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## Ergonomics and the public manager: Modeling a successful program

Ellen Anderson

*University of Nevada, Las Vegas*

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Ergonomics and the Public Manager: Modeling a Successful Program

by

Ellen Anderson

Masters of Public Administration

Department of Public Administration

University of Nevada, Las Vegas

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## INTRODUCTION

A registered nurse named Beth Picknick worked in the Intensive Care Unit of a hospital. She helped move patients from their beds to chairs and back. Twisting and bending had been

normal physical activities of her job throughout her professional career. She had never experienced any type of back problem. One day she moved a patient and severely injured her back. Two years after the incident doctors performed spinal fusion surgery. Beth's ergonomic-related injury ended her career as a nurse and greatly limited her family activities (www.osha.gov/pls/oshaweb/owadisp.show\_document?p\_table=TESTIMONIES&P\_ID=184).

Unfortunately for Beth and thousands of other employees, ergonomic injuries have become prevalent in the workplace. These injuries can have serious, long-lasting effects on the employees' work and personal lives. According to a 1999 news release from the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), every year 1.8 million U.S. workers experience work-related musculoskeletal disorders, such as injuries from overexertion or repetitive motion. Approximately one-third or 600,000 of those injured required time off of work. Beth's story is only one example of the many thousands of employees requiring time off of work to recover from musculoskeletal injuries.

These injuries affect the workforce but they also affect the finances of an organization. Each year employers pay a large amount of money toward workers compensation expenses. In fact, one-third of those payments are directly associated to work-related musculoskeletal disorders.

(http://www.osha.gov/pls/oshaweb/owadisp.show-document?p\_table=NEWS\_RELEASES&). In actual dollars, these musculoskeletal injuries and illnesses cost employers \$15 to \$20 billion every year in workers' compensation payments. With the addition of indirect costs, the total payments made by employers actually add up to \$60 billion (www.osha.gov/pls/oshaweb/owadisp.show\_document?p\_table=SPEECHES&p\_id=242).

Ergonomic injuries have greatly impacted organizations as well as seriously affected its employees. Organizations have felt the stress in their budgets through sick time used, medical

costs incurred and disability payments paid. Employees have experienced the impact through 38  
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temporary pain, surgeries and irreparable disabilities. What is the solution?

“For years, many employers have known that good ergonomics is often good economics and those employers have not only saved their workers from injury and potential misery, but they have saved millions of dollars in the process”

([www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=TESTIMONIES&P\\_ID=184](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=TESTIMONIES&P_ID=184)).

This exploratory research paper will investigate what comprises “good ergonomics.” The paper will focus on localized governmental commitments to addressing ergonomics injuries in the workplace. Information will be gathered about the utilization of ergonomics programs and use of performance measurements. The information gathered for this paper will identify cities of similar size in the Southwestern region of the United States. The data will also include effective ergonomics program elements and compare those to the elements utilized in the cities’ programs.

The data gathered for this research paper will be used to answer the following questions:

1. Are municipalities of a particular size implementing ergonomic programs?
2. What elements encompass an effective program?
3. Do the cities include these elements in their programs?
4. If one of these elements is program evaluation, are performance measures being used to evaluate the program?

What is ergonomics? The term is being used more frequently in the workplace than in the past. But do employees and employers really understand what it is? Do they realize what is involved in addressing this important issue?

The word ergonomics stems from two Greek words, ergon and nomi. “Ergon” means work and “Nomi” means natural laws. Ergonomics deals with human beings’ abilities and work requirements (Pleasant, 1996). Ergonomics involves scientifically fitting the job to the worker. When this is accomplished, workers’ productivity will

Addressing ergonomics in organizations will help prevent workplace injuries and illnesses that develop when human capabilities are not considered in relation to physical job requirements, equipment used to perform the jobs or the physical setting for performing the jobs (Kohn, 1999).

The U.S. Department of Labor, Occupational Safety & Health Administration (OSHA), adopted a definition for ergonomic-related injuries. OSHA labeled ergonomic-related injuries under the single title of “musculoskeletal disorders” or “MSDs”

([www.osha.gov/ergonomics/FAQs-external.html](http://www.osha.gov/ergonomics/FAQs-external.html)). In the Federal Register OSHA describes an MSD incident. The description is:

“In this standard, the term “MSD incident” means either an MSD that is work-related and:

Involves a work restriction, or

Requires medical treatment beyond first aid, or

Involves MSD signs or symptoms that are work-related and persistent for 7 or more consecutive days after the employee reports them to the employer.”

([http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=\\_register&docid=page=6...](http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=_register&docid=page=6...))

The Department of Labor defines a musculoskeletal disorder as:

“a disorder of the soft tissues, specifically of the muscles, nerves, tendons, ligaments, joints, cartilage, blood vessels and spinal discs that is not caused by a slip, trip, fall, or motor vehicle accident.”

Although OSHA only gave a single definition for a musculoskeletal disorder, different names have been utilized to describe MSDs. For example, in Kohn’s book Ergonomic Process Management (1999) he explained common ergonomic-related injuries as well as various terms associated with them. The terms included: Cumulative

One of the largest injury categories included in MSDs is back injuries. According to Kohn (1999) back injuries account for one-third of the ergonomic-related job injuries. He stated that back injuries cost on the average \$9,000 in workers' compensation and medical expenses. The annual cost totals \$80 billion to the U.S. economy and industry. Kohn (1999) stated that the National Institute for Occupational Safety and Health (NIOSH) estimated the average carpal tunnel costs to be \$3,000 in benefits. The medical costs average \$40,000 and an average carpal tunnel surgery can total \$18,000.

A review of who is actually being injured reveals women disproportionately become victims to the most serious MSDs. The reason is not because of weakness but rather that many women's jobs require using repetitive motion, awkward positioning and the lifting of heavy objects. Women comprise 70% of all carpal tunnel victims and 62% of all tendinitis victims that require time off of work. On a yearly basis, more than 100,000 women injure their backs and require time off of work  
([http://www.osha.gov/pls/oshaweb/owadisp.show-document?p\\_table=NEWS\\_RELEASES&](http://www.osha.gov/pls/oshaweb/owadisp.show-document?p_table=NEWS_RELEASES&)).

The importance of addressing the issue of ergonomics in the workplace should be taken very seriously. Employers and employees pay a high price for these injuries. Employers realize the expense through their budgets and employees experience the expense through their suffering. Instituting an effective ergonomics program within an organization will help prevent injuries as well as address the employees already injured from musculoskeletal disorders.



## **LITERATURE REVIEW**

The introduction to this research paper informed the reader about the large numbers of ergonomic-related injuries and shared statistics about the tremendous expense for employers. This next section of the research paper will discuss the history of the ergonomic standard, the development of current ergonomics guidelines and effective ergonomic strategies.

### History of the Ergonomics Standard

The evolution and adoption of a national ergonomics standard took ten years to develop and yet only a couple of months to rescind. In August 1990, Secretary of Labor, Elizabeth Dole committed the Labor Department to “taking the most effective steps necessary to address the problem of ergonomic hazards on an industry wide-basis” and commenced to work on an ergonomics standard. Secretary Dole believed there was enough scientific evidence to go forward and address “one of the nation’s most debilitating across-the-board workers’ safety and health illnesses of the 1990’s” ([www.aflcio.org](http://www.aflcio.org)).

In December of 1995, the Bureau of Labor Statistics (BLS) released a 1994 annual survey on injuries and illnesses. The survey identified the number and rate of disorders that were connected to repeated trauma and showed a continual increase in these disorders. Although injuries had decreased from 1992 to 1994, ergonomic injuries were increasing. The Bureau of Labor Statistics (1995) reported that ergonomic incidents had increased by more than 15% during the two-year time frame ([www.bls.gov](http://www.bls.gov)). With the Bureau of Labor Statistics data, it was obvious as to “why ergonomics was called the occupational injury/illness epidemic of the 1990’s” (Kohn, 1997).

This “epidemic” was supported by data recorded in the Federal Register of November 23, 1999 under OSHA’s submitted proposal of an ergonomics rule. Included in the proposal was various statistics that related to the potential number of workers affected, jobs corrected, financial expenses and financial savings for employers. The data indicated that the ergonomics standard would affect 1.9 million workers and 27.3 million general industry workplace employees. OSHA projected that after the first year 7.7 million jobs that were or could be potential MSDs hazards would be addressed. Over the next decade, the proposed standard would prevent 3 million work-related musculoskeletal injuries. The projected savings would total a staggering \$9.1 billion. The estimated cost for each organization to comply was estimated at \$900 per year. The dollars

([http://www.nacubo.org/public\\_policy/federal\\_register\\_update/1999/112399.html](http://www.nacubo.org/public_policy/federal_register_update/1999/112399.html)).

In November 1999 OSHA released a proposed ergonomics standard and held public hearings in February, March and April of 2000. During the April 2000 public hearing the Bureau of Labor Statistics (BLS) released results of the 1998 Lost Work-Time Injuries and Illnesses: Characteristics and Resulting Time Away From Work Report. It showed that there were 1,730,534 reported injuries and illnesses. Of that total 592,544 or 34% were attributed to musculoskeletal disorders. This study validated that musculoskeletal disorders accounted for one-third of the work time lost due to injury and illness. The Lost Work-Time reports from the BLS for 1999, 2000 and 2001 also reflected strong evidence that musculoskeletal disorders reported after 1998 to the Bureau of Labor continued as the dominant category under reported injuries and illnesses (www.bls.gov).

Bureau of Labor Statistics

Total number of nonfatal occupational injuries and illnesses involving days away from work and the number of those involving musculoskeletal disorders (MSDs).

Year Reported	1998	1999	2000	2001
Total incidents	1,730,534	1,702,470	1,664,018	1,537,567
Total MSDs	592,544	582,340	577,814	522,528
MSDs % of total	34%	34%	35%	34

The 2002 data was not included because the BLS has not yet published it.

During the April 2000 hearing, Charles N. Jeffress, Assistant Secretary for Occupational Safety and Health spoke of the widespread occupational health problem of work-related

musculoskeletal disorders. He stated that every year almost two million employees are victims of occupational injury and illness and approximately 600,000 injuries are work-related

musculoskeletal disorders. He also shared financial consequences. One dollar out of every three dollars spent on workers' compensation can be related back to insufficient ergonomic conditions.

Mr. Jeffress said 15 to 20 billion per year was the direct cost attributed to MSDs.

([http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=TESTIMONIES&p\\_id...](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=TESTIMONIES&p_id...))

After the April 2000 hearing, OSHA published a news release that stated ergonomic programs operated by state OSHA programs could include as many as 8.7 million employees at the state level and 155,000 sites at the local governmental level. A total of these public sector workers could account for 175,000 musculoskeletal disorders per year. Instituting an ergonomics program could prevent as many as 47,000 injuries per year

([http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=NEWS\\_RELEASE&](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=NEWS_RELEASE&)).

OSHA continued to gather information to support the need for an ergonomics standard. In the November 14, 2000 Federal Register under the Ergonomics Program, Final Rule, it stated that there was scientific evidence to support OSHA's efforts to protect workers with an ergonomics standard.

“This evidence strongly supports two basic conclusions: (1) There is a positive relationship between work-related musculoskeletal disorders and employee exposure to workplace risk factors, and (2) ergonomics programs and specific ergonomic interventions can substantially reduce the number and severity of these injuries”(www.archives.gov/federal\_register).

With a lot of supportive data available, President Clinton supported an ergonomics rule and signed it into law on November 14, 2000. OSHA was able to issue the final ergonomics standard and then published the ergonomics implementation rule to be effective January 16, 2001. The ergonomics rule required companies to implement an ergonomics program if it met the

([www.osha.gov/archive/ergonomics-standard/archive.html](http://www.osha.gov/archive/ergonomics-standard/archive.html)).

After the passage of the ergonomics rule, many employers were concerned about the cost of implementing an ergonomics program. According to the National Center for Policy Analysis article "Costly Ergonomics Rule is Near"(November 2000), the ergonomics rule would become the most expensive workplace regulation in history. In the article it was stated that because of the "zero tolerance" rule, one complaint from an employee would require enforcement by the employer. The article also included estimates for implementing some new ergonomics programs.

Those estimates were:

- "The Employment Policy Foundation (EPF) estimated the first year compliance costs at \$129.5 billion and continuing costs equivalent to \$91.4 billion.
- Based on OSHA's estimate of benefit per case averted, the EPF estimated costs will exceed benefits by a factor of 15 to 1.
- The costs could cut corporate earnings per share by 5% and stifle incentives for new business starts."  
([www.ncpa.org/pd/regulat/pd092200e.html](http://www.ncpa.org/pd/regulat/pd092200e.html))

In January 2001, President Clinton completed his four-year term as president and George W. Bush, Jr. became the new president of the United States. On March 7, 2001, the Senate repealed the ergonomics rule through a "Resolution of Disapproval" under the Congressional Review Act (CRA). Under this law, Congress had the authority to overturn issued rules. With the passing of the resolution to disapprove, the ergonomics rule could not be amended. No other ergonomics standard could be resubmitted for approval. On March 20, 2001, President Bush signed Resolution 6. That action reduced the ergonomics standard to guidelines ([www.govexec.com/dailyfed/o301/030801cdam](http://www.govexec.com/dailyfed/o301/030801cdam)).

### Development of Current Ergonomics Guidelines

Although President Bush signed Resolution 6, he made a promise to find an answer to ergonomic-related injuries that affect the U.S. workforce

([www.govexec.com/dailyfed/o301/030801cdam](http://www.govexec.com/dailyfed/o301/030801cdam)). In keeping with his promise, action was taken one year later. On April 5, 2002, OSHA announced a Comprehensive Ergonomics Plan to

address musculoskeletal disorders in the workplace. After three public hearings with three-hundred-sixty-eight written comments and one hundred speakers, a strategy and comprehensive plan was developed. The four components for OSHA's approach included: guidelines, enforcement, outreach and assistance and research. Guidelines included industry or job task guidelines for numerous industries. Compliance-covered inspections for ergonomic hazards and the issuance of citations qualifying under the General Duty Clause which requires employers to keep a safe working environment for their employees. Outreach and Assistance involved proactive approaches to ergonomic issues in workplaces. Research involved working with the National Institute for Occupational Safety and Health (NIOSH) and the National Occupational Research to encourage and expand research in the area of ergonomics ([www.osha.gov/SLTC/ergonomics/guidelines](http://www.osha.gov/SLTC/ergonomics/guidelines)).

In a news release dated April 30, 2002, OSHA announced the formation of a National Advisory Committee on Ergonomics (NACE). The committee was created as part of OSHA's comprehensive approach to help reduce ergonomic-related illness in the workplace by addressing guidelines, research, outreach and assistance and enforcement. John L. Henshaw, Assistant Secretary of Labor of Occupational Safety and Health, said that OSHA will work with other governmental agencies such as the National Institute for Occupational Safety and Health (NIOSH) to help acquire additional research that would help reduce ergonomic-related injuries.

([www.osha.gov/SLTC/ergonomics/guidelines](http://www.osha.gov/SLTC/ergonomics/guidelines)). Previous to this announcement NIOSH had already concluded through a research project in 1997 that there was a strong association between work and MSDs.

([http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=SPEECHES&p\\_id=235](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=SPEECHES&p_id=235)).

### Effective Ergonomic Strategies

- Management leadership and employee participation
- Training
- Hazard information and reporting
- Job hazard analysis
- Job hazard control
- MSD management
- Program evaluation

([www.archives.gov/federal\\_register/](http://www.archives.gov/federal_register/))

The above strategies were utilized when the ergonomics standard was signed into law.

What is included in each element? Management leadership and employee participation are vital components of any program. Management leadership involves the leaders of any organization who lead by example. Written policies from management give employees guidance about the priorities of their organization and its goals. The written policy should include information about employee participation and each person’s role and responsibilities. Training

Awareness of ergonomic issues and recognition of musculoskeletal disorders should definitely be taught to all employees. Hazard information and reporting is of high importance. It involves communicating about musculoskeletal injury hazards and having a reporting procedure in place. Job hazard analysis covers guidelines evaluating job risk factors. Hazard control involves developing solutions to limit as well as eliminate job hazard exposure risks. MSD management covers the availability of health care providers that are trained to recognize and treat MSD injuries. The final item OSHA recommended for inclusion in setting up an ergonomics program is the program evaluation. Program evaluations are necessary components for a review of the various aspects of a particular program and include performance measurements for assessing program success ([www.ergodyne.com/new/EI-ErgoProg](http://www.ergodyne.com/new/EI-ErgoProg)). All seven of the elements that OSHA submitted as part of its ergonomics standard should be included in any ergonomics program. Each element has a specific purpose and serves to support the overall ergonomics program.

As OSHA battled to get its ergonomics standard into law, two of the twenty-six states with OSHA approved programs were successful in adopting ergonomics standards. California adopted its ergonomics standard on November 14, 1996 and Washington adopted its ergonomics standard on May 26, 2000 ([http://www.osha-slc.gov/SLTC/ergonomics/state\\_plan.html](http://www.osha-slc.gov/SLTC/ergonomics/state_plan.html)).



## **RESEARCH METHODOLOGY**

The purpose of this paper was to identify (1) whether municipalities of a particular size implement ergonomic programs, (2) what elements encompass an effective program, (3) if the cities include these elements in their programs, and (4) if one of these elements is program evaluation, are performance measures being used to evaluate the program. To set a framework for what I wanted to study, I wanted to research the cities that are the approximate size of Las Vegas, Nevada, which is where I am currently employed. I also decided to limit my research to the southwest United States. The first step involved the development of a list of the cities with a population above 400,000 in the United States. ([www.demographia.com/db-2000city50kr](http://www.demographia.com/db-2000city50kr)). Then cities in the Southwestern region were selected as a subset of the population. Twenty cities (See Appendix A for the list of the cities) were initially contacted through a semi-structured phone survey from January 26 -30, 2004. When contact was made a challenge arose in trying to connect with the appropriate person that had information about the city's ergonomics program. After contacting the appropriate person by phone, the following two questions were asked:

1. Does your City have an ergonomics program? If yes, please give details.
2. If no, what is used?

Upon completion of contacting the twenty cities the next step was to eliminate any cities without an ergonomic program. Those cities included Dallas, Las Vegas, San Antonio and San Francisco. Cities using consultants for their programs were also excluded and they were Denver, Long Beach

and Seattle. After reviewing the information, the total number of remaining cities was thirteen. 38  
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(See Appendix B for a list of the thirteen cities that participated in the email survey).

Phone calls were made on March 1 and 2, 2004 to each representative of the thirteen cities to explain their city would be included in the paper. During the phone conversation, each representative agreed to participate in completing the email survey. They were told to expect an email survey within one week. All email addresses were verified and the survey was sent to the thirteen cities on March 4, 2004. Six completed surveys were returned by March 12, 2004. Follow up phone calls were made on March 15, 2004 to the cities that had not yet responded. On March 16, 2004, El Paso and Fort Worth completed the survey by answering the questions by telephone. The remaining five cities returned the completed surveys by email. The thirteenth survey was received on March 18, 2004. The response rate was 100%. Data collection and analysis of the survey responses were performed by the researcher.

During the initial phone conversation with the representatives, they were asked their preference to a phone survey or an email survey. All responded that they preferred an email survey. The response rate reflects the fact that the format of an email survey was the easiest format for the City representatives to respond. El Paso and Fort Worth City representatives answered the survey question by phone only because their email responses were not received by the researcher. There appeared to be technical computer problems.

While conducting the literature review, the researcher found elements that were components of an effective ergonomics program. Those elements were used in the development of the survey questions (See Appendix C for a list of the survey questions). The survey included twelve questions. Eight of the questions were closed-ended questions and the remaining four questions were open-ended questions without explicit response choices.

The limitations of the research involve the population size and limits of the number of cities surveyed. The survey was limited to cities with populations more than 400,000. Also,

## FINDINGS

This section of the paper will include analysis of the information acquired from the survey of thirteen cities. Although all cities indicated they each had an ergonomics program there were definite differences in the programs that were evidenced from the responses of the survey questions. This section of the paper is divided into six sections. Those sections are written policy, organization commitment, training, record keeping, performance measurements and years ergonomics programs existed.

### Written Policy

For any type of program in an organization, a written policy should be developed by management and distributed to all employees. Written policies explain the purpose of a particular program and how the purpose will be accomplished. If a program is implemented without a written policy then there is no roadmap to determine purpose or accomplishment. One of the survey questions asked if the organizations have a written policy in place for procedures in addressing ergonomics issues? A review of Table 1 shows that approximately one-third or 38% of the cities surveyed have written policies. The five cities in the “written policy” category are located in three states, California, New Mexico and Texas. A review of these states showed three of the five California cities in this research have a written policy, the one New Mexico city and one of the four Texas cities in this research responded they have a written policy. Because of the limited number of cities in this research, no specific comparison was made. California did exceed the other states with three of five or 60% of the cities in the research had written policies. The high response is attributed to the existence of a state ergonomics standard program in California. With such a small sampling of the cities in California this generalization could not be made for all cities in California.

Written Policy?	Yes	No
Number of cities	5	8
%	38%	62%

The table also reflects that two-thirds or 62% of the cities do not have a written policy. A review of the eight cities without a written policy showed that three of the cities were from Texas, two from California, two from Arizona and one from Oregon. Because there are limited numbers of cities in the research no specific findings can be validated with a comparison of the states. It is important to note that there is a definite need to develop a written policy at the eight cities that do not have one in place. An effective ergonomics process system should include a policy statement (Kohn,1999).

### Organization Commitment

It is management's responsibility to give full commitment to support all activities of the organization. A written policy is one method of support to those that work within the organizations. When surveyed about the support given from the organization for the ergonomics programs responses varied. The information in Table 2 shows that almost half or 46% of the support came from within departments, over one-third or 38% indicated support was given through management and a few cities indicated there was no support.

Table 2 Organization Support

Organization Support	From Management	From Department	No Support
Number of cities	5	6	2
%	38%	46%	15%

According to Kohn (1999) “No aspect of a safety and health plan can be successful or effective without a firm, written and reinforced commitment from management.” Of the five cities with management support, three of them (Albuquerque, Fresno and Sacramento) also had a written ergonomics policy.

Another type of support comes from the evaluation of job functions that may pose an ergonomic hazard exposure. A review of Table 3 reveals that over three-fourths or 85% of the cities evaluate job functions that may pose an ergonomic hazard exposure. These types of evaluations are important because they help address situations in which employees may be exposed to ergonomic-related injuries. It is a proactive approach to protecting employees and their health.

Table 3 Evaluate Job Function of Possible Ergonomic Hazard Exposure

Evaluate Job Functions?	Yes	No
Number of cities	11	2
%	85%	15%

Once a job function is identified as an “at risk” situation, it is management’s responsibility to address and correct the situation. Table 4 indicates that over half or 54% of the cities do conduct Job Safety Analysis (JSA) assessments. The analysis is generally conducted by using a standard form for the assessments. Approximately one-fourth or 23% of the cities indicated they discuss the job function with management and the employee. This format may bring additional information to the attention of management to assist in correcting potentially unsafe conditions in the workplace. The remaining cities that responded indicated that appropriate equipment is looked at or that action is taken when an employee submits a request.

Table 4 Address Job Functions “At Risk”

Action Taken	JSA	Employee & Management	Equipment	Upon Request
Number of cities	7	3	2	1
%	54%	23%	15%	8%

When addressing employee needs management has the responsibility of providing health care support for employees. Employees that need medical attention through doctors visits, surgery, therapy or rehabilitation as a result of a work-related injury should have access to appropriate health care support. Table 5 shows that over three-fourths or 77% of the cities stated that there was health care access available to address MSD complaints. The majority of the cities involved in the survey do take care of their employees' medical needs. The remaining one-fourth or 23% said there was little support or did not respond to the question. These three respondents were from three different states. No correlation was made.

Table 5 Health Care Assistance

Health Care Assistance	Yes	Little Support	N/A
Number of cities	10	1	2
%	77%	8%	15%

### Training

According to Shafritz and Russell (2000) "Training has frequently been a victim of organization neglect." Employee training is an important component for any organization. The investment involves educating employees and improving their skills so that they can perform their jobs at an effective level. An educated, skilled workforce will definitely enhance the success of any organization. A review of Table 6 indicated that approximately two-thirds or 62% of the cities surveyed do have an employee's training program. Of the eight responses half or 50% were

from California. With only five California cities participating in the survey, the information reflects the fact that 80% of the cities in the survey from California consider training programs important. Responses identified that 75% or three of the four Texas cities involved in the survey utilize training programs. It appears that California and Texas consider training an important component of their ergonomics programs.

Table 6 Training

Have Training Programs?	Yes	No
Number of cities	8	5
%	62%	38%

Although a majority of the cities indicated they did conduct employee training very few stated that the training was required of the employees. The data reflected in the literature review shows that addressing ergonomic issues in the workplace is an important issue. The data in Table 7 did not give a clear picture of how many cities required training. Over two-thirds or 69% of the cities did not respond. Therefore there is incomplete data available on whether training is volunteer or required in the majority of those cities surveyed.

Table 7 Training Required

Volunteer or Required?	Volunteer	Required	N/A
Number of cities	3	1	9
%	23%	8%	69%

An employee training schedule is often handled through the Human Resource Departments. Depending on the size of the workforce, it may be often or sporadic. The size of the training staff and the number of employees in an organization will affect training schedules. The data on Table 8 shows that less than one-tenth or 8% of the cities conduct monthly training sessions. One-fourth or 23% of those cities surveyed have a scheduled yearly training.

non-respondents in Table 8 no correlations were identified for requirements of training and training schedules.

Table 8 Training Schedule

Training Schedule	Monthly	Yearly	Varies	N/A
Number of cities	1	3	4	5
%	8%	23%	31%	38%

### Record Keeping

Record keeping is an important aspect of understanding what a program is actually doing. According to Russ-Eft & Preskill (2001), the following items should be identified before collecting records: evaluation’s purpose, intended users, usage of the information and questions to be answered with the information. According to the responses on Table 9, records are being kept by more than four-fifths or 85% of the cities. Four of the five cities or 80% from California and three of the four cities or 75% from Texas responded positively to record keeping practices. Although the percentages are high for California and Texas, it may be difficult to conclude findings with a limited number of cities from each state involved in this research.

Table 9 Records Kept

Records kept?	Yes	No
Number of cities	11	2
%	85%	15%

Record keeping needs to be managed in an efficient manner in order to utilize the information for program assessment purposes. Included in the literature review was OSHA’s recommendation to include a program evaluation element when setting up an ergonomics program. Record keeping is a vital component of an effective program evaluation.

OSHA also includes in its recommendations of elements of an ergonomic program that a job hazard analysis is done. This involves assessing jobs that may be “at risk” Table 10



The five cities that do keep records are from four different states. There was no connection to those states that keep records and those states that categorize job injuries by function.

Table 10 Injury Categorized by Job

Categorized by Jobs?	Yes	No
Number of cities	5	8
%	38%	62%

Proactive action should be taken for “at risk” jobs but jobs that have led to musculoskeletal injuries should be assessed also. Categorizing job injuries in connection with MSD injuries should be kept in the records to accurately account for all factors involved in work-related injuries.

### Performance Measurements

The final element that OSHA recommended employers include in an ergonomics program is a program evaluation. There are various items that are utilized in program evaluations but one of the most important items is a performance measurement. Performance measurements set the framework for assessing the available program records and data. With a measurement tool in place success can be documented, failure explained and adjustments made to make the program better. The data from Table 11 reflects the fact that less than one-fifth or 15% of the cities surveyed had performance measurements in place to evaluate their ergonomics programs. The need for developing performance measurements in the majority of the cities surveyed was evident from the data. The two cities that had measurements in place were from two different states. There was no correlation derived from the data, except the fact that this was an important component that most cities did not utilize in their ergonomics program.

Table 11 Performance Measurements

Performance Measurement used?	Yes	No
Number of cities	2	11
%	15%	85%

The thirteen cities that were surveyed indicated that their ergonomics programs had been in place for a variety of years. Table 12 shows the longevity of the various ergonomic programs of the thirteen cities that participated in this research. The responses spread out over several years of existence. An interesting response came from two cities that initially indicate they had an ergonomics program but then responded to this question they did not have an ergonomics program existence.

Table 12 Years Ergonomics Programs Existed

Years Existed	0 years	1 - 5 years	6 - 10 years	11 -14 years
Number of cities	2	3	7	1

A review of the information revealed the median number of years ergonomics programs had been operated was seven years. The cities that had ergonomic programs for seven or more years were located in all five states that were included in this study. California and Texas each had one city with seven or more years of program length. Arizona, Oregon and New Mexico each had one to two cities in the study and all of those cities in those states had ergonomics programs for eight or more years, exceeding the median of the thirteen cities.

Compiled in Table 13 is a list of the recommended ergonomic program elements and a list the cities' that use them in their programs. A review of the data in Table 13 revealed that 23% of the cities utilized 86% of the recommended elements in their programs. 38% of the cities included 71% of the elements in their programs. 23% of the cities used 57% of the elements and 15% of the cities included 43% of the elements. No city in the study utilized all seven recommended elements.

A close review of the information showed that 62% of all the cities used 5 or more of the elements. The data also reflected the fact that 60% of the California cities were using 5 or more

of the elements. This may be attributed to the existence of a state ergonomics standard in California. The overall information reflected the fact that the majority of the cities in this research do utilize a majority of OSHA's recommended elements for effective ergonomics programs.



San Diego			X	X	X	Παγείο 2X οφ 38	Modeling a Successful Program	4	57%
San Jose	X	X		X	X	X	X	6	86%
Tucson		X	X	X	X	X		5	71%

A compilation of responses to several questions revealed some interesting data. Although the thirteen cities included in this study said they had an ergonomics program, only one-third of the cities had written policies and less than one-fifth of the cities had performance measurements in place for accessing the success of their ergonomic programs. A review of the record keeping practices showed more than three-quarters of the cities kept records but only one-third recorded job injuries in categories. Information is available but not being collected for effective usage for performance measurements. This data reflected a strong need for the development of written policies, the creation of performance measurements and improved record keeping methods.

With almost half of the support given to address ergonomic issues in the organizations coming from departments, interdepartmental communication and support from Human Resources, Purchasing and Finance is vital. Some proactive strategy that was mentioned during the first phone contact with the cities was working with their Purchasing Departments to set up specifications for purchasing office equipment that encompassed appropriate ergonomic equipment standards. Another City mentioned the safety staff train the Information Technology (IT) staff who travels to the various department to repair computers. With the proper training, the IT staff can recognize and report work settings that should be accessed to improve the work sites for the employees.

Training programs are very important to educate employees, increase awareness of ergonomics and help support the organizations' efforts on addressing this issue. OSHA recommended training as one of the desirable components for employers to include when starting an ergonomics program. In the initial semi-structured phone survey, one city reported they have monthly meetings with safety volunteers from each department. Those volunteers conduct education programs within their departments. Following this format will increase the number and frequency of training sessions.

hazard information and reporting. One survey question asked if job functions that pose an ergonomic hazard exposure were addressed? The response was high with three-fourths of the cities indicating yes they did conduct evaluations. With this information it appeared that proactive action for "at risk" job categories was taking place but that follow through on record keeping of injured employees' job categories was not happening. Improved efforts for job categorization could definitely expand knowledge in identifying job areas that tend to have a higher risk factor for exposure to musculoskeletal injuries.

A surprisingly large number of cities (eleven of the thirteen) said they did not have a measurement tool in place to gauge their success or failure with their ergonomics programs. An important step in setting up a program is evaluating that program. According to Leibfried and McNair (1992) the "implementation of a new process and procedure is never complete until the measurement system is brought in line." There is no way to measure the success of a program without a measurement tool. The response to this question indicates programs were started but there is no empirical data to validate or evaluate success or failure.

A review of the longevity of the cities' ergonomics programs revealed some interesting facts. Two of the cities responded zero years for the length of existence of their ergonomics program, although in the initial interview the city representatives indicated their city did have an ergonomics program. A review of all data reflected a wide range of years that ergonomics programs had been in operation at the various cities. The median number of years totaled seven. An interesting fact did emerge from the longevity responses. Eight of the thirteen cities surveyed had started their ergonomics programs a minimum of two years before President Clinton signed the ergonomics rule in 2000.

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A broad overview of the survey information acquired for this paper answered the proposed questions. It revealed that two-thirds of the cities in the Southwestern region of the United States with a population more than four hundred thousand do have ergonomics programs. The elements recommended by OSHA for employers to utilize in an effective ergonomics program were generally being utilized but there were definite areas that should be addressed and improved upon. Those deficit areas include having a written policy, conducting regular training to include employees in the program, improved record keeping methods and incorporation of performance measurements into the ergonomics programs.

Because the continuation of musculoskeletal injuries and illnesses account for one-third of all nonfatal occupational injuries and illnesses with days away from work, as reported by the BLS, all organizations should be concerned about addressing ergonomics within in their entities. Musculoskeletal injuries and illnesses affect employees' health, productivity, fiscal expenditure and the overall operation of each organization. By improving working conditions for employees, their sick leave will decrease and their productivity will increase. The organization's financial burden of paying for the care and recuperation of employees and the dollars spent for disability payments will improve.

There is still a lot for organizations to learn about operating a successful ergonomics program but the investment of time and money will certainly show a positive return for all organizations and their employees.

### Future Studies

There are many areas that warrant additional investigation in the field of ergonomics. Little to no information was available relating to public sector practices in the field of ergonomics. Suggested areas for future research could involve investigating innovative ergonomic solutions within organizations and what type of collaborative efforts are being used between departments in



managing ergonomic issues. Other suggested areas of future research could be a Comparison 38  
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study of California and Washington state ergonomics programs, a study of public sector female  
employees, their jobs and musculoskeletal injuries and finally, the status of carpal tunnel incidents  
in the workplace.

The study of ergonomics is an interesting field for exploration. There appears to be  
limited documentation available in regarding ergonomics programs and the public sector. This  
leaves many avenues of exploration for researchers. The suggestions for future studies are only a  
few of the areas that may lead to more answers for modeling a successful ergonomics program in  
the public sector.

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## **APPENDIXES**

### **APPENDIX A**

Cities with a population above 400,000 in the Southwestern United States

1. Albuquerque, New Mexico
2. Austin, Texas
3. Dallas, Texas
4. Denver, Colorado
5. El Paso, Texas
6. Fort Worth, Texas
7. Fresno, California
8. Houston, Texas

9. Las Vegas, Nevada
10. Long Beach, California
11. Los Angeles, California
12. Phoenix, Arizona
13. Portland, Oregon
14. Sacramento, California
15. San Antonio, Texas
16. San Diego, California
17. San Francisco, California
18. San Jose, California
19. Seattle, Washington
20. Tucson, Arizona

## APPENDIX B

### Cities that were sent and participated in the survey

1. Albuquerque, New Mexico
2. Austin, Texas
3. El Paso, Texas
4. Fort Worth, Texas
5. Fresno, California
6. Houston, Texas
7. Los Angeles, California
8. Phoenix, Arizona
9. Portland, Oregon
10. Sacramento, California
11. San Diego, California

## APPENDIX C

### Ergonomics Questionnaire

1. Does your organization have a written policy in place for procedures in addressing ergonomic issues?
2. Is there an employees' training program in your organization?  
If so, is it on a volunteer basis? Are there representatives from each department that are trained? How often does training take place?
3. Are there written guidelines for employees so that they know who to report health issues to?
4. Do you evaluate job functions that may pose an ergonomic hazard exposure?
5. How do you address job functions that pose an ergonomic hazard exposure?
6. What types of injuries are reported?
7. Are they categorized ex. Technology related, labor related.
8. What type of support from health care providers do employees receive to address MSD's complaints?
9. What type of support is given to address ergonomic issues in your organization?
10. Are records being kept on ergonomic injuries?

11. Are there performance measurements in place to measure the success of your ergonomics program since its inception?
12. How long has your ergonomics program been in operation?