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## Ergonomics Program

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## **I. INTRODUCTION**

The Ergonomics Program at the University of North Dakota (UND) exists to effectively plan and implement principles of ergonomics towards the provision of a rewarding, healthy, and productive workplace for all personnel. The Ergonomic Program at the University of North Dakota is designed to allow and foster personnel involvement as much as possible.

Requirements contained within this program apply to all UND personnel, contractors, vendors, and visitors while at UND or UND controlled sites. Contractors may use their own ergonomics program provided it meets the requirements of this program. When working at non-UND controlled sites, UND personnel must either follow the site-controllers program or this program, whichever is more stringent.

Identification of the ergonomic stressors and risk factors that are linked to the development of musculoskeletal disorders and cumulative trauma disorders (CTDs) is an important aspect of the Ergonomic Program. Risk factors are job attributes or exposures that increase the probability of the occurrence of CTDs. The greater the exposure is to a single factor or a combination of factors, the greater is the risk of the development of a CTD. The existence of a risk factor does not necessarily mean an employee performing a job is at excessive risk of injury. Risk factors may pose minimal risk of injury if exposure is minimized and if sufficient recovery time is provided. Proper preventative measures will control the risk.

## **II. PURPOSE**

Ergonomics is the study of the relationship between people, their work, and their physical work environment. The major goal of ergonomics is to fit the job to the individual.

The purpose of this Ergonomics Program is to prevent the pain and suffering, as well as the institutional costs associated with ergonomic-related injuries. This is done through a combination of training, evaluation of workstations, work practices, and implementation of ergonomics control strategies including, but not limited to:

- A. Assess for and reduce cumulative trauma risk factors.
- B. Involve administration, supervisors, and personnel in ergonomic planning.
- C. Maintain appropriate claims management as it is related to workplace cumulative trauma injuries.
- D. Provide an ergonomic assessment with all Workers Compensation claims that appear to be the result of cumulative trauma/repetitive injury.
- E. Consider the cost effectiveness of ergonomic interventions.
- F. Identify resources to maintain knowledge of ergonomic trends and effective work practices.
- G. Guarantee the dynamic nature of the program, recognizing new ergonomic hazards, newly developed products, and research findings to help guide further planning and interventions for the ergonomics program.

## **III. POLICY**

UND strives to provide a safe and healthy environment for its students, faculty, staff, and visitors. Engineering and administrative controls, safe work practices, and the use of personal protective equipment remain the primary means of controlling work-related injuries. The information in this document represents the acceptable requirements regarding ergonomics. Affected persons must be trained in these procedures and strictly adhere to them except when doing so would expose the person to a greater hazard. A person's failure to follow the policies and procedures outlined in this document could lead to disciplinary action, up to and including termination.

#### IV. REFERENCES

- A. Center for Disease Control and Prevention. Department of Health and Human Services. 29 Apr. 2005. <<http://www.cdc.gov>>.
- B. Ergonomics and Musculoskeletal Disorders. National Institute for Occupational Safety and Health. 29 Apr. 2005. <<http://www.cdc.gov/niosh/topics/ergonomics/>>.
- C. National Institute of Occupational Safety and Health. 2002. 29 Apr. 2005. <<http://www.niosh.com.my/>>.
- D. Personal Workstation Checklist. 16 Dec. 1999. University Health Systems, University of California. 4 Feb. 2000. <<http://www.uhs.berkeley.edu/FacStaff/Ergonomics/>>.

#### V. DEFINITIONS

- A. **Administrative Controls:** Interventions aimed at reducing exposure to ergonomic hazards without making actual physical changes to the workstation itself. Examples of administrative controls are as follows:
  - 1. Job rotation
  - 2. Rest breaks
  - 3. Job enlargement
  - 4. Overtime limits
  - 5. Staffing levels
  - 6. Cross-training
- B. **Awkward Posture:** Deviation from the ideal neutral working posture of elbows at the side of the torso, wrists hanging naturally and neutral. Awkward postures include reaching behind, twisting, forward or backward bending, pinching and low bending or squatting.
- C. **Continuous Work:** These are work activities that are uninterrupted, do not provide regular breaks, or are sustained in quality and practice. Continuous work, especially when the work is demanding, results in earlier fatigue than does intermittent work.
- D. **Engineering Controls:** Actual physical changes to the workstations, equipment, materials, or facilities that contribute to a reduction in risk factor exposure.
- E. **Ergonomics:** Invented in the early 1950s by a group of scientists and engineers interested in the relationship between people and machine. There are two principles to ergonomics: fitting the person to the job and fitting the job to the person.
- F. **Essential Job Functions:** Job functions and tasks that are primary in nature and required for a specific position.

- G. **Fatigue:** The reduction in ability, caused by a period of excessive work followed by inadequate recovery or rest time. Muscle fatigue results in a buildup of lactic acid in the muscle.
- H. **Job:** A job consists of one or more tasks that are performed during a workday. Usually similar sets of tasks are performed on a daily basis. Jobs are sometimes described by tasks or groups of tasks such as machine operation, shipping, catering, or maintenance.
- I. **Job Restriction:** Documentation of job restrictions involves decisions about what work activities are appropriate for a returning injured or ill person. Identified restrictions may be either temporary or permanent. The physician, nurse practitioner, physician's assistant or physical therapist determines what restrictions are to be in place. Specific tasks or jobs that would aggravate the illness or injury are designated as not suitable for that person. The restrictions are in place as long as the condition exists, but are updated on a regular basis. Additional job tasks may be allowable as recovery progresses. There may be differences in obligations the employer has regarding the availability of restricted duty with a work-related injury compared to a non work-related injury or an illness.
- J. **Job Stress Factor:** Any feature of a job that has a potentially harmful effect on the worker, also called a risk factor, job specific.
- K. **Medical Management:** The effective use of available health-care resources and claims management to facilitate return to work programs and prevent work-related musculoskeletal disorders.
- L. **Neutral Posture/Position:** Refers to the resting position of each joint, the position in which there is the least tension or pressure on nerves, tendons, muscles and bones. It is also the position in which muscles are at their resting length, neither contracted nor stretched. Muscles at this length can develop maximum force most efficiently. One aspect of ergonomic redesign is the reworking of tools, work stations and processes to allow the worker's joints to remain in neutral position as much as possible.
- M. **Occupational Injury:** Any injury, such as a laceration, burn, sprain, fracture or any other incident etc., which results from a work accident or from a harmful exposure in the workplace.
- N. **Occupational Illness:** An abnormal condition or disorder other than resulting from a specific occupational injury. It is likely caused by exposure to environmental factors associated with employment. It includes acute and chronic illnesses or diseases which may be caused by inhalation, absorption, ingestion, or direct contact.
- O. **Pinch Grip:** The hand grasps the top edge of a container or object with the thumb on one side and the fingers on the other. Suitable for light loads only.
- P. **Power Grip:** The hand is wrapped around a handle with the end of the thumb overlapping the finger.
- Q. **Reasonable Accommodation:** Making existing facilities accessible to disabled personnel through a variety of possible modifications including but not limited to scheduling flexibility, equipment modifications, and assistance in transportation/mobility.
- R. **Recovery:** Periods of reduced exposure to physical stress. These may be in the form of formal rest breaks, pauses in work activity, or motions and exertions that provide specific body areas the opportunity to recover from their work tasks.
- S. **Repetitiveness:** Constantly repeating a certain sequence of movements. Injury can result when the tissues involved (skin, muscle, tendons, joints, etc.) do the same motion over and over without rest periods between extended time frames of activity.

- T. **Risk Factors:** A job stress that may exceed human limitations. Multiple risk factors can exist with a single job task.
- U. **Static Load:** Work involving prolonged sitting or standing with joints held in fixed positions.
- V. **Task:** A subunit of a job or group of activities that accomplishes the work objective or job.
- W. **Work Enlargement:** An administrative strategy for decreased exposures to job stressors and risk factors giving a worker a more varied work routine.
- X. **Workforce Safety and Insurance (WSI):** WSI administers North Dakota's Workers Compensation Program. WSI promotes workplace safety by assisting employers in providing safe work environments for their workers. Benefits of WSI coverage include payment of medical, disability (wage replacement), vocational rehabilitation (if medically and vocationally necessary), impairment, and death benefits.
- Y. **Work-Related CTD's:** CTD's (cumulative trauma disorders) can be identified as work-related when work contributes significantly to their causation, aggravation, or precipitation.
- Z. **Workstation:** The workspace occupied by a specific worker. It may include office equipment, worktables, benches, stools, chairs, desks, conveyers, loading devices, etc.

## VI. RESPONSIBILITIES

### A. Safety and Environmental Health

1. Develop and implement training programs to educate supervisors and personnel about ergonomic risk factors, the potential harm to their bodies, and the need for, and the methods of early reporting of musculoskeletal disorder signs and symptoms.
2. Perform ergonomic risk factor measurements and observations and communicate results to supervisors.
3. Prioritize ergonomic evaluations based on available severity, prevalence, and incident rate data.
4. Coordinate the development of ergonomic risk factor reporting and case tracking mechanisms, and early sign/symptoms reporting.
5. Review all incident reports and identify any ergonomic trends.
6. Manage Workers Compensation claims for affected personnel
7. Maintain records of ergonomic assessments and incidents.

### B. Supervisors/Department Chairs

1. Responsible for recognizing ergonomic hazards within the department and contacting Environmental Health and Safety for assistance.
2. Ensure that all "worksite evaluation" recommendations are given reasonable review and acted upon accordingly.
3. Provide funding to implement corrective measures to identified ergonomic risk factor exposures.
4. Set a departmental climate which encourages active participation.
5. Encourage early reporting of signs and symptoms of musculoskeletal disorders.
6. Ensure that the proper level of ergonomics training is provided to all personnel.

### C. Personnel

Every individual on campus may be impacted by musculoskeletal disorders and their related discomfort and potentially disabling effects. Personnel must communicate with their supervisors to identify areas of improvement needed and changes that involve budget considerations. Although ergonomics assessments are available through the ergonomic program, personnel must learn to work in partnership with their supervisors in the identification and solution of ergonomic issues. All personnel must:

1. Adjust their worksite/job operation to fit their work needs.
2. Vary their work tasks throughout the day.
3. Stretch at their workstations throughout the day.
4. Report early signs and symptoms of musculoskeletal disorders.
5. Follow work practice procedures related to their jobs that are intended to reduce ergonomic risks.
6. Actively participate in the recognition, analysis, and abatement of ergonomic risks.

## **VII. STEPS TO BE TAKEN BY ALL PERSONNEL**

A. Work in neutral postures: There is increased stress on the body when awkward positions are maintained and this increases the difficulty of a particular task.

1. A normal “S-curve” should be maintained with the spine.
2. The elbows should be held naturally at the side of the body.
3. The wrists should be in a neutral position.

B. Reduce excessive force: Excessive force can overload the muscles, creating fatigue, and raising the possibility of a work-place injury.

1. Use a power grip whenever possible and consider mechanical assists when available.
2. Push carts and dollies, unless the cart is designed to be pulled. Pushing is more efficient than pulling.
3. Use items such as hoists, mechanical arms, dollies, etc. for heavy items.
4. Do not use hands or feet to strike objects, use mallets, hammers, or other appropriate tools.

C. Keep materials and tools within easy reach:

1. Keep frequently used items in close range.
2. Avoid reaching down into boxes. Set the box on one side, or work with containers with drop-down sides.
3. All personnel need to have a good understanding of their job tasks so it can be clearly identified which work objects/tools need to be used most often.

D. Work at appropriate height:

1. Work is generally done best at elbow height. If the work surface is not adjustable, an adjustable stool or chair should be used to make the appropriate adjustments.

2. Working at appropriate height is difficult when several people are using the same workstation. In some cases, a riser may be put in the workstation for shorter individuals.
3. Tilting the work surface allows work to be done at elbow height, while making it easier to see what is being done.

E. Reduce excessive motion:

1. Avoid tools that vibrate excessively.
2. Determine the most efficient layout possible whenever possible.
3. Take rest breaks when needed
4. Alternate repetitive activities.

F. Minimize fatigue and static load:

1. Reduce fatigue by spreading peak loads over time, adding staff, rotating with less demanding tasks, and taking short rest breaks.
2. Minimize periods of static load. Holding the same position for an extended period of time may eventually lead to pain and fatigue. Take breaks, or use mechanical methods for holding items.
3. Avoid “writer’s cramp.” After a pencil or pen or other small tool is held for an extended period of time without a break, the muscles will tire and begin to hurt. Prevention includes stopping to stretch, using a looser grip, and using a wider instrument.

G. Minimize pressure points:

1. Continued contact with a hard surface can lead to nerve dysfunction and decreased blood flow.
2. Use tools designed to avoid the need for pinch grips.
3. Use anti-fatigue mats where appropriate. Standing for long periods of time, especially on hard surfaces can damage tissue in the heels, contribute to other leg disorders, and increase fatigue.
4. In office stations, palm rests may be used intermittently to prevent extended contact with hard surfaces.

H. Provide clearance:

1. Maintain workspace with barrier free access. Lack of clearance can create bumping hazards or make it necessary to work in contorted postures.
2. Provide tall individuals with appropriate space. Re-organize equipment and shelves when needed.

I. Move, Exercise, and Stretch:

1. Jobs may have limited opportunities for movement and stretching. All personnel need to create opportunities for these activities throughout the work day. Several stretching exercises are given in Appendix C.

2. For heavy tasks, workers should warm up prior to engaging in the work activity. This is the same principle as when an athlete stretches out and warms up prior to the beginning of a competition.
3. When performing close up work or using a computer for an extended period, take occasional breaks for your eyes. Change focus to an object more than twenty feet away. Repeatedly switch focus from near to far helps stretch the eye muscles through their full range.

#### J. Back Safety

1. Do stretching and back exercises on the job to prevent injury and make the job easier.
2. There are back stressors for individuals who sit for long time periods in the work place. Maintain good posture and intermittently change positions to promote comfort and prevent injury.
3. Keep your knees slightly higher than your hips in a sitting position.
4. Assess the appropriateness of a lift and proper mechanics before attempting a lift.
5. Get assistance when necessary and use mechanical assistance when possible.
6. Turn to face the object you are about to lift.
7. Lift and unload slowly.
8. Avoid bending at your waist.
9. NEVER bend and twist at the same time. This action can cause severe disc injury.

### VIII. ERGONOMIC ASSESSMENTS

A. Types of Assessments: Currently there are two types of assessments performed at UND by the Ergonomics Coordinator: Workers Compensation when there is an ill or injured employee, and Preventative. An assessment similar to the Workers Compensation assessment would be conducted for illness or injury to personnel who are not UND employees, such as students or working visitors.

#### 1. Workers Compensation:

- a. Any time a cumulative trauma claim is filed; the Workers Compensation Claims Coordinator visits the injured employee and completes an ergonomic assessment, which is kept in the confidential Workers Compensation claim file.
- b. Following the assessment, the coordinator visits with both the employee and the supervisor to discuss possible changes in the workstation to correct any ergonomic problems.
- c. When requested by Work Force Safety and Insurance (WSI) or when the Workers Compensation Claims Coordinator wishes to submit the report as a part of its investigation of the claim, a copy of the ergonomic assessment will be sent to the WSI in Bismarck for their review.

#### 2. Preventative:

- a. UND personnel may request an ergonomic assessment from the Ergonomics Coordinator. These are done at no cost.
- b. Whenever an assessment is requested, the individual and his/her supervisor is made aware of the request and is informed of any recommendations made.
- c. Follow-up telephone calls and visits may be made after the implementation of the recommendations to see if changes have been effective.

B. Assessment: Checklists are included in Appendix A. The appropriate checklist should be used based on the type of work being done. Additional information for use of laptop computers is included in Appendix B.

C. Assessment goals:

1. Identification of Risk Factors:

- a. Employees provide information regarding their job tasks, amount of time needed to be devoted to each activity, and any concerns they have during the assessment process. In addition to their work practices, skills such as keyboarding and other tasks are observed during ergonomic assessments. This is done in a supportive and constructive manner and the employee is encouraged to ask questions during the assessment process.
- b. A job analysis is performed so that risk factors and hazards that exist can be recorded, and interventions to limit exposure can then be determined.
- c. The following list is not intended to be complete, but contains some common risk factors that should be looked for during an assessment:
  - i) Awkward Posture: Deviation from ideal working posture may include reaching behind, twisting, working overhead, etc.
  - ii) Force: Muscles in the body are responsible for producing force required to perform necessary activities.
  - iii) Extreme temperatures.
  - iv) Hand-arm vibration.
  - v) Poorly fitted gloves that reduce dexterity and feeling, resulting in a need to use stronger muscle force. Also poorly fitting gloves can fold, wrinkle, or bunch and form pressure points on various parts of the hand/wrist.
  - vi) Repetitiveness of tasks.
  - vii) Static loading.
  - viii) Heavy materials handling.
  - ix) Poor lighting.
  - x) Poorly designed tools.
  - xi) Poorly placed handles for carrying utensils.

2. Identification of a cumulative trauma or musculoskeletal disorder. The following information should be considered when determining if an ergonomic illness or injury exists:

- a. Symptoms that may indicate a cumulative trauma or musculoskeletal disorder: pain, stiffness, tingling in the hands, wrists, fingers, forearms, or elbows; weakness in a joint, pain or numbness that wakes an individual up during the night, localized fatigue or loss of strength, decreased coordination, swelling, skin rash, prolonged cough or congestion, fingers or toes turning white and clumsiness of the hands such as dropping things.
- b. Any time that one or more of these symptoms are reported to the supervisor, medical assessment is indicated. It is not appropriate for a supervisor to attempt to determine the nature of the problem.
- c. The cause of cumulative problems is not necessarily directly related to the occupation of the individual. There may be personal and home activities that contribute. The important thing in the work place is that risk factors are minimized and any symptoms that exist are reported early, regardless of contributing factors at work or at home.
- d. CTD's are sometimes called repetitive motion disorders. In addition to work-related issues, there are individual factors that can pre-dispose people to these problems. These include pre-existing neuropathy, peripheral circulatory disorders, reduced estrogen levels, small hand/wrist size, inexperience in job tasks, and high levels of personal stress. Other medical conditions that can lead to tendon damage are diabetes, rheumatoid arthritis, thyroid disease, and gout. Additional medical conditions that are sometimes correlated include pregnancy, birth control pills, and sudden weight gain.

### 3. Controls to Eliminate and Minimize Risk Factors

- a. Engineering Controls: When possible, these are the preferred type of controls and may have the greatest impact. These controls include the following:
  - i) Appropriate workstation design.
  - ii) Adjustable workstations.
  - iii) Full range of movement provided in workstation.
  - iv) Work methods should be designed to decrease static, extreme, and awkward postures.
  - v) Controls present to transport materials in a manner with minimized exposure to risk factors.
  - vi) Well-designed tools and proper fitting tools.
  - vii) Availability of different size and type of tool appropriate for the job assigned.
- b. Administrative Controls: These controls reduce the duration, frequency, and severity of exposures. Administrative controls are management-dictated work practices and policies. Examples of administrative controls are as follows:
  - i) Decreased production rate.
  - ii) Provision of rest breaks.
  - iii) Increased number of employees assigned to a group of tasks (increase staffing resources).
  - iv) Job rotation as a preventative measure.
  - v) Provision of sufficient relief personnel when needed.

- vi) Limiting the amount of allowable overtime.
  - vii) Training in the recognition of risk factors and instruction in work practices that will ease the work demand.
- c. Work Practice Controls: Procedures for safe and proper work that are understood and followed by managers, supervisors, and workers:
- i) Proper work technique.
  - ii) Employees should be in condition for their job positions.
  - iii) Regular monitoring of job performance at all levels of operation.
  - iv) Providing feedback when appropriate.
  - v) Enforcing policies and work instructions.
  - vi) Proving an appropriate new employee orientation period.
  - vii) Make appropriate modifications when indicated.

## **IX. REPORTING AND MANAGEMENT OF ERGONOMIC INJURIES OR ILLNESS**

- A. Office of Record: The Safety and Environmental Health Office is considered the office of record at UND regarding Ergonomics. Files are confidential and maintained according to identified record retention guidelines.
- B. Administrative Leadership: The Safety and Environmental Health Office has primary responsibility for the Ergonomics Program at UND providing training and education on a variety of ergonomic topics.
- C. Reporting an ergonomic injury or illness:
1. A report of an injury or illness that may be the result of cumulative trauma is made using the same procedure as any other incident report. The supervisor will be asked to complete a supervisor's investigation Incident Report per Safety and Environmental Health guidelines. This is the same form used for any work-related injury. However in this case, information related to the amount of time doing the activity on an uninterrupted basis, any awkward postures noted, and any aspects related to cumulative trauma need to be identified for further follow-up by the UND Workers Compensation Claims Coordinator.
  2. Through education efforts, it is important to outline the manner with which cumulative trauma symptoms are to be reported, the value of early reporting and indications that medical attention is advised (see Medical Management section). The employee, supervisor, and ergonomics coordinator work collaboratively to address any reported ergonomic difficulties.
- D. Medical Management: UND needs to make the best use of available health care resources in the management of cumulative trauma and all work-related injuries and illnesses. The ultimate goal is to assist the personnel in making timely progress towards a full recovery. To be successful, medical management requires communication and cooperation between all involved parties.
1. Listed here are the general goals of medical management:

- a. Prevention of injury and work-related illness.
  - b. Identification of signs and symptoms as soon as they occur.
  - c. Proper evaluation and treatment of injured workers.
  - d. Safe and timely return to work for injured workers.
  - e. Reduce direct costs of work-related injuries and decrease time loss and disability by retaining workers and providing modified duty.
  - f. Maintain contact with the care provider as appropriate throughout the entire process.
2. The Ergonomics Coordinator will implement a work-place ergonomic assessment to identify any risk factors present and recommend any needed improvements.
  3. Work restrictions, as a result of any cumulative trauma injury, are managed the same as for any other injury. The care provider determines work restrictions and the individual is not given responsibility for any job tasks that are outside of those restrictions. Restrictions are in effect for 24 hours a day. Administrative controls such as more frequent work breaks may be necessary for a period of time as the individual recovers.
  4. When appropriate, it is normal practice for the Ergonomics Coordinator to clarify restrictions with the care provider. In addition, information on the specific job tasks the injured individual normally performs may be discussed or provided in writing.
  5. When injuries do not seem to resolve, they may become chronic in nature. In these cases, the goal is to ensure the individual returns to work without further complications and to prevent disability.

#### E. Workers Compensation Claims by Employees:

1. For those cumulative trauma incidents that do become workers compensation claims, all policies that relate to workers compensation such as restrictions, communications with supervisors, contact with care providers, and completion of appropriate forms will be followed.
2. If there is a workers' compensation claim filed, the State Risk Management Office and WSI are informed through the filing process. The filing process is the responsibility of the Safety and Environmental Health Office.
3. At UND, medical management for workers compensation claims including repetitive strain injuries are managed internally by the University's Workers Compensation Claims Coordinator.
4. Employees are encouraged to communicate with the claims coordinator any time they have questions regarding their claim or assessing their workstation. Workers compensation and the Ergonomic Program are intended to be supportive processes that will assist employees in obtaining optimal medical care, appropriate workers compensation benefits, and helpful ergonomic consultations.
5. The return-to-work program encourages all involved to focus on what an employee can do, rather than what he or she cannot do. A positive supportive approach is essential.
6. The opportunity for and availability of modified duty at UND is explained.
7. When requested, or when part of a workers' compensation claim, the ergonomics coordinator may travel to visit an employee at a University facility located away from the main campus in Grand Forks.

## **X. OFFICE CHAIR INFORMATION AND TRIAL PROGRAM**

- A. The University, in collaboration with office furniture businesses in Grand Forks, offers UND personnel the opportunity to try out chairs prior to purchase. This will help the individual determine whether or not it is ergonomically helpful to them. The department does not need to make a commitment to purchase a chair before the trial. Delivery and use of the chair is free for the trial period, even if there is no purchase planned. It is recommended that the individual visit the vendor's place of business to look at the variety of chairs available before requesting a trial.
- B. In choosing a chair, degrees of flexion should be within the ranges listed below. Degrees of flexion are measured and evaluated during an ergonomic assessment, and the following ranges are acceptable:
  - 1. Thigh-Torso angle: Should not be less than 90 to 100 degrees.
  - 2. Between upper and lower legs: Should be 60 to 100 degrees.
  - 3. Between upper and lower arm: Neutral is 90 degrees. Acceptable range is 70 to 135.
- C. For additional information or assistance contact the Safety Office at 777-3341 or Purchasing at 777-2681.

## **XI. PROGRAM EVALUATION**

Evaluation of the ergonomics program is multi-faceted and dynamic. Components include the following:

- A. Service to personnel: The Ergonomics Program offers ergonomic assessments to UND personnel for the purpose of promoting comfort and preventing cumulative trauma.
- B. Service to supervisors and managers: Supervisors and managers often request ergonomic assessments in order to have purchases or purchase requests prioritized. Sometimes there is a difference between what is "needed" and what is "wanted." Supervisors may request an assessment in order to assist them in making purchasing decisions and identifying areas of most concern.
- C. Workers Compensation statistics: Initially, an increase in claims is expected due to heightened awareness of symptoms, but eventually this should level off. Following the initial increase, there should be a decrease in the incidence of cumulative trauma cases. In order to see if this is accurate, workers compensation statistics regarding cumulative trauma need to be analyzed.
- D. Difficult variables: In objective terms, it is difficult to separate contributing factors in an employee's home vs. work tasks. Both may contribute to cumulative trauma injuries.
- E. The evaluation of the Ergonomic Program needs to provide information on the cost/benefit ratio of the program.
- F. Consistent documentation of the Ergonomic Program is necessary. These records are locked in file cabinets at Safety and Environmental Health.

## **APPENDIX A: ERGONOMIC CHECKLISTS**

The following checklists should be used for performing ergonomic assessments.

1. Chair Adjustment
2. Computer and Office Workstation Adjustment (2 pages)
3. Work Habits
4. General Assessment Form (2 pages)

## UND Ergonomic Assessment Checklists

### 1. CHAIR ADJUSTMENT

	Yes	No*
Is your chair height adjustable?		
Does your chair support your lower back?		
Is there room between the front edge of the seat pan and the back of your knees?		
Can you easily reach your work without interference from the arms of your chair?		
Are your arms and shoulders relaxed without interference from the arms of your chair?		
When typing or using a mouse, are you able to keep your arms in a comfortable position without resting them on the armrests?		
Does your feet rest flat on the floor or footrest?		
Are your knees bent at approximately a 90 degree angle?		

Sitting with your feet flat on the floor (or supported by a footrest) will help support your spine. Having your thighs parallel to the seat with knees bent at approximately a 90 degree angle and having adequate clearance behind your knees, will keep the chair from interfering with the circulation to your legs.

If the back of your chair is adjustable, raise or lower it so that the contour of the chair provides maximum lumbar (lower back) support. If possible, adjust the tilt of the back rest to support your body in an upright position. A slight angle, either forward or back, is also acceptable. Adjust the chair according to what is most comfortable for you.

If your chair has arms, they should allow you to get close to your work without getting in the way. If you are typing, they should be at the height where they just barely contact your elbows when your arms are resting comfortably at your side. Chair arms should not force you to elevate your shoulders or wing your arms to the side.

\* If you answer “No” to any of the questions above, it may indicate a need for ergonomic modifications.

## UND Ergonomic Assessment Checklists

### 2. COMPUTER AND OFFICE WORKSTATION ADJUSTMENT

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Work Surface/Keyboard Adjustment	Yes	No*
With your chair adjusted properly, is your keyboard at approximately elbow level?		
Are your arms resting at your sides rather than stretched out in front of you?		
Are your shoulders relaxed and not elevated when you work at your work surface?		
When typing at your work surface, is there approximately a 90 degree angle between your forearms and upper arms?		
When typing at your work surface, are your wrists in line with your forearms and not bent upwards, downwards, or to one side or another?		
Is there at least two inches of clearance between the bottom of your work surface and the top of your thighs?		

Ideally, with your arms resting comfortably at your side, the home row of your keyboard (the row with letters a, s, d . . .) should be approximately elbow level. If your work surface is adjustable, start by adjusting your chair. Once that is at the proper height, then adjust the work surface. If your work surface is too high and cannot be adjusted, adjust the chair to bring your elbows to the home row level of the keyboard and support your feet with a footrest if necessary.

\* If you answer “No” to any of the questions above, it may indicate a need for ergonomics modifications.

Monitor Adjustment	Yes	No*
Is the viewing distance to your computer monitor somewhere between 16 and 24 inches?		
Is the top of your computer screen at or just below eye level?		
Is your computer monitor protected from excess glare?		
If you wear bifocals or trifocals, are you able to look at the monitor without tilting your head?		

Once your chair and work surface are properly adjusted, adjust your computer monitor so that the top of the screen is at or just below eye level.

People who wear bifocals or trifocals often end up tilting their heads back to read through the lower portion of their glasses. This can sometimes lead to neck, shoulder, and back discomfort. Lowering the computer monitor or purchasing glasses specifically designed for the viewing distance to your terminal screen can help alleviate this problem.

\* If you answer “No” to any of the questions above, it may indicate a need for ergonomics modifications.

## UND Ergonomic Assessment Checklists

### 2. COMPUTER AND OFFICE WORKSTATION ADJUSTMENT

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Work Station Accessory Arrangements	Yes	No*
Are your input devices (mouse, trackball, digitizing tablet) at the same level as your keyboard?		
Are your primary work materials/input devices located in front of you?		
Do you have enough room on your work surface for all your computer accessories?		
Are your most frequently accessed items (phone, manuals, etc.) easy to reach?		
Do you have an adjustable document holder to hold reference materials?		
Are you able to keep your arms from resting on any hard or square edges on your work surface?		
If a large percentage of your time involves using a phone, do you use a phone headset?		

Rectangular work surfaces often don't allow enough space for computers and related accessories. Keyboard trays or similar devices are one option to increase desk space. However, these devices can sometimes be too far away from your primary work surface, force you to reach for your mouse or other accessories, or put your mouse at a higher level than the keyboard. All of these problems may cause pain or discomfort to arms and shoulders. They may also interfere with the thigh clearance under your work surface. Corner work surfaces are often preferable because they provide additional depth and, since they wrap around you, place your accessories closer to you.

As you change tasks, remember to move primary materials/input devices in front of you. If you must frequently look at reference materials as your type, you should consider a document holder or slant board. Keep your head aligned over your spine to help prevent or relieve neck, shoulder, and back discomfort. If using a document holder, position it at the same height and distance as your monitor.

A padded wrist rest can help support your wrists in a straight and neutral position. This takes some of the load off your neck, shoulder, and back muscles, plus helps maintain circulation by keeping your arms off the hard edges of the work surface. Ideally, the wrist rest should be made of firm foam and constructed so that the pad height matches the front (toe) height of your keyboard.

Talking on the phone with the receiver cradled between your ear and neck can cause neck, shoulder, and back pain. A headset will allow you to maintain the spine in alignment while talking on the phone.

\* If you answer "No" to any of the questions above, it may indicate a need for ergonomic modifications.

## UND Ergonomic Assessment Checklists

### 3. WORK HABITS

	Yes	No*
Do you take short and frequent breaks throughout the day to reduce fatigue?		
Do you frequently change body positions while working?		
Do you provide your eyes with vision breaks every hour?		
Do you work fairly regular hours without a lot of overtime?		
Are you able to meet deadlines without excessive stress?		
Are you comfortable and free of pain while working?		

Periodic breaks help to alleviate fatigue and strain to your eyes and upper body. Taking a break does not mean that you have to stop working. Rather, it allows you to integrate other activities such as making phone calls, making copies, or talking with a co-worker.

Changing positions periodically helps maintain circulation and prevents putting pressure on any one area of the body for an extended period of time.

Working overtime or working under stress to meet deadlines, often adds to the pain or discomfort. In addition to taking breaks and changing positions periodically, you should pay attention to how your body responds to pain. Pain that goes away over night is usually a sign of fatigue. Pain that is continuous and doesn't go away overnight may indicate a more serious problem. If you experience continuous pain, notify your supervisor and call the UND Student Health at 777-3963 or Altru Occupational Health at 780-1947 for an appointment. It is much easier to treat a problem in its early stages. Ignoring pain could lead to chronic or serious injury.

Finally, develop good habits outside of work. While you may not be able to adjust all of the work surfaces at home, you may be able to make minor adjustments that are significant to your body. Good posture and good work habits are just as important outside of work, whether you're typing on your home computer, doing chores around the house, or involved in special projects or hobbies.

\* If you answer "No" to any of the questions above, it may indicate a need for ergonomic modifications.

**UND Ergonomic Assessment Checklists**

**4. GENERAL ASSESSMENT FORM**

<b>FORCE</b>	Yes	No	NA	COMMENTS
1. Are excessively heavy materials moved or handled?				
2. Are awkward or bulky materials moved or handled?				
3. Do employees have to push or pull heavy items?				
4. Do employees have to use high force to move materials or tools?				
5. Are employees required to lift materials at arm's reach?				
<b>REPETITION</b>	Yes	No	NA	COMMENTS
1. Does this task require a high volume of output to be completed in a short period of time?				
2. Is there high repetition of the same low back motion?				
3. Are materials handled more than once for the same task?				
4. Is the task overly labor-intensive?				
5. Is there only one person assigned to this task?				
<b>POSTURES AND POSITIONS</b>	Yes	No	NA	COMMENTS
1. Are employees able to work with their backs in natural alignment?				
2. Do employees have to reach for materials or equipment controls in a way that puts them into poor postures?				
3. If more than one employee uses the work station or equipment, is the workstation or equipment easily adjustable?				
4. Is equipment and workstations currently adjusted properly by the employee using them?				
5. Are there a combination of motions such as lifting and twisting?				
6. Does the task allow the employee to change from standing to sitting or from sitting to standing?				
7. If the employee sits at the desk, does the chair provide support to the lower back?				
8. Is the chair easily adjustable and is it currently adjusted property?				

**UND Ergonomic Assessment Checklists**

**4. GENERAL ASSESSMENT FORM**

<b>POSTURES AND POSITIONS</b>	Yes	No	NA	COMMENTS
9. If the person is working at a machine, is there a place to put finished materials at the same height as the machine?				
10. Is the material stored with the heaviest and/or most frequently used objects between the knees and the shoulders?				
11. If the employee is standing, is there a cushioned mat to stand on?				
12. If the employee is standing, is there a place for the employee to place one foot in a raised position with the knee bent?				
<b>OTHER</b>	Yes	No	NA	COMMENTS
1. Do employees have the opportunity to vary their tasks throughout the day?				
2. Can employees get assistance to perform heavy tasks?				
3. Are employees using proper body mechanics to move materials?				
4. Are employees periodically stretching throughout the day?				
5. Do employees stretch and warm up prior to starting work?				

## **APPENDIX B: LAPTOP COMPUTER USE**

Laptop or notebook computers have increased in use. Using notebooks/laptops offers a form of personal computing that is powerful, fast, and portable. However, using laptops presents unique ergonomic challenges that both the occasional laptop users and full-time users must be aware of.

Laptops may be the computer of choice for individuals who travel on a regular basis for business, need to work at more than one location, and/or prefer a small device that can accompany them wherever they go for business or pleasure. However, laptops have some design features that present unique ergonomic challenges.

When laptops are used primarily in the office with only occasional use away from the office environment, peripheral devices such as a regular sized mouse and regular keyboard could be attached. There are specially designed small stands/shelves that can be put under the laptop to make it reach a more desirable height. This will help promote neutral neck positioning.

The neck and shoulder positions are usually the ones most compromised during laptop use. The user may have to look “downward” and “round” the shoulders in order to see adequately what is on the screen. This makes neutral alignment nearly impossible.

Following is a list of suggestions to consider when using laptop computers (notebooks):

1. Use the notebook when needed but avoid extended work periods without rest, stretching, etc.
2. If using a laptop in a regular office station, elevate the notebook and use a docking station, full sized keyboard, and mouse.
3. Users may use tilt trays to promote a neutral wrist position. Check with vendors of laptop accessories to explore options.
4. Always use a stable chair when using a laptop computer. Avoid using hotel beds.
5. When using the notebook in an airplane, listen when use is allowed and place notebook on the take down tray.
6. Take a break from laptop activity when working without a regular mouse, keyboard, and tilt tray. For example, do simple stretching and flexibility exercises intermittently throughout the day.
7. Pay attention to the shoulders, neck, and upper muscle groups. These muscle fibers are at great risk for both cumulative and static position exposure. Do exercises as shoulder rolls, reversing the back curve, neck stretching, etc.
8. For individuals with large hands, it is especially important to include exercises for the fingers and wrists to compensate for the increased risk the skeletal size/keyboard may

present. Exercises may include alternating flexion and extension of the hand. Other exercises may include “shaking the hand” in all directions, and the “finger fan” where a fist is made following by release and immediate spreading of the fingers.

9. Avoid using laptop recreationally on business days when use has been heavy. No one can dictate what an individual does while off the job, but it will be helpful to avoid exposure to risk factors unnecessarily.

10. Do visual exercises focusing to the distance as with a regular computer.

Laptops can be an excellent method of computing and maintaining a business that a need to be “on the move” in order to grow. Many individuals are finding laptops help meet personal needs as well, and notebooks are no longer a novelty or unreasonable expenditure. By being aware of potential problems and following simple measures to avoid them, safe laptop computing is possible. By following simple guidelines of appropriate use, the benefits of laptops will be greater than the potential hazards of using them.

## **APPENDIX C: STRETCHING EXERCISES THAT CAN BE DONE IN THE WORKPLACE**

### **A. Guidelines on “How to Stretch.”**

1. Breathe and exhale deeply when doing any exercises.
2. Always stretch within comfortable limits, never to the point of pain.
3. Breathe slowly, rhythmically. Do not hold your breath.
4. Stretch slowly. The goal is a long sustained mild stretch. This will reduce tension and feelings of “tightness.”
5. Specific body areas may be targeted depending on what tasks are required.
6. A possible time span to hold a stretched position is approximately five to ten seconds.

### **B. Neck**

1. Lower ear to shoulder. Slowly roll chin on chest up to other shoulder and back again. Go separately to each direction. Do not make circular motions with the neck. Repeat this back and forth stretching exercise 5 times in each direction.
2. Turn head, look over shoulder. Hold 5 counts. Repeat 4 times each side.

### **C. Hands and wrists**

1. Circle wrists inward, then outward 10 times each direction.
2. Spread fingers wide, hold 5 counts and release. Repeat 5 times.
3. Grasp palm and fingers; gently bend back the opposite wrist. Hold 5 counts. Repeat this activity with the other wrist.
4. Press hands together at chest height. Lower hands toward lap until you feel stretch in wrists. Hold 5 counts.
5. Spread fingers wide. Do five times holding for 5 counts.
6. Gently pull thumb back and down until you feel the stretch. Hold 5 counts. Repeat with the other thumb.
7. Curl fingers into a fist starting with little finger. When you have completed the curl, the inside of the fisted hand should back the employee. Hold the hands in this position for five counts. Repeat this exercise 4-5 times.
8. Massage inside and outside of hand with thumb and fingers. Continue this to promote comfort and stretching. “Shake out” after completing the massaging activity.

### **D. Upper back and shoulders**

1. Move arms overhead in a sustained reaching motion. Repeat 10 times with each upper extremity.
2. Circle shoulders forward, then backward. Repeat 10 times each direction.

### **E. Lower back**

1. Bend to one side. Hold 10 counts. Repeat on other side.
2. Gently rotate body to each side (right, backwards, left, and forward). Hold 10 counts on each side.
3. Stand with hands supporting lower back. Gently arch your back backwards. Hold 5 counts. Repeat approximately 4-5 times. This exercise is sometimes called “reversing the curve.”