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Enhancing Ergonomics through Occupational Therapy Services

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Enhancing Ergonomics Through Occupational Therapy Services

By

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CHAPTER I

INTRODUCTION

Introduction

The scholarly project is the design of an occupational therapy (OT) ergonomic protocol for use in industrial work settings. The protocol emphasizes the identification and prevention of risk factors contributing to work-related back injuries. The development of the education protocol for all employees is based upon an extensive literature review. The literature review has defined the promotion of a safe working environment, exercise and stretching principles before, during, and after work, increasing quality performance in ergonomics, methods to prevent injuries and work-related pain, safe and proper body mechanics strategies, and effective workforce principles to achieve comfort, safety, and overall increased health and wellness. Due to the broad scope of diagnoses that can benefit from ergonomic intervention, this scholarly project chose to limit its focus on back injuries which currently account for 80% of all industrial work-related injuries (Mayo Clinic, 1999).

The goal for this project is the development of a comprehensive educational protocol to prevent and limit back injuries in industrial settings. This protocol consists of eight sessions that provide education and demonstration of the following areas; 1) spine anatomy, 2) back care principles, 3) prevention of back injuries, 4) back exercises, 5) managing back pain, 6) ergonomics, 7) proper lifting and positioning, and 8) Industrial Occupational Therapy interventions.

In addition, this project will benefit industrial settings by utilizing preventative measures to increase productivity and decrease work-related injuries and Workers Compensation claims.

CHAPTER II

REVIEW OF LITERATURE

Based on research by Occupational Safety and Health Administration (OSHA) and Workers Compensation, there is a considerably high rate of back injuries in the workplace. Statistics reveal that four out of five (80%) of industrial workers will experience back pain, thus it is imperative to increase the awareness of how to prevent back pain (Mayo Clinic, 1999). Work-related back injuries result in a substantial loss of employee and company productivity in which can lead to an enormous financial debt. The most important factor is the potential disabling condition that an employee may experience as a result of injury. However, with appropriate education, intervention, and follow through services by an Industrial Occupational Therapist, these negative outcomes could be minimized or eliminated.

Industrial Costs

Workers Compensation costs to industry and society are enormous. Every year, nearly two percent of the working American population files a Workers Compensation claim because of work-related back pain (Pransky, Benjamin, Hill-Fotouhi, Fletcher, Himmelstein, and Katz, 2002). Jones and Kumar (2001) and Pheasant (1991) indicate that back injuries are the most expensive work-related malady for industrialized companies. Five percent of the working American population is affected by work-related back pain every year, which results in over 100 million lost work days and costs that exceed nine billion dollars (Jones et al., 2001).

According to Williams, Feuerstein, Durbin, and Pezzullo (1998) detailed trends in health care costs and absentee days typically result from occupational low back pain. Occupational low back pain makes up at least 33% of all health care and indemnity under Workers Compensation. Workers Compensation indemnity claims are filed when an employee has lost time from work due to a work-related injury. The preferred method to solve the increased dollars spent towards Workers Compensation claims is to prevent and manage the occurrences of low back pain. In order to prevent and manage occupational low back pain in a workplace, it is necessary to track the risk indicators along a temporal continuum. The longer an individual is off work due to a work-related injury, he/she is less likely to return to work safely, functionally, pain, and symptom free. Through education, physical assessments, and psychosocial assessments, a global understanding can be achieved amongst the company and all the employees. Therefore, strategic planning regarding resource allocation will allow effective management and prevention of work disability in low back pain risks (Williams et al., 1998).

Industrial Diagnoses

Low back pain is the most common work-related musculoskeletal disorders. It is characterized by sharp, dull, diffuse, or localized pain. Common symptoms of low back pain are muscle spasms and the limitation of movement (Pheasant, 1991). Low back pain is associated with repetitive tasks in fixed working positions. The workers often find that their back problems are worse in prolonged sitting and standing positions. Working for long periods in a stooped position may also increase back pain.

The literature reveals that using varied positions during work tasks are preferred over fixed/static positions and relaxed positions are preferred over static and tense positions. In addition, prolonged sitting leads to discomfort, swollen legs, and can cause varicose veins while prolonged standing can lead to aching legs and feet. Both scenarios can contribute to a high prevalence of low back pain. It is important to remain physically fit by stretching the muscles before work and taking frequent rest breaks and walks to help relieve symptoms of low back pain (Pheasant, 1991).

Industrial Back Injuries

It is estimated that 85% of the industrial workers have a medical diagnosis of low back pain (Staal, Hlobil, van Tudler, Koke, Smid, and van Mechelen, 2002). Since this has an enormous socioeconomic impact on the industry, studies reveal that there is a large amount of worker absenteeism due to back pain.

Study outcomes reveal that industrial workers identify many factors that relate to low back pain. These factors include physical, psychosocial, employment, and economic hardships that influence return to work outcomes (Jones et al., 2001; Hagen, Eriksen, Ursin, 2000; & Hadler, 1997). There is one factor that is minimally addressed by many other ergonomic or Industrial Therapy Professionals. This factor is psychosocial. Industrial Occupational Therapists focus on addressing psychosocial factors in addition to physical factors. Studies reveal that the return-to-work rate is lower if an industrial worker experiences physical pain along with psychosocial concerns such as depression.

When an individual is unable to cope with the back pain, it is then labeled as an injury, thus an emphasis can be placed on reducing psychosocial concerns to increase the return-to-work rate within the workplace (Jones et al., 2001; Hagen et al., 1997).

Since typical daily movements intensify back pain, ergonomic strategies need to be implemented by an Industrial Occupational Therapist in order to correct improper positioning, lifting, and postures throughout all daily activities. Therefore, it is essential to establish a weight limit for all manual lifts within the workplace. The back muscles are not intended to perform excessive lifting activities; hence the back muscles need to work in coordination with the stomach muscles to stabilize the spine and aid in maintaining a balanced posture during lifting. However, the lift itself should be performed by using both the larger muscles of the hips and legs (Melnik, Saunders, and Saunders, 1998).

Job demands that contribute to work-related back pain include lifting heavy objects, twisting while lifting, prolonged sitting or standing, reaching above shoulder level or below the waistline, working in awkward positions, and in unsafe work areas. Many of the demands described relate to all individuals that work in an industrial setting regardless of job placement (Jones et al., 2001; Hagen et al., 2000; & Hadler, 1997).

One primary work-related risk factor in low back pain includes heavy manual occupations. Although back pain has an insidious onset in both heavy and light workers, those jobs that require repetitive bending, lifting, and forceful exertion of highly weighted objects are more physical demanding and detrimental to the body. Seventy-three percent of reported back pain is due to bending/straightening actions, lifting and carrying (50%), and twisting (48%) (Pheasant, 1991).

Repetitive forward bending is also an indicator for low back pain. Esola, McClure, Fitzgerald, and Siegler (1996) show the association between forward bending and low back pain. As an industrial worker engages in forward bending, the spine increases in flexibility which also increases stress on the back muscles. The posterior hip muscles are also active during forward bending to control the tilting of the pelvis as the spine flexes. To determine prevention strategies of low back pain, the industrial worker must restore normal lumbar and hip motion during forward bending. Thus, it is necessary to increase hamstring flexibility to allow greater hip motion and less stress on the lumbar spine. During forward bending, whether its either early, middle, or late forward bending from the hips, the worker should move less from the lumbar spine during early and middle forward bending and more from the hips to support greater velocity during the initial 25 % of forward bending time (Esola et al., 1996). Therefore, insufficient hip flexibility with excessive lumbar motion during forward bending often results in low back pain.

Other factors that may cause low back pain are acute ligamentous or muscular strain problems, osteoarthritis, poor quality or deficient sleep, fatigue, and physical/mental de-conditioning. In order to determine the cause of such symptoms, work/productivity, motor skills, postural control, physical endurance and tolerance to activity, and the physical and social environment must all be assessed by an Industrial Occupational Therapist. For example, one problem that the industrial worker may be experiencing is the inability to perform the lifting requirements of his/her job demands due to inadequate physical capabilities or lack of education in proper body mechanics that ultimately can cause back pain (Reed, 2001).

The majority of all back problems are not the result of a single injury, therefore, it is important that individuals understand risk factors that develop back pain. Some of these include poor positioning, faulty body mechanics, and loss of flexibility (Melnik et al., 1998). The improper methods to lift heavy objects include lifting the load away from the body, lifting with knees straight and the back curved, and lifting with twisting motions. These will all contribute to a back injury if these tasks are performed repetitively. The reinforcement and utilization of proper lifting and handling techniques can prevent low back pain and/or significant injury, thus reducing Workers Compensation claims and the amount of worker absenteeism (MacFarlane, Thomas, Papgeorgiou, Croft, Jayson, and Silman, 1997).

The recurrence rate of re-injury is high with 60 % prevalence in one year (Pheasant, 1991). Risk factors for re-injury on the job site include negative employer responses to injury, poor workstation modifications, and worker dissatisfaction with their current low back condition. It is necessary to inform companies and their employees about risks of repetitive physical demands and re-injury possibilities in order to devise a plan to decrease work-related back injuries, worker absenteeism, and Workers Compensation claims. It is imperative that the workplace promote a positive and open employer/employee communication system to ensure that necessary education and appropriate modifications are provided for all of the employees, especially the injured workers (Jones et al., 2001).

Back injuries are the leading cause of disability in adults and approximately 80% of the population will experience low back pain at some point during their working lives (Jones et al., 2001). Considering the statistics, it is vital that an ideal protocol be developed to reduce back injuries. The protocol would focus on education, exercise, and an ergonomic component in order to gain an understanding of the contributions of each area (Unger, n. d.). Another method to examine job tasks and worker capabilities through direct measures include back education, worker screening programs, and roles of psychosocial factors within the workplace.

Trends and Intervention

It is essential that industrial workplaces hire an Industrial Occupational Therapist to decrease low back pain occurrences. This therapist routinely develops a "Back Program" or educational protocol based on the company's and individuals' needs (Saunders, Stulz, Saunders, and Anderson, 1995). A back program usually consists of educational sessions focusing on the anatomy of the spine, back care principles, prevention of back injury, back exercises, managing back pain, ergonomics, proper lifting and positioning techniques, and therapeutic activities (Saunders et al., 1995 & Unger, n.d.). Therefore, being able to educate the industrial workers on low back pain can lead to positive outcomes and improved motivation level of the individuals for active involvement in work tasks (Hsieh, Adams, Tobis, Hong, Danielson, Platt, Hoehler, Reinsch, and Rubel, 2002).

The therapists also focus on instructing the industrial corporations' safe and healthy techniques that could begin the prevention of back pain.

Back injuries can be prevented by abiding by four primary intervention techniques such as 1) involving a management team, 2) focusing on ergonomics, 3) implementing physical fitness for the job, and 4) providing adequate education/awareness and proper training (Saunders et al., 1995). All four of these areas need to be addressed in order for the back prevention program to be successful. A multidimensional management team helps to ensure employee follow through.

To properly implement a back education protocol, it is necessary to gain support from all workers regardless of job stature. Without proper support, the educational protocol will be more likely to fail. It is also important that all employees be aware of potential work-related injuries and unsafe working environments. All hazards should be reported immediately to the employer and therapist in order to prevent further injuries from occurring. A positive, friendly, and open communication environment also needs to be addressed to ensure that workers feel appreciated and part of the team. The implementation of job rotations can be cost effective and provide injury prevention guidelines (Saunders et al., 1995).

Treatments of low back pain can be accomplished through biomedical approaches, compensatory approaches, and rehabilitation by an Industrial Occupational Therapist. Such approaches include work conditioning and work hardening, back care principles to improve productivity, safety, and physical tolerance in a workplace, and education in proper body mechanics. Without back education and care, unresolved low back pain may lead to failure of the person to resume work activities which will decrease productivity and can also lead to loss of job (Reed, 2001).

Injured workers that attend educational sessions on the anatomy of the spine will learn pertinent exercises to increase strength, endurance, flexibility, and posture that can lead to an increased awareness into injury prevention (StayWell Company, 2001). The exercise portion of this educational protocol can include warm up exercises, flexibility exercises, stretching, relaxation training, body awareness training, and cardiovascular fitness training. Industrial workers will receive vital information on psychosocial issues and how to overcome the fear of further injury. The workers that receive early intervention relating to information on the back, exercises and psychosocial issues have a higher return to work rate. These workers are taught how to perform daily living tasks without the risk of further injury, which can lead to an increase in self-confidence and a decrease in anxiety levels or fear of re-injury (Hagen et al., 2000 &Skouen, Grasdal, Haldorsen, and Ursin, 2002).

Since low back pain claims are the source of 40% Workers Compensation losses, instruction in body mechanics are important for determining the safest lifting techniques (Lieber, Rudy, and Boston, 2000). An educational protocol focuses on principles to decrease the effects of mechanical stress on the structures of the spine. Another integral component of an educational protocol is to examine the postulating moment during lifting. An adequate description of lifting techniques or body mechanics requires both assessments of the starting posture as well as the interjoint coordination of the spine, which focuses on flexibility and stability of the spine (Lieber et al., 2000). There are five main biomechanical factors that usually constitute a back injury claim against industrial corporations. These factors include: 1) the lifting frequency required, 2) the load movement, 3) lateral trunk velocity, 4) trunk twisting velocity, and 5) trunk sagittal angle.

When these biomechanical factors are repetitious and the human body is stressed both mentally and physically, individuals file an injury claim (Hadler, 1997).

Another therapeutic intervention that can be incorporated into an industrial setting are to maintain good postures at all times to ensure the spine is properly balanced in the position of greatest comfort and stability during activities (Mayo Clinic, 1999). Some common postural positions to avoid during a manual lift include forward inclination of the head, neck, and trunk, unnecessary movements, twisting, and asymmetrical postures. These specific tactics will enable the workers to maintain proper positioning while performing work activities (Pheasant, 1991). An additional intervention can include using long-handled work tools to match one's reach while maintaining correct posture. It is also necessary to address stress management and relaxation techniques to relieve muscle strain and tension that may result from prolonged sitting or standing (Mayo Clinic, 1999).

Correct posture techniques and exertion forces must be utilized to ensure proper lifting in the workplace. These factors are needed in order to have an effective and safe working environment. The identification of injury causation, utilization of assessments, and treatment planning can all be implemented by an Industrial Occupational Therapist to reduce low back pain in the workplace (Jones et al., 2001).

It is indicated that the back is most likely to be injured during lifting and handling activities. It is important that workers keep their backs straight and knees bent when performing a manual lift. Most back injuries result from overexertion with a 61% occurrence rate (Pheasant, 1991; MacFarlane et al., 1997; & Hadler, 1997).

To prevent back injuries during lifting, three specific strategies can be implemented. First, is selection of physical characteristics in a person; second is training/education on proper back care for increased knowledge, and lastly, the implementation of ergonomics with redesigning work habits/routines. There are always unplanned lifting and handling tasks that occur even with proper lifting training/education. In order to maintain a healthy posture during work activities, environmental controls and workstation modifications can be performed by adjusting the tables and other equipment at levels that are suitable for each individual. Therefore, it is important to address the workstation design when considering work-related injuries and back pain. It is these actions and movements that need to be reinforced and be cognizant of while performing activities that involve heavy manual work (Pheasant, 1991).

Taylor and Hoelscher (1999) define ergonomics as 'fitting the job to the worker'. Ergonomic principles identify the design of the job and the equipment and tools utilized by the workers (Jones et al., 2001). Ergonomic principles assist in making the worksites safer and more productive for the worker. Physical fitness helps to increase strength, endurance, and overall a healthy lifestyle (Saunders et al., 1995).

Further research is needed to discover effective prevention strategies and treatment options in order to reduce the amount of worker absenteeism. Some common return-to-work interventions that can be implemented by an Industrial Occupational Therapist include physical exercises and stretches, education, and ergonomic measures. All of these interventions are necessary in order to prevent chronic symptoms or further disability from occurring (Staal et al., 2002).

Industrial Occupational Therapy in an Industrial Setting

An Industrial Occupational Therapist can assist workers in achieving healthy backs and ultimately provide a holistic perspective of psychosocial, physical, and emotional well-being for each industrial worker. Industrial Occupational Therapy services are unique because they offer educational programs to industrial corporations for professional consultation to increase safe behaviors, prevent work-related injuries, and improve productivity. Industrial occupational therapists have specialized training to accurately analyze job duties, body positioning, ergonomics, back care, and safety procedures. To promote a safe working environment and decrease work-related back injuries, these interventions will also assist in improving the individual's work tolerance level (Saunders, et. al., 1995).

An Industrial Occupational Therapist's primary focus is on providing the industrial workers with instruction on prevention of back injuries, back care principles, exercises, back pain management techniques, ergonomics, and proper body mechanics. The Industrial Occupational Therapist will determine if the individual is performing at a suitable functional capacity to return to his/her previous work position or if further modifications are needed in the individual's work area (Joy, Lowy, and Mansoor, 2000).

An Industrial Occupational Therapist's role is to assure quality of care to industrial workers by offering structured, graded, and work-oriented activities in order to increase psychosocial, physical, and emotional tolerance (King, 1993). The primary mission of an Industrial Occupational Therapist is to improve worker physical and mental capabilities and prevent work-related back injuries to ensure maximal productivity for the job tasks (Taylor et al., 1999).

Industrial Occupational Therapy services concentrate on providing the highest quality of care that meets or exceeds employee expectations. Industrial Occupational Therapists receive extensive education and are competent in the areas of human anatomy concepts and principles, ergonomics, workstation modifications, proper body mechanics and positioning techniques, and psychosocial functioning.

Industrial Occupational Therapists strive to help industrial workers manage back pain. Several basic principles for proper back care include not remaining in one position for an extended period of time, maintaining a wide, stable base while standing and lifting, pivoting one's feet when carrying items, avoiding twisting motions, lifting objects properly by using the legs and not the back, and keeping items close to the body when lifting and/or carrying. An Industrial Occupational Therapist encourages everyone to implement these principles into their daily routine in order to decrease the risk of injury (Melnik et al., 1998).

Industrial Occupational Therapists provide ergonomic assessments that specifically define a problem, formulate goals based on the needs, and identify individualized interventions that can correct the problem(s). In addition, Industrial Occupational Therapists offer follow through services to ensure a continuum of care for all workers. These follow through services include conducting employee satisfaction outcome studies and random screenings/observations to verify that all workers are utilizing proper body mechanics, safe lifting and positioning techniques, correct ergonomics, and suggested back care principles and guidelines (Taylor et al., 1999).

In order for these interventions to be properly implemented, the Industrial Occupational Therapist must involve the industrial corporation's managers, supervisors, safety directors, and all the employees in the education process. As a result, this will provide efficient and effective work environments that will increase awareness of proper guidelines to follow in order to reduce the risk of work-related back injuries (Saunders, et al., 1995).

Industrial Occupational Therapists often suggest the previously mentioned ideas to increase administrative and company follow through. Engaging in these ideas may appear to be time consuming, however, they are imperative to implement if the company's goal is to increase employee satisfaction (emotional, physical, and psychosocial well-being), productivity, and to reduce unnecessary employee absenteeism and Workers Compensation claims.

CHAPTER III

ACTIVITIES

This scholarly project was initiated through a mutual interest between the authors regarding ergonomics and the implementation of occupational therapy services in industrial settings. In the spring of 2002, a program plan for IR Bobcat Company in Gwinner ND was developed to identify a need for occupational therapy services. This program plan involved conducting an extensive literature review on work-hardening in an industrial setting and a survey that was used to determine the amount of work-related injuries that were primarily associated with physical and mental job demands. The survey results indicated that back injuries were the majority (56%) of all reported work-related injuries (IR Bobcat Company, Gwinner, ND 2002). A market analysis and the implementation of Industrial Occupational Therapy services were developed to support the need for a work-hardening program at IR Bobcat Company.

In the fall of 2002, the authors gathered information from occupational therapy practitioners that are currently practicing in the following areas: ergonomics, back related injuries, and occupational therapy interventions in the workplace. The authors consulted with the faculty advisor at the University of North Dakota Occupational Therapy Department regarding pursuing a scholarly project that would focus on addressing education concerning back injuries in the workplace. On November 19, 2002, the authors submitted a topic proposal, *Enhancing Ergonomics through Occupational Therapy Services* to the Dean of the graduate school. This topic proposal gained approval from the Dean on December 3, 2002.

In the spring of 2003, the authors conducted an extensive literature review of relevant information on educational protocols designed to reduce or prevent work-related back injuries in the workplace. The literature review consisted of researching current refereed journal articles at the Harley French Medical Science Library on the University's campus. In addition, textbooks on the topics of spine anatomy, back care principles, preventions for back injuries, back exercises, managing back pain, ergonomics, proper lifting and positioning techniques, and Industrial Occupational Therapy interventions that can be implemented in the workplace were utilized. The design of the educational protocol is based on considerable research of physical, psychosocial, and treatment considerations in industrial settings.

CHAPTER IV

PRODUCTS

Educational Protocol: Enhancing Ergonomics Through Occupational Therapy Services

This educational protocol consists of eight sessions that are designed to be implemented by an Industrial Occupational Therapist in industrial settings. These sessions are presented through various educational methods and techniques such as; power point presentations, safety meetings, educational pamphlets, and demonstration workshops to increase worker safety and awareness.

*Please refer to appendices A through H for entire educational protocol.

Session One: Spine Anatomy

- Education on the spine anatomy
- Primary functions of the spine
- Proper positioning

*See Appendix A for power point presentation on Spine Anatomy

Session Two: Back Care Principles

- Education
- Importance of maintaining a healthy back
- Good posture
- Safe lifting
- Proper body mechanics
- Good health habits

* See Appendix B for power point presentation on Back Care Principles

Session Three: Prevention of Back Injuries

- Education
- Preventative techniques
- Benefits of implementing a prevention protocol

*See Appendix C for power point presentation on Prevention of Back Injuries

Session Four: Back Exercises

- Education
- Demonstration

* See Appendix D for educational handout on Back Exercises

Session Five: Managing Back Pain

- Managing back pain symptoms
- ADL performance areas
    - Self-care tasks
    - Home management tasks
    - Leisure activities
    - Work tasks

* See Appendix E for power point presentation on Managing Back Pain

Session Six: Ergonomics

- Education of ergonomic principles
- OSHA recommendations
- Ergonomic considerations
- Evaluations
- Introduction to workstation modifications

* See Appendix F for power point presentation on Ergonomics

Session Seven: Proper Lifting and Positioning

- Education and demonstration of proper body mechanics
- Safe lifting
- Proper lifting techniques
- Proper positioning techniques

*See Appendix G for power point presentation on Proper Lifting and Positioning

Session Eight: Industrial Occupational Therapy Interventions

- Qualifications and credentials
- Industrial Occupational Therapy services
- Environmental and physical interventions
- Managerial ideas to increase follow through with services

* See Appendix H for power point presentation on Industrial Occupational Therapy Interventions

* See Appendix I for educational handout on Managerial Ideas to Increase Worker Follow Through of Industrial Occupational Therapy Service

CHAPTER V

SUMMARY AND CONCLUSIONS

This educational protocol serves as an orientation into back care awareness in industrial settings. The protocol design resulted in educational products for use in instructing workers on the initial topics of 1) spine anatomy, 2) back care principles, 3) prevention of back injuries, 4) back exercises, 5) managing back pain, 6) ergonomics, 7) proper lifting and positioning techniques, and 8) Industrial Occupational Therapy interventions. Industrial workers that attend these educational sessions will be introduced to new techniques to implement while performing work tasks. Education and knowledge concerning the performance of these recommended activities is the primary prevention approach designed in this protocol. As employees demonstrate the preventative knowledge and skills, this can facilitate awareness among other co-workers to prevent back injuries. Success of such endeavors is heavily dependent on teamwork to facilitate a healthy, safe, injury-free, and satisfying work environment.

Following the educational component of the protocol, the next step in implementing a safe and productive industrial environment which includes; performing job analyses, workstation modifications, and ergonomic reports to ensure a safe working environment. The industrial workers will be provided with opportunities to ask questions pertaining to back injuries and receive direct therapy services from an Industrial Occupational Therapist. The therapist will be available during various work hours for personal appointments to discuss these concerns.

An Industrial Occupational Therapist is highly qualified to administer this educational protocol to workers, managers, and supervisors. The therapist specifically designs interventions that are individualized to the workers' needs in order to utilize preventative measures to decrease work-related injuries, worker absenteeism, and workers' compensation claims.

The most effective and efficient approach to a comprehensive program is to employ an Industrial Occupational Therapist full-time. This ensures the program is implemented as designed. It also contributes to efficiency in program evaluation and modification with an immediate response rate to meet the needs of the employees and the industrial corporation.

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APPENDIX A: SPINE ANATOMY

APPENDIX B: BACK CARE PRINCIPLES

APPENDIX C: PREVENION OF BACK INJURIES

APPENDIX D: BACK EXERCISES

APPENDIX E: MANAGING BACK PAIN

APPENDIX F: ERGONOMICS

APPENDIX G: PROPER LIFTING AND POSITIONING

APPENDIX H: INDUSTRIAL OCCUPATIONAL THERAPY INTERVENTIONS

APPENDIX I: MANAGERIAL IDEAS