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Stress-Related Injury Prevention Business Plan

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STRESS-RELATED INJURY PREVENTION BUSINESS PLAN

by

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A Scholarly Project

Submitted to the Occupational Therapy Department

of the

University of North Dakota

In partial fulfillment of the requirements

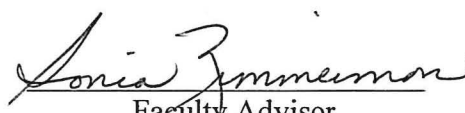
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Master's of Occupational Therapy

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This Scholarly Project Paper, submitted by Jose Lucio in partial fulfillment of the requirement for the Degree of Master's of Occupational Therapy from the University of North Dakota, has been read by the Faculty Advisor under whom the work has been done and is hereby approved.


Faculty Advisor

8-16-05

Date

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Department Occupational Therapy
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CHAPTER I

INTRODUCTION

Occupational Therapy services can promote proper ergonomic principles to prevent stress-related injuries by providing educational programs and worksite analysis to the benefit of both injured workers and prevention of future costly accidents and decreased productivity of labor for industry. An example of a company that could benefit from occupational therapy ergonomic services is that of the FedEx Corporation, one of the largest operating parcels distributing company in the world. During deliveries, employees continuously exit and enter the delivery truck while handling a package and/or transferring heavy packages adding stress on the knee joint and trauma to the musculoskeletal system, increasing risk of injury. Educational programs and worksite analysis, as well as other therapy services could assist in preventing and/or reducing the incidence of stress-related worksite injuries.

An extensive literature review has been conducted on ergonomics and approaches in occupational therapy to develop a stress-related injury prevention program suitable for industry implementation. This business plan allows occupational therapy services to be implemented to reduce the cost of injury and increase productivity. Services will include, but are not limited to, equipment modifications and in-service education for employees on various strategies, such as lifting, exiting/entering vehicle, and stretching.

Chapter two is a review of literature explaining how industry can reduce injuries utilizing occupational therapy services, providing educational information and strategies to reduce work-related injuries.

CHAPTER II
REVIEW OF LITERATURE
Musculoskeletal Disorders

A musculoskeletal disorder (MSD) is defined by the U.S. Department of Labor (OSHA, 2004) as “an injury or disorder of the muscles, nerves, tendons, joints, cartilage, and spinal discs that is not caused by slipping/tripping or trauma incidents.” MSDs are a continuing problem facing both industry and workers today. Industry is witnessing what has been termed an “industrial epidemic,” an overwhelming increase in reports of work-related disorders that affect not only industry productivity and labor costs but also the quality of workers’ lives both inside and outside the workplace (Sanders, 2004). Many business leaders, corporations, and legislators claim that not enough studies have been conducted to conclusively prove that occupational hazards cause MSDs (Gourley, 2000). However, the National Institute for Occupational Safety and Health (NIOSH, 1997) has found that certain jobs or working conditions containing repetitive, forceful, or prolonged hand movement; frequent heavy lifting, pushing, or pulling; or prolonged awkward postures, contribute to MSDs. These injuries, in return, result in decreased profitability and an inability to compete with competitors. It is estimated that 90% of America’s workers will be affected by an MSD sometime in their lives (Whitmore, 1997).

Work-Related Injuries

According to the U.S. Department of Labor: Bureau of Labor Statistics (OSHA, 2004), 1.5 million workdays were missed resulting from work-related injuries in 2002. Four out of every ten lost-workday injuries and illnesses were from sprains, strains and tears, occurring mostly in the back. The main cause of work-related injuries that occurred in the musculoskeleton resulted from overexertion of physical load handling (Genaidy et al., 1998). Other identifiable factors resulted from twisting motions, poor sitting posture, vibration from automobiles, static standing positions, and poor bending and lifting techniques. Falls on the job site are the third leading cause of disabling work injuries in the United States, representing 17% of lost time in workers' compensation cases across all occupational titles (Keyserling, Monroe, Woolley & Ulin, 1999). Truck drivers, health care workers, and laborer and non-construction workers comprised the top three high risk populations for work-related musculoskeletal disorder (Kerserling, Moneroe, Woolley & Ulin, 1999).

For example, FedEx is among many companies that are overwhelmed with work-related injuries secondary to the amount of stress that is placed upon the musculoskeletal system. The mission statement of FedEx is as follows:

FedEx Corporation will produce superior financial returns for its shareowners by providing high value-added logistics, transportation and related information services through focused operating companies. Customer service requirements will be met in the highest quality manner appropriate to each market segment served. FedEx Corporation will strive to develop mutually rewarding relationships with its employees, partners and suppliers. *Safety will be the first consideration in all operations.* [Italics added for emphasis] Corporate activities will be conducted to the highest ethical and professional standards (FedEx, 2004).

Despite the company emphasis on safety as a primary consideration, data provided by FedEx supports that injury does exist within the company as a result of repetition, force, awkward postures, mechanical compression and vibration. These injuries lead to direct and indirect injury costs financially. An injury report provided by David Foster, Senior Safety SPC/Field illustrates the details of injuries for the Mountain District between 6/01/01 through 9/30/04 demonstrating a total of 412 injuries (D. Foster, personal communication, October 8, 2004). This report entails the employee number, date of injury, time of injury, type of injury, nature of injury, part of body injured, agency of injury, lost time and days, and station in which the injury occurred. A total of 57 injuries have occurred within the first 9 months of 2004. These types of injuries range from loading, sorting, handling, caught in between objects, lifting strains, entering/exiting vehicle, walking, struck by/against an object, slip or fall, vehicle accident, and illness (Appendix A). Specific information regarding body parts injured and the nature of injuries at FedEx are detailed in Appendices B and C. The objects that directly affect a FedEx employee which result in injury are included in Appendix D.

Cost of Musculoskeletal Disorders

The cost of workplace musculoskeletal disorders can be high to the worker, workplace and also society. MSDs are a major contributor to increased absenteeism, workers' compensation costs, and employee turnover. According to Whitmore (1997), MSDs cost American businesses \$20 billion per year in lost medical wage benefits and medical costs. The 1.6 million employers potentially affected by OSHA standards complain that implementation of a risk-management and ergonomics program designed to reduce the adverse impact of workers' compensation claims, injuries, and lost time

would be far too costly (Gourley, 2000). However, according to OSHA, compliance would cost industries an estimated \$4 billion a year reducing losses suffered to the U.S. economy that have reached \$150 billion per year (Whitmore, 1997).

Not all costs are financial. Consequences to the worker are devastating leaving potential for permanent disability, emotional stress, and loss of the valuable worker role. This decline in the quality of the work experience often leads to reduced levels of work satisfaction. Work satisfaction is defined as “a positive emotional state that results from appraisal of one’s work and resulting experiences (Jacobs, 1994, p. 158).” Attempts to understand work satisfaction and foster its growth are based on a desire to increase worker productivity and profitability. According to T. Morris Fraser (1989), when many workers, regardless of skill level, are asked to perform depersonalized or inherently stressful tasks in an alien, restrictive, and high-pressure environment, personal dissatisfaction, sickness and social unrest and economic disruption are often predictable end results. Therefore, the most important determinants of job satisfaction reside in the nature of the job tasks performed by the worker. Industries that employ ergonomic changes can lead workers in obtaining an effective interaction between the person and the environment.

Ergonomics

Ergonomics developed into a recognized field during World War II, when technology and the human sciences were systematically applied in a coordinated manner addressing problems arising from the operation of complex military equipment. This inter-disciplinary approach continued and has progressed in industry. The first ergonomics society was established in England producing and adopting the term known

today as “ergonomics.” This was followed by the creation of the International Ergonomics Association, which represents ergonomics societies in 40 countries or regions (Dul & Weerdmeester, 2001).

Ergonomics today is an applied science and discipline concerned with the matching of the task, the tool and the environment to the physical and psychological abilities of the worker (Whitmore, 1997). “Ergonomics focuses on humans and their interactions with the environment (Rice, 1999, p. 10).” Ergonomics applies multidisciplinary, scientific information regarding human abilities and limitations to the design of objects, systems and environments for safe, efficient, and comfortable human use. Ergonomics draws its knowledge from various fields in the human sciences and technology, including anthropometrics, biomechanics, physiology, psychology, toxicology, mechanical engineering, industrial design, information technology and industrial management. This inter-disciplinary ergonomic approach therefore relates to many different human factors that may affect performance in engagement of job tasks. A human factor is the process of designing the interface between operator and machine to improve the exchange of information in order to control the rate of error (Sanders, 2004).

Ergonomics also applies a mutual interaction between the worker and the workplace in order to fit the capabilities of the worker. Neglect of ergonomic principles can affect the efficiency of the workplace through low productivity and poor quality (Whitmore, 1997). Unsafe, unhealthy, uncomfortable or inefficient situations at work can be avoided by taking into account both physical and psychological capabilities and limitations. A large number of factors play a role in ergonomics; these include body posture and movement (sitting, standing, lifting, pulling and pushing), environmental

factors (noise, vibration, illumination, climate, chemical substances), information and operation (information gained visually or through other senses, controls, relation between displays and control), as well as work organization (appropriate tasks, interesting jobs) (Sanders, 2004).

The ergonomic approach results in the adaptation of the workplace or environment to fit the person in order to efficiently perform occupational tasks. The ultimate goals of an ergonomics program are to help people function effectively in a competitive work environment, prevent work-related injuries and the development of chronic medical conditions, and help employees return to work after an injury has occurred. Application of ergonomic principles can improve performance, reliability and productivity (Fontana, 2002).

Ergonomic Program Elements

A well-designed ergonomic program encompasses several levels of intervention which include but are not limited to active and passive surveillance, medical management of affected workers, worksite evaluation and workstation redesign, extensive education and training, evaluation of work hardening and work conditioning. Program titles such as work hardening, return to work, industrial rehabilitation, occupational rehabilitation, or work rehabilitation program differ in name but all have the primary goal to assist the injured worker in returning to gainful employment (Jundt & King, 1999).

A written plan with a statement of management commitment, goals, responsibilities and time line for implementation is the key to implementation of a work rehabilitation program (Whitmore, 1997). Active participation from managers,

supervisors, workers, safety and health, and engineering staff provide success for implementation of ergonomics.

The result of a study conducted by Jundt and King (1999) concluded a wide variety of services are offered by work rehabilitation programs. Areas of service that practitioners focus pertained to prevention, assessment and rehabilitation. Prevention usually takes the form of ergonomic training and design. Injured employees were trained to identify risk factors, and ergonomic design principles were applied to the workstation in order to reduce and prevent injury. This study also explained that work programs have adopted work conditioning rather than work hardening rehabilitation. The second most prevalent rehabilitation services pertain to job accommodation and modifications. Prevention, assessment and rehabilitation services not only focus on the worker's condition, but work programs have become aware of the significant influence that the workplace has on prevention of injuries, rate of recovery from injury, and integration back to productive employment. This is further emphasized by the high number of work programs offering on-site services to employers. Independent providers are gaining access to businesses in order to treat employees with work-related injuries on-site. A Workplace Rehabilitation and Wellness Clinic at the Pillette Road Truck Assembly Plant in Windsor, Ontario, has given providers an opportunity for employees who experience injuries to obtain immediate rehabilitation through a program established by Toula Reppas, PT, and Judy Gelman, PT/OT in 1999 called Physiotherapy Active Treatment Towards Health (PATH). Pillette Road is a 920,000-sq-ft facility that consist of more than 2,0000 employees who obtain injury to shoulder, elbow, hand, and back secondary to assembly-type work (Sadusky, 1999). The PATH program is staffed with two on-site

physical therapists along with the industrial physician and ergonomist. Together, these individuals provide treatment and work modifications to reduce work related injuries within the company. Employee and employer benefited from these services in that employees are treated for injuries earlier and employers gained productivity by reducing lost work days and attendant costs. PATH research conducted at other clinics concluded that 90% of patients treated in the rehabilitation program returned to full-time work in an average recovery time of 6 weeks, at an average cost of \$1,000 per patient, providing cost-effective and competitive services (Sadusky, 1999).

Programs such as work hardening and work conditioning provide services to employees that are not quite ready to return to part-time or full-time duties. Both programs possess components of cardiovascular fitness, strengthening and work simulation. However, they take different approaches with similar end goals to return the worker to full duty as quickly, safely and efficiently as possible.

Work conditioning uses strengthening and conditioning tasks to restore function. Work conditioning is an enhancement of the medical model's conditioning program that allows the individual to participate in job task simulation (Gould, 1995). For example, a worker lifting a 20 lb box at work will lift the box in spurts to a cart or table within an eight hour workday. Time spent within the work simulation is increased as the worker improves strength and condition. This program is implemented in individualized hourly sessions for up to five days a week that may last one to three months depending on the severity of injury. An initial evaluation is conducted in order to gather baseline information and functional data about the worker's physical abilities. The therapist analyzes manual material handling, determines positional tolerances, gathers grip

measurements and conducts a metabolic equivalence test. Harrison (2003) explains that workers with deficiencies in strength and endurance can lead to other injuries such as back strains, meniscus knee tears or a rotator cuff tear. Workers with altering basic mechanisms of accomplishing tasks are more likely to be at risk of re-injury. Therefore, education consisting of instruction on proper body mechanics and manual material handling can reduce occurrence.

Work hardening is designed to gradually strengthen and condition the worker to maximum possible function (Gould, 1995). This approach is intended to minimize the risk of re-injury when the worker returns to work. Workers attend daily sessions for four consecutive hours during the first week. With each week of progress, one hour is added to daily sessions until the worker is able to complete full shift duties. Work hardening focuses on the functional aspects of a job (Harrison, 2003). These sessions consist of work simulation tasks, with small components of strength and conditioning. This option is appropriate for workers who can't tolerate various positions or job demands, but who also lack strength and endurance. Work hardening programs are individualized to each worker based on the results identified by the functional capacity assessment.

A functional capacity assessment (FCA) evaluation is completed in order to measure, record, and analyze a person's ability to safely perform a number of job-related functions, such as lifting, lowering, pushing, pulling and carrying weights, climbing stairs, sitting, bending, stooping, crouching, kneeling, crawling, and grasping (Key, 1995). According to Key (1995), functional capacity assessment's role in industrial therapy has been steadily growing in importance in recent years for practitioners. The FCA has enabled therapists to provide quantitative support for maintaining and

expanding the therapists' involvement in industrial therapy. Through use of the FCA, industries are able to increase return-to-work percentages, reduce reinjury rates, and yield short and long term cost reductions. The assessment results determine a worker's safety level for purposes of job placement, injury prevention, and rehabilitation. Deficiencies in areas of job tasks are then focused upon and treated during work simulation tasks and educational programs.

Ergonomic Education

Educational instruction is an important aspect of ergonomics. Education enables employers and employees to be familiar with terms, identifying and distinguishing dangerous outcomes that may prohibit participation in work tasks. It also provides the opportunity for new and senior employees to continue learning routines essential for safety.

Employees that educate their employees about ergonomics, prevention of injury and safety improve employee productivity and job performance. Melnik (2000) suggests that successful education requires having a process in place that evaluates, reinforces, and encourages the integration and experience of new information. The practitioner helps employees recognize changing behaviors in order to develop or improve acquired new skills. Education provides information about proper body mechanics and manual material handling. The therapist also educates the worker about the affects of injury during activities of daily living. The education process allows companies to implement an on-going ergonomic plan, instead of a once-a-year seminar, that reduces the cost of injury.

Deficiencies in education on proper lifting and handling techniques, workstation design, and job performance can increase the likelihood of worker injury. For example, an employee who twists at the trunk may severely injure the back, leaving the worker with lost time and wages. In order to reduce back injuries, educational instruction on proper techniques for lifting and handling packages should be implemented. When lifting, the back should be kept straight; feet shoulder width apart; the knees should be bent to a comfortable level with the legs exerting the lifting force; and the package should be kept close to the body. Twisting and bending the trunk, while transferring packages, should be done independent of each other. According to the US National Institute for Occupational Safety and Health (Waters, Putz-Anderson & Fine, 1993), 50 pounds is the maximum load that can be handled safely by the majority of the workforce. This is considered a 'somewhat heavy' load and can be handled by only 43% of the worker population. According to FedEx Express: Your Safety Handbook (November, 2002), a maximum of 75 pounds can be handled by each person. Therefore, workers and their employers should be cautious in interpreting the perception of handling a safe load among workers while performing their duties.

Education on repetitive motion and extreme loading can reduce the incidence of trauma or deformity to musculoskeletal derived from added stress/compression on stabilizing structures (ligaments, muscles, and joints) during job participation (Dale, 2004). For example, a substantial drop from the back of a truck without any ramps or steps can lead to trauma such as, joint-compression, strained muscles, or torn ligaments. During deliveries, the drivers are frequently exiting and entering the vehicle while handling packages and/or transferring heavy packages through use of a hand truck.

According to Keyserling et al. (1999), installing ramps from the back of a truck will reduce the physical stress on the job. Biomechanical loads on musculoskeletal tissues will be decreased throughout the body through use of ramps. Many employers try to prevent injuries at their work setting by educating workers on the benefits of utilizing lumbosacral support belts during lifting. Marras et al.,(1993) determined that the support minimizes the load movement by reducing the horizontal movement of the trunk and reducing the sagittal range of motion of the trunk. However, according to Hackney (2001), the use of a lumbosacral support belt does not necessarily generate “good body mechanics.” Hackney’s concluded that wearing the support the conventional way did not achieve a statistically significant difference and that using an elastic lumbosacral support influences only a small reduction in the calculated maximum compression directed to the lumbar five-sacral one joint while lifting due to its affect on lifting posture. The lifting techniques used by the participants actually accounted for a greater amount of difference on compression than did the belt (Hackney, 2001). Previous studies conducted by Wassell, Garnder, Landsittel, Johnston, & Johnston (2000) and van Poppel, Koes, Van der Ploeg, Smid, & Bouter (1998) also demonstrate the inefficacy of back belts to reduce back pain and injury. Therefore, education on proper body mechanics during lifting should be the primary target rather than use of lumbosacral belts.

Occupational therapists educate regarding the significance for proper ergonomic workstation design in offices and industries to employers and employees in order to prevent workplace injuries and increase worker productivity (Fassbender, 1996). Workstations or frequently-used equipment and controls should be located within comfortable reach for the worker. Frequently-used supplies should be placed within arms

reach in order to reduce fatigue and strain. Sanders (2004) explains that reach distances in front of the body should be approximately 17 to 18 inches, depending on the person's body size and whether he or she is standing or sitting. Reach distances are measured from the shoulder to hand while grasp distances are measured from the elbow to hand. Tasks that require hand grasp should be reduced by 2 inches (5 cm) in order to keep proper alignment of the body during functional use of equipment. Kroemer & Grandjean (2001) support these identified distances for reaching and grasping from a seated workstation in order to reduce muscle fatigue and allow optimal occupational performance between the workstation and person.

Footwear is a major concern for many employees, especially those who are consistently on their feet throughout the work day. Employee education on proper footwear and gait patterns can decrease the incidence of foot deformity and permit participation in job tasks. According to the American Academy of Orthopedic Surgeons (2004), one in six persons in the U.S. has a foot problem in relation to improperly-fitting shoes. These foot disorders can lead to other musculoskeletal problems, such as lower back pain, leg pain, and knee pain. For example, hyper-pronation, is a common biomechanical problem that occurs in the walking process when a person's medial longitudinal arch collapses upon weight bearing causing severe discomfort and leading to other foot problems (Stovitz & Coetzee, 2004). Without properly supported arches, even walking can pull the body out of alignment and cause painful stress, strain, and fatigue of the lower extremities. A review of literature conducted by Razeghi and Butt (2000) indicated the effectiveness of an orthosis on aligning the orientation and movement of lower extremity structures thus reducing the degree of abnormal pronation and

deformities. A previous study conducted by Mundermann, Nigg, Humble, & Stefanyshyn (2004), suggests that placing a foot orthosis in a shoe may result in altered sensory feedback leading to positive changes in gait kinetics and muscle activation patterns. Therefore, education, evaluation of footwear and orthotic intervention may reduce the likelihood of injury to musculoskeletal structures.

Promotion of Ergonomics by Legislation

Legislation, such as the Ticket to Work and Work Incentives Improvement Act of 1999 (TTW, WIIA), have promoted opportunities in industrial rehabilitation. The Work Incentives Improvement Act portion of the legislation allows Supplemental Security Income (SSI) and Social Security Disability Insurance (SSDI) recipients to extend premium-free Medicare Part A coverage for approximately 6 years after they return to work. This extension creates a safety net for covered individuals to attempt returning to work and is anticipated to significantly increase the incentive for persons with disabilities to seek work. The Ticket to Work portion of the legislation and its Ticket to Work and Self-Sufficiency Program (TWSSP) gives SSI and SSDI beneficiaries a “ticket” in the form of a paper document to obtain vocational rehabilitation services, employment services, and other support services (including occupational therapy) from an employment network of their choice (Ruprecht, 2001, p. 1)].

The intent of the TWSSP is to enable individuals with disabilities to exert greater choice and control of the employment services and supports they receive, as well as to promote innovation and competition among agencies providing employment services for individuals with disabilities (Virginia Commonwealth University Rehabilitation Research and Training Center, 2000).

According to Ruprecht (2001), the occupational therapy profession is in a unique position to provide services to persons with disabilities who would like to return to work.

Occupational therapy's knowledge in areas of mobility, transportation, wheelchair evaluation, adaptive equipment, and cognitive and psychosocial functioning allow practitioners to implement their skills in areas of industrial rehabilitation (functional capacity evaluation, job analysis, and work conditioning).

Cost Benefits

Job- and people-specific ergonomic programs benefit business and industry in health and safety, quality of work life, and operation. Ergonomic programs help keep people at work longer and return people to work sooner following problems; keep the cost of health care down; and improve productivity, thereby making it a more competitive and financially stable employer (Fontana, 2002). In turn, employee morale and job satisfaction is strengthened leading to less turnover and absenteeism. A healthier workforce is established reducing medical and insurance costs for employers.

Ergonomic programs not only benefit large corporations but can be utilized for small businesses and corporations that lack funds. An Oklahoma nursing home facility cut work-related injuries by 75% and reduced lost work days even further by implementing a simple education program that targeted prevention of back injuries (Gourley, 2000). The facility held lectures and distributed videos and handouts to effect change.

Occupational Therapy and Ergonomics

The American Occupational Therapy Association (AOTA) supports and promotes involvement of occupational therapy practitioners in the development and provision of

health promotion and disease/disability prevention programs and services (Brownson & Scaffa, 2001). These health promotion and prevention programs and services primarily serve to prevent or reduce the incidence of illness, accidents, and injuries in the population; improve overall health and well-being of persons with illness or disability; and promote healthy living practices, social opportunities, and healthy communities, with respect for cross-cultural issues and concerns. Occupational therapy services are provided to clients who possess or are at risk for impairments, activity limitations, or participation restrictions.

The role of occupational therapy is to emphasize the importance of injury prevention and education at every level for promotion of good health and well-being (Melnik, 2000). Brownson & Scaffa (2001) describe three critical and unique roles for occupational therapy practitioners in promotion and disease/disability prevention. These roles allow occupational therapists to provide preventative services to reduce/inhibit injuries within an industry. The first role has to do with promoting a healthy lifestyle for all clients and their families. Occupational therapists promote a healthy lifestyle by educating and training clients to identify and utilize adaptive strategies that can reduce work-related injuries and prevent secondary disabilities. The second role describes the opportunity to complement existing health promotion efforts by adding the unique contribution of occupation to programs developed by experts in health education, nutrition, exercise, and so forth. Occupations important to the injured client encourage participation and reinforce continuation in rehabilitation. Finally, to be effective, intervention to health promotion requires a holistic approach that consists of the individual, group, organizational, and community level. The occupational therapist can

provide education and training about proper body mechanics for lifting or positioning techniques to the worker. As a group, the practitioners can provide musculoskeletal disease/disability prevention and management programs for workers. Organizationally, the practitioner can consult with industrial managers regarding the benefits of rest breaks, stress management, promoting ergonomically correct workstations, regular stretching, and proper body mechanics for employees. Practitioners can also educate the client in the importance of participating in special interest groups in the community, such as recreational centers and fitness centers, in order to stay active and healthy.

With these roles in mind, the profession of occupational therapy can be recognized as having the opportunity to apply their knowledge regarding ergonomics within industries. The Occupational Health and Safety Association (2004) defines a qualified professional as "...a person who possesses a recognized degree or professional credentials in ergonomics or a closely related allied field (such as human factors engineering) and who has demonstrated, through knowledge and experience, the ability to identify and recommend effective means of correction for ergonomic hazards in the workplace."

Occupational therapists are professionals who have training in injury prevention. King, PhD, OTR, FAOTA, an occupational therapy ergonomics professor at the University of Wisconsin-Milwaukee stated that, "Occupational therapy students get a good background in areas like anatomy, physiology, and human development, and...in work capacity, evaluation, and job analysis, and they certainly know how to treat work injuries (Gourley, 2000, p. 15)." This educational background provides occupational therapists with a solid foundation in factors that lead to work-related injuries.

Occupational therapists use ergonomic principles to provide educational programs and worksite analysis not only to rehabilitate workers with illness or injury but also to assist business and industry in organizing and designing the work place to prevent costly accidents and illnesses (Jacobs, 2003). While ergonomics is a multidisciplinary science, occupational therapy practitioners use their knowledge of the structure and function of the human body, the effects of illness and injury, the components of work, and interactions with the work environment to increase a person's involvement in safe and productive work (AOTA, 2000). The occupational therapy practitioner considers a variety of work-related factors, including the person's physiological, psychophysical, and biomechanical function. Occupational therapists also use their observational skills, training, and experience to conduct complex task analysis and assess the environmental factors affecting work performance. Other ways in which occupational therapy can assist persons with work-related performance deficits include activities to increase and improve general work behaviors and skills such as stress management and situational coping skills, education and instruction in injury prevention and use of proper body mechanics (Whitmore, 1997).

Occupational therapists not only have training in anatomy, physiology, kinesiology, pathology, and medical conditions, but are one of the few professions whose members truly understand and have training in performing activity analysis (Fontana, 2002). In essence, this educational background provides occupational therapists the opportunity to approach work-related injuries from both a biomechanical and behavioral standpoint. Therefore, one role of the occupational therapist in the ergonomics field is to offer cost-effective solutions that will benefit employees while supporting the employer's

goals and enhancing the bottom line (Fontana, 2002, p 15). The following is an example of behavioral solutions pertaining to ergonomics:

Task: Performing various lifting, pushing, or pulling activities or operating or riding in a motor vehicle over rough, off-road conditions.

Hazard: Without proper warm-up exercises, employees who are lifting, pushing, or pulling various objects of operating or riding in a motor vehicle on unpaved roads are at risk for pulling a back, shoulder, or extremity muscle. If a person weighing 200 pounds is sitting in a truck and has good lordotic posture, the pressure on the last three discs will be equivalent to roughly all of his or her body weight. If the person slumps, the pressure in the disc spaces increases to 150% of body weight. When operating a motor vehicle over unpaved area that are rutted and washed out, the jarring and jolting of the person's body will force the trunk and neck in many different directions quickly and suddenly. This movement will substantially increase the forces on the disc as the spine flexes. Although the force in this example of a 200 pound person will be below the 770 pounds NIOSH has identified as the risk threshold, over time this repeated "trauma" can result in the disc material loading to one side or the other, weaken the structure, and speed degenerative changes of the spine.

Abatement: Have the person stretch and warm up before starting the work-day and after any period of relative inactivity, including operating or riding in a motor vehicle over unpaved and rough terrain. Instruct employees in a general full-body warm up and stretching exercise program (Fontana, 2002, p16-17).

Industry has typically turned to engineers, safety, and design professionals to create work environments that increase worker productivity and engagement in job requirements. However, industry is often unaware that occupational therapy practitioners specializing in ergonomics are a valuable resource for creating healthy and safe work environments (Dahl, 1997). Skills that are acquired by occupational therapists can be implemented within an industry reducing the overall outcome of work-related injuries. Specific ergonomic services provided by occupational therapists include:

1. identification and elimination of accident and injury risk factors associated with repetition, force, fixed or awkward postures, poorly designed tool handles, heavy loads, distance, vibration, noise, extreme temperatures, poor lighting, psychosocial and other occupational stresses
2. analysis of essential job functions and job descriptions based on job tasks
3. design of post offer or pre-placement screening tests to determine candidate suitability
4. tool and equipment design and modification
5. education and training on injury prevention
6. workplace health and safety regulations
7. management of job related stress
8. determination of reasonable accommodations and worksite accessibility according to the Americans with Disabilities Act
9. recommendations on administrative and engineering controls to minimize injury and accident risk factors
10. consultation related to psychosocial adjustment in the workplace.

(AOTA, 2000)

In order to successfully implement an injury prevention program, the employee, management, and occupational therapist need to be involved in every level of prevention. A study conducted by Dale (2004) concluded that occupational therapy collaboration with managers in an industrial setting revealed the effectiveness of programs to improve safety and wellness for workers. Intervention within this study aimed at influencing the worker from an organizational level in order to reinforce

adoption of improved work habits. The goals of this type of program include: reducing the cost of work and non-work related disability; diminishing the amount of lost workdays and restricted days due to injury; decreasing the number of reported injuries from new and senior employees; and increasing productivity and employee morale and professionalism. Potential problems need to be addressed before severe injuries progress into a long-term debilitating injury. This may be achieved through comprehensive job site analysis, ergonomic modifications, job rotation, employee education, and work conditioning (Isernhagen, 2000). In order to be successful, the program's strategies need to be communicated openly and consistently, with involvement from all levels of corporate management. The program should be applicable to all positions within the company. To achieve an efficient program, the goals and outcomes should be measured periodically. Continuation, modification, or termination of the program can be made possible through these strategies and employee feedback (Ficca, 2003).

Theoretical Application

Three theoretical perspectives most often used in ergonomic occupational therapy include the Model of Human Occupation (MOHO), Biomechanical Frame of Reference, and Rehabilitative Frame of Reference. MOHO incorporates a systems view of the human being that indicates disengagement from occupations arising from problems encountered in volition, habituation, performance capacity, and the environment. The biomechanical frame of reference is used to treat individuals with activity limitation due to impairment in biomechanical body structure and function. The rehabilitative frame of

reference is the processes of helping a person with a disability perform competently in social roles and daily activities.

The Model of Human Occupation (MOHO) provides theory aimed at explaining aspects of healthy occupation and problems that arise in association with illness and disability (Forsyth & Kielhofner, 2003). Its concepts address the motivation for occupation, routine patterning of occupational behavior, nature of skilled performance, and influence of environment on occupation. MOHO is concerned with the person's occupational nature and their balance of work, play, and rest. It proposes how and why people engage in occupational roles. Meaningful occupation is seen as necessary for health. People engage in activities that maintain self, contribute productively to the social group and participate in playful events of their culture. People possess an innate urge to explore and master their environment which results in occupational behavior.

MOHO depicts the person in three components: volition, habituation, and performance capacity. Volition is the process by which a person is motivated to choose what they do. Habituation is the process whereby doing is organized into patterns and routines. Performance capacity refers both to the mental and physical abilities obtained through life experiences. Within industry, employees choose their actions while performing job tasks. They scan the area to employ a plan of action before transporting boxes or other job requirements. Through this choice they are able to experience and interpret what methods are safe, comfortable, and pain-free. Habituation organizes occupational behavior into the recurrent patterns of behavior that make up much of our daily routines (Forsyth & Kielhofner, 2003). Habituation regulates the patterned, familiar, and routine features of what we do. In industry, workers develop habits within

their role as a worker. Proper body mechanics is established by repetition of performing correct body alignment while transporting objects. Worker roles also establish the development of habituation during the performance of job tasks. An employee who delivers boxes may be identified by outsiders as a courier. However, the worker interprets their role as a professional who delivers packages on time with dignity. The capacity for performance is affected by the status of one's musculoskeletal, neurologic, cardiopulmonary, and other bodily systems that are used when performing tasks (Forsyth & Kielhofner, 2003). Performance also is dependent upon mental or cognitive abilities such as memory and planning. Through reduction of work-related injuries or musculoskeletal disorders, employees are able to perform work tasks more productively and efficiently.

The environment and occupational performance play a vital role in performance. The environment can be either a barrier or enabler to occupational performance. Occupational therapists can alter or modify workstations or equipment within the worker environment in order to reduce work-related injuries and musculoskeletal disorders. Education on adaptive strategies within the environment allows employees to carry out discrete purposeful actions that inhibit injury through utilization of these skills.

The biomechanical frame of reference is utilized with individuals that experience limitations during participation in tasks due to impairments in biomechanical body structures and function. A top-down approach is applied within this frame of reference in order to ensure that the relationship between specific biomechanical impairments and occupational performance are clear (Trombly, 1995). Treatment is aimed at reducing biomechanical impairments by applying mechanical principles of kinetics and kinematics

to the movement of the human body (Pedretti & Early, 2001). These mechanical principles deal with the way that forces acting on the body affect movement and equilibrium of the worker while transporting boxes from one location to another. This frame of reference addresses the effectiveness and results of utilizing proper body mechanics within industry. Methods of treatment in this model use principles of physics related to forces, levers, and torque. Examples of biomechanical techniques are joint measurement, muscle strength testing, kinetic activity, and therapeutic exercise. The purposes of the biomechanical methods are to assess specific physical limitations in range, strength, and endurance; restore function of range, strength and endurance; and reduce deformity. Biomechanical impairments can be corrected through varied treatment methods, such as adjunctive modalities, which prepare the client for engagement of occupational performance (Pedretti & Early, 2001). Implementations of transitional activities within the client's occupational performance ensure the reduction of limitations and allow workers to perform their specific job tasks efficiently and effectively.

The rehabilitative frame of reference embraces the philosophy of rehabilitation to enable a person with physical disability or chronic illness to achieve maximum function in the performance of daily activities (Seidel, 2003). When medical or surgical remediation of impairment is not possible, rehabilitation is the next intervention strategy (Hagedorn, 1997; Trombly, 1995). Rehabilitation emphasizes an individual's ability to perform or engage in occupation; therefore, the rehabilitative frame of reference focuses on compensatory methods, assistive devices, and environmental modifications to improve the individual's functional capacity in daily activities. Skilled observation allows the occupational therapist to evaluate factors associated with an individual's functional

status, including characteristics of physical and social environments in which the client functions; equipment and economic resources used by the client; levels of supervision and assistance available to the client; developmental expectations for the client's performance; motor, process and social interaction skills that are absent or are limiting a client's function (Seidel, 2003). This evaluation analysis provides the occupational therapy practitioner a holistic perspective of a client's function in areas of daily activities.

The rehabilitative frame of reference utilizes a client-centered approach which includes collaboration, process skills, and environment. Both the therapist and client must be able to establish a plan of intervention based on goals that are meaningful to the client. The client must be able to process new skills acquired through compensatory methods or assistive devices. This will influence the ability to learn and apply skills necessary for the engagement in daily activities. Finally, the environment needs to obtain necessary equipment, objects, support, and feedback systems that contribute to the client's commitment to change and that match the client's learning style.

Through utilization of these theoretical perspectives, occupational therapy is able to develop a protocol that will implement goals, objectives, and interventions for each employee in order to achieve adaptation and increase occupational performance.

Conclusion

Musculoskeletal disorders are becoming a problem for both industry and workers today. Musculoskeletal disorder or work-related injuries are a major contributor to increased absenteeism, workers' compensation costs, and employee turnover (Fontana, 2002). Ergonomics applies multidisciplinary, scientific information regarding human

abilities and limitations to the design of objects, systems and environments for safe, efficient, and comfortable human use.

The American Occupational therapy Association supports and promotes involvement of occupational therapy practitioners in the development and provision of health promotion and disease/disability prevention programs and services. Training and clinical experience enable occupational therapy practitioners to understand the physical, psychosocial and organizational environments as they relate to injury, prevention and ergonomics.

This scholarly project proposes an injury prevention program incorporating a full set of occupational therapy services (assessment, intervention, follow-up, and evaluation) to industries. Occupational therapy practitioners utilize theoretical perspectives to investigate the perceived ergonomic problems in industry and identify/incorporate ergonomics solutions that are meaningful to the individual client that positively influence productivity for the overall business. Assessments such job analysis, ergonomic report and functional capacity assessment allow occupational therapy practitioners to collect data, make observations, set goals, and recommend interventions. It is the successful implementation of both the occupational therapist and all levels of management to incorporate recommendations for ergonomics solutions to reduce or eliminate risk factors for musculoskeletal disorders that ultimately leads to creating a safer and healthier work environment.

Chapter three describes the methodology utilized in order to complete this scholarly project.

CHAPTER III

METHODOLOGY

This scholarly project was initiated through an interest regarding ergonomics and the implementation of occupational therapy services in an industrial setting. An extensive literature review was conducted obtaining relevant information on musculoskeletal disorders, ergonomics, and implementation of occupational therapy within the field of ergonomics in order to describe the need for occupational therapy services in an industrial setting. The literature review consisted of researching current refereed journal articles at the Harley French Medical Science Library on the University's campus, consulting textbooks on the topics of musculoskeletal disorders, ergonomics and examining occupational therapy assessments to develop a rationale for occupational therapy services. The business plan established for the industrial setting describes interventions that will reduce work-related injuries and improve employee productivity.

The following chapter describes a proposed business plan to implement occupational therapy services within an industrial setting.

CHAPTER IV

PRODUCT

The business plan was originally developed for the FedEx Corporation to provide the company with an alternative to dealing with work injuries. Although this was the original intent in design, the business plan is being presented as generic to broaden its functional application. The reader can take the generic business plan and modify it to meet their individual needs.

The business plan was designed to assist a therapist in marketing their programs and skills to industries that are faced with the problem work injuries. Historically industries have developed pre-employment ergonomic training programs that focus primarily on body mechanics. However, many companies have failed to develop a program that implements injury prevention within occupation, such as worksite redesign and job analysis. In addition to a prevention program, many companies do not have a basic rehabilitation program that focuses on job tasks. Many injured employees are rehabilitated through weight machines which is a one dimensional technique used to return employees back to work.

This business plan focuses on the applicability of Occupational therapy, which utilizes a holistic approach that fits the person within the environment through the design and implementation of an injury prevention program. It exposes the reader to the role of occupational therapy, mission, services, and objectives that can be utilized in order to prevent injuries within a company. Rehabilitation is provided utilizing a wide variety of interventions that slowly incorporates work tasks in order to prevent relapse of injury.

In order for implementation an injury prevention program within a company, the employees, management and occupational therapist need to be involved in every level of prevention. There are supportive statistics that indicate the presence and level of involvement contribute to the success of an injury prevention program. Individual company results can show an improvement in the safety and wellness for workers through evaluation of program outcomes.

A Generic Injury Prevention Program Business Plan Template
By
LUCIO INDUSTRIAL THERAPY

Our mission is to help your company provide a safe,
motivational, and health work environment.

Jose Lucio
Owner
3500 Ergoguy Way
Casper, Wyoming

Plan Prepared by: Jose Lucio
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Executive Summary

LUCIO INDUSTRIAL THERAPY is a company that contracts with corporations and agencies both profit and non-profit for the design, implementation and evaluation of injury prevention programs.

LUCIO INDUSTRIAL THERAPY has designed a generic business plan proposal template to use as a general guide for an industrial therapy company. This template can be individualized to design a business plan contract with an organization for the provision of an Injury Prevention Program.

LUCIO INDUSTRIAL THERAPY is based on two simple facts:

1. Healthy employees are more productive than chronically ill employees.
2. It costs less to prevent injuries or illnesses than to treat them after they occur.

At LUCIO INDUSTRIAL THERAPY, it is the belief that traditional approaches to the current health care issues in industry are misdirected. These traditional efforts are reactive in that typically services are not provided until after an injury or illness has occurred with an employee and then payment is made for the necessary treatments. We believe that prevention and early intervention is much more proactive, efficient and cost effective.

By implementing prevention and early intervention programs, LUCIO INDUSTRIAL THERAPY can contribute to lowering a company's health care expenditures, while raising worker productivity. Health care expenditures will decrease due to reduced medical insurance premiums, reduced absenteeism, reduced turnover

rates, reduced worker's compensation claims, reduced tardiness, shorter hospital stays and a faster return to work.

- 1) This program will work to ensure a safe, motivational, and healthy work environment for all Mountain Region FedEx employees through high quality occupational services focused on minimizing or eliminating work-related injuries. For success of this program, it is necessary to have complete collaboration of FedEx management and employees. Research demonstrates that commitment, at all levels, results in raising productivity, employee morale and professionalism while reducing lost wages and medical costs to this corporation (Dale, 2004). In summary, the primary goal of Lucio Industrial Therapy is to assist business and industry in organizing and designing the work place to prevent costly accidents and illnesses (Jacobs, 2003).

Jose Lucio will direct the provision of occupational therapy services to meet the needs of the company through the Injury Prevention Program. The owner, Jose Lucio, has a Master's of Occupational Therapy Degree from the University of North Dakota. Relevant educational preparation consisted of the completion of coursework focusing on administration/management, assistive technology and industrial therapy.

The basic package Lucio Industrial Therapy is proposing will include the following services: on-site services and intervention, 25 job analysis/per year, ergonomic assessments and interventions as needed, 3-5 in-services/quarter based on needs, work hardening and work conditioning as needed, functional job descriptions, and evaluation of program. The details of the proposed program are available on page forty-three.

The start-up costs are estimated at \$75,000.00 for the first year. A ten to twenty percent savings can occur within the first year of the implementation of the injury prevention program. The details of the areas of savings are expanded on within the business plan.

General Company Description

LUCIO INDUSTRIAL THERAPY is a company that offers and provides comprehensive occupational services (O.T.) to organizations and agencies both for profit and non-profit. The role of O.T, in an industrial setting, is to evaluate and design client oriented intervention to meet the needs of the corporation and its employees.

LUCIO INDUSTRIAL THERAPY specialty area is in industrial therapy. Our philosophy is based on the belief that healthy employees are more productive and efficient.

Our mission is to provide high quality services to meet the individual and collective needs of those we serve ensuring a safe, motivational and healthy work environment. We believe in prompt response, efficiency, effectiveness, strong communication and collaboration focusing on the end goal of minimizing or eliminating work related injuries and reducing the overall costs of lost wages and medical intervention.

Our primary goal is to assist business and industry in organizing and designing the work place to prevent costly accidents and illnesses (Jacobs, 2003). Our objectives to meet the goal include:

- 1) Evaluate the current status of the organization to determine; a) immediate needs, b) short term needs (1 year time span) and c) long term needs (2-5) years.
- 2) To design and implement a high quality program that specifically meets the needs of the organization and its employees that are efficient and effective.

- 3) To monitor the process and outcomes of the program to ensure effectiveness, identify hidden needs, identify fiscal savings and ensure continued attainment of goals.
- 4) Create an injury-free work environment that promotes increased productivity, positive health work attitudes and a positive team environment.
- 5) All job positions will have a job analysis completed within three years resulting in a functional job description.

The major competitive strength that this company can offer to a company, via the proposed contract, is in the ability to provide client-centered and occupation-based services. Lucio Industrial Therapy will also have the flexibility to travel within the company's in order to serve the employees within all company's facilities.

This business is a sole proprietor ownership by its founder, Jose Lucio. As the business operation grows, the owner will consider re-registering as a limited liability company or as a corporation depending on the overall benefit for the company's future needs. Additional personnel will be added as needed.

Products and Services

LUCIO INDUSTRIAL THERAPY provides the following services:

Assessment

1. **Job Analysis:** utilizes the principles of ergonomics to analyze the components of a job for a particular employee. It is frequently performed as part of the treatment of an injured worker or to prevent injuries in the development of a functional job description.
2. **Ergonomic Assessment:** to provide comprehensive assessment services to determine vocational potential for safe, low-risk employment, whether for initial job assignment, or return to work post injury.
3. **Functional Capacity Evaluation:** to provide evaluation services to determine an individual's functional capacity and work tolerance capability to return to work. Upon completion of an evaluation, intervention will be designed to meet the specific needs of the individual and/or the work process.

Education and Intervention: to provide education and injury prevention services to industry.

1. **Education Modules on:**
 - Strategies to reduce work-related injuries that will include ergonomic principles, joint protection principles, and equipment modifications.
 - Injury prevention
2. **Work Conditioning/Work-Hardening Programs** for employees requiring additional intervention. Both work conditioning and work hardening are rehabilitative systems that address specific aspects of the individual for the return

to work process. Employees within these programs will participate in strengthening/conditioning tasks and simulated work in order to restore function in job tasks, safely and efficiently.

- Work hardening is designed to gradually strengthen and condition the worker to maximum possible function. This measured approach is intended to minimize the risk of reinjury that would be present when the worker returns to work (Gould, 1995).
 - Work conditioning uses strengthening and conditioning tasks to restore function. This program focuses its activities to simulate job requirements in a controlled environment. This provides the opportunity for the occupational therapist to observe, modify, correct and reinforce ergonomic principles during simulation of job tasks. The work conditioning program goal is to advance the injured worker towards restored function, an end point that simulates the size of the load, the positions in which the load is required to be moved, and the pace at which the tasks are expected to be accomplished (Gould, 1995).
3. Follow-up: Once the client is back to work, at maximum activity level, the occupational therapist will provide follow-up services for at least 30 days to assure the stability, productivity and safety of the worker.
- The therapist will provide an interview with the returned worker and discuss any concerns that may elicit job performance.
4. Functional Job Descriptions: job analysis is performed for the purpose of delineating the job duties, critical tasks. A functional job analysis is used for the

purpose of delineating the job duties, critical tasks, physical demands, and any special considerations of a specific job. This is essential in complying with the ADA.

5. Ergonomic Interventions based on the needs of the employee to ensure safety while maximizing their productivity.
 - A. Acute management: appropriate early intervention often returns workers to their job without additional rehabilitation.
 - B. Sub-acute management: focus is on work conditioning if worker cannot return to work due to unresolved physical problems.
 - C. Chronic management: for those limited number of workers with significant injury who may require an interdisciplinary program to return them to work or provide case closure.
6. Discharge: from the injury prevention program will be assessed through documentation provided by occupational therapy, which include employee attendance record, job performance, physical compatibility with the job, risk factors, and safety measures.

Outcome Management: The expected outcomes resulting from implementation of this injury prevention program will improve and enhance occupational performance, client satisfaction, role competence, prevention, and promotion of health and wellness.

Employers will be able to increase productivity and professionalism of the worker while reducing costs related to injuries. Outcome Management will utilize data collected via observation, review of records, interviews, follow up assessments/reviews and the OSHA 300 logs.

Outcome Management will be conducted utilizing data collected via observation, review of records, interviews, follow up assessments/reviews and the OSHA 300 logs. The purpose is to monitor the process and outcomes of the program to ensure effectiveness, identify hidden needs, identify fiscal savings and ensure continued attainment of goals.

Outcomes will be assessed by:

1. The rate of success to return workers back to their jobs without recidivism.
2. Client satisfaction with the prevention program will also determine the success for implementation at the company.
3. One hundred percent of the company's employees will participate and gain awareness of all aspects of the program.
4. Ninety-eight percent of employees injured at work will return to work duties in a functional capacity within one month of injury.
5. All job positions will have a job analysis completed within three years resulting in a functional job description.

Marketing Plan

Service Business Analysis

Injury Prevention Services is an industry typically providing a limited line of services through hospitals and privately owned businesses. Currently, the primary preference of most industrial therapy companies is to provide services within a facility that is not located at the industry site. This requires employees to leave work in order to access and obtain services. LUCIO INDUSTRIAL THERAPY is unique in that we are willing to travel to the industrial site in order to provide injury prevention services within the industrial environment.

Market Analysis Summary

We are witnessing what has been termed an “industrial epidemic,” which is an overwhelming increase in reports of work-related disorders that affect not only industry productivity and labor costs but also the quality of workers’ lives (Sanders, 2004). Musculoskeletal disorders cost American businesses \$20 billion per year in lost medical wage benefits and medical costs (Whitmore, 1997). Many business leaders, corporations, and legislators claim that not enough studies have been conducted to conclusively prove that occupational hazards cause musculoskeletal disorders that lead to work-related injuries (Gourley, 2000). However, the National Institute for Occupational Safety and Health (NIOSH, 1997) has found that certain jobs or working conditions containing repetitive, forceful, or prolonged hand movement; frequent heavy lifting, pushing, or pulling; or prolonged awkward postures, contribute to musculoskeletal disorders. According to the U.S. Department of Labor Bureau of Labor Statistics (2000), 1.5 million workdays were missed resulting from work-related injuries in 2002. Four out of every

ten lost-workday injuries and illnesses were from sprains, strains and tears, occurring mostly in the back (OSHA, 2004). The main cause of work-related injuries that occurred in the musculoskeleton resulted from overexertion of physical load handling (Genaidy et al., 1998). Other identifiable factors resulted from twisting motions, poor sitting posture, vibration from automobiles, static standing positions, and poor bending and lifting techniques. Falls on the job site are the third leading cause of disabling work injuries in the United States, representing 17% of lost time in workers' compensation cases across all occupational titles (Keyserling, Monroe, Woolley, & Ulin, 1999). Truck drivers, health care workers, and laborer and non-construction workers comprised the top three high risk populations for work-related musculoskeletal disorder. These injuries result in decreased profitability and an inability to compete with competitors. It is estimated that 90% of America's workers will be affected by a musculoskeletal disorder sometime in their lives (Whitmore, 1997). Therefore, job- and people-specific injury prevention programs benefit business and industry in health and safety, quality of work life, and operation.

There are generic barriers that may affect the entry of LUCIO INDUSTRIAL THERAPY within a company that may include: a) the inability to attain management commitment to proposed program, b) the inability to attain acceptable compromise to services, products and/or budget and c) consumer acceptance that LUCIO INDUSTRIAL THERAPY will reduce medical and lost wage costs, and training. However, LUCIO INDUSTRIAL THERAPY can overcome these barriers by providing research from previous studies that indicate injury prevention programs do lower costs and increase productivity. Another way to overcome these barriers is to conduct a study at the

company, by providing services within a time frame, and concluding how and where occupational therapy services are beneficial to the company. Through establishing a rapport with management and employees the barrier of non-compliance will be minimized or eliminated with to facilitate successful implementation of an injury prevention program. In addition to the primary issues of employee health, safety and fiscal costs, it is also important to stay abreast of governmental regulations as described by OSHA. LUCIO INDUSTRIAL THERAPY will keep updated with such changes and adapt its services to proactively meet requirements established by OSHA and ensure continued compliance by your organization.

Product

The benefit that customers gain from participating in this prevention program include: increased productivity, professionalism, and morale; quicker recovery rates from injury efficiently and safely; education in identifying risk factors and initiating compensatory strategies to stay healthy; and modification to equipment and environment in order to enhance job performance. On site delivery of services will ascertain that the employees recover from on site injuries with a quicker response time. They will not have to obtain time off from work and the company will decrease the amount of worker's compensation distributed when employees are injured. Follow up and education will also help employees increase productivity and professionalism while performing job tasks. Employee moral will strengthen with the attitude that the company is invested in ensuring that they receive prompt services when injured. Modifications to equipment and the environment will enhance performance of job tasks. Employees will be able to implement strategies during job tasks in order to decrease the amount of strain placed on

the musculoskeletal and limit the amount of injuries received. Employees will be able to work effectively with energy conservation techniques secondary to modifications to equipment. All in all, both parties prosper for future investment.

Customers

Our customers are currently profit and non-profit organizations within the state of Wyoming. The general state population is about 493,782 people. The types of industry include: truck transportation, construction, wood manufacturing, mining, oil corporations, couriers, rail transportation, and metal transportation. These industries are prospective customers for injury prevention services within the state of Wyoming.

Competition

There are currently two other businesses that provide occupational based injury prevention services within the state of Wyoming. These businesses are; Ivinson Memorial Hospital and Rehabilitation Services and OCCUMED. In the following table a competitive analysis has been conducted to identify the strengths and weaknesses of the two businesses in comparison to LUCIO INDUSTRIAL THERAPY.

Table 1: Competitive Analysis of LUCIO INDUSTRIAL THERAPY and other businesses that provide injury prevention programs

| Factor | LUCIO INDUSTRIAL THERAPY | Strength | Weakness | Ivinson Memorial Hospital Rehabilitation Services | OCCUMED | Importance to Customer |
|----------|--|---|----------|--|--|------------------------|
| Products | Functional capacity assessments, job-site analysis, ergonomic assessment, intervention, follow-up and evaluation of program outcomes, work hardening and conditioning, on-site services, education, equipment modification | This is a strength because we offer more services | | back/neck specialist, work injury rehabilitation, back school and ergonomic programs, functional capacity assessments, and job-site analysis | post-injury and pre-placement screening, job task analysis, functional capacity evaluation, Ergonomic assessment, light duty assessment, and safety training | Very Important |
| Price | Per Assessment FCA: \$2,500 - \$3,500 Job Analysis & Placement: \$1,000-\$1,500 Education & Prevention: | Competitive prices | | Per Assessment FCA: \$2,600-\$3,600 Job-site analysis: \$2,500-\$3,200 Work injury rehabilitation: | Per Assessment FCA: \$2,400-\$3,300 Post-injury & pre-placement screening: \$7,000-\$12,000 Job task analysis: \$1,500- | Very Important |

| Factor | LUCIO INDUSTRIAL THERAPY | Strength | Weakness | Ivinson Memorial Hospital Rehabilitation Services | OCCUMED | Importance to Customer |
|--------------------|---|----------------------------|---|---|--|------------------------|
| | \$2,500-\$3,000 Work Hardening & Conditioning: \$5,000-\$8,000 | | | \$3,000-\$8,000 Back school & ergonomic programs: \$6,000-\$10,000 | \$2,000 Ergonomic assessment: \$1,500-\$2,200 Light duty assessment: \$1,500-\$2,200 Safety training: \$3,000 | |
| Quality | Professional services | Equal services | | Professional services | Professional services | Very Important |
| Selection | Occupational therapy | | One dimensional selection | Occupational therapy, physical therapy, back/neck specialist, doctor | Occupational therapy, physical therapy, doctor | Very Important |
| Service | Ergonomic & Rehabilitation | Equal service provided | | Rehabilitation hospital | Ergonomic & Rehabilitation | Somewhat Important |
| Stability | Start-up company | | New company | Experienced company | Experienced company | Important |
| Expertise | Occupational therapy | | Limited expertise | Back/neck specialist, occupational therapy, physical therapy, medical doctors | Occupational therapy, physical therapy | Very Important |
| Company Reputation | Newly formed company | | New company | Well-known company that provides quality services | Company that provides quality services | Very Important |
| Location | Main offices located in Casper, WY | On-site | | Laramie, WY | Riverton, WY | Somewhat Important |
| Appearance | Proposed business would be located at FedEx for 3 years | Newly established facility | | Hospital | Local business | Somewhat Important |
| Sales Method | Yellow pages, Internet, Newspaper | | Limited to the FedEx Corporation | Yellow pages | Yellow pages | Important |
| Credit Policies | Pay per contract agreement | | Based upon contract agreement | 30 day | 30 day | Important |
| Advertising | Newspaper, internet, yellow pages, radio, television, billboards | More advertisement | | Internet, yellow pages | Internet, yellow pages | Important |
| Image | Provide quality occupational therapy rehabilitation services to clients | | New establishment, has not yet built an image like the other companies. | Work specific with injuries to return the client to work | Assess the client and determine their functional abilities | Very Important |

As indicated in the table, LUCIO INDUSTRIAL THERAPY is a new company that has not yet developed a reputation or image that the other companies have obtained. However, LUCIO INDUSTRIAL THERAPY will provide up-to-date interventions and services based upon that fact that the owner is a new graduate in the occupational therapy

profession. LUCIO INDUSTRIAL THERAPY has an advantage over the other companies in that services will be provided on-site. Major disadvantages to LUCIO INDUSTRIAL THERAPY are that the service selection is limited to only occupational therapy and limited experience within industrial ergonomics.

Niche

By providing a complete range of injury prevention services, LUCIO INDUSTRIAL THERAPY will be able to offer its customers the satisfaction of obtaining a holistic ergonomic and rehabilitative approach to developing an injury-free and safe environment for your company.

LUCIO INDUSTRIAL THERAPY's niche is that we provide on-site services for FedEx employees. This is a benefit for a company in that it reduces time away from work for FedEx employees by providing easier access to injury prevention services. LUCIO INDUSTRIAL THERAPY is also based on the belief that the services we provide will raise worker productivity and lower overall injury-related costs for employers. By developing and providing client-centered and occupation-based intervention, LUCIO INDUSTRIAL THERAPY will develop a respected reputation for quality customer service.

LUCIO INDUSTRIAL THERAPY services are implemented in conjunction with managers, supervisors, employees, safety and health, and engineering staff at every level of prevention in order to implement ergonomics within an injury prevention program. A written plan with a statement of management commitment, goals, responsibilities and time line for implementation will be developed through active participation. In order to be successful, the program's strategies need to be communicated openly and consistently,

with involvement from all levels of corporate management. To achieve an efficient program, the goals and outcomes will be measured periodically determining continuation, modification, or termination of the program.

Market Strategy

LUCIO INDUSTRIAL THERAPY will offer a strategy of injury prevention and intervention to employees of your company. Information based upon this injury prevention program will be placed in the company's employee bulletin and newsletter. LUCIO INDUSTRIAL THERAPY will also provide information tents on tables and posters on walls. The primary strategy is client-centered in which occupational therapy services will focus on a 1:1 (employee: therapist) ratio providing services in education, training, and assistance. Unlike other rehabilitative service providers, LUCIO INDUSTRIAL THERAPY will offer its services on-site which will allow occupational therapy to fit the person to the environment. Follow-up appointments will allow LUCIO INDUSTRIAL THERAPY to evaluate the effectiveness of the injury prevention program implemented within the company. Pricing will be based upon a competitive wage from other companies offering the same services within Wyoming. As a result, the cost rate of injury will be reduced allowing the company an additional competitive edge.

Operational Plan

Production

Services are based on the expertise and knowledge of injury prevention provided by occupational therapy. All services will be conducted within the on-site facility established within your company. Employees will have the opportunity to complete a customer service survey that will allow both the employee and LUCIO INDUSTRIAL THERAPY to determine the quality of services provided.

Company Locations and Facilities

The space on-site is estimated to be 3,000 sq-ft consisting of equipment required for day to day operations, such as a computer, library index, assessments and interventions, rehabilitation equipment, etc. A dedicated fax line and high speed internet will be installed within the office. A cell phone will be used as the company phone in order to service customers efficiently.

The space acquired will contain all equipment necessary to complete assessments and interventions. Portable equipment will be purchased so that LUCIO INDUSTRIAL THERAPY can access all facilities within the company's region. LUCIO INDUSTRIAL THERAPY will purchase a van to enable the transportation of equipment necessary for implementation of services. Operational hours will be staggered Monday through Friday in order to meet the needs for day and night shifts.

Legal Environment

LUCIO INDUSTRIAL THERAPY will stay abreast and proactively deal with legal issues related to workers compensation, occupational safety and health administration and company. A lawyer representing LUCIO INDUSTRIAL THERAPY

will ensure that LUCIO INDUSTRIAL THERAPY is abiding by regulation laws and standards developed by OSHA and workers compensation. A liability disclaimer for improper use of equipment by employees will be developed to ensure the safety of LUCIO INDUSTRIAL THERAPY. The occupational therapist will obtain practitioner licensure and malpractice/liability insurance to ensure the safety of the services provided to employees.

Personnel

LUCIO INDUSTRIAL THERAPY will be operated by the owner who will provide skilled occupational therapy services. The pay structure will be based on the operational needs in order to sustain services provided by LUCIO INDUSTRIAL THERAPY. Requirements in order to practice within industrial ergonomics include a Master's degree from an accredited university or college, and licensure within the occupational therapy profession. The owner will attend continued education credits within the field of industrial ergonomics and later obtain certification in professional ergonomics. In order to meet requirements for certification, the practitioner will need to have at least four years of work experience in ergonomics and submit a work product that demonstrates the capability to apply ergonomic principles to the design of the product, system, or work environment.

Inventory

Materials and supplies that will need to be kept on hand will include assessments, rehabilitation equipment, therabands, splinting supplies, copy supplies, and office supplies. Average value in stock will be 25% of the profit accumulated upon production of LUCIO INDUSTRIAL THERAPY. Seasonal buildups will determine the amount of

inventory needed secondary to weather/seasonal changes. Winter months may consist of more injuries which may require an increase in equipment maintenance.

Suppliers

- Office Max for copy supplies and office supplies – website allows customers to order supplies with free delivery.
- Valpar International Corporation for work-related assessments – provides a list of products for work-related assessments via phone order.
- MedPlus International for rehabilitation supplies – catalog provides description of items. Delivery available within 5-7 business days.

Management and Organization

Management Summary

LUCIO INDUSTRIAL THERAPY is currently a small organization headed by one individual. This individual is not only the CEO/Director of Sales and Marketing but is also responsible for directing injury prevention programs, finance and administration issues. The CEO obtains a Master's of Occupational Therapy degree with background in administration and management. The owner is currently obtaining certification in industrial ergonomics.

The gaps for management of LUCIO INDUSTRIAL THERAPY include:

- Limited experience in providing injury prevention services within industry. This gap will be addressed by continued education/training in the ergonomics field for all direct service personnel, as well as establishment of a mentor relationship with a therapist established in the field.
- Minimal expertise in areas of finance and accounting. This gap will be addressed by the hiring of an accountant to handle the accounting and financial aspects of the business and a lawyer to provide legal advice.

Fiscal Expenses & Expenditures

The company founder, Jose Lucio, will handle day-to-day operations of the plan and will ensure that this business venture is a success.

The start-up costs for the contract are estimated at \$75,000.00 which includes: therapists time, purchase of supplies, rehabilitation equipment, assessments and evaluations, onsite office/department set up which will remain the company's property if the contract should not continue, computer equipment, work hardening and conditioning, follow-up and functional job descriptions based upon the employees' duties.

Industrial investment of this injury prevention program will improve and enhance occupational performance and health and wellness which in return will lead to increased productivity/professionalism of the worker while reducing workman's compensation costs, missed work days and insurance rates to industry.

CHAPTER V

SUMMARY

According to Jacobs (2003), occupational therapists use ergonomic principles to provide products such as educational programs and worksite analysis not only to rehabilitate workers with illness or injury but also to assist business and industry in organizing and designing the work place to prevent costly accidents and illnesses. An industrial occupational therapist is qualified to implement an injury prevention program in order to reduce work-related injuries, worker absenteeism, and workers' compensation claims. A business plan has been developed to address occupational therapy services applied within an injury-prevention program to include assessments, intervention, follow-up and evaluation of program outcomes to assure success.

LUCIO INDUSTRIAL THERAPY is a proposed company that would contract with corporations and agencies, both profit and non-profit, for the design, implementation and evaluation of injury prevention programs. The product or services that Lucio Industrial Therapy seeks to provide includes: work conditioning, work hardening, education on ergonomics, joint protection principles and strategies, ergonomic assessment, equipment modifications, job analysis, and functional capacity assessments.

The mission is to ensure a safe, motivational, and healthy work environment for all Mountain Region FedEx employees through high quality occupational services focused on minimizing or eliminating work-related injuries. For success of this program, it is necessary to have complete collaboration of FedEx management and employees (Dale, 2004). Objectives and outcome criteria will be evaluated periodically to determine the effectiveness and success of the program, which will determine any

necessary modifications. It is the successful implementation of recommendations for injury prevention to reduce or eliminate risk factors for musculoskeletal disorders that ultimately leads the organization into creating a safer, healthier work environment.

Limitations and Recommendations

A major limitation within this project is the fact that the proposed business plan has not yet been implemented. Another limitation is that industries are unaware of the services offered by occupational therapists within an injury prevention program. It is recommended that this scholarly project be presented to the FedEx Corporation in order to determine interest in its implementation and evaluate the proposed outcomes of the business plan. A second recommendation is to market occupational therapy services to industries (i.e. displaying information pamphlets at industrial conventions). In conclusion, it is important for industry to understand and capitalize on the value that occupational therapy services offers for the employees and overall growth of the company.

APPENDICES

APPENDIX A

Types of Injuries That Have Occurred In the FedEx Mountain District, 2004.

| | |
|--------------------------|----|
| Loading/Sort/Handling | 8 |
| Caught in Between | 5 |
| Lifting/Strain | 2 |
| Enter/Exit/Walking | 7 |
| Struck By/Against Object | 15 |
| Slip/Fall | 12 |
| Vehicle Accident | 4 |
| Illness | 4 |
| TOTAL INJURIES | 57 |

(used with permission from David Foster, Senior Safety SPC/Field)

APPENDIX B

FedEx Employee Body Part Injured within the Mountain District, 2004.

| | |
|----------------------|----|
| Head/Teeth/Face/Neck | 8 |
| Arm/Shoulder/Elbow | 3 |
| Back | 15 |
| Knee | 4 |
| Foot/Ankle | 8 |
| Toe | 0 |
| Chest/Abdomen | 3 |
| Hand/Wrist/Finger | 6 |
| Groin | 1 |
| Leg/Thigh/Hip | 9 |
| Nervous/Respiratory | 0 |
| Eye | 0 |
| TOTAL INJURIES | 57 |

(used with permission from David Foster, Senior Safety SPC/Field)

APPENDIX C

FedEx Employee Nature of Injury within the Mountain District, 2004.

| | |
|------------------------|----|
| Hernia | 0 |
| Fracture | 2 |
| Irritation/Rash | 0 |
| Puncture/Bite | 2 |
| Pulled Muscle | 0 |
| Laceration/Abrasion | 5 |
| Soreness | 17 |
| Bruise/Contusion/Crush | 9 |
| Sprain/Strain | 19 |
| Loss of Motion | 3 |
| TOTAL INJURIES | 57 |

(used with permission from David Foster, Senior Safety SPC/Field)

APPENDIX D

FedEx Employee Agency of Injury within the Mountain District, 2004.

| | |
|--------------------------|----|
| Animal/Insect | 1 |
| Hazardous Substance | 0 |
| Stairs/Steps | 0 |
| Weather Related | 1 |
| Floor/Ground | 7 |
| Bodily Reaction | 3 |
| FXD/Moving Objects | 11 |
| Dock/Platform | 3 |
| Heavy Weight Cargo | 1 |
| Cargo Handling Equipment | 4 |
| Vehicle/Aircraft | 5 |
| Cargo | 21 |
| TOTAL INJURIES | 57 |

(used with permission from David Foster, Senior Safety SPC/Field)

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