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Title of Thesis: "Predicting Outcome in Patients with Work-Related Upper Extremity Disorders: A Prospective Study of Medical, Physical, Ergonomic, and Psychosocial Risk Factors"

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Department of Medical and Clinical Psychology
Master of Science
1999

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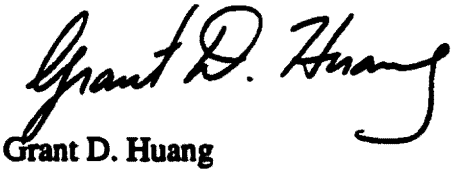

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ABSTRACT

Title of Thesis: Predicting Outcome in Patients with Work-Related Upper Extremity Disorders: A Prospective Study of Medical, Physical, Ergonomic, and Psychosocial Risk Factors

Grant D. Huang, Master of Science, 1999

Thesis directed by: Michael Feuerstein, Ph.D.

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Although predictors of work-related upper extremity disorders (WRUEDs) have been identified, little is known about what predicts clinical outcomes in patients who already have this problem. The present investigation prospectively examined workers with WRUEDs (n = 70) over a 3 month period. A baseline questionnaire was used to assess demographic characteristics, occupational status, medical history, symptoms, physical function, ergonomic risk exposure, work demands, occupational psychosocial factors (e.g., job stress), social support (e.g., job support), and individual psychosocial factors (e.g., general distress, reactivity to pain). Logistic regression analyses were then conducted to predict composite outcome status. The composite outcome measure included symptom severity, functional status, mental health, and lost days from work. At both 1 and 3 months, ergonomic risk exposure (1 month RR = 1.06, 95% CI = 1.01 - 1.11; 3 month RR = 1.08, 95% CI = 1.01 - 1.15), job support (1 month RR = 1.03, CI = 1.00 - 1.07; 3 month RR = 1.04, CI = 1.01 - 1.08), and catastrophizing (1 month RR = 1.58, CI = 1.12 - 2.23; 3 month RR = 1.81, CI = 1.24 - 2.66) predicted poorer outcome.

Number of past upper extremity diagnoses (RR = 1.71, CI = 1.14 - 2.57), baseline SF-36 Mental Health score (RR = 1.24, CI = 1.01 - 1.54), and pain severity (RR = 1.50, CI = 1.08 - 2.07) also predicted outcome status at 1 month, while baseline symptom severity (RR = 6.21, CI = 1.28 - 30.09), past recommendation for surgery (RR = 5.53, CI = 1.18 - 25.86), number of prior treatments (RR = 2.24, CI = 1.26 - 3.96), and job stress (RR = 1.21, CI = 1.02 - 1.43) were additional significant predictors at 3 months. These findings indicate the need to address medical, physical, ergonomic, and psychosocial factors in efforts to improve outcomes. Furthermore, it is suggested that an organizational environment that encourages a coordinated effort from employees and management should also help improve recovery from these complex disorders.

Predicting Outcome in Patients with Work-Related Upper Extremity Disorders: A Prospective Study of Medical, Physical, Ergonomic, and Psychosocial Risk Factors

by

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INTRODUCTION

Work-related upper extremity disorders (WRUEDs) impact workers and work organizations because of the diverse set of medical, psychological, legal, social and financial challenges that they can present. This impact is further magnified considering that a wide array of individuals can be affected and/or involved with the case. In addition to the worker and management, physicians, occupational/physical therapists, ergonomists, psychologists, as well as co-workers and family members may also be affected by the sequelae of a given WRUED case. Over the past few decades, empirical investigations have found that medical, physical, ergonomic, and psychosocial factors are correlated with and/or predictive of these disorders (e.g., Armstrong et al., 1993; Bongers et al., 1993; Hales & Bernard, 1996). However, it is less clear how these factors contribute to clinical outcomes once a worker has developed a disorder.

Work-Related Upper Extremity Disorders

The International Labor Organization Advisory Committee on Salaried and Professional Workers noted that "repetition strain injuries" were an occupational problem related to mechanized work during the 1960s (Chatterjee, 1987). In the 1980s, marked increases in the incidence and/or prevalence of these problems were reported in Australia (Hocking, 1987), Canada (Ashbury, 1995), and the United States (Hanrahan et al., 1991). As these "repetition strain injuries" received greater attention, other names were used synonymously in the literature, including: cumulative trauma disorders, repetitive trauma disorders, and overuse syndromes (Gerr et al., 1991). However, these descriptions imply a causal mechanism (i.e., repetition, overuse) that has not yet been definitively

established. One term that does not suggest an etiology and, therefore, is more appropriate is "work-related upper extremity disorders."

More precisely, WRUEDs stem from symptoms and functional limitation associated with muscles, tendons, and/or nerves in the finger, hand, wrist, elbow, arm, shoulder, and neck regions (Feuerstein, Huang, & Pransky, 1999; Rempel et al., 1992; Putz-Anderson, 1988). Cases typically present symptoms of pain, tingling, numbness, swelling, and/or tenderness (Szabo & Madison, 1995; Amadio, 1995; Downs, 1997). Additionally, while definitions for what constitutes a WRUED may vary, some of the more common diagnoses include: carpal tunnel syndrome, tendinitis, tenosynovitis (e.g., deQuervain's disease), lateral epicondylitis, and nerve entrapment syndromes (Rempel et al., 1992; Gerr et al., 1991).

WRUEDs and Their Relation to Physical and Psychological Health

It has been noted that individuals with work-related upper extremity disorders continue to work with pain (Feuerstein et al., 1998). However, should symptoms associated with such disorders persist, functional limitations and/or work disability may result (Feuerstein, Huang, & Pransky, 1999). In other words, a worker may experience pain and/or other symptoms to an extent that he/she can no longer tolerate them and his/her ability to work becomes impaired. Should this impaired ability to work continue, the worker may eventually become disabled.

In addition to physical health considerations, the psychological health of WRUED patients also deserves attention. Anxiety disorders were found to be the most prevalent DSM-IIIR (American Psychiatric Association, 1987) diagnosis in a sample of carpal

tunnel syndrome patients who sought treatment from an orthopedic hand surgeon (Mathis et al., 1994). In a study of sign language interpreters, a fear of developing pain was associated with the presence of an upper extremity disorder and also had an impact on function, pain and perceived muscle tension while at work (Feuerstein et al., 1997). While causality cannot be established from the designs of these studies, the findings highlight the importance of addressing both physical and psychological health aspects in patients with WRUEDs.

Additional Impact of WRUEDs

In addition to the physical and psychological impact on the worker, WRUEDs can also have significant organizational, financial, social, and legal impacts. Recent data reported by the Bureau of Labor Statistics (1999) indicated that over 419,000 upper extremity injuries/illnesses involved days away from work in 1997. According to the same data, carpal tunnel syndrome and tendinitis accounted for about 47,000 of these cases. Reports have also indicated that mean costs for upper extremity disorder cases can range between $8,000 to $10,000 (Webster & Snook, 1994; Brogmus & Marco, 1992). In 1989, it was estimated that all compensable upper extremity disorders in the United States cost approximately $563 million (Webster & Snook, 1994). From a legal perspective, impairments of the upper extremities (i.e., arm, shoulder, hand, cumulative trauma disorders, carpal tunnel syndrome) were found to be the fourth most prevalent source of litigation associated with the Americans with Disabilities Act over a six-year period (Huang & Feuerstein, 1998). These data suggest that WRUEDs consume a large amount of resources at several levels. Therefore, it would seem that primary and

secondary prevention efforts that address WRUEDs could provide substantial benefits to the worker, work organization, and society.

Towards a Multidimensional Approach to Understanding WRUEDs

Presently, a combination of medical, physical, ergonomic, and psychosocial factors is theorized to contribute to the development, exacerbation, and maintenance of work-related upper extremity disorders. Although the exact mechanisms by which these factors interact remain unclear, several models have been proposed to explain this multidimensional nature and to provide a conceptual framework for understanding WRUEDs. Armstrong and colleagues (1993) have suggested a dose-response model that focuses on mechanical and physiological factors and also notes the role of psychological factors. According to this model, internal doses (e.g., tissue loads and metabolic demands) stem from external exposure to work requirements. These internal doses subsequently lead to internal "disturbances" (i.e., mechanical, physiological, or psychological) that in turn, produce responses such as changes in tissue shape, ion concentrations, and substrate levels. After repeated or sustained doses and responses, an individual's capacity to adapt to the internal changes may be enhanced or reduced. It is believed that when this capacity is reduced, muscle, tendon, or nerve-related disorders result.

In a model of work disability associated with occupational musculoskeletal disorders in general, Feuerstein (1991) has suggested that such disability results from a complex interaction among medical status, physical capabilities, work demands, and psychological/behavioral resources. More specifically, this model suggests that medical

status variables associated with the musculoskeletal, neurologic, and cardiovascular systems influence a person's physical ability to work. These physical capabilities, in conjunction with work demands (i.e., biomechanical, aerobic, and psychological), determine a worker's ability to execute a given job task. However, discrepancies between the physical capabilities and work demands reduce the likelihood of returning to work from a work-related musculoskeletal disorder. Additionally, the model also suggests that the amount psychological/behavioral resources available to the worker can also moderate the discrepancy between physical capabilities and work demands. Taken together, this model proposes that medical, biomechanical, physical, and psychological factors all contribute to the worker's ability to return to work after a musculoskeletal injury or illness.

Physiological / Medical Factors

Physiologically, inadequate blood supply, non-optimal hydrogen ion concentrations, and decreased supply of adenosine triphosphate and calcium ions are important factors that contribute to muscle fatigue (Rodgers, 1997). Additionally, if a worker is not given an adequate recovery time, symptoms such as aching, swelling, burning, and pain may arise from sustained and/or repetitive efforts. One study of workers who performed a standardized machine-paced task found that higher levels of static trapezius muscle activity (measured by electromyographic (EMG) recordings) were significantly correlated with complaints of soreness, fatigue, or pain in the neck and shoulder regions (Veiersted, Westgaard, & Andersen, 1990).

Compression of the median nerve at the wrist can also result in symptoms related to carpal tunnel syndrome (CTS) (Dawson, 1993). In cases of CTS, the pressure inside the carpal tunnel can increase from 3 mm Hg to 30 mm Hg (Rempel, Harrison, & Barnhart, 1992). Clinical assessment methods for CTS include Phalen's test, Tinel's sign, and determining nerve conduction velocity from the wrist to the thenar muscles (Dawson, 1993). It should be noted, however, that there is not a "gold standard" in diagnosing these problems (e.g., Baron, Hales, & Hurrell, 1996). In an investigation of asymptomatic workers, median sensory nerve conduction studies were not found to predict future CTS-like symptoms (i.e., pain, numbness, tingling, or burning) in the hands or fingers (Werner et al., 1997). Self-report measures of symptoms such as the Symptom Severity Scale (Levine et al., 1993) have also been developed to assess pain, weakness, numbness, and tingling. Studies on this scale have found it to be significantly correlated with physical measures (e.g., grip strength, pinch strength, and 2-point discrimination) of CTS (Levine et al., 1993).

Ergonomic Risk Factors

Ergonomic risk factors such as forceful exertions, repetitive or prolonged activities, awkward postures, contact stresses, vibration, and temperature extremes have all been associated with work-related upper extremity symptoms and disorders (e.g., Williams & Westmorland, 1993; Gerr et al., 1991). Methods for assessing exposure to ergonomic risk factors include direct observation, the use of checklists, and self-report (e.g., Punnett, 1998; Stetson et al., 1991). A study that assessed ergonomic exposure by means of a questionnaire as well as observation found an increasing prevalence of upper

extremity disorders was associated with greater exposure to ergonomic risk factors including non-neutral postures, vibration, manual forces in handling tools and parts, and mechanical pressures in tool use (Punnett, 1998). Another study that utilized the 1988 National Health Interview Survey found that self-reported repetitive bending/twisting of the hands/wrists as well as use of vibrating hand tools placed a worker at a greater risk for carpal tunnel syndrome (Tanaka et al., 1995). In a review of upper extremity disorders associated with video display unit work (Punnett & Bergqvist, 1997), factors such as high keyboard position, lack of arm support, chair discomfort, non-optimal desk height, and non-optimal screen height have also been found to place a worker at greater risk for neck/shoulder, arm/elbow, and hand/wrist disorders.

Occupational Psychosocial Factors

Several models of occupational stress have incorporated organizational and individual characteristics in addressing occupational health in general as well as work-related musculoskeletal disorders (e.g., Cooper, 1986; Smith & Carayon, 1996). In these models, occupational stress has been proposed to stem from factors such as job/task design, organizational role, career development, interpersonal relationships at work (i.e., with colleagues, supervisors), work demands, and organizational climate.

Empirical investigations on occupational psychosocial risk factors have also found several variables to be associated with and/or predictive of WRUEDs. A review of these studies by Bongers and colleagues (1993) found that time pressure, monotonous work, high perceived work load, poor work content, high perceived work stress, and low job satisfaction were positively associated with neck or shoulder pain. Furthermore,

previous studies have found that lower levels of job support were associated with greater self-reported numbness in the hand and arm regions (Faucett & Rempel, 1994) and a greater risk for self-reported of shoulder and neck pain (Linton & Kamwendo, 1989). Additionally, lower job support levels in both blue- and white-collar workers have predicted a change in the occurrence of upper extremity symptoms and disorders over a 10-year period (Leino & Hanninen, 1995).

Individual Psychosocial Factors

Emotional distress, perceptions, and interpretation of pain have been noted as some of the major components of an individual's pain experience (Craig, 1994; Weisenberg, 1994). Furthermore, it has been noted that stress can lead to increases in pain by triggering greater autonomic, visceral, and skeletal activity (Craig, 1994). In a study of musicians, a pain stressor task produced EMG elevations in the flexor and trapezius muscles in the musicians who had a history of upper limb pain (Moulton & Spence, 1992).

Patients with a history of upper extremity pain have been found to report higher levels of anxiety and distress prior to the provision of relaxation training and/or EMG biofeedback treatments (Spence et al., 1995). "Catastrophizing" has been described as "negative self-statements and overly negative thoughts and ideas about the future" and has also been implicated as a mediator of pain and function (Weisenberg, 1994). A study of low back pain patients that utilized the Catastrophizing subscale of the Coping Strategy Questionnaire found that a catastrophizing coping style was related to how a person adjusted to chronic pain (Rosenstiel & Keefe, 1983). Catastrophizing has also

been found to distinguish between workers with an upper extremity disorder who were disabled and those who continued working (Himmelstein et al., 1995).

Study Rationale

While it is important to continue efforts that are directed at elucidating the etiology of these disorders, few studies have examined predictors of outcomes. Older age, non-white ethnicity, repetitive hand or wrist bending, and industry of last employment have been indicated as risk factors for work cessation in persons with carpal tunnel syndrome (Blanc et al., 1996). A recent study of U.S. Army soldiers found that age, race (i.e., Caucasian), lower organizational status, and self-reported occupational stress was predictive of work disability associated with an upper extremity disorder (Huang et al., 1998). Cole and Hudak (1996) reviewed prognoses related to nonspecific work-related upper extremity disorders and found that a longer duration of symptoms before medical consultation was sought and increased workplace demands were potentially important prognostic factors. However, they argue that methodological limitations and the lack of empirical evidence suggest a need for more research on the prognosis of these disorders. Another review of treatment outcomes in carpal tunnel syndrome patients (Feuerstein et al., 1999) found that compared to open release surgery, endoscopic release was related to increased physical function and fewer days to return to work. The same review also indicated that pain reduction was associated with steroid injections, use of vitamin B6, range of motion exercises, and cognitive behavior therapy. Return to work was also associated with range of motion exercises and multidisciplinary rehabilitation. Yet, despite these findings, the authors also note that there are few well-

controlled investigations of such outcomes. Considering this scarcity of outcomes-related research, even less is known about determinants of clinical outcomes in workers once diagnosed with a WRUED.

The present investigation prospectively examined a sample of patients with a recently diagnosed WRUED. It was hypothesized that a combination of medical, physical, ergonomic, occupational psychosocial, and individual psychosocial factors would predict a composite outcome comprised of symptom severity, functional status, mental health, and lost days. The purpose of this investigation was to delineate specific predictors in order to enable a more focused approach for future intervention and prevention efforts. Such strategies may subsequently help to improve health outcomes in affected workers, resulting in increased productivity, efficiency, and job satisfaction, as well as improvements in one's overall quality of life.

METHODS

Study Participants

Study participants were recruited from the metropolitan Washington, D.C. region (including Maryland and Northern Virginia) through advertisements placed in regional newspapers, health newsletters, clinics, and hospitals. Persons interested in participating underwent a telephone interview to determine eligibility for the study (see Appendix A). Eligibility was based on the following criteria:

1) meeting a modified National Institute of Occupational Safety & Health (NIOSH) case definition for an occupational upper extremity disorder; this definition includes:

   a) symptoms of pain, aching, stiffness, burning, tingling, and/or numbness in the finger, hand, wrist, elbow, arm, shoulder, or neck regions

   b) symptoms beginning after employment at the present job

   c) symptoms having lasted for more than one week, or at least once per month since their onset

   d) no prior non-occupational accident or acute trauma to the symptom area within the past year

   e) no prior diagnosis to the specified symptom area

   f) having received a diagnosis from a health care provider within the past six weeks

2) between 20 and 65 years of age

3) presently working at least 20 hours per week

Based on these criteria, 87 individuals were determined eligible for participation.

Baseline Procedure

After participants consented to participate and provided documentation of their diagnosis from their health care provider, a physical examination was given to obtain measures of height, weight, pinch grip strength, and hand grip strength. Both the pinch grip strength and hand grip strength measurement procedures were conducted in accordance with the recommendations of the American Society of Hand Therapists (Casanova, 1992) as well as the manufacturers of the Jamar dynamometer. Following this examination, participants were given a 347-item baseline questionnaire. Approximately 1 hour was required to complete the questionnaire and participants were allowed to take breaks as needed. Additionally, the investigator conducted checks at 15-20 minute intervals to provide clarification on questionnaire items, if necessary.

After completing the questionnaire, participants were given a packet that included three copies of a follow-up questionnaire to be completed at 1, 2, and 3 months post baseline survey. A note indicating the three follow-up dates was also provided in the packet. Monetary compensation ($40) was provided to the participants upon the receipt of the third follow-up questionnaire.

At the conclusion of the initial visit, participants were offered the opportunity to participate in a test-retest investigation. This test-retest investigation was conducted to determine the reliability of the measures used in the present study. It involved returning to the university within 2 weeks of the baseline visit, completing the 347-item questionnaire again, and receiving monetary compensation upon completion. 24 participants (27.6% of the total sample) volunteered for the test-retest investigation.

All data obtained on the baseline and test-retest questionnaires were double-scored and double-entered into the database by two research assistants.

Follow-Up Procedure

In addition to being provided with a reminder, participants were called 3 to 5 days prior to the follow-up date. Despite the follow-up efforts, 17 (19.5%) subjects were lost to follow-up. Reasons for this attrition included: decision to terminate participation after the initial visit because of a lack of personal time, loss of interest in the investigation, and failure to return the follow-up questionnaire on time. Of the 17 subjects lost to follow-up, one subject participated in the test-retest evaluation. All follow-up data were double-scored and double-entered into the database by two research assistants.

Baseline Questionnaire

The baseline questionnaire was multidimensional in nature and assessed factors hypothesized to contribute to outcomes associated with upper extremity disorders. These factors were categorized as: demographic characteristics, occupational status, medical history/status, symptoms, physical function, ergonomic/biomechanical, occupational psychosocial, work demands, social support, and individual psychosocial. The entire questionnaire is provided in Appendix B.

Demographic Characteristics

Demographic information obtained included age, gender, education level, marital status, and ethnicity.

Occupational Status

Questions on occupational status included the following: type of job, duration at present job, part/full time status, days lost within the past month, and limited duty days.

Medical History / Status

Items relating to medical history and status were primarily concerned with the upper extremity disorder and included the following: prior workers' compensation injury, number of past diagnosed upper extremity disorders, time between onset of present upper extremity symptoms and seeking medical help, number and types of therapies obtained, whether or not surgery had been recommended for any upper extremity disorder.

Additionally, questions regarding medical problems (i.e., diabetes, gout, thyroid problems, kidney failure, alcoholism, lupus, ruptured disc) and various health behaviors (i.e., tobacco, alcohol, prescription medication usage) were included in this section.

Symptoms

Self-report of symptoms was obtained using three different measures. The first measure was the Symptom Severity Scale (SSS) (Levine et al., 1993) which is an 11-item measure that assesses pain, numbness, tingling, and weakness. It should be noted that while the questions specifically address symptoms in the hand and wrist regions, subjects in the present study were instructed to answer questions as they related to the area of their upper extremity disorder. The SF-36 Bodily Pain Subscale (Ware & Sherbourne, 1992) was also included to assess overall pain. This subscale consists of two questions relating

to the frequency of any bodily pain over the past 4 weeks. The third measure of symptoms was a single question using a 10-cm. visual analog scale of pain severity during the past week.

Physical Function

Four different measures were used to determine physical function. These measures were the Functional Status Scale (FSS) (Levine et al., 1993), the Physical Function and Role-Physical Subscales of the SF-36 (Ware & Sherbourne, 1992), and the Upper Extremity Function Scale (UEFS) (Pransky et al., 1997).

The FSS is an 8-item scale that measures a person's difficulty in conducting various daily hand-related tasks (e.g., writing, buttoning clothes, chores). The SF-36 Physical Function and Role-Physical subscales are comprised of 14 items (total) that assess general function/activity levels on daily life activities (e.g., bathing, moving). The UEFS is an 8-item questionnaire that assesses how problematic certain daily tasks (e.g., sleeping, writing, picking up small objects, washing dishes) are for a person as a result of his/her symptoms.

Ergonomic / Biomechanical

Self-report of exposure to suspected ergonomic/biomechanical risk factors were obtained through two sets of questions. The first set of questions contained 10 items and was based on potential risk factors listed by Stetson and colleagues (1991) as well as those identified in the literature (e.g., Armstrong et al., 1993; Hagberg et al., 1995). These risk factors included frequency of: repetition, forceful movements, ulnar/radial

deviation, and rest breaks. Questions on specific work-related tasks such as frequency of using the computer keyboard, mouse, telephone as well as frequency of writing and other hand motions were also included. All responses were obtained by using a 10-cm. visual analog scale.

The second set of questions was obtained from a questionnaire developed by Pransky and Hill-Fotouhi (1996). This questionnaire contains 10 items assessing frequency of performing work-related tasks that may place a worker at risk for injury or increased pain. Included in this measure are items regarding forceful movements, awkward postures, repetition, temperature extremes, and duration of sitting/standing.

Occupational Psychosocial

Occupational psychosocial stressors that were examined were general job stressors. Items addressing general job stress were obtained from the Life Stressors and Social Resources Inventory (LISRES) (Moos & Moos, 1994) as well as the NIOSH Checklist of Work-Related Psychosocial Conditions (Tepper & Hurrell, 1995). The job stress measure of the LISRES contains six items on work-related conflicts, physical environment, and perceptions of work pace. The NIOSH checklist is a 26-item measure that examines a worker's perceptions on the physical work environment, work demands, work characteristics, and perceived work expectations. A 6-item measure of cognitive workstyle (Feuerstein, Huang, & Pransky, 1999) developed for this study was also included (Appendix B, Items 335-341). This measure was used to assess an individual's cognitive responses to work. Test-retest reliability analysis of this measure indicated a correlation coefficient of 0.85 ($p < 0.01$). An internal consistency analysis resulted in a Cronbach's alpha of 0.87.

Work Demands

Measures of work demands were based on questions developed by Caplan (1971) which had also been used in prior NIOSH investigations (e.g., Hales et al., 1994). Specifically, these questions measure workload, workload variance, and physical and mental exhaustion. Borg's (1998) CR10 Scale which measures perceived exertion during a "typical day" was also included to assess perceived levels of work demands.

Social Support

Three separate scales were used to measure social support. The first measure included an 11-item measure of social support at work (i.e., from co-workers and supervisor) that was based on questions developed by Caplan (1971). Prior NIOSH studies (e.g., Hales et al., 1994) have also used these questions to assess job support. However, it should be noted that for the purposes of this investigation, responses to these items were modified into a visual analog format.

The second measure of social support at work was obtained from the Job Resources Subscale of the LISRES (Moos & Moos, 1994). This subscale contains six items that assess the frequency of job support as well as perceptions of job characteristics (e.g., responsibility, challenge provided).

The third measure used five items obtained from the Organizational Self Assessment (OSA) (Habeck et al., 1991) to assess the availability and/or offering of workplace accommodations. While the OSA contains 30 questions that relate to organizational climate as well as various management practices, only five items were

selected for the present study because of their relevance to general health and work-related upper extremity disorders. Specifically, these items asked about frequencies concerning: the provision of health-related resources and safety training, supervisory monitoring and encouragement in assisting with return to work, modifications made to help workers with pain and symptoms, and participation in decision-making and problem-solving in company operations. An internal consistency analyses of these five items resulted in a Cronbach's alpha of 0.71.

Individual Psychosocial

Items assessing an individual's psychological health and emotional reactivity to stress and pain were obtained from four sources. The first was the 5-item Mental Health Subscale of the SF-36 (Ware & Sherbourne, 1992). The second was the State-Trait Anxiety Inventory (STAI), Form X-2 (Spielberger, Gorsuch, & Lushene, 1970), which is a 20-item measure of general anxiety. The third measure was the 6-item Catastrophizing Subscale from the Coping Strategies Questionnaire (Rosenstiel & Keefe, 1983). The fourth measure was the Discomfort Intolerance Survey (DIS) (Schmidt, 1995). The DIS is a 6-item visual analog scale that measures one's ability to tolerate pain/discomfort and his/her reactivity to such pain/discomfort.

Measures of Outcome

A follow-up questionnaire consisting of 100 self-report items was designed to obtain measures on the following outcomes: days lost from work within the past month, symptom severity, physical function, and mental health. Additionally, in order to

determine the influence of baseline levels of these variables, items used in the follow-up questionnaire were identical to those administered at baseline. Specifically, the scales used for follow-up were: the Symptom Severity Scale (Levine et al., 1993); the Functional Status Scale (Levine et al., 1993); the Physical Function, Vitality, Role-Physical, and Social Function Subscales of the SF-36 (Ware & Sherbourne, 1992); CR10 Scale of perceived exertion (Borg, 1998); the Mental Health Subscale of the SF-36 (Ware & Sherbourne, 1992); and, the STAI (Spielberger et al., 1970). The entire follow-up questionnaire is provided in Appendix C.

Selection of Potential Predictors

Several measures within each of the categories (i.e., demographic characteristics, medical history/status, symptoms, function, ergonomic/biomechanical, occupational psychosocial, work demands, social support, and individual psychosocial) hypothesized to contribute to upper extremity-related outcomes were obtained. Therefore, in an effort to reduce the number of potential predictors that were to be examined as well as any redundancies, correlation coefficients among variables within each of these categories were first obtained. In the ergonomic/biomechanical risk factor category, a correlation coefficient of 0.26 ($p < 0.05$) was found for the Pransky-Futouhi (1996) Scale and the ergonomic stressors scale based on Stetson et al. (1991). Since more than two variables were included in the other categories, the correlation matrices for these categories are provided in Tables 1 to 6.

Selection of potential predictors was partially based on an examination of the correlation coefficients. Measures determined to be representative of the construct in

question were chosen based on having a minimum correlation coefficient of 0.25 ($p < 0.05$) with other variables assumed to measure the same construct within the category. When two or more variables were significantly correlated, simplicity of the items (e.g., wording, number of items) and hypothesized relevance to upper extremity disorders (versus general or back-related problems) were factored into the final selection process.

The variables chosen for further analyses were: *Demographic Characteristics* - age, gender; *Occupational* Status - work days lost in the past month at baseline; *Medical History/Status* - prior workers' compensation injury, number of past upper extremity diagnoses, dominant hand grip strength, recommendation of surgery for an upper extremity disorder, treatment history; *Symptoms* - SSS at baseline, pain severity; *Physical Function* - FSS at baseline; *Occupational Psychosocial* - Moos & Moos (1994) Job Stress Subscale and the cognitive workstyle scale; *Work Demands* - Borg's (1998) CR10 Scale of perceived exertion; *Social Support* - Caplan's (1971) job support (i.e., co-workers and supervisor) scale and work accommodation (Habeck et al., 1991); *Individual Psychosocial* - SF-36 Mental Health Subscale (Ware & Sherbourne, 1992) and catastrophizing (Rosenstiel & Keefe, 1983).

Calculation of Composite Outcome Index

For both the 1-month and 3-month follow-up periods, factor analyses were conducted on the standardized scores of four outcome measures: days lost from work, the SSS, the FSS, and the Mental Health Subscale of the SF-36 (e.g., Grice & Harris, 1998; Gorsuch, 1983). These measures were chosen because they represent outcomes of interest in several WRUED studies (e.g., Blanc et al., 1996; Franzblau et al., 1997; Stock et al., 1996; Spence, 1991). From the analyses, factor loadings on the four outcomes

were used to generate a composite outcome score. Since there were two follow-up periods of interest (1 and 3 months), a composite score for each follow-up period was calculated. Table 7 shows the loading factors obtained from the factor analyses for months 1 and 3. Based on a median split, the composite scores were categorized as "high" or "low." Scores above the median indicated poorer outcome. That is, high scorers had more days lost, higher levels of symptoms, poorer function, and lower mental health scores than low scorers.

Analyses

Logistic regression analyses (using SPSS v. 8.0) were conducted to predict composite outcome status (high vs. low) at both 1- and 3- month follow-up periods. Variables selected as potential predictors were all simultaneously entered into the logistic regression model. A simultaneous entering method was chosen so that the predictive ability of the variables could be determined within the context of the other variables. From these analyses, risk ratios, 95% confidence intervals, Wald test statistics, and standardized parameter estimates were obtained.

Subsequently, multiple linear regression analyses were conducted to determine predictors (at 1- and 3-month follow-up) of each of the four separate outcomes (i.e., symptom severity, functional status, lost days, and mental health) used to calculate the composite outcome score. Independent variables entered into the linear regression analyses were identical to those used in the logistic regression analyses. These variables were also simultaneously entered into the model.

RESULTS

Through t-test and χ^2 analyses, a comparison of study participants with (n = 70) and without (n = 17) complete 1- and 3-month follow-up data found no significant differences in age, education level, ethnicity, job category, or gender. The results described are based upon the 70 subjects for whom all follow-up (i.e., both 1- and 3-month) data were obtained.

Demographic Characteristics

The sample ranged in age from 22 to 64 years with a mean age of 40.8 years (SD = 10.5). The majority of the sample was Caucasian (74.3%), female (77.1%), and had at least some college education (92.9%). Table 8 provides a more detailed description of the demographic characteristics.

Table 9 provides the breakdown of the International Classification of Diseases, Ninth Revision (ICD-9) (World Health Organization, Geneva, Switzerland, 1995) diagnoses of the participants. As shown in the table, carpal tunnel syndrome was the most common diagnoses in the sample. The second most frequent diagnosis was an unspecified disorder of the synovium, tendon, and/or bursa. In addition, the types of prior treatments that participants had before the baseline, 1-month, and 3-month assessment periods are given in Table 10.

There was a moderately significantly difference in age between the 1-month "high" (M = 43.23, SD = 10.45) and "low" (M = 38.37, SD = 10.05) scoring groups (t = -1.98, p = 0.05). No significant differences were found between these groups in education level, ethnicity, job category, or gender. For the 3-month follow-up period,

"high" and "low" scorers on the composite outcome measure did not significantly differ on age, education level, ethnicity, job category, or gender.

Test-Retest

Test-retest correlations ($n = 23$) on the independent variables of symptoms, function, ergonomic risk exposure, occupational psychosocial factors, social support, and individual psychosocial factors were examined. The correlation coefficients are provided in Table 11. As shown, all measures were found to be significantly correlated ($p < 0.05$), with correlation coefficients ranging from 0.42 to 0.90. These results indicate a moderate to high level of reliability in the self-report of the various assessment measures at baseline.

Predictors of Composite Outcome Status at 1 Month

After a preliminary logistic regression analyses was conducted, a more specific model was determined by selecting variables that reflected the proposed multivariate nature of predictors and were significant at the $p < 0.15$ level. Variables that were entered into the final logistic regression model were: number of past upper extremity diagnoses, the Mental Health Subscale of the SF-36 at baseline, pain severity within the past week, ergonomic risk exposure, job stress (Moos & Moos, 1994), job support (Caplan, 1971), and catastrophizing.

All variables entered into the final logistic regression model with the exception of job stress were found to be significant predictors of composite outcome at 1 month. Table 12 provides a summary of all significant predictors with their risk ratios (RR), 95%

confidence intervals (CI), Wald statistic, and standardized parameter estimates. All significant predictors had a continuous response scale, and therefore, the risk ratios are for each unit increase in a given response.

Demographic Characteristics

No demographic characteristic variables from the preliminary model met the selection criteria for the final model.

Occupational Status

No occupational status variables were found to meet the selection criteria for the final model.

Medical History / Status

A history of upper extremity disorders was found to place a person at a greater risk for poorer outcome. Specifically, each upper extremity diagnosis was associated with a 1.71-fold risk (CI = 1.14 - 2.57) for a poorer outcome.

Symptoms

Self-reports of greater pain severity within the past week also resulted in a greater likelihood for poorer outcome (RR = 1.50; CI = 1.08 - 2.07).

Physical Function

No functional measures were entered into the final logistic regression model because of failure to meet the selection criteria for the final model.

Ergonomic / Biomechanical

Exposure to ergonomic risk factors was found to place a person at a greater likelihood for poorer outcome (RR = 1.05; CI = 1.01 - 1.11).

Occupational Psychosocial

Job stress was not found to be a significant predictor of composite outcome status.

Work Demands

Perceived exertion as measured by the Borg CR10 Scale did not meet the selection criteria for the final model.

Social Support

Reporting less social support from one's co-workers and/or supervisor was found to predict poorer outcome. Each unit decrease in reported social support had a risk ratio of 1.03 (CI = 1.00 - 1.07).

Individual Psychosocial

A person who had a lower SF-36 Mental Health Subscale score (indicating poorer mental health/greater distress) at baseline was more likely to have a poorer outcome (RR = 1.25; CI = 1.01 - 1.54). Additionally, individuals who "catastrophized" more over their pain had an increased likelihood for a poorer outcome (RR = 1.58; CI = 1.12 - 2.23).

The final logistic regression model correctly classified 78.6% of all subjects (χ^2 = 24.80, df = 7, $p < 0.001$). Specifically, 77.1% of the "low" scorers and 80.0% of the "high" scorers were classified correctly.

Predictors of Composite Outcome Status at 3 Months

Similar to the 1-month analyses, a preliminary logistic regression model was examined to obtain variables for a more specific model targeted at predicting composite outcome at 3 months. SSS score at baseline, past recommendation for surgery, number of prior treatments, ergonomic risk exposure, job stress, perceived exertion during a typical workday, job support, work accommodation, and catastrophizing were the variables found to be significant at the $p < 0.15$ level. Therefore, these variables were entered into the final model.

Table 13 summarizes the significant predictors identified by the final logistic regression model. All significant predictors, with the exception of past recommended surgery, had a continuous response scale. Therefore, for these continuous variables, the given risk ratios are for each unit increase in the responses.

Demographic Characteristics

No demographic characteristics met the selection criteria for the final 3-month model.

Occupational Status

No occupational status variables were found to meet the selection criteria for the final model at 3 months.

Medical History / Status

Recommended surgery as well as the number of prior treatments were found to significantly predict poorer outcome status. Having had a past recommendation for upper extremity-related surgery resulted in a risk ratio of 5.53 (CI = 1.18 - 25.86). Each treatment for an upper extremity disorder placed an individual at a 2.24-fold greater risk (CI = 1.26 - 3.96) for a poorer outcome.

Symptoms

An individual's baseline Symptom Severity Scale score significantly predicted poorer outcome. Each point increase in baseline SSS score was associated with a risk ratio of 6.21 (CI = 1.28 - 30.09).

Physical Function

No measures of function were entered into the final model.

Ergonomic / Biomechanical

Poorer outcome status was predicted by self-report of higher exposure levels to ergonomic risk factors ($\dot{RR}$ = 1.08; CI = 1.01 -1.15).

Occupational Psychosocial

Persons who reported higher levels of job stress also had a greater likelihood of having a poorer outcome (RR = 1.21; CI = 1.02 - 1.43).

Work Demands

Perceived exertion during a typical workday was not found to be a significant predictor of outcome.

Social Support

Job support was found to predict poorer composite outcome status, while work accommodation was not a significant predictor. Lower levels of job support from co-workers and/or supervisor was associated with a risk ratio of 1.04 (CI = 1.01- 1.08) for poorer outcome.

Individual Psychosocial

A greater tendency to "catastrophize" over pain significantly predicted poorer outcome (RR = 1.81; CI = 1.24 - 2.66).

The final logistic regression model correctly classified 77.1% of all subjects (χ^2 = 48.38, df = 13, $p < 0.001$). In this model, 80.0% of the "low" (i.e., better outcome) scorers and 74.3% of the "high" (i.e., poorer outcome) scorers were correctly classified.

Predictors of Individual Outcomes at 1 Month

Table 14 summarizes the predictors of the individual outcomes incorporated into the composite outcome index. Baseline SSS score was found to predict days lost, symptom severity and functional status at 1 month. Catastrophizing was found to predict symptom severity, functional status, and mental health. Baseline measures of days lost and mental health predicted their respective outcomes at 1 month as well.

Predictors of Individual Outcomes at 3 Months

Table 14 also summarizes the predictors of the individual outcomes that were incorporated into the composite outcome index at 3 months. Baseline SSS score predicted days lost in the past month, symptom severity, and functional status. Additionally, 3-month symptom severity and functional status were predicted by a greater tendency to "catastrophize" over pain. An individual's cognitive workstyle was also found to predict days lost. More precisely, an adverse cognitive workstyle in which a person had more frequent beliefs of needing to continue work and/or being unable to take off from work predicted days lost. Poorer mental health was predicted by a lower baseline mental health score as well as perceived exertion during a typical workday.

DISCUSSION

The present investigation prospectively examined a community sample of workers with an upper extremity disorder to identify predictors of a composite measure of outcome. The findings indicated that poorer outcome could be predicted by a combination of medical, ergonomic, occupational psychosocial, and general distress factors and, therefore, supported the study's hypothesis. The specific variables found to distinguish outcome status at both 1- and 3- month follow-up periods were: exposure to ergonomic risk factors, job support, and catastrophizing. Additional predictive variables at the 1-month follow-up period included: history of upper extremity disorders, mental health (as measured by the SF-36 Subscale), and baseline pain severity within the past week. At the 3-month follow-up period, baseline symptom severity, recommended surgery, number of prior treatments, and job stress were also found to predict outcome status.

Risk Factors for Poorer Outcome

Medical History / Status

In addressing the future outcome of a worker with an upper extremity disorder, the present findings suggest that baseline medical history is an important preliminary factor to consider. A worker with past upper extremity diagnoses in multiple anatomical locations, who has had surgery recommended for a work-related upper extremity problem, and/or has had a multiple past treatments is at an increased risk for delayed recovery. These are potentially more complex cases and perhaps deserve greater attention especially with regard to follow-up.

Symptom Severity

It is interesting that even though greater symptom severity predicted poorer outcome at both 1 and 3 months, different measures were found to be significant predictors at the two follow-up periods. The implication of these findings is that perhaps a broader measure of symptoms (e.g., the SSS) would be more sensitive for assisting with the determination of future outcome. It is also interesting that none of the other baseline measures of functional status, lost days, or mental health predicted the outcome status that incorporated these variables. This finding suggests that a particular focus should be placed on the other factors (e.g., ergonomic and psychosocial) that were found to be significant predictors of outcome in workers with a WRUED.

Ergonomic Risk Factor Exposure

While studies have found ergonomic and biomechanical risk factors to be associated with and/or predictive of upper extremity symptoms and disorders (e.g., Punnett, 1998; English et al., 1995; Tanaka et al., 1995; Feuerstein & Fitzgerald, 1992), few investigations have examined these variables as predictors of both physical and psychological health outcomes. The present study indicates that within a sample of upper extremity disorder patients, self-report of ergonomic risk factors can be used to predict a composite outcome index that incorporates both physical and psychological health.

Occupational Psychosocial Factors

Occupational stress has been found to be correlated with and/or predictive of upper extremity symptoms as well as mental health. A study of newspaper employees

found that increased job pressure and working under deadlines are associated with a greater prevalence of neck, shoulder, hand, and wrist disorders (Bernard et al., 1994). Peer cohesion, staff support, control, work pressure, clarity in policies/rules, job satisfaction, work autonomy, stress, and physical comfort have also been found to distinguish between reports of "high" or "low" levels of pain in a sample of visual display unit operators employed at a newspaper publishing organization (Stephens & Smith, 1996). Occupational stress has also been found to be related to mental health outcomes as well (e.g., Smith, 1997; Spurgeon et al., 1997). In an empirical investigation of electronic company employees, items relating to trouble at work, greater job responsibility, lower margin for error, and poor relationships with superiors have been found to be associated with poorer general mental health as determined by the General Health Questionnaire (Shigemi et al., 1997). The present findings are consistent with previous studies and indicate that job stress can predict a composite outcome that incorporates a worker's physical and mental health. Furthermore, given that the present study assessed job stressors such as time pressure and interpersonal conflicts (i.e., using the Job Stress Subscale), the present findings relating to job support (discussed in the following section) take on added importance.

Low Job Support

Social support has been noted to be positively associated with physical and psychological health (House et al., 1988). A number of studies have also observed a relationship between lower levels of job support and upper extremity symptoms/disorders (Faucett & Rempel, 1994; Linton & Kamwendo, 1989; Leino & Hanninen, 1995). In the

present investigation, lower perceived levels of support specific to one's work environment (i.e., from co-workers, supervisor) was found to be a significant predictor of poorer outcome status. This result suggests that job support continues to play a role in the outcome of a worker once he/she develops an upper extremity disorder.

Individual Psychosocial Factors

The findings also indicate that a greater reactivity to pain from an upper extremity disorder and its impact (i.e., catastrophizing) is predictive of poorer outcome at 1 and 3 months. Catstrophizing in relation to pain has also been found to differentiate work-disabled and non-disabled patients with a work-related upper extremity disorder as well as those with longer duration of disability (Himmelstein et al., 1995). The present results regarding heightened reactivity are also consistent with past studies indicating the significance of considering general distress in workers with WRUEDs. In a cohort of Finnish farmers, psychological distress (measured by the Symptoms Distress Checklist) was found to be a risk factor for disability from neck-shoulder disorders (Manninen et al., 1997). Additionally, self-reported depressive symptoms have been found to predict changes in neck/shoulder and upper limbs symptoms in both men and women (Leino & Magni, 1993).

Potential Mechanisms

In considering the identified risk factors of the present study, potential mechanisms can be suggested for conceptualizing how these variables may lead to poorer outcomes. It is interesting that both ergonomic and occupational stressors were found to

predict poorer outcomes. While multidimensional models of WRUEDs address the role of ergonomic and occupational psychosocial factors, their roles in outcomes is unclear. One possibility is that in workers who have already developed a WRUED, occupational stress can result in a heightened physiological reactivity, which in turn, can lead to a more detrimental outcome from exposure to ergonomic risk factors. This construct of "workstyle" (Feuerstein, Huang, & Pransky, 1999) has been proposed as a potential link between ergonomic and psychosocial factors in WRUEDs. While further empirical support is needed to validate this construct, it may provide a way to understand the potential interaction between psychosocial and ergonomic stressors.

Interpersonal relationships on the job also appear to play an important role in WRUED outcomes. Again, it should be noted that the Job Stress Subscale of the LISRES (Moos & Moos, 1994) used in the present study included items concerning relationships with co-workers and supervisors. Also, job support was found to be a significant predictor at both the 1-month and 3-month follow-up periods. Therefore, not only can adverse work relationships be a source of stress for workers with WRUEDs, but they also do not allow the worker to obtain support for which to better cope with pain and/or other consequences of the disorder. As these sequelae persist over time, they may contribute to poorer outcomes.

Personality factors (e.g., stable, enduring interactions with one's environment) have been associated with upper extremity disorders. For example, performance focus and efficiency, goal directedness, timeliness of task accomplishment, and organization of physical space taken from the Lifestyle Approaches scale (Williams et al., 1992) have been found to distinguish between carpal tunnel syndrome (CTS) and non-CTS patients

(Vogelsang, Williams, & Lawler, 1994). An investigation of Danish salespersons with self-reported musculoskeletal (i.e., neck, shoulder, low back) symptoms found that an interaction between low control and high levels of perceived competition from other salespeople placed a salesperson at a greater risk for neck-related symptoms (Skov, Borg, & Orhede, 1996). It has also been reported that 21% of acute carpal tunnel syndrome patients who saw an orthopedic hand surgeon met DSM-IIIR diagnostic criteria for at least one personality disorder (Mathis et al., 1994). In this sample, obsessive-compulsive (9%) and paranoid (9%) personality disorders were the most common diagnoses. This pattern of findings suggests that high levels of task-oriented behavior and heightened sensitivity to negative consequences in the environment are associated with upper extremity disorders. Subsequently, this disposition may place a worker with upper extremity symptoms at a greater susceptibility for distress which may exacerbate the problem.

In addition to these personality factors, it is has been suggested that uncertainty about prognosis may also contribute to greater distress (i.e., catastrophizing) in WRUED patients (Himmelstein et al., 1995). Failed attempts at seeking relief may further result in distress regarding the WRUED and, therefore, lead to poorer outcome. These possibilities may become more problematic when coupled with a work environment that contains adverse relationships, little or no support from co-workers and/or supervisors, and exposure to ergonomic risk factors. Other mechanisms by which catastrophizing may be related to pain experiences include a negative appraisal of and a decreased ability to cope with the pain (Weisenberg, 1994). Therefore, it is possible that stressful relationships at work as well as a lack of support may result in a reduced ability to cope

with and recover from a WRUED. Subsequently, workers with these risk factors may be more likely to have poorer outcomes in relation to their WRUED.

While these potential mechanisms are speculative, they highlight future directions for which research on WRUED outcomes can proceed. By obtaining a greater understanding of such mechanisms, more focused prevention and intervention efforts can also be conducted.

Implications and Suggestions for Intervention

Few prospective studies have examined the combination of factors that were employed in the present investigation. Furthermore, while past studies have identified some predictors of work-related upper extremity disorders, it is less clear what role these factors play once the problem has developed. As previously discussed, there is also a need to identify mechanisms by which WRUEDs occur and how various factors contribute to their exacerbation and/or maintenance. However, the present findings that ergonomic risk exposure, job stress, job support, and catastrophizing predicted composite outcome at 3 months highlight the potential importance of an integrative approach to improving worker health and/or preventing further decrements in outcome following the onset of a WRUED. In addition, the present results suggest that such efforts should also address both organizational and worker-related factors.

Several organizational interventions have been suggested to address ergonomic risk factors (e.g., Cohen et al., 1997) and occupational stressors (e.g., Cooper & Cartwright, 1997; Murphy, 1996; Ivancevich et al., 1990). However, few intervention strategies have been proposed that target both ergonomic and psychosocial stressors.

Attempts at reducing these stressors should utilize a multidisciplinary team that involves management, the employee, occupational health providers, ergonomists, and psychologists. This approach has been suggested as a feasible way for generating and implementing accommodation efforts for disabled workers in light of the Americans with Disabilities Act (Kearney 1994; Stockdell & Crawford, 1992; Huang & Feuerstein, 1998). Schurman (1996) has also proposed the use of an intervention and research method called "participatory action research (PAR)" for redesigning work organizations as well as to improve performance, health, and safety. Components of PAR include: a focus on system development, a co-learning process, a participatory and democratic process, an empowering process, and a balance between research an intervention. Additionally, PAR should be a joint effort on the parts of labor, management, and researchers. A recent publication by the National Research Council (Druckman, Singer, & Van Cott, 1997) has noted that changes in technology, environment, and the population are major factors that influence organizational change. In response to these changes, different types of organizational forms have been developed. One such form utilizes a team-based organizational approach. While these teams can be temporary (called "adhocracies") or permanent in nature, it has been suggested that they can be appropriate given a particular type of situation.

With a multi-faceted team, a problem-solving strategy (Nezu & Nezu, 1993) may be utilized to reduce risk factors that may lead to decreased worker health. Specifically, this strategy involves identifying and analyzing problems, generating potential solutions, then selecting, implementing, and evaluating the solution. It has been indicated that self-appraised "effective" problem-solvers tend to report fewer physical symptoms (Elliott &

Marmarosh, 1994). A positive relationship has also been shown to exist between problem solving ability and reduced levels of psychological distress (D'Zurilla & Sheedy, 1991). Other studies on social problem solving have found it to be a moderator of depressive symptoms related to stress (Nezu et al., 1986; Nezu & Ronan, 1988). With a multidisciplinary team involved in a problem-solving process, it is possible that considerations and/or barriers can be more directly and effectively addressed. As a result, more immediate and efficient solutions for reducing organizational and/or environmental risk factors can be obtained and implemented.

The use of a multidisciplinary team may also help to increase levels of job support. It should be noted that one aspect of the job stress measure assessed in the present study was interpersonal conflicts on the job. Coupled with the findings relating to job support, it would appear that interpersonal relations on the job play a vital role in influencing the outcome of a worker with a WRUED. This suggestion can be better understood within the context of "autonomy support." Ryan and Solky (1996) describe this type of support as:

> "...the readiness of a person to assume another's perspective or internal frame of reference and to facilitate self-initiated expression and action" (p. 252).

Within a work organization, it is possible that the inability of a worker to take the perspective of management and vice versa may help explain how interpersonal factors affect upper extremity outcome. Accordingly, if employees and management can learn to increase their awareness of the pressures, concerns, and/or difficulties of the other party, then a less antagonistic and more supportive environment may be produced.

Furthermore, with such a support system available, anxiety and heightened reactivity (i.e., catastrophizing) associated with the disorder may also be reduced.

Presently, it is not clear how to best design a work environment that encourages autonomy support and/or a team-based form of organization. However, the organizational literature has discussed total quality management (TQM) as one technique for facilitating organizational change that encourages such workplace attributes. Although the construct of TQM has not been clearly specified and quality can be a relative concept (Druckman, Singer, & Van Cott, 1997), TQM does address the strategy, culture, techniques, activities, and overall functioning of the organization. Therefore, it is possible that TQM may be a potential strategy for improving the upper extremity health of workers as well as enhancing an organization's overall performance. However, a lack of empirical evidence on the effectiveness of TQM highlights the preliminary nature of these suggestions and emphasizes the need for more systematic investigations of these approaches.

Study Limitations

While this study has several implications for the improvement of physical and psychological health as well as for secondary prevention, the limitations of the study must also be taken into account. In generalizing the present findings to a larger population, one should note that the majority of the participants in the present study were college educated, Caucasian women. While gender differences in WRUEDs have not been definitively established, past studies have found that women are more likely to report upper extremity symptoms (e.g., Polanyi et al., 1997; Bernard et al., 1994). There

is also uncertainty concerning the role of education in WRUEDs. Certain jobs (i.e., cleaners, hairdressers, secretaries, assembly line workers, and machine operators) have been found to be significantly over-represented in women who were diagnosed with an upper extremity disorder (English et al., 1995). However, job type may not necessarily be a direct reflection of educational level. Therefore, to understand how applicable the present findings are to the population in general, further investigations that delineate individual predictors of WRUEDs (e.g., gender, ethnicity, education) and their outcomes are needed.

The eligibility criteria of a recent diagnosis presented some difficulty in obtaining participants for the study. Subsequently, a relatively small sample size was examined. However, even with the limited sample size, a number of variables were found to be significant predictors at 3 months. Therefore, it is possible that for the identified risk factors, a larger sample size would have found a greater likelihood for a poorer outcome.

The methodological approach used in obtaining information relating to upper extremity diagnoses could have also been improved. Although upper extremity disorder diagnoses were documented by each participant's respective health care provider, the use of a standardized method for diagnosis (e.g., using a single physician) would have been more desirable. Such a method may also have provided useful objective information regarding clinical presentation, symptoms, and quantitative functional limitations. Nevertheless, given that significant findings were obtained with a diverse set of diagnostic procedures, this study provides useful information concerning this heterogeneous population.

The exclusive use of self-report measures in the composite measure of outcome may have also been a limitation because of the potential for subject bias. The Symptom Severity Scale and the Functional Status Scale were utilized in the present study because of their correlations with other clinical measures (Levine et al., 1993). Nevertheless, future investigations should incorporate concurrent measures of symptoms, functional limitation, and psychosocial factors from sources such as health care utilization and/or medical records, personnel records, and/or supervisor reports. It has been argued that because expert judgments as well as self reports of ergonomic exposures may provide only a limited amount of information, future research might also use direct observations in the ergonomic assessment (van der Beek & Frings-Dresen, 1998).

It is also possible that differences in the patterns of predictors may have been found for a longer follow-up period. The predictors of composite outcome status may change when a patient has had time to heal and/or obtain treatment. Presently, there is an on-going effort to determine outcome in these patients after a 12-month period. Once this follow-up is completed, it would be possible to determine whether any differences occur in the patterns of predictors over time. These subsequent results may also provide further direction for improving worker health and/or secondary prevention efforts.

One other potential study limitation may be the definition of composite outcome. While symptoms, function, lost days, and mental health have recently become more commonly measured clinical outcomes, perhaps a more empirically validated set of outcomes should be examined. However, few studies have utilized a composite outcome measure that incorporates both physical and mental health outcomes. Consequently, it is

difficult to ascertain what a meaningful measure of composite outcome and/or health should entail.

Conclusion

The present investigation indicated that ergonomic and psychosocial stressors associated with one's work are predictive of poorer outcome in workers with a WRUED. There were also indications that medical history, symptom severity, and interpersonal factors deserve attention as potential moderators of these stressors. Implementation of an interdisciplinary team that utilizes a problem solving approach was proposed as one strategy for removing potential barriers that contribute to poorer outcome. An organization with such a team dedicated to improving worker health may also facilitate more positive worker perceptions of a supportive work environment. While future evaluation of such an intervention is needed to determine its efficacy, the present findings indicate that medical, physical, ergonomic, and psychosocial factors all need to be addressed in any efforts targeted at helping workers recover from work-related upper extremity disorders. By improving outcomes in these workers, it is hoped that recurrent and/or chronic problems associated with these disorders can be prevented. Subsequently, it is possible that organizational efficiency as well as worker satisfaction, productivity, and overall quality of life can be increased.

TABLES

TABLE 1

CORRELATIONS AMONG MEDICAL STATUS MEASURES

	Dominant Hand Grip Strength	Dominant Hand Pinch Strength	Prior Workers' Compensation Injury	# of Past Upper Extremity Diagnoses	Time from Symptom Onset to Seeking Treatment	# of Past Treatments	Surgery Recommended	Other Medical Problems
Body Mass Index	0.170	0.100	0.150	0.122	0.008	-0.031	0.250*	0.167
Dominant Hand Grip Strength	----	0.862**	0.208	-0.176	0.369**	-0.313**	0.030	-0.095
Dominant Hand Pinch Strength		----	0.172	-0.239*	0.256*	-0.233	0.033	-0.144
Prior Workers' Compensation Injury			----	-0.42	0.040	-0.034	0.148	0.037
# of Past Upper Extremity Diagnoses				----	-0.112	0.276	-0.086	0.070
Time from Symptom Onset to Seeking Treatment					----	-0.014	0.088	0.010
# of Past Treatments						----	0.083	-0.152
Surgery Recommended							----	0.326**

n = 70

* $p < 0.05$ ** $p < 0.01$

TABLE 2

CORRELATIONS AMONG SYMPTOM MEASURES

	SF36 Bodily Pain	Pain Severity
Symptom Severity Scale	-0.402**	0.481**
SF36 Bodily Pain	----	-0.387**

$\underline{n} = 70$

* $\underline{p} < 0.05$ ** $\underline{p} < 0.01$

TABLE 3

CORRELATIONS AMONG PHYSICAL FUNCTION MEASURES

	SF36 Physical Function	SF36 Role-Physical	Upper Extremity Function Scale
Functional Status Scale	-0.642**	-0.543**	0.880**
SF36 Physical Function	----	0.395**	-0.623**
SF36 Role - Physical		----	-0.620**

n = 70

* $p < 0.05$ ** $p < 0.01$

TABLE 4

CORRELATIONS AMONG OCCUPATIONAL PSYCHOSOCIAL MEASURES

	NIOSH Occupational Psychosocial Checklist	Cognitive Workstyle
Job Stress (Moos & Moos, 1994)	0.644**	0.370**
NIOSH Occupational Psychosocial Checklist	----	0.437**

$\underline{n} = 70$

* $\underline{p} < 0.05$ ** $\underline{p} < 0.01$

TABLE 5

CORRELATIONS AMONG WORK DEMAND MEASURES

	Workload Variance	Physical / Mental Exhaustion	Borg (1998) CR 10 Scale of Perceived Exertion
Workload	0.406**	0.490**	0.277*
Workload Variance	----	0.439**	0.200
Physical / Mental Exhaustion		----	0.340**

$\underline{n} = 70$

* $\underline{p} < 0.05$ ** $\underline{p} < 0.01$

TABLE 6

CORRELATIONS AMONG INDIVIDUAL PSYCHOSOCIAL MEASURES

	State-Trait Anxiety Inventory	Catastrophizing	Discomfort Intolerance Scale
SF36 Mental Health	-0.687**	-0.625**	-0.321**
State-Trait Anxiety Inventory	----	-0.442**	0.206
Catastrophizing		----	0.206

$n = 70$

* $p < 0.05$ ** $p < 0.01$

TABLE 7

STANDARDIZED FACTOR LOADINGS FOR COMPOSITE OUTCOME INDEX

Factor	Composite Health Index Loading	
	1 Month	3 Months
Functional Severity	0.871	0.875
Symptom Severity	0.832	0.804
Days Lost	0.431	0.723
Mental Health	0.755	0.689

TABLE 8

DEMOGRAPHIC CHARACTERISTICS

Age		
Mean (years)	40.8	
SD	10.5	
	n	**%**
Gender		
Female	54	77.1
Male	16	22.9
Ethnicity		
White/Caucasian	52	74.3
Black/African-American	11	15.7
Latino/Hispanic	4	5.7
Asian/Pacific Islander	2	2.9
Other	1	1.4
Education Level		
High School Diploma or GED	5	7.1
Some college	17	24.3
2 Year degree	6	8.6
Bachelor's degree	10	14.3
Some graduate school	11	15.7
Master's degree	15	21.4
Graduate degree	6	8.6
Job Category		
Clerical worker; word processor	23	34.3
Professional/Technical	23	34.3
Management/Administration	12	17.1
Service	4	5.7
Sales	3	4.3
Machine Operator	2	2.9
Craftsman	1	1.4

n = 70

TABLE 9

DIAGNOSES

Specific ICD-9 Diagnosis	No. of Subjects *
Nerve Root and Plexus Disorders (353)	
Thoracic Outlet Syndrome (353.0)	2
Mononeuritis of Upper Limb (354)	
Carpal Tunnel Syndrome (354.0)	33
Unspecified mononeuritis of upper limb (354.9)	3
Cubital Tunnel Syndrome (354.2)	1
Disorders of the Cervical Region (723)	
Cervicalgia (pain in neck) (723.1)	2
Unspecified neck symptoms or disorders (723.9)	1
Peripheral Enthesopathies (726)	
Lateral epicondylitis (726.32)	5
Medial epicondylitis (726.31)	2
Unspecified enthesopathy (726.9)	2
Tendon, Synovium, and Bursa Disorders (727)	
Unspecified disorder of synovium, tendon, and bursa (727.9)	13
Radial styloid tenosynovitis (deQuervain's) (727.04)	4
Trigger finger (acquired) (727.03)	1
Other tenosynovitis of hand/wrist (727.05)	1
Disorders of muscle, ligament, and fascia (728)	
Muscle spasm (728.85)	1
Unspecified disorder of muscle, ligament, and fascia (728.9)	1
Other Disorders of Soft Tissues (729)	
Myalgia, myositis, fibromyositis (729.1)	2

* Note: Total number of subjects is greater than sample size (n = 70) because certain subjects had multiple diagnoses.

TABLE 10

TREATMENTS USED PRIOR TO BASELINE, 1 & 3 MONTH FOLLOW-UPS

Treatment	Baseline n (%)	1 Month n (%)	3 Months n (%)
Medical			
Nonsteroidal anti-inflammatory drugs	59 (84.2)	56 (80.0)	44 (62.9)
Local steroid injections	14 (20.0)	17 (24.3)	14 (20.0)
Surgery	6 (8.6)	5 (7.1)	9 (12.9)
Other	2 (2.9)	4 (5.7)	5 (7.1)
Oral steroids	2 (2.9)	1 (1.4)	0 (0.0)
Antidepressants	1 (1.4)	4 (5.7)	3 (4.3)
Physical Therapy			
Splinting	36 (51.4)	37 (52.9)	30 (42.9)
Ultrasound	17 (24.3)	18 (25.7)	16 (22.9)
Other	16 (22.9)	17 (24.3)	17 (24.3)
Muscle re-education	11 (15.7)	9 (12.9)	9 (12.9)
Transcutaneous nerve stimulation	9 (12.9)	11 (15.7)	10 (14.3)
Traction	3 (4.3)	3 (4.3)	3 (4.3)
Collar	0 (0.0)	2 (2.9)	1 (1.4)
Psychological			
Stress management	6 (1.4)	4 (5.7)	5 (7.1)
Other	1 (1.4)	1 (1.4)	0 (0.0)
Pain management	0 (0.0)	2 (2.9)	1 (1.4)
Psychotherapy	0 (0.0)	1 (1.4)	0 (0.0)
Biofeedback	0 (0.0)	0 (0.0)	1 (1.4)

TABLE 11

TEST-RETEST RELIABILITY OF INDEPENDENT VARIABLES

Measure	r
Symptom Severity Scale	0.79**
Functional Status Scale	0.90**
SF-36 Mental Health Subscale	0.84**
Ergonomic Stressors Scale	0.86**
Job Stress Subscale	0.83**
Cognitive Workstyle	0.85**
Job Support	0.84**
Catastrophizing	0.72**
Work Accommodation	0.42*

n = 23

* $p < 0.05$ ** $p < 0.001$

Note: Duration = 2 weeks

TABLE 12

PREDICTORS OF COMPOSITE OUTCOME STATUS: 1 MONTH

Baseline Variable	Risk Ratio	95% CI		Wald	R
		Lower	Upper		
No. of Past Upper Extremity Diagnoses	1.71 *	1.14	2.57	6.62	0.22
SF36 Mental Health	1.24 *	1.01	1.54	4.29	0.15
Pain Severity	1.50 *	1.08	2.07	5.90	0.20
Ergonomic Risk Exposure	1.06 *	1.01	1.11	4.78	0.17
Job Support	1.03 *	1.00	1.07	4.83	0.17
Catastrophizing	1.58 **	1.12	2.23	6.85	0.22

n = 70

* $p < 0.05$ ** $p < 0.01$

TABLE 13

PREDICTORS OF COMPOSITE OUTCOME STATUS: 3 MONTHS

Baseline Variable	Risk Ratio	95% CI		Wald	R
		Lower	Upper		
Symptom Severity Scale	6.21 *	1.28	30.09	5.14	0.18
Recommended Surgery	5.53 *	1.18	25.86	4.71	0.17
No. of Prior Treatments	2.24 **	1.26	3.96	7.62	0.24
Ergonomic Risk Exposure	1.08 *	1.01	1.15	4.63	0.16
Job Stress (Moos)	1.21 *	1.02	1.43	4.71	0.17
Job Support	1.04 *	1.01	1.08	5.63	0.19
Catastrophizing	1.81 **	1.24	2.66	9.27	0.27

$\underline{n} = 70$

* $\underline{p} < 0.05$ ** $\underline{p} \leq 0.01$

TABLE 14

PREDICTORS OF INDIVIDUAL OUTCOMES: 1 & 3 MONTHS

Days Lost in Past Month

1 Month			3 Months		
Variable	**Beta**	**ΔR^2**	**Variable**	**Beta**	**ΔR^2**
No. of Past UE Diagnoses	-0.330 **	0.184	Baseline SSS Score	0.301 *	0.210
Baseline SSS Score	0.267 *	--	Cognitive Workstyle	0.444 **	0.128
Baseline Days Lost	0.465 **	0.294			

Symptom Severity

1 Month			3 Months		
Variable	**Beta**	**ΔR^2**	**Variable**	**Beta**	**ΔR^2**
Baseline SSS Score	0.755 **	0.635	Baseline SSS Score	0.557 **	0.404
Perceived Exertion	-0.188 *	0.023	Catastrophizing	-0.482 *	0.066
Catastrophizing	-0.281 *	0.022			

Functional Status

1 Month			3 Months		
Variable	**Beta**	**ΔR^2**	**Variable**	**Beta**	**ΔR^2**
Baseline SSS Score	0.182 *	0.613	Baseline SSS Score	0.230 *	0.497
Catastrophizing	-0.308 *	0.027	Catastrophizing	-0.472 *	0.063

Mental Health

1 Month			3 Months		
Variable	**Beta**	**ΔR^2**	**Variable**	**Beta**	**ΔR^2**
Baseline SF36 Mental Health Score	0.666 *	0.541	Baseline SF36 Mental Health Score	0.652 **	0.434
Catastrophizing	0.484 **	0.066	Perceived Exertion	0.246 *	0.038

n = 70

* $p < 0.05$ ** $p < 0.01$

APPENDICES

WRUED PHONE SCREEN INTERVIEW

Hi, I'm _____, a researcher at the Uniformed Services University. I'm calling you back to ask whether you are interested in participating in the research study of **work-related upper extremity disorders**. The study involves coming in for ONE 1 to 1½ hour visit where you will fill out a questionnaire and complete several tasks. You will also be given **three copies of a brief 20-minute** questionnaire to fill out **1, 2, and 3 months after your visit**. You'll mail them back in the self-addressed, pre-paid envelopes provided.

None of the procedures are harmful or dangerous in any way. For instance, there are no needles or blood draws or taking of any drugs. For your participation, (a total of about 2 hours of your time), you will receive **$40.00** upon completion of the third follow-up questionnaire.

Do you think that you might be interested in participating?

If NO, say, "Thank you anyway for your time. Goodbye."

If YES, say, "Great. Let me do two things now if you have a few minutes. OK, the **FIRST** thing I'd like to do now is to ask you some questions in reference to your medical history. Do you have a few more minutes now to answer these questions?

If NO, say, "When is a good time for me to call you back?"

If YES, continue with he screen on the next page.

Interviewer: _____

Date: _____

Name: _____

Phone: H _____ **/W** _____

Gender: **M** **F**

1) What is your age? _____

2) Are you currently employed? **Y** **N**

If YES, how many hours per week? _____

If YES, what kind of work do you do? _____

3) Have you been diagnosed with an **UPPER EXTREMITY DISORDER** Y N

If yes, when? _____

If yes, did you or the doctor who diagnosed it believe that it was related to your work? Y N

If yes, was the diagnosis within the last 30 days? (will accept up to six weeks) Y N

If yes, have you ever had surgery for an Upper Extremity Disorder? Y N

If yes, would you be able to obtain a note from your doctor stating this or would he/she be able to fill out a short form with a couple of questions about your diagnosis? Y N

4) Do you have any significant medical, physical, or emotional problems, such as diabetes, ulcer, thyroid problems, arthritis, alcoholism, depression, panic? Y N

If yes, what ?_____

when ?_____

What kind of medications were you prescribed?

_____

5) Are you taking any medications currently?

If YES, what _____

6) Do you have any other condition that might be affecting your current health status?

Y N

Do you have any questions?

AFTER THE MEDICAL SCREEN:

OK, SECOND, let me briefly explain the main components of the study. One, at your visit, you will be given a questionnaire to fill out that will ask you some questions about such things as your work, medical history, and your pain or symptoms. You will have your height and weight measured, along with what we call a pinch/grip test of your hand strength. Afterward, you will be given three copies of a brief questionnaire to take home and mail back 1, 2, and 3 months after your visit. That's it. Any questions at this point?

What would be a good time for you to come and do the questionnaire?

UPPER EXTREMITY SCREEN

NAME: _____

DATE: _____

SOCIAL SECURITY NUMBER: _____

STREET ADDRESS: _____

CITY, STATE, ZIP: _____

WORK ADDRESS: _____

CITY, STATE, ZIP: _____

HOME PHONE: _____

WORK PHONE: _____

HEIGHT: _____

WEIGHT: _____

PINCH: _____

GRIP: _____

UPPER EXTREMITY SCREEN

ID #: _____

I. DEMOGRAPHICS

1) Age: What is your date of birth? (month/day/year) _____

2) Gender: Male _____ Female _____

3) Education: What is the highest level of education that you have completed? *(Circle one letter)*
   a) Less than High School
   b) High School diploma or GED
   c) Some College
   d) 2 year degree
   e) Bachelor's Degree
   f) Some graduate school
   g) Master's Degree
   h) Graduate Degree

4) Marital Status: *(Circle one letter)*
   a) Single
   b) Single but cohabiting (unmarried, living together in romantic love relationship)
   c) Divorced
   d) Separated
   e) Widowed
   f) Married

5) Ethnicity/Race: *(Circle one letter)*
   a) Asian or Pacific Islander
   b) Black or African-American
   c) Latino or Hispanic
   d) Native American or Alaskan Native
   e) White or Caucasian, but non Hispanic
   f) Other: _____

6) What are you primarily? *(circle one)*

   Right-handed Left-handed Both

7) What is your current job title? _____.

8) If military, what branch/corps/rate? _____.

9) How long have you held your current job? _____ years _____ months

10) Is your job. . . *(circle one)*

    part-time *(20 hours per week or fewer)* full-time *(more than 20 hours per week)*

11) How long have you consistently (without breaks longer than one month) been working a similar number of hours per week in type of job?

    _____ years _____ months

12) For the chart below, circle the month when you had your work injury.
Place an "N" in the box below each month when you were not working at all.
Place an "L" in the box for months when you were on light duty or alternate duty.
Place an "R" for months you were on regular duty.

If you were on any status for less than one month, indicate the number of weeks by placing a number indicating this before the l you chose.

For example, if you were on 2 weeks limited duty and 2 weeks regular duty in January 1995, you would place "2L" and "2R" in first box. If it was only days, indicate it was days instead of weeks by "2daysL" instead of "2L."

1997

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

1998

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

II. MEDICAL STATUS

13) Have you had any pain or discomfort that you believe to be related to your work? . . . . . Yes N

➪(If NO, stop here)

14) Has this problem been interfering with your ability to do your job? . . . . . Yes N

15) Have you been maintaining your regular work schedule and number of hours? . . . . . Yes N

16) Has your work decreased to a limited, alternate, or light duty status? . . . . . Yes N

17) Have you missed work due to this problem? . . . . . Yes N

18) If Yes, how much work did you miss in the last month due to this problem?

_____ days _____ weeks

19) Have you not been able to work at all due to work-related injury . . . . . Yes N

On the following question: (Place a straight vertical line through the appropriate area on the horizontal line below.) You can us entire range to best indicate your answer.

Example: I have a low pain threshold.

Not at All Like Me ——— Extremely Like Me

20) Please rate the severity of your pain during the past week.

No pain ——— Severe pain

21) Excluding your present problem, have you ever had a prior worker's comp injury? *(circle one)*.. Yes N

22) If yes to #21, were you off from work for more than 6 months? *(circle one)* ..... Yes N

23) Tobacco Intake History: Do you smoke cigarettes or chew tobacco? ..... Yes N

24) If so how many cigarettes or how much tobacco do you chew/day? _____

25) Do you ever consume alcohol? ..... Yes N

26) If so how many drinks (count doubles as 2) per week? _____

27) Do you take any prescription medications? ..... Yes N

28) If so what are these medications? _____

29) How much and how often do you take these prescription medications? _____

30) Do you take any non-prescription medications? ..... Yes N

31) If so what are these medications? _____

32) How much and how often do you take these non-prescription medications?

_____

33) Have you been diagnosed with a specific upper extremity disorder? ..... Yes N

34) If so what was the diagnosis? _____

35) Have you ever been told by a doctor that you had tendonitis, tenosynovitis, carpal tunnel syndrome, thoracic outlet syndrom bursitis in any of the these areas? *(circle any or all that apply)*

neck	left	right	both	none
shoulder	left	right	both	none
elbow	left	right	both	none
forearm	left	right	both	none
hand/wrist	left	right	both	none

36) What was the length of time between the onset of any upper extremity symptoms and your seeking medical help?
(Please check the appropriate answer.)

___ Had no difficulty that needed medical help (skip to #41)
___ 0-1 month
___ 1-2 months
___ 2-3 months
___ 3-4 months
___ 4-5 months
___ 5-6 months
___ 6-12 months
___ more than 1 year
___ more than 2 years
___ Have problems but never sought medical help (skip to #41)

37) Please check all of the following therapies that you have had for any type of pain or other problem in your hands, wrist, arms, shoulders, or neck:

MEDICAL:

___ Nonsteroidal anti-inflammatory drugs (i.e., Ibuprofen, Naproxen, Naprosyn)
___ Oral steroids
___ Local steroid injections
___ Antidepressants
___ Surgery: indicate type _____ problem _____
___ Other (specify)_____

PHYSICAL THERAPY:

___ Splinting
___ Muscle re-education
___ Transcutaneous nerve stimulation
___ Ultrasound
___ Traction
___ Collar
___ Other (specify) _____

PSYCHOLOGICAL:

___ Stress Management
___ Pain Management
___ Psychotherapy
___ Hypnotherapy
___ Biofeedback
___ Other (specify) _____

38) Think about all the examinations, treatments, and therapy you've had for your work injury. How much pain or discomfort have had from these examinations, treatments, or therapy?

____ None
____ Slight pain or discomfort
____ Average pain or discomfort
____ Severe pain or discomfort

39) Has your physician ever recommended surgery for work-related problems in any of these areas?
(Please check all that apply)

___ Neck ___ Shoulder ___ Elbow ___ Forearm ___ Hand/wrist

40) Have you ever *had surgery* for *work-related* problems in any of these areas? *(Please check all that apply)*

___ Neck ___ Shoulder ___ Elbow ___ Forearm ___ Hand/Wrist

41) Have you ever been told by a doctor that you had any of the following? *(Please check all that apply)*

___ Diabetes
___ Gout
___ Thyroid problems
___ Lupus
___ Ruptured disc in NECK
___ Ruptured disc in BACK
___ Rheumatoid Arthritis
___ Alcoholism
___ Kidney Failure

How helpful have the following providers and treatments been toward your recovery from your work injury?
(Please circle one number that corresponds to your answer for each question)

	Helped a Lot	Helped a Little	Didn't Help or Hinder	Hindered a Little	Hindered a Lot	Does not Apply
42) Family doctor	5	4	3	2	1	8
43) Specialist (for example, Orthopedist)	5	4	3	2	1	8
44) Psychologist	5	4	3	2	1	8
45) Worker's Comp Case Manager	5	4	3	2	1	8
46) Overnight hospital stay	5	4	3	2	1	8
47) Surgery	5	4	3	2	1	8
48) Prescription medicines or injections	5	4	3	2	1	8
49) Over-the-counter (non-prescription) medicines	5	4	3	2	1	8
50) Splint or brace	5	4	3	2	1	8
51) Physical therapy	5	4	3	2	1	8
52) Ultrasound	5	4	3	2	1	8
53) Chiropractic treatment	5	4	3	2	1	8
54) Work rehabilitation program	5	4	3	2	1	8
55) Sports program or gym	5	4	3	2	1	8
56) Stress Management	5	4	3	2	1	8
57) Pain Management	5	4	3	2	1	8
58) Psychotherapy	5	4	3	2	1	8
59) Hypnotherapy	5	4	3	2	1	8
60) Biofeedback	5	4	3	2	1	8
61) Other (explain)*	5	4	3	2	1	8

* *Explain:* _____

Think about the person (family doctor, chiropractor, etc.) who primarily treated you for your work injury. Did this person...

62) Explain your medical condition in a way that you could understand?..... Yes No

63) Tell you when you could return to work?..... Yes No

64) Encourage you to go back to work?.....Yes No

65) Take your problem seriously?.....Yes No

III. PAIN / SYMPTOMS

The following questions refer to your symptoms for a typical twenty-four-hour period during the past two weeks. (circle one answer each question)

66) How severe is the hand or wrist pain that you have at night?

1 I do not have hand or wrist pain at night.
2 Mild pain
3 Moderate pain
4 Severe pain
5 Very severe pain

67) How often did hand or wrist pain wake you up during a typical night in the past two weeks?

1 Never
2 Once
3 Two or three times
4 Four or five times
5 More than five times

68) Do you typically have pain in your hand or wrist during the daytime?

1 I never have pain during the day
2 I have mild pain during the day
3 I have moderate pain during the day
4 I have severe pain during the day
5 I have very severe pain during the day

69) How often do you have hand or wrist pain during the daytime?

1 Never
2 Once or twice a day
3 Three to five times a day
4 More than five times day
5 The pain is constant

70) How long, on average, does an episode of pain last during the daytime?

1 I never get pain during the day
2 Less than 10 minutes
3 10 to 60 minutes
4 Greater than 60 minutes
5 The pain is constant throughout the day

71) Do you have numbness (loss of sensation) in your hand?

1 No
2 I have mild numbness
3 I have moderate numbness
4 I have severe numbness
5 I have very severe numbness

72) Do you have weakness in your hand or wrist?

1 No weakness
2 Mild weakness
3 Moderate weakness
4 Severe weakness
5 Very severe weakness

73) Do you have tingling sensations in your hand?

1 No tingling
2 Mild tingling
3 Moderate tingling
4 Severe tingling
5 Very severe tingling

74) How severe is numbness (loss of sensation) or tingling night?

1 I have no numbness or tingling at night
2 Mild
3 Moderate
4 Severe
5 Very severe

75) How often did *hand numbness or tingling* wake you up during a typical night during the past two weeks?

1 Never
2 Once
3 Two or three times
4 Four or five times
5 More than five times

76) Do you have difficulty with grasping and use of small objects such as keys or pens?

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Very severe difficulty

(Place a straight vertical line | through the appropriate area on the horizontal line below.) You can use the entire range to best indicate your answer.

Example: I have a low pain threshold.

Not at All Like Me ——|—— Extremely Like Me

77) I can tolerate a great deal of physical discomfort.

Not at All Like Me ——————— Extremely Like Me

78) I have a high pain threshold.

Not at All Like Me ——————— Extremely Like Me

79) I take extreme measures to avoid feeling physically uncomfortable.

Not at All Like Me ——————— Extremely Like Me

80) I push my physical limits when I exercise.

Not at All Like Me ——————— Extremely Like Me

81) When I begin to feel physically uncomfortable, I quickly take steps to relieve the discomfort.

Not at All Like Me ——————— Extremely Like Me

82) I am more sensitive to feeling physical discomfort compared to most people.

——————— Extremely Like Me

IV. ACTIVITY

On a *typical day* during the past two weeks have hand and wrist symptoms caused you to have any difficulty doing the activities listed below? Please circle one number that *best* describes your ability to do the activity.

83) Writing

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

84) Buttoning of clothes

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

85) Holding a book while reading

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

86) Gripping of a telephone handle

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

87) Opening of jars

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

88) Household chores

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

89) Carrying of grocery bags

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

90) Bathing and dressing

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

91) Typing / keyboarding / word-processing

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

92) Lifting a heavy box

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

93) Reaching overhead

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

94) Using a hammer or screwdriver

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

95) Hobbies

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

96) Performing your job

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

97) Brushing your teeth

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

98) Picking up a coin or other small object in your fingers

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

99) Sleeping

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

100) In general, would you say your health is: *(circle one)*

Excellent Very Good Good Fair Poor

101) *Compared to one year ago*, how would you rate your health in general *now?* (circle one)

a) Much better than one year ago
b) Somewhat better than one year ago
c) About the same as one year ago
d) Somewhat worse now than one year ago
e) Much worse than one year ago

The following items are about activities you might do during a typical day. Does *your health limit you* in these activities? *(Circle your response for each question)*

102) *Vigorous* activities, such as running, lifting heavy objects, participating in strenuous sports

Yes, limited a lot Yes, limited a little No, Not limited at all

103) *Moderate* activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf

Yes, limited a lot Yes, limited a little No, Not limited at all

104) Lifting or carrying groceries

Yes, limited a lot Yes, limited a little No, Not limited at all

105) Climbing *several* flights of stairs

Yes, limited a lot Yes, limited a little No, Not limited a

106) Climbing *one* flight of stairs

Yes, limited a lot Yes, limited a little No, Not limited a

107) Bending, kneeling, or stooping

Yes, limited a lot Yes, limited a little No, Not limited at

108) Walking more than a mile

Yes, limited a lot Yes, limited a little No, Not limited at

109) Walking *several* blocks

Yes, limited a lot Yes, limited a little No, Not limited at

110) Walking *one block*

Yes, limited a lot Yes, limited a little No, Not limited at

111) Bathing or dressing yourself

Yes, limited a lot Yes, limited a little No, Not limited at

During the *past 4 weeks*, have you had any of the following problems with your work or other regular daily activities *as a result of your physical health? (Circle Yes or No for each item)*

112) Cut down the amount of time you spent on work or othe activities

Yes No

113) *Accomplished* less than you would like

Yes No

114) Were limited in the *kind* of work or other activities

Yes No

115) Had *difficulty* performing the work or other activities (fo example, it took extra effort)

Yes No

During the *past 4 weeks*, have you had any of the following problems with your work or other regular daily activities *as a result of any emotional problems* (such as feeling depressed or anxious)?

116) Cut down the *amount of time* you spent on work or other activities

Yes No

117) *Accomplished less* than you would like

Yes No

118) Didn't do work or other activities as *carefully* as usual

Yes No

119) During the *past 4 weeks*, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

Not at all A little bit Moderately Quite a bit Extremely

120) How much *bodily* pain have you had during the *past 4 weeks*?

None Very mild Mild Moderate Severe Very Severe

121) During the *past 4 weeks*, how much did *pain* interfere with your normal work (including both work outside the home and housework)?

Not at all A little bit Moderately Quite a bit Extremely

These questions are about how you feel and how things have been with you *during the past 4 weeks*. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the *past 4 weeks*:

122) Did you feel full of pep?

5=All of the time
4=Most of the time
3=A good bit of the time
2=Some of the time
1=A little of the time
0=None of the time

123) Have you been a very nervous person?

5=All of the time
4=Most of the time
3=A good bit of the time
2=Some of the time
1=A little of the time
0=None of the time

124) Have you felt so down in the dumps that nothing could cheer you up?

5=All of the time
4=Most of the time
3=A good bit of the time
2=Some of the time
1=A little of the time
0=None of the time

125) Have you felt calm and peaceful?

5=All of the time
4=Most of the time
3=A good bit of the time
2=Some of the time
1=A little of the time
0=None of the time

126) Did you have a lot of energy?

5=All of the time
4=Most of the time
3=A good bit of the time
2=Some of the time
1=A little of the time
0=None of the time

127) Have you felt downhearted and blue?

5=All of the time
4=Most of the time
3=A good bit of the time
2=Some of the time
1=A little of the time
0=None of the time

128) Did you feel worn out?

5=All of the time
4=Most of the time
3=A good bit of the time
2=Some of the time
1=A little of the time
0=None of the time

129) Have you been a happy person?

5=All of the time
4=Most of the time
3=A good bit of the time
2=Some of the time
1=A little of the time
0=None of the time

130) Did you feel tired?

5=All of the time
4=Most of the time
3=A good bit of the time
2=Some of the time
1=A little of the time
0=None of the time

131) During the *past 4 weeks*, how much of the time has your *physical health or emotional problems* interfered with you social activities (like visiting with friends, relatives, etc.)?

All of the time	Most of the time	Some of the time	A little of the time	None of the time

How TRUE or FALSE is *each* of the following statements for you? *(Circle your response)*

132) I seem to get sick a little easier than other people

Definitely true	Mostly true	Don't know	Mostly false	Definitely false

133) I am as healthy as anybody I know

Definitely true	Mostly true	Don't know	Mostly false	Definitely false

134) I expect my health to get worse

Definitely true	Mostly true	Don't know	Mostly false	Definitely false

135) My health is excellent

Definitely true	Mostly true	Don't know	Mostly false	Definitely false

V.

The following asks a series of question regarding how you view your work.

Using the scale below, please answer the following questions about your work situation.
(Select the appropriate number under your choice and fill in the blank line before each question).

Rarely	Occasionally	Sometimes	Often	Very Often
1	2	3	4	5

The next series of questions asks how often certain things happen at your job.

136) ____ How often does your job require you to work very fast?

137) ____ How often does your job require you to work very hard?

138) ____ How often does your job leave you with little time to get things done?

139) ____ How often is there a great deal to get done?

140) ____ How often is there a marked increase in your workload?

141) ____ How often is there a marked increase in the amount of concentration required on your job?

142) ____ How often is there a marked increase in how fast you have to think?

143) ____ How often are you physically exhausted at the end of the work day?

144) ____ How often are you mentally exhausted at the end of the work day?

(Place a straight vertical line | through the appropriate area on the horizontal line below.) You can use the entire range to best indicate your answer.

Example: I have a low pain threshold.

Not at All Like Me ——— Extremely Like Me

146) At work: How frequently do you find your fingers/wrists/hands/arms (any one or combination) moving "as fast as they can go?"

Never ——— Very Frequently

146) At work: How frequently do you find your fingers/wrists/hands/arms making jerky, quick, sudden movements?

Never ——— Very Frequently

147) At work: How frequently do you find your fingers/wrists/hands/arms making repetitive movements?

Never ——— Very Frequently

148) At work: How frequently do you find your fingers/wrists/hands/arms making forceful movements?

Never ——— Very Frequently

149) At work: How frequently do you pause or stretch for at least one minute during a typical hour/day at work?

Never ——— Very Frequently

150) At work: During a typical workday, how concerned are you with maintaining the precision and accuracy of movements in your fingers/wrists/hands/arms that affect your work quality? (for example: typing accurately and rapidly requires highly precise movements to certain keys to achieve work goal)

Never ——— Very Frequently

151) Think about the job you were doing when your work injury occurred. How often did you have to do the following?
(Please circle one number that corresponds to your answer for each statement)

	Never	Seldom	Sometimes	Often	Very Often
Lift heavy objects	1	2	3	4	5
Twist your back while lifting	1	2	3	4	5
Work in a cold or refrigerated area less than 55° F?	1	2	3	4	5
Push, pull, or pinch with a lot of force	1	2	3	4	5
Sit for long periods without a chance to get up	1	2	3	4	5
Stand for long periods without a chance to sit down	1	2	3	4	5
Work with your arms raised	1	2	3	4	5
Work in an awkward position	1	2	3	4	5
Repetitive activities (for example, type, turn screws, assemble, pack, cut) more than twice per minute	1	2	3	4	5
Use equipment that vibrates (for example, power tools)	1	2	3	4	5

152) At work: How frequently do you find yourself moving your wrists from side to side either with or without using a tool?

Never — Very Frequently

153) At work: How frequently do you find yourself making a "clothes-wringing type" motion?

Never — Very Frequently

154) At work: How frequently do you find yourself making a "screwdriver-twisting type" motion?

Never — Very Frequently

155) At work: How frequently do you find yourself making a "hammering-type" motion?

Never — Very Frequently

156) At work: How frequently do you find yourself making a "pinching type" motion?

Never — Very Frequently

157) At work: How frequently do you find yourself making a "squeezing or fist type" motion?

Never — Very Frequently

158) At work: How much can the configuration or layout of the work surface at your worksite be changed or adjusted?

Not at all — Very Much

159) At work: How much can the height of the work surface be adjusted?

Not at all — Very Much

160) At work: How much can the location of the work surface be adjusted?

Not at all — Very Much

161) At work: How often is the tool that you use one that is suspended from something?

Never — Very Frequently

162) At work: How frequently do you find yourself using the computer mouse?

Never — Very Frequently

163) At work: How frequently do you find yourself using a keyboard?

Never — Very Frequently

164) At work: How frequently do you find yourself holding a document/book at eye level?

Never — Very Frequently

165) At work: How frequently do you find yourself sorting or turning pages in documents?

Never ——— Very Frequently

166) At work: How frequently do you find yourself holding or dialing a telephone?

Never ——— Very Frequently

167) At work: How frequently do you find yourself writing?

Never ——— Very Frequently

168) At work: How frequently do you find yourself using manual hand-held tools?

Never ——— Very Frequently

169) At work: How frequently do you find yourself using your palm as a striking tool?

Never ——— Very Frequently

170) At work: How frequently do you find yourself manually stapling?

Never ——— Very Frequently

171) At work: How frequently do you find yourself using your finger or thumb as pressing tool?

Never ——— Very Frequently

172) At work: How frequently do you find yourself grasping objects with your hands?

Never ——— Very Frequently

173) At work: How frequently do you find yourself picking up small objects in your fingers?

Never ——— Very Frequently

174) Do you wear bifocals while working?

Yes No

175) Rate the degree of physical exertion or effort you believe is associated with a typical day at work.

0 Nothing at all
0.5 Very, very easy
1 Very easy
2 Easy
3 Moderately hard
4 Somewhat hard
5 Hard
6
7 Very hard
8
9
10 Very, very hard

176) Rate the degree of physical exertion or effort you believe is associated with a highly demanding day at work.

0	Nothing at all
0.5	Very, very easy
1	Very easy
2	Easy
3	Moderately hard
4	Somewhat hard
5	Hard
6	
7	Very hard
8	
9	
10	Very, very hard

Please circle Yes or No to the following work environment characteristics:

Would you say that in your job you:

177) Work at a forced pace ..... Yes No

178) Work rotating shifts ..... Yes No

179) Are required to work overtime ..... Yes No

180) Have flexible work hours ..... Yes No

181) Work serving the public ..... Yes No

Circle the answer that best *describes your impressions of the following work environment characteristics (at your workplace).*

182) A clean work area.

Very	Somewhat	A little	Not at all	Can't determine
1	2	3	4	9

183) A quiet work area.

Very	Somewhat	A little	Not at all	Can't determine
1	2	3	4	9

184) A comfortable air quality (in terms of usual temperature, circulation, moisture, odors).

Very	Somewhat	A little	Not at all	Can't determine
1	2	3	4	9

185) A well-lighted work area.

Very	Somewhat	A little	Not at all	Can't determine
1	2	3	4	9

186) A work space appropriate for the job.

Very	Somewhat	A little	Not at all	Can't determi
1	2	3	4	9

187) A fast-pace.

Very	Somewhat	A little	Not at all	Can't determi
1	2	3	4	9

188) Physically strenuous.

Very	Somewhat	A little	Not at all	Can't determi
1	2	3	4	9

189) Repetitive.

Very	Somewhat	A little	Not at all	Can't determin
1	2	3	4	9

190) Mentally demanding.

Very	Somewhat	A little	Not at all	Can't determin
1	2	3	4	9

191) A high workload.

Very	Somewhat	A little	Not at all	Can't determin
1	2	3	4	9

192) Resources for performing work tasks readily available.

Very	Somewhat	A little	Not at all	Can't determin
1	2	3	4	9

193) Clear job expectations.

Very	Somewhat	A little	Not at all	Can't determin
1	2	3	4	9

194) Workers feel pressured to keep working.

Very	Somewhat	A little	Not at all	Can't determin
1	2	3	4	9

195) Job activities are controlled by the workers.

Very	Somewhat	A little	Not at all	Can't determin
1	2	3	4	9

196) Cooperation and support among workers is high.

Very	Somewhat	A little	Not at all	Can't determin
1	2	3	4	9

197) Channels for communication between managers and workers are effective.

Very	Somewhat	A little	Not at all	Can't determine
1	2	3	4	9

198) Employee contributions are recognized by managers.

Very	Somewhat	A little	Not at all	Can't determine
1	2	3	4	9

199) Opportunities for advancement are available.

Very	Somewhat	A little	Not at all	Can't determine
1	2	3	4	9

200) A frequently-changing work environment.

Very	Somewhat	A little	Not at all	Can't determine
1	2	3	4	9

201) Good job security.

Very	Somewhat	A little	Not at all	Can't determine
1	2	3	4	9

202) Workers are satisfied with their jobs.

Very	Somewhat	A little	Not at all	Can't determine
1	2	3	4	9

For each question, please indicate how often these things happen at your workplace. *(If the question is Not Applicable due to the nature of your work situation, please circle NA.)*

203) The company provides wellness programs and fitness resources to promote employee health.

Never	Seldom	Sometimes	Fairly Often	Often

204) Procedures are used to monitor and encourage individual supervisors to assist the return of injured workers to their departments.

Never	Seldom	Sometimes	Fairly Often	Often

205) Safety training occurs as a regular part of orientation for new and transferred employees.

Never	Seldom	Sometimes	Fairly Often	Often

206) Light duty assignments and/or modified work are used to help workers who have experienced pain and other symptoms come back to work.

Never	Seldom	Sometimes	Fairly Often	Often

207) Employees participate in problem-solving and decision making as a regular part of company operations.

Never	Seldom	Sometimes	Fairly Often	Often

If you thought the following accommodations would help you return to work or work more comfortably, how likely do you think your employer would be to provide you with:

(Place a straight vertical line | through the appropriate area on the horizontal below each question)
You can use the entire range to best indicate your answer.

208) A new keyboard:

Not at all likely ——— Extremely likely

209) A new wrist-rest:

Not at all likely ——— Extremely likely

210) A new chair:

Not at all likely ——— Extremely likely

211) A modified work schedule:

Not at all likely ——— Extremely likely

212) A modified work area (for example: a new arrangement, location, or lighting for your desk):

Not at all likely ——— Extremely likely

213) How many people work for your company / local organization? *(circle one)*

Fewer than 50 More than 50

How often do you say these things to yourself when you are in pain?

214) It's terrible and I feel it's never going to get any better.

not at all	sometimes	quite a bit	often
0	1	2	3

215) It's awful and I feel that it overwhelms me.

not at all	sometimes	quite a bit	often
0	1	2	3

216) I feel my life isn't worth living.

not at all	sometimes	quite a bit	often
0	1	2	3

217) I worry all the time about whether it will end.

not at all	sometimes	quite a bit	ef
0	1	2	

218) I feel that I can't stand it anymore.

not at all	sometimes	quite a bit	ef
0	1	2	

219) I feel like I can't go on.

not at all	sometimes	quite a bit	ef
0	1	2	

---

220) Based on the all the things you do to cope, or deal with your symptoms, on an average day, how much control do you feel t
you have over them? *(Place a straight vertical line | through the appropriate area on the horizontal below each question)*
You can use the entire range to best indicate your answer.

No control ——————————————— Complete control

How often do you use the following strategies to deal with your pain? *Please circle your answer.*

221) I leave the house and do something, such as going to the movies or shopping.

not at all	sometimes	quite a bit	often
0	1	2	3

222) I read.

not at all	sometimes	quite a bit	often
0	1	2	3

223) I try to be around other people.

not at all	sometimes	quite a bit	often
0	1	2	3

224) I do anything to get my mind off the pain.

not at all	sometimes	quite a bit	often
0	1	2	3

225) I do something I enjoy, such as watching t.v., or listening to music.

not at all	sometimes	quite a bit	often
0	1	2	3

226) I do something active, like household chores or projects.

not at all	sometimes	quite a bit	often
0	1	2	3

Confidence Scale:

10 20 30 40 50 60 70 80 90 100

Not certain at all — Very certain

(USE NUMBERS FROM 0-100 BASED ON THE SCALE ABOVE)

Essential activity required to perform your job	Put a √ if you need to perform this activity on the job	Put a √ if you can do this activity on the job	Rate your confidence to perform this activity on the job
227) Use of a computer mouse.			
228) Keyboarding / typing / wordprocessing.			
229) Holding of document/book at eye level.			
230) Page turning, papersorting.			
231) Holding / dialing telephone.			
232) Writing.			
233) Carrying with right hand			
234) Carrying with left hand.			
235) Carrying with both hands (arms).			
236) Use of manual hand held tools.			
237) Use of power tools.			
238) Use of palm, finger or thumb as pressing or striking tool.			
239) Grasping objects with hands.			
240) Picking up small objects in fingers.			

For the questions below:
(Place a straight vertical line | through the appropriate area on the horizontal below each question)
You can use the entire range to best indicate your answer.

241) How certain are you that you will be physically able to return to your usual work capacity?

Very uncertain — Very certain

242) How certain are you that you will be able to return to your job?

Very uncertain — Very certain

VI.

The following asks a series of questions regarding how you view your work.
In the future, some jobs will be changing while others will by staying the same.
Here are some questions which deal with this topic. Use the scale below to answer the questions.

Using the scale below, please answer the following questions about your work situation.
(Select the appropriate number under your choice and fill in the blank line before each question).

Very Uncertain	A Little Uncertain	Somewhat Certain	Fairly Certain	Very Certain
1	2	3	4	5

243) ____ How certain are you about what your future career picture looks like?

244) ____ How certain are you of the opportunities for promotion and advancement which will exist in the next few years?

245) ____ How certain are you about whether your job skills will be of use and value five years from now?

246) ____ How certain are you about what your responsibilities will be six months from now?

247) ____ If you lost your job, how certain are you that you could support yourself?

248) ____ How likely is it that in the next few years your job will be replaced by computers or machines?

(Place a straight vertical line | through the appropriate area on the horizontal below each question)

249) How certain are you that your job will be waiting for you when you are able to return to work?

Very uncertain ——————————————— Very certain

250) I am satisfied with the way my fellow workers talk things over with me and share problems with me.

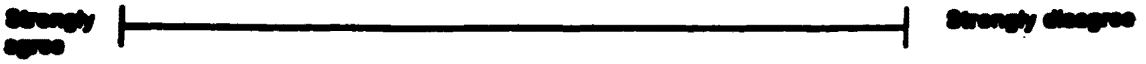
Strongly agree ——————————————— Strongly disagree

251) I get along well with my coworkers.

Strongly agree ——————————————— Strongly disagree

252) It is easy for me to talk with my coworkers.

253) I can rely on my coworkers when things get tough at work.



254) My coworkers are willing to listen to my personal problems.

255) My coworkers go out of their way to make my worklife easier.

256) I get along well with my closest immediate supervisor.

257) It is easy for me to talk with my immediate supervisor.

258) I can rely on my immediate supervisor when things get tough at work.

259) My immediate supervisor is willing to listen to my personal problems.

260) My immediate supervisor goes out of his/her way to make my worklife easier.

261) I enjoy the tasks involved in my job.

The following asks a series of questions regarding *how you view your work*. Using the scale below, please answer the following questions about your work situation by placing the number that corresponds with your answer in the blank by each question.

Disagree Strongly	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree
1	2	3	4	5

262) ____ In my workgroup, people cannot afford to relax.

263) ____ In my workgroup, there is constant pressure to keep working.

264) ____ In my workgroup, there is a sense of urgency about everything.

(Place a straight vertical line | through the appropriate area on the horizontal line below each question)
You can use the entire range to best indicate your answer.

265) I am angry about how my employer has treated me since my upper-extremity problem began.

Strongly agree |——————————————————————| Strongly disagree

266) I blame my employer for my upper-extremity problem.

Strongly agree |——————————————————————| Strongly disagree

The following is a list of reactions that your supervisor or employer may have had to your work injury. *Check all that apply in your case.*

267) Your supervisor/employer:

____ Blamed you for the injury
____ Was helpful
____ Was angry that you were off work
____ Did not believe that anything was wrong with you
____ Was eager for you to return to work
____ Didn't want you to file a claim
____ Wanted you to file a claim
____ Had no reaction
____ Other (*Explain*) _____

268) Would you say your co-workers' reactions to your work injury were:

____ Sympathetic
____ Unsympathetic
____ Had no reaction
____ Some other way (*Explain*) _____
____ I had no co-workers
____ Do not know

269) Did anyone contact you to ask how you were doing after your work injury?

____ Yes ____ No

270) If YES to the above question, Who contacted you? *(check all that apply)*

____ Supervisor
____ Co-worker
____ Union representative
____ Company Nurse or Doctor
____ Case Manager
____ Claims Manager
____ Someone else *(explain)* _____

Did your employer make any of the following arrangements permit you to return to work:

271) Arrange for reduced hours until able to work pre-injury hours

Yes No

272) Arrange a flexible work schedule

Yes No

273) Provide special training

Yes No

274) Modify the layout or equipment in the area where you work

Yes No

275) Offer light duties

Yes No

276) Other *(explain)*

_____

_____

_____

_____

_____

_____

When you think about how your employer responded to your work injury, how satisfied are you with the following?

	Very Satisfied	Somewhat satisfied	Unsure	Somewhat unsatisfied	Very Unsatisfied	Does Not Apply
277) Employer's efforts to communicate with you after your work injury	1	2	3	4	5	8
278) Changes made to your job	1	2	3	4	5	8
279) Employer's efforts to prevent reinjury	1	2	3	4	5	8
280) Worker's Comp insurer's handling of your claim	1	2	3	4	5	8

Compared to the job you were doing when your work injury occurred, how often do you have to do the following on your current jo

	Less than the Job Before Your Work Injury	The Same as the Job Before Your Work Injury	More than the Job Before Your Work Injury
281) Lift heavy objects	1	2	3
282) Push, pull, or pinch with a lot of force	1	2	3
283) Exert heavy physical effort	1	2	3
284) Work in a cold or refrigerated area less than 50° F	1	2	3
285) Twist your back while lifting	1	2	3
286) Sit for long periods without a chance to get up	1	2	3
287) Stand for long periods without a chance to sit down	1	2	3
288) Work with your arms raised	1	2	3
289) Work in an awkward position	1	2	3
290) Perform repetitive activities (for example, type, turn screws, assemble, pack cut) more than twice per minute	1	2	3
291) Use equipment that vibrates (for example, power tools)	1	2	3

282) Check which one below *best* describes how your work injury now affects your work status:

____ Because of my work injury, I've changed jobs.

____ Because of my work injury, I'm on light duty or alternate work.

____ I am unable to work because of my work injury.

____ I have been laid off or fired because of my work injury.

____ I have changed jobs since _____ (date), but this is not related to my work injury.

____ I am not working, but this is not related to my work injury.

____ No effect; I've been working at the same job since _____ (date).

283) Are you a member of a union? . . . . . Yes No

284) Have you consulted an attorney regarding your worker's compensation claim? . . . . . Yes No

285) Are you currently involved in litigation regarding your worker's compensation claim? . . . . . Yes No

Here are some questions about your current job. The questions are intended to apply to all work environments. However, some words may not be quite suitable for your work environment. For example, the term supervisor is meant to refer to the boss, manager, department head, or the person or persons to whom an employee reports. *For each question, please indicate how often these things happen.* If the question is Not Applicable due to the nature of your work situation, please check NA.)

Note: If you don't have a supervisor, please place a check here ____

286) Do you talk with fellow employees about your work problems?

Never Seldom Sometimes Fairly Often Often NA

287) Are your co-workers friendly toward you?

Never Seldom Sometimes Fairly Often Often NA

298) Does your supervisor criticize you over minor things

Never Seldom Sometimes Fairly Often Often

299) Do you have conflicts with your co-workers?

Never Seldom Sometimes Fairly Often Often

300) Do you have conflicts with your supervisor?

Never Seldom Sometimes Fairly Often Often

301) Do you get adequate recognition for your contributio work?

Never Seldom Sometimes Fairly Often Often

302) Is there constant pressure to keep working?

Never Seldom Sometimes Fairly Often Often

303) Are responsibilities at work clearly defined?

Never Seldom Sometimes Fairly Often Often

304) Is your work really challenging?

Never Seldom Sometimes Fairly Often Often

305) Does there seem to be a rush or urgency about everything?

Never Seldom Sometimes Fairly Often Often

306) Can you use your own initiative to do things?

Never Seldom Sometimes Fairly Often Often

307) Are there unpleasant physical conditions on your jo such as too much noise, dust etc.?

Never Seldom Sometimes Fairly Often Often

'11.

(Place a straight vertical line | through the appropriate area on the horizontal below each question)
You can use the entire range to best indicate your answer.

308) I am satisfied with the way my spouse / lover / friends / relatives talk things over with me and share problems with me.

Strongly agree ——————————————— Strongly disagree

309) I get along well with my spouse / lover / friends / relatives.

Strongly agree ——————————————— Strongly disagree

310) It is easy for me to talk with my spouse / lover / friends / relatives.

Strongly agree ——————————————— Strongly disagree

311) I can rely on my spouse / lover / friends / relatives when things get tough at work.

Strongly agree ——————————————— Strongly disagree

312) My spouse / lover / friends / relatives are willing to listen to my personal problems.

Strongly agree ——————————————— Strongly disagree

313) My spouse / lover / friends / relatives go out of their way to make my worklife easier.

Strongly agree ——————————————— Strongly disagree

VIII.

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number below each question that corresponds to your response indicating how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you *generally* feel. Please circle your answer.

314) I feel pleasant.

1 Almost Never 2 Sometimes 3 Often 4 Almost Always

315) I tire quickly.

1 Almost Never 2 Sometimes 3 Often 4 Almost Always

316) I feel like crying.

1 Almost Never 2 Sometimes 3 Often 4 Almost Always

317) I wish I could be as happy as others seem to be.

1 Almost Never 2 Sometimes 3 Often 4 Almost Always

318) I am losing out on things because I can't make up my mind soon enough.

1 Almost Never 2 Sometimes 3 Often 4 Almost Always

319) I feel rested.

1 Almost Never 2 Sometimes 3 Often 4 Almost Always

320) I am "calm, cool, and collected."

1 Almost Never 2 Sometimes 3 Often 4 Almost Always

321) I feel that difficulties are piling up so that I cannot overcome them.

1 Almost Never 2 Sometimes 3 Often 4 Almost Always

322) I worry too much over something that really doesn't matter.

1 Almost Never 2 Sometimes 3 Often 4 Almost Always

323) I am happy.

1 Almost Never 2 Sometimes 3 Often 4 Almost Alw

324) I am inclined to take things hard.

1 Almost Never 2 Sometimes 3 Often 4 Almost Alw

325) I lack self-confidence.

1 Almost Never 2 Sometimes 3 Often 4 Almost Alw

326) I feel secure.

1 Almost Never 2 Sometimes 3 Often 4 Almost Alw

327) I try to avoid facing a crisis or difficulty.

1 Almost Never 2 Sometimes 3 Often 4 Almost Alw

328) I feel blue.

1 Almost Never 2 Sometimes 3 Often 4 Almost Alw

329) I am content.

1 Almost Never 2 Sometimes 3 Often 4 Almost Alway

330) Some unimportant thought runs through my mind and bothers me.

1 Almost Never 2 Sometimes 3 Often 4 Almost Alway

331) I take disappointments so keenly that I can't put them out of my mind.

1 Almost Never 2 Sometimes 3 Often 4 Almost Alway

332) I am a steady person.

1 Almost Never 2 Sometimes 3 Often 4 Almost Alway

333) I get in a state of tension or turmoil as I think over my recent concerns and interests.

1 Almost Never 2 Sometimes 3 Often 4 Almost Alway

(Place a straight vertical line | through the appropriate area on the horizontal below each question)
You can use the entire range to best indicate your answer.

334)Since your current carpal tunnel syndrome problem began, how successful have you been in coping with stressful situations in your life (for example, finances, spouse conflicts, childrens' behavior)?

Not at all Successful ——— Extremely Successful

At work: How frequently do you experience each of the following thoughts:

335) " I must keep working this way despite my discomfort or the quality of my work will suffer."

Never ——— Very Frequently

336) " I can't take off from work because this place would fall apart without me."

Never ——— Very Frequently

337) " I can't take off from work because I'd be letting down or burdening my co-workers."

Never ——— Very Frequently

338) " I can't take off from work because I'd be letting down or burdening my boss."

Never ——— Very Frequently

339) " I can't take off from work because I need to keep my nose to the grindstone and work as much as I can to keep paychecks coming"

Never ——— Very Frequently

340) " I can't take off from work because it will negatively affect my evaluations, promotion, and job security."

Never ——— Very Frequently

341) " I can't take off from work because other people at work will think less of me."

Never ——— Very Frequently

342) Do you believe that your work makes your carpal tunnel syndrome problem worse? (circle one)..... Yes No

343) Did you have many stresses in your life before your current carpal tunnel syndrome problem began.....Yes No
(circle one)

344) Did you experience physical symptoms (problems) *most of the time* before your current carpal tunnel syndrome problem began? (circle one).....Yes No

(Place a straight vertical line | through the appropriate area on the horizontal below each question)
You can use the entire range to best indicate your answer.

345) At work: How frequently do you find yourself concerned about planning efficiently and finding useful, effective solutions to problems?

Never |——————————————————————| Very Frequently

346) At work: How frequently do you find yourself maintaining a feeling of calm emotional composure and self-control

Never |——————————————————————| Very Frequently

347) At work: How frequently do you focus on the positive aspects of situations?

Never |——————————————————————| Very Frequently

THANK YOU very much for completing this questionnaire.

HEALTH STATUS FOLLOW-UP

ID #: _____

Date: _____ Follow-Up #: 1 2 3 4 5 6 (circle one)

I. _____

1) Please check one job type that best describes the kind of work you are currently doing.

✓	Job Type	Examples
	Professional or Technical	lawyer, scientist, health professional, teacher, artist
	Farmer and Farm Manager	
	Manager and Administrator	bank officer, office manager, inspector
	Sales Worker	insurance or real estate agent, sales clerk
	Clerical Worker	bank teller, receptionist, word processor
	Craftsman	carpenter, electrician, machinist, mechanic
	Transport Equipment Operator	cab, truck, or bus driver; conductor
	Machine Operator	assembler, machine or textile operative
	Service Worker	janitor, cook, waitress/waiter, nursing aide, police
	Private Household Worker	private cook, maid, child care worker

2) How long have you held your current job? _____ years _____ months

3) Is your job. . . (circle one)

part-time *(20 hours per week or fewer)* full-time *(more than 20 hours per week)*

4) During the past month , have you had any pain or discomfort that you believe to be related to your work?

Yes No

➪(If NO, skip to # 6)

5) Has this problem been interfering with your ability to do your job?

Yes No

6) Have you been maintaining your regular work schedule and number of hours?

Yes No

7) If Yes, has your work decreased to "limited," alternate, or "light duty" status?

Yes No

8) Have you missed work due to this problem?

Yes No

9) If Yes, how much work did you miss in the last month due to this problem: _____ days _____ weeks

10) Have you not been able to work at all due to work-related injury?

Yes No

11) Check which one below *best* describes how your work injury now affects your work status:

____Because of my work injury, I've changed jobs.

____Because of my work injury, I'm on light duty or alternate work.

____I am unable to work because of my work injury.

____I have been laid off or fired because of my work injury.

____I have changed jobs since _____(date), but this is not related to my work injury.

____I am not working, but this is not related to my work injury.

____No effect; I've been working at the same job since _____(date).

II.

The following questions refer to your symptoms for a *typical twenty-four-hour period* during the past two weeks (circle one answer f each question).

12) How severe is the hand or wrist pain that you have at night?

1 I do not have hand or wrist pain at night.
2 Mild pain
3 Moderate pain
4 Severe pain
5 Very severe pain

13) How often did hand or wrist pain wake you up during a typical night in the past two weeks?

1 Never
2 Once
3 Two or three times
4 Four or five times
5 More than five times

14) Do you typically have pain in your hand or wrist during the daytime?

1 I never have pain during the day
2 I have mild pain during the day
3 I have moderate pain during the day
4 I have severe pain during the day
5 I have very severe pain during the day

15) How often do you have hand or wrist pain during the daytime?

1 Never
2 Once or twice a day
3 Three to five times a day
4 More than five times day

16) How long, on average, does an episode of pain last during the day time?

1 I never get pain during the day
2 Less than 10 minutes
3 10 to 60 minutes
4 Greater than 60 minutes
5 The pain is constant throughout the day

17) Do you have numbness (loss of sensation) in your hand?

1 No
2 I have mild numbness
3 I have moderate numbness
4 I have severe numbness
5 I have very severe numbness

18) Do you have weakness in your hand or wrist?

1 No weakness
2 Mild weakness
3 Moderate weakness
4 Severe weakness
5 Very severe weakness

19) Do you have tingling sensations in your hand?

1 No tingling
2 Mild tingling
3 Moderate tingling
4 Severe tingling
5 Very severe tingling

20) How severe is numbness (loss of sensation) or tingling at night?

1 I have no numbness or tingling at night
2 Mild
3 Moderate
4 Severe
5 Very severe

21) How often did hand numbness or tingling wake you up during a typical night during the past two weeks?

1 Never
2 Once
3 Two or three times
4 Four or five times
5 More than five times

22) Do you have difficulty with grasping and use of small objects such as keys or pens?

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Very severe difficulty

23) Please rate the severity of your pain during the past week.

(Place a straight vertical line | through the appropriate area on the horizontal line below.)
You can use the entire range to best indicate your answer.

No pain |——————————————————————————| Severe pain

24) Please check all of the following therapies that you have had for any type of pain or other problem in your hands, wrists, arms shoulders, or neck:

MEDICAL:

___ Nonsteroidal anti inflammatory drugs (i.e., Ibuprofen, Naproxen, Naprosyn)
___ Oral steroids
___ Local steroid injections
___ Antidepressants
___ Surgery (indicate type and problem)
type _____
___ Other (specify) _____ problem _____

PHYSICAL THERAPY:

___ Splinting
___ Muscle re-education
___ Transcutaneous nerve stimulation
___ Ultrasound
___ Traction
___ Collar
___ Other (specify)_____

PSYCHOLOGICAL:

___ Stress Management
___ Pain Management
___ Psychotherapy
___ Hypnotherapy
___ Biofeedback
___ Other (specify) _____

25) Think about all the examinations, treatments, and therapy you've had for your work injury. How much pain or discomfort have had from these examinations, treatments, or therapy?

____ None
____ Slight pain or discomfort
____ Average pain or discomfort
____ Severe pain or discomfort

III.

On a *typical day* during the past two weeks, have hand and wrist symptoms caused you to have any difficulty doing the activities listed below? Please circle one number that *best* describes your ability to do the activity.

26) Writing

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

27) Buttoning of clothes

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

28) Holding a book while reading

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

29) Gripping of a telephone handle

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

30) Opening of jars

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

31) Household chores

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

32) Carrying of grocery bags

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

33) Bathing and dressing

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

34) Typing / keyboarding / word-processing

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

35) Lifting a heavy box

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

36) Reaching overhead

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

37) Using a hammer or screwdriver

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

38) Hobbies

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot Do at all due to Hand or Wrist Symptoms

39) Performing your job

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

40) Brushing your teeth

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

41) Picking up a coin or other small object in your fingers

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

42) Sleeping

1 No difficulty
2 Mild difficulty
3 Moderate difficulty
4 Severe difficulty
5 Cannot do at all due to hand or wrist symptoms

43) In general, would you say your health is (circle one):

Excellent Very Good Good Fair Poor

44) *Compared to one year ago*, how would you rate your health in general *now (circle one)*?

a) Much better than one year ago
b) Somewhat better than one year ago
c) About the same as one year ago
d) Somewhat worse now than one year ago
e) Much worse than one year ago

The following items relate to activities you might do during a typical day. Does *your health limit you* in these activities?
(Circle your response for each question)

45) *Vigorous activities*, such as running, lifting heavy objects participating in strenuous sports

Yes, limited a lot Yes, limited a little No, Not limited at a

46) *Moderate activities*, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf

Yes, limited a lot Yes, limited a little No, Not limited at a

47) Lifting or carrying groceries

Yes, limited a lot Yes, limited a little No, Not limited at a

48) Climbing *several* flights of stairs

Yes, limited a lot Yes, limited a little No, Not limited at a

49) Climbing *one* flight of stairs

Yes, limited a lot Yes, limited a little No, Not limited at a

50) Bending, kneeling, or stooping

Yes, limited a lot Yes, limited a little No, Not limited at a

51) Walking more than a mile

Yes, limited a lot Yes, limited a little No, Not limited at a

52) Walking *several* blocks

Yes, limited a lot Yes, limited a little No, Not limited at

53) Walking *one block*

Yes, limited a lot Yes, limited a little No, Not limited at

54) Bathing or dressing yourself

Yes, limited a lot Yes, limited a little No, Not limited at

During the *past 4 weeks*, have you had any of the following problems with your work or other regular daily activities *as a result of* y *physical health?* (Circle Yes or No for each item)

55) Cut down the amount of time you spent on work or other activities ..... Yes No

56) *Accomplished* less than you would like ..... Yes No

57) Were limited in the *kind* of work or other activities ..... Yes No

58) Had *difficulty* performing the work or other activities (for example, it took extra effort) ..... Yes No

During the *past 4 weeks*, have you had any of the following problems with your work or other regular daily activities *as a result of a emotional problems* (such as feeling depressed or anxious)?

59) Cut down the *amount of time* you spent on work or other activities ..... Yes No

60) *Accomplished less* than you would like ..... Yes No

61) Didn't do work or other activities as *carefully* as usual ..... Yes No

62) During the *past 4 weeks*, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

Not at all | A little bit | Moderately | Quite a bit | Extremely

63) How much *bodily* pain have you had during the *past 4 weeks*?

None | Very mild | Mild | Moderate | Severe | Very Sever

64) During the *past 4 weeks*, how much did *pain* interfere with your normal work (including both work outside the home and housework)?

Not at all | A little bit | Moderately | Quite a bit | Extremely

These questions are about how you feel and how things have been with you *during the past 4 weeks*. For each question, please (circle) the one answer that comes closest to the way you have been feeling. How much of the time during the *past 4 weeks*:

65) Did you feel full of pep?

5=All of the time
4=Most of the time
3=A good bit of the time
2=Some of the time
1=A little of the time
0=None of the time

66) Have you been a very nervous person?

5=All of the time
4=Most of the time
3=A good bit of the time
2=Some of the time
1=A little of the time
0=None of the time

67) Have you felt so down in the dumps that nothing could cheer you up?

5 All of the time
4 Most of the time
3 A good bit of the time
2 Some of the time
1 A little of the time
0 None of the time

68) Have you felt calm and peaceful?

5 All of the time
4 Most of the time
3 A good bit of the time
2 Some of the time
1 A little of the time
0 None of the time

69) Did you have a lot of energy?

5 All of the time
4 Most of the time
3 A good bit of the time
2 Some of the time
1 A little of the time
0 None of the time

70) Have you felt downhearted and blue?

5 All of the time
4 Most of the time
3 A good bit of the time
2 Some of the time
1 A little of the time
0 None of the time

71) Did you feel worn out?

5 All of the time
4 Most of the time
3 A good bit of the time
2 Some of the time
1 A little of the time
0 None of the time

72) Have you been a happy person?

5 All of the time
4 Most of the time
3 A good bit of the time
2 Some of the time
1 A little of the time
0 None of the time

73) Did you feel tired?

5 All of the time
4 Most of the time
3 A good bit of the time
2 Some of the time
1 A little of the time
0 None of the time

74) During the *past 4 weeks*, how much of the time has you *physical health or emotional problems* interfered with yo social activities (like visiting with friends, relatives, etc.)'

All of the time	Most of the time	Some of the time	A little of the time	None

How TRUE or FALSE is *each* of the following statements for you? *(Circle your response)*

75) I seem to get sick a little easier than other people

Definitely true	Mostly true	Don't know	Mostly false	Definit false

76) I am as healthy as anybody I know

Definitely true	Mostly true	Don't know	Mostly false	Definit false

77) I expect my health to get worse

Definitely true	Mostly true	Don't know	Mostly false	Definit false

78) My health is excellent

Definitely true	Mostly true	Don't know	Mostly false	Definit false

IV. Your Mood :

A number of statements which people have used to describe themselves are given below. Read each statement and then circle appropriate number below each question that corresponds to your response indicating how you *generally* feel. There are no ri wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you *gen* feel. Please circle your answer.

78) I feel pleasant.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Always

79) I tire quickly.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Always

81) I feel like crying.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Always

82) I wish I could be as happy as others seem to be.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Always

83) I am losing out on things because I can't make up my mind soon enough.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Always

84) I feel rested.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Always

85) I am "calm, cool, and collected."

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Always

86) I feel that difficulties are piling up so that I cannot overcome them.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Always

87) I worry too much over something that really doesn't matter.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Always

88) I am happy.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Al

89) I am inclined to take things hard.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Al

90) I lack self-confidence.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Al

91) I feel secure.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Al

92) I try to avoid facing a crisis or difficulty.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Al

93) I feel blue.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Al

94) I am content.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Al

95) Some unimportant thought runs through my mind an bothers me.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Al

96) I take disappointments so keenly that I can't put the of my mind.

1 Almost Never | 2 Sometimes | 3 Often | 4 Almost Al

97) I am a steady person.

1	2	3	4
Almost Never	Sometimes	Often	Almost Always

98) I get in a state of tension or turmoil as I think over my recent concerns and interests.

1	2	3	4
Almost Never	Sometimes	Often	Almost Always

99) Rate the degree of physical exertion or effort you believe is associated with a typical day at work.

0 Nothing at all
0.5 Very, very easy
1 Very easy
2 Easy
3 Moderately hard
4 Somewhat hard
5 Hard
6
7 Very hard
8
9
10 Very, very hard

100) Rate the degree of physical exertion or effort you believe is associated with a highly demanding day at work.

0 Nothing at all
0.5 Very, very easy
1 Very easy
2 Easy
3 Moderately hard
4 Somewhat hard
5 Hard
6
7 Very hard
8
9
10 Very, very hard

THANK YOU very much for completing this questionnaire. Please return this form as soon as possible in the self addressed stamped envelope provided to you. If you have misplaced the envelope, please mail the completed form to: Dr. Michael Feuerstein, USUHS, MPS, 4301 Jones Bridge Rd., Bethesda, MD 20814.

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