

**BY ORDER OF THE
COMMANDER**

**MAXWELL AIR FORCE BASE INSTRUCTION 48-106
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Bioenvironmental Engineering

ERGONOMICS MANAGEMENT PROGRAM

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction establishes a Maxwell/Gunter Ergonomics Management Program, which includes back injury management. It provides responsibilities and procedures for management leadership and employee participation, hazard identification and information, job hazard analysis and control, training, medical management, and program evaluation. It establishes a Maxwell Ergonomics Working Group and a Base Ergonomics Manager. It applies to all Maxwell and Gunter personnel.

1. Background and Overview.

1.1. The Occupational Safety and Health Act (OSHA, 29 CFR) requires that employers provide a workplace free from recognized safety and health hazards, including ergonomic hazards. (See attachment 1 for definitions). OSHA promulgated a rule that requires establishing an ergonomics program to reduce cumulative trauma disorders (CTDs) arising from the workplace.

1.2. The need for increased emphasis on ergonomics is reflected by labor statistics. In 1990, 50% of all occupational illnesses in America were associated CTDs. The National Institute for Occupational Safety and Health (NIOSH) estimates that five million Americans suffer from CTDs and that by the year 2000, 50% of all workplaces will present a risk for causing these disorders. Currently, CTDs account for more than 16 million lost workdays per year. Estimated costs to employers for CTDs are \$40 billion per year.

1.3. Solving ergonomic problems in the workplace requires inter-disciplinary cooperation and resource allocation. It requires emphasis at all levels of command and responsibility. The emphasis is on reducing fatigue and injury by designing tasks within people's capabilities. The human body has limitations, which should be considered in the design of tools, workplaces, or products.

1.4. The concept of ergonomics in industrial and administrative settings involves designing work areas and job processes for the individual worker. Because of the wide range of tasks and motions associated with CTDs, each employee should have a basic understanding of common causes. The goal then is to decrease CTDs and other musculoskeletal illnesses and to increase productivity in the work place through work place surveillance and employee awareness and training.

1.5. The six main elements in the Maxwell AFB CTD prevention program are:

1.5.1. Senior Leadership and Shop Participation

1.5.2. Hazard Identification and Information

1.5.3. Job Hazard Analysis and Control

1.5.4. Training and Education

1.5.5. Medical Management

1.5.6. Program Evaluation

1.6. The 42d Medical Group's Bioenvironmental Engineering Flight (42 ADOS/SGGB) is the office of primary responsibility (OPR) and Occupational Medicine (42 ADOS/SGGF), Public Health (42 ADOS/SGGM), Physical Therapy (42 MDOS/SGOMY), and the 42d Air Base Wing Ground Safety office (42 BW/SEG) make up the standing committee for the Maxwell AFB cumulative trauma disorder prevention program.

2. Responsibilities.

2.1. The Commander, 42d Air Base Wing, establishes an effective ergonomics management program and appoints the Bioenvironmental Engineering Flight Commander (42 ADOS/SGGB) as the Base Ergonomics Manager (BEM).

2.2. The BEM:

2.2.1. Establishes a Maxwell/Gunter Ergonomics Working Group and oversees all ergonomic-related activities in 42 ABW units and associated tenants.

2.2.2. Assists commanders in prioritizing projects and resources in order to make the best use of limited funds.

2.2.3. Establishes a written, comprehensive ergonomics management plan to implement ergonomic related activities and to make the best use of resources.

2.2.4. Develops or adopts critical pathways or practice parameters for evaluation, medical management, and follow-up of Work-Related Musculoskeletal Disorders (WMDs) treated on the installation.

2.3. Commanders:

2.3.1. Ensure that all job activities in their units are reviewed annually to assess the potential for these activities to cause CTDs.

2.3.2. Provide adequate resources to meet the responsibilities in this standard.

2.3.3. Ensure supervisors and workers receive appropriate training on prevention of WMD.

2.3.4. Ensure all office work station furniture and industrial work equipment purchases consider ergonomic design before procurement.

2.4. The Maxwell Ergonomics Working Group (EWG) meets quarterly or as directed by the Base Ergonomics Manager. The EWG:

2.4.1. Reviews and investigates all diagnosed cumulative trauma disorders.

2.4.2 Develops specific goals and objectives for the base Ergonomics Management Program and establishes mechanisms to implement these goals and objectives. These mechanisms must be detailed and must provide in-depth procedures for worksite analysis, hazard prevention and control, medical management, and training and education.

2.4.3 Establishes procedures to record and track CTD cases, to prioritize ergonomic resources, to record training and education, and to keep a record of solutions implemented for specific ergonomic hazards.

2.4.4. Serves as a clearing-house and resource center for ergonomics, including policies, regulations, manufacturer's catalogs, training materials, books and ordering information for tools and equipment.

2.4.5. Advises the installation AFOSH Council and the Aerospace Medicine Council (AMC) on the effectiveness of the installations CTD prevention program.

2.5. **Medical Treatment Facility (MTF) Commander.** In addition to the commander responsibilities in para 2.1., the MTF Commander:

2.5.1. Provides appropriate manpower and resources for medical personnel involved in efforts to reduce WMD.

2.5.2. Ensures health care providers properly identify, document, and report occupationally related WMD.

2.6. **Medical Services.** Chief, Medical Services ensures that health care providers properly identify cases they suspect to be WMD to Public Health using a **Standard Form (SF) 513**, or electronic equivalent.

2.7. Bioenvironmental Engineering. Flight Commander, BE:

2.7.1. Documents work analyses in the industrial case file or facility case file.

2.7.2. Prioritizes and performs work analyses.

2.7.3. Assists supervisors in selecting the appropriate control measures to eliminate or minimize ergonomic risk factors.

2.7.4. Evaluates the effectiveness of the implemented controls in eliminating or minimizing risk factors.

- 2.7.5. Reviews plans for new or modified operations to ensure ergonomic design principles have been considered.
- 2.7.6. At the request of a health care provider, assists the supervisor in modifying the workplace to accommodate the medical restrictions for an existing WMD.
- 2.7.7. Assists the ground safety manager with investigating incidents when routine risk factors may have contributed to the injury.
- 2.7.8. Assigns risk assessment codes to new WMD hazards.
- 2.7.9. Submits to AL/OEM copies of reports that describe solutions which have not been described in any guidance and were effective in resolving hazards.
- 2.7.10. Provides training, which covers description of WMD and the associated ergonomic risk factors, recognition of symptoms associated with ergonomic disorders, the importance of early medical intervention, and local procedures for reporting suspected ergonomics risk factors and the WMD. WMD awareness education may take many forms including briefings, newspaper articles, brochures, and computer software.
- 2.7.11. Coordinates additional ergonomic education programs with the Health and Wellness Center to ensure program access for supervisors, workers, and other installation personnel as needed.
- 2.7.12. Documents ergonomic incidents on AF Form 2754, **Chronological Record of Work Place Visits**, for all non-industrial shops.
- 2.8. Public Health (PH). Flight Commander, Public Health:
- 2.8.1. Collects data through passive and active surveillance techniques to determine incidence and prevalence of base ergonomic illness and injury events.
- 2.8.2. Coordinates with Director of Base Personnel and Chief, Ground Safety to establish on-going base surveillance process for work-related musculoskeletal disorders. Reviews results of reported WMD and risk factor data for trends.
- 2.8.4. Provides data obtained through passive and active surveillance efforts and trend analysis to the Ergonomics Working Group for discussion and actions.
- 2.8.5. Analyzes data for association among ergonomic risk factors, employee discomfort, and reported WMD (if available) and report results to the EWG.
- 2.8.6. Evaluates the effectiveness of the controls in reducing employee discomfort and WMD incidence through trend analysis, shop visits, and follow-up administrations of the JR/PD (when indicated).

2.8.7. Provides WMD awareness education and training to supervisors (and lesson plans for supervisors to administer training to shop personnel), and to shop workers, healthcare providers, administrative workers, and other installation personnel as needed.

2.8.8. Assists BE in educating supervisors and workers, especially on proper design and organization of work environment.

2.8.9. Initiates an investigation (when event is reported or referred) and interview the patient to determine if the reported ergonomic disorder is an occupational illness/injury utilizing ASMIS EPI-Module (AF 190 computer generated version). Forwards the computer generated report to BES for further evaluation and a risk assessment.

2.8.11. Makes disposition (in coordination with BEM) and record result (substantiated or unsubstantiated) into the ASIMS Occupational Health computer module (after receiving the report back from BES with their recommendations and risk assessment).

2.8.12. Provides a copy of all reports and AF Form 739 for investigation and mishap reporting to Ground Safety.

2.8.13. Ensures one copy of report (computer generated) is reviewed by the referring physician, one placed in the patient's medical record, and the shop folder AF Form 2754 is annotated. Closes out case in ASIMS and electronically forward report to AL/AOE monthly.

2.9. Physical Therapy:

2.9.1. Participates in the EWG.

2.9.2. Provides information on back injuries, restricted duty, stretching exercises, and worker rehabilitation as requested by BE, PH, or OM. Coaches employees to ensure the medical restrictions are incorporated into work practices, as requested.

2.9.4. Assists Health and Wellness Center (HAWC) and Public Health (PH) with WMD awareness and training, as requested. Provides work related caseload information to PH to ensure cases are entered in the data collection system. Consults on workstation evaluations with BES. Makes recommendations for improvements in ergonomics of workstations. When processed, sends CA1 and CA2 reports to PH. Assists PH with education of proper postures for body and neck as needed.

2.10. Civilian Personnel Flight (CP)/Human Resources Office (HRO):

2.10.1. Provides PH with civilian (DoD/NAF and appropriated) WMD data including compensation costs, lost workdays, and restricted workdays.

2.10.2. Briefs once a year (April) to AFOSH council continuation of pay with regards to WMD.

2.11. Health and Wellness Center (HAWC):

2.11.1. Provides access to awareness education in conjunction with Public Health.

2.11.2. For jobs that use computers, HAWC tailors the training toward the specific needs of computer users and describes the proper computer workstation set-up. Provides training and specific conditioning exercises for personnel working in high ergonomic risk areas.

2.12. Ground Safety Manager:

2.12.1. Maintains and analyzes basic information about injuries and trends in coordination with PH.

2.12.2. Compiles basic information about the musculoskeletal injuries, such as the type of work being performed, when and where the incident occurred, the body parts involved, and the classification of the injury.

2.12.3. Performs ergonomic analysis in administrative areas and reports the analysis at every EWG meeting.

2.13. Supervisors:

2.13.1. Participates in the EWG to discuss specific ergonomic problems that relate to their units or workers.

2.13.2. Encourages workers to promptly report signs and symptoms of WMD suspected to be associated with the job.

2.13.3. Assists in identifying ergonomic hazards and stressors in the work area. (See attachment 2).

2.13.4. Consults with workers and review improvements that will abate the ergonomic risk factors.

2.13.5. Enforces the use of required measures to control ergonomic risk factors, include engineering controls, administrative controls, work practice controls, and personal protective equipment.

2.13.6. Ensures that workers follow the guidelines set forth in this operating instruction.

3. Procedures: The basic elements of an ergonomics program are:

3.1. Senior Leadership and Shop Participation

3.2. Hazard Identification and Information

3.3. Job Hazard Analysis and Control

3.4. Training and Education

3.5. Medical Management

3.6. Program Evaluation

3.1. Management Leadership and Employee Participation. The purpose of leadership management is to assure support is there for the overall program and that employee participation occurs throughout the shops on base. Employees must have ways to report problems, get responses and be involved in the program.

3.2. Hazard Identification and Information. The purpose of worksite analysis is to identify high-risk job and tasks, and the specific risk factors associated with them. This identification process must involve workers, supervisors, commanders, and the EWG.

3.2.1. The EWG develops systematic procedures, checklists (attachment 2), and other tools for accomplishing worksite analysis. Bioenvironmental Engineering conducts industrial workplace analysis during the periodic industrial hygiene surveys with results being briefed at the EWG meeting. Safety conducts administrative workplace analysis during their annual surveys and report to the EWG. The EWG also reviews, at least quarterly, injury and illness logs kept by Public Health, Ground Safety, and Civilian Personnel/HRO for evidence of cumulative trauma disorders.

3.2.2. The actual worksite analysis is performed by the members of the EWG, as directed by the BEM. The analysis is performed by direct observation, by videotape review, or both. The BEM reviews and documents each analysis and the conclusions or recommendations based on the analysis.

3.3. Job Hazard Analysis and Control. Prevention and control of ergonomic hazards are accomplished through a combination of engineering controls, work practices, administrative controls, and protective equipment. Whenever feasible, engineering controls are the preferred control measure.

3.3.1. Engineering controls are designed to fit the task to the person. These controls include redesigning workstations, work methods, tools, and requirements in order to reduce or eliminate excessive exertion, repetitive motion, awkward postures, and other risk factors.

3.3.2. Work practice controls are those procedures that provide for safe working methods, and are clearly understood and followed by employees, supervisors, and commanders. These procedures include work techniques, lifting techniques, employee conditioning, regular monitoring, feedback, equipment maintenance, adjustments and modifications, and enforcement.

3.3.3. Administrative controls are intended to reduce the duration, frequency, and severity of exposure to ergonomic hazards. Administrative controls include reducing total number of repetitions of a task per employee; providing rest periods; increasing the number of employees assigned to a task; rotating employees to other tasks that are less stressful or that use different muscle-tendon groups; and by providing standby/relief personnel to prevent overtime or to compensate for personnel on leave, TDY, training, etc.

3.3.4. Protective equipment is considered a last resort in the control of ergonomic hazards. Where appropriate, the protective equipment must be provided in a variety of sizes, must accommodate the physical requirements of workers and the job, and must not contribute to extreme postures or excessive forces.

3.3.5. For each workcenter where worksite analysis has identified high-risk jobs or tasks, the EWG, under direction of the BEM, recommends appropriate controls as described above. Where engineering or design changes are required, commanders and supervisors take necessary action to implement these changes.

3.4. Training. Employees in problem jobs, employees in similar jobs that are problem jobs, and their supervisors must be trained to recognize WMD signs and symptoms and the importance of early reporting. In addition, they must be trained on job specific controls and work practices that have been implemented in their jobs to control these hazards.

3.5. Medical Management. Medical management for CTDs includes early evaluation, diagnosis, and treatment, and measures to prevent their occurrence. The BEM develops and implements a medical management program for CTDs that includes, as a minimum, the following elements:

3.5.1. Periodic Workplace Walk-Through of Industrial Areas. These visits allow health care providers maintain contact with employees, and enable them to remain familiar with work practices and procedures.

3.5.2. Symptom Surveys. These are used to identify CTD problem areas and to assess the effectiveness of corrective actions over time. By not including names or social security numbers, these surveys are designed to encourage participation of employees who may not be relating CTD symptoms to their supervisors or to health care providers.

3.5.3. Identification of Restricted Duty Jobs. The BEM or a designated physician, on a case-by-case basis, identifies a list of jobs with low ergonomic risk in order to provide employees restricted duty which allows injured muscle-tendon groups to rest. Restricted duty jobs are tailored by the physician to the individual worker's signs and symptoms.

3.5.4. The purpose of health surveillance is the early identification of CTD problems, and preventing their progression to more severe, disabling conditions. The health surveillance program includes the following elements:

3.5.4.1. Before assignment to high ergonomic risk areas, as determined by the BEM, employees receive a baseline health assessment. This is not a screening mechanism, but rather a means of establishing a base against which changes in health status can be compared and evaluated.

3.5.4.2. Post-Conditioning Period Assessment. Employees assigned to high ergonomic risk areas are trained by Physical Therapy in conditioning their muscle-tendon groups prior to working at full capacity. This breaking-in period is 1 month or as specified by the BEM. At the end of this conditioning period, Physical Therapy performs a follow-up assessment to determine if conditioning has been successful.

3.5.4.3. Periodic health assessments are conducted every 3 years for all employees assigned to high ergonomic risk areas, and any other employees identified by the BEM as requiring this assessment. This assessment is similar to the baseline health assessment.

3.6. Training and Education. The BEM establishes an ergonomics training and education program that includes employees, supervisors, and commanders. The program ensures sufficient

information is provided to enable personnel to understand the types and causes of CTDs, the means of preventing and controlling ergonomic hazards and risk factors, early symptoms, and medical management of CTDs.

3.6.1. Because of the diversity of jobs and tasks which involve ergonomic risk, all employees are provided a minimum level of awareness training. The BEM designs this training package and assist commanders and supervisors in providing this training to employees. This training is documented on each employee's AF Form 55, **Employee Safety and Health Record**.

3.6.2. Employees in high-risk areas, as determined by the BEM, receive more in-depth training and education. The BEM establishes a training program individually tailored to all high risk areas and assist commanders and supervisors in conducting the training. Training is documented on each employee's AF Form 55.

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Attachments:

1. Ergonomics Terms and Definitions
2. Work Area Ergonomic Evaluation
3. Checklist for Computer Workstations
4. Musculoskeletal Disorders by ICD-9CM Code

Attachment 1

Ergonomics Terms and Definitions

A1.1. Ergonomics. Ergonomics includes the study of physiological responses to physically demanding work; environmental stressors such as heat, noise, and illumination; complex psychomotor assembly tasks; and visual monitoring tasks. The emphasis is on reducing fatigue by designing tasks within people's capabilities. Ergonomics is an interdisciplinary science that brings together engineering and medicine to analyze the interaction between people and the work environment.

A.1.2. Several principles are fundamental to ergonomics:

A1.2.1. The human body has limitations that should be considered in the design of any tool, workplace, or product.

A1.2.3. Individuals possess different limitations. Good design takes into consideration the diversity of potential users.

A1.2.4. Musculoskeletal injury is possible when human capabilities are exceeded.

A1.3. Ergonomic Deficiencies. Situations in the workplace that over time will adversely affect human health. Manifestations include extreme posture, excessive force, concentration of stress, and static loading. Also included is the final outcome; pain and/or discomfort, and high incidence of occupational disorders.

A1.3.1. Extreme Posture. Causes include a) Improper reach, arms fully extended above the shoulder or below the waist; b) Improperly designed tools and machine controls; too bulky to hold or difficult to reach without adopting an extreme posture.

A1.3.2. Excessive Force. The worker exerts force to overcome mechanical disadvantage of maneuvering bulky, heavy objects while in an awkward position.

A1.3.3. Concentration of Stress. Stress is force divided by area. The fewer muscles used to deliver the force, the higher the stress placed on the body. Repetitive jobs using short and fast motions are inclined to concentrate the stress. Time is an important factor. Stress applied infrequently is not as harmful as stress occurring throughout the day.

A1.3.4. Static Loading. Body segments are motionless or prevented from changing positions. This causes fatigue and decreased blood flow.

A1.4. Cumulative Trauma Disorders (CTDs). Painful and limiting soft tissue failures that result from repeated or continuous application of slight to moderate physical stress over extended periods of time. The result is often damage to the muscles, tendons, joint surfaces, nerves, or other soft tissues.

A1.5. Work-Related Musculoskeletal Disorders (WMDs). Injury or illness of the muscles, tendons, ligaments, peripheral nerves, joints, cartilage bones, and/or supporting blood vessels in

either the upper or lower extremities or back which is associated with workplace risk factors and is not the result of acute or instantaneous events (i.e. slips or falls)

A1.6. Risk Factors. Six general categories of ergonomic risk factors are found in a wide range of industrial jobs:

A1.6.1. Forceful exertions.

A1.6.2. Awkward work postures.

A1.6.3. Repetitive motions.

A1.6.4. Localized contact stresses.

A1.6.5. Whole body or segmental vibrations.

A1.6.6. Temperature extremes.

A1.7. Carpal Tunnel Syndrome (CTS). A wrist pain syndrome due to soft tissue swelling and resultant compression of the median nerve. Nerve conduction studies are the best diagnostic technique. Individual cases of CTS should be confirmed by nerve conduction prior to having a confirmed diagnosis of CTS.

Attachment 2**WORK AREA ERGONOMIC EVALUATION**

WPID:
SQUADRON:
SHOP:
SUPERVISOR:
OFFICE SYMBOL:
EXTENSION:

A2.1. Number of Employees (all shifts, full-time, part-time):

A2.2. Brief description of work in this shop:

A2.3. Shop tasks:

Include in each description:

Hours it takes to perform the task

Number of repetitions it takes to complete the task

Range of weight, in pounds, carried by hand (e.g. 20-50)

Average weight, in pounds, carried by hand

Number of times this task is performed per week

Number of workers who perform this task

Are personnel rotated through this task? (Y or N)

INSTRUCTIONS FOR COMPLETING THE RISK FACTOR CHECKLISTS

These general risk factor checklists offer a quick method for identifying some important risk factors that contribute to work-related musculoskeletal disorders (MSDs). This checklist is used to identify jobs that require a quick fix or more thorough job analysis:

CHECKLIST A is used to score risk factors for upper extremities (hands, wrists, arms, shoulders, neck).

CHECKLIST B is used to score risk factors for the back and lower extremities.

CHECKLIST C is used to assess manual handling tasks. Scores from this checklist are used in Checklist B.

To calculate risk factor scores, complete the following steps:

STEP 1. Fill in the general information—date of analysis, job, department, name of employee, name of analyst, and any comments on each checklist. Read the description of each risk factor carefully.

STEP 2. If the employee performs more than one major task, list each task in the space provided.

STEP 3. Assess the amount of time the employee spends performing the job described. If the job consists of more than one task, you will need to estimate the hours the employee spends performing each task, then estimate the hours for each risk factor associated with the task (see example below). For force and awkward postures, estimate the time spent in both static and repetitive activities.

STEP 4. Circle the risk factor score in either Column C or Column D on checklist A and B. If the employee performs tasks that involve the risk factor for more than 8 hours a day, circle the score in column D and add 0.5 point for each additional hour the employee experiences that risk factor, record the total in Column E.

STEP 5. Enter the score circled in Column C or D (also add the values in Column E) in the space provided in Column F.

STEP 6. Complete this process for all of the risk factors in Checklists A and B.

STEP 7. Complete Checklist C and record the score in the box provided for the manual handling score at the bottom of Checklist B.

STEP 8. Add the risk factor scores for a total score for each checklist. Record each total in the boxes provided.

STEP 9. If either Checklist A or Checklist B has a score higher than 5, the job is a problem job. Do not add the scores from Checklists A and B.

TASK	ESTIMATED TIME (Hours)	RISK FACTORS	TIME/RISK FACTOR (Hours)
Assembly	6 hours	Repetition	5 hours
		Awkward shoulder posture	5 hours
		Pinch force	5 hours
		Neck bend	2 hours
Microscope Work	1 hour	Neck bend	1 hour

UPPER EXTREMITY RISK FACTORS

Date: _____

Job: _____

Department: _____

Employee: _____

Analyst: _____

Comments: _____

<i>Task Risk Factor</i>	<i>Total Time</i>
_____	_____
_____	_____

UPPER EXTREMITY RISK FACTOR SCORES Page 1

A	B	C	D	E	F
RISK FACTOR CATEGORY	RISK FACTORS	TIME			SCORE
		2 to 4 hours hours <i>Circle the score</i> hour	4+ to 8 hours	8+ Add 0.5 per	
Repetition (Finger, Wrist, Elbow, Shoulder, or Neck Motions)	1. Identical or Similar Motions Performed Every Few Seconds <i>Motions or motion patterns that are repeated every 15 seconds or less. (Keyboard use is scored below as a separate risk factor).</i>	1	3		
	2. Intensive Keying <i>Scored separately from other repetitive tasks in the repetition category and includes steady pace as in data entry.</i>	1	3		
	3. Intermittent Keying <i>Scored separately from other repetitive tasks. Keyboard or other input activity is regularly alternated with other activities for 50 to 75 percent of the work.</i>	0	1		
Hand Force (Repetitive or Static)	1. Grip More Than 10-Pound Load. <i>Holding an object weighing more than 10 pounds or squeezing hard with hand in a power grip.</i>	1	3		
	2. Pinch More Than 2 Pounds <i>Pinch force of 2+ pounds as in the pinch used to open a small binder clip with the tops of fingers.</i>	2	3		
Awkward Postures	1. Neck: Twist/Bend <i>Twisting neck to either side more than 20°, bending neck forward more than 20° as in viewing a monitor, or bending neck backward more than 5°.</i>	1	2		

UPPER EXTREMITY RISK FACTORS

UPPER EXTREMITY RISK FACTOR SCORES Page 2					
A	B	C	D	E	F
RISK FACTOR CATEGORY	RISK FACTORS	TIME			SCORE
		2 to 4 hours <i>Circle the score</i>	4+ to 8 hours	8+ hours Add 0.5 per hour	
Awkward Postures (continued)	2. Shoulder: Unsupported Arm or Elbow Above Mid-Torso Height <i>Arm is unsupported if there is not an arm rest when doing precision finger work, or when the elbow is above mid-torso height.</i>	2	3		
	3. Rapid Forearm: Rotation <i>Rotating the forearm or resisting rotation from a tool. An example of forearm rotation is using a manual screwdriver.</i>	1	2		
	4. Wrist: Bend/Deviate <i>Consider wrist bends that are more than 20 degrees flexion (bend wrist palm down) or more than 30 degrees extension (bending wrist back. Bending can occur during manual assembly and data entry.</i>	2	3		
	5. Fingers <i>Forceful gripping to control or hold an object such as click-and-drag operations with a computer mouse or deboning with a knife.</i>	0	1		
Contact Stress	1. Hard/Sharp Objects Press Into Skin <i>Includes contact of the palm, fingers, wrist, elbow, or armpit.</i>	1	2		
	2. Using the Palm of the Hand as a Hammer	2	3		
Vibration	1. Localized Vibration (Without Vibration Dampening) <i>Vibration from contact between the hands and a vibrating object such as a power tool.</i>	1	2		
	2. Sitting/Standing on Vibrating Surface (Without Vibration Dampening)	1	2		

UPPER EXTREMITY RISK FACTORS

UPPER EXTREMITY RISK FACTOR SCORES Page 3					
A	B	C	D	E	F
RISK FACTOR CATEGORY	RISK FACTORS	TIME			SCORE
		2 to 4 hours hours <i>Circle the score</i>	4+ to 8 hours	8+ Add 0.5 per hour	
Environment	1. Lighting (Poor Illumination/Glare) <i>Inability to see clearly (e.g., glare on a computer monitor).</i>	0	1		
	2. Cold Temperature <i>Hands exposed to air temperature of less than 60° for sedentary work, 40° for light work, 20° for moderate/heavy work, cold exhaust blowing on hands.</i>	0	1		
Control Over Work Pace	1. No Control Over Pace <i>Machine paced, piece rate, constant monitoring, or daily deadlines. Enter 1 if one control factor is present or 2 if two or more control factors are present.</i>				

TOTAL UPPER EXTREMITY SCORE FOR CHECKLIST A
 (Sum of pages 1, 2, and 3) _____

BACK AND LOWER EXTREMITY RISK FACTORS

Date: _____

Job: _____

Department: _____

Employee: _____

Analyst: _____

Comments: _____

<i>Task Risk Factor</i>	<i>Total Time</i>
_____	_____
_____	_____

BACK AND LOWER EXTREMITY RISK FACTOR SCORES Page 1					
A	B	C	D	E	F
RISK FACTOR CATEGORY	RISK FACTORS	TIME			SCORE
		2 to 4 hours hours <i>Circle the score</i>	4+ to 8 hours hours	8+ Add 0.5 per hour	
Awkward Postures (Repetitive or Static)	1. Mild Forward or Side Bending of Torso More Than 20° But Less Than 45°	1	2		
	2. Severe Forward Bending of Torso More Than 45°	2	3		
	3. Backward Bending of Torso	1	2		
	4. Twisting Torso	2	3		
	5. Prolonged Sitting Without Adequate Back Support Back is not firmly supported by a back rest for an extended period.	1	2		
	6. Standing Stationary or Inadequate Foot Support While Seated <i>Stand in one place (an assembly line or check stand) without sit/stand option or walking, or feet are not firmly supported when sitting.</i>	0	1		
	7. Kneeling/Squatting	2	3		
	8. Repetitive Ankle Extension/Flexion <i>Using a foot pedal to start or stop a machine cycling (as in sewing machine operations).</i>	1	2		

BACK AND LOWER EXTREMITY RISK FACTORS

BACK AND LOWER EXTREMITY RISK FACTOR SCORES Page 2					
A	B	C	D	E	F
RISK FACTOR CATEGORY	RISK FACTORS	TIME			SCORE
		2 to 4 hours hours <i>Circle the score</i>	4+ to 8 hours	8+ Add 0.5 per hour	
Contact Stress	1. Hard/Sharp Objects Press Into Skin <i>Includes contact against the leg.</i>	1	2		
	2. Using the Knee as a Hammer or Kicker	2	3		
Vibration	1. Sitting/Standing on Vibrating Surface (Without Vibration Dampening).	1	2		
Push/Pull	1. Moderate Load <i>Force needed to push/pull a shopping cart full of apples.</i>	1	2		
	2. Heavy Load <i>Force needed to push/pull a two-drawer, full file cabinet across a carpeted room.</i>	2	3		
Control Over Work Pace	1. No Control Over Pace <i>Machine paced, piece rate, constant monitoring, or daily deadlines. Enter 1 if one control factor is present or 2 if two or more control factors are present.</i>				

MANUAL HANDLING SCORE (From CHECKLIST C) _____

TOTAL BACK AND LOWER EXTREMITY SCORE FOR CHECKLIST B
(Sum of both pages 1 and 2 of CHECKLIST B) _____

1. Moderate load = 20 pounds of initial force needed to push/pull an object, such as a shopping cart loaded with five 40-pound bags of dog food (200 pounds).

2. Heavy load = 50 pounds of initial force needed to push/pull an object, such as a two-drawer, full file cabinet across a carpeted floor.

MANUAL HANDLING

<p>Step 1: Determine If the Lift Is Near, Middle, or Far (Body to Hands)</p> <p>--Use an average horizontal distance if a lift is made every 10 minutes or less.</p> <p>-- Use the largest horizontal distance if more than 10 minutes pass between lifts.</p>	<p>Near Lift</p>	<p>Middle Lift</p>	<p>Far Left</p>
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<p>Step 2: Estimate the Weight Lifted (Pounds)</p> <p>--Use an average weight if a lift is made every 10 minutes or less.</p> <p>--Use the heaviest weight if more than 10 min pass between lifts.</p> <p>-- Enter 0 in the total score if the weight is 10 lbs or less.</p>	<p>Near Lift</p> <p>DANGER ZONE: More Than 51 lbs 5* points</p> <p>CAUTION ZONE: 17 to 51 lbs 3 points</p> <p>SAFE ZONE: Less Than 17 lbs 0 points</p>	<p>Middle Lift</p> <p>DANGER ZONE: More Than 35 lbs 6 points</p> <p>CAUTION ZONE: 12 to 35 lbs 3 points</p> <p>SAFE ZONE: Less Than 12 lbs 0 points</p>	<p>Far Lift</p> <p>DANGER ZONE: More Than 28 lbs 6 points</p> <p>CAUTION ZONE: 10 to 28 lbs 3 points</p> <p>SAFE ZONE: Less Than 10 lbs 0 points</p>
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- If lifts are performed more than 15 times per shift, use 6 points.

STEP 2 SCORE: _____

Step 3: Determine the Points for Other Risk Factors	FACTOR	OCCASIONAL LIFTS PERFORMED FOR 1 HOUR OR LESS IN TOTAL PER SHIFT	LIFTS PERFORMED FOR MORE THAN 1 HOUR IN TOTAL PER SHIFT
--Use occasional lifts if more than 10 minutes pass between lifts. -- Use the more than 1 hour points if the risk factor occurs with most lifts and lifting is performed for more than 1 hour.	Twist torso during lift	1	1
	Lift one-handed	1	2
	Lift unstable loads (people, liquids, or loads that shift around or have unequal weight distribution)	1	2
	Lift between 1 to 5 times per minute	1	1
	Lift 5 or more times per minute	1	1
Step 3: Determine the Points for Other Risk Factors	FACTOR	OCCASIONAL LIFTS PERFORMED FOR 1 HOUR OR LESS IN TOTAL PER SHIFT	LIFTS PERFORMED FOR MORE THAN 1 HOUR IN TOTAL PER SHIFT
--Use occasional lifts if more than 10 minutes pass between lifts. -- Use the more than 1 hour points if the risk factor occurs with most lifts and lifting is performed for more than 1 hour.	Lift above the shoulder	1	2
	Lift below the knuckle	1	2
	Carry objects 10 to 30 feet	1	2
	Carry objects farther than 30 feet	2	3
	Lift while seated or kneeling	1	2

STEP 3 SCORE: _____

TOTAL SCORE

(Add scores from Steps 2 and 3. Enter total score on Checklist B).

TOTAL: _____

Attachment 3

CHECKLIST FOR COMPUTER WORKSTATIONS

Supervisors, employees, and safety use this checklist to evaluate computer workstations that are used periodically. This checklist may be changed to meet local conditions, to improve its usefulness, or to incorporate new regulatory requirements as they arise. Answering Y to any of the questions below indicate an area that potentially could be an ergonomic stressor. Careful evaluation of the workstation should be considered to determine the root cause of the stressor and steps should be taken to fix any problem areas.

Is the employee able to:		
Y	N	...rest the feet (flat) comfortably on the floor or footrest?
Y	N	...sit with the knees (90 degree angle) and legs in a comfortable position without interfering obstructions (with at least 2 inches of clearance between the work surface and thighs)?
Y	N	...work with the head vertical (not holding head forward or to the side, i.e. talking on the phone)?
Y	N	...work without repeatedly rotating the head forward, backward, or to the side (document holder available)?
Y	N	...work without reaching or bending the trunk repeatedly or extended for long durations?
Y	N	...work with the shoulders in a relaxed or comfortable position (any reaching for the mouse or telephone)?
Y	N	...hold the wrists in a neutral or comfortable position with support available, if needed (wrists in line with your forearms and not bent upwards, downwards, or to one side or another)?
Y	N	...when typing, is there approximately a 90 degree angle between forearms and upper arms?
Y	N	...change posture frequently?
Y	N	...take short and frequent breaks while working to reduce fatigue?
Y	N	...frequent change in body positions while working?
Y	N	...provide eyes with vision breaks every hour?
Y	N	...comfortable with the room temperature?
Y	N	...is air circulation sufficient, air quality satisfactory (too dry, too humid)?
Y	N	...is the sound an annoyance?
Does the seat have:		
Y	N	...height, slope, and arm rest adjustments?
Y	N	...a seat pan deep and wide enough to comfortably accommodate the employee?
Y	N	...a "waterfall" front edge so the employee does not have excess pressure under the leg?
Y	N	...a backrest that can be adjusted to provide lower back (lumbar) support?

Does the work surface have:		
Y	N	...enough width to locate accessories within a comfortable reach?
Y	N	...enough depth that the monitor and keyboard can be placed directly in front of the employee?
Y	N	...enough area to allow free movement of feet, legs, and knees beneath the surface?
Is the computer (VDT) monitor:		
Y	N	...at a level slightly below the employee's eye level?
Y	N	...adjustable between 16 and 24 inches from the employee?
Y	N	...screen clean and free from flickering?
Y	N	...adjustable for brightness and contrast?
Y	N	...screen able to adjust horizontally, tilt vertically, and yaw (rotate)?
Y	N	...screen well lit without glare on the screen from lights, windows, or reflected surfaces?
Is the keyboard:		
Y	N	...detachable from the display unit?
Y	N	...height and angle easily adjustable?
Y	N	...keystroke pressure comfortable for the employee?
Is the mouse:		
Y	N	...shape, size and button comfortable and easy to operate?
Y	N	...located so the employee does not have to reach repeatedly or for extended duration?
Y	N	...is the palm supported for mouse use?
Is there a holder or support for source document:		
Y	N	...located so the employee is not required to rotate head excessively or for long durations?
Y	N	...easy to adjust?
Is there adjustable support:		
Y	N	...for arms (armrests)?
Y	N	...for palms at the keyboard?

Attachment 4

MUSCULOSKELETAL DISORDERS BY ICD-9CM CODE

A.4.1. These ICD-9CM Codes encompass illnesses that can arise from workplace exposure.

A.4.2. When health care providers encounter these illnesses, they should question whether they may have been caused or exacerbated by the patient's work.

A.4.3. Health care providers who suspect that one of these illnesses relates to the workplace must complete an SF 513 and submit it to BE or PH.

353.0	Thoracic Outlet Syndrome
354.0	Carpal Tunnel Syndrome
354.2	Cubital Tunnel Syndrome
354.5	Digital Neuritis
354.2	Pronator Teres Syndrome
354.3	Radial Tunnel Syndrome
444.21	Hypothenar Hammer
443.0	Raynaud's Syndrome
715	Osteoarthritis
722	Intervetebral Disc Disorders
723.1	Cervicalgia
724.1	Thoracic Spine Pain
724.2	Lumbago/Low Back Pain
724.3	Sciatica
724.5	Backache, unspecified
726.1	Rotator Cuff Syndrome
726.2	Shoulder Periarthritis
726.32	Lateral Epicondylitis
727.0	Synovitis/Tendonitis
727.03	Trigger Finger
727.04	DeQuervains Disease
727.05	Hand/Wrist Tenosynovitis
727.2	Specific bursitides
727.4	Ganglion Cyst (all series)
728.4	Game-Keeper's Thumb
728.85	Muscle Spasms
729.81	Swelling
729.92	Cramp, Tingling in Hands
840.80	Muscle Strain/Sprain