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HEADQUARTERS, 101st AIRBORNE DIVISION (AIR ASSAULT) AND FORT CAMPBELL
2700 Indiana Avenue, Fort Campbell, Kentucky 42223-5656
16 November 2007

Medical Services
INSTALLATION ERGONOMICS PROGRAM

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1. Purpose

This regulation establishes the policy and procedures for the Installation Ergonomics Program. The Installation Ergonomics Program strives to prevent injuries and illness by eliminating or reducing worker exposure to ergonomic hazards resulting in work-related muscular-skeletal disorders (WMSDs). Benefits include:

- a. Preserving and protecting our military and civilian workforce while decreasing related costs.
- b. Reducing the potential for fatigue, error, and unsafe acts by adapting the job and workplace to the worker's capabilities and limitations.
- c. Abating workplace hazards or conditions that have caused or contributed to WMSDs in military and civilian personnel.
- d. Collecting data to track sentinel cases that may indicate high-risk trends in similar exposure groups (SEGs) for both civilian and military personnel.
- e. Appointing ergonomic monitors in each directorate and military unit to perform routine active surveillance and early intervention for their workers.
- f. Ensuring Occupational Safety and Health (OSH), Physical Therapy, Occupational Therapy, Occupational Health and/or clinic personnel assess work sites of personnel receiving medical treatment, and high risk groups.

2. References

See appendix A.

3. Background

- a. Ergonomic programs are essential elements of Occupational Safety and Health (OSH) programs as discussed in AR 40-5 and AR 385-10. An effective ergonomics program can:
 - (1) Prevent workplace injuries.
 - (2) Reduce medical and associated costs of ergonomic WMSDs.
 - (3) Preserve the fighting strength of the Armed Forces.
- b. The Fort Campbell Ergonomics program is based upon the following references:
 - (1) Department of the Army Pamphlet 40-21, Ergonomics Program, 15 August 2003.
 - (2) Occupational Safety and Health Administration (OSHA) final Ergonomics Program standard (29 CFR 1910.900). 29 CFR 1910.5 a (1) General Duty Clause.
 - (3) Rehabilitation Act of 1973, as amended by the Americans with Disabilities Act of 1990.
 - (4) Ergonomics Program Management Recommendations for General Industry from the OSHA Elements of Ergonomics Programs No 97-117, March 1997, National Institute of Occupational Safety and Health (NIOSH).
 - (5) Hands and Arms Evaluation, Brough and Associates, 1991, (upper extremity algorithm).

This regulation supersedes CAM Regulation 40-3 dated 25 October 2002.

- (6) Lifting: Evaluating Your Workplace, Brough and Associates, 1991 (back algorithm).

4. Scope

This regulation applies to the Fort Campbell installation.

5. Responsibilities and Procedures

All levels of employees (commander, manager, supervisor, worker and soldier) must enter a collaborative partnership to achieve the purpose and goals of the Installation Ergonomics Program. Commanders and managers must demonstrate visible involvement, motivation and commitment of resources to implement an effective ergonomics policy. AR 385-10, chapters 1 and 2, and AR 40-5, chapters 1 and 5, provide the general responsibilities of the ergonomics program component, and use the following procedures.

a. The Installation Commander will--

- (1) Integrate ergonomics into all phases of the Safety and Occupational Health (SOH) program.

- (2) Subject to availability, provide funding and other resources to carry out responsibilities in this regulation.

- (3) Take responsibility for the success or failure of the program.

- (4) Work with installation and tenant personnel, the unions, the public, and the appropriate regulatory authorities to effectively address ergonomics issues.

- (5) Designate the Installation Ergonomics Officer (IEO) and members of the ergonomics subcommittee, with advice from the installation medical authority (IMA).

- (6) Provide funding for local ergonomic training programs, resource materials, and static equipment displays Self Service Supply Center (SSSC), building 5210, to increase the accessibility of trained personnel and equipment to the workforce.

b. The Installation Medical Authority will--

- (1) Be responsible to the Installation Commander for all medical aspects of the OSH program per AR 40-5, paragraph 1-4i.

- (2) Advise the Installation Commander on appropriate individuals for membership on the ergonomics subcommittee.

c. The IEO will--

- (1) Come from available medical assets or other available installation personnel, as appropriate, and must have received at least 40 hours of formal training in ergonomics.

- (2) Chair the ergonomics subcommittee, providing an interface between the ergonomics subcommittee and the SOH advisory council.

- (3) Develop and implement the installation ergonomics plan, with the assistance of the ergonomics subcommittee and approval of the SOH advisory council.

- (4) Ensure completion of a regular (at least semiannually) evaluation and review of the ergonomics program.

- (5) Present at least a semiannual review to the SOH advisory council.

- (6) Ensure accurate record keeping of ergonomics subcommittee reports.

- (7) Identify and recommend acceptable ergonomic furniture and other items from various sources of supply (GSA, commercial vendors, etc.) to assist activities in procuring required ergonomic items.

d. The ergonomics subcommittee (see appendix B) will--

- (1) Under the installation SOH advisory council, assist in developing and implementing the installation ergonomics plan.

- (2) Oversee and participate in:

- (a) Gathering and evaluating injury, lost work time, trends, productivity, and complaint data on worksites and work processes;

- (b) Identifying existing and potential ergonomic hazards;

- (c) Conducting worksite evaluations;

- (d) Setting priorities for identified ergonomic hazard abatement;

- (e) Implementing corrective action; and

- (f) Providing appropriate worker training.

- (3) Develop methods to evaluate the effectiveness of the corrective actions and document the results.

- (4) Provide at least semiannual reports to the installation SOH advisory council.

e. Personnel of the Industrial Hygiene Section, Preventive Medicine Service, Medical Department Activity (MEDDAC), will--

- (1) Consider ergonomic hazards resulting in WMSDs during routine worksite evaluations.

- (a) Assist in solving identified ergonomic problems associated with WMSDs.
- (b) Keep accurate records of identified ergonomic hazards associated with WMSDs and solutions, and provide these records to the ergonomics subcommittee for review and tracking.
- (c) Assist in ergonomics training and education for employees, during routine worksite evaluations.
- (2) Provide at least one representative from their staff to serve on the ergonomic subcommittee.
- (3) Conduct local ergonomic monitor training courses IAW Center for Health Promotion and Preventive Medicine (CHPPM) guidance for monitor certification if CHPPM personnel are not available.
- f. Installation Safety Office.
 - (1) All Installation and tenant safety personnel staff will--
 - (a) Oversee the safety aspects of the ergonomics effort.
 - (b) Coordinate the annual Standard Army Safety and Occupational Health Inspection by OSH Program Personnel.
 - (c) Maintain appropriate records, including the installation Log of Federal Occupational Injuries and Illnesses, or equivalent, and the OSH Hazard Abatement Log.
 - (d) Review injury and illness records related to ergonomic problems, develop trend analysis, and report results to the ergonomics subcommittee.
 - (e) Assist with ergonomics training and education for employees during routine worksite evaluations.
 - (2) At least one representative from the Installation Safety Office will serve as a member on the ergonomics subcommittee.
 - (3) Conduct local ergonomic monitor training courses IAW Center for Health Promotion and Preventive Medicine (CHPPM) guidance for monitor certification if CHPPM personnel are not available.
- g. Personnel of the Occupational Health Section, Preventive Medicine Service, MEDDAC, will--
 - (1) Develop a written protocol for the early recognition, evaluation, treatment, and follow-up for employees with ergonomic WMSDs disorders (appendix C, paragraph 2, provides most of the structure and content of this protocol).
 - (2) Develop and conduct baseline medical screening for new employees.
 - (3) Assist trained ergonomics personnel in the identification of light or restricted duty jobs.
 - (4) Make specific recommendations to the Civilian Personnel Advisory Center or unit on the assignment of injured workers to light or restricted duty jobs. [See appendix C), for clarification on light or restricted duty.]
 - (5) Provide employee training and education.
 - (6) Ensure a representative from specific health care areas (for example, nurse, occupational and physical therapists, physician, and physician assistant) serves on the ergonomics subcommittee.
- h. The Civilian Personnel Advisory Center will--
 - (1) Use local medical treatment facility, occupational health program, health care personnel, and ergonomics subcommittee recommendations and concerns in the employment placement office.
 - (2) Ensure newly appointed supervisors, managers, and employees receive appropriate ergonomics training.
 - (3) Maintain the installation log of lost duty time as a result of injury or illness and provide this information for review by the ergonomics subcommittee.
 - (4) Appoint at least one representative to serve on the ergonomics subcommittee. This may be the Federal Employee Compensation Act (FECA) coordinator or other appropriate personnel.
- i. The Director of Information Technology Business Center will:
 - (1) Ensure the integration of ergonomic considerations into the purchase of new equipment.
 - (2) Integrate ergonomic considerations into workstation modifications.
 - (3) Implement recommendations to eliminate or reduce ergonomics risks.
 - (4) Prevent and correct ergonomic hazards through job and workstation design and proper maintenance.
 - (5) Appoint an advisory or support representative to serve on the ergonomics subcommittee
- j. The Directorate of Logistics will:
 - (1) Ensure integration of ergonomic considerations into the purchase of new equipment.
 - (2) Implement recommendations to reduce ergonomic hazards when feasible.
 - (3) Consult with the ergonomics subcommittee and trained ergonomics personnel to assist in the evaluation of equipment and furniture for ergonomic design.
 - (4) Appoint an advisory or support representative to serve on the ergonomics subcommittee.
- k. All Civilian directors will:
 - (1) Provide at least one trained ergonomic monitor to assist directorate staff with routine interventions and assessments.
 - (2) Ensure active surveillance is conducted throughout their area of responsibility annually.

- (3) Appoint an advisory or support representative to serve on the ergonomics subcommittee.
 - (4) Ensure the integration of ergonomic considerations into the purchase of new equipment.
 - (5) Integrate ergonomic considerations into workstation modifications.
 - (6) Implement recommendations to eliminate or reduce risks associated with WMSDs.
 - (7) Prevent, correct and eliminate hazards through administrative controls, job and workstation design, proper maintenance, and workplace assessment.
 - (8) Consult with the ergonomics subcommittee and trained ergonomics personnel to assist in the evaluation of equipment, furniture and workplaces.
 - (9) Purchase high cost items such as articulated chairs when supported by assessments indicating elevated risks to personnel based on medical treatment, production or exertion rates for either individual patients or similar exposure groups.
- l. The Director of Public Works will, in addition to the above duties:
 - (1) Integrate ergonomic considerations into facility modifications and construction.
 - (2) Implement recommendations to eliminate or reduce ergonomics risks.
 - (3) Appoint an advisory or support representative to serve on the ergonomics subcommittee.
 - (4) Ensure engineers and maintenance personnel:
 - (a) Prevent and correct ergonomic hazards through job and workstation design and proper maintenance.
 - (b) Apply ergonomics concepts both in general and in regard to the specific conditions of the facility.
 - (5) Appoint an advisory or support representative from engineering and maintenance to serve on the ergonomics subcommittee.
 - m. Ergonomic monitors will:
 - (1) Train personnel in recognizing and reporting hazards associated with WMSDs.
 - (2) Maintain a list of all their work area locations and date surveyed.
 - (3) Conduct and record assessments using algorithm tools and assist employees in workstation adjustments, safe work practices, and equipment selection.
 - (4) Review work areas at least once a year and report results to the ergonomics committee.
 - (5) Refer non-routine requests for assistance beyond their level of experience or expertise to OSH personnel.
 - (6) Provide records to OSH personnel when requested.
 - n. Union representatives will:
 - (1) Serve as a member of the ergonomics subcommittee.
 - (2) Ensure that key personnel recognize and report ergonomic hazards.
 - (3) Ensure that the American Federal Government Employee Union, Local 2022, is offered the opportunity to appoint an advisory or support member.
 - (4) Accompany OSH personnel on employee workplace assessments, in accordance with the Collective Bargaining Agreement (CBA), Article 6, Sec. 6-3c; Article 29, Sec. 29-6.
 - o. Supervisors will ensure employees:
 - (1) Follow safe work practices.
 - (2) Recognize and correct hazardous work practices.
 - (3) Recognize and report early symptoms of potential ergonomic disorders.
 - (4) Routinely review areas for potential ergonomic risks.
 - (5) Coordinate with the ergonomics subcommittee and trained ergonomics, safety, and health personnel to reduce risks and support the overall ergonomics effort.
 - (6) Maintain an effective schedule for facility, equipment and tool maintenance, adjustments, and modifications.
 - (7) Ensure measurable safety performance standards are included in all employee and supervisor performance evaluations.
 - p. Supervisors will:
 - (1) Provide general training to employees at an initial orientation and when responsibilities change to identify work place hazards and early symptoms of WMSDs.
 - (2) Provide specific hands-on training to employees which include the proper operating procedures and adjustments for all tools and equipment and safe work practices.
 - (3) Learn to recognize common symptoms of musculoskeletal ergonomic disorders WMSDs and follow the guidance in the health care management section in appendix C. This includes:
 - (a) Reporting diagnosed WMSDs on a CA-2, as soon as identified, and provide to the Workers Compensation Program Administrator.

- (b) Ensuring that symptomatic soldiers and civilian employees report for a medical evaluation in a timely manner, strictly avoiding disincentives for employee reporting.
- (c) Providing light or restricted duty assignments to allow injured muscle-tendon groups time to rest, assisting in the healing process per the guidance found in appendix C.
- (d) Support ergonomics monitors and OSH personnel and strive to prevent and control ergonomic hazards associated with WMSDs using the tools and guidance in appendix C, to include providing employees the training necessary for them to recognize risk factors and empower them to assist in the design of their work area to avoid and eliminate work-related musculoskeletal disorders (WMSDs).
- (e) Avoid surge workload assignments with a short suspense. Distributing work assignments reduces hand and back over-use and the potential for the development of scar tissue.
- q. Military and civilian personnel will:
 - (1) Modify work practices as recommended.
 - (2) Notify supervisors of potential ergonomic hazards in the workplace.
 - (3) Recognize and report symptoms early.
 - (4) Participate in the medical surveillance program.
 - (5) Perform recommended conditioning exercises and activities.
 - (6) Actively participate in the suggestion process.
- r. The staff of the Occupational Therapy and Physical Therapy Clinics, MEDDAC, will:
 - (1) Ensure workplace hazards are minimized for symptomatic personnel by performing evaluations or making referrals to OSH personnel. Participate in workplace evaluation.
 - (2) Assist in providing employee training and education.
 - (3) Provide statistics related to patient treatment of WMSDs to the ergonomics committee. Data will include MOS, unit, suspected source/process or other factors contributing to current condition.

FOR THE COMMANDER:



THOMAS D. VAIL
Colonel, GS
Chief of Staff

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Appendix A References

AR 40-5

Preventive Medicine.

AR 385-10

The Army Safety Program.

AR 385-40

Accident Reporting and Records.

AR 690-800

Insurance and Annuities.

AR 40-10

Health Hazard Assessment Program.

DODI 6055.1

DOD Occupational Safety and Health Program.

EO 12196

Occupational Safety and Health Programs for Federal Employees.

PL 91-596

Occupational Safety and Health Act of 1970, as amended (29 USC 651, et seq.) (1976).

TB MED 503

The Army Industrial Hygiene Program.

29 CFR 1910.5 (a) (1) General Duty Clause.

29 CFR 1960

Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters. (Available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.)

American National Standards Institute. (1993) Control of Cumulative Trauma Disorders – ANSI Z-365 Draft. National Safety Council (NSC), Itasca, IL. (Available at cost from NSC, P.O. Box 558, Itasca, IL 60143-0429.)

Rehabilitation Act of 1973, as amended by the Americans with Disabilities Act of 1990.

Chapanis, A., 1991. To Communicate the Human Factors Message, You Have to Know What the Message Is and How to Communicate It. Human Factors Society Bulletin, Vol 34 (11): 1-4.

Directorate of Civilian Personnel and Installation Safety, 1992. A Supervisors Guide to the Civilian Resource Conservation Program. (Available from the Directorate of Civilian Personnel and Installation Safety, Fort McPherson, Georgia.)

Revised NIOSH Equation for the Design and Evaluation of Manual Lifting Tasks. (Available from National Institute for Occupational Safety and Health (NIOSH), 4676 Columbian Parkway, Cincinnati, OH 45226.)

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Rice, V. J., and Sind, P.M. (1991, June). Ergonomics Worksites Risk Analysis Workshop (handbook). Presented at the American Occupational Therapy Association Annual Conference: Cincinnati, Ohio.

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U.S. Department of Labor, OSHA. 1991. Ergonomics Program.

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Elements of Ergonomics Programs No 97-117, March 1997, National Institute of Occupational Safety and Health (NIOSH).

Hands and Arms Evaluation, Brough and Associates, 1991, (upper extremity algorithm).

Lifting: Evaluating Your Workplace, Brough and Associates, 1991(back algorithm).

CA-1

Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation.

CA-2

Notice of Occupational Disease and Claim for Compensation.

CA-16

Authorization for Examination and/or Treatment.

CA-17

Duty Status Report.

DA Form 285

U.S. Army Accident Report.

DA Form 3075

Occupational Health Daily Log.

DA Form 3076

Army Occupational Health Report.

OSH Hazard Abatement Log.

OSHA No. 200

Bureau of Labor Statistics Log and Summary of Occupational Injuries and Illnesses.

SF 600

Health Record-Chronological Record of Medical Care.

Log of Federal Occupational Injuries and Illnesses. (Available from the office of Federal Agency Programs, 200 Constitution Avenue, N.W., Washington, D.C. 20210).

Appendix B Recommended Membership of the Ergonomics Subcommittee

B-1. Chairperson

The IEO will--

- a. Serve as chairperson of the ergonomics subcommittee.
- b. Be appointed by the Installation Commander with consult from the IMA.
- c. Will come from available medical assets or other available installation personnel as appropriate. They must have received at least 40 hours of formal training in ergonomics. A representative from Physical or Occupational Therapy is suggested as the Chairperson for more effective integration of the military patient population.

B-2. Membership

All subcommittee members should receive appropriate ergonomics training as discussed in appendix C, paragraph C-5. The ergonomics subcommittee should include, but need not be limited to, representatives of the following offices:

- a. Core membership.
 - (1) Blanchfield Army Community Hospital (nurses, occupational and physical therapists, physicians, physician assistants, and other trained medical personnel).
 - (2) Industrial Hygiene Office.
 - (3) Installation Safety Office.
 - (4) Union Representative.
 - (5) Civilian Personnel Office Advisory Center.
 - (6) Chief, Occupational Therapy, MEDDAC.
 - (7) Chief, Physical Therapy, MEDDAC.
- b. Support and Advisory Membership.
 - (1) Directorate of Public Works Business Center.
 - (2) Directorate of Logistics.
 - (3) Directorate of Contracting.
 - (4) Community Activities Business Center.
 - (5) Directorate of Information Management.
 - (6) Mission Resource Management Office.
 - (7) Brigade Level Unit Representatives.

Appendix C Program Guidance

C-1. Ergonomics Program Component

a. Research identifies the following as specific workplace conditions that can contribute to the development of ergonomic WMSDs disorders:

- (1) Repetitive motions (especially during prolonged activities).
- (2) Sustained or awkward postures.
- (3) Excessive bending or twisting of the wrist.
- (4) Continued elbow or shoulder elevation (for example, overhead work).
- (5) Forceful exertions (especially in an awkward posture).
- (6) Excessive use of small muscle groups (for example, pinch grip).
- (7) Acceleration and velocity of dynamic motions.
- (8) Vibration.
- (9) Mechanical compression.
- (10) Restrictive workstations (for example, inadequate clearances).
- (11) Improper seating or support.
- (12) Poorly designed hand tools and work stations.
- (13) Machine-pacing and production-based incentives.
- (14) Extreme temperatures and poor lighting.
- (15) Prolonged exposure to noise.

b. The combined effect of several risk factors in one job or workstation may lead to a higher probability of causing an ergonomic disorder.

C-2. Worksite Analysis

a. Problem Identification. Identification of jobs or worksites with ergonomic WMSD risk factors can be accomplished using the following procedures of systematic passive and active surveillance:

(1) Systematic passive surveillance involves the analysis of data provided in existing monthly or quarterly reports. This analysis can identify ergonomic problems, set intervention priorities, and organize the ergonomics effort. Sources of data include:

- (a) Routine injury and illness reports.
- (b) OSHA No. 200 (Bureau of Labor Statistics Log and Summary of Occupational Injuries and Illnesses) or equivalent.
- (c) FECA claims.
- (d) Medical and safety records.
- (e) Workforce reports and suggestions.
- (f) Physical Therapy, Occupational Therapy or Occupational Health referrals.

(2) Systematic active surveillance involves focused and pro-active efforts to gather information about Ergonomic workplace hazards at worksites and identify workers at risk of developing a cumulative trauma disorder. Active surveillance can be performed by directorate and unit ergonomic monitors in conjunction with regular training, or industrial hygiene and safety surveys.

(3) Systematic active surveillance should be performed at all worksites at least once per year. Walkthrough surveys should also be performed for any new or significantly changed job, process, equipment, or method.

b. Examples of active surveillance procedures include:

(1) Questionnaires and surveys. Supervisor and worker questionnaires and symptom or body part discomfort surveys provide information about ergonomic cumulative trauma hazards, often before actual injuries occur.

(2) Observation.

(a) Direct observation by trained directorate and unit ergonomics personnel conducting regular surveys and recording results with algorithm tools such as Hands and Arms Evaluation, Brough and Associates, 1991 or Lifting: Evaluating Your Workplace, Brough and Associates, 1991.

(b) Routine walk-through Industrial Hygiene, Defense Occupational and Environmental Health Readiness System (DOEHRS) surveys, Health Hazard Information Module (HHIM), or Standard Army Safety and Occupational Health Inspection (SASOHI) surveys, can identify ergonomic hazards. Worker interviewed during

these surveys, can identify tasks or situations that are uncomfortable and may indicate ergonomic injury risks. For example, workers know that cold temperatures make it difficult to grip hand tools.

(c). Sentinel event or incident reporting. Specific health or performance events symptoms, such as wrist pain, back pain, or increased errors, may be indicative of ergonomic cumulative trauma injury risks. A specific reporting procedure should be used to facilitate reports.

c. Case referrals. Case referrals may be used to identify a work area with potential ergonomic injury risk of soft tissue injury or ergonomic disorders cumulative trauma. For example, a laboratory technician seeks medical care for hand and wrist pain and provides an occupational history that indicates possible worksite risk factors.

(1) Health care personnel who are treating a patient with a suspected WMSD, should request a worksite evaluation for the patient through the IEO and the ergonomics subcommittee or through Preventive Medicine. Trained safety or industrial hygiene personnel, together with health care personnel, should conduct the worksite evaluation.

(2) Flow diagrams depicting the handling of traumatic injury and occupational disease and illness are available in the Center for Health Promotion and Preventive Medicine Technical Guide 220.

(3) In many cases, corrections to the ergonomic eliminating/reducing hazards resulting in WMSDs are simple, quick, on-the-spot workplace changes. Ergonomics personnel conducting regular walk-through surveys can identify and implement the solution immediately. Paragraph C-3 provides information on ergonomic hazard prevention and control. More complex problems will require prioritization and detailed analyses.

(4) If a worksite or job is identified as high risk, special medical surveillance may be indicated.

e. Prioritization. Worksites should be prioritized for detailed analyses based on the passive and active surveillance information. The prioritization may be based on incidence rates, the number of workers affected, direct costs, lost work time, or severity of cases. Calculate incidence and prevalence rate by unit, work section, or job series to identify high risk areas. Use FECA claims information to identify high cost injuries and high risk work areas.

f. Detailed Analysis.

(1) Detailed analysis is necessary for further evaluation of those jobs or worksites having ergonomic cumulative trauma risk factors as determined by systematic passive and active surveillance. When conducting the detailed analysis, trained ergonomics personnel should systematically:

(2) Consider the concept of multiple causation and the degree of ergonomic risk;

(3) Look for trends, including age, gender, work task, and time of injury;

(4) Identify the work tasks or portions of the process that contain risk factors; and

(5) Identify both problems and solutions.

g. The following data, analysis tools, and methods may be helpful during a detailed analysis:

(1) Incidence rates (OSHA No. 200 or equivalent), accident and injury reports, and lost work time or absenteeism reports by job, unit, department or facility.

(2) Checklists, questionnaires, and interviews.

(3) Direct observation, videotape analysis, and job analyses.

(4) Tests.

(5) Revised NIOSH Equation for the Design and Evaluation of Manual Lifting Tasks.

(6) Static and dynamic strength testing.

(7) Energy expenditure evaluation.

(8) Timed activity analysis.

(9) Biomechanical analysis.

(10) Cardiovascular or metabolic measurements.

C-3. Prevention and Control of Ergonomic Hazards

a. Intervention Hierarchy. The primary method of preventing and controlling exposure to ergonomic hazards resulting in WMSDs is through effective design (or redesign) of a job or worksite. Intervention methods are defined, in order of priority, in subparagraphs b-g below.

b. Process Elimination. Elimination of the ergonomically demanding process essentially eradicates the hazard. For example, eliminate a meat wrapper's need to use a manual tape dispenser and label applicator by providing an automatic label and tape dispenser.

c. Engineering Controls. Ergonomic engineering controls redesign the equipment or worksite to fit the limitations and capabilities of workers. Equipment or worksite redesign typically offers a permanent solution. For example, provide a visual display terminal workstation that can be adjusted to a wide range of anthropometric dimensions.

d. Substitution. Substituting a new work process or tool (without ergonomic hazards) ergonomically designed for a work process/tool with identified ergonomic hazards proven deficiencies can effectively eliminate the hazard. For example, replace hand tools that require awkward wrist positions (extreme wrist flexion, extension, or deviation) with tools that allow a neutral wrist posture.

e. Work Practices. Practices that decrease worker exposure to ergonomic cumulative trauma risks include changing work techniques, providing employee conditioning programs, and regularly monitoring work practices. It also includes equipment maintenance, adjustment, and modification of current equipment and tools, as necessary.

(1) Proper work techniques include methods that encourage correct posture, use of proper body mechanics, appropriate use and maintenance of hand and power tools, and correct use of equipment and workstations.

(2) Employee conditioning refers to the use of a conditioning or break-in period. New and returning employees may need gradual integration into a full workload, depending on the job and on the employee. Supervisors, trained ergonomics personnel, and health care personnel should identify those jobs that require a break-in period. Health care personnel should evaluate those employees returning from a health-related absence and define the break-in period for each individual employee.

(3) Regular monitoring of an operation helps to ensure proper work practices and to confirm that the work practices do not contribute to cumulative trauma injury or hazardous risk factors.

(4) Effective schedules for facility, equipment and tool maintenance, adjustments, and modifications will reduce ergonomic hazards. This includes ensuring proper working conditions, having sufficient replacement tools to facilitate maintenance, and ensuring effective housekeeping programs. Tool and equipment maintenance may also include vibration monitoring.

f. Administrative Controls. Administrative controls can be used to limit the duration, frequency, and severity of exposure to ergonomic hazards. Examples of administrative controls include, but are not limited to:

(1) Reducing the number of repetitions by decreasing production rate requirements and limiting overtime work.

(2) Reducing the number and speed of repetitions by reducing decreasing line or production speed by having , thereby promoting worker input in determining into production speed (that is, using worker-based rather than machine-based production speed).

(3) Providing rest breaks to relieve fatigued muscle-tendon groups. Determine the length of the rest break by the effort required, total cycle time, and the muscle-tendon group involved.

(4) Increasing the number of employees assigned to the task (for example, lifting in teams rather than individually).

(5) Instituting job rotation as a preventive measure, with the goal of alleviating physical fatigue and stress to a particular set of muscles and tendons. Do not use job rotation in response to symptom development in all employees involved in rotation schedule rather than preventing problems. Trained ergonomics and health care personnel should conduct an analysis of the jobs used in the rotation schedule.

(6) Providing light or restricted duty assignments to allow injured muscle-tendon groups time to rest, assisting in the healing process. Make every effort to provide light or restricted duty assignments when physical limitations (as identified by a health care provider) allow the worker to return to work performing less than his or her normal work requirements. In regard to light or restricted duty assignments:

(a) A health care provider should specifically identify assignments or job tasks for the individual worker based on his or her symptoms, capabilities, and limitations.

(b) Health care providers with specific knowledge in both occupational demands and cumulative trauma injuries should cooperate with trained ergonomics personnel to develop a list of jobs with low ergonomic risk for soft tissue injury.

(c) Job descriptions for each light duty position should be written. Civilian personnel representatives and supervisors, in conjunction with health care personnel, should identify light duty positions and write job descriptions for light restricted duty positions that conform to documented requirements. The job description for each light duty position should include ergonomic soft tissue trauma risk factors and muscle-tendon groups required to perform the job.

g. Personal Protective Equipment (PPE). PPE is not necessarily recommended for controlling exposure to ergonomic cumulative trauma hazards, as little research has been conducted to support claims of their usefulness.

(1) Ergonomic appliances, such as wrist rest, back belts, back braces, etc., are not considered to be PPE. Before purchasing such devices, discuss their effectiveness with trained ergonomics personnel.

(2) Consider ergonomic hazards when selecting PPE. The PPE should:

(a) Be available in a variety of sizes;

(b) Accommodate the physical requirements of the worker and the job;

- (c) Not contribute to ergonomic hazards resulting in cumulative trauma damage in soft tissues.

C-4. Health Care Management

a. Early Evaluation of Patients. Early recognition and medical management of ergonomic disorders WMSDs are critical to reduce the impact of injury on both the employee and the employer.

(1) Common symptoms of musculoskeletal ergonomic disorders WMSDs can include (but are not limited to): pain, tingling, numbness, stiffness, and weakness in the neck, shoulders, arms, hands, back, and legs. Other symptoms can include headaches, visual fatigue, and increased errors.

(2) Soldiers and employees with symptoms of ergonomic cumulative trauma disorders should report to medical personnel for an evaluation.

(a) Active duty soldiers should report to their primary care provider and request work-place surveillance from OSH personnel.

(b) Civilian employees should report to Occupational Health with the appropriate forms: CA-2 for all ergonomic disorders WMSDs except back injuries which require CA-1 and CA-16.

(3) Supervisors should ensure that symptomatic soldiers and civilian employees report for a medical evaluation in a timely manner.

(4) Disincentives for employee reporting must be avoided.

b. Medical Evaluation. The initial medical evaluation of a patient with a possible ergonomic disorder WMSD should include a detailed medical occupational history and a physical examination. Health care personnel should:

(1) Complete a medical and occupational history that includes:

(a) Military occupational specialty or job title and number of years and months at the job.

(b) Prior work history.

(c) Detailed description of current job tasks and amount of time normally spent on each task.

(d) Detailed description of symptoms to include location character (such as burning, sharp, dull, pins and needles), severity, onset, duration, exacerbating and relieving factors.

(e) Lost time or limited duty due to symptoms.

(f) Prior evaluation, diagnosis, and treatment of symptoms.

(g) Other existing medical conditions and history of trauma and surgery.

(h) Activities and hobbies outside of work.

(i) Current medications.

(2) Conduct a physical examination that includes, but need not be limited to:

(a) Appearance (swelling, muscle atrophy, erythema ecchymosis).

(b) Range of motion and muscle strength.

(c) Neurologic assessment (motor, sensory, reflexes).

(d) Vascular assessment (pulses, capillary refill).

(e) Evaluation for pain and tenderness.

(f) Special tests, such as median nerve percussion (Tinel's sign) and the wrist flexion test (Phalen's test) when appropriate.

(3) Perform additional testing as indicated, such as nerve conduction velocities, laboratory tests, and radiographic procedures.

c. Treatment. Health care personnel should initiate appropriate treatment and rehabilitation as defined by current standards of medical practice. In general, try conservative therapy before invasive treatment.

(1) Supervisors, Civilian Personnel Advisory Center, and coworkers should encourage civilian employees with a suspected work-related ergonomic disorder WMSD to seek evaluation and treatment in an Army MTF where possible, according to AR 690-800, paragraph 810, subparagraph 6. Occupational Health personnel should coordinate with the Civilian Personnel Advisory Center and MEDDAC Patient Administration Division when there are questions about an employee's entitlement to care.

(2) Active duty soldiers with a suspected work-related ergonomic disorder WMSD, should be seen at Blanchfield Army Community Hospital.

d. Patient Work-place surveillance and light/restricted duty assignments. Health care personnel should request a work-area assessment by trained ergonomics OSH/IH personnel to ensure patients are not returning to unmitigated hazards and to recommend duty assignments that will not aggravate a patient's condition, as discussed in Appendix C.

e. Follow-up. Medical personnel should perform regular follow-up for patients being treated for ergonomically cumulative trauma-related injuries and illnesses, to monitor the efficacy of therapy and worksite intervention.

f. Medical Surveillance.

(1) A general screening medical surveillance program is not indicated for ergonomic injuries. Instead, use the methods of problem identification as described in paragraph 2. Health care personnel should:

(a) Conduct periodic, systematic worksite walk-through evaluations to remain knowledgeable about operations and work practices. A minimum of once every 6 months is suggested.

(b) Provide written documentation of the walk-through evaluation. Documentation should include date, area(s) visited, risk factors identified, and actions taken (if any). If prioritized follow-up is needed, it should also be documented.

(2) Special surveillance may be indicated for:

(a) Specific jobs where a high incidence of ergonomic injuries or illnesses cumulative trauma have been demonstrated; or

(b) Specific jobs that have been identified high risk based on systematic active surveillance and detailed analysis as discussed in paragraph 2.

(3) Baseline and periodic health assessment results should be maintained in employee's medical records.

Attention should be given to any changes that could indicate an ergonomic disorder WMSD.

g. Reporting Forms. Reporting occupational health, safety, and health care personnel should use the following forms to document work-related ergonomic disorders:

(1) OSHA No. 200 or equivalent.

(2) CA-2 [all cumulative trauma disorders (CTDs) except back injuries].

(3) CA-1, CA-16, CA-17 (Duty Status Report) (back injuries).

(4) SF 600 in the medical record.

(5) DA Form 3075.

(6) DA Form 285 for reporting military occupational illnesses according to AR 385-40, chapter 3-5.

h. Worksite Evaluation Referrals.

(1) Health care personnel who are treating a patient with a suspected work-related CTD should request a worksite evaluation for the patient through the IEO and the ergonomics subcommittee or Preventive Medicine. Trained Industrial Hygiene and Occupational Health ergonomics personnel shall conduct the worksite evaluation. Staff performing evaluations, together with health care personnel, should ensure abatement actions are effective for the patient.

(2) Flow diagrams depicting the handling of traumatic injury and occupational disease and illness are available from the United States Army Center for Health Promotion and Preventive Medicine (USCHPPM) Technical Guide 220.

C-5. Education and Training

a. The "train the trainer" concept administers training programs in a pyramid fashion.

(1) Ergonomic experts provide training to develop army certified trained ergonomics directorate and unit personnel ergonomic monitors.

(2) Trained ergonomic personnel monitors:

(a) Then train others at the installation level, including supervisors and workers.

(b) May also train special assistants, who can help with recognizing ergonomic soft tissue hazards in high risk or densely populated work-places. The special assistants may be representative from each department or division who assist other department members in recognizing and reporting ergonomic hazards.

b. Education.

(1) The IEO will have:

(a) A minimum of 40 hours of formal ergonomics training.

(b) Training and experience sufficient to identify ergonomic hazards and risk factors.

(2) Trained ergonomics personnel should have:

(a) A minimum of 40 hours of formal ergonomics training.

(b) Training and experience sufficient to identify ergonomic hazards and risk factors.

(3) Core ergonomics subcommittee members, support and advisory ergonomics subcommittee members, and installation-level personnel providing assistance in recognizing ergonomic hazards should have basic ergonomics training, to include elements listed in Appendix C, paragraph C-5 from trained ergonomics personnel.

c. Training. Personnel responsible for administering the program should receive appropriate special training.

Training is necessary for all levels of civilian employees and active duty soldiers to enable them to understand and recognize potential ergonomic cumulative trauma disorder risks hazards and actively participate in the ergonomics effort.

- (1) Personnel requiring training:
 - (a) All affected employees.
 - (b) Supervisors.
 - (c) Managers.
 - (d) Engineers and maintenance personnel
- (2) The instructor:
 - (a) Army certified ergonomics personnel should conduct training.
 - (b) Suitable health care personnel should conduct specific portions of training, such as those related to health risks.
- (3) Curriculum considerations. Trained ergonomics personnel should--
 - (a) Present training at a level appropriate to ensure audience comprehension.
 - (b) Include in the training curriculum an overview of:
 - (b.1) The potential risk of ergonomic WMSDs.
 - (b.2) The possible causes and symptoms.
 - (b.3) How to recognize and report symptoms.
 - (b.4) The means of prevention.
 - (b.5) The sources of treatment.
 - (c) Include methods for evaluating the effectiveness of the ergonomics effort, as discussed in paragraph C-6.
- (4) Types of training.
 - (a) General training. Employees who are potentially exposed to ergonomic hazards resulting in WMSD risks should receive formal instruction on hazards associated with their jobs and equipment. Employees should receive training at an initial orientation and annually thereafter.
 - (b) Specific training. New employees and reassigned workers should receive an initial orientation and hands-on training from trained ergonomics personnel and the immediate supervisor prior to being placed in a full production position. The initial orientation should include:
 - (b.1) A demonstration of the proper use and care of, and the proper operating procedures for, all tools and equipment.
 - (b.2) Use of safety equipment.
 - (b.3) Use of safe and proper work practices and procedures such as proper lifting techniques.

C-6. Ergonomics Program Evaluation

- a. Internal Evaluations. The IEO ensures evaluation of the ergonomics effort regarding program participation and effectiveness. Methods of measuring both of these elements are listed below:
 - (1) Program participation.
 - (a) Number of requests for ergonomic assistance by management occurring during a specified period. Directorates and military units with ergonomic monitors assigned.
 - (b) Number of employee suggestions related to ergonomics during a specified period. Directorates and military units with representation at the ergonomic committee.
 - (c) Number of education programs in ergonomics offered or number of personnel attending educational programs. CHPPM ergonomic certified OSH, medical treatment staff and key supply representatives.
 - (2) Program effectiveness, short-term goals. Work-related musculoskeletal disorders are the result of cumulative exposures over a period of time. Short term goals must be successfully executed for 5 or more consecutive years to reap long term goal results. Even a program that is immediately 100% effective cannot resolve scarring or other tissue damage that already exists in the worker population.
 - (a) Referrals of patients for work-place surveillance. Number of military/civilian patients treated for WMSD relative to the number referred for work place surveillance.
 - (b) Assessments by OSH/IH personnel for high risk workers. Number of detailed workplace analyses for identified military or civilian patients returning to work areas after receiving medical treatment/consult for WMSD or unresolved soft tissue pain/tingling.
 - (c) Completed abatement actions for Cohort group of sentinel worker. Number of abatement actions conducted for work areas/functions with two or more WMSD from the same source or production quotas indicative of high risk.
 - (d) Assessments by ergonomic monitors, generally lower risk. Number of directorates and military units with ergonomic monitors performing active surveillance for 50% or more of their respective areas.
 - (e) Directorate involvement in training. Number of directorates that had worker and supervisor ergonomic training classes and number of personnel in attendance.

(f) Credit for multiple courses convened in a unit/directorate. Total number of training classes conducted during the reporting period.

(g) Increase in the footprint of trained ergonomic personnel. Base: worker to certified monitor ratio (10,000+ to one). Decrease the worker- to-certified ergonomic monitor ratio by conducting local army courses.

(g.1) Number of general or systematic identifications of potential ergonomic hazards.

(g.2) Number of detailed analyses conducted.

(g.3) Number of high priority listings relating to ergonomics.

(3) Program effectiveness, long term goals:

(a) Change in the incidence rate of ergonomically cumulative trauma disorder (CTD) related FECA claims or dollar amount of new FECA claims within a particular period.

(b) Change in the incidence rate of ergonomically related CTD illness or injury reports filed for military and for civilians.

(c) Change in the incidence rate of ergonomically related CTD illness or injury by department or unit.

(d) Change in the incidence rate of lost or restricted duty time due to ergonomically related CTD illness or injury.

(e) Change in the number of new job reassignments to ergonomically related CTD illness or injury.

(f) Change in productivity or production costs that can be attributed to ergonomic interventions. In some cases, there may be an increase in illness or injury reporting at the start of an ergonomics program due to increased employee and supervisor awareness. This reporting rate decreases as the program becomes established.

(g) Identification of army-wide MOS prevalence rate data that can also be incorporated into risk assessments and assist in directing OSH inspections, resource assets, process and equipment review.

(h) Ensure incidence and prevalence rates by MOS or Job Series are available to OSH and IH staff to enable better prioritization of inspection workload.

b. Regular Evaluation and Review.

(1) The IEO and the ergonomics subcommittee will:

(a) Conduct at least a semiannual program evaluation and review.

(b) Present the results of this program evaluation and review to the installation OSH advisory council.

(c) Communicate the results of the program evaluation and review to top management and all workplace personnel.

(2) The program evaluation assesses the implementation, progress, and effectiveness of the ergonomics plan. It should include:

(a) Summary progress report or program update.

(b) Plans, goals, and accomplishments for the program as a whole and by the critical program elements cited in Appendix C, paragraph C-6. Accomplishments should include intervention results in terms of incidence rate changes, productivity improvements, and economic results.

(c) Identification of trends, deficiencies, and corrective action needed.

(d) New or revised program goals, priorities, and time lines.

(3) The following information can be used to develop the evaluation and review.

(a) Analysis of trends in injury or illness rates according to:

(a.1) Health care facility sign-in logs.

(a.2) OSHA No. 200 or an equivalent log.

(a.3) Individual employee medical records.

(4) The Defense Occupational and Environmental Health Readiness Systems (DOEHRS) surveys and the Standard Army Safety and Occupational Health Inspections (SASOHI).

(a) Review of results of installation evaluations.

(b) Before and after surveys or evaluation of worksite improvements.

(c) Observation of work practices to determine the effect of training and education.

(d) Employee surveys or interviews conducted by department, job title, or work area to monitor trends.

Appendix D Terms

D-1. Anthropometry

The study of the physical dimensions of people, including size, breadth, girth, distance between anatomical points, and joint range of motion. This information is used in the design and analysis of workspaces, tools, and equipment.

D-2. Cumulative trauma disorders (CTDs)

Disorders of the musculoskeletal or nervous system that are the result of, or contributed to biomechanical risk factors. CTDs are a class of musculoskeletal disorders involving damage to the tendons, tendon sheaths, synovial lubrication of the tendon sheaths, and the related bones, muscles, and nerves. Synonymous terms include WMSD, repetitive motion injury, occupational overuse syndrome, and repetitive strain injury.

D-3. Equivalent civilian training

A minimum of 40 hours training covering WMSDs; workstation and job design; hand-tool design; current regulatory requirements and issues; analysis and design of manual materials handling tasks; analysis and design of the office environment; and conducting, analyzing, documenting, and presenting an ergonomic worksite evaluation, including hands-on experience.

D-4. Ergonomics

A body of knowledge about human abilities, human limitations, and other human characteristics that are relevant to the design of tools, machines, systems, tasks, jobs, and environments for safe, comfortable, and effective human use. The aim of the discipline is to fit the job to the person in order to—

- a.* Prevent the development of occupational injury or illness.
- b.* Reduce the potential for fatigue, error, or unsafe acts.
- c.* Increase effective, efficient work.

D-5. Ergonomics expert

An individual who—

- a.* Possesses a recognized degree or professional credentials in ergonomics or human factors engineering (typically a master's or doctorate degree).
- b.* Demonstrates the ability to identify and correct WMSDs in the workplace.
- c.* Teaches the 40-hour ergonomics course for trained ergonomics personnel.
- d.* Provides consultation only in cases in which trained ergonomics personnel are unable to solve identified problems. In most cases, an ergonomics expert will not be available at each installation.

D-6. Ergonomics team

Those responsible for identifying and correcting occupational hazards in the workplace, including trained ergonomics personnel, health care providers, industrial hygienists, safety personnel, engineers, and other support personnel, managers, and supervisors.

D-7. Health care personnel

Physicians, chiropractic physicians, nurses, occupational therapists, physical therapists, physician assistants, and other health care professionals and their related, supervised technicians (for example, certified occupational therapy assistants and licensed practical nurses). Health care personnel participating in the ergonomics program should have training in basic ergonomics and epidemiology and be up-to-date in the systematic recognition, evaluation, treatment, and rehabilitation of WMSDs.

D-8. Microtrauma

A series of minor stresses to the body, each of which alone does not cause discernible damage; however, their accumulation over time can lead to WMSDs. These disorders (injuries or syndromes) are also known as CTDs, overuse disorders, repetitive motion injuries, repetitive strain injuries, and occupational motion-related injuries.

D-9. Occupational hazards

Workplace conditions that may harm the worker; improperly designed workstations; tools and equipment; improper work methods; and excessive tool or equipment vibration. Other examples include aspects of work flow, line speed, posture, force required, work and rest regimens, and repetition rates.

D-10. Occupational illness and injury

To be recorded as an occupational illness or injury, the condition must be diagnosed by a physician or other person who, by training or experience, is capable of making such a determination (such as an occupational therapist, physical therapist, physician assistant, registered nurse, or nurse practitioner). Note that DOL requires physician diagnosis for FECA claim submission. In order to be classified as an occupational injury or illness for FECA purposes, the condition must be accepted by DOL as causally related to work. To be classified as an occupational illness or injury, the condition must meet the following criteria:

a. Either physical findings or subjective symptoms must exist, that is, at least one physical finding (for example, positive Tinel's, Phalen's, or Finkelstein's test; swelling, redness, or deformity; or loss of motion or strength) or at least one subjective symptom (for example, pain, numbness, tingling, aching, stiffness, or burning).

b. At least one of the following response actions must occur: medical treatment (including self-administered treatment if made available to personnel by their employer), lost or restricted work activity, or transfer or rotation to another job.

c. WMSDs must be associated with repeated trauma, and exposure at work must have caused or contributed to the onset of symptoms or aggravated existing symptoms.

D-11. Pinch grip

A grip that involves one or more fingers and the thumb.

D-12. Sentinel event

When one individual in a group of workers who are performing similar job functions demonstrates adverse effects from exposure to WMSD risk factors, that individual may be considered to be the most susceptible worker in the group. The occurrence of an injury or illness in that individual has been identified as a sentinel event, with the scientific concern that other individuals in the group will soon demonstrate adverse effects from the same, unmitigated risk factor exposure.

D-13. Trained ergonomics personnel

Health care, industrial hygiene, environmental science, safety, or engineering personnel with approved training in ergonomics. Minimum acceptable training for installation-level trained ergonomics personnel is the basic 40-hour ergonomics course offered by USACHPPM or equivalent civilian training.

D-14. Working community

All members of the work environment, at all levels of authority. It consists of major command commanders, installation commanders, medical commanders, the designated IEO, identified ergonomics personnel, health care personnel, safety personnel, human resources personnel, contracting support personnel, public works personnel, logistics personnel, union representatives, tenant activities representatives, unit commanders, supervisors, and active-duty military and civilian personnel. For the program to be successful, all members of the working community must be considered equal and must share the commitment to ergonomics.

D-15. Work-related musculoskeletal disorders (WMSDs)

The range of health problems arising from repeated stress to the body encountered in the workplace. These health problems may also affect the nervous, neuromuscular and neurovascular systems. WMSDs may include the various occupationally induced cumulative trauma injuries and repetitive motion disorders involving damage to tendons, tendon sheaths, synovial lubrication of the tendon sheaths, bones, muscles, and nerves of the hands, wrists, elbows, shoulders, neck, back, and legs. Some WMSDs that are reported include chronic back pain, carpal tunnel syndrome, DeQuervains disease, epicondylitis (tennis elbow), Raynaud's syndrome (whitefinger), synovitis, tenosynovitis, stenosing, tenosynovitis crepitans (trigger finger), and tendinitis.

D-16. Worksite

A work area or work environment.

D-17. Workstation

An individual person's work area, such as a desk, chair, and computer terminal or an individual inspection station.

Appendix E

Abbreviations

This publication uses the following abbreviations, brevity codes, and acronyms not contained in AR 310–50. These include use for ergonomic programs, workplace injuries, and other health-related activities.

CTD

Cumulative Trauma Disorder

FECA

Federal Employee Compensation Act

IEO

Installation Ergonomics Officer

IH

Industrial Hygiene

NIOSH

National Institute for Occupational Safety and Health

OSH

Occupational Safety and Health

OSHA

Occupational Safety and Health Administration

PPE

Personal Protective Equipment

RAC

Risk Assessment Code

USACHPPM

U.S. Army Center for Health Promotion and Preventive Medicine

WMSD

Work-related Musculoskeletal Disorder(s)