

23 January 96

Aerospace Medicine

ERGONOMICS MANAGEMENT PROGRAM

This directive establishes an Ergonomics Management Program for the installation. It provides guidance for five program elements, which are: worksite analysis, hazard prevention and control, medical management, and education. It establishes a base Ergonomics Manager and a base Ergonomics Working Group. The primary goal of a base-level ergonomics program is to prevent work-related musculoskeletal disorders, and to minimize the effects of existing morbidity.

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 (definitions, Atch 1). OSHA is promulgating a rule that will require establishing an ergonomics program to reduce work-related musculoskeletal disorders (WMDs) arising from the workplace. Most WMDs arise from repetitive motion tasks that cause a cumulative trauma (CT) disorder.

1.2. The National Institute for Occupational Safety and Health (NIOSH) has guidelines for preventing ergonomic injuries and illnesses in the workplace. Air Force Occupational Safety and Health (AFOSH) written policy is near completion. Current recommendations for the management of ergonomic interventions in the Air Force are outlined in the draft AFOSH Ergonomics Standard (AFOSH Std 48-3).

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

1.4. Surveillance of WMDs on Vandenberg AFB since 1992 has demonstrated a relatively low incidence. The low number of overall reported WMDs could be due to under-reporting, and/or minimal ergonomic risk factor exposure. Following the guidelines in this directive for WMD surveillance will lead to a realistic perspective of the incidence of WMDs on the base. Prevention and intervention efforts can then be targeted.

1.5. Solving ergonomic problems in the workplace requires complete cooperation and resource allocation. It requires emphasis at all levels of command and responsibility. The fundamental issue, however, is very simple: If it's causing pain, it's a problem. Solutions to ergonomic problems are generally very straight-forward, and drawn from common sense. Simply stated with the primary goal in mind: Identify and then solve real and potential ergonomic problems as early as possible, and with available resources.

1.6. The base Ergonomics Management Program includes back injury prevention. Back injuries are a unique ergonomic disorder; their prevention is managed the same way as prevention of WMDs.

1.7. An Ergonomic Site Support Visit was conducted on Vandenberg AFB on 9-11 May 95 by Air Force Ergonomic experts from Brooks Air Force Base. This visit was extremely helpful, and acted as tremendous catalyst to start Vandenberg's local program. The written summary of this visit is an excellent reference; a copy of it is kept in the Occupational Health section of the Public Health Flight. Specific recommendations given by the support visit staff should be followed. Key general recommendations given by the support visit staff have been incorporated in this instruction.

2. Responsibilities:

---

No. of Printed Pages: XX

OPR: 30 MDG/SGPM

Approved by: Colonel John A Reyburn, Jr.

Distribution: F plus HQ AFSPC/SGP

Editor:

2.1. The Installation Commander will:

- 2.1.1. Establish an effective ergonomics management program
- 2.1.2. Appoint the Chief of Aerospace Medicine (30 MDG/SGP) as the Base Ergonomics Manager (BEM).

2.2. The BEM will:

- 2.2.1. Establish an Ergonomics Working Group, whose membership will at a minimum consist of a representative from each of the following sections: base safety, civilian personnel, union representative, physical therapy flight, public health flight, physical exams flight, bioenvironmental engineering flight, 30 MDG/CC and 30 AMDS/CC.
- 2.2.2. Oversee all ergonomic-related activities on the installation, including associated tenants.
- 2.2.3. Assist commanders in prioritizing projects and resources in order to make the best use of limited materiel and funds.
- 2.2.4. Establish a written, comprehensive ergonomics management plan to implement ergonomic related activities and to make the best use of resources.

2.3. Commanders will:

- 2.3.1. Appoint a representative to the Ergonomics Working Group, as requested by the Base Ergonomics Manager.
- 2.3.2. Ensure that all job activities in their units are reviewed annually to assess the potential for these activities to cause WMDs.

2.4. The Ergonomics Working Group (EWG) will:

- 2.4.1. Meet monthly, or as directed by the Base Ergonomics Manager.
- 2.4.2. Serve as a resource center for ergonomic initiatives, policies, regulations, books, catalogs, and other ordering or management information.
- 2.4.3. Develop specific goals and objectives for the base Ergonomics Management Program, and establish mechanisms to implement these goals and objectives. These mechanisms must be detailed, and provide procedures for worksite analysis, hazard prevention and control, medical management, and supervisor/worker education.
- 2.4.4. Establish procedures to record and track WMD cases, to prioritize ergonomic resources, to record training and education, and to record solutions implemented for specific ergonomic hazards.
- 2.4.5. Review and investigate all diagnosed ergonomic WMDs.
- 2.4.4. Review requests for workcenter engineering controls (reasonable accommodations) as needed.

2.5. 30th Medical Group will:

- 2.5.1. Provide personnel trained in ergonomics to conduct worksite evaluations.
- 2.5.2. Conduct epidemiological analysis of WMDs; identify potential ergonomic problem areas and tasks.
  - 2.5.2.1. Risk-order potential ergonomic problem areas and tasks.
- 2.5.3. Provide training and education for personnel working in high ergonomic risk areas.
- 2.5.4. Provide medical oversight of ergonomic cases.
- 2.5.5. Recommend specific conditioning, flexibility, and strength exercises for personnel in high ergonomic risk work areas.

2.6. Workcenter supervisors will:

- 2.6.1. Identify to the EWG all potential high-risk activities and tasks in the workcenter that relate to ergonomics.
- 2.6.2. Ensure ergonomics training is provided to applicable personnel.
- 2.6.3. Implement this instruction in the work center.
- 2.6.4. Implement ergonomic hazard prevention and control measures.

2.7. Vandenberg employees will:

- 2.7.1. Bring ergonomic concerns to their supervisor at any time, but preferably before there is a problem.

- 2.7.2. Seek prompt medical attention for any potential WMD.
- 2.7.3. Use and comply with engineering and administrative controls implemented in the workcenter for reducing and eliminating ergonomic hazards.
- 2.7.4. Follow medical recommendations given to reduce or eliminate real and potential work-related ergonomic injuries and illnesses.
- 2.7.5. Follow medical recommendations given to restrict or eliminate off duty tasks and hobbies that exacerbate work related ergonomic injuries and illnesses.

### 3. Procedures:

3.1. Procedures for Ergonomics Management Program address four main areas: worksite analysis, hazard prevention and control, medical management, and education. Effective implementation of this program requires high emphasis at every level of command and supervision. It may require redesign of workstations, purchase of ergonomically designed tools and equipment, changes in work practices and procedures, and recognition on the part of commanders and supervisors that short-term production goals cannot take precedence over the long-term health of employees.

3.2. Worksite Analysis: The purpose of worksite analysis is to identify high-risk jobs and tasks, and the specific risk factors associated with them. This identification process must involve workers, supervisors, commanders, and the EWG.

3.2.1. Commanders will provide an ergonomic survey (example, Atch 2) to all workcenter supervisors. Surveys will be conducted annually. Supervisors will review with employees all tasks performed in the workcenter in order to complete the survey. This will assist the EWG in prioritizing worksite analyses.

3.2.2. The EWG will develop systematic procedures, checklists, and other tools for accomplishing worksite analysis. The EWG will also review, at least quarterly, injury and illness logs kept by Public Health, Ground Safety, and Civilian Personnel for evidence of WMDs.

3.2.3. The EWG will distribute questionnaires to employees in high-risk jobs to assess symptoms of WMDs.

3.2.4. The actual worksite evaluation and analyses will be directed by the BEM. The BEM may choose to have a team from the EWG and/or the medical group perform the evaluation. Specific team members will be chosen, depending on training and experience. Evaluations may be conducted using direct observation, measurements, videotape review, photographs, etc. Data collected will undergo epidemiological analysis. The BEM will review and document each evaluation, and the conclusions or recommendations based on final analysis.

3.3. Hazard Prevention and Control: Prevention and control of ergonomic hazards will be accomplished through a combination of engineering controls, modified work practices, administrative controls, and protective equipment. Engineering controls are preferred whenever feasible.

3.3.1. Engineering controls are designed to fit the task to the person. Reasonable accommodations (redesign of workstation, work practice modification, special tool purchase or limited tool use, etc.) will be made to reduce or eliminate excessive exertion, repetitive motion, awkward postures, and other risk factors at work centers. Reasonable accommodations may be recommended for individuals by a health care provider.

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

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 number of employees assigned to a task, rotating employees to other tasks that are less stressful or that use different muscle-tendon groups, and providing standby/relief personnel to prevent overtime, or, to compensate for personnel on leave, TDY, etc.

3.3.4. Protective equipment is considered a last resort in the control of ergonomic hazards. Where appropriate, 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, will recommend appropriate controls as described above. Where engineering or design changes are critical, commanders and supervisors will take necessary action to implement recommendations.

3.4. Medical Management: Medical management of WMDs includes early evaluation, diagnosis, and treatment, and measures to prevent their occurrence. The BEM will develop and implement a medical management program for WMDs that at a minimum will include the following four elements:

3.4.1. Periodic workplace walk-through. These visits allow health care providers to maintain contact with employees, and enable them to remain familiar with work practices and procedures.

3.4.2. Symptom surveys. These are used to identify WMD 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 reporting CT symptoms to their supervisors or to health care providers.

3.4.3. Identification of restricted duty jobs. The BEM or a designated physician, will on a case-by-case basis, identify a list of jobs with low ergonomic risk in order to provide employees restricted duty (light duty) which allows injured muscle-tendon groups to rest. Restricted duty jobs will be tailored by the physician to the individual worker's signs and symptoms.

3.4.4. Health surveillance. The purpose of health surveillance is early detection of WMDs, and prevention of their progression to more severe, disabling conditions. The health surveillance includes the following:

3.4.4.1. Baseline Health Assessment. Prior to assignment to high ergonomic risk areas, as determined by the BEM, employees will 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.

3.4.4.2. Post-Conditioning Period Assessment. Employees assigned to high ergonomic risk areas will be trained by EWG Physical Therapy liaison in conditioning muscle-tendon groups prior to working at full capacity. This break-in period will be one month, or as specified by the BEM. At the end of this conditioning period, EWG Physical Therapy liaison will perform a follow-up assessment to determine if conditioning has been successful.

3.4.4.3. Periodic Health Assessments. Conduct periodic health assessments every three years for all employees assigned to high ergonomic risk areas, and any other employees identified by the BEM as requiring this assessment. This assessment will be similar to the baseline health assessment.

3.5. Education and Training.

3.5.1. The BEM will establish an ergonomics education and training program that includes employees, supervisors, and commanders. The program will ensure sufficient information is available, and ensure a minimum level of awareness.

3.5.1.1. Availability of information will be sufficient for personnel to understand types, causes, early symptoms and medical management of WMDs, the means of preventing and controlling ergonomic hazards, and ergonomic risk factors.

3.5.1.2. Minimum level of awareness will be provided to all workers, because of the diversity of office jobs and tasks with ergonomic risk. The BEM will design a training package and assist commanders and supervisors in providing training to employees. Training will be documented on each employee's AF Form 55, Employee Safety and Health Record.

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

OFFICIAL

JUDD E. BLAISDELL, Colonel, USAF  
Commander

XXXXXXXXXXXXXXXX USAF  
Chief, Base Information Management

2 Attachments:

1. Ergonomic Terms and Definitions
2. Work Area Ergonomic Evaluation

**ERGONOMIC TERMS AND DEFINITIONS**

**Ergonomics:** Includes the study of physiological responses to physically demanding work; environmental stresses 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.

**Work-Related Musculoskeletal Disorder:** Terms often used for work-related musculoskeletal disorders (WMDs) include cumulative trauma disorders, repetitive strain illnesses and repetitive motion disorders. OSHA defines WMDs as an injury or illness of the muscles, tendons, ligaments, peripheral nerves, joints, cartilage, bones, and supporting blood vessels in either the upper or lower extremities, or back, which are associated with workplace risk factors, and which are not the result of acute or instantaneous events (e.g. slips or falls). This refers collectively to signs, or persistent symptoms, or clinically diagnosed WMDs when they are caused or aggravated by exposure to workplace risk factors.

**Cumulative Trauma (CT):** Continuous application of slight to moderate physical stress over extended periods of time, often resulting in damage to muscles, tendons, joints, nerves, and other soft tissues.

**Carpal Tunnel Syndrome (CTS):** A common wrist/forearm pain syndrome due to soft tissue swelling and resultant compression of the median nerve. Suspected cases of CTS should be confirmed by nerve conduction tests.

**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 are the outcome - pain and/or discomfort, and high incidence of occupational disorders.

**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.

**Static Loading:** Body segments are motionless or prevented from changing positions. This causes muscle fatigue and decreased blood flow.

**Fundamental principles of ergonomics:**

1. The human body has limitations which should be considered in the design of any tool, workplace, or product.
2. Individuals possess different limitations. Good design takes into consideration the diversity of potential users.
3. Musculoskeletal injury is possible when human capabilities are exceeded.

**Ergonomic Risk Factors:** Attributes, experiences, and exposures that increase the probability of occurrence of WMDs. Risk factors include:

1. Excessive force
2. Awkward/extreme work postures
3. Repetitive motions
4. Contact stresses
5. Vibrations.
6. Temperature extremes
7. Poor lighting
8. Unassisted manual material handling (lifting, pulling, pushing, carrying)
9. High concentration of stress
10. Static loading

WORK AREA ERGONOMIC EVALUATION (Supervisor Assessment)

SQUADRON: \_\_\_\_\_ SHOP: \_\_\_\_\_ SUPERVISOR: \_\_\_\_\_  
OFFICE SYMBOL: \_\_\_\_\_ EXTENSION: \_\_\_\_\_ EVALUATOR: \_\_\_\_\_

1. Number of Employees: Full Time: \_\_\_\_\_ Part Time: \_\_\_\_\_

2. Brief description of work in this shop:

QUESTIONS: Do any tasks require the following: YES NO

3. Repetitive motions (scanning, sanding, riveting...) for > 2 hrs at a time? \_\_\_\_\_  
If yes, describe: \_\_\_\_\_

4. Fixed or awkward postures (overhead work, bent neck, bend, stoop) for > 2 hrs at a time? \_\_\_\_\_  
If yes, describe: \_\_\_\_\_

5. Forceful hand exertions (crimpers, various tools) for > 2 hrs at a time? \_\_\_\_\_  
If yes, describe: \_\_\_\_\_

6. Vibration from hand tools or equipment (jackhammer, pneumatic sander) for > 2 hrs? \_\_\_\_\_  
If yes, describe: \_\_\_\_\_

7. Unassisted lifting of loads > 25 lbs? \_\_\_\_\_  
If yes, describe: \_\_\_\_\_

8. Do any tasks require manual material handling (lifting, pushing, pulling, carrying) > 2 hrs  
If yes, describe: \_\_\_\_\_

9. Excessive twisting of the body when performing tasks? \_\_\_\_\_

10. Gentle placement at the end of a lift (computer monitors, other delicate equipment)? \_\_\_\_\_

11. Workers to remain in one position for long uninterrupted periods of time? \_\_\_\_\_

12. \_\_\_\_\_

13. Workers to place hands or forearms along sharp edges of work surfaces (side of table)? \_\_\_\_\_

14. Workers to work in a cold environment, or use cold hand tools? \_\_\_\_\_

**WORK AREA ERGONOMIC EVALUATION - continued**

**OTHER QUESTIONS:**

- 15. Are work surfaces padded or modified to support wrists or forearms? \_\_\_\_\_
  - 16. Are step stools or foot rests available for shorter workers? \_\_\_\_\_
  - 17. Are concrete or tile floors padded at work stations (rubber mat)? \_\_\_\_\_
  - 18. Are tools available with different sizes of hand grips? \_\_\_\_\_
  - 19. Are tool hand grips angled or padded to keep neutral wrist position? \_\_\_\_\_
  - 20. Are work surfaces tilted toward the workers? \_\_\_\_\_
  - 21. Are the heights of work surfaces and chairs easily adjustable? \_\_\_\_\_
  - 22. Are protective gloves flexible enough to not affect job performance of tasks? \_\_\_\_\_
  - 23. Are workers rotated through tasks that have ergonomic risks (questions 1- 14) \_\_\_\_\_
23. Please note any additional ergonomic complaints which workers may have with this work area:

**OTHER COMMENTS:**

**SUPERVISOR'S SIGNATURE:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

**EVALUATOR SIGNATURE:** \_\_\_\_\_