing through you nose, just breath in thorough your mouth. Breathing again deeply, fully. Let yourself exhale again letting you shoulders relax. Let all your muscles feel heavy and let your body sink into the surface beneath you.

This exercise will guide you through the major muscle groups from your feet to your head, asking you first to tense and then relax those muscles. If you have pain in any part of your body today, you may choose not to tense that area. Instead, just focus on any tension that may already be there and let go of that tension.

Take another deep breath in, 2, 3, and relax out, 2, 3.

Become aware of your feet, curling your toes tightly under, increasing the arch in your soles. Feel the increased tension and hold it for a breath. Now release the tension, as you breathe out. Feel the relaxation and maybe some increased warmth.

Now push your heels into your chair, legs feeling the increased tension in your calves and back of your thighs. Hold the muscles tense. Recognize the tension and relax letting the muscles feel soft as if they are melting into the surface beneath you.

Ergonomics at the office – (Handout)

What is Ergonomics?

Ergonomics

Ergonomics
"Science of Matching the Work to the Worker"

Ergonomics is the science of matching the work to the worker. Office ergonomics includes workstation design, job design and the work environment. A poor fit between the worker and the environment causes physical and psychological stress on the worker. This can result in physical health problems and injury to muscles, joints and nerves.

Occupational Therapists, Physiotherapists and Kinesiologists use ergonomics to ensure that an individual's occupation does not impede their health and well being.

Good Ergonomics will...

1) Benefit employees by leading to...

Increased comfort, improved morale, improved job satisfaction, improved productivity

2) Benefit employers by contributing to:

Prevention of injuries, early return to work, reduced absenteeism, decreased costs: (fewer sick days, lower compensation payments) improved worker morale.

General Ergonomic Tips to Consider

Some general ergonomic tips to consider...

- **Look up and away** from the monitor regularly, blinking your eyes, to reduce eye fatigue.
- **Avoid over-reaching, twisting and bending**. Place frequently used work materials in a comfortable arc in front of you.
- **Regular work breaks** can help prevent repetitive strain injuries by allowing time to stretch or change body positions. For continuous computer work, performing alternate non-computer tasks for 5 to 15 minutes per hour is generally recommended.

- **Fitness** and consistent use of **good posture** is important to maintain a healthy spine. Participate in a regular fitness activity for flexibility, strength and endurance

Chair Features (insert photos)

Seat height adjustability allows the user to adjust the chair so that his/her feet are on the floor or the work surface or keyboard is at an appropriate height.

Seat depth adjustability, achieved either by **backrest in-out adjustability or a sliding seat pan**, changes the front-to-back depth of the seat.

Backrest angle adjustability refers to changing the angle of the backrest relative to the angle of the seat.

Chair recline, or tilt, changes the angle of the entire seat relative to the floor.

Seat pan angle adjustability generally refers to changing the forward-back angle of the seat.

Height-adjustable armrests help support the arms. Armrests, which are too high, result in elevated shoulders and pressure on the undersides of the elbows and forearms. Armrests, which are too low, require the worker to slump or lean to one side to use them.

Width-adjustable or pivoting armrests change the distance between armrests. This permits the user to rest their arms with the elbows close to their sides.

Padded armrests potentially avoid uncomfortable pressure on the undersides of the forearms and elbows.

Lumbar support is intended to prevent the flattening of the lumbar spine that occurs in most people when seated.

Backrest height adjustability refers to a change in height of the lumbar support area of the chair backrest. This feature is often interpreted to mean a change in height of the entire backrest.

Backrests are available with varying back heights (low, mid, high back).

Lumbar depth adjustability affects the size and sometimes the firmness of the lumbar support curve in a chair's backrest.

- A regular monitor (14" screen) should be positioned within 18 to 24" from the eyes, depending on the person's visual acuity.

- If a very large monitor (i.e. greater than 14") is used, it should be positioned a distance greater than 24" from the eyes so that there is a better viewing area and less neck movement is required.

Keyboard

1. Keyboard should be positioned at elbow height with the elbows at 90^0 or angled between 80^0 to 100^0.

2. The shoulders should be in a relaxed position with the keyboard at elbow height at the level of the home row keys.

3. The keyboard should be positioned so that the wrist is neutral (i.e., same position as if hands were rested on a desk).

4. If keyboarding, the G and H keys should be centred with the worker. If the numeric keypad is being used, the number keys should be positioned directly in front of the hand/arm used. If the entire keyboard is used, the entire keyboard should be centred.

5. The wrists should be in a neutral position when keyboarding. Wrists should not be deviated to the right or left. This is more difficult to achieve with people of larger stature due to the outward positioning of their elbows. A split keyboard may be useful in this case.

Mouse Considerations

- ✓ Mouse location should be adjacent to the keyboard at the same height in order to avoid long reaches and awkward postures.
- ✓ Learn keystroke substitutes for menus, i.e. arrows, function keys, enter, etc. to decrease amount of time spent using mouse.
- ✓ Program computer to control speed and sensitivity of the mouse and use a mouse pad.
- ✓ Break frequently/alternate other tasks with mouse work.
- ✓ Alternate other non-computer tasks with mouse programs.
- ✓ Rest hand comfortably on mouse with index finger resting on button; i.e. do not hold finger up in the ready position.

Organizing

- Organize your work so that the items used most frequently are within an easy and comfortable reach, i.e. with arms relaxed by sides, elbows at 90^0 for frequently used items and within arms length for items occasionally used.
- Avoid clutter.
- Avoid piling items.
- Maximize use of desk space rather than placing items on overhead shelving to minimize reaching above shoulder height.
- Place computer in a corner if possible to maximize the space.
- Organize equipment and tasks so that both arms are being used equally.
- Ensure sufficient leg room under the desk/computer.
- Being organized eliminates the need for searching and handling items, which are not necessary.
- Do not reach behind shoulder line and minimize reaching above shoulder height.

Visual Environment

- ✓ The monitor should be positioned 90 degrees to the window to avoid direct light on the screen.
- ✓ The monitor should be level or tilted downward slightly to reduce glare from overhead lighting. Antiglare screens can be helpful.
- ✓ The brightness and contrast of the screen should be adjusted.
- ✓ Vision breaks should be incorporated (palming, deep winks, refocusing on other objects).
- ✓ Ensure correction of vision problems by having regular eye exams. Viewing distances and angels may influence your vision.
- ✓ All florescent lighting should be shielded with a proper covering. Flickering lights should be replaced. Removal of florescent lighting directly over a workstation may be an option to reduce glare.
- ✓ Try alternate lighting if standard florescent lighting is bothersome to the eyes, i.e., task lighting, full spectrum lighting.

Preventing and Treating Repetitive Strain Injuries - Homework

LIST WAYS TO PREVENT REPETATIVE STRAIN INJURIES IN THE WORKPLACE:

Eg. Sit properly in my chair.

1.

2.

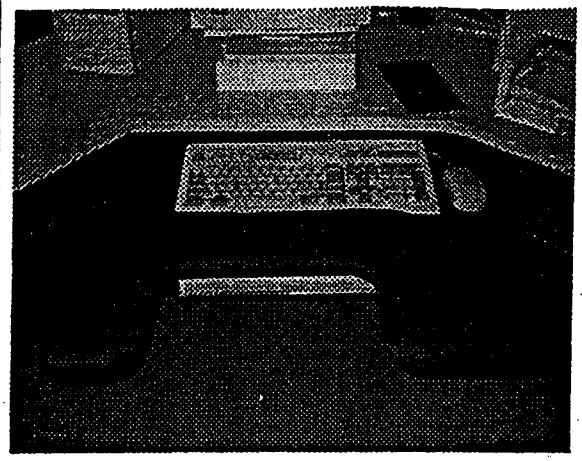
3.

LIST METHODS OF TREATING REPETATIVE STRAIN INJURIES ONCE THEY OCCUR:

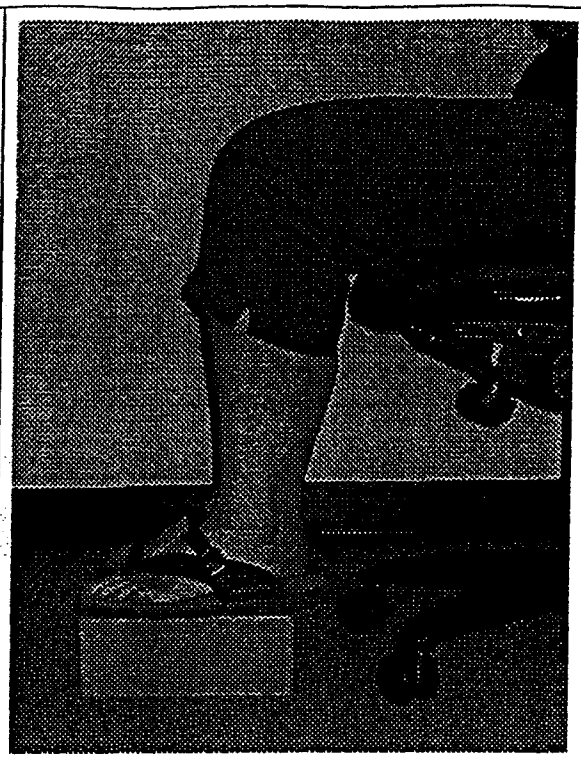
1.

2.

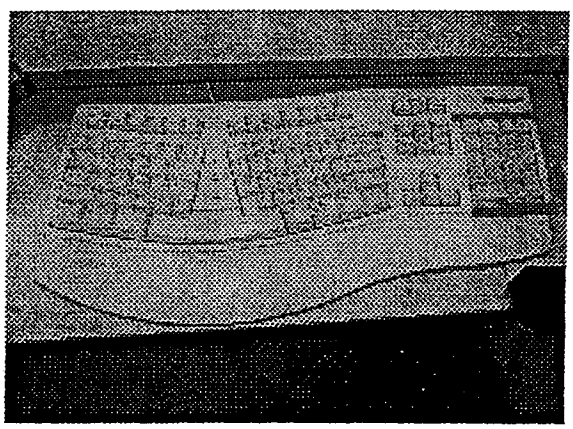
3.



Forearm Support



Footrest



Ergonomic Keyboards

Other items include:

-Ergonomic Chairs

-Tracker Balls

-Phone Props

-Monitor Arms

-Antiglare screens

-Headsets

Most office suppliers carry a selection of ergonomic equipment. Various suppliers carry different brands and lines of equipment, which may vary considerably in design and price. You should "shop" around and consult a professional if you are not sure what features to look for.

SESSION 3

Preventing RSI's, Stretching Exercises and Communication Skills

Purpose:

- To review prevention and treatment of RSI incorporating information from homework assignment.
- To introduce general principles of exercise.
- To instruct group members in specifics of stretching techniques.
- Provide opportunity to practice "mini-break" office stretching exercises.
- To introduce general principles of effective 2-way communication.
- To give participants skills in working more effectively with co-workers.

Objectives: By the end of the session, the group members will be able to:

- State at least 5 methods of preventing and treatment of RSI's.
- State the general principles of exercise
- Describe the 3 parts of an exercise program
- Demonstrate proper stretching technique
- Practice mini breaks and integrate into work schedule.
- State the basic components of effective 2-way communication.
- Demonstrate use of "I" messages.
- Make a contract for the coming week.

Homework: Complete Stress Index – Life Changes

Materials:

General	Participant Handouts
PowerPoint projector, screen, and laser pointer	Exercise Principles and Stretching
Attendance sheet	Stress Index – Life Changes
Easel, markers, nametags, pens	Communication skills / "I" messages
Lunch	Preventing Repetitive Strain Injuries

1.0 Preventing Repetitive Strain Injuries

Method: Brainstorm/Discussion

1.1 Introduction: In the previous session we talked about RSI and your homework assignment was to think about ways to prevent RSI's. To start today's session we are going to:

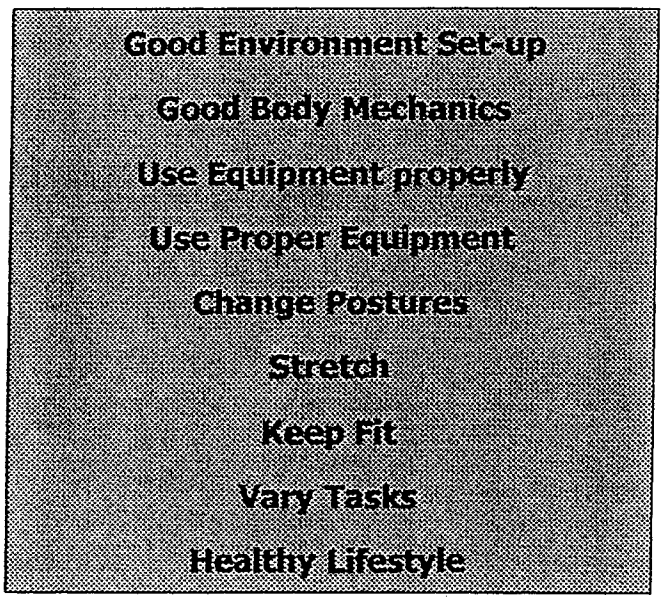
1.2 **Brainstorm**

What are some things we can do to prevent repetitive strain injuries:

1.3 Following the brainstorm review of the following factors:

Preventing RSI's

- **Slide:**



- Ensure good environmental set-up
- Utilize good body mechanics
- Utilize equipment appropriately
- Change postures regularly
- Stretch
- Maintain good physical fitness

2.0 Exercise Principles

Method: Brainstorm, Lecturette, Demonstration

2.1 "In this session, we will talk about exercise for fun and fitness. To get you thinking on the topic we'd like to do a brainstorm.

What does it mean to be fit?"

One leader will write responses on the board. Make sure the following points are covered:

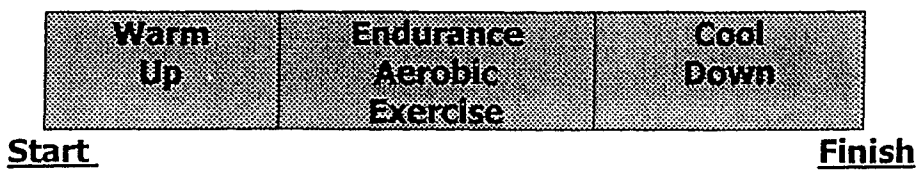
a) Strong Muscles and Bones
b) Good Flexibility
c) Strong Cardiovascular System/Heart and Blood Vessels
d) Good Endurance/Stamina
e) Low Percentage Body Fat and Body Weight
f) Better Sleep
g) Better Body Mechanics
h) Better Energy/Less Fatigue
i) Less Pain
j) Less Stress Response
k) Improved Self Esteem

A good fitness program accomplishes all of the above and more.

2.2

- **Slide:**

THREE PARTS OF A FITNESS PROGRAM



3.0 Flexibility or Stretching Exercises (10 min)

Method: Lecturette, Demonstration, and Practice

3.1 Today, we will discuss the flexibility component of a fitness program while strengthening and aerobic exercise will be reviewed in Session 5.

Why do we want to be flexible?

- To perform activities with freedom of movement or agility.
- To prevent stress/injury to muscles and joints in ADL (e.g., doing up back zipper, putting on shoes, doing up seat belt, golfing, any sports.)
- For balance reactions.

How do we tell if we are flexible?

- There are many self-tests to determine flexibility, e.g. touch your toes with knees straight, touch hands behind back (one behind head, other behind back)
- If you can't do what you want to, or what you used to be able to do, you may be less flexible than you once were.

How can we become more flexible?

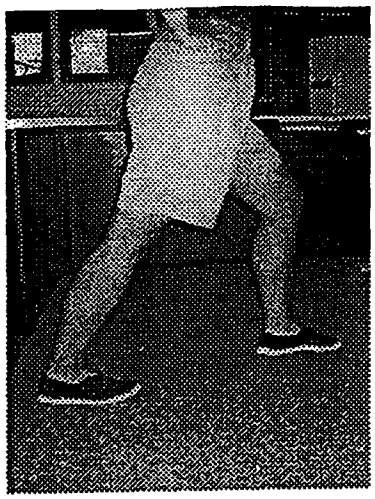
Just as inactivity or sedentary lifestyles can lead to decreased flexibility, flexibility may be improved in most cases through regular stretching exercises over time. The keys are regularity and relaxation. Warm muscles stretch better than cold ones. So a warm bath or shower or warm up exercises first, is a good idea.

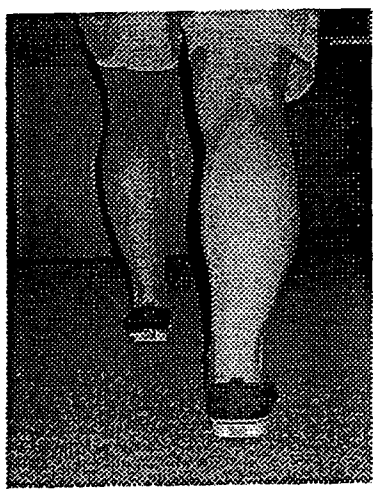
3.2 **Why stretch?**

1. To warm up prior to aerobics.
2. To become more flexible.
3. Stretching helps to counter act stiffness so can be used effectively to break up sedentary work, for better circulation or to reverse prolonged positions (i.e., if sitting a long time, back extension, hip extension and chest expansion stretches can be effective.)

How to:

1. Position yourself, watching joint alignment.
2. Stretch until you feel slight muscle tension.
3. Breathe out, and if you feel some release of muscle tension, take up the slack.
4. Breathe out again and take up any more slack, but not to the point of pain.





5) The cycle continues

4.4 Ways to Improve Communication

1) Take time to formulate what you want to say especially in stressful situations – practice or write down points.

2) Pick words that express how you feel about a situation without blaming or lecturing.

3) Use body language, which matches what you want to say. Eg., don't sit behind a desk with your arms crossed when asking someone what is troubling them.

4) Use humor to make your point.

5) Become a Good Listener:

   - Look at the speaker
   - Listen to the works, tone of voice, body language
   - Acknowledge having heard by paraphrasing or ask for clarification "Is this what you mean?"
   - Don't cut off the speaker
   - Nod your head only if you hear and understand
   - Don't jump to conclusions
   - Don't try to think of your response before the speaker has finished

4.5 "I Messages"

This next exercise will focus on the delivery of the message – choosing appropriate words to express our feelings for optimum communication. We focus on two specific words – the use of **I** and **You**.

The use of "You" in messages tends to blame and promote defensiveness in the receivers. Eg., "You make me so angry when you don't clean up".

The use of "I" in messages takes ownerships of feelings expressed such as anger or frustration without blame. Eg., "I feel angry when I find nothing has been cleaned up". Work place examples would be:

Worker 1: "I asked you to put these files in specific order with a card on top. You never listen. Now they are all done wrong."

5.0 **Contracting and Feedback**

Method: Modelling, Practice (10 min)

5.1 As we did last week and will do each week, we are going to review our contracts. Remember to state:

- What your contract was.
- How sure you were.
- How you did.
- Any problem solving.
- Next weeks contract.

Leader Model if necessary.

Stress Index – Life Changes (Homework)

Communication Skills (Handout)

The goal in any communication between two people is first that the other person understand what you are trying to say. Feeling you are not understood, leads to frustration. A prolonged feeling of frustration, can lead to depression, anger and helplessness. Poor communication is the biggest factor in poor communication whether between spouses, family members, friends, co-workers, managers, doctors and patients. Even in casual relationships, poor communication causes frustration.

Communication is a 2-way street. Two important aspects of good communication are: 1) Listening and 2) expressing your feelings and relaying information.

When we talk about listening, it sounds very easy. It is unfortunately very complex. When listening, you need to direct your attention to what is being said and not be distracted by other conversations, daydreaming etc. Consider not only the words that are being spoken, but the person's body language. Sometimes, body language says much more than words. Is the speaker relaxed or tensed? Are their arms crossed? When listening, remember you do not need to argue, nor do you have to find fault, criticize or apologize. All you have to do is listen. We are often busy thinking about what we are going to say in response, that we do not hear all that is being said. Always let an individual finish before speaking. Do not butt in or cut them off, as you may loose valuable information. Do not jump to conclusions if you do not understand what is being said, ask for it to be repeated or paraphrased. Results of miscommunication: frustration, safety concerns, misunderstood feelings.

When it is time for you to express your feelings, it is best to first take a few moments to review in your mind exactly what is bothering you and what you are feeling.

Here are some suggestions for accomplishing good communications:

- Always show regard for the other person. The use of the word "you" such as "you always", "you did", "you have", is often a clue that your communication might be blaming. Be clear. Test your assumptions verbally. Determine the reason why the other person acted or spoke in a certain manner.
- Be honest and open about your feelings.
- Accept the feelings of others and not try to understand them.
- Be tactful and courteous.
- Work at using humor.

In that example you can see how Worker 1 used the word "you" which immediately elicited a "you" response back.

Here is a second example:

- **Worker 1:** "I need these files put in particular order with a card on top because they are much easier to utilize. When they are not in a particular order, it causes a lot of disruption. I thought I was clear on what I needed done."

- **Worker 2:** "I didn't realize the order was so important. I can rearrange them in a couple of minutes."

In this example, the "I" message allowed communication to reach the point where the workers were able to express their feelings without blaming each other and to find a solution to the problem instead of leaving each other with hurt feelings. The "you" messages tended to be more aggressive and hostile and put the receiver on the defensive blocking further communication and the opportunity to find a solution to the problem.

Plan Outline: Session 4

1.0 Stress management: (30 mins)

2.0 Exercise: - Self monitoring (10mins)

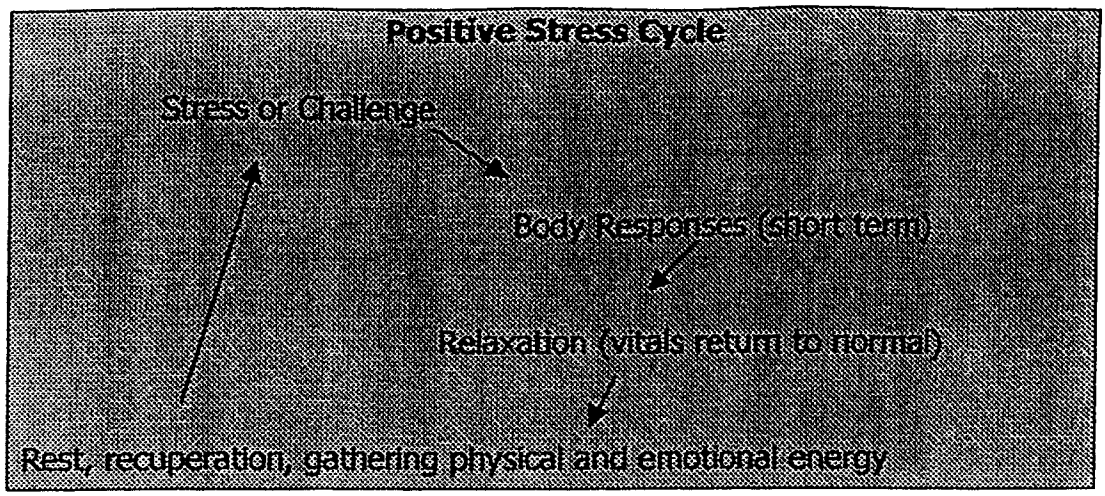
3.0 Feedback/Contracting (10 mins)

4.0 Relaxation – Guided Imagery (10 mins)

5.0 Closing

Homework: Assess current level of physical conditioning using handout.

- **Slide: 4, 1.2**

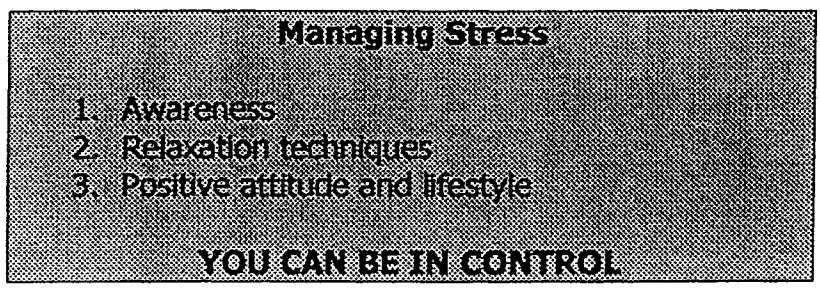


1.3 Negative Stress:

Stress becomes negative when you are unable to meet the needs of your challenge and/or are unable to relax after meeting the challenge. If there is no recuperation period to recharge batteries, a permanent state of tension can develop, leading to emotional and physical strain.

1.4 Managing Stress:

- **Slide: 4, 1.3**



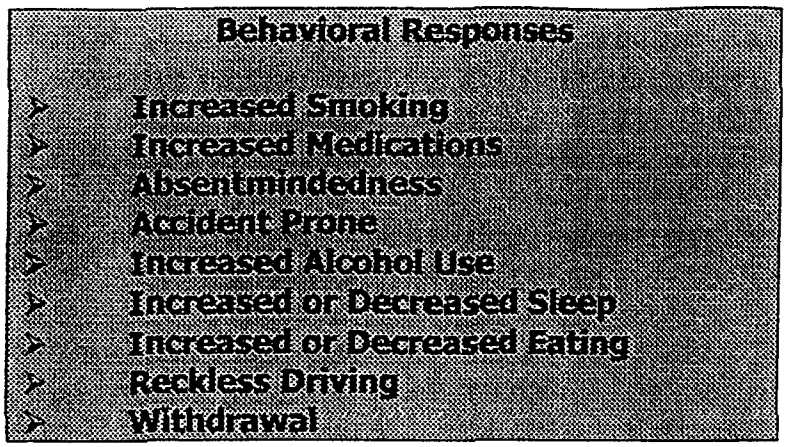
Regarding the first point...
We need to be aware of how our **body reacts** to stress, as well as what **situations** make us feel stress.

1.5 Brainstorm:

What are possible short-term physical responses to stressors? e.g., Think of someone going through a red light in front of you at an intersection.

Add any missing responses as per list:

- **Slide: 4, 1.6**

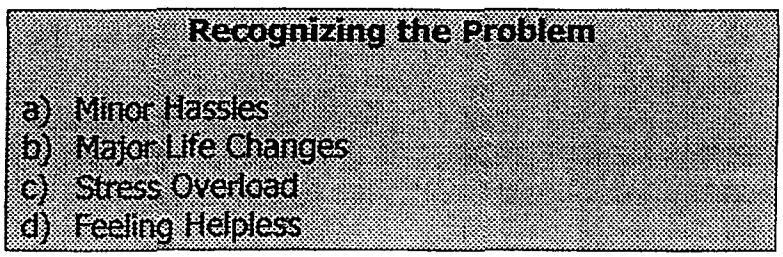


Once you have recognized your automatic body responses you can take charge and bring yourself back to a resting state more quickly. Deep breathing, muscle relaxation, positive self talk, healthy life-style, exercise and communication are just some of the management skills we've talked about to help deal with stress. You also have a handout called "Steps to Reducing Stress". It may be useful to post this for easy reference.

1.7 Recognizing the Problem:

Before we can return to a relaxed state, we have to recognize and deal with our **stressors.** It may be helpful in managing stress to categorize the events that lead to stress response.

- **Slide: 4, 1.7**



We can cut down on our stress responses by first recognizing the little things that "bug us" and by problem solving to change them or learning to accept that there may not be a solution and "letting it go". Little stress responses cumulatively can lead to chronic tension. Lets just try a little exercise to illustrate this strategy.

a) **Minor Hassles**: First list a few routine events that may get your blood pressure up or muscles tense during your day. (i.e., They may be as minor as

Solutions: When stress builds up to the "I can't cope" level, sometimes one needs to step back, take a time out and 10 deep breaths, to calm down, then look at the problems a bit more objectively. It may be a coffee break or just a moment of quiet to assess the situation, prioritize the problems, and work out solutions. Communicate with others your feelings; it may be necessary to share the load.

d) Feeling Helpless

Being faced with major life changes/challenges, without a sense of being in control and seeing "no way out" can lead to depression, and other illness. (e.g., financial ruin, death of a child)

Solution: GET HELP

See a doctor to rule out medical causes and if no physical problem exists, seek professional help in the form of a doctor or counselor who can help you understand your feelings and can help you cope.

Someone removed from the situation can often provide an objective point of view and helpful suggestions. Support groups can help one to recognize feelings and to suggest problem solutions.

2.0 Exercise Principles: Getting Started (10 min)

Method: Lecturette

2.1 In your **handouts**, you have a sheet to assess your starting point for exercise. We have also included an exercise heart rate chart to plot your target heart rate.

Review calculations to determine fitness level and show how to read heart rate chart. Use self as example.

- **Slide: 4, 2.1 (Fitness Calculation Chart)**
- **Slide: 4, 2.2 (Aerobic Heart Rate Chart)**

Once you have found your fitness level, plot your program.
Use an exercise diary, find a friend and start.
You have a **handout** on walking and an exercise planner/ diary.

- **Slide: 4, 2.3 (Exercise Planner)**

For **homework**, please find your fitness level and then fill out your planner. Next session, we will spend more time on how to strengthen and how to do aerobic exercise properly.

(Handout and Slide 4, 2.2)

Monitoring Aerobic Fitness

	Max heart rate	Low intensity	Moderate intensity	Pulse	
AGE	MHR	60%	75%	10 sec	15 sec
20	200	120	150	20-25	30-38
25	195	117	146	20-24	29-37
30	190	114	143	19-24	29-36
35	185	111	139	19-23	28-35
40	180	108	135	18-23	27-34
45	175	105	132	18-22	26-33
50	170	102	128	17-21	26-32
55	165	99	124	17-21	25-31
60	160	96	120	16-20	24-30
65	155	93	117	16-20	23-29
70	150	90	113	15-19	23-28
75	145	87	110	15-18	22-28
80	140	84	105	14-18	21-26
80+	130	78	98	13-16	20-25

3.0 **Feedback and Contracting (10 min)**

3.1 Review contracts from last week and problem solve as necessary. Review contracts for this week.

4.0 Guided Imagery (10 min)
Method: Lecturette/Practice

(Dim lights if possible. We are now going to practice another relaxation technique)

Guided Imagery is like a guided daydream where you transport yourself to another time and place, to take your mind off any worries or pain. It helps you achieve deep relaxation by picturing yourself in a peaceful, stress-free environment.

We will start with our deep breathing, again, if possible, in through your nose, draw the air down deep into your "stomach", and out through your mouth, with lips pursed as if you are going to whistle.

Now, close your eyes and give yourself permission to relax. Settle yourself comfortably, uncross arms and legs. Take another deep breath, in through your nose, expanding you're abdomen, and filling your lungs. Exhale slowly and completely through pursed lips, letting your body sink heavily into the surface below you....Once again, take a deep breath, letting go of any tension as you breath out. Clear your mind of any thoughts except for your breathing.

Now imagine yourself walking along a peaceful, old, country road. The sun is warm on your back.... The birds are singing... the air is calm and fragrant.

As you walk along, your mind naturally wanders to the concerns and worries of the day. Then you come upon a box by the side of the road, and it occurs to you that this box is the perfect place to leave your cares behind, while you enjoy this time in the country. You open the box and put into it any concerns, worries, or pressures that you're carrying with you. You close the box and fasten it securely, knowing that you can come back and deal with those concerns whenever you're ready.

You feel lighter as your progress down the road. Soon you come across an old gate. The gate creaks as you open it and go through. You find yourself in a beautiful, overgrown garden, flowers growing where they have seeded

5.0 Closing

Remind participants to:

5.1 Hand in nametags.

5.2 Check they are registered.

5.3 Read over handouts on reducing stress.

5.4 Practice Guided Imagery.

5.5 Find their own Fitness Level using handout.

5.6 Identify their hassles and solutions.

5.7 Work on contracts.

Fitness (Handout)

A good fitness program includes a **warm-up, aerobic exercise** and a **cool-down.**

Chart of 3 fitness components

Warm Up	Endurance Aerobic Exercise	Cool Down

The warm-up and the cool-down include stretching or flexibility and strengthening exercises. How long you spend on each, depends on your fitness level. When starting an exercise program it may be enough just to do a warm-up and cool-down. When you can do 25 minutes of stretching and strengthening, you are ready to move on to your aerobic activity.

Eg. Start with a few stretches, walk slowly for 5 minutes, then briskly for 5-10 minutes, then slowly for 5 more minutes. Finish with a few more stretches.

Rules of Exercise

- Exercise should be done regularly
- Always start out mildly
- Increase the intensity gradually
- A little pain during exercise is alright
- Pain should not last more than an hour after
- Neck exercises that cause arm pain or back exercises that cause leg pain should not be done
- Do both sides equally, and front and back, to balance muscle groups

Flexibility/Stretching Exercises

1. Flexibility is needed to maintain proper posture and to perform normal activities of daily living without causing tissue injury.
2. Stretching Exercises help to increase flexibility and improve muscle circulation. They are a very important component of a fitness program and can break up static work positions.

SESSION 5

Strengthening, Aerobic Exercise and Treatment of MSK complaints

Purpose:

- Discuss principles of strengthening.
- Discuss principles of aerobic exercise.
- To assist participants in developing a personal exercise program incorporating stretching, strengthening and aerobic components.
- Provide information re: local fitness resources.
- Discuss treatment of MSK complaints including lifestyle management, therapeutic intervention, and workplace assessment.

Objectives: By the end of the session, the group members will be able to:

- Demonstrate effective stretching techniques.
- State 2 ways to self monitor aerobic exercise.
- Develop a personal exercise program incorporating stretching, strengthening, and aerobic components.
- Identify local fitness resources.
- Describe 3 lifestyle factors that affect MSK wellness.
- State 3 therapeutic resources in the community.
- Identify resource for workplace assessment.
- Make a contract for the upcoming week.

Homework: Identify problems in the workplace that influence MSK complaint.

General	Participant Handouts
PowerPoint projector, screen, and laser pointer	Exercise (strengthening, aerobic exercise, individual programs, resources)
Attendance sheet	Treatment of MSK complaints
Easel, markers, nametags, pens	Lifestyle factors affecting workplace wellness, sleep, Canada Food Guide
Lunch	Therapeutic resources
Exercise elastic, cuff weight	Workplace assessment resources

1.0 **Strengthening (20 min)**
Method/Lecturette/Practice

- **Slide: 5, 1.1 (<u>Strength</u> -"The power to resist force" Opposite equals weakness)**

1.1 There are two types of strength – short bursts like a power lifter (red muscles) and an enduring strength, such as needed by a rower or someone in the moving business (white muscles).

- **Slide: 5, 1.2 (Endurance – "Capacity for exertion over time", opposite equals fatigue) or ability to do the same task over and over.**

To perform daily activities we need a combination of short-term strength and endurance.

- **<u>Slide: 5, 1.3</u>**

About Strength

Needed for:
- Support
- Posture
- Body mechanics
- Balance

Everyone can gain, but it's easily lost.

<u>About Strength</u>

- Needed to support joints, decrease wear and tear.
- Needed to maintain proper posture.
- Needed to perform daily activities with proper body mechanics.
- Needed for balance especially as we get older.
- Decreases, as we get older even with exercise.
- 5 days of disuse leads to 20% less strength.
- Almost anyone can increase their strength.
- Needed to have a conditioned body.

Strengthening exercises improve posture, balance, endurance, joint support and bone strength.

4. Partial sit ups or sit backs. Do not hook feet, 3 directions for 3 groups of abdominal muscles.

5. Squats against wall or knee press with nautilus. Keep knees lined up with toes and hips, gradually progress squat.

6. Standing push ups with toes on one or two feet.

7. Back lifts, lying on your stomach. 4 progressions of arm positions.

Don't do what hurts, no exercises of neck or back should cause arm or leg pain. **Remember, pain should not last more than an hour after exercise.**

Remember it is very important to perform warm up exercises to prepare the body for "working out" and it is also important to perform cool down exercises to allow the body to return to a lower rate gradually.

- Start slowly – what is your baseline? Refer to Session 4 Homework ("Finding your Fitness Level")

  - **Slide: 5, 2.3**

Your goal may be to:	A	B
1. Elevate heart rate to	60%	75% of Max. HR
2. For duration of	15 min.	30 min
3. As frequently as	3 times/week	5 times/week
	A = 2 x 3 x 3 = 18 Beginner Fitness Level	B = 3.5 x 4 x 4 = 56 Intermediate Fitness Level

2.3 How do you measure your efforts??

  - **Slide: 5, 2.4**

Measuring Aerobic Effort

1. Heart Rate
2. Talk Test
3. Perceived Exertion
4. Weekly Fitness Record

1. **Heart Rate: (Needs a second hand)**
   Let's all try to find our carotid pulse. Slide your index and middles finger down from your ear, in front of the large neck muscle in line with your Adam's apple. Usually one counts the beats for 10-15 seconds and then multiplies, to find the beats per minute.

Aerobics (Handout)

Aerobic Exercises – Stress heart, blood vessels, muscles, and respiratory system continuously for a period of time.

- Uses large muscle in rhythmical continuous activity.
- Causes increase in heart rate, respiratory rate and depth of breathing.
- Increases the body's metabolic rate by 10-15 times.
- Performed regularly and frequently, leads to more efficient cardiovascular system at rest as well as during exercise.

Remember to **warm up** before "**working out**"

Start Slowly – What is your Baseline????

Use the Fitness Level Chart to find a starting point.

Your goal may be to:

Your goal may be to:	A	B
1. Elevate heart rate to	60%	75% of Max. HR
2. For duration of	15 min.	30 min
3. As frequently as	3 times/week	5 times/week
	A = 2 x 3 x 3 = 18 Beginner Fitness Level	B = 3.5 x 4 x 4 = 56 Intermediate Fitness Level

Measure your efforts by your heart rate, the talk test, using your fitness record.

Caution: If you have not done any aerobic exercise for a long time and have concerns about your abilities, you may need to see your doctor for a physical before you start.

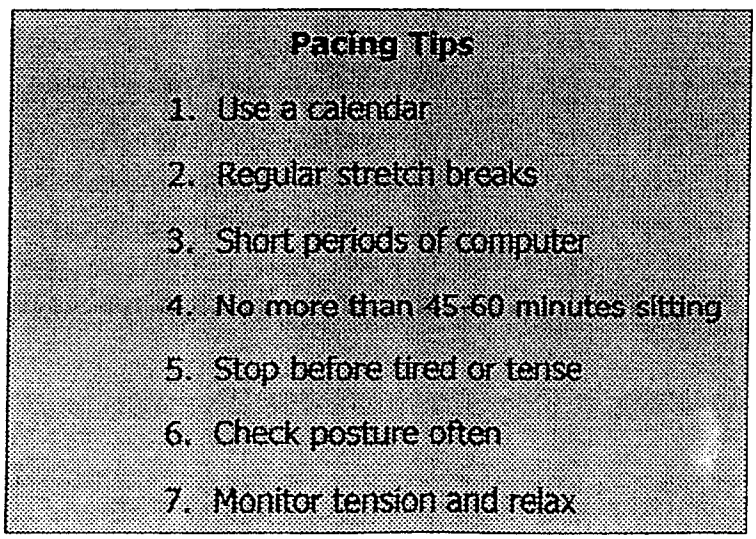
If you have chest pain while exercising, **STOP** immediately and seek medical attention.

Pacing Tips

1. Use a calendar to plan your day, wee, month to plan altering more sedentary tasks with more mobile one.
2. Take regular stretch breaks to alternate positions if your job is primarily a sedentary one.
3. Short periods of computer use spread throughout the day are preferable to prolonged periods of computer use.
4. Do not sit for more than 45 to 60 minutes at a time before you stand and change position. Set a timer, watch chime or radio alarm to remind you to move, especially if you tend to loose track of time.
5. You will learn how long to work at a task by trail and error. It is important to stop working before you become tired, tense or you experience increased discomfort.
6. Check your posture regularly. Make sure you are using good body mechanics at all times.
7. Monitor the tension in your muscles, especially around neck and shoulders. Relax muscles that are tense and stretch them on a regular basis. e.g. Progressive muscle relaxation and/or exercise mini breaks.

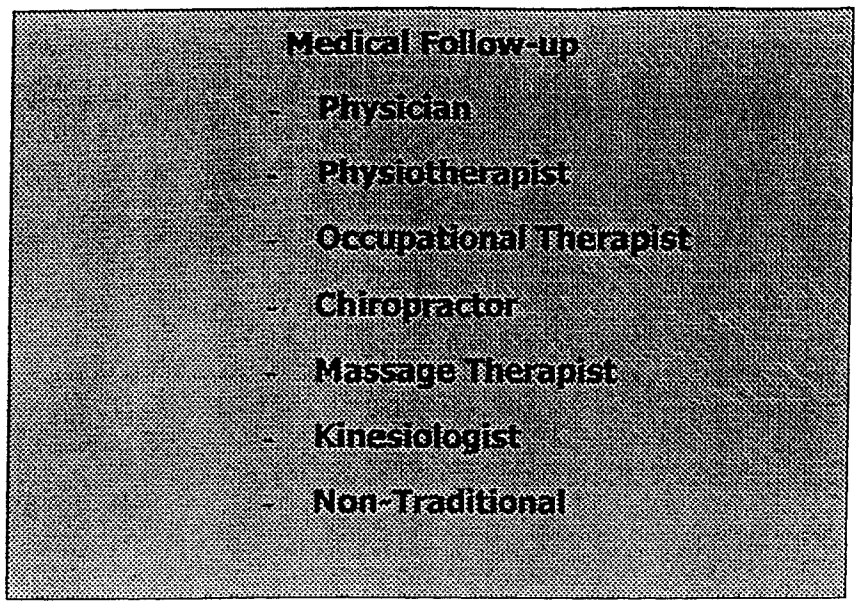
Pacing may be a new way of doing things and takes a lot of practice. By pacing your daily activities, you will be able to manage your pain and be more productive in the long term. It is not pacing if you wait until the pain causes you to stop.

- **Slide 3.2 b:** (Slide for Treatment of MSK complaints)



3.4 Medical Follow-up

- **Slide 3.4**



Physician – Can assess to see if there is any systemic cause for the problem eg., inflammatory arthritis. May prescribe anti-inflammatories or muscle relaxants or pain relievers. May also refer you to a specialist. Sometimes medications are necessary to break the pain cycle, reduce inflammation or allow the muscles to relax. They may be very helpful used in combination with many of the other coping strategies discussed during this course. They are rarely beneficial in the long term, if used without other therapist such as exercise.

Physiotherapist – Can review body mechanics, exercises for flexibility and strength, treat pain, swelling and stiffness with various modalities.

Occupational Therapist – Can do a workplace assessment and recommend changes and assistive devices. Can assess for splints.

Chiropractor – Can assess for posture and may help with manipulation for acute back or neck pain in some cases.

Massage therapist – Can help to relieve muscle tension from mental and physical stressors.

Kinesiologist/Exercise Specialist – can be very helpful in developing an exercise program to suit your fitness level and needs.

Non-Traditional – i.e., acupuncturist, herbalist, spa etc.

Remember no body has a magic wand to cure a problem and treatments will only work in conjunction with self-management and evaluation of lifestyle.

3.7 Nutrition

The best information that we have today about proper nutrition is based on the Canada Food Guide. A good diet includes food from all categories or food groups with those at the top of the rainbow being needed in larger quantities than those on the bottom. With a balanced diet one should not need supplements. In fact, some supplements can be quite harmful. See your handout on Canada Food Guide.

Eating Well.

Why:

- To maximize energy and minimize fatigue.
- Prevent dehydration, constipation or loose bowels.
- To maintain chemical balance within our body.
- To prevent illness.
- To prevent or slow osteoporosis.

How:

- Enjoy a variety of foods to get essential vitamins, minerals, carbohydrates, protein, and fats.
- Eat the correct amount of each group, depending on your needs.
    - **Slide:**

Suggested Servings:

- 5-10 fruit or vegetables a day.
- 5-1- of grain products
- 2-4 of milk
- 2-3 of meat and alternatives
- Choose lower fat, leaner, fresher foods.
- Drink plenty of fluids (6-8 glasses per day)

4.0 Contracting (10 min)

Take out your contract sheets from last week. We will now go through each person's contract to see how you did. If any problems arouse, you can let the group know how you solved the problem, or if it is unresolved, the group may offer you help.

- First state your contract.
- Next, how certain you were.
- Then, how well you completed the contract.

Before going on, we will ask you to state this coming weeks contract.

(Leader model own contract first)

Let participants offer help before the leader. Don't spend more than 2 minutes on any one person. Remember to have them state "will" not "I'll try".

5.0 Closing

5.1 Remember to hand in nametags.

5.2 Check names registered.

5.3 Review handouts on Treatment of MSK complaints.

5.4 Complete homework "Identifying problems in the workplace that influence MSK complaints".

5.5 Work on contract.

Workstation Set-up – Have you checked your equipment height, positioning, support and lighting? Ask for an ergonomic assessment by an Occupational Therapist if you can't pin point the problem. (See handout on Workplace Assessment Resources)

Self Treatment

- **Rest** – local or full rest for a short period is sometime necessary. E.g. Not doing the activity, which causes the pain or using a splint or support to rest the strained area.
- **Ice** – to relieve swelling and pain, spasm not more than 10-15 minutes. Make sure temperature returns to normal before re-application.
- **Heat** – for relaxation and before stretching in from shower, bath, heating pad.
- **Stretching** – when a body part is in pain the normal tendency is the hold it still to protect it. This can cause an increase in muscle tension and decreases in circulation, which can aggravate the problem. Gentle stretching to improve the circulation and maintain flexibility is important.
- **Postural Change** – sitting is more stressful to the lower back than standing or lying.
- **Massage** – often combined with heat can relieve muscle tension.

Medical Follow-up

Physician –Your family physician will take a history of your symptoms and perform an examination. He/she may provide you with a diagnosis and treatment plan immediately or further tests may be required. These may include blood tests, X-rays, bone scan, MRI, CT scan. Unless conditions are prolonged or severe, tests are not typically required at this time. Your physician may prescribe anti-inflammatories, muscle relaxants or pain relievers. Sometimes medications are necessary to break the pain cycle, reduce inflammation or allow the muscles to relax. They may be very helpful used in combination with many of the other coping strategies discussed during this course. They are rarely beneficial in the long term, if used without other therapist such as exercise. Referral may be provided for various types of therapy. A splint or brace may be

WORKPLACE ASSESSMENT RESOURCES **(Handout)**

Some companies have internals resources for completion of Ergonomic Workstation Reviews. There may be a trained staff person who can do an initial review and make suggestions. If the problem is more complicated an Occupational Therapist may be required to perform a more detailed assessment. An external consultant may be required. Your organization may deal with a particular consultant or company. If not, consult your physician or other health care professionals who may be able to recommend an appropriate service. If all else fails consult the phone book where local companies should be listed in the Occupational Health and Safety Section or under specific disciplines, eg. Occupational Therapists.

Evaluate Lifestyle Factors

Evaluate lifestyle factors, which may be contributing to the symptoms or impacted on recovery. Factors include: relaxation, exercise programs, nutrition, sleep patterns and stress management.

Sleep

General Facts:

- Sleep makes up 1/3 of our life.
- Most people need about 8 hours, some a bit more, some a little less.
- Most good sleepers wake 5 to 15 times per night.
- There are different depths of sleep and we need a combination of deep to nearly awake sleep for brain cell and body tissue repair.

Are you getting enough good quality sleep?

Adequate restorative sleep is an essential ingredient in the recipe of healthy living. Sleep may be disturbed for many reasons including illness, pain, stress responses, burning the candle at both ends, and travel to name a few. Inadequate sleep can lead to:

- Fatigue
- Decrease in memory
- Decrease in concentration
- Increase likelihood of injury
- Decrease in productivity
- Illness
- Irritability

Some Tips for Better Sleep Habits

There are many possible approaches to remedy sleep problems. A few are listed below.

1. **Have a busy, full, daily routine** so that you require rest at night. Get plenty of exercise and fresh air during your regular routine, but avoid heavy exercising in the evening.

2. **Avoid napping in the afternoon** or evening. This will sometimes take the "edge off your sleeping appetite" – just like snacking before a meal.

13. **Don't get overly anxious** about not sleeping on an occasional night; this will only add to your night tensions. Get up to do something relaxing if you find you are simply becoming more anxious by staying in bed. Clean out a drawer, read for a short time. Try not to watch the clock.

The best information that we have today about proper nutrition is based on the Canada Food Guide. A good diet includes food from all categories or food groups with those at the top of the rainbow being needed in larger quantities than those on the bottom. With a balanced diet one should not need supplements. In fact, some supplements can be quite harmful. See your handout on Canada Food Guide.

Alcohol, Drugs, Smoking

Are you stressing your body by overusing abusive substances? Are you using any of these as a crutch?

SESSION 6 - Problem Solving, Depression and Assistive Devices

Purpose:

- To discuss the principles of problem solving.
- To provide examples of specific workplace assistive devices to decrease MSK stress.
- To practice the problem solving process with participants' examples.
- To discuss depression, and how it relates to the stress cycle.
- To discuss strategies for dealing with depression
- To discuss positive and negative self talk.

Objectives: By the end of the session, the group members will be able to:

- State the 7 steps of problem solving.
- Identify 5 common workplace assistive devises.
- Use problem solving techniques on self identified problems
- Recognize the signs of depression.
- Identify 5 strategies to deal with depression.
- Demonstrate changing negative self-talk to positive self-talk.
- Make a contract for the coming week.

Homework: Identify a work or home-related problem and work through the problem solving steps to find a solution or solutions.

Materials:

General	Participant Handouts
PowerPoint projector, screen, and laser pointer	Problem Solving
Attendance sheet	Assistive devices
Easel, markers	Resource List
Nametags	Positive self talk
Pens	Depression (signs, ways of dealing with depression)
Folder for participants	

APPENDIX B: WMSP QUESTIONNAIRES

Baseline Questionnaire

Questionnaire

Baseline Questionnaire

Please answer the following questions by placing a check (√) in the appropriate corresponding box.

1. Age:
   ☐ under 21 ☐ 21-30 ☐ 31-40 ☐ 41-50
   ☐ 51-60 ☐ 61-70 ☐ over 71

2. Gender:
   ☐ male ☐ female

3. Marital Status:
   ☐ single ☐ married ☐ divorced ☐ widowed
   ☐ separated ☐ common-law

4. Highest level of education completed:
   ☐ some high school ☐ high school graduate
   ☐ college ☐ university

5. How many children do you have in the following categories?
   Infant – 5 years _____
   6 – 8 years _____
   12 – 14 years _____
   16 + years _____

With respect to the pain and discomfort you are experiencing

6. When was the last time you experienced pain?_____

7. What is(are) the location(s) of the joint pain/discomfort you have experienced over the past 3 months? (check all that apply)
   ☐ neck ☐ back ☐ shoulder(s) ☐ wrist(s)
   ☐ hip(s) ☐ knee(s) ☐ foot (feet) ☐ hand(s)
   ☐ other (please specify): _____

8. With 1 being "slight discomfort" and 10 being "severe pain" please rate your pain/discomfort by circling a number on the scale:

1	2	3	4	5	6	7	8	9	10
slight discomfort				moderate pain					severe pain

9. Have you been diagnosed by a medical doctor with any of the following chronic rheumatic diseases? (check all that apply)
   ☐ Osteoarthritis ☐ Rheumatoid Arthritis
   ☐ Fibromyalgia ☐ Carpel Tunnel Syndrome
   ☐ Chronic Pain ☐ Repetative Strain Injury
   ☐ Other (please specify): _____

10. What medications, if any, are you taking for your pain?

_____

_____

_____

_____

For the following statements, please indicate whether you 'strongly disagree', 'disagree', 'agree' or 'strongly agree' by circling the number that corresponds to your answer.

	Strongly Disagree	Disagree	Agree	Strongly Agree
11. Pain is controlling my life.	0	1	2	3
12. If I do all the right things, I can successfully manage my pain.	0	1	2	3

13.No matter what I do or how hard I try, I just can't seem to get relief from my pain.	0	1	2	3

For the following statements, addressing the past month, please answer with either 'rarely or none of the time', 'occasionally', 'frequently', or 'most or all of the time' by circling the number that corresponds to your answer.

	rarely or none of time	occasionally	frequently	most of the time
14.I felt sad.	0	1	2	3
15.I had trouble keeping my mind on what I was doing.	0	1	2	3
16.I felt that I could not shake off "the blues" even with help from family and friends.	0	1	2	3
17.I did not feel like eating; my appetite was poor.	0	1	2	3

18.Have you received enough emotional support in the past year?

- ☐ no, I need a lot more emotional support
- ☐ no, I need a little more emotional support
- ☐ yes, I have received enough emotional support

19.Have you received enough help in daily tasks in the past year?

- ☐ no, I need a lot more help
- ☐ no, I need a little more help
- ☐ yes, I have received enough help

Pre/post intervention Questionnaire

Questionnaire

Please consider the following situation:

> ***"You are an office worker who inputs into a computer for 5 hours per day and files for 2 hours per day. You experience low back pain and wrist pain and are very stiff and fatigued at the end of her work day. "***

What are some of the coping strategies, resources and tips you would suggest to decrease your stress and improve her musculoskeletal wellness? Give as many suggestions as you are able.

Coping Skills: _____

_____

_____

_____

Ergonomics: _____

_____

_____

_____

Resources: _____

_____

_____

_____

Answer each of the following questions as they pertain to you by circling a number on the scale.

1. **How certain are you that you can decrease your pain quite a bit?**

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Moderately Uncertain					Very Certain

2. **How certain are you that you can continue most of your daily activities?**

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Moderately Uncertain					Very Certain

3. **How certain are you that you can keep arthritis pain from interfering with your sleep?**

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Moderately Uncertain					Very Certain

4. **How certain are you that you can make a small-to moderate reduction in her your pain by using methods other than taking extra medication?**

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Moderately Uncertain					Very Certain

5. **How certain are you that you can make a large reduction in your joint pain/discomfort by using methods other than taking extra medication?**

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Moderately Uncertain					Very Certain

Working Well Program
Date: _____ Participant ID#_____ Participant Initials: _____

Post Intervention Questionnaire

Answer each of the following questions as they pertain to you by circling a number on the scale.

1. How certain are you that you can decrease your pain quite a bit?

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Moderately Uncertain					Very Certain

2. How certain are you that you can continue most of your daily activities?

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Moderately Uncertain					Very Certain

3. How certain are you that you can keep arthritis pain from interfering with your sleep?

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Moderately Uncertain					Very Certain

4. How certain are you that you can make a small-to moderate reduction in your pain by using methods other than taking extra medication?

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Moderately Uncertain					Very Certain

5. How certain are you that you can make a large reduction in your joint pain/discomfort by using methods other than taking extra medication?

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Moderately Uncertain					Very Certain

Special directions: **For the items (1-3) below, please place a line on the continuum to indicate the percentage of work time that you feel that this statement describes you in the past *month:***

1. **When my (health problem) bothered me, the percentage of my time that I was as productive as usual was:**

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

2. **Compared to my usual level of productivity, when my (health problem) bothered me, the percentage of my work that I was able to accomplish was:**

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

3. **When my (health problem) bothered me, the percentage of my work time that I was likely to make more mistakes than usual was:**

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Please consider the following situation:

> ***"You are an office worker who inputs into a computer for 5 hours per day and files for 2 hours per day. You experience low back pain and wrist pain and are very stiff and fatigued at the end of your work day. "***

What are some of the coping strategies, resources and tips you would suggest to decrease your stress and improve your musculoskeletal wellness? Give as many suggestions as you are able.

Coping Skills: _____

_____

_____

_____

Date: _____ Participant ID#_____ Participant Initials: _____

Ergonomics: _____

_____

_____

_____

Resources: _____

_____

_____

_____

Do you have any comments regarding the program?

_____

_____

_____

_____

_____

_____

_____

_____

_____

Working Well Program
Date: _____ Participant ID#_____ Participant Initials: _____

Program Evaluation:

Directions: **Answer each of the following questions by circling the number on the scale that best matches how you feel.**

1. The information provided by the sessions of the **Working Well** program was:

10	20	30	40	50	60	70	80	90	100
not informative				somewhat informative					very informative

2. Did you find the information provided by the sessions of the **Working Well** program easy to understand?

10	20	30	40	50	60	70	80	90	100
not difficult			difficult	somewhat			difficult		very

3. How often were you able to apply the information provided by the sessions of the **Working Well** program in your workplace and/or at home?

10	20	30	40	50	60	70	80	90	100
not often				somewhat often					very often

4. Were the take home exercises effective in helping you understand and implement the self help techniques in your workplace or at home?

10	20	30	40	50	60	70	80	90	100
not effective			effective	somewhat				effective	very

5. Would you recommend this program to other sedentary workers?

10	20	30	40	50	60	70	80	90	100
not at all				somewhat					highly

Working Well Program
Date: _____ Participant ID#_____ Participant Initials: _____

Directions: **Rate each of the topics presented in Working Well by giving it a score from 1 to 10, (0 being not beneficial/helpful at all, 10 being very beneficial/helpful)**

1. Goal Setting/ Target Activities _____
2. Office Ergonomics: _____
3. Repetitive Strain Injuries: _____
4. Posture and Back Education: _____
5. Fitness and Exercise Principles: _____
6. Nutrition _____
7. Pain Cycle: _____
8. Stress Management: _____
9. Relaxation Techniques: _____
10. Improving Sleep: _____
11. Communication Skills: _____
12. Problem Solving Skills: _____

Please feel free to make any additional comments regarding how you think the program could be improved. Any feedback would be greatly appreciated. Thank you._____

APPENDIX C: HIC APPLICATION

- Co-investigators: Tanis L.Adey, Proton Rahman

- Local contact (name and contact information) if principal investigator is external: **N/A**

- Research Coordinator (if relevant): **N/A**
  Telephone Number:
  Email:

- Contact information for company to be invoiced for review: N/A

  Sponsor Name: _____

  Contact Person: _____

  Mailing Address: _____

  _____

2. Title of study: Implementation of workplace self-management program to improve musculoskeletal wellness
Please include protocol number and date (if relevant): **N/A**

3. Generic and brand names of drugs to be tested in this study: N/A

Generic name: Brand name:

4. Study timeline:

- Proposed start date *[at least 4 weeks from date of submission]:* M/D/Y **Jan/01/03**
- Anticipated completion date: M/D/Y **July/30/04**
- Deadline for ethics approval: M/D/Y **Nov/30/03**
  Indicate below if:

  [ ] competitive enrollment
  [ ] course project

5. Setting of study and data sources:

- Setting – **Please specify the institutions and/or communities involved:**
  1) Memorial University, St. John's,
  2) Newfoundland Hydro, St. John's
  3) Atlantic Blue Cross, St. John's

- Check relevant data sources:
  (a) Patients [ ]
  (b) Health Providers [ ]
  (b) Residents in the community [X]
  (d) Other: [*please specify*]

6. Objectives:

1. **To evaluate the efficacy of a new 6-week self-management workplace program designed to increase knowledge regarding management of musculoskeletal pain**

2. **To evaluate the efficacy of the program in its ability to reduce absenteeism in the workplace**

7. Introduction to the study:

- What previous work has been done in this area? Summarize previous human studies

Patient education programs that utilize behavioral and cognitive modification techniques have proven to be beneficial in a number of chronic diseases. One such program that is widely utilized in individuals with mild to moderate arthritis is the Arthritis Self Management Program (ASMP). This community-based program is set within the framework of the self-efficacy theory and aims to enhance perceived ability to control various aspects of arthritis through skill mastery, modeling reinterpretation of symptoms and persuasion. Randomized controlled trials have shown that after attending the ASMP, participants reported an increased sense of control, decreased pain and a reduction in depressed mood with fewer short-term visits to physicians.

- What is the rationale for this study, i.e., why are you doing this study?

Recent meta-analysis of the ASMP shows that the result in pain and disability reduction is small. Furthermore, there are a limited number of studies investigating measures to reduce absenteeism from musculoskeletal symptoms in the work place. Our immediate objective is to evaluate the efficacy of a new 6-week self-management workplace program designed to increase knowledge and awareness regarding management of musculoskeletal pain and workplace wellness. The long-term goal is to determine the efficacy of the program in reducing absenteeism in the workplace. This will capture a varied group of individuals from those that are entirely asymptomatic, to early symptomatic disease, as well as those with well-established chronic rheumatic disease.

- Why is this research important? What contributions could it make?

Disability is an alteration of an individual's capacity to meet personal, social

or occupational demands because of an impairment. It is the gap between what an individual can do and what the individual needs or wants to do. In Canada, work disability accounts for 1% of the gross national product ($9 billion/yr) and is a prime contributor to the indirect cost of musculoskeletal disease. Indirect costs far exceed the direct cost of most common disorders, with respect to the cost of medications, clinic visits and hospitalization. Important factors contribute to work disability in patients with chronic musculoskeletal disease including issues related to disease / symptoms, work place, demographic variables and social support.

At present, up to 14% of the working population report having arthritis. This number will undoubtedly increase over the next 20 years as the number of working Canadians between the ages of 45 to 64 is expected to double. Thus the economic costs due to rheumatic disease will undoubtedly surge. Any effort to reduce work loss will result in substantial economic savings.

Much of the effort in reducing work loss has focused on re-integration into the work force of those with well established rheumatic disease that are already disabled. However more recent studies suggest that work disability develops quickly in persons with inflammatory arthritis and this concept can likely be extended to non-inflammatory musculoskeletal disorders. Thus it may be prudent to intervene early in an attempt to modify clinical, psychological or functional parameters that can lead to work loss.

8. Blood or other tissue sampling which is part of the study: Not Applicable [X]

- List samples to be taken from participants, the frequency of sampling and the amount of sample.

- Will any samples be kept after the completion of this study? Yes [ ] No [ ]
  [*If yes, you must include "Storage of Tissue" in the consent form*]

- Can participants withdraw their blood, tissue or other sample? Yes [ ] No [ ]
  [*If yes, please describe the process for withdrawal]*

- Will any samples now archived by a health care institution be used in the study? Yes [ ] No [ ]
  [If yes, attach copies of the letter requesting access and of the letter approving access signed by the data guardian; see Application Guidelines]

9. Research interventions and/or modes of data collection:

- List any procedures or tests to be administered to participants which are not part of normal patient management.

Six 1-hour educational self management sessions, will be delivered during lunch break, to participants over a 6 week period by an occupational or physiotherapist.

- List questionnaires, information sheets, covering letters, telephone or face-to-face interview scripts/outlines or chart audit forms to be used. Include copies of each with each copy of the application; if standard questionnaires are being used – SF36, EROTC, etc. *[see list on HIC website]* include one copy only.

An initial questionnaire to assess demographic variables and behavioral status will be administered to all participants. As well SF-12 Health survey will be administered to all participants to assess quality of life. A second questionnaire will be administered to the active intervention group after six weeks to assess the ability to acquire new knowledge. Company absenteeism records will be reviewed.

10. For clinical trials: N/A

- What treatment do **you** now use for patients who would meet the inclusion criteria for this study, i.e., how would you manage these patients if they did **not** go into this study? **N/A**

  - What clinical trial phase is this study?
  - What is the design of this trial, e.g., double-blind, parallel, cross-over, factorial?
  - What are the inclusion criteria for this trial?
  - What are the exclusion criteria for this trial?
  - What provisions are made for monitoring safety in this trial?

11. Description of study:

Give a brief description of the study, including interventions and outcome measures in plain language. Describe briefly what the patient will be asked to do. Attach one copy of the protocol if relevant.

Design: A single centered randomized prospective trial of a self-management workplace program of 18 months duration.

Setting: Typical work force of medium to large size companies that routinely record work absenteeism.

Implementation: Weekly group education session during lunch hours for six weeks to be delivered by allied health professionals (occupational or physiotherapist).

Outcome measures: Short-term secondary outcome measures will be focused on the knowledge and awareness gained regarding management of musculoskeletal pain and workplace wellness. Outcome measures to be assessed include coping strategies, ergonomic knowledge and awareness of available resources. The long-term outcome measures will assess work absenteeism. The long-term outcomes will be evaluated in reference to a comparative group.

12. Sample size: *[if measuring statistical differences/equivalencies]*

Give the basis – power, alpha, difference to be detected, etc., for the choice of sample size.

Univariate analysis will be used to compare the two groups with respect to demographics, acquisition of ergonomic knowledge and work absenteeism. Continuous variables will be compared using the student t-test while the categorical variables will be assessed using a contingency table with chi-squared tests. For categorical variables, if the expected frequencies in any cell were less than 5, Fisher's exact test will be used. As this is an exploratory study, no corrections will be made for multiple comparisons. We will test up to 20 variables thus a sample size of 200 was chosen to assure at least 5 participants/ parameter studied.

13. Participants:

- Describe the participants to be contacted or whose record information will be used.

(a) Adults [X] (b) Children under 19 [ ]
(c) Persons incompetent to give consent [ ] (d) Protected or vulnerable populations [ ]

If including children, incompetent adults or persons in protected or vulnerable

populations, please justify their inclusion in the research study.

- Number of participants in previous studies of this drug: **N/A**
- Number of participants at this site: **N/A**
- Will pregnant women be excluded? Yes [ ] No [**X**]
- Is this a part of a national/international study? Yes [ ] No [**X**]
  - If yes, what is the total number of participants at all sites.
  - If yes, where is the main study site?

- Will contact be made with potential participants? Yes [**X**] No [ ]

After briefing the employers of the proposed project, our research team hold information sessions for all clerical employees in a given work place inviting them to participate in the study. The participants who volunteer to the study will then be randomized to receive the self-management intervention vs usual practice.

- If yes, who will make the first contact to provide information about the study?

(a) Attending physician [ ] (b) Investigator [**X**] *[See guidelines]*
(c) Other: *[Please specify]*

14. Consent process:

- Who will obtain the consent? **Research nurse**

- Explain the procedure you will use to obtain consent.

  Information sessions will be carried out at potential workplace sites in which the Investigator will summarize the protocol for workers. Once a volunteer is self-identified as a potential study participant, they will be given a consent form to read and the opportunity to ask, and have questions answered. If the potential participants wishes to discuss their consent form with other individuals their enrollment will be delayed until the decision has been made.

[If including children, incompetent adults, or persons in protected or vulnerable populations, describe in detail how parental or proxy consent will be obtained. See Application Guidelines]

15. Risks, discomforts and inconveniences:

- What risks, discomforts or inconveniences are involved?

  risks: no
  discomforts: no
  inconveniences: time taken for six 1-hour education sessions and completion of questionnaires

16. Benefits

- Are there any immediate benefits for participants, including controls?

  NO

17. Privacy and confidentiality:

- What steps will be taken to protect privacy and confidentiality of information?

(a) Oath of confidentiality [**X**]
(b) Locked storage [**X**]
(c) Limited access [**X**] Data will be restricted only to the study investigators.
(d) Password-protected computer files [**X**]
(e) Denominalized files provided by data holder to investigator [ ]
(f) Coded study number [**X**]
(g) Locked room [**X**]
(h) Anonymous responses to investigator [ ]

- List below the names of **all** personnel who can access the identities of study participants:
  Kim Doyle OT, Jill Seviour PT, Yvonne Tobin RN, Samra Mian Graduate Student, Proton Rahman MD

18. Debriefing: N/A

Explain the process, if any, for feedback to the research community, participants, agencies, communities. [*See guidelines*]

19. Payments:

- Do you intend to reimburse participants for expenses incurred?
  Yes [ ] No [X] Amount [$]

20. Budget: **Not Applicable [ ]**

Please attach a copy of the budget to each application including the source of funding

- Source of funding: **Existing grants**

- Will the budget be administered through the University Finance Office? Yes [ ] No [**X**]]
  If no, please specify the person or agency responsible: **Existing grants**

21. Potential conflict of interest:

- Is any investigator a shareholder in any company/agency funding this study? Yes [ ] No [**X**]

- Will any investigator receive direct financial or other benefit? Yes [ ] No [**X**]
  If yes, please describe:

- Will any investigator receive indirect financial or other benefit? Yes [ ] No [**X**]
  [share of profits, future royalties, patent rights, et al]

  If yes, please describe:

22. Ownership, storage and destruction of data:

- **The investigator must be free to publish within 6 months after submitting the manuscript to the sponsor for review. Publication of the full study must be assumed no longer than 1 year after the completion of the study. In agreement with the Office of Research, HIC will assume these terms will be negotiated in any research contract.**