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GETTING INJURED WORKERS BACK TO WORK: A DESCRIPTIVE STUDY
OF THE INTEGRATED WORK PROGRAM SUCCESS AT REHABILITATION
TECHNOLOGY WORKS

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Business Administration

by
Waldtraut Jedamski, M.D.

December 2001

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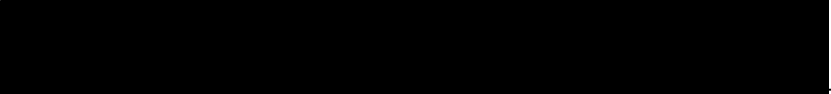
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ABSTRACT

Rehabilitation Technology Works is an aggressive rehabilitation center in Southern California. Their Integrated Work Program has had tremendous success. As managed care enters the Workmans' Compensation field, there will be more demand to demonstrate how it compares to other programs.

Success means early return to work and continued employment as well as a lack of re-injury. A major goal of the Integrated Work Program is to educate the worker on using better techniques to prevent future problems. If the worker continued to use what he had learned a year later, it is felt that this is a major advantage of the Integrated Work Program over traditional therapy. The study purpose was to show that RTW's program met these goals.

A descriptive study was devised with the use of a questionnaire to attempt to get employee feedback and control for some of the factors that influence successful return to work. It was very difficult to get the workers' trust enough to even participate. Many had been lost to follow up; others had limited recall, but all participants had strong feelings about the program. Because of the descriptive type nature of the study, no conclusions can

be made as to what really made it successful or how its success compares to other treatment modalities.

Inspite of the limitations, the study demonstrated continued use of what the therapists taught, most feeling a positive impact in their work and personal life. They invariably rated their therapist higher than any other aspect of their rehabilitation experience. The amount of involvement that the supervisors had in the recovery seemed minimal and it is concluded that this is one aspect where there could be a tremendous improvement.

It is hoped that this study will lead to a long-term cohort study, using a similar questionnaire. Only then can one make a conclusion as to how valuable the integrated work program is and what possibly could be done to improve it.

ACKNOWLEDGMENTS

Want to thank Linda Niemeyer, Ph.D., OTR for the help she was in this study. Her drive and inspiration is a tremendous asset to Rehabilitation Technology Works.

Want to thank Dr. Nabil Razzouk for his unending interest in the success of his students.

Want to thank my son, Kurt Hummel, for being so patient and understanding during all the times that I was not able to be there for him.

DEDICATION

This project is dedicated to my mother, Emilie Jedamski, who was such an inspiration to everyone during her life, especially by demonstrating how powerful and important the little things in life are. She was always there for me and her undying love will never be forgotten.

It is also dedicated to my father who helped mom in such an untiring way and never gave up.

And it is dedicated to my wonderful son, Kurt Hummel, who has been so patient and for whom I could not have more love.

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CHAPTER ONE

BACKGROUND

Introduction

In our global economy with the heightened sense of competition and acute awareness of the bottom line, it has become even more important than ever for business to be cognizant of how to keep their employees able to work. They are business' most valued assets and their welfare affects the health of all companies in a myriad of ways. Direct costs of injuries are enormous, but the indirect costs are usually four times as high (Snook & Webster, 1987) and are often forgotten.

It is in the best interest of business to do whatever it can to get the worker back to work as quickly as possible. How to accomplish this is not always easy to know, especially since there are different ways to define what constitutes successful return-to-work. What at first looks the most successful can, in a long-term outcome study, actually have the lowest overall employment rates for injured workers a year or more down the line. Also, the lowest costs up front do not always reflect the lowest cost to business.

A good work rehabilitation program provides a smooth transition between acute care and return to work while addressing the issues of safety, physical tolerances, work behaviors, and functional abilities. Rehabilitation Technology Works (referred to as RTW from here on out) is a large Rehabilitation Center located at 2195 Club Center Drive, Suite "G" in San Bernardino, California, and services the Inland Empire's injured workers with an aggressive program known as Integrated Work, a term they coined. There are other centers utilizing similar programs, but very little has been done to try to assess its success when compared to traditional therapies.

Statement of the Problem

Rehabilitation of the injured worker is everybody's business. If we do not do a good job of getting them back to work quickly the costs will eventually be passed on to the consumer in increased cost of goods and services.

There are numerous players in the workers' compensation and rehabilitation system. They do not all have the same interests. The business and workers' compensation interest in saving the most money up front may be in direct conflict with what is best for the worker. Unfortunately, in medicine, especially with

managed care, this is the way much of health care is run. As the costs of rehabilitation keep going up there is more pressure to show outcome studies for the various programs available. If one wants to survive and do well one needs to show that the monies spent by business, insurance, and the workers' compensation system is cost effective. Feeling good about a rehabilitation program is not enough. When the managed care and capitated medical care models become more utilized in this area, it would behoove us to be able to show that one needs to remember the whole picture, which includes the direct and indirect costs as well as the long term outcomes for the patients.

RTW's Integrated Work Program is a unique program with 45 minutes of traditional type therapies followed by simulated job tasks in an intensive program for another 45 minutes in order to get the worker back to his normal functional capacity as soon as possible. It involves a Functional Capacity Evaluation at the beginning and end of the therapy, or when a plateau is reached before full integration into their usual job. This allows the therapist to customize the program to their needs. The success rate for return to work is better than average because they work closely with business whenever possible to make sure that the job tasks are fully understood and

appreciated and to communicate any needs or concerns above and beyond the functional limitations of the worker. However, the rehabilitation costs for the Integrated Work Program are a concern to many who look on it as something that may not be necessary.

Need for the Study

RTW has been a rehabilitation center for work related injuries for many years and has been aggressive in trying to utilize the best techniques for success in getting workers back to work. Their most utilized program to accomplish this is the Integrated Work Program, which grew out of the Work Hardening Program that was developed in the mid-1980's. Although Work Hardening was successful in the return-to-work rates, it was utilized for workers with chronic and more serious de-conditioning problems. Because of the tremendous cost of the Work Hardening Program, it fell out of favor. As the pressures to contain costs and justify the effectiveness of treatment in rehabilitation is increasing, it is becoming more important than ever to be able to show that one treatment modality is better than another.

There have not been many outcome studies done to assess programs similar to the Integrated Work Program. In

fact, there is little mention in the literature about this program except by those directly involved in RTW, especially Dr. Linda Niemeyer, who is their research coordinator. Very few in business or the medical community have even heard about it. Even though the overall success of the Integrated Work Program is impressive, especially when a business works directly with them, no studies show that this program is better than others with lower up front costs.

Purpose

This is a descriptive study of the experience that some workers had with the Integrated Work Program at RTW during 1999 and 2000. There were many goals in conducting the study. Number one, the author wished to describe the rate of successful return-to-work and assess if the worker has continued to stay at his job or been re-injured. Second, it is of interest to see if they have continued to utilize what was taught during the Integrated Work Program and how they feel about the affect it has on their present ability to do their job well and control any further pain. Also, the amount of support and pressure a worker feels more than likely affects the overall outcome, and it was of interest to note if it indeed made a significant

difference, especially when it comes to supervisor support and involvement. There often is a feeling of distrust on the part of the worker as to whether or not the employer and workers' compensation system care about them and take them seriously. Furthermore, it was of interest to see what the worker felt about his overall experience and the aspects they felt most positive and negative about. A negative experience with their care may very well influence outcome. Finally it was felt that job factors, such as job security, physical and mental demands, and deadline pressures, needed to be analyzed as well as such things as educational and income levels to attempt to assess if there was a significant correlation with success.

A primary purpose of this study was to help initiate a long-term cohort study to assess these aspects in terms of the Integrated Work Program. Only with such a study can one begin to control for some of the confounding and biases involved in a short-term descriptive study and make some conclusions about the cost effectiveness of this rehabilitation program. It is hoped that it will lead to a questionnaire that will be utilized on as many patients as possible from various types of business for a time period

of at least a year, with a follow-up questionnaire for long-term employment success assessment.

Methods

It was felt that there was a need to go back far enough in order to look at the long-term picture. Just because one gets a worker back to his job quicker does not mean that that rehabilitation modality is better than some others. If the re-injury rate is higher because nothing has changed at the job or he was returned too early and did not have the functional capabilities and stamina to fulfill his primary job duties, one cannot label that as being successful.

In order to control for confounding as much as possible, only workers from one major supermarket chain in the Inland Empire treated during a twelve-month span of time were included. It was the wish of the author to limit the effect of the employer involvement as much as possible.

Because the chance of getting any amount of significant worker involvement by a mailed questionnaire was so low, the author chose to develop one for telephone interviews. The questionnaire was narrowed down to be no longer than 15 minutes, unless the worker chose to give

more input on the open ended questions. There was fear that this was too long, but because the primary purpose was to describe the overall feeling it was decided to not cut it any shorter.

At first it was planned to compare the experience of two different groups of patients from the same employer. One would have been from around the time that the Integrated Work Program was introduced in 1995 and the other from 1999 to 2000. Because of the difficulty in getting enough participation because of loss to follow-up as well as recall difficulties, it was decided to just use the latter time period. Also, such a comparison would have introduced a cohort effect because of the different populations involved at such a marked difference in time. Many changes had taken effect in this supermarket chain and the workmans' compensation climate during this time period that would have affected the ability to make any conclusions.

Limitations

A major limitation of this study is time, which limits the type of study that could be undertaken. Ideally, one would like to have a Case Control Study with random assignment to different groups, but this is very

difficult to do even without the time limitations, especially when one feels so strongly about the benefits of one type of intervention far exceeding those of another. It was the wish of the author to compare the success at RTW with that of another rehabilitation facility in the Inland Empire that just utilizes a more traditional approach, but no one was willing to participate and most did not have the access to data that was necessary for such a short period of time. The second choice was to compare outcome results for the insurance carrier for this grocery store chain with that of another grocery store chain that they may provide workers' compensation coverage for. No one would return the numerous phone calls made. The unwillingness of others to participate in this study greatly limited the final conclusions that can be made as to success and true cause and effect.

At the onset of the study it was appreciated that there would be quite a bit of recall bias, however, as one of the major wishes was to assess their long-term success, this was a limitation that had to be dealt with. There was a major loss to follow-up with changes in phone numbers, but also, the workers sometimes were not sure of the answers. Overall, most were very emphatic about their

answers being correct with the major limitation of recall being their exact return-to-work date.

Because of the feelings of distrust that often is present amongst workers that are injured, many did not wish to participate. Their fears were sometimes allayed when the interviewer would explain that the study was being done by a physician who is having to retrain because of a work related injury, but often one was not even given the chance to explain. Many would give the interviewer the feeling that they would participate, but always at another time. There was much self-selection bias because of these fears. Interviewer bias also cannot be ignored. Because there were two interviewers there was probably more introduction of interviewer bias.

Many factors have been shown by studies to influence the return-to-work outcome. It is very difficult to try to control for this confounding, especially in a limited short-term study. The feelings that the worker has for his job, for instance, will often reflect on the final outcome and their feeling towards every aspect of the workers' compensation system.

Summary

This study was designed to give a broad picture of the experience of workers with the Integrated Work Program at RTW. As such, it is a descriptive study trying to assess various factors that the literature has pointed out influence the eventual success of a return-to-work program and the overall feelings that the worker has towards his experience. It is the wish of the author that this will lead to a more thorough and involved long-term cohort type study that will show businesses, physicians, insurance and workmans' compensation carriers, as well as other rehabilitation services the value of the Integrated Work Program.

CHAPTER TWO

REVIEW OF THE LITERATURE

Cost of Injuries

A conservative estimate has it that 10 million work-related injuries and 430,000 new work-related illnesses occur in the United States each year (Bureau of Labor Statistics, n.d.). The 99 BLS data indicates that 6.3 of every 100 workers suffer a work-related injury or illness every year (Bureau of Labor Statistics, n.d.) and over half of them result in lost time (Fitzpatrick, Trief, VanBeveren, Yuan, & Baum, 2001). There are about 9,999 workers each day who experience a disabling injury and 16 die (Levy & Wegman, 2000) and approximately 11 million persons in the working age group of 18 to 65 years are either totally or partially occupationally disabled (Lechner, 1994). This is a gross underestimation and it is suggested that only about "3% of workers with occupational illnesses receive compensation under the workers' compensation insurance system because of the difficulty of diagnosis and the likelihood employers will dispute illness claims" (LaDOU, 1997).

In 1997 the civilian workforce was approximately 130 million and adults in the United States spend, on average,

nearly 25% of their time at work. In spite of the high degree of automation and computerization of American industry, many are exposed to hazards (Levy & Wegman, 2000). "Work-related injuries occur at a rate more than twice that of injuries in the home or public places and account for more than 200 million lost workdays annually at a cost in excess of \$25 billion" (LaDou, 1997).

Some problems do not come to the attention of the employer, others are not recognized as being work related, while others are never reported even if the link is made. Leigh reports that one can assume 20% under-reporting for non-disabling and 35% for disabling conditions (Leigh, 1987).

The workers' compensation system is an increasingly costly burden on employers. True costs of disability are often significantly underestimated because of a lack of productivity measurements including direct and indirect costs. NIOSH states that workloads compensate for the absent employee, increasing the stress among the remaining employees and decreasing productivity (Center for Disease Control and Prevention, 2001). Smith (1997) states that the indirect and direct costs of occupational injuries in 1992 were \$145 billion, and for occupational diseases the total was about \$26 billion. This can be put into

perspective when one compares it to the annual cost during the same time period for AIDS of \$35 billion, Arthritis of \$114 billion, Heart Disease and Stroke of \$164 billion, and Cancer of \$171 billion (Leigh, 1997). LaDou (1997) stated that US employers incur more than \$69 billion in direct workers' compensation costs each year, triple what was spent ten years earlier. "Total costs for workers' compensation in the United States has grown from \$2.1 billion in 1960 to an estimated \$200 billion in 2000 and about 85% of the costs for on-the-job injuries are incurred by 10% of the injured workers, many involving an injury where recovery was prolonged well beyond what would normally be expected" (Colledge & Johnson, 2000).

Often all the employer is interested in are the direct costs of the rehabilitation program and do not even consider the indirect cost savings. When one includes the indirect costs, including lost wages, disruption of work processes, production delays, damage to equipment, overtime, temporary workers, workplace accommodations, administrative costs, rework, decreased turnover and inability to fill orders, recruiting and training of replacement workers, overtime, loss of savings and homes, professional counseling and vocational retraining, as well as caregiver services and modification of homes to

accommodate the worker, the total cost comes to about \$350 billion (Colledge & Johnson, 2000). If a company can retain skilled employees the training and recruitment costs are decreased. Morale is markedly affected by the loss of good employees and others that subsequently get hurt have lowered expectations of their ability to retain employment.

“Work-related injuries are among the highest if not the highest risk exposure that business and industry face today. The impact on a company and its employees can be emotionally, physically, and financially devastating” (Isernhagen, 1992). Colledge and Johnson (2000) state, “Despite remarkable advances in health care, increased awareness and emphasis on safety, ergonomics, and general employee health, disability from on the job injuries such as back pain is increasing at a rate 14 times greater than population growth.” The scope of the problems of injured workers is enormous.

Occupational injuries and illnesses and how well we treat them affect all of us, if not directly, then indirectly. Eventually the costs are passed on to every one in increased cost of goods and services. Firms absorb some of the workers' compensation premiums through lower profits but probably also pass some of it on to the other

non-injured workers through lower wages. Temporary total disability benefits in most states are 66.67% of the employee's average weekly wage and are not paid until the employee has missed from three to seven days (CPCU, 2000). "Cost of workplace injuries is about 10% of the payroll, on average, for direct and indirect costs" (Fitzpatrick & King, 2001).

One area in health care costs that has escaped managed care to a large degree in the past has been in the care of the injured worker. This is changing and more and more players in the field are considering a managed care or capitated approach. It is therefore becoming a much more competitive marketplace and rehabilitation programs continue doing the usual without considering the need to show which rehabilitation approaches are more effective and less costly to everyone involved. There is an increasing demand for accountability by the health care payers and rehabilitation groups need to be more willing to collect helpful outcome data that can be shared in trying to evaluate various programs (King, 1998).

Total costs include not only economic and physical costs, but also have an enormous psychosocial impact on the disabled worker, including loss of self-esteem and over all well-being. "Unemployment is more destructive to

physical and mental health than all but the most dangerous jobs" (Levy & Wegman, 2000). "Unemployment increases mortality from heart disease, liver disease suicide, and other stress-related ailments" (Levy & Wegman, 2000). Workers internalize the experience of joblessness as personal lack of worth and it does not matter what is responsible for his loss of a job (Levy & Wegman, 2000). It causes problems of morale amongst the workers who fill in to pick up the slack, especially if there is not a good disability management program in place that communicates the management's interest in the worker's welfare and early return to work. Things like loss of worker morale cannot even be measured. It may be very difficult to ascertain the true cost of disability since the hidden costs are usually much greater than the obvious visible costs.

It is of interest to everyone involved as to which therapies are the most cost effective and have the best results. One must choose the rehabilitation methods carefully and evaluate them in order to provide the best care and service to everyone concerned. Are they cost effective and meeting our objectives of getting the worker back to work quicker than other programs? Are they keeping the worker at work with a lower re-injury rate? These are

questions that need to be addressed. Just because we have been doing something for many years and feel good about them does not mean that they should be continued. All programs can be improved, but how to do this can only be answered with careful study and comparisons. Program evaluation is often an after thought and consideration should be given to the information that will be needed to evaluate it at the beginning of the program (AMA, 1989).

A Northwestern National Life Insurance Company Study concluded that "for every dollar spent on rehabilitating an employee, a company can save \$30 in wage-replacement costs, lost productivity, and escalating disability premiums" (Markarian, 1994). The loss in productivity, escalating health care costs and increased regulations have caused businesses to take a closer look at how they are preventing and managing the work injuries. They are finding it more and more necessary to take control of this problem and are demanding more effective and efficient services from health care providers.

Overview of the Workmans' Compensation System in California

"The workers' compensation system was adopted in most states during the 1920's as a no-fault system, meaning

that the injured employee need not prove the injury was someone else's fault in order to receive workers' compensation benefits for an on-the-job injury" (The California Workers' Compensation System, 1998). This design helped eliminate lawsuits as to who was at fault that were so prevalent, although they are still common in trying to determine if it was job related or how much in benefits someone is entitled to. Most of the cost and litigation involve the more serious cases with a significant length of disability. Most cases, however, are settled without litigation.

The worker has to use the medical treatment chosen by their employer for the first 30 days, unless they have been seeing another physician for a related injury or illness previously, at which time they can continue to see their own doctor. After three lost workdays, the employee is entitled to a compensation up to a maximum of \$490 per week. If it is determined that they are permanently disabled they will get this for life and, if it is expected that they can be retrained, they are entitled to any retraining costs. During vocational rehabilitation, the maximum weekly amount is reduced to \$246 per week, but the worker is able to collect in advance partial payment

for permanent disability benefits up to the same weekly total.

In most states, workers' compensation is administered by private insurance carriers. Some companies are able to be self-insured. "The state's role is to oversee the provision of workers' compensation benefits, provide information and assistance to employees, employers, and others involved in the system, and to resolve disputes that arise in the process" (The California Workers' Compensation System, 1998).

Niemeyer (1998) reports that there was a very rapid growth in medical costs from 1985 into the early 1990's. During this time "there were more than 8 consecutive years of unprofitability for workers' compensation insurers when costs exceeded premiums by as much as 23%." At the same time, the rehabilitation outcomes were poor.

"Psychologists and other health care professionals focused on the injured workers as the source of the problem and conducted studies to determine ways to identify and deal with 'malingerers'. Others focused on the system and the term comalingerers was used to describe the fact that poor outcomes were partly due to "competing and conflicting interests of health care providers, legal representatives, organized labor, legislators, claimants, employers and

compensation or insurance agencies were being served at the expense of the whole" (Niemeyer, 1998).

"Workers' compensation premium costs in California fell significantly from 1993 through 1998. This was largely due to the 1993 reform act, cutting the premiums by about 45%" (The California Workers' Compensation System, 1998). This has driven the cost for the employer down considerably, although the premiums are still tied to the claims history. Part of the reason for this drop is due to the movement towards more of a service industry and less in manufacturing. Another change that fueled the decrease was a transition from fee-for-service to managed care. Medical expenses account for about 29% of the system costs, with another 39% for indemnity benefits and vocational rehabilitation services, and 32 % covering the costs of administration of benefit. Of the medical expenses 21% go towards physical therapy (The California Workers' Compensation System, 1998).

The cost of workers' compensation insurance is rate adjusted for all but the smallest employers through what is known as experience rating. The costs are lowered when there are fewer injuries and less lost time from work, so employers are very much interested in knowing that the type of therapy utilized is the most cost effective.

Outcome Evaluations

How to best evaluate a program can be very difficult. Usually one tries to compare it to a benchmark, maybe the experience of another rehabilitation company, or a previous program utilized in the same company. Many biases are introduced depending on the approach. In this kind of setting it is difficult to nearly impossible to set up a true experimental study with randomization and controls. No one wants to be the "guinea pig" and informed consent needs to be obtained, which again introduces biases as to who chooses to be in the control or treatment groups. When one compares a before and after scenario one needs to remember the environmental changes that may have occurred in the meantime, not only in the company but in society and the workers' compensation arena. There may have been many changes in the public's attitude, employee education and training, composition of the workforce, etc. The number of confounding factors can be enormous.

One also needs to decide what outcome measure to use in order to judge success. It may be a decrease in overall Workers' Compensation costs or injuries. It could be early return to work and lack of re-injury. These outcomes may be affected quite strongly by factors other than the rehabilitation method chosen and need to be considered

before making a conclusion as to the best treatment modalities.

Above all, good evaluations require good record keeping, which many rehabilitation centers do not readily utilize. When important data is kept on all patients in a way that can be easily accessed, one can only then hope to begin to evaluate success or failure properly. The data kept needs to include the cost and time involved, success of return-to-work with the time from injury to return to work noted, the type of injury and interventions, the days lost before and after the rehabilitation, the degree of functional impairment and accommodations made in the very least, but should also include such things as the acceptance and satisfaction of the worker and employer immediately and in the long run. Are they staying at work once they return? Unless this is looked at one cannot possibly understand the true cost of the injury and rehabilitation. If one can compare the Workers' Compensation costs of a company before a program is first instituted and then again several years later, some if not most of the changes can be attributed to the rehabilitation program, if there are no other major changes.

"The newer the occupational health service, the harder it is to do a cost/benefit analysis, since the full impact of the service's policies and programs will not be felt for several years" (AMA, 1989). Work Hardening, which is similar to the Integrated Work Programs, have been used for about 20 years, yet very few studies have tried to assess its success. The Society of Chartered Property and Casualty Underwriters (CPCU, 2000) in the fall of 2000 questioned the value of Work Hardening in returning injured workers back to work after severe back injuries. They concluded that workers' compensation claim files where Work Hardening was not used actually have higher return to work rates than do files where Work Hardening was part of the treatment program, yet the fact that the ones who did not get placed into Work Hardening tend to be employees with less severe or prolonged problems is not addressed. This introduces tremendous bias and the conclusions need to be made by comparing similar patients in each group and their return-to-work rates. They go on to say that management needs to resist being pushed into this mode of therapy, which they feel is a needless waste of money. Their flawed reasoning will result in many patients who would be helped by this technique, but would fail with traditional therapies, to be denied a therapy

modality that may be very beneficial but has not been studied enough.

Description of Injuries

The only national routine source of information on occupational injuries and illnesses in the United States is the Annual Survey of Occupational Injuries and Illnesses conducted by the Bureau of Labor Statistics. It is a random sample of about 250,000 private sector businesses, excluding the self-employed, farms with fewer than 11 employees, private households, and all government agencies (Bureau of Labor Statistics, n.d.). It provides estimates of injuries and illnesses based on information provided by employers to Bureau of Labor Statistics from their OSHA 200 log of recordable injuries and illnesses, so there is a significant amount of underestimation of the scope of the problem. Under the OSHA Act of 1970, employers must record all work-related injuries that require medical treatment (other than first aid) or involve loss of consciousness, restriction of work or motion, or transfer to another job, as well as diagnosed occupational illness. All back disorders are classified as injuries. Illness data is separated into six subcategories - the category that includes most of the musculoskeletal

conditions is disorders associated with repeated trauma.

"The most common occupational injuries involve the musculoskeletal system, with over 1 million workers sustaining back injuries each year" (LaDou, 1997).

The summary data did not adequately describe the nature of occupational injuries and illnesses and related risk factors, so the survey was changed in 1992 in order to include more detailed information on those cases requiring days off from work. It now includes data describing demographic information about the injured workers as well as specific characteristics of the injury or illness, including the nature of the condition as described by the employer (sprain, carpal tunnel syndrome), the part of the body affected (back, wrist), the source of the injury or illness that directly produced the disabling condition (weight of object), and the event or exposure that describes the manner in which the injury or illness was inflicted [overexertion, repetitive motion] (BLS web site).

According to Bureau of Labor Statistics on cases involving days away from work, 32% resulted from overexertion or repetitive motion. The majority of those involving overexertion involved injuries to the back, with the median time away from work being six days for lifting,

seven days for pushing/pulling, and six days for holding, carrying, or turning injuries. The number of cases of repeated trauma increased from 23,800 in 1972 to 332,000 in 1994, a fourteen-fold increase. Bureau of Labor Statistics reports that in 1995 308,000, or 62% of all illness cases were due to disorders associated with repeated trauma, which was a 7% decrease from the previous year. Of the injuries or illnesses due to repetitive motion, 55% affected the wrist, 7% the shoulder, and 6% the back. The median time away from work was 18 days, compared to 30 days overall (Bureau of Labor Statistics, n.d.).

Musculoskeletal disorders involve the nerves, tendons, muscles, and supporting structures, such as intervertebral discs. They range from a mild periodic condition to ones that are severe and debilitating. They are not typically the result of any instantaneous or acute event but develop gradually over time. The work environment may contribute significantly to their development or they may simply be made worse and longer lasting by work conditions. Those of the upper extremities are the most common and include carpal tunnel syndrome, wrist tendonitis, epicondylitis and rotator cuff tendonitis. "The manner in which workers sustained severe

injuries differed, suggesting that remedies to prevent such injuries need to address a variety of circumstances. Virtually all cases of carpal tunnel syndrome resulted from stress or strain upon a worker's wrist due to a task's repetitive nature. Examples include grasping and unraveling bolts of cloth, scanning groceries, typing or key entry, and cutting meat or poultry on an assembly line" (Bureau of Labor Statistics, n.d.).

Musculoskeletal disorders are the most prevalent medical problems in the United States with an estimated 7% of the population being affected. They account for 14% of doctors' visits and 19% of hospital stays. Of those with musculoskeletal disorders, 62% have some degree of limitation on activity, compared to 14% of the population as a whole (Centers for Disease Control and Prevention, 2001). They are the most common of all lost-time injuries and illnesses in almost all industries and among the most costly of all occupational problems, especially those involving the back (Bureau of Labor Statistics, n.d.). The highest rates occur in industries with substantial amount of repetitive forceful work, such as grocery store clerks, which is also an industry with the largest number of serious nonfatal injuries, along with food service places

and hospitals (Centers for Disease Control and Prevention, 2001).

For disorders of the neck and shoulder, NIOSH states the literature identifies two important workplace factors, sustained postures causing static contractions of the neck and shoulder muscles (working overhead) and combinations of highly repetitive and forceful work involving the arm and hand, which also affects the muscles of the neck and shoulder. Studies have also shown that the greater the level of exposure to a single risk factor or combination of factors, the greater the risk of having a work-related musculoskeletal disorder. They point out that the time between each episode of exposure is important. When there is adequate time to recover or adapt, particularly when lower forces are involved, there may be less harm from repeated exposures (Centers for Disease Control and Prevention, 2001).

Between 1971 and 1981, the number of people with disabling back problems increased 168% whereas the population increased by 12.5% (Gatchel, Polatin, Mayer, & Garcy, 1994; Aranoff et al., 2000). Chronic low back pain is a major cause of lost workdays (Maurits) and comprises about one third of the total compensable injuries, with direct costs of approximately \$16 billion (Lechner, 1994).

They are the most expensive of all industrial injuries (Aronoff et al., 2000). The average cost of a workers' compensation claim for a low back disorder is \$8,300, which is more than twice the average cost of \$4,075 for all compensable claims combined. CDC estimates for the cost of low back pain to society ten years ago was between 50 and 100 billion dollars a year, with about \$11 billion of this in workmans' compensation costs. Moreover, according to the CDC, approximately 30% of workers are in jobs that routinely require them to perform activities that may increase risk of developing low back disorders. In many countries chronic low back pain is the most common cause of long-term disability in middle age (Bradley, Rasooly, & Webster, 1994). It is the most expensive occupational injury in adults younger than 45 (Aranoff et al., 2000) and one per cent of the population being totally and permanently disabled by chronic back problems (Bigos, Baker, & Lee, 1993).

"Approximately 70-80% of adults develop a spinal disorder during their life and 90% of them resolve within 6 months, with the remaining 10% developing chronic pain and disability" (Proctor, Gatchel, & Robinson, 2000). This includes every job that requires stressful lifting tasks or awkward postures. We do not understand the

pathophysiology of low back pain completely and certainly do not know what treatments are best, more research being needed to assess this. In the meantime, there is a trend towards a heavy emphasis on prevention strategies.

According to CDC and NIOSH 2000 statistics, back injuries comprised 27% of all injury and illness cases with days away from work in private industry, with upper extremities equaling 23% and lower extremities 20%). NIOSH (Centers for Disease Control and Prevention, 2001) conducted a review of the literature in terms of work risk factors and specific injuries. The literature supports a relationship between the development of low back disorders and the following factors:

1. lifting and forceful movement
2. bending and twisting in awkward postures
3. whole-body vibration

They cite the experience in a grocery warehouse in Ohio where workers perform long hours of repetitive, heavy manual lifting and found a rate of workers' compensation claims for back injuries of 16 per 100 workers, compared to a national average rate of 1 to 2 cases per 100 full-time workers. NIOSH cites workers' compensation data from the National American Wholesale Grocers' Association and the International Foodservice Distributors Association

for the years 1990 to 1992 saying that back strains/sprains accounted for 30% of all injuries for warehouse workers and that more than a third of all of these workers experience an annual injury, costing \$0.61 per worker-hour.

The Median days away from work due to occupational injury or illness was 25 days for Carpal Tunnel Syndrome, 11 for Tendonitis, 6 for sprains and strains, and 3 for bruises and contusions. The median for all types of injuries is 5 days (CDC/NIOSH, 2000).

Factors Affecting Return-to-Work and Injury Rates

In order to adequately compare the success of different therapies one must attempt to control for some of the factors that have been shown to have a significant influence on outcome. Baldwin states, "Socioeconomic factors seem to be more important than health care in determining durations of initial absences from work" (Baldwin, Johnson, & Butler, 1996). The reason we have not been more successful in past prevention efforts was because of 'focusing on purely physical factors'" (Bigos et al., 1991).

The World Health Organization has stated that occupational injuries and illnesses are multifactorial, with a number of risk factors contributing to them (World Health Organization [WHO], 2001). These factors are outlined as being physical, work organizational, psychosocial, individual, and sociocultural. There is much disagreement as to the strength of association between these factors and injuries, but for sure, these will vary by the individual and the type of job he has. Feuerstein (1991) states that one needs to not only take into account the biological deficit but also must look at the psychological and social aspects of the injury if one wants to avoid chronicity as much as possible. "In order to understand and properly treat disability following an occupational injury, one needs to realize that there is an interaction of many different factors, including the medical condition, physical capabilities ergonomic demands, and many psychosocial factors (Feuerstein, 1991).

There are a lot of reasons why one worker may not have as great a success at return-to-work as another. Much of this has to do with his psychological make up. CARF (The Rehabilitation Accreditation Commission, 2001) quotes Killian (1988) as saying that these character traits include depression, dependent personality, substance

abuse, and sociopathic personality. Poor work habits such as absenteeism, poor attitude, and dissatisfaction in their work will significantly decrease the likelihood of return-to-work. "Studies have shown that psychological stress is a serious problem and is responsible for increasing numbers of disability claims" (Smith, Michael, Karsch, Ben-Tzin, Moro, & Francisco, n.d.). The Worker's Disability Syndrome has been described by Hanson-Mayer in 1984, where the patient often has a greater investment in their disability than in their work, decreasing the likelihood that they will be open for work options (The Rehabilitation Accreditation Commission, 2001). Aronoff et al. (2000) quotes Jensen (1994) and Lackner (1996) as saying that patients' beliefs about their pain and to what degree it affects their capabilities were the strongest predictors of task performance such as lifting and long-term rehabilitation. "When one experiences pain and discomfort added to increasing psychological or social stresses, anxiety disorders and depression worsen and the physical discomfort becomes unbearable and an otherwise expected discomfort becomes validated as an "injury" and allows, either consciously or unconsciously, escape from the original psychosocial discomfort, often justifying

failure in a more socially acceptable way" (Colledge & Johnson, 2000).

"Current multidisciplinary biopsychosocial rehabilitation regards disabling chronic pain as the result of multiple interrelating physical, psychological, and social or occupational factors. The three elements influencing an individual's ability to tolerate physical discomfort are biological stimulus, psychological distress, and social stress" (Colledge & Johnson, 2001). Nachemson (1991) states that "psychosocial factors, including insurance benefits have been shown to be more important than biomechanical workload in the prognosis for both acute and chronic low back pain." Guzman, Esmail, Karjalainen, Malmivaara, Irvin, and Bombardier (2001) assessed the effect of multidisciplinary biopsychosocial rehabilitation on outcomes in patients with chronic low back pain. They found strong evidence that intensive multidisciplinary biopsychosocial rehabilitation with functional restoration improves function and moderate evidence that it reduces pain when compared to outpatient non-multidisciplinary rehabilitation or usual care. Less intensive therapies were not effective. There was contradictory evidence it improved work readiness; however, they concluded that it may have done so if the

rehabilitation was more work oriented, which is a major goal for the Integrated Work Program. One certainly would think that if their functional ability and pain level improved significantly one should be able to reincorporate the worker into his job much more easily if work related factors are also kept in mind.

A history of prior medical treatment for a back problem was the only physical variable predictive of reporting acute back pain at work. Bigos et al. (1991) found that the most predictive individual factors were job task dissatisfaction and distress. Gallagher, Rauh, and Haugh (1989) found that psychosocial factors are often more important determinants of return to work than physical factors and stated one needed to adjust for the confounding effects of age and length of time away from work. Lancourt and Kettelhut (1992) found that lower back pain patients who returned to work had fewer job, personal, or family related problems and there were no significant differences between patients who returned to work and those who did not when comparing myelograms, CAT scans, and X-rays. The psychosocial associations are very difficult to study, when compared to physical factors, because they are so much more difficult to measure and quantify.

Although findings of studies are not entirely consistent, there is growing evidence that the job climate has a significant impact on injury rates. "They suggest that perceptions of heavy workloads, monotonous work, low levels of job control and lack of clarity about job expectations, low social support, and a lack of decision-making opportunities on the part of the employee are associated with workplace disorders. Even after adjusting for physical demands, the associations still exist, although they have only a modest strength of association" (NIOSH). "Work and job environment factors are often thought of as demands, or 'risk factors', that may pose a threat to health", as the CDC website (Centers for Disease Control and Prevention, 2001) quotes Hurrell and Murphy (1992). Psychosocial Factors, including job satisfaction, relationship with employer and coworkers, financial pressures, and system issues such as benefits are important in the overall injury and rehabilitation success rates (Brines, Salazar, Graham, & Pergola, 1999). The work environment factors would include the corporate culture and organization, interpersonal relationships and support, financial and economic aspects, including pay, benefits, and equity issues, various aspects of job content, such as workload, job control, mental demands,

job clarity, repetitiveness, temporal aspects, such as cycle time and shift work, and community aspects, such as occupational prestige and status. Work distress and dissatisfaction have been shown to influence the occupational rehabilitation of physically disabled workers, especially when the disability involves musculoskeletal disorders (Bigos, et al., 1991; Feurerstein, 1991). Bigos, et al. (1991), in a large prospective study, showed that job dissatisfaction was the biggest factor in terms of predicting the reporting of a back injury. Bigos et al. (1992) and Aranoff et al. (2000) found that injured workers who were unhappy at their work prior to leaving are less likely to return to their work even after medical clearance. When the worker sees a future at work and gets along with his co-workers there is a significant improvement in the return-to-work success (Gates, 1993).

The degree of varying job opportunities and training levels, as well as autonomy and years of employment have been factors affecting degree of rehabilitation success in various studies. Higher wages and more seniority have a direct influence on successful return to work (Tate, Habeck, & Schwartz, 1986). "Among structural factors, the division of labor at work was the most important factor

for return to work, particularly the ability to do as much as colleagues, both quantitatively and qualitatively" (Gard & Sandberg, 1998). Appelberg Romanov, Heikkila, Honkasalo, and Koskenvuo, (1996) state, "The opportunity for job control was an important motivating factor for return to work."

The worker who has conflicts with co-workers or his supervisor has a significantly lower rate of return, (Bigos, et al., 1992; Aranoff, et al. 2000; Gates, 1993; Akabas & Gates, 1990) as does anyone who has a feeling of lack of security at his job for any reason. Appelberg, et al. (1996) found that interpersonal conflict at work predicted work disability only among married women with interpersonal conflicts also with their spouse, which very well is due to decreased security in their lives. The factors predictive for work disability among men are monotonous work, neuroticism, life dissatisfaction, and experienced stress of daily activities. Among women, only life dissatisfaction is a significant risk factor besides interpersonal conflict at work" (Appelberg, et al., 1996). Even though some studies have suggested that gender may be a factor it has not held up to scrutiny (LaDou, 1997).

"Improving the rehabilitees' own physical or psychosocial resources is not enough; changes at the

workplace are also required in order to reach a good outcome" (Harkapaa, Jarvikoski, Hakala, & Jarvilehto, 1996). Workplace risk factors, along with personal characteristics, such as physical limitations, existing health problems, and psychosocial factors not only contribute to the development of injuries, but may also reduce worker productivity or cause worker dissatisfaction, which can influence the injury and rehabilitation rates (MacKenzie, Morris, Jurkovich, & Yasui, 1998). How successful and content they are with their job, the perceived job demands, and physical, occupational, and psychosocial factors can create adversarial relationships and disincentives to return to work. "The vast majority of these factors are not related to the nature of the injury or underlying biomedical condition, but reflect psychosocial-economic issues (Aronoff, et al., 2000).

Akabas and Gates found that a major determinant of successful rehabilitation was the responsiveness of the supervisor to the worker (1990). "Supervisors are viewed as conduits of responsiveness. If the supervisor is responsive, then the workplace is the same" (Gates, 1993) Bigos, et al., (1992) also found that shifts longer than 8 hours decreased a patient's confidence level in terms of

ability to return to work. Other factors that he found affecting successful return were the employee's age, educational level, wages and the amount of wage replacement.

"Major component in patients' ability to return to work seems to be motivation rather than education or fitness" (Murphy, 1994; Greenfield & Harnandez, 1994), but satisfaction with preinjury job was not a significant predictor of return to work according to a study by MacKenzie, Morris, Jurkovich, and Yasui (1998) "Patients who were on longer sick-leave tended to more often perceive their work tasks as comprising uncomfortable and monotonous sitting positions with high demands for precision (Thorbjornsson et al., 2000). They tended to perceive higher job constraints and experienced fewer opportunities for stimulation and development in their jobs and fewer possibilities for influencing their work" (Ekberg & Wildhagen, 1996). "Those who 'hardly ever' enjoyed their jobs were 2.5 times more likely to report a back injury than subjects who 'almost always' enjoyed their tasks. Foreman and Murphy (1996) quotes Warr (1987, 1994) as saying there were nine features of work environments that are related to affective wellbeing. "These aspects of environments include: opportunity for

interpersonal contact, control, and for skill use. Externally generated goals, variety, environmental clarity, financial rewards, safety, and valued social position.

Over all unemployment rates that are high will increase the choices for replacement workers so there may be more uneasiness about job security, but also there will be a more difficult time for the worker to find a job that is more appropriate for his abilities and limitations (Baldwin, Johnson, & Butler, 1996).

"Workers who received job accommodations, such as reduced hours and light work, are less likely to experience multiple spells of work absence than workers who do not. This suggests a strong employee attachment to firms that are willing to provide accommodations" (Baldwin, Johnson, & Butler, 1996; Williams, 1991).

"Injured workers who are offered modified work return to work about twice as often as those who are not" (Krause, Dasinger, & Neuhauser, 1998). "Companies with the most successful disability management programs establish a transitional or light duty work program to get people back to work early. This does not mean they have to be 100% recovered before they re-enter the job environment" (Smith, Michael, Karsch, Ben-Tzin, Moro, & Francisco

1997). The most important aspect of support is the provision of "practical assistance in contrast to emotional support," which a willingness to accommodate communicates (MacKenzie, Morris, Jurkovich, & Yasui, 1998).

Early intervention shows a worker that he is considered a valued member of a team. "Pain is a major inhibitor of motivation and physical therapy can reduce the patient's level of pain, thus increasing their motivation and degree of success" (Gard & Sandberg, 1998). Gard and Sandberg goes on to say that "Everyday responsibility, feedback, and support in daily work tasks were important in increasing self-confidence, an important motivator." "Research evidence suggests that those workplaces that demonstrate a caring attitude for the health and wellness of their workers are likely to have greater success in controlling workers' compensation and disability costs" (Shrey, 2000).

"Many employers are frustrated by physicians' general lack of awareness of the high cost to industry of absence from work" (Makdessian, 2000). "Rehabilitation professionals use the term 'Doc Holiday' to refer to physicians who routinely write orders for lengthy time off of work no matter what the injury, limitation, or job

requirements." The time off of work has been found to be one of the major factors of the chance of successful return-to-work. "Present day medical care often prolongs disability by reinforcing illness behavior" (Colledge & Johnson, 2000). One has to avoid prolonged inactivity to prevent this. "Any delay in offering rehabilitation tends to encourage applicants to focus on their disability rather than their residual ability or potential" (Sim, 1999). Doctors still tend to recommend reduced activity and rest, but patients benefit from maintaining activity as normally as possible (Malmivaara, et al., 1995; Hagen, Eriksen, Ursin, 2000). Aronoff, Feldman, and Campion (2000) quotes Hall and colleagues as saying that "an unwarranted restriction implies disability and may become a self-fulfilling prophecy." "One should not underestimate the importance of the physician" in the overall success of a rehabilitation program.

"A central principle to Chronic Pain Syndrome and disability convictions is the belief that because of chronic pain one is unable to meet occupational responsibilities" (Aronoff, et al., 2000). The feeling of disability and anticipation of not being able to return to work is often reinforced by a multitude of factors, including the way the injury is treated by the medical

care providers. If the patient is given traditional therapy with time off, analgesics, and rest being the central theme one does not have to be surprised if the patient feels disabled. Health care providers often tell the patient not to do something if it hurts, reinforcing the theme of pain being a disability. One of the main advantages of an Integrated Work Program is to help the patient work through the pain. The feeling of disability is minimized as much as possible by incorporating them into job tasks almost immediately, reinforcing the viewpoint of early anticipated return to work.

There is an increasing danger that as the time from injury increases, the patient will have a poor return-to-work outcome (Beissner, Saunders, & McManis, 1996; Niemeyer, Jacobs, Reynolds-Lynch, Bettencourt, Lang, 1994; Haig & Penha, 1991; Williams, 1991; Aronoff, Feldman, & Campion, 2000; Bigos, Baker, & Lee, 1993; Rathburn & Seeman, 1994; Zeller, Sturm, & Cruse, 1993; Haig & Penha, 1991). Immediate response to a worker's rehabilitation needs prevents him or her from feeling powerless or not responsible for their recovery (Andrews 1981). Andrews found a very significant decrease in the probability of return to work the longer the patient was out of work. An individual with an injury that is out of

work six months has only a 50% probability of return to work. At two years it became zero. Preventing disability from work-related low-back pain requires timely and appropriate intervention (Frank, et al., 1996). "Research has shown that extended disability leave has cumulative negative physical, psychological, and social effects that contribute directly to a reduction in an individual's potential for recovery" (Rieth, Ahrens, & Cummings, 1995).

Malmivaara et al. (1995) of Finland randomized 186 patients with low back pain to either two days of bed rest, back mobilization exercises, or continuation of normal activities as their pain would allow. The latter group was the control group. More than 90% of patients in all groups received anti-inflammatory drugs and analgesics. Twelve-week outcomes showed that bed-rest patients recovered significantly more slowly than did the controls. Those who continued their normal activities as much as possible had significantly fewer absences from work and were able to do their job more easily and with less pain. The study agrees with others that show that as little as two days of bed rest can lead to a slower recovery and longer sick leaves.

Social interaction is very important in terms of the success. In the military it was found that those suffering

from battle stress who were removed from the front the furthest had the worst recovery rates and return to active duty. The longer he was away from his unit the weaker his bonds became and the worse the reintegration rate (Colledge & Johnson, 2000). "The social structure of a job such as the level of discretionary job activity, supervisory status, psychological demands of the job, all play an important role in predicting work disability." In a review of the literature a lack of social confidence and poor social support are factors in return to work success (Thorbjornsson, et al., 2000).

"Setting return-to-work goals soon after the onset of disability and providing timely rehabilitation is critical for the successful return-to-work of the worker" (Fitzpatrick, 2001). Those treated for low back pain and given advice to stay active have a significantly greater chance of success when compared to those with conventional treatment with rest [68.4% vs. 56.4%] (Hagen, Eriksen, & Ursin, 2000) "Impairment is often magnified through disuse" (Matheson, Ogden, Violette, & Schultz, 1985). Workers suffer not only physical and financial losses when injured but also considerable emotional losses and the longer they are off the higher these costs (Krause, Dasinger, & Neuhauser, 1998). Aranoff, Feldman, and

Campion (2000) state that "Those staying out of work longer suffer more emotionally and find it harder to get future employment compared with those who go back to work early". Extended disabilities often make patients depressed and show decreased motivation with their outcomes usually worse than those of patients who participate in early-return-to-work programs" (Nighswonger, 2000).

"Patients' perceived health and own belief in a vocational return have been found to be the most important overall predictors of the outcome of rehabilitation efforts" (Eklund, Eriksson, & Fugel-Meyer, 1991) and "motivation for recovery has been found to be a major factor in rehabilitation success" (King & Goddard 1994). Sandstrom and Esbjornsson (1986) in a study of back pain reported that the patient's own predictions of the probability of return-to-work at initial assessment were significant predictors of actual outcomes a year and four years later (Sandstrom & Esbjornsson, 1986). Quoting Lechner (1994), "Injured workers often fulfill the clinical and labeling expectation placed on them". Studies have shown that injured workers placed into recovery programs with directed care that outlines specific return-to-work expectancies return to work much more

quickly than those in non-directed programs (Williams, 1991). They also show "fewer re-injuries and remain on the job at a higher rate" (Colledge & Johnson, 2000). Lechner (1994) quoted Catchglove and Cohen (1982) as having explained to their patients at the beginning of their program that they would need to return to work within 1 to 2 months. This was reinforced continuously during therapy. Compared to those patients who were not told that they would return to work, this approach increased the percentage of workers who returned to work by 40%.

"The individual's subjective estimate of the likelihood of getting re-injured if he goes back to work is the factor related to motivation to return, not the objective probability of this happening. Experiences such as interactions with key medical advisors, conversations with similarly injured employees, communications, or lack of, from representatives of the employer all influence return-to-work motivation" (Foreman & Murphy, 1996).

In research it has to be remembered that the interrelationship of all of these factors is very complex. Each individual, under the exact same social and work environment, will have a different reaction. Their personal and situational characteristics will determine how much they will influence them. The CDC quotes several

studies (Bergqvist 1984; Bongers 1993; Bernard 1993; Sauter & Swanson 1996) which attempted to explain how work-related psychosocial factors affect injuries. They came up with four possible explanations. Psychosocial demands may influence injuries by:

1. Producing increased muscle tension and exacerbating task-related biomechanical strain
2. Affecting awareness and reporting of injuries or influence the perceptions of their cause or magnitude
3. Causing initial episodes of pain based on a physical insult to trigger a chronic nervous system dysfunction, physiological as well as psychological, and perpetuate a chronic pain process.
4. Causing changes in physical demands and biomechanical stresses
(Centers for Disease Control and Prevention, 2001)

The evidence for a relationship between psychosocial factors and injuries is stronger for neck and shoulder disorders than for those of the hand and wrist. An explanation for this, given by the NIOSH (Centers for Disease Control and Prevention, 2001) review of the

literature is that the strong association with the neck and shoulder disorders is seen because most of the studies were from Nordic countries which tend to focus on them more than the hand and wrist health outcomes. Also, most of these studies were in office settings where physical factors may be less important.

Depression can be a major factor in a disability. There are extremely high rates of major depressive disorders in chronic pain patients" (Proctor, Gatchel, & Robinson, 2000). Atkinson (1989) found that up to half of all patients with chronic pain suffer a major depressive episode and most improved when treated with antidepressive medications. "Depression can be both a cause of the development of chronic pain and the result from chronic pain" (Aranoff, et al., 2000). "A relationship has been found between pain duration and frequency and depression" (Proctor, Gatchel, & Robinson, 2000). "Depression lowers pain tolerance, increases analgesic requirements, and is a factor in diminished sleep, poor coping, and improved functioning with chronic pain." "Under conditions of anxiety and stress, psychological defense mechanisms may form to 'protect' the individual and have the potential to transform a relatively simple disorder into an illness that is acceptably serious" (Colledge & Johnson, 2000).

There often are concomitant psychological and psychosocial issues because of hopelessness and despair felt by the worker at his altered lifestyle. The worker affected "by chronic pain will concentrate increasingly more on pain and less on interpersonal relationship." He will increasingly withdraw from his or her goals and responsibilities, becoming increasingly depressed (The Rehabilitation Accreditation Commission, 2001). In order to fully understand a person's disability and the success or failure of a treatment modality one needs to keep in mind these relationships and try to assess the influence of depression.

It has been found that chronic lower back pain patients with depression avoid activities more than those who do not suffer from depression and injured workers with depression are less likely to benefit from treatment" (Proctor, Gatchel, & Robinson, 2000). This then leads to unemployment being a more likely outcome and this in turn increases depression even more. Pretty soon there is a cycle that is difficult to break.

Pain behavior is not necessarily indicative of a poor prognosis. "Pain behavior did not predict treatment outcome (Hazard, et al., 1989). Aronoff et al. (2000) quotes Werneke et al. (1993) as finding that there was a

decrease in signs of distress and pain behavior in those returning to work and not in those who did not. Aronoff et al. goes on to say that "the reduction in psychological distress, exhibited as pain behavior, in the course of treatment, rather than the degree of distress upon initial evaluation, is the salient factor in predicting return to work.

Environmental parameters outside of work that may play a significant role in injuries and rehabilitation include factors associated with family demands, as well as community roles and demands. These factors and their influence on the worker are particularly difficult to study, especially since the work situation can greatly influence the social interactions outside of work. It becomes a question of which came first.

Quoting Petersen (1995), LaDou (1997), and Rathburn and Seeman (1994), people get an attorney to represent them because the system is so adversarial. "Contributing to this adversarial situation is what many workers describe as an unwritten rule that the likelihood of job loss is markedly increased following an injury claim" (Aranoff, Feldman, & Campion, 2000). In Aranoff, Feldman, and Campion (2000) experience "patients retaining attorneys soon after injury have delayed recovery

significantly more than those who get an attorney only after what they perceive to be an extended period of not getting adequate care or being treated unfairly."

Receipt of compensation was found to be one of the strongest predictors of return-to-work according to MacKenzie, Morris, Jurkovich, and Yasui (1998), but others have not found any relation between compensation and return to work. The number of studies that show an influence and those that do not are about equally divided (Hunter, Shaha, Flint, & Tracy, 1998). The Federal Employers Liability Act (FELA) is a law that compensates interstate railroad workers and allows employer liability damage awards with no limits no matter how small the injury. "Jury awards of \$200,000 and \$300,000 have not been unusual for back injuries, even when there is no objective evidence" (Hunter, Shaha, Flint, & Tracy, 1998). Hunter Shaha, Flint, and Tracy conducted a long-term follow-up study of 178 railroad workers after low back injuries. They completed what is termed a multidisciplinary rehabilitation program. At follow-up exam it was found that 89% of the patients contacted were employed, with 61% still at the railroad. Lost workdays and length of employment were found to be the most predictive factors of long-term work status. "Success,

however, was not predictive of long-term work status, suggesting that other factors have an impact on work status" (Hunter, Shaha, Flint, & Tracy, 1998) and physical/medical factors have been found to be poor predictors of injury severity or return to work after an injury" (Hunter, Shaha, Flint, & Tracy, 1998; Eklund, Eriksson, & Fugel-Meyer, 1991; Gallagher, Rauh, & Haugh, 1989; Cairns, Mooney, & Crane, 1984; Sandstrom & Esbjornsson, 1986; Milhous, Haugh, Frymoyer, Ruess, Gallagher, & Wilder 1989; Hazard, et al., 1989; Lancourt & Kettelhut, 1992; Bigos, et al., 1991). In fact, Bigos et al. found that only muscle wasting was found to be positively correlated with high cost claimants, and (Lancourt & Kettelhut, 1992) found that in lower back pain patients receiving workers' compensation the only physical measure associated with return to work was muscle atrophy (Lancourt & Kettelhut, 1992). A 1991 study found that only 60% of persons reimbursed for work injuries received workers' compensation (Centers for Disease Control and Prevention, 2001).

Non-work factors can have a significant influence on injuries. Recreational activities and hobbies outside of work can be the primary cause of the disorder, as can such medical conditions as Diabetes or Rheumatoid Arthritis, so

it is often very difficult to assess the occupational contribution. Liira, et al., as quoted by NIOSH, concluded that "nonoccupational causes of low back pain are probably more common than workplace causes, but even then, musculoskeletal disorders may be aggravated by workplace factors."

Petersen (1995) and Baldwin Johnson, and Butler (1996) found a relationship between recovery success and education. Low education level had a negative effect on rehabilitation (Tate, Habeck, & Schwartz, 1986; Petersen, 1995; Aranoff, Feldman, & Campion, 2000; LaDou, 1997). Increased education leads to "greater investments in health-related activities than less-educated workers so they are better prepared to recover from the effects of an injury" (Baldwin Johnson, & Butler, 1996). Also, the less educated individuals usually have jobs with more physical demands, which will affect the amount a particular impairment will influence the ability to do the job and also the chance of reinjury. Someone with a higher level of education is less likely to be poor and more likely to have jobs with fewer physical demand, both having an influence on return-to-work, but it is very difficult to analyze the interrelatedness of multiple covariates (MacKenzie, Morris, Jurkovich, & Yasui, 1998).

The amount of time from injury until return to work "cannot be fully predicted by the type and extent of the injury (Foreman & Murphy, 1996), however the more physically demanding the job the less the chance of return-to-work (MacKenzie, Morris, Jurkovich, & Yasui, 1998). The amount of medical care needed is not related to success (Bear-Lehman, 1983). "Studies have shown that the correlation between physical impairment and the rate of return-to-work is weak" (MacKenzie, Morris, Jurkovich, & Yasui, 1998), however Thorbjornsson et al. (2000) found that physical strength, smoking, and a history of back pain were found to have a negative relationship to successful work return.

With an increase in age there was a longer and more difficult recovery, less reserve and physical capacity to compensate for limitations of disability (Baldwin, Johnson, & Butler, 1996; Braveman, 1999; Aranoff, Feldman, & Campion, 2000). "Patients aged 18-24 were nearly three times more likely to return to work than patients with similar impairments who were 45 years old or more" (MacKenzie, Morris, Jurkovich, & Yasui, 1998). Those over 50 were found to return to work with less frequency than those less than 50 (Fredrickson, Trief, VanBeveren, Yuan, & Baum, 1988). Volinn, Koevering, and Loeser (1991) found

that workers older than 40 had twice the risk of becoming chronically disabled as those less than 25.

There are many personal co-factors that have been related to the development of Carpal Tunnel Syndrome. Obesity, square wrist configuration, small carpal canal area, diabetes and other connective tissue disorders, and poor general fitness have all been associated with higher prevalence of Carpal Tunnel Syndrome. The mechanism of injury is probably ischemia so anything contributing to a decreased health of the vascular system could compromise the health of the nerves, muscles, and tendons. With repetitive motion injuries one must also remember that outside hobbies or second jobs could have a marked effect on the success or failure of a program.

Lack of a Team Approach

Too often an injured worker is mired in a drawn out process of assessments and treatments with little interaction and communication between all the entities of the rehabilitation process. Disputes may arise as to who will pay or how much time off is needed.

"The best results are obtained if there is a coordinated effort in the rehabilitation interventions, doing so expediently with a clear goal of return-to-work

as soon as possible by all involved. Good case management means:" (Orthopedic & Sports Physical Therapy Associates Inc., n.d.)

- Coordinating the care of injured or disabled workers
- Arranging their timely return to the work place through communication with the client, referring physician and physical therapist
- Facilitating communication with the insurance companies
- Monitoring the client's adherence to the treatment program
- Interfacing with rehab nurses to facilitate discharge planning, according to physician's recommendations.
- Ensuring that the client's medical and psychosocial needs are met

An analysis of the reasons for lack of success would not be complete without considering the possibility of malingering. This is difficult to assess, especially since the presence of an organic disorder does not exclude malingering and the presence of malingering does not exclude an organic disorder (Enselada, 2000). Enselada goes on to say that there is a "far greater shame of not

treating a person as having deficiencies when they do than having a malingerer succeed in getting compensation."

History of Work Hardening and the Integrated Work Program

In 1981, the cost of disability income payments and health care services for the occupationally disabled was \$184 billion. At the same time, legislation mandating vocational rehabilitation, caused workers' compensation boards to expand the benefits. It was under this climate that Work Hardening, and subsequently Work Integration, was developed (Lechner, 1994). As the incidence of chronic musculoskeletal disorders increased, "work hardening became a service that filled a much-needed niche (Matheson, Ogden, Violette, & Schultz, 1985). "A small but important percentage of injured workers treated with a purely biomedical approach were not returning to work, but were remaining disabled for years after injury" (Frymoyer, 1988).

Work hardening and Work Conditioning Programs evolved in the late 1970's in an effort to minimize the economic and human costs of work related injuries (Lechner, 1994). Leonard Matheson, PhD, developed the first Work Hardening Program in 1977 at Rancho Los Amigos Hospital in Downey, California. He described it in his article of 1985 as a

"work oriented treatment program that has an outcome which is measured in terms of improvement in the client's productivity" (Matheson, Ogden, Violette, & Schultz, 1985). It was designed to bridge the gap that exists when a person has recovered from the acute phase of an injury but has residual problems that prevent him or her from returning to the job (CPCU, 2000). Debbie Holmes-Enix of RTW states that it originally was supposed to be a "short-term intervention used as a bridge to develop dexterity, strength, and endurance in an injured worker to the point where he can successfully go back to work". She goes on to say that she was present when the Work Hardening Program was developed and it was not intended to be primarily for chronic and long-term injuries. Doctor Linda Niemeyer of RTW, who helped develop Work Hardening, states that it was used in patients with severe deficits with more chronic conditions and became a very expensive, long, and intensive therapy that employers and insurance carriers no longer wanted to pay for so it fell out of favor inspite of the good results in outcomes.

When patients go to their doctor after an injury they want guidance as to how to get back their normal function. Rarely do they get this and they are left to deal with a haphazard approach that is not well planned out or based

on a thorough evaluation of their functional capabilities. When they do get guidance and a planned approach in terms of their recovery, they are more likely to have good results. The Integrated Work Program has a thorough approach geared toward careful planning of the rehabilitation, which answers these concerns of the patients. When this is communicated well to the patient he will have more confidence that he will recover. It doesn't just get the worker into a modified duty program where they do something totally different, but reintegrates them back into their same job duties.

In 1989 Work Hardening was officially defined by the Commission on Accreditation of Rehabilitation Facilities (The Rehabilitation Accreditation Commission, 2001) as "a highly structured, goal-oriented individualized treatment program designed to maximize the individual's ability to return to work" (CARF). They recommended that this service be "interdisciplinary and use real or simulated work tasks combined with conditioning activities in order to achieve therapeutic goals related to improvement of the injured worker's biomechanical, neuromuscular (strength, endurance, movement, flexibility, stability, and motor control) functions, cardiovascular-metabolic, and psychosocial functioning." It goes on to say that the

goals need to be that of improved and restored productivity, safety, physical tolerance and endurance, and ergonomically sound work behaviors and techniques.

A Work Hardening Program uses "simulated work tasks in an environment where expectations for basic worker behaviors, such as timeliness, attendance, and dress, are in keeping with workplace standards" (Matheson, Ogden, Violette, Schultz, 1985). It provides a means for an injured worker to improve on his or her physical abilities to meet the critical demands of the job by increasing his work tolerance, improving his work rate, improving work habits, and being able to work through his/her pain. That could mean increasing strength, flexibility, and tolerance for pain or by teaching skills to conduct tasks and use work adaptations and assistive devices. "The average program length is 6-8 weeks until a plateau is reached, goals are attained, or for some reason participation becomes an issue" (Matheson, Ogden, Violette, & Schultz, 1985).

Work Hardening and Integrated Work Programs need to have both physical and aerobic conditioning. Not only does the worker need to be able to do the job tasks physically, but he/she must also attain the proper endurance level to last the full work shift for 40 hours a week. Physical

abilities must therefore be improved beyond that required for the job in order to provide the worker with some reserve capacity and ensure a safe level of functioning.

Work Hardening and Integrated Work Programs apply the philosophy of early intervention that has been followed for years in Sports Medicine. Workers are often referred to as "Industrial Athletes" and typically are much healthier than the general public. In this model, "the therapist assumes the role of coach who is a mentor and role model for self-motivation" (Darphin, Smith, & Green, 1992). An injured worker like an injured athlete has lost the physical ability to do certain activities safely or adequately. If inactivity continues there will be de-conditioning due to lack of activity, so athletes are typically made to "walk off" sprains and strains. He will lose strength, mobility, endurance, coordination, and balance if left to rest. "During the past sixty years, the militaries of the world discovered that when certain individuals with relatively simple injuries were left alone, or received inappropriate treatment for subjective physical complaints only, many became permanently and totally disabled" (Colledge & Johnson, 2000). Colledge and Johnson goes on to say that they have developed what they call "Forward Treatment" which prevents what is called

"system-induced disability within this highly stressed and entitled or compensated group."

If the functions lost are not restored in the proper sequence and to the needed degree for the job tasks, the worker may adapt with possibly dysfunctional habits that will often lead to re-injury or a new injury. Success in sports medicine has shown that immediate and aggressive therapy is best because deconditioning is minimized, the worker does not develop the disability mind-set, and the negative reactions by the employer, coworkers, and family and social circle have less time to develop into psychological factors that will affect success. In sports injury cases, the patient has a strong feeling that they need to get back that often is missing with industrial injuries. If they are dissatisfied with their job they are less likely to wish a quick return and will lack considerable motivation. It is important to get them back to work before new ideations and feelings emerge.

It is the aim of all rehabilitation to help the worker recover, but Work Hardening and Integrated Work Programs emphasize the goal to return him or her to productive work as soon as possible with minimal dysfunction and the ability to minimize re-injury through education and conditioning. An Integrated Work Program is

much like Work Hardening, except it is less intensive and the worker does not spend as much time in the treatment program on each visit. Work Hardening is used when there has been a marked decrease in functional ability, reserve, and energy level because of a major amount of deconditioning, either because of the type of injury or the time from injury to rehabilitation. It is typically utilized when the worker has gone through various modes of medical and surgical treatments and is still not improved enough to successfully return to work, either because of continuing pain or physical disability and lack of endurance.

Integrated Work Programs are individualized for the worker's type of injury/deficit and job demands. They are goal-oriented treatment programs designed to restore the worker's strength, endurance, movement, flexibility, and motor control (Holmes-Enix & Lopez, 1998). The conditioning tasks are designed to progressively improve the neuromuscular, cardiovascular/metabolic and psychosocial functions of the individual in conjunction with real and simulated work activities. The employee is slowly reintegrated into his full job function. At the same time, he learns the proper body mechanics to utilize, which decreased the chance of re-injury, education during

the job simulation exercises being an important factor (Markarian, 1994).

Typically, following a "cooling off period" after an acute injury and possibly surgery, the patient is referred for therapy. Appropriate traditional therapy is given first in order to get the worker to a degree of functional capacity that would allow the therapist to begin working on specific job tasks. Typically, the patient has about thirty to forty-five minutes of therapy and warm up sessions followed by thirty to sixty minutes of the Integrated Work Program during each visit. During this time the worker uses the actual equipment required at the job, such as hammers, nails, screwdrivers, baskets, carts, bricks, gravel, ladders, and railroad switches to name a few.

The therapist, in essence, becomes a coach and teacher who guides the employee in proper body mechanics, lifting technique, pacing and other characteristics of the job. Some programs actually utilize classroom settings where workers are taught the anatomy of the spine and musculoskeletal system, mechanisms of injury, good body mechanics and exercises, as well as good nutrition and stress management.

Workers are often either brought back to their job tasks too quickly or else their physician is overly cautious in trying to get them completely ready by being too conservative in terms of limitations they place on the worker. The Integrated Work Program allows caregivers to better assess how quickly the worker can be integrated fully back into their usual job tasks. The employee gains confidence in his ability by being able to actually do things required of them at work during therapy. These programs do much in helping allay the fears of workers about their abilities after an injury and keep them from developing what is called a disability mind-set with limited anticipation about successful re-integration into the work force. With the Integrated Work Program one can have more specific directives instead of just stating the person can return to light duty.

Functional Capacity Evaluations

Physicians often base their assessment of the patient's return to work capabilities on what the patient reports. One should not take the word of the patient alone in assessing capabilities and coming up with treatment plans. "Physicians tend to err on the conservative side because of lack of information" (Aranoff, et al., 2000).

The Functional Capacity Evaluation is the most common type of functional assessment of a worker's ability to perform his essential functions of the job. "The original term, coined by Dr. Leonard Matheson in the early 1980's, was work capacity evaluation" (Niemeyer, Jacobs, Reynolds-Lynch, Bettencourt, & Lang, 1994). Functional Capacity Evaluations (FCE's) assess the client's general functional abilities and limitations and are job specific. The patient is assessed as to his deficits and ability to return to work, typically over a two day period for at least 3-4 hours each day in order to fully evaluate their endurance and long-term capacities. Recently, RTW began to do their FCE's in one day, including a lunch period, allowing them to better evaluate the existence of latency symptoms. Shorter Functional Ability Evaluations do not give the information one needs to assess prolonged tolerances.

All physical demands including an individual's tolerance for sitting, standing, walking, lifting, carrying, pushing, pulling, bending, reaching, climbing, gripping coping strategies, safety, body mechanics and perceived functional abilities are looked at. There are various measures used to assure maximal effort is exerted.

It allows the therapist to set realistic goals as well as job and patient specific treatment plans.

Functional Capacity Evaluations should include both a psychological and a physical assessment of the patient. The therapist needs to examine his ability to manage and cope with the pain and stress involved due to his injury. He needs to evaluate what psychosocial factors are possibly at play in regards to the work place and the need for emotional support.

There are several types of standardized forms of Functional Capacity Evaluations utilized. A few examples are Key, Isernhagen, Malhesan, and Blankenship Assessments. Everyone does not do physical assessments the same way, but by utilizing standardized forms, duplication is easier and one can better compare results for patients with similar capacity deficits and needs. This will not only allow better comparisons between the two Functional Capacity Evaluations before and after treatment courses to see the improvements, but also allow better evaluations of the degree of success for different treatments.

Once the therapist knows the parameters of the job and those in which the worker can physically work safely, job modifications may be made if the worker has not adequately recovered. The intensity and frequency of

physical demands are assessed, as are tolerances, endurance, technique, and the positions required, as well as the patient's ability to maintain them.

Indications for a Functional Capacity Evaluation are chronic disabling injuries, excessive pain, and inability to meet critical job demands or a patient that has reached a plateau or is not progressing as expected during the course of treatment. Contraindications are unstable acute injuries, surgically correctable lesions, and psychosis (Orthopedic & Sports Physical Therapy Associates Inc., n.d.).

Job Site Visits

Before the design of the Integrated Work Program for an individual, the therapist must understand the nature of the job demands, the resources available, and the adjustments that can or need to be made as well as the functional limitations of the worker. These needs are fulfilled through job evaluations, site visits, and Functional Capacity Evaluations.

The Job Site Visit is one aspect that is sometimes ignored yet it is absolutely vital to ensure effective recovery. If the worker knew everything that could have caused or influenced his injury, he may not even have

become disabled, so the therapists and physicians should not rely on what the worker describes as his job description. Not having the proper Integrated Work Program set up will certainly negatively impact the degree of success. A good understanding of the job is necessary to develop the proper work simulation program.

The evaluation includes subjective reports by the worker and his supervisors along with an objective on-site analysis. The therapist needs to understand the forces required, frequency and duration of various necessary activities, distances involved, time pressures and the pace of the work, opportunities for job variations and rest periods, tools and equipment used, as well as the physical environment of the work area.

In examining the job site the therapist determines what problems exist that may have led to the injury. The employer and employee are then able to make changes that will help prevent re-injury. If the injury was not job related it may be learned that there are certain aspects of the job tasks that could delay full recovery. In the job site evaluation, the therapist examines the tasks that are necessary in the course of the employee's job and identify any that may aggravate the injury or slow recovery. This is especially true in terms of back strains

and repetitive motion injuries. It also helps in determining if the worker needs to return to modified duty or would be better off being placed in a different job.

Michael J. Smith (1997) proposes a model to examine interventions for musculoskeletal disorders based on the balance theory of Smith & Carayon-Sainfort (1995). The model states that "working conditions and other environmental features outside of work can produce a 'stress load' on the person. That load can have biomechanical, physiological, and psychological consequences such as forces on the joints, increased blood pressure and/or perceptions of pain. The load can produce a negative influence on the person, which leads to 'strain' if it exceeds the person's capacity. This has been called a 'misfit' between the environmental demands and the personal resources and can produce serious musculoskeletal disorders if it continues for a prolonged period of time."

"Ergonomics is the science of fitting workplace conditions and job demands to the capabilities of the working population" (NIOSH). It is an approach to deal with a number of work related disorders. During the site visit, ergonomic risk factors that could result in repetitive strain of an individual while performing work

tasks can be assessed. The worker can then be instructed on proper workstation set-up, posture and stretching exercises, and proper rest periods. These rest periods do not mean, necessarily, that the worker is having a coffee break, but should keep them productive doing other tasks after a certain time at the computer, or filing and sorting of mail. Varying repetitive tasks throughout the day will decrease the number of problems in the long run. When a good fit is achieved there will be increased productivity and worker satisfaction, and fewer injuries and illnesses.

By discussing the worker and his injury with the employer, with the consent of the patient, the therapist can trigger preventive actions at the business and may bring to light problems with other employees that can then be remedied before they have an injury. He also will develop a rapport with the managers that will more than likely increase supervisor involvement and help make the injured worker feel that he is interested in their recovery.

Efficacy of the Integrated Work Program

Not much has been done to show how efficacious an Integrated Work Program is and whether or not it is cost

effective when compared to traditional therapy. This is a term actually coined by RTW, but there are similar programs that have utilized the basic ideas of Work Hardening as a return to work therapy along with conditioning and traditional type therapies. Most studies are in terms of Work Hardening, much like the Integrated Work Program but the former being much more intense, prolonged and utilized primarily with patients who have chronic conditions and have been more deconditioned.

A number of studies have attempted to assess how varying factors affect rehabilitation results with work hardening. Petersen (1995) reviewed 100 medical records of workers with low back pain and other musculoskeletal disorders and found that 76% successfully completed the Work Hardening Program with 50% returning to work. Nonphysical factors that limited success were pain behaviors, attorney involvement, and having less than a High School Diploma. Zeller, Sturm, and Cruse (1993) studied the Work Hardening experience in the Tampa General Hospital and found an overall rate of success of return-to-work of 60%, but 91% of the burn patients were successful. They felt that the difference was due to the fact that the burn patients had an earlier referral and more emphasis placed on rehabilitation for return to work,

which more than likely helped the patients gain more confidence in the probable success of the program.

A study by Niemeyer et al in 1994, a review of the outcomes research from 1982 to 1992, found that the return to work rates for industrial rehabilitation programs ranged from 50-88%. They looked at 36 Work Hardening Programs and found that almost 25% of patients never completed the program. As the length of time off of work increased the successful return-to-work decreased significantly, and they state that "78.7% overall returned to work, 48.2% to the job they held at the time of injury and 30.5% to a form of modified duty or a different job". They found no significant relationship between the number of Work Hardening visits or the number of care-givers involved and successful return-to-work.

Feuerstein, Callan-Harris, Hickey, Dyer, Armbruster, and Carosella (1993) of the Center for Occupational Rehabilitation at the University of Rochester Medical Center conducted a long-term study of a program which "included work and vocational conditioning, pain and stress management, ergonomic intervention, and vocational counseling". He looked at two groups with similar disability, pain levels, psychological distress and fears of re-injury, age and educational level, and work

environment. One was given traditional care and the other group work rehabilitation, including Work Hardening. The latter group had daily treatment for 4-6 weeks and this consisted of a half hour of warm up, 55 minutes of physical conditioning, 55 minutes of job simulation, and 45 minutes of pain and stress management. The rate of return to work for this group was 74% when compared to the usual care group, which had a rate of 40%. The problem with the study is that the sample size for each group was very small and no comparisons were made as to cost of each program.

Linstrom et al. (1992) did a randomized prospective clinical study with an Operant-Conditioning Behavioral approach to see if graded activity restored workers with low back pain of at least two months duration. They were randomly assigned to a control group and an activity group. The activity group first underwent a functional capacity evaluation. After a work-place site visit, an individual, submaximal, gradually increasing exercise program with an operant-conditioning behavioral approach was developed based on the demands of the job and their physical condition. They also underwent "back school education". This program was developed because of the knowledge about the "advantages of physical activity and

the damaging effects of immobilization on muscles, tendons, joints, and disks." They felt that "pain behavior should be understood to be a social communication and the best way to change behavior is to change the consequences that immediately follow the behavior." When the patient fulfilled his tasks well he was rewarded and when pain was displayed it was recorded "But no attempt was made to change the program in response to such displays." They used his functional capacity and not the display of pain to govern the activity, and the patients came to realize that it is not necessary to be free of pain in order to be successful in their tasks. Those in the activity group had a significantly higher successful return to work and fewer sick days used over the following two years. Even though this is not a true Integrated Work Program, it uses many of the same premises. Functional Capacity Evaluations determined the activities that should be gradually increased and geared towards their job tasks. More importantly, they did not quit just because the patient had pain. The goal is not to get rid of pain but to keep them active and back to work. As they get better and get reintegrated fully into their job there will be other factors, such as decreased stress, that will more than

likely improve the level of pain and the patient's tolerance.

A review of claims information from the Dodson Group, which markets workers' compensation insurance in 23 states and is located in Kansas City, Missouri was undertaken and summarized in the CPCU (Society of Chartered Property and Casualty Underwriters) Journal in Fall 2000. They collected data describing the sex, age, type of injury, first day unable to work and date returned to work, if Work Hardening was utilized, the name of the vendor, and the cost of the therapy, date entered Work Hardening, state, and weekly benefit paid to the patient while out of work. They state that comparing the workdays lost between patients treated with Work Hardening and those who were not as being the strongest measurement for the effectiveness of the program in returning employees to work, which really does not show the big picture. There is no mention of what happens a year down the line in terms of re-injury or continued employment, which is a major factor in cost to a company. A second question they wanted to look at was if those with Work Hardening returned to work faster and were the costs of Work Hardening less than the temporary benefits that would have been paid if they had not returned to work? This viewpoint is unfortunate

but not surprising coming from an insurance perspective. Certainly there are many indirect and direct costs that affect the company's bottom line that this totally ignores and treats as being unimportant. There is much more at stake than just the medical costs and workers' compensation benefits. The sample sizes were quite small, consisting of 30 in each group. They were unable to find a statistically significant difference in the rate of return to work between the two groups. They go on to say that those treated with Work Hardening had a mean of 604 weeks of lost time while those without Work Hardening had a mean of 544, the conclusion being that "this is proof enough that Work Hardening is not cost effective and no further investigation into cost-effectiveness is necessary". They are only focusing on the direct cost differences. Also, with such a small sample size it is difficult to say how statistically significant the difference is, which was not even mentioned as having been looked at.

Two well-designed studies that suggest that Work Hardening and Integrated Work Programs have better results than traditional therapies are those by Lindstrom et al (1992) and Hazard, et al (1989). These studies suggest that they return a greater percentage of workers back into the work force and do so more efficiently. Hazard et al.

provides evidence that these programs are successful in a group of patients with more chronic conditions, with a 52% increase in the rate of return to work in the treatment group. There needs to be, however, more studies that have control groups in order to show businesses and workmans' compensation programs that there are substantial cost savings when these treatment modalities are used over traditional therapies.

A review of the literature by Lechner (1994) showed that a work conditioning program was useful in return-to-work success in those off work at least two months and that the rate of return to work for when Work Hardening was introduced as a treatment option increased the success by 52%. Smith (University of Wisconsin) quoted a study by Zepp that showed that "early and aggressive intervention improves clinical outcomes overall and reduces costs." The Integrated Work Program certainly encourages this type of therapy.

Lindstrom et al. (1992), in one of the most important studies, randomly assigned 103 patients who were 8 weeks from the date of injury to either a control or treatment group. The physical characteristics of those in each group were very similar, so the improvements in the treatment groups could very likely be because of effects of the

intervention. Work conditioning, very similar to the Integrated Work Program, received treatment 3 days per week until they returned to work. The intervention included functional capacity evaluation, education, graded exercise, and work site visits. The control group received traditional therapy including bed rest, analgesics, and "available physical therapy". After 6 weeks the treatment group had a 59% return to work rate while the control group rate was 40%. After 12 weeks the treatment group had an 80% back at work while the control group had a rate of 58%. The control group needed an average of 15 weeks to return whereas the treatment group took, on average, 10 weeks. The major difference between the two, with probably the greatest overall savings to the company, was the re-injury rate. The recurrence of low back pain in the treatment group was 21% while the control group had twice that number. One criticism of the study is that the assignment to either the treatment or the control group may not have been so random with the physician making the decision possibly being biased in his assignment choices. Another possible bias is that the treatment group could have had better results because they received more individualized attention.

One main factor in Integrated Work Program success may very well be that it is a "forward-looking approach" (Aranoff, et al., 2000) that has a focused goal from the start of return to work. It has been found that "those being directed during treatment to return to work were more likely to do so than those who were not (Aranoff, et al., 2000). He goes on to quote Cohen as saying that patients view themselves as incapable of full recovery if return to work is not encouraged.

Management's Role

The management of disability in workers is a legal obligation in many states. Under the ADA the employer is required to make reasonable accommodations for any disabled or impaired worker. In its entirety, disability management can be defined as the process of preventing and managing absence from work (Dyck, 2000). Akabas and Gates (1991) state that it is "a complete system to reduce costs, increase productivity, meet employee needs, and ensure legal compliance."

There has been a tremendous increase in the number of employers with integrated disability management programs from 17% in 1996 to 42% in 1998, the main reason being its success (Ziegler, 1999). "It means that employee benefit

programs that have been around for a long time (health care, sick leave, short- and long-term disability and workers' compensation, all previously compartmentalized) work with each other and with the company. The common goal is to resolve whatever problem an employee is having and to get him or her back to the job as quickly as possible" (Ziegler, 1999). "A good disability program treats the employees as full members of the organization who contribute to achieving the organization's goals. As such, they are a valuable asset to be nurtured by the company. This approach focuses attention on the individuals' capabilities rather than on their limitations. This can facilitate a disabled employee's timely return to work" (Smith, 1997).

The main benefit of an integrated system is that duplication of effort is minimized. A management plan with policies and procedures in terms of treatment of injuries and illnesses being in place will decrease absenteeism and chronic disability. Good integrated management systems require good communication between all parties involved. This includes the physician, therapist, employer, employee, workers' compensation case managers, and attorneys, if one is involved.

There are many success stories with disability management. "Ryder Systems, Inc. had an annual compensation cost of \$1500 per employee. After they started a return-to-work program with accelerated claims reporting procedures, improved employee communication, and implemented an early contact and early intervention program annual costs per employee were reduced to \$600 per employee" (Shrey & Hursh, 1999)

"When formal return-to-work processes are not in place, workers often expect that the only consequence of a lost-time injury is paid compensation. Concurrently, managers and supervisors often expect that workers' compensation costs are merely the 'costs of doing business.' In reality, disability costs are frequently the cost of not taking care of business" (Shrey & Hursh, 1999).

The prevention and management of work-related injuries needs a number of components linked together in a well-rounded and integrated approach at reducing work-related injuries successfully. There are two key components. One is a system to help the employee through the disability, from injury to medical care and therapy. The other part is the corporate culture. "Without supervisors who are willing or trained to help disabled

employees come back on terms they can handle, without the provision of flex time or flexible duties, without help from the employees' individual work groups, the concept of integrated disability management can't live up to its promise" (Ziegler, 1999).

"To ensure effective functioning, one central figure should coordinate the daily operations of a disability management program. He is an active supporter of the injured employee and family members and functions as a catalyst for facilitating the reintegration of the disabled worker into the workplace" (Dyck, 2000). "Early intervention begins with a case manager contacting the disabled employee as soon as possible rather than waiting to be contacted" (Smith, 1997). Supervisors need to be involved, making contact with the injured worker immediately to cheer him on and let him know that the company goal, not only the worker's goal, is to get him or her fit as soon as possible. The message needs to be given that the employer will accommodate the worker whenever possible and wish to see him back even before he may be 100% fit.

The employer can do much to minimize the injuries, thereby improving the return-to-work rate and decreasing the workers' compensation costs. Many businesses have put

together programs to do just that. NIOSH has, after review of their experience in all aspects of the work environment, put together a primer that outlines what a successful program should include. The employer can create a corporate culture that substantially decreases the magnitude of injury costs to their bottom line by following some basic steps, (Niosh, Habeck 1999)

- Providing good education and training regarding risk factors and recognition of symptoms
- Encouraging early reporting and prompt evaluation and contact the injured worker within 24 hours.
- Allowing health care providers to make adequate job sit evaluations
- Looking for signs of potential problems such as frequent reporting of aches and pains or job tasks requiring repetitive, forceful exertions or awkward postures. Modify when necessary in order to support disability management objectives.
- Gathering data to identify conditions most problematic by using injury and illness logs and job site visits. Should develop an integrated usable system to document, analyze, manage, and

evaluate data about incidences, costs, services, and impact.

- Modification of jobs and establishment of controls to minimize job risk factors and to accommodate functional limitations and communicate that the worker will be accommodated to return before he is 100% better.
- Minimizing risk factors when planning new work process by using good designs and active use of prevention strategies to avoid incidence occurrence
- Showing Management Commitment in addressing problems and encouraging worker involvement. Assignment of responsibilities and accountability is necessary.
- Ensuring confidentiality

"The organization must accept the responsibility for their costs associated with disability rather than blame the injured workers, the state legislature, the health care industry, etc. and then actively design and implement measures designed to control the costs and at the same time promote employee welfare. The employers' culture, their policies, and strategies necessary to support a disability management program all need to be in place

before anyone can truly help an injured worker" (Isom, 1998)

Management needs to realize that employees may be faced with conflicting job demands or requirements. On the one hand they may be required to follow safety rules, including proper rest breaks and avoidance of excess strain or prolonged repetitive motions. On the other hand, management may put undue pressure on the employee to meet quotas and may reward those who actually follow the safety rules the least through better pay.

Early reporting may be discouraged by such actions as tying supervisor compensation to the number of injuries. Such policies will discourage the employee from reporting minor symptoms that, if treated promptly, prevent long-term problems and increase productivity. Employees should never be afraid of any kind of discrimination based on early reporting. A Study of 200,000 workers' compensation claims by a Hartford Insurance Group showed that "injuries reported within 10 days were 47% less costly than those that were not reported until one month after they occurred" (Smith, 1997).

Health benefit and disability management costs are increasingly looked at by companies as investments in their most valued asset, the employees. Having programs to

help the workers stop smoking or improve their fitness will provide the companies with workers who are less likely to call in sick or become disabled.

Prevention of injuries has become a major theme throughout the business world and the occupational medicine arena. Right-to-know laws have made it mandatory that employee education is an ongoing aspect of business. The right-to-know movement began in the 1980's with employee lobbying of state and federal government, leading to more direct involvement of the employee in his safety.

Prevention of injuries needs to begin by making sure that there is a good match between the worker and his job requirements. Before he is ever given the job, management needs to make sure that he is physically and mentally equipped to do the work without injury to himself or others. The American Disabilities Act prevents discrimination against anyone, but one can ask about and test for the capabilities of the potential employee for the specific job requirements. If he has the knowledge, skill, and physical ability to do the job, he must have the same opportunity as anyone else in getting the job.

There has been a steady increase in emphasis on injury prevention. State and Federal regulations require more education and training to assure the employee is well

protected and equipped to perform safely in his responsibilities. Emphasis is no longer just on body mechanics and safe lifting techniques, but now is also on repetitive activities and non-material handling activities. Ergonomics in the work place is a major part of this prevention education and training.

Another trend is towards early intervention and more acute care instead of giving a lot of time off to stay at home to recuperate through nonuse of the affected areas. "An essential element of success of subacute-stage intervention in returning people to work is to involve the workplace explicitly in the process. A supportive workplace response to injury needs to start when the pain is first reported. An individualized non-adversarial approach that includes early return-to-work should follow promptly to circumvent the development of disability behavior" (Aronoff, et al., 2000).

Goals of Work Rehabilitation

Studies of Work Hardening and Integrated Work Program success do not always have the same goals for their program. Many do not state their goals. Most use the return-to-work as their primary goal, while others have their goals as either improving the physical impairments

of individuals, improving patient function, or returning to work as quickly as possible. It is important to document the goals in studies in order to adequately compare them (Lechne, 1994).

AOTA (Orthopedic & Sports Physical Therapy Associates Inc., n.d.) summarizes the goals of work rehabilitation as follows:

- To insure a smooth, rapid, safe transition into the work force
- To develop physical tolerance for work, including flexibility, strength, and endurance
- To develop safe job performance to prevent re-injury
- To develop and reinforce appropriate work behaviors
- To provide data concerning a worker's physical and psychological tolerances that are essential to the vocational planning process
- To determine if tool or job site modifications, ergonomics, or assistance technology will remove barriers to return to work.
- To promote patient responsibility and self-management

Benefits of Work Rehabilitation

There are numerous benefits of work rehabilitation. The worker not only maintains his ability to make a living and provide for his family, but also maintains the social ties he has through his job, which affects his overall well-being and sense of accomplishment. With a loss of employment the worker loses self-esteem and has increasing individual and family distress, leading to depression and feelings of hopelessness and shame. Rehabilitation helps to maintain the bonds when it gets the person back to work quickly. After a prolonged period, new ties are made by co-workers and feelings of resentment on their part may set in.

AOTA (Orthopedic & Sports Physical Therapy Associates Inc., n.d.) outlines the benefits of work rehabilitation as follows:

- Injured individuals return more quickly and safely to employment with greater physical endurance/human performance levels and ability to meet and perform the job requirements.
- Injured individuals gain a clear knowledge of their capabilities and prepare them for reentry into the community and work force.

- Employers receive assurance that the employee is physically competent to perform the essential functions of the job and has the necessary work readiness skills. The employer may realize a reduction in lost workdays, lost productivity, workers' compensation claims and associated costs.
- Insurance carriers receive rapid case resolution and a decrease in the administrative costs of case management.
- Physicians receive objective documentation of physical abilities on which to base return to work clearance, impairment rating or disability determination.

Rehabilitation case managers gain a clearer picture of the individual's physical capacities, which aids in focused program planning and vocational exploration.

Measure of Success

In rehabilitation, success means different things to different people. An insurance carrier will be interested in decreasing the medical and legal costs. The employer wants to look at measures of productivity, costs of training and hiring, and employee satisfaction. Other than

the patient, he has the most at stake. The caregivers and injured workers will want to know that the intervention will increase functioning and quality of life, "which is not readily translated into monetary amounts" (Krause, Dasinger, & Neuhauser, 1998).

One way that is usually used to measure success is the return-to-work rate, but one must question whether or not the return-to-work, or even earlier return-to-work, is the best measure of success. Some say not (Baldwin, Johnson, & Butler, 1996; Butler, et al., 1995). It is important to use more than one outcome measure. Some interventions may have opposite effects. Baldwin, Johnson, and Butler (1996) used data from "The Survey of Ontario Workers with Permanent Impairments", the world's largest survey of injured workers, to show that return-to-work alone will give misleading conclusions about success. First of all, he states that "return-to-work is affected by many factors not directly related to the care given and the return-to-work merely is usually the end of one of many incidences of disability caused by the original or a subsequent injury". There was an 85% rate of success in the Ontario workers if one uses the first post-injury return-to-work as an indication of successful recovery, but 61% of them had subsequent incidences of disability.

The length of time one uses to monitor the continued success of a program makes a marked difference in the conclusions one will draw. There needs to be an interest in keeping the worker employed long term without re-injury or continued pain before one can say a therapeutic measure was successful. The Integrated Work Program is important in this sense because it gives an opportunity during specific job tasks for the therapist to observe techniques and to educate the worker to use better body mechanics or to use proper rest periods, stretching exercises, or merely alternate tasks to prevent repetitiveness. This will help prevent re-injury and chronic pain that may only lead the worker to lose faith in the ultimate complete subsidence of his difficulties.

In studying Work Hardening and Work Conditioning Programs, most studies do not even include a report of the cost per patient. Costs on those reporting ranged from \$1,400 to \$ 9,000 per patient. The one that used about \$1,400 per patient used a social worker rather than a psychiatrist or psychologist for psychosocial counseling and their program consisted of three half-day sessions per week instead of five full-day sessions, with no inpatient stays. The return to work rates were about the same.

Difficulties in Intervention Outcome Research Design

In a good research study one has adequate means of studying results, good controls, randomization, controlling for confounders, and multiple observation points to measure results in each participant, besides having an adequate number involved in the study. Trying to incorporate all of these into intervention research projects can be very difficult to nearly impossible. Random assignment is very unlikely to occur, especially since the patient is coming from a multitude of work sites and physician referral bases. Control groups that get no or minimal treatment is not possible because the reasons for being chosen for these groups causes a lot of bias introduction and typically are those with less severe injuries, which often get better no matter what the treatment.

Niemeyer, Jacobs, Reynolds-Lynch, Bettencourt, and Lang, (1994), and Haig and Penha (1991) suggested that "outcomes research would be helped by the setting of uniform standards in data collection when trying to establish the efficacy of a rehabilitation program. If this were done we would be much better able to show which treatments work the best both in terms of cost and

outcome". Niemeyer, Jacobs, Reynolds-Lynch, Bettencourt, and Lang go on to say that when success comparisons are made one needs to group patients in terms of length of disability and make judgments between those who actually finished the program, as well as using subcategories of return-to-work status and consistency in terms of the follow up period once discharged. "Aggressive attempts are needed to develop reliable, uniform outcome measurement questionnaires which allow consistent pre- and post-intervention follow-ups at regular intervals to enhance comparison of ability to generalize across studies. We need standardized and reliably proven techniques to better understand the short and long-term outcome of health care and promotion programs" (Harkapaa, Jarvikoski, Hakala, & Jarvilehto, 1996).

Study designs will greatly affect study biases and the conclusions that can be made. It is not usual that different rehabilitation programs are willing to share data in a joint effort to show treatment effectiveness. Those who do not use the integrated work program in the same service area as RTW have not been willing to even share their data on the overall successful return-to-work for different types of injuries in grocery store workers. This makes it difficult to build in controls. The ideal

study would be a cohort study with randomly assigned control groups or matched comparison groups, with a standardized set of criteria used to include or exclude study subjects in order to minimize biases as much as possible. The subjects in each group need to be assessed in terms of type and site of injury, physical abilities, job demands, level of pain, psychosocial and demographic characteristics, and types of insurance involvement as well as whether or not there is ongoing or pending litigation. Also, the control group therapy needs to have intervention controls built in so that some patients in the control group did not get treatments very similar to the Integrated Work Program. If there is poor contrast between the intervention groups, it will be difficult to assess success. Patients rarely get just one type of therapy, which can confuse the results and causal effects even more. Another area that would make things difficult to interpret results would be the inability to adequately interpret results because there are a lot of interrelated components such as training, exercise, organizational changes, and ergonomic improvements. The study needs to be long enough in order to assess overall long term success as well as to get an adequate number of subjects in the study. Standardized evaluations that can be replicated

need to be done before and after treatment to assure comparisons of similar patients.

The Rehabilitation Technology Works Experience

Rehabilitation Technology Works (RTW), located at 2195 Club Center Drive, Suite G, in San Bernardino, California, is a very aggressive rehabilitation center that sees about 15,000 patients a year actively pursues the best rehabilitation techniques through its research and own experience. Dr. Linda Niemeyer, Ph.D., OTR is their research coordinator and helped develop the Integrated Work Program the way it presently is used at RTW. She is excited about the results that have been achieved, but concedes that research needs to be done to prove to the insurance carriers and businesses that the full Integrated Work Program is better than a shortened version or traditional therapy. There is more and more pressure to shorten the amount of the Integrated visits or not to do them at all. Those employers who have a close relationship with RTW, overall, see the benefit and yet even then the feeling is sometimes that there isn't the need for as much time in this aspect of the rehabilitation as the therapist would like. Also, there are many physicians who are unaware of what the Integrated Work

Program is and in trying to educate them it would be helpful to have some outcome data available to.

Their building is located just off of the I-10 freeway at the end of the Waterman Exit. There is ample parking, easy accessibility and visibility. It is approximately 17,000 square feet of very open and well-organized floor space with a comfortable waiting room and open front desk area that always has brochures and newsletters readily available for the patient. One immediately gets the feeling that this is a well run and friendly rehabilitation facility, which is strongly confirmed when one enters the treatment areas. Everyone is upbeat in a very contagious sort of way. It seems obvious to the casual onlooker that patients would be excited to be there and want to do their best. There is little chance to be gloomy about one's injuries.

Everything indicates an anticipation to return to work. Work reminders are everywhere: shelves to lift and stock boxes and crates of goods; wheelbarrows, ropes, sacks and ladders; a small open framed room in the middle has many ways to mimic a carpenter's, electrician's, as well as a fireman's or policeman's job; mail sorting room as well as a check stand complete with a conveyor belt; a seat for a bus driver and a set up for a lineman; stairs;

gravel; a car and a truck; and any kind of tool one can think of. There is no escaping the work environment by coming here for a day with a therapist to enjoy one's massage and feel like one is on vacation. One can see that this is a rehabilitation facility with a work oriented treatment approach with a mission to return the worker back to his job successfully.

They opened in 1993 at a time when workmans' compensation costs had seen tremendous increases. The term "comalingering" was used coined during this year to "refer to intentional or involuntary cooperative manipulation of a disability compensation system that subverts rehabilitation goals" (Foto & Niemeyer, 1993). It stated at this time its primary goal as being "early intervention and timely return to work through effective application of rehabilitation therapies, and decreased overall cost of disability" (Foto & Niemeyer, 1993). Dr. Linda Niemeyer states that at that time the work program followed the going model. Injured workers received traditional medical intervention with OT or PT treatment. If they were not able to successfully return to work, they became Qualified Injured Workers and were referred to vocational counselors who had pretty free rein. Their referrals, therefore, were from Vocational Counselors, who ordered 1) Work Capacity

Evaluation, a combination of work capacity testing (physical tolerances) combined with vocational evaluation (aptitudes, interests, general education, etc.); 2) Work Hardening for clients they were seeing to improve physical tolerances and thus improve options for alternate employment; and 3) functional capacity evaluation to get an overview of tolerances to help with appropriate vocational planning. As Linda Niemeyer describes it, "vocational counselors were doing a gangbuster business as were the CARF approved work hardening centers nationwide."

Changes were developing in the workmans' compensation system in the early 1990's that almost put vocational counselors and work hardening centers out of business about a year after RTW opened for business. Their main referral base, the Vocational Counselors, was drying up. The managed care approach in all other aspects of medical care was being tried in the workman's compensation system and Work Hardening was no longer popular because of its high cost. RTW had to adapt in order to survive and their Integrated Work Program was developed. This is a transitional program to begin treating patients in the acute and subacute phases of injury recovery by integrating them back into their job through simulated work activity. Debbie Enix, MPH, OTR states that this is a

work oriented treatment whose goal is to focus on function and return the patient back to work as soon and as safely as possible. She illustrates their approach as the same one used in sports injuries where the athlete is excited to return inspite of pain he still has because he feels a need to get back and, in fact, is excited to do so. Too often medical providers focus on getting the patient pain free, which should not be the goal. RTW realizes that there are many factors influencing the success of return to work that need to be dealt with and the more issues there are at work, the less likely the worker will get excited to get back. Soon their personality changes, they focus on their pain and disability, negative family and interpersonal dynamics develop. Now it is more difficult to counteract the "disability mind set" than it would have been to prevent it in the first place through early intervention and reintegration. The patient should not be given the chance to no longer see himself as a worker and a valued asset to their company.

For a while RTW offered this as a part of the regular therapy hour, billed as functional activity with 30 minutes of traditional therapy and 30 minutes of simulated work. No one knew about the program and its value so authorizations were impossible to get and it was given at

no extra cost as a marketing strategy. Occasionally they were able to get authorized for 90- minute therapy periods, which became quite common. Presently, most patients get 45 minutes of traditional therapy followed by 45 minutes of the Integrated Work Program. At first the percent of their patients in the program was 15-20% in 1995, increasing to about 30-40% presently. Dr. Niemeyer states this is probably because of their increasing ease in obtaining authorizations as the benefits are seen by more of their referral base and their insurance carriers.

Over the years their therapy mix has changed. Originally they were mainly a hand therapy practice, with one PT taking care of about 20-30% of their business. Presently PT is about 66% of their practice. Workers' compensation is 80% or more of total referrals and has been this for a number of years.

Dr. Niemeyer reports that, when looking at the total Workmans' Compensation patient population, chronic and acute, return to work is about 74% to 78%. When one selects out groups where RTW has a relationship with the employer, such as the grocery food chain involved in this study, that allows early intervention and consistent authorization for the Integrated Program, they get a

consistent rate of 89% to 90% rate of return to their usual and customary job.

Each patient undergoes a Functional Capacity Evaluation (FCE) in order to assess "the parameters of the individual's physical tolerances at that moment in time", states Debbie Enix. It uses short term structured and standardized activities over a five hour day. They used to do them over a two-day period of time but changed it to one day with an hour for lunch in order to see any latent symptoms that may develop. Also, it was sometimes very difficult for a patient to set aside two days so quite a few did not return for the second day. A standard format is utilized by everyone, but there is flexibility built in. The chart is reviewed and the patient interviewed in order to put together all the information needed to come up with a list of "critical physical demands" to be tested. Dr. Niemeyer states that "these are physical demands that are likely to be problematic for the patient. If we are looking at return to a specific job, then we design the FCE around specific job demands. We also get orders for FCE's to provide a general overview of the client's capabilities. Physical demands include: sitting, standing, walking, stooping, kneeling, crouching, lifting, carrying, pushing, pulling, handling, fingering, feeling,

etc. For each physical demand, there is a standard approach to testing that we all use." She goes on to outline a list of three things they choose from:

- Standardized tests that provide percentile ratings based on tests of normal populations. These include all the dexterity tests, and the lifting screening; they use the PILE, or Progressive Isoinertial Lifting Evaluation
- Work Samples: These were developed by vocational evaluators to assess physical tolerances along with certain aptitudes. So they are more "work-like." Some offer normative data, but most score speed of performance based on "Methods, Time, Motion (MTM)" standards developed by engineers based on time and motion studies.
- "Content Valid" tasks, which present realistic physical demands and closely resemble actual work tasks. Scoring is determination of whether performance appears to match the job demand.

Dr. Niemeyer goes on to share a chart with a sampling of the standardized structure that they follow:

Table 1.

Rehabilitation Technology Work's Standardized Structure
for the Functional Capacity Evaluations

Critical Physical Demand	Name of Test	Type of Test
Lifting	PILE Screening Work Simulation	Standardized/No normative Content Valid
Whole body range of motion (reaching, stooping, crouching, etc)	Valpar 9 "Mobility Screening" Work Simulation	Work Sample Content Valid Content Valid
Handling, fingering, grasping, etc.	Dexterity test battery Valpar or Vitas tests Jamar/Pinch battery Work Simulation	Standardized/No normative Work Samples Standardized/No normative Content Valid

The Functional Capacity Evaluation usually begins with the more standardized measures and progresses to what is realistic work simulation for their job tasks. The standardization allows better comparisons and assessments of capabilities for program outcome studies. The final report for the patient shows a combination of data that indicates their standing compared to a normative population and also their performance compared with a specific work target.

The Isernhagen and Keys method were given as examples of standardized FCE methods available on the market. They standardize all tasks and allow scoring of all physical

demand areas compared to norms. As Dr. Niemeyer states, they choose their own method for the following reasons:

- These "cookbook" approaches are less flexible
- They are licensed and have fees attached to each assessment, so it would raise the total costs
- Normative data is useful, but is less relevant for many of their referrer's needs than simple comparison of performance to specific work demands. Conclusions based on normative data actually don't hold up as well in court, where one gets tough questions regarding the nature of the normative population, and whether you can generalize, etc. comparison with a work standard is simple and straightforward.

Dr. Linda Niemeyer was actually the developer of this approach in the 1980's along with Dr. Leonard Matheson. They called the approach Work Tolerance Screening. Later the Physical Therapists, Blankenship and Isernhagen, also developers of protocols, coined the term Functional Capacity Evaluation, which became the phrase used throughout the industry.

All patients in the Integrated Work Program receive instructions in posture, lifting, bending, etc. as well as stretching exercises they can use at work. They use Kramer

series handouts for body mechanics, which are very easy to follow. There is also a computer program ("TED") that they use in order to print out customized exercise programs for individuals. One of the things that was of interest is to see what percent of the patients continued to utilize the techniques learned a year or more later.

Work Hardening is a similar program to the Integrated Work Program offered at RTW, but not used as often. It is ordered by physicians for workers who need additional intensive conditioning in order to be returned to their physically demanding jobs.

RTW is very aggressive in trying to make sure that they know the demands of the workers' jobs through site visits. This allows them to set up a better program, but also builds a relationship with the workers' supervisors. They presently have direct involvement with at least a half dozen of employers, where they have an ongoing relationship with supervisors, risk managers, etc. who handle the injured workers' cases. Those relationships facilitate injury prevention and disability management. Even though they probably have even more of an interest than anyone else to get the worker back to his job, these employers are not willing to share their data, but they

tell RTW that they are saving money through the Integrated Work Program.

Trends and Paradigms

We are becoming an increasingly service centered work force with over 75% of the work force being employed in service industries in 1996, up from about 66% in 1979 (Levy & Wegman, 1997). There are more people who have part time or temporary work and fewer unions fighting for workers' rights within this service-oriented climate. There is less job security and fewer benefits.

The work force is also becoming older with the aging of the baby boomer generation, improved healthcare and lifestyles. This leads to more disabilities because "the frequency of disabilities is greater for workers over 55 than for any other work group" (Shrey & Hursh, 1999). The disabilities are less likely to result in return to work, as discussed earlier.

With an increasingly global economy and a growing fear of a major recession competition has never been keener and businesses have needed to focus more attention on managing their bottom line. Disability costs are eating into profits at an alarming rate, causing an HMO oriented Occupational Medicine focus and more and more need for

proving cost effectiveness of treatments and interventions. It is not enough just to continue to use rehabilitation methods that seem to work or make us feel good. Some, like Work Hardening and the Integrated Work Program offered by many rehabilitation centers, cost more money than the traditional treatments given before the mid-1980's. On the surface they look great and make us feel good because workers, overall, have felt happy with these types of therapies and are getting good results, but there have been very few studies that have looked at the issue of how cost effective they really are and whether or not they have made a difference in the rate of return-to-work and the continued safe employment of the worker.

Trends are often driven by the research being done. One driving force in research into occupational disability and treatment is The National Occupational Research Agenda (NORA, NIOSH web site), which was developed in 1996 through NIOSH in partnership with over 500 stakeholders in the public and private sectors. It provides guidance in occupational research at NIOSH and throughout the United States. They have a list of priorities that focus on the critical occupational research that is most likely to improve the safety and health of workers. Upper Extremity and Low Back Disorders were rated as top priorities,

especially since they account for about 27% of all nonfatal occupational injuries and illnesses involving lost workdays. Another priority is the assessment of the effectiveness of interventions.

Improved technologies and medical care is continually increasing the successful return of workers to the work force. It is increasingly recognized that it is necessary not only to worry about the injury rate and providing a safe work place, but also to make sure the service we provide when an injury does occur is of the highest value possible in terms of successful return to work and productivity at the least cost. More studies are needed to determine what gives a service the most value and these are led by such organizations as NORA and NIOSH, as well as AOTA and Healthy People 2000 and 2010. NIOSH is a research institute within the Centers for Disease Control and Prevention, a part of the Department of Health and Human Services. It is the only federal agency mandated to conduct research and train professionals to identify and prevent workplace hazards (Centers for Disease Control and Prevention, 2001). The research conducted by NIOSH will certainly lead the trends of the future in regards to disability management and outcome.

Since 1966, CARF (the Rehabilitation Accreditation Commission) has partnered with the medical rehabilitation community in promoting outcomes-driven, value-based services for people with activity limitations as a result of disease or injury (CARF website). "CARF accreditation has assumed a pivotal role in ensuring the quality of both privately and publicly financed medical rehabilitation care and their mission is to promote the quality, value, and optimal outcomes of services, even within a changing delivery system" (The Rehabilitation Accreditation Commission, 2001). They outline what organizations that seek their accreditation must demonstrate as follows:

- Service design and delivery that focus on the needs of the persons served.
- Assignment of designated, qualified, competent personnel to provide medical rehabilitation services.
- Program accessibility and designation of space for the provision of medical rehabilitation services.
- Accomplishment of predicted outcomes.
- Partnership with the persons served in decision-making and the development of goals.

- A system of accountability that measures the success of the medical rehabilitation program by evaluating the outcomes achieved by the persons served.
- External communication to a variety of stakeholders regarding program performance.

These are some lofty goals that, if followed, will lead to more outcome studies to demonstrate which therapy interventions give the most value.

Work Hardening became big business in the late 1980's and was a very expensive, although it was a successful mode of rehabilitation. Competition to get into the market was fierce and it became one of the fastest growing rehabilitation specialties until it fell out of favor, mainly because it was not cost effective for most injuries.

The overall vision of Work Hardening has survived and was given various names. The basic premise is to get the worker back to work as soon as possible by not only giving them the traditional therapy, but also by teaching them good techniques while doing work simulation in a more shortened form of work hardening. The movement went to a more multidisciplinary approach that takes into consideration other factors than the physical aspects of

the injury. It was recognized that one needs to also consider the psychosocial factors that interplay in the recovery rate and success. Out of this there grew the Integrated Work Program Popular that RTW uses.

There has also been a trend towards more standardized assessments and equipments in order to improve reliability, validity, and efficiency. There are an increasing number of computerized strength measuring, exercise, and work simulation allow the therapist to see if the effort is submaximal and be able to show a more accurate assessment of the percent impairment. Numerous facilities, including RTW, are using variations of their own more individualized, yet still standardized, functional capacity evaluations.

This type of intervention needs a lot of space and will lead to bigger treatment centers. Evaluations will continue to be given also in smaller centers (Niemeyer, 1998) More realistic work simulations will be readily available through computers.

Work Simulation Therapies are moving more and more towards earlier intervention and prevention as well as continuity of care and prevention. This approach is being brought more into the acute phase of rehabilitation. Traditionally, it is not initiated until the patient was

felt to have reached maximum medical improvement. One of the biggest trends is to get the worker back to activity and work as soon as possible through early intervention with work injuries, because time off work is inversely correlated to the rate of return to work (Lechner, 1994). The longer the individual is off of work the less likely he is to successfully return. The patient should not wait until his pain is gone. In fact, RTW believes this should never be a goal. Pain is a complex process that is affected by many factors and inactivity, except during the acute phase, is not going to give good long-term results or get rid of the pain. It has been found that individuals who are working report less pain and disability and attempts to keep them working during the healing process may enhance the long-term retention at work (Dworkin, Handlin, & Richlin, 1986; Tait, Chibnall, & Richardson, 1990). At RTW the Integrated Work Program is begun in the acute phase at low intensity levels for this reason. The patient is less likely to assume a "sick role" and more likely to return to work if they are kept as active as possible. RTW is fairly unique and trend setting in doing so instead of waiting until they are more recovered. Earlier intervention helps prevent secondary problems such as "secondary impairment because of deconditioning

syndrome, symptom magnification syndrome, psychological injury because of prolonged anxiety and depression, and feelings of alienation and hostility directed at the system" (Niemeyer, 1998). "This approach serves to pull the work ethic in early in the recovery process, avoids bringing in an attorney and teaches the worker that although the injury might be permanent, the disability is temporary" (Niemeyer, 1998).

Business is increasingly concerned with prevention. The Integrated Work Program is an ideal way to improve the prevention by teaching good techniques and postures. Site visits should be made in order to help the business develop a better preventative approach and plan a more successful simulated work program. Workstations may need to be changed and controls put into place. Ergonomic concerns are on the forefront of the rehabilitation of workers.

In order to remain competitive and serve everyone, including the insurance industry, work simulation therapy centers and administrators will need to pursue the industry's support. This can be done through research, but also by inviting them to the site to watch and learn how the program is run, giving lectures to help educate and maintain ties with various entities at every stage of

patient therapy. This is an area that RTW is very active in, especially in trying to make ties directly with the patient's supervisors. They have frequent lectures in their conference room, inviting those having any connection to the care of an injured worker. They are very informative and are a great way to open up the facility to others.

Rehabilitation services and businesses are focusing less on pathology and more on a holistic approach. A wellness model, that emphasizes prevention and optimized functioning of the worker, is an increasing focus of everyone. As business gets more and more into the wellness approach, the bigger ones that are self-insured will more than likely develop their own on-site work simulation clinics.

There is a trend to try the managed care and capitated approach increasingly in rehabilitation services. This may work well in some areas of medical services, although that has been put into more and more question, but in the rehabilitation services the approach of focusing on the short-term cost containment and contracting with the lowest cost provider may actually increase the overall cost to society and business in the long run. Because the worker gets subsidized for long-term

disability with partial wage replacement, the money saved initially by not aggressively treating the patient will translate into more chronic disabilities. By choosing the lowest cost provider, who may withhold care that would make a difference in the rate of return to work, there will be a prolongation of time to case closure. This may put the better providers out of business, but more than that, by not giving the care that may make a difference there are increasing numbers of barriers put up against the return to work because of deconditioning, forced dependency, financial losses, marital problems, and other life stresses related to not working (Niemeyer, 1998). Once the patient becomes chronic the chance of return to work drops to less than 50% and the costs increase tremendously. NORA, a subsidiary of the CDC states that with this trend, especially with the shortage of physicians trained in occupational medicine, there will be even more limited access for the injured worker to health professionals that are trained to recognize, treat, and prevent work-related disease.

Dr. Niemeyer (1998) outlines the paradigm shifts for the 1990's as follows:

- An increased focus on good providers, not just those giving low cost care.

- Requests for reporting based on improvement in work-related function rather than just reduction in impairment
- Early case management and timely specialized care for the injured worker
- Creation of partnerships instead of the adversarial "vendor-vendee" relationships that have been so common. Partnering needs to include the sharing of information and a coordinated effort to avoid "comalingering"
- An outgrowth of partnering is disability prevention programs through partnerships between the employer, insurer, physician, rehabilitation provider and the worker
- Development of Policies and Procedures in order to have a proactive approach to injury prevention by identifying health and safety risks.
- Coordinated Claims Management

Insurance trends are the increased managed care approach mentioned earlier, but also, what is called "24-hour care" where all of the worker's care (personal and work related) is through one insurance carrier in order to decrease overhead and duplication of services.

Also, insurance companies are increasing their data collection capabilities with the ability to make treatment, job, and community comparisons. They have not yet been willing to allow the health care industry access to their information in order to do outcome studies on various therapies without the insurance focus bias of wanting the lowest up front costs. We are entering a recession and experience has shown that during economic downturns the number of workers' compensation claims increases, employee morale declines, and the length of time out on disability increases. This makes it even more important to know what the best course of action is.

The final shift in the rehabilitation service delivery is a focus more towards the employer as the customer, instead of the insurance company or even the patient. Employers have become increasingly self-insured, forcing them to be more involved in the overall health of their employees. This is a great marketing opportunity for rehabilitation service providers in developing products and programs to improve the health and recovery of the workers (Niemeyer, 1998).

Summary

There are many studies that show the difficulty of trying to assess whether or not one rehabilitation program for a worker is better than another. Many factors have been shown to affect outcomes, some totally out of our control, but others not. Knowing these will help a business to better deal with the disabilities of their employees and get them back to work sooner. Above and beyond this, any outcome studies need to keep these factors in mind. One cannot just compare the days lost and costs to see which route is the best to take.

The Integrated Work Program at RTW is unique because it begins therapy, which is work simulation oriented, while the worker is still in the acute and subacute phase. They firmly believe that studies and experience shows that the sooner the worker can again perform his necessary job tasks the better the outcome. It minimizes many of the changes that the worker undergoes the longer he is out of work, including getting into the "sick-worker" syndrome. Their mindset remains focused on work and the goal of early return to work is kept in the forefront.

There are many who want more and more proof that one therapy is better than another. This is very difficult to do. This study tries to show some measure of success in

the Integrated Work Program by assessing the percent return of the participants and their overall feelings towards the program, their level of pain over the course of time, and the things, if any, they have carried from the program to help reduce the chance of reinjury. It is a descriptive study so it cannot assess cause and effect, but it is felt that such a study would indicate a significant measure of success and lead to a more extensive cohort study.

CHAPTER THREE

STUDY

Restatement of the Problem

Rehabilitation success or failure has long-term ramifications in every part of society. The worker who is not successfully rehabilitated loses an identity and social interactions at work. His life style and means of support diminish and the family and social dynamics in his life are almost always adversely affected. Beyond that, he usually lives with pain and depression that has an effect on his health. Until in this position, one cannot appreciate the full magnitude of the negative consequences.

The employer has many direct and, even more, indirect costs. Workers' compensation costs are eventually passed on to the employers, but if better treatment modalities can be used, there will be enormous savings and improved survival for all businesses. The costs are eventually passed on to the rest of the workers and customers. We all end up paying for the added burden placed on society.

Since there have not been many studies to look at the success of the Integrated Work Program it was decided that a descriptive study of the patient's feelings and

return-to-work outcome would be helpful in marketing the program to new businesses and strengthening the ties with the ones presently involved with RTW's Integrated Work Program. It was felt that, in the least, it would help in setting up a future cohort study that could run for a longer period of time without all the biases that were introduced through the modality of this study.

Limitations of Study

At first glance it appears that one can make some reliable assessments of the success of the Integrated Work Program by comparing outcomes on workers with similar jobs and injuries from before the Integrated Work Program was utilized and after a year or so of its initial development at RTW. Changes in the workers' compensation climate, economy and industry, compensation practices, court case results, and composition of the workforce during the study period may be responsible for changes that are attributed to the type of intervention used. This cohort effect could be enormous and appeared to be too great a problem so the focus was on developing a descriptive study to assess outcomes for the Integrated Work Program at RTW from 1/99 until 1/01. The main focus of the study was to describe the individual experiences of the workers. Data was

collected from telephone interviews conducted by two different individuals, who each did about half.

A questionnaire was devised based on a wish to control for some of the factors that the literature review pointed out were significant factors in the final return-to-work outcome. The main focus was to see what percent returned-to-work and what the overall success rate was for continued employment in their job. Also, it was the wish of the examiner to see if the education given by the therapists at RTW made a long-term impression on the worker and if they continued to use the techniques learned, thereby decreasing re-injury rates.

The author is aware of the fact that in a descriptive study one cannot assess cause and effect, but descriptive outcome studies can help in future cohort and case control studies where cause and effect could possibly be shown. It is the hope that the study will help guide and initiate a long-term study with ongoing questionnaires and more intensive data collection in order to show the value of the Integrated Work Program. Because of time constraints it was impossible to come up with such a study for this paper.

The limitations of the study have to do with many biases being introduced because of the type and scope of

the study. Self-selection bias is tremendous in such a study. Those who are willing to answer may be on either extreme of results, with those being just satisfied not being willing to take the time to participate. It was our hope to minimize the interviewer biases that may be introduced, but the workers often wanted to talk for quite a while so that there probably was some influence by the interviewer as to the magnitude of response on some of the graded questions. Distrust that workers have towards the workmans' compensation system was quite evident in that some were quite angry and demanded not to be called again, even though they stated at some point that their therapy was fine. Many who participated had to ask several times if we really were not doing something for the insurance carrier or their employer.

Many variables have been found to be associated with return-to-work outcomes in the literature, including sociodemographic factors, injury type, severity of disability and length off of work, medical history, psychological factors, workplace perceptions and support, compensation and economic conditions. This causes a lot of confounding and difficulty in deciding what is the real reason behind success or failure.

So as to reduce confounding as much as possible it was decided to limit the study to injured workers during a fairly short period of time from a major grocery store chain in the San Bernardino County area. Going back further would seriously affect recall, but not going back far enough would mean that the long-term picture would be missed. There will be some who initially were able to return-to-work and then had to quit or retrain. Success cannot be measured only on return-to-work but needs to be assessed in terms of future sick time, re-injury, and future ability to maintain one's work capabilities.

It was felt later that early reporting was an issue that needs to be addressed more. The recall was such that it could not be assessed in this study, but for future studies, it would be an important aspect to look at. Those who reported an injury early would be expected to be more likely to have a successful outcome and more positive feelings about the program.

The fact that the number of workers who chose to participate was only 28 out of the original 62 attempted introduces Type II Errors. Another difficulty in assessing outcomes is the fact that the first three visits of Integrated Work Programs were many times provided at no cost while RTW awaited authorization. They did not wish to

hold up treatments, knowing that the outcomes would probably be adversely affected and they wanted to use this as a marketing strategy to get the trust built up with the employers and insurance carriers.

Questionnaire

See addendums

Data Analysis

The time frame of the therapies given was from 1/99 through 1/01. Of the total 28 interviewed, 15 (53.57%) were males. Because of the small size of the study, the statistical significance of various factors with return-to work success was not significant, especially since 32.14% could not remember when they returned. There initially were 62 people whom the interviewers attempted to contact, but only 28 (45.16%) were reached or willing to participate. Many had moved, quite a few were working such odd hours that it was difficult to make contact and then they decided they did not wish to participate because it was not a good time. When these were called back they invariably could not be reached or said they would not be interested after all. Most were very leery of participating because they were thinking there must be something behind it that would hurt them in some fashion.

Many were not willing to answer any questions until they were assured that this was a study being conducted by a physician who is having to retrain because of a job related injury. At that point many of the patients were more than willing to talk and the interview often lasted for more than 30 minutes, the worker being very eager to talk.

The age distribution had a normal Gaussian Distribution with a mean age of 36.11 and a Std Deviation of 8.97. The minimum age was 20 and the maximum was 63, which was an outlier with the maximum on the distribution curve at 50.

The one worker who was 63 actually was the most unhappy and felt that the employer was trying to get rid of him, not giving any support and causing him so much grief that he finally gave up dealing with it and got the same job with modified duty as a custodian at another grocery store. He had no high school diploma, which was the highest education level that only one other person interviewed had. Studies show (see review of literature) that age and low education level have a negative impact on the overall success of rehabilitation. He rated the amount of support from his supervisor as none and the amount of pressure as extreme; in fact, he stated that his

supervisor never contacted him except to give him a hard time. His injury was an elbow sprain from cumulative trauma and he stated that they did not take him seriously, believing he was "faking". He never quit work, although his duties were somewhat modified, having to work through the pain. He rates everyone but his therapist and family as giving him extreme pressure and only his family and therapist as giving him more than an average amount of support. He rated every aspect of his RTW experience as a 4, except for encouragement, which he ranked a 5 on a scale of 1 to 5 with 1 being not helpful and 5 being very helpful. He stated that there was nothing he did not like about his therapy and continues to use what he learned quite a bit. The amount the therapy has helped him with his home life is ranked as a 5, and at work a 4, with 1 being it had no impact and 5 being it had a strong positive impact. It was a month after he first got injured before he could get into therapy, the mean being 6.37 months, however, this includes an employee who had a very complex history and is an outlier. The majority began therapy in less than a month.

It is interesting that there were three workers who received a promotion, all not returning to their usual job after their injury. Even though the individuals seemed to

have had some of the worst times in terms of getting well, they were very positive about everything. One could tell they loved their job and were very satisfied with their treatment by the employer. They had felt very secure in their job prior to the injury.

The return-to-work rate was 85.7%, which is very close to RTW's rate that was reported to the author of 89% when there is an ongoing relationship with the employer, as was the case here, and 85.7% felt they still had not fully recovered, which was surprising. Three of the participants only did part of the interview, not wanting to be bothered anymore after barely getting into the interview. Of the 25 completing the questionnaire, 68% reported ongoing pain, 6 with more than just some pain. No one had more pain after therapy than when they started, only 2 having the same extreme pain at the end of therapy as at the beginning, both of these no longer having as much pain. On a scale of 1 to 5, with 1 being no pain and 5 being extreme pain, the mean level of pain at the beginning of therapy was 4.58 (Std Dev .70) and at the end was 2.54 (Std. Dev of 1.1). Almost all had a decrease in pain level of at least 2 points, the percent being 76.92% (See Table 2).

Table 2.

Changes of Pain Level

Rated on a Scale of 1-5 with 1 being no pain and 5 being extreme pain

	N	Mean	Std Dev
Pain at start of therapy	26	4.58	.70
Pain at end of therapy	26	2.54	1.10
Present level of pain	25	2.00	.91
Degree pain interfered with ability at work last week	22	1.91	1.02
Degree pain interfered with ability at home last week	26	2.19	1.13

Even though they had a significant amount of pain few felt difficulty at work. On a ranking from 1-5, where 1 means extreme difficulty and 5 meaning no difficulty, the mean ranking ranged from 4.14 to 4.33 for all aspects questioned (see Table 3). One cannot conclude that this was because they went through the Integrated Work Program, but a future Cohort Study may show a possible connection. If they indeed learned better body mechanics and techniques and were stronger and used breaks as needed because of the things they learned in the Integrated Work Program, it would appear that it has a significant

beneficial impact on the longterm successful employment and lack of reinjury.

Table 3.

Amount of Difficulty Doing Work in the Previous Week
 Rated at a Scale of 1-5 with 1 being extreme difficulty
 and 5 being no difficulty

	Mean	Std Dev
Using your usual technique for work?	4.33	.91
Doing your usual work because of pain?	4.14	1.01
Doing your work as well as you would like?	4.19	1.03
Spending your usual amount of time doing your work?	4.24	.94

Table 4 gives the means of the results to the questions attempting to assess how the workers felt about what the Integrated Work Program is still doing for them at work. The answers were ranked from 1-5 with 1 being not at all and 5 being a lot, and they were asked how the Integrated Work Program made them feel in terms of strength, energy, using proper body mechanics, ability to set up workstation properly, pacing themselves with breaks, symptom control, using what they learned to

prevent further injury, and gaining more confidence in performing their job.

Table 4.

Worker Feelings towards the Integrated Work Program's

Continued Effect at Work

Scale of 1 to 5, 5 being a lot of help

	Mean	Std Dev
Stronger?	3.33	1.24
More energetic?	2.90	1.45
More able to use proper body mechanics?	4.10	1.04
More able to properly set up your workstation?	3.32	1.77
More able to pace yourself by using micro stretch breaks?	3.37	1.71
More able to control symptoms while remaining productive?	3.67	1.39
Able to apply what you learned to prevent further injury at work?	3.90	1.30
Have more confidence in performing your job?	3.86	1.20

The most significant improvement that the Integrated Work Program seemed to have in terms of the education given was with the use of proper body mechanics. The rating was an average of 4.1 meaning it has helped a lot.

No one rated this aspect less than 2, meaning everyone felt that it had a lasting effect on their use of Body Mechanics many months later at least to some degree. When it was looked at how the Integrated Work program seemed to help in terms of family and home life there did not seem much help overall, although the mean showed at least some positive impact in all areas, but the participation in their work was rated at a mean of 3.5 with a Standard Deviation of 1.41 (Table 5).

Table 5.

Worker Feeling of Integrated Work Program Impact in Daily Life

Scale of 1 to 5, 5 being a lot of Impact

	Mean	Std. Dev
Impact with Home Responsibilities	3.12	1.67
Impact with Recreational Activities	2.70	1.55
Impact with Social Activities	2.36	1.55
Impact with Sleep Patterns	2.24	1.69
Impact with Work Participation	3.50	1.41

The supervisors did not contact the employee at all 33.33 % of the time and 70.37% of the employees felt they got no support from them, with the mean level of support

from supervisors being 1.96, the lowest of any support received (See Appendix) This is sad, especially since there is evidence that employer involvement and support helps improve the return-to-work rates. It does not take much time to make a phone call in order to express support and a positive outlook. Many expressed their dismay that the employer made no contact.

Out of all the people giving support in their lives, the therapists were ranked at a mean of 4.63 (Scale of 1-5 with 5 being best), even higher than family support at 4.52. The mean amount of Physician support was a 3.33, with most not feeling any support from them.

The amount of pressure felt was the most from the self-imposed pressures at 3.19. The Physician was felt to give a pressure of 2.31 compared with the Case Managers at only a 1.13. The lowest pressure was from the therapist at 1.04. It was surprising that financial pressures were not rated very high, being only at a level of 2.58.

Ranking the facility was interesting with even the workers who had a negative overall attitude about everything brightening up when it came to questions about RTW. Out of those finishing the interview, 80.76% ranked the location at a 4 or higher (Scale of 1-5, with 5 being best) with only 1 person at a 1, saying it was too far for

him. The Facility set-up was ranked at a 4 or higher by 100% of the participants, as was the communication of the plan. Flexibility in scheduling was ranked at a 4-5 by 88.46%, with the only complaint being that it was not possible to be seen if one was late and a couple stating it was difficult to set up appointments with work. Clarity of Expectations was ranked a 4-5 by 92.3% and the encouragement 96.15%. The Therapists were ranked at a 5 by 80.76% of the patients, with only 2 ranking them as average, one of them stating that everything was fine as far as what they did, but they just did not "jive" and the other stating the therapist was great until they plateaued, at which time they felt neglected. The biggest area of possible improvement was shown in the area of follow-up. This is the only complaints that they had, if any. Even then, it was ranked at a 3.19.

Table 6.

Overall Worker Feelings of Facility

Scale from 1-5 with 1 being not at all helpful and 5 being very helpful

	Mean	Std Dev
Helpfulness of Location	4.42	.95
Helpfulness of Facility Set-Up	4.73	.45
Flexibility	4.46	.86
Communication of Plan	4.81	.40
Clarity of Expectations	4.46	1.03
Encouragement of RTW	4.77	.59
Therapist helpfulness	4.73	.60
Warm up session helpfulness	4.52	.65
Integrated Work helpfulness	3.96	1.15
Follow-up	3.19	1.60

The only other complaint was that they would have liked to have had something like orange juice being offered, especially since the therapy burned so much energy and the individual had to often leave work and rush over, not having time to stop for a drink on the way and another that the therapy sessions were too long. Two people said that the job tasks were not well simulated, but others said that this was done well. Many said that

they continued to use their exercises at home and are very aware now of how to do things better at work. Quite a few said that everything was good and nothing could be improved.

CHAPTER FOUR

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Even though this was just a Descriptive Study, which therefore limits conclusions about cause and effect, one can conclude that the patients at RTW have an overwhelmingly positive feeling about their whole experience at the facility, even when their overall success was not that great. Because the therapist spends the most time with the patient, one would feel that they would have the most positive influence, which was born out, but it surprised me that they, overall, ranked their therapist's support above that received from their family. The only suggestion that could be made to RTW for the future is to improve their follow-up. Even though this did not seem to effect the overall attitude, this was one area that they felt could have been improved. Also, the suggestion about orange or apple juice being made available probably is a good one, but I would suggest that this be in the form of a machine that dispenses juice so as to prevent health problems.

The overall success of return to work of 85.7% was very close to their norm for the Integrated Work Program

success and higher than the overall average near about 70% for the industry. Although the number of participants was not high enough to be statistically significant, this reflects favorably on the program's success.

The most disgruntled employee was the one who was 63 years old. He felt very mistreated by everyone except for RTW and seemed to have had a lot of pressure to go elsewhere to get a job. He seemed very intimidated because of a language barrier, but communicated very well about his anger towards the treatment he received from his employer after the injury, stating that he never got support or encouragement. He had never quit work, which made him even more angry.

The biggest surprise is how much the workers remembered about the things they learned during their therapies about proper body mechanics and exercise. Many volunteered the information that they continued to use them regularly, with two actually reporting that they taught others at work about the things they learned. Even though they described the Integrated Work Program, several had no idea what it meant.

The area that probably needed the biggest improvement in their experience was the interaction, or lack thereof, with their supervisor. The literature indicates that

support at work makes a big difference in terms of the successful reintegration of the worker. This would be a very simple area for the employer to work at with possibly even more improvement in the back to work success rates. Business cannot blame the medical community about lack of success or cost of therapy if it does not do its part in areas that are known to be significant factors for return-to-work success.

Recommendations

The best type of study would be a long -range cohort study with randomization into integrated work treatment and control groups using traditional therapy alone. This would be difficult to do, especially by a progressive rehabilitation group such as RTW that is so convinced that the integrated program is so much better. To put someone into a control group randomly would be malpractice in their minds. The best thing would be to have other rehabilitation centers willing to work with RTW and share their data, comparing their results between groups of patients with similar characteristics in terms of the factors found in previous studies to effect outcome. I attempted to have some large groups in the Inland Empire to share their existing data, but most claimed they did

not have it readily available and/or were not willing to share for fear of patient confidentiality issues or just because they did not wish to get involved. This is unfortunate because by sharing data on success for workers from similar jobs, such as other large grocery store chains, and compare their return to work rate and long term success we can all benefit and improve our services and do a better job at patient care, which should be our ultimate goal, even above and beyond any business goals.

A long-range cohort study would need to make a distinction between measures of effectiveness and efficiency. Effectiveness describes the extent to which a specific intervention does what is intended in a defined population. Efficiency describes the end results achieved in relation to the effort expended, including money, resources, and time. Cost data is an important issue with this, not only the direct costs but also the indirect costs. The upfront costs of therapy could be more expensive, but if the patient then had fewer days of sick time, fewer future injuries, and long term full employment, the indirect costs could be a much more important factor that needs to be kept in mind. One needs to not only look at effectiveness of a program in terms of return to work, but also improved physical functioning and

quality of life outside of work, their satisfaction and lack of reinjury, their control of pain and improved body mechanics, as well as a lack of need to be retrained and an ability to maintain earning power.

Providing details of program components will be extremely important in reports of future research so that successful programs can be duplicated and studied under various settings and with a variety of patients. Also, the only way to really say which programs are most effective is to control for confounders as much as possible, which means one needs to control for subject characteristics, program goals, and program content.

Subject characteristics would include age, education level, type of injury, length of disability, and time to start of therapy, as well as employer and job task characteristics. All of these have been shown to affect the chance of return-to-work outside of the degree of success contributed by the type of therapy given. When a worker enters the rehabilitation process will greatly affect outcome studies, as will the type of injury, whether back or repetitive motion injuries of the upper extremities, etc, will have an

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impact on which treatment modality appears better. About 70% of back pain will resolve within a month no matter what the treatment, for instance, and of those who are off work for greater than 6 months, only half will return to work (Lechner, 1994). If the mixture of cases is higher for disorders that have a high chance of resolving on their own, or those who enter rehabilitation programs early, it will appear that the success rate is higher than

average. "Although it is difficult to control for the various patients' characteristics due to the case mix and the individually tailored approach in each case, we must begin to develop tools which will finally allow for better decisions about which type of intervention is appropriate for whom, and when, and under what conditions, from the health-cost-benefit perspective" (Harkapaa, Jarvikoski, Hakala, & Jarvilehto, 1996).

The goal set for success needs to be the same when making comparisons. Return-to-work is the major goal in most studies, but the long-term goals of lower re-injury or long term successful employment past six months, for example, may indicate totally different conclusions about treatment program success. Other goals to compare could be early return-to-work, improved patient function, or the overall decrease in workers' compensation costs for a company. One needs to remember, however, that factors that are out of the control of the therapist may have a greater impact on an individual's decision to return to work (Hunter, Shaha, Flint, & Tracy, 1998).

Program content may be quite different from one Integrated Work Program to another. Certainly, how actively involved the therapists are in assessing the patient's required job tasks and limitations will make a

difference in overall outcome. Those who do adequate job site assessments and Functional Capacity Evaluations will be better able to individualize a successful Integrated Work Program. Those with the best resources available at the rehabilitation site will be best able to mimic the actual work experience. Only then can one say if the Integrated Work Program is more or less successful than other treatment modalities.

Cost comparisons need to be looked at carefully. Those which are a little more costly upfront may actually be more cost effective in the long run in terms of a decrease in indirect costs and overall future Workers' Compensation costs to the employer. If a program is more costly but gets the worker back sooner and has a lower re-injury rate because of education during the rehabilitation or adequate strengthening and proper progression in the rehabilitation program, the overall costs to the employer will be much less and the true cost effectiveness will be better.

It is the author's recommendation that RTW undergo a more thorough long term cohort study with a similar questionnaire to assess the Integrated Work Program. By doing this during the therapy, the patient/worker would probably be much more at ease in terms of the motivation

behind the questions. Also, many of the biases would be minimized, especially that of memory. The study would need to be long enough in order to see what the long range success rate is, remaining cognizant of the fact that only then can we say that the worker was successfully rehabilitated.

The grocery store chain needs to rethink its disability management system, especially as far as the supervisors go. They can only be helped by knowing that the patients rarely got contacted by them and felt very negative towards their level of support even when they were.

Cost data was not helpful in this study because one could not assess the true cost when there were quite a few Integrated Work Treatments given at the cost of RTW. As they need to use this marketing strategy less often than probably when these patients went through, in the future it will be easier to do a cost benefit analysis.

It was a shame that no one was willing to share in the data collection and combine forces. The rehabilitation service centers seemed to be afraid that maybe it would be shown that they are not as up on the best techniques as RTW. At least the insurance carrier should have been able to share data on return to work rates and lost workdays

for those employers using the Integrated Work Program and those that do not, but this was not the case. Business, including the insurance businesses, are only hurt by this attitude.

APPENDIX A
STUDY QUESTIONNAIRE

Integrated Work Study Questionnaire

Questions Answered by Interviewer

Name _____ Gender _____ Race _____

Phone Number _____

Job Title _____

Birth Date _____ Age at Time of Therapy _____

Date of Injury _____

Injury Description _____

Date First Seen at RTW _____ Date Entered Integrated Work Program _____

Number of Integrated Visits _____ First Session Date _____ Last Session Date _____

Services Seen _____

Cost of Therapy _____

A physician, who is retraining because of a job related injury, is doing a study as part of the MBA requirements at Cal State San Bernardino. The purpose of the study is to assess the Integrated Work Program at RTW in order to better service workers and businesses. You can be assured that the information given will be treated in strictest confidence and will not become part of your medical records. Your interview will be assigned a number and names will not be tied to the information in any way for anyone else to see. A few individuals will be asked if they would give a more extensive interview with their permission to use as examples, but names of any other parties brought up will not be used at any time. We are most grateful for your participation and want to thank you in advance for your help.

Phone Interview Questions

Following your therapy at RTW, were you able to return to work? Yes No

(If no), are you...

Still under medical treatment	Yes	No
Laid Off	Yes	No
Retired	Yes	No
Seeing a vocational counselor	Yes	No
Other	Yes	No

(If yes), what was the date you returned? _____

Are you with the same Employer? Yes No

Do you have the same job, different job, or are you on modified duty?

Same Job Different Job Modified Duty

Please answer yes or no to each of the following questions.

Have you received a promotion?	Yes	No
Have you been retrained?	Yes	No
Are you on permanent modified duty?	Yes	No
Do you think you are fully recovered from your injury?	Yes	No
Have you experienced a re-injury to the same body part?	Yes	No
Have you experienced a new injury?	Yes	No
Have your hours been decreased because of the injury?	Yes	No

Rate from 1 – 5 the following four aspects of your physical ability at work in the past week, with 1 meaning you had extreme difficulty and 5 meaning you had no difficulty, did you have any difficulty . . .

	Extreme Difficulty	Severe Difficulty	Moderate Difficulty	Mild Difficulty	No Difficulty
a. Using your usual technique for work?	1	2	3	4	5
b. Doing your usual work because of pain?	1	2	3	4	5
c. Doing your work as well as you would like?	1	2	3	4	5
d. Spending your usual amount of time doing your work?	1	2	3	4	5

Rate from 1 – 5 the amount of pressure you felt from the following people to return to work, 1 meaning none and 5 meaning extreme pressure.

Supervisors

1 2 3 4 5

Workers' Compensation Insurance

1 2 3 4 5 N/A

Workers' Compensation Case Manager

1 2 3 4 5 N/A

Physician

1 2 3 4 5

Therapist

1 2 3 4 5

Family

1 2 3 4 5

Financial Need

1 2 3 4 5

Self-Imposed Pressures

1 2 3 4 5

Rate the Amount of Support you Received from the Following people after you got injured, 1 being none and 5 being a lot.

Supervisors	1	2	3	4	5	
Workers' Compensation Insurance Adjustor	1	2	3	4	5	N/A
Workers' Compensation Case Manager	1	2	3	4	5	N/A
Physician	1	2	3	4	5	
Therapist	1	2	3	4	5	
Family	1	2	3	4	5	
Other Social Support	1	2	3	4	5	

Rate the overall level of pain you had when you started therapy at RTW, 1 being none and 5 being extreme pain.

1 2 3 4 5

Rate the overall level of pain you had when you finished therapy, 1 being none and 5 being extreme pain.

1 2 3 4 5

Rate your overall present level of pain, 1 being none and 5 being extreme pain.

1 2 3 4 5

In the last week, to what degree did pain interfere with your functional ability at home, 1 being none and 5 being completely?

1 2 3 4 5

In the last week, to what degree did pain interfere with your functional ability at work, 1 being not at all and 5 being completely.

1 2 3 4 5

Reflecting on your therapy with RTW, what would you say helped you the most?

Considering what you found most helpful about your therapy, rate the following aspects from 1 to 5, with 1 being not helpful and 5 being very helpful.

Location	1	2	3	4	5
Facility Set-up	1	2	3	4	5
Flexibility	1	2	3	4	5
Communication of plan	1	2	3	4	5
Clarity of expectations	1	2	3	4	5
Encouragement	1	2	3	4	5
Therapists	1	2	3	4	5
Warm up sessions	1	2	3	4	5
Integrated work aspects	1	2	3	4	5
Follow-up	1	2	3	4	5

What did you not like about your Therapy? _____

Rating from 1 to 5 how the Integrated Work Program has helped you in your job, 1 being not at all helpful, 2 being a little bit, 3 somewhat, 4 quite a bit, and 5 being very helpful, has it made you...

	Not at All	A little bit	Somewhat	Quite a bit	A lot
Stronger?	1	2	3	4	5
More energetic?	1	2	3	4	5
More able to use proper body mechanics?	1	2	3	4	5
More able to properly set up your workstation?	1	2	3	4	5
More able to pace yourself by using micro stretch breaks?	1	2	3	4	5
More able to control symptoms while remaining productive?	1	2	3	4	5
Able to apply what you learned to prevent further injury at work?	1	2	3	4	5
Have more confidence in performing your job?	1	2	3	4	5

Rate from 1-5, 1 being no impact and 5 being a very strong positive impact, how the Integrated Work Program has had an impact on your recovery in terms of...

Participation in your customary family and home responsibilities	1	2	3	4	5
Participation in your work	1	2	3	4	5
Participation in your customary recreational activities	1	2	3	4	5
Participation in your customary social activities	1	2	3	4	5
Your sleep patterns	1	2	3	4	5

Reflecting on your present job, what is the heaviest object you have been required to lift since returning? _____ Approx. Wt. _____

Has it been difficult for you to lift this? Yes No

Considering your job at the time of injury, rate the following from 1 to 5 with 1 being none, 2 being some, 3 average amount, 4 more than average, and 5 being a lot.

1. The level of Job Security you felt
1 2 3 4 5
2. The degree to which your job was mentally demanding
1 2 3 4 5
3. The degree your job was physically demanding
1 2 3 4 5
4. Amount of deadline pressures you felt at work
1 2 3 4 5

Rate The Following From 1 to 5, 1 meaning you strongly disagree and 5 meaning you strongly agree

1. My injury was dealt with in a timely manner
1 2 3 4 5
2. I went back to work too quickly
1 2 3 4 5

Do you smoke? Yes No

Do you have heart or lung problems? Yes No

If yes, what is the amount this affects your physical abilities?
None
Mild
Moderate
Severe

Exercise Level Prior to Injury Less than once per week
One to Two times per week
Three to Four times per week
Five to Seven times per week

Exercise Level Presently Less than once per week
One to Two times per week
Three to Four times per week
Five to Seven times per week

If your exercise level has decreased, what is it due to?

Old Injury
Different Injury
Other Health Factors
Other

Approximate Height _____ Approximate Weight at time of Injury _____

To What degree do you feel self-responsibility for keeping your body in good physical condition, 1 being not at all and 5 being complete responsibility?

1 2 3 4 5

What is your Marital Status? S M D

Do you have any children? Yes No

(If yes) What are their ages? _____

What is the highest Educational Level you achieved?

- No High School Diploma
- High School Diploma
- Vocational School
- Some College
- College Degree
- Graduate Level Studies

What was your hourly wage at time of injury? Please do not answer if you do not wish to.

- <\$9.99
- \$10 - \$14.99
- \$15 - \$19.99
- \$20 - \$24.99
- ≥ \$25

I want to thank you for your time and the valuable information you have shared with us. Please let us know if there is anything more we can do for you. We will be asking a few people for a more extensive interview, allowing them to talk all they want about the Integrate Work Program. Would you be willing to do this if asked? (Yes No)

APPENDIX B
FREQUENCY TABLE

Age Distribution Frequency Table

Statistics

Age at Injury

N	Valid	28
	Missing	0
Mean		36.11
Std. Deviation		8.97
Minimum		20
Maximum		63

Age at Injury

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20	1	3.6	3.6	3.6
	25	1	3.6	3.6	7.1
	26	1	3.6	3.6	10.7
	27	1	3.6	3.6	14.3
	28	2	7.1	7.1	21.4
	29	1	3.6	3.6	25.0
	30	1	3.6	3.6	28.6
	32	1	3.6	3.6	32.1
	33	3	10.7	10.7	42.9
	34	2	7.1	7.1	50.0
	35	1	3.6	3.6	53.6
	36	1	3.6	3.6	57.1
	37	2	7.1	7.1	64.3
	38	1	3.6	3.6	67.9
	40	1	3.6	3.6	71.4
	42	3	10.7	10.7	82.1
	44	1	3.6	3.6	85.7
	46	2	7.1	7.1	92.9
	51	1	3.6	3.6	96.4
	63	1	3.6	3.6	100.0
	Total	28	100.0	100.0	

Frequencies

Statistics

Return to Work

N	Valid	28
	Missing	0
Mean		1.14
Std. Deviation		.36
Minimum		1
Maximum		2

Return to Work

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid yes	24	85.7	85.7	85.7
no	4	14.3	14.3	100.0
Total	28	100.0	100.0	

Frequency Table

Time of injury to first visit

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1	8	28.6	29.6	29.6
2	5	17.9	18.5	48.1
3	3	10.7	11.1	59.3
3	1	3.6	3.7	63.0
4	1	3.6	3.7	66.7
5	3	10.7	11.1	77.8
7	1	3.6	3.7	81.5
12	1	3.6	3.7	85.2
18	1	3.6	3.7	88.9
19	1	3.6	3.7	92.6
25	1	3.6	3.7	96.3
42	1	3.6	3.7	100.0
Total	27	96.4	100.0	
Missing System	1	3.6		
Total	28	100.0		

Number of Years at Job

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	1	3.6	4.3	4.3
	0	1	3.6	4.3	8.7
	1	1	3.6	4.3	13.0
	2	1	3.6	4.3	17.4
	3	2	7.1	8.7	26.1
	4	1	3.6	4.3	30.4
	6	1	3.6	4.3	34.8
	8	1	3.6	4.3	39.1
	9	1	3.6	4.3	43.5
	10	3	10.7	13.0	56.5
	11	1	3.6	4.3	60.9
	12	3	10.7	13.0	73.9
	14	2	7.1	8.7	82.6
	15	1	3.6	4.3	87.0
	19	2	7.1	8.7	95.7
	21	1	3.6	4.3	100.0
	Total	23	82.1	100.0	
Missing	System	5	17.9		
Total		28	100.0		

Return Time in Months

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.0	2	7.1	10.5	10.5
	1.0	3	10.7	15.8	26.3
	1.5	1	3.6	5.3	31.6
	2.0	3	10.7	15.8	47.4
	2.5	1	3.6	5.3	52.6
	3.0	3	10.7	15.8	68.4
	4.0	1	3.6	5.3	73.7
	4.5	1	3.6	5.3	78.9
	5.0	2	7.1	10.5	89.5
	8.0	1	3.6	5.3	94.7
	10.0	1	3.6	5.3	100.0
	Total	19	67.9	100.0	
Missing	System	9	32.1		
Total		28	100.0		

Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Time of injury to first visit	27	1	42	6.37	9.44
Number of Visits	28	5	90	24.21	17.19
Number of Integrated Visits	28	2	20	6.61	4.64
Cost of RTW Rehab	25	85.00	2550.00	712.5776	622.2132
Number of Years at Job	23	0	21	9.36	6.17
Return Time in Months	19	.0	10.0	3.079	2.589
Valid N (listwise)	12				

Frequency Table

Cost of RTW Rehab

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	85.00	1	3.6	4.0	4.0
	150.00	2	7.1	8.0	12.0
	225.00	1	3.6	4.0	16.0
	255.00	4	14.3	16.0	32.0
	375.00	1	3.6	4.0	36.0
	382.00	3	10.7	12.0	48.0
	450.00	1	3.6	4.0	52.0
	573.75	1	3.6	4.0	56.0
	637.00	2	7.1	8.0	64.0
	765.00	1	3.6	4.0	68.0
	892.00	1	3.6	4.0	72.0
	1020.00	1	3.6	4.0	76.0
	1050.00	1	3.6	4.0	80.0
	1243.69	1	3.6	4.0	84.0
	1275.00	1	3.6	4.0	88.0
	1530.00	1	3.6	4.0	92.0
	2040.00	1	3.6	4.0	96.0
2550.00	1	3.6	4.0	100.0	
Total		25	89.3	100.0	
Missing	System	3	10.7		
Total		28	100.0		

Number of Years at Job

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	1	3.6	4.3	4.3
	0	1	3.6	4.3	8.7
	1	1	3.6	4.3	13.0
	2	1	3.6	4.3	17.4
	3	2	7.1	8.7	26.1
	4	1	3.6	4.3	30.4
	6	1	3.6	4.3	34.8
	8	1	3.6	4.3	39.1
	9	1	3.6	4.3	43.5
	10	3	10.7	13.0	56.5
	11	1	3.6	4.3	60.9
	12	3	10.7	13.0	73.9
	14	2	7.1	8.7	82.6
	15	1	3.6	4.3	87.0
	19	2	7.1	8.7	95.7
	21	1	3.6	4.3	100.0
	Total	23	82.1	100.0	
Missing	System	5	17.9		
Total		28	100.0		

Return Time in Months

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.0	2	7.1	10.5	10.5
	1.0	3	10.7	15.8	26.3
	1.5	1	3.6	5.3	31.6
	2.0	3	10.7	15.8	47.4
	2.5	1	3.6	5.3	52.6
	3.0	3	10.7	15.8	68.4
	4.0	1	3.6	5.3	73.7
	4.5	1	3.6	5.3	78.9
	5.0	2	7.1	10.5	89.5
	8.0	1	3.6	5.3	94.7
	10.0	1	3.6	5.3	100.0
	Total	19	67.9	100.0	
Missing	System	9	32.1		
Total		28	100.0		

Descriptive

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Difficulty using usual techniqu	21	2	5	4.33	.91
Usual Work because of pain	21	2	5	4.14	1.01
Work as well as like	21	2	5	4.19	1.03
Spending usual amt of time doing work	21	2	5	4.24	.94
Degree pain interfered with ability at work last week	22	1	4	1.91	1.02
Level of Pain at beginning of therapy	26	3	5	4.58	.70
Level of Pain at end of therapy	26	1	5	2.54	1.10
Present Level of Pain	25	1	4	2.00	.91
Degree pain interfered with ability at home last week	26	1	4	2.19	1.13
IW made more energetic	21	1	5	2.90	1.45
IW helped body mechanics	21	2	5	4.10	1.04
Integrated Work made stronger	21	1	5	3.33	1.24
IWhelped pace with stretch breaks	19	1	5	3.37	1.71
IW helped set up work station	19	1	5	3.32	1.77
IW helped control symptoms	21	1	5	3.67	1.39
IW helped apply what learned for safety	21	1	5	3.90	1.30
IW helped with job confidence	21	1	5	3.86	1.20
IW positive impact with home responsibilities	25	1	5	3.12	1.67
IW positive impact with work participation	22	1	5	3.50	1.41
IW positive impact with recreational activities	23	1	5	2.70	1.55
IW positive impact with social acitivities	25	1	5	2.36	1.55
IW positive impact with sleep patterns	25	1	5	2.24	1.69
Difficulty Lifting	20	1	2	1.55	.51
Valid N (listwise)	14				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Physician Pressure	26	1	5	2.31	1.81
Therapist Pressure	26	1	2	1.04	.20
Family Pressure	26	1	3	1.19	.57
Financial Pressure	26	1	5	2.58	1.60
Workers' Compensation Case Mgr pressure	23	1	2	1.13	.34
Self-Imposed Pressure	26	1	5	3.19	1.47
W C Insurance Adjustor pressure	22	1	5	1.27	.88
Supervisor Support	27	1	5	1.96	1.58
W C Insurance Adjustor Support	21	1	5	2.86	1.65
W C Case Manager Support	22	1	5	3.09	1.63
Physician Support	27	1	5	3.33	1.62
Therapist Support	27	2	5	4.63	.74
Family Support	25	2	5	4.52	.96
Other Support	25	1	5	3.72	1.79
Valid N (listwise)	20				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Helpfulness of Location	26	1	5	4.42	.95
Helpfulness of Facility Set-UP	26	4	5	4.73	.45
Flexibility	26	2	5	4.46	.86
Communication of Plan	26	4	5	4.81	.40
Clarity of Expectations	26	1	5	4.46	1.03
Encouragement of RTW	26	3	5	4.77	.59
Therapist helpfulness	26	3	5	4.73	.60
Warm up sessions helpfulness	25	3	5	4.52	.65
Helpfulness of integrated work aspect	26	1	5	3.96	1.15
Follow-up	21	1	5	3.19	1.60
Valid N (listwise)	20				

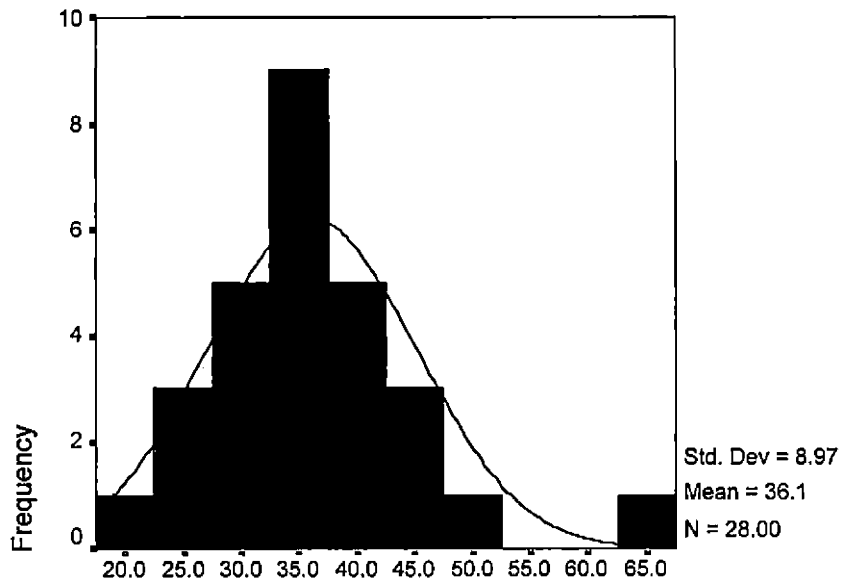
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Integrated Work made stronger	21	1	5	3.33	1.24
IW made more energetic	21	1	5	2.90	1.45
IW helped body mechanics	21	2	5	4.10	1.04
IW helped set up work station	19	1	5	3.32	1.77
IWhelped pace with stretch breaks	19	1	5	3.37	1.71
IW helped control symptoms	21	1	5	3.67	1.39
IW helped apply what learned for safety	21	1	5	3.90	1.30
IW helped with job confidence	21	1	5	3.86	1.20
Valid N (listwise)	18				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
IW positive impact with home responsibilities	25	1	5	3.12	1.67
IW positive impact with work participation	22	1	5	3.50	1.41
IW positive impact with recreational activities	23	1	5	2.70	1.55
IW positive impact with social activities	25	1	5	2.36	1.55
IW positive impact with sleep patterns	25	1	5	2.24	1.69
Valid N (listwise)	21				

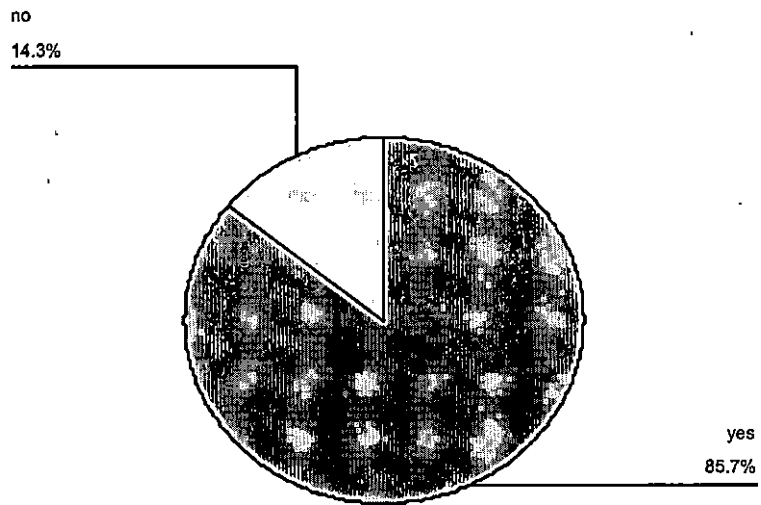
Age at Injury



Age at Injury

N	Valid	28
	Missing	0
Mean		36.11
Std. Deviation		8.97
Range		43
Minimum		20
Maximum		63

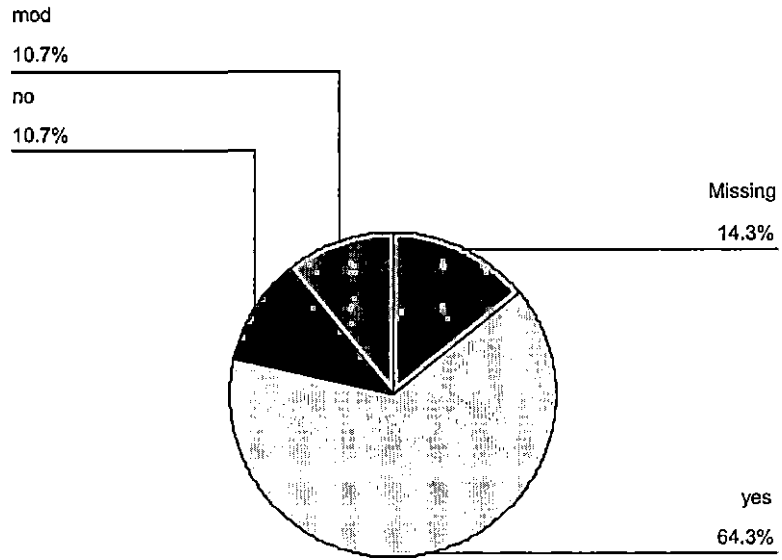
Return to Work



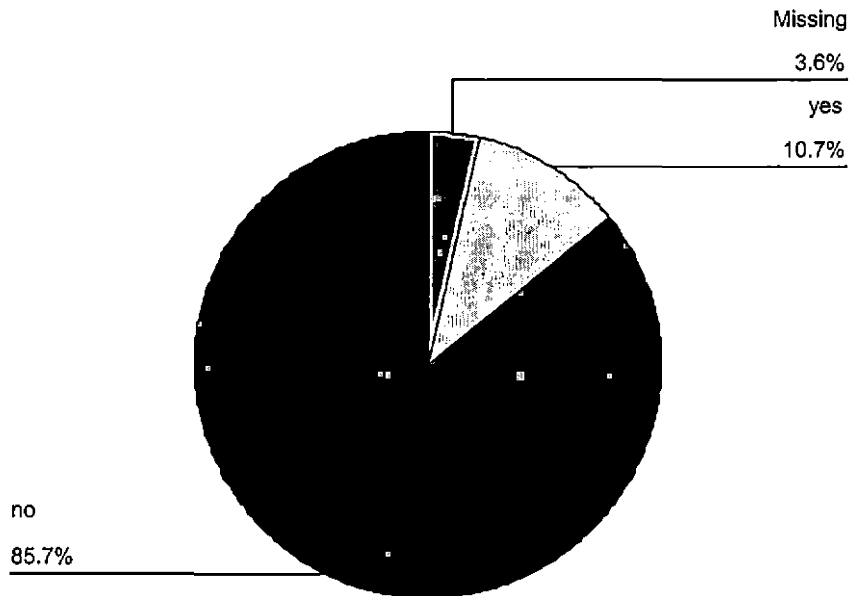
Return to Work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	24	85.7	85.7	85.7
	no	4	14.3	14.3	100.0
	Total	28	100.0	100.0	

Percent Returning to Same Job



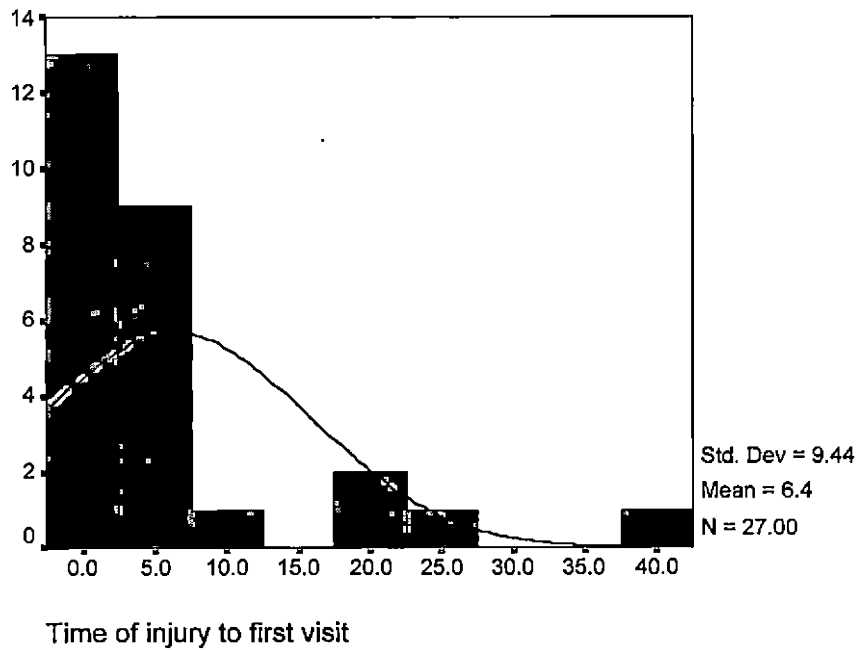
Percent Feeling Fully Recovered



Statistics

		Time of injury to first visit	Number of Visits	Number of Integrated Visits	Cost of RTW Rehab	Number of Years at Job	Return Time in Months
N	Valid	27	28	28	25	23	19
	Missing	1	0	0	3	5	9
Mean		6.37	24.21	6.61	712.5776	9.36	3.079
Median		3.00	23.50	5.50	450.0000	10.00	2.500
Std. Deviation		9.44	17.19	4.64	622.2132	6.17	2.589
Minimum		1	5	2	85.00	0	.0
Maximum		42	90	20	2550.00	21	10.0

Histogram of Time from Injury to Therapy



Pressure and Support Felt by Worker

	N	Minimum	Maximum	Mean	Std. Deviation
Physician Pressure	26	1	5	2.31	1.81
Therapist Pressure	26	1	2	1.04	.20
Family Pressure	26	1	3	1.19	.57
Financial Pressure	26	1	5	2.58	1.60
Workers' Compensation Case Mgr pressure	23	1	2	1.13	.34
Self-Imposed Pressure	26	1	5	3.19	1.47
W C Insurance Adjustor pressure	22	1	5	1.27	.88
Supervisor Support	27	1	5	1.96	1.58
W C Insurance Adjustor Support	21	1	5	2.86	1.65
W C Case Manager Support	22	1	5	3.09	1.63
Physician Support	27	1	5	3.33	1.62
Therapist Support	27	2	5	4.63	.74
Family Support	25	2	5	4.52	.96
Other Support	25	1	5	3.72	1.79
Valid N (listwise)	20				

Worker Feelings About RTW

	N	Minimum	Maximum	Mean	Std. Deviation
Helpfulness of Location	26	1	5	4.42	.95
Helpfulness of Facility Set-UP	26	4	5	4.73	.45
Flexibility	26	2	5	4.46	.86
Communication of Plan	26	4	5	4.81	.40
Clarity of Expectations	26	1	5	4.46	1.03
Encouragement of RTW	26	3	5	4.77	.59
Therapist helpfulness	26	3	5	4.73	.60
Warm up sessions helpfulness	25	3	5	4.52	.65
Helpfulness of integrated work aspect	26	1	5	3.96	1.15
Follow-up	21	1	5	3.19	1.60
Valid N (listwise)	20				

How Integrated Work Program Helped the Worker Do His Job

	N	Minimum	Maximum	Mean	Std. Deviation
Integrated Work made stronger	21	1	5	3.33	1.24
IW made more energetic	21	1	5	2.90	1.45
IW helped body mechanics	21	2	5	4.10	1.04
IW helped set up work station	19	1	5	3.32	1.77
IW helped pace with stretch breaks	19	1	5	3.37	1.71
IW helped control symptoms	21	1	5	3.67	1.39
IW helped apply what learned for safety	21	1	5	3.90	1.30
IW helped with job confidence	21	1	5	3.86	1.20
Valid N (listwise)	18				

How the Integrated Work Program Helped in the Worker's Daily Life

	N	Minimum	Maximum	Mean	Std. Deviation
IW positive impact with home responsibilities	25	1	5	3.12	1.67
IW positive impact with work participation	22	1	5	3.50	1.41
IW positive impact with recreational activities	23	1	5	2.70	1.55
IW positive impact with social activities	25	1	5	2.36	1.55
IW positive impact with sleep patterns	25	1	5	2.24	1.69
Valid N (listwise)	21				

Amount to Difficulty Doing Work in the Past Week

	N	Minimum	Maximum	Mean	Std. Deviation
Difficulty using usual techniques	21	2	5	4.33	.91
Usual Work because of pain	21	2	5	4.14	1.01
Work as well as like	21	2	5	4.19	1.03
Spending usual amt of time doing work	21	2	5	4.24	.94
Valid N (listwise)	21				

Pain Level

	N	Minimum	Maximum	Mean	Std. Deviation
Level of Pain at beginning of therapy	26	3	5	4.58	.70
Level of Pain at end of therapy	26	1	5	2.54	1.10
Present Level of Pain	25	1	4	2.00	.91
Degree pain interfered with ability at home last week	26	1	4	2.19	1.13
Degree pain interfered with ability at work last week	22	1	4	1.91	1.02
Valid N (listwise)	21				

How Integrated Work Program Helped the Worker

	N	Minimum	Maximum	Mean	Std. Deviation
Integrated Work made stronger	21	1	5	3.33	1.24
IW made more energetic	21	1	5	2.90	1.45
IW helped body mechanics	21	2	5	4.10	1.04
IW helped set up work station	19	1	5	3.32	1.77
IW helped pace with stretch breaks	19	1	5	3.37	1.71
IW helped control symptoms	21	1	5	3.67	1.39
IW helped apply what learned for safety	21	1	5	3.90	1.30
IW helped with job confidence	21	1	5	3.86	1.20
IW positive impact with home responsibilities	25	1	5	3.12	1.67
IW positive impact with work participation	22	1	5	3.50	1.41
IW positive impact with recreational activities	23	1	5	2.70	1.55
IW positive impact with social activities	25	1	5	2.36	1.55
IW positive impact with sleep patterns	25	1	5	2.24	1.69
Valid N (listwise)	17				

Feelings Towards Job Security and Demands

	N	Minimum	Maximum	Mean	Std. Deviation
Job Security at time of injury	25	1	5	3.92	1.58
Degree of mental demand	25	1	5	3.84	1.31
Degree of physical demand	25	2	5	4.68	.75
Amount of Deadline Pressures	25	1	5	3.80	1.29
Valid N (listwise)	25				

Injury Dealt with in a timely manner - 1 meaning strongly disagree and 5 strongly agree

	N	Minimum	Maximum	Mean	Std. Deviation
Injury dealt with in a timely manner	24	1	5	3.46	1.61
Valid N (listwise)	24				

Returned to Work Too Quickly - 1 meaning strongly disagree and 5 strongly agree

	N	Minimum	Maximum	Mean	Std. Deviation
Returned to work too quickly	21	1	5	2.71	1.76
Valid N (listwise)	21				

Return To Work Success by Gender

			Gender		Total
			1 male	2 female	
Return to Work	1 yes	Count	14	10	24
		% within Gender	93.3%	76.9%	85.7%
Total	2 no	Count	1	3	4
		% within Gender	6.7%	23.1%	14.3%
Total		Count	15	13	28
		% within Gender	100.0%	100.0%	100.0%

Reinjury Rate By Gender

			Gender		Total
			1 male	2 female	
Reinjury	1 yes	Count	4	2	6
		% within Gender	28.6%	20.0%	25.0%
Total	2 no	Count	10	8	18
		% within Gender	71.4%	80.0%	75.0%
Total		Count	14	10	24
		% within Gender	100.0%	100.0%	100.0%

Level of Pain at the Beginning of Therapy by Gender

			Gender		Total
			1 male	2 female	
Level of Pain at beginning of therapy	3 moderate	Count	2	1	3
		% within Gender	14.3%	8.3%	11.5%
Total	4 a lot	Count	1	4	5
		% within Gender	7.1%	33.3%	19.2%
Total	5 extreme	Count	11	7	18
		% within Gender	78.6%	58.3%	69.2%
Total		Count	14	12	26
		% within Gender	100.0%	100.0%	100.0%

Level of Pain at End of Therapy by Gender

			Gender		Total
			1 male	2 female	
Level of Pain at end of therapy	1 none	Count	2	1	3
		% within Gender	14.3%	8.3%	11.5%
	2 some	Count	7	6	13
		% within Gender	50.0%	50.0%	50.0%
	3 moderate	Count	3	2	5
		% within Gender	21.4%	16.7%	19.2%
	4 a lot	Count	2	1	3
		% within Gender	14.3%	8.3%	11.5%
	5 extreme	Count		2	2
		% within Gender		16.7%	7.7%
Total	Count	14	12	26	
	% within Gender	100.0%	100.0%	100.0%	

Present Level of Pain

			Gender		Total
			1 male	2 female	
Present Level of Pain	1 none	Count	2	6	8
		% within Gender	14.3%	54.5%	32.0%
	2 some	Count	9	2	11
		% within Gender	64.3%	18.2%	44.0%
	3 moderate	Count	2	2	4
		% within Gender	14.3%	18.2%	16.0%
	4 a lot	Count	1	1	2
		% within Gender	7.1%	9.1%	8.0%
	Total	Count	14	11	25
		% within Gender	100.0%	100.0%	100.0%

Was Injury Dealt With in a Timely Manner

			Gender		Total
			1 male	2 female	
Injury dealt with in a timely manner	1 strongly disagree	Count	3	3	6
		% within Gender	21.4%	30.0%	25.0%
	2 agree somewhat	Count		1	1
		% within Gender		10.0%	4.2%
	3 agree	Count	1		1
		% within Gender	7.1%		4.2%
	4 agree more than average	Count	4	4	8
		% within Gender	28.6%	40.0%	33.3%
	5 strongly agree	Count	6	2	8
		% within Gender	42.9%	20.0%	33.3%
Total	Count	14	10	24	
	% within Gender	100.0%	100.0%	100.0%	

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