

An Introduction to the Ergonomic Risk Reduction Process

Boston Processing & Distribution Center

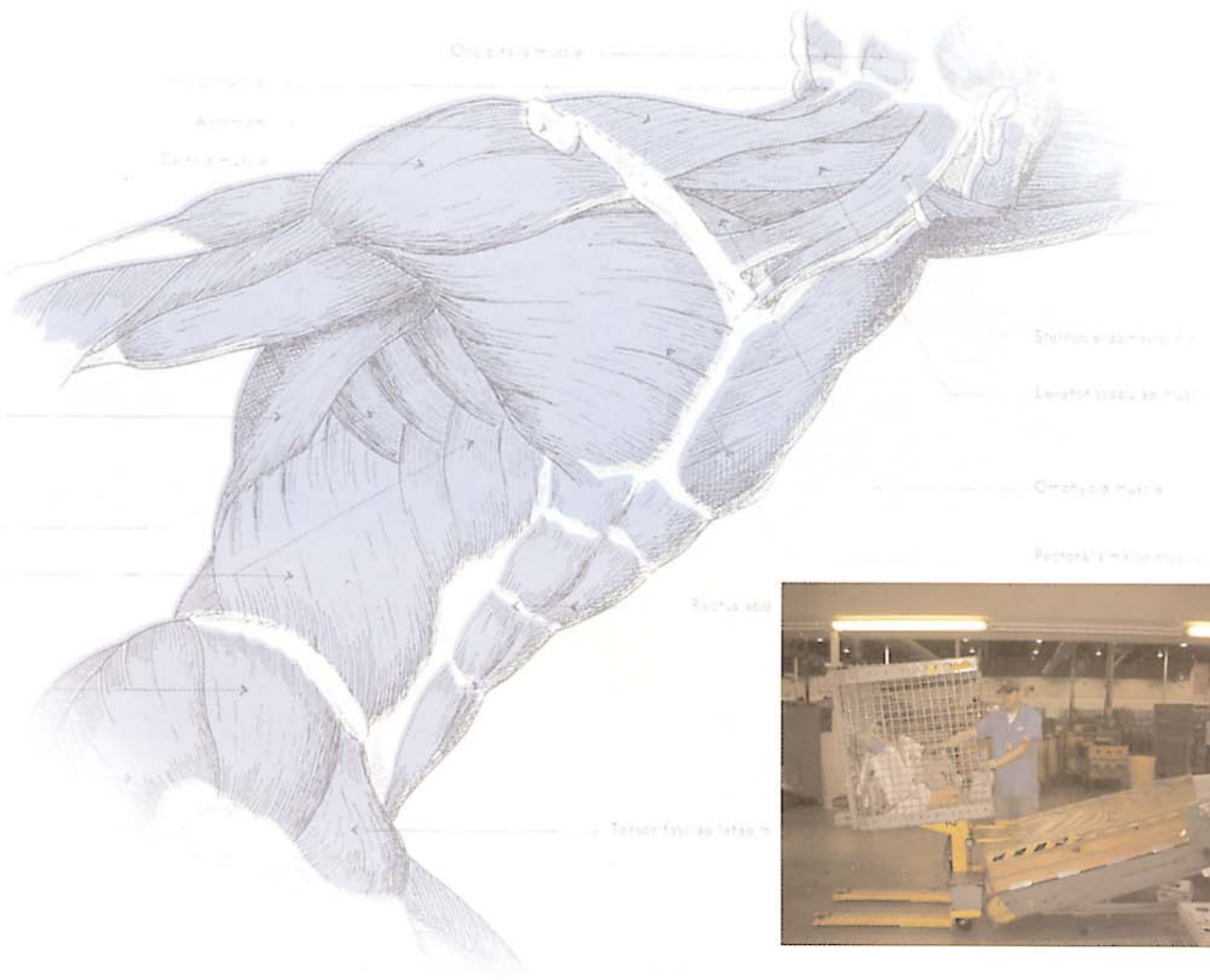


APWU
AMERICAN POSTAL WORKERS UNION, AFL-CIO



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USPS Tradition in Ergonomics

The Postal Service has a long history of attention to ergonomics. It started decades ago with the design of the height-adjustable bungee cord cloth hampers (to reduce the amount of bending) .

The Postal Service also created the rest bars, which provided an alternative to standing constantly in one position. Additional examples include:

- **Plastic pallets** - lighter weight;
- **Hamper tilter** - less bending;
- **Containerized truck trailers** - less lifting;
- **Flat Mail Carts** - less bending;
- **Tray Management System** - less material handling and less bending.

The current need is to expand on these centralized activities by initiating an ergonomics process at the facilities level. It is at the facilities level where you play an important role.

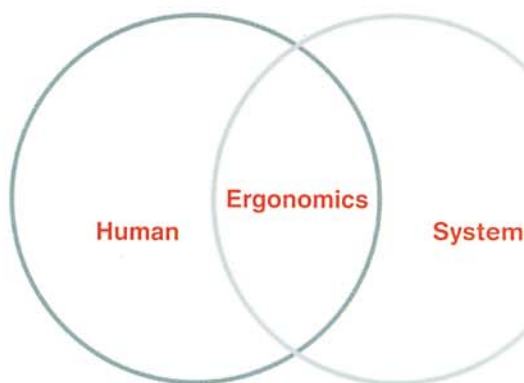
The purpose of this booklet and training is to help you in that role.

What is the Ergonomic Risk Reduction Process (ERRP)

Goals of ERRP

The ultimate goal of ergonomics Risk Reduction Process is to ensure that you return home in the same condition that you came to work, and eventually, in a condition that you can enjoy your well-deserved retirement.

With more than 720,000 career employees in over 38,000 facilities, the USPS is one of the largest employers in the world. Recognizing the effect of musculoskeletal disorders (MSD's) in the workforce, the Postal Service initiated a strategic partnership to identify and control ergonomic risk factors. The members of the partnership are the USPS, the National Postal Mail Handlers Union (NPMHU), the American Postal Workers Union (AFL-CIO-APWU) and the Occupational Safety and Health Administration (OSHA). On April 4, 2003 the partnership agreement was signed, with the members of the partnership agreeing to work cooperatively to implement the ongoing process of the Ergonomic Risk Reduction Process (ERRP). Since that time, the process has been initiated at a large number of facilities, with additional facilities regularly scheduled through the year 2007.



Introduction to Ergonomics

Ergonomics is derived from the Greek language - ergon meaning "work" and nomos meaning "rules."

The rules of work is the process of fitting the work environment to you - the person doing the work. Ergonomics focuses on optimizing the design of equipment, tools, and workplaces to minimize risk and potential injury.

Ergonomics starts with you and attempts to accommodate your strengths and limitations.

Considerations include your strength, size, endurance, range of joint motion, age, gender, and physical condition (health & fitness).

The goal is to design a work process that can appropriately fit you and people that work with you.

A machine has limitations to what it can perform and so does the human body. Just as an engineer would not design a job beyond the capacity of a machine, ergonomics focuses on designing within the capabilities of the human body. When these limitations are exceeded, the potential for injury increases.

Ergonomics does not need to be complicated. In most cases ergonomics is common sense. If something does not feel natural, chances are it may include one or more ergonomic risk factors. Many times a minor adjustment to the work process can make a tremendous difference.

For the program to be effective it is crucial that everyone work together to improve the workplace for ourselves and future employees.



In the design of new equipment, for example the AFSM 100, considerable planning has gone into improving the working position for employees, i.e., ergonomics.

The Ergonomic Risk Reduction Process is designed to accomplish the following goals at participating worksites:

- A. Improve the safety and health environment so that all parties can work together to reduce MSD's.
- B. Identify tasks and conditions where MSD incidents occur and develop and implement ergonomic control processes to reduce or eliminate risk factors and MSD incidents.
- C. Train USPS local managers, supervisors, and targeted craft employees.
- D. Reduce the number of MSD related incidents, thereby reducing the number of days away from work for both lost workday and restricted duty cases associated with MSD incidents.
- E. Develop and evaluate good ideas that can be shared and implemented in other postal facilities with similar ergonomic issues.
- F. Train and develop local employees into Core Teams that can focus attention on the identification and resolution of risk factors.
- G. Improve the overall quality and efficiency of the processes being evaluated.



The older hampers with bungee cords constitute a traditional ergonomic design.



The lightweight plastic pallets are much easier to lift.



The newer spring-loaded tow bar was designed to eliminate bending and lifting the detachable tow bar.



The Tray Management System eliminates much manual lifting. Among other features, trays are delivered at waist height (above right).



Containerization has minimized the job of unloading full trucks of "bed-loaded" mail sacks.



The 4-height footrests on the FSM 1000 are quite inventive, since they are so simple and effective. Where else are these needed?

The following is a brief description of the process at your facility.

1. Senior Postal Management, as well as local representatives from the other partners, such as local union presidents, are briefed by ERRP headquarters personnel. A Site Coordinator is appointed, who works closely with a Headquarters funded Ergonomist.
2. Site Core Teams are formed, with members coming from all tours, and includes all crafts and management. These teams are trained by the Ergonomist and meet weekly to conduct systematic ergonomic assessments. The focus is to improve items that are within the facility's control. The purpose of the assessment is to identify potential risk factors and recommend steps to reduce them. Recommendations may be related to Administrative, Work Method, or Physical Controls. The Site Core Team is trained in various problem solving techniques to institute these changes quickly and effectively.
3. The Site Core Team, in conjunction with the Site Coordinator and Ergonomist, reviews safety records to focus on those incidents that involve MSD's. This allows the team to prioritize the work areas being studied to get the most out of their efforts.
4. Education and training is provided to employees. The specialized training includes awareness of the process, and focuses on the work performed by each targeted group.
5. Again, the goal is to reduce wear and tear on your body by "working smarter, not harder". We want all employees to go home in as good a condition as when they reported.

Classification of Ergonomic Controls

Physical Controls

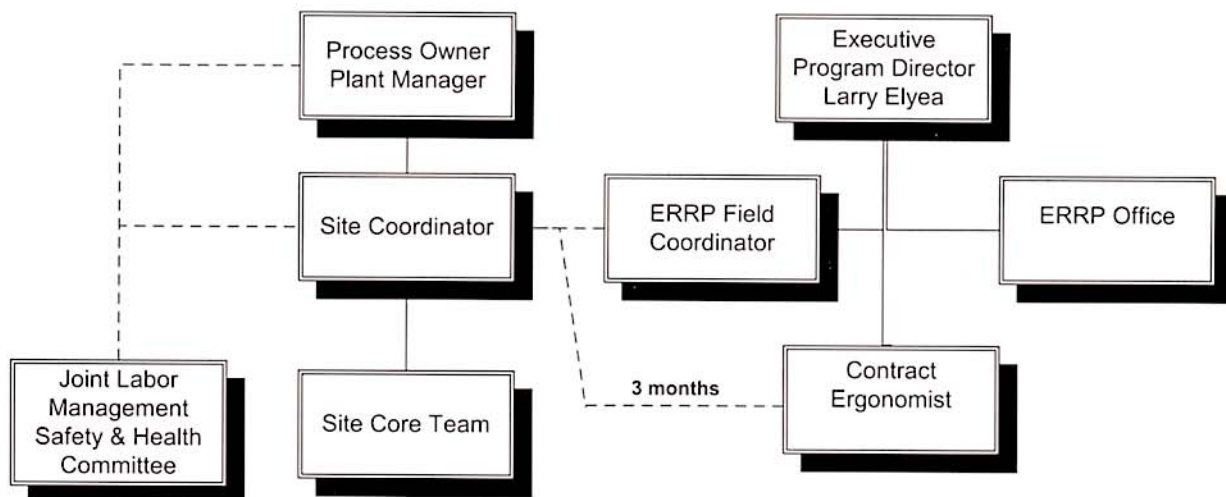
- Redesign or design of new equipment and workstations
- Improvement of tools
- Installation of mechanical assists
- Engineering Change Board
- Alternative layouts.

Work Method Controls

- Changes in work technique
- Job task distribution
- Process changes.

Administrative Controls

- Job rotation
- Scheduled rest breaks
- Cycle time changes
- Training in proper work method.
- The ergonomist and members of the Ergonomic Core Team will be studying jobs and discussing issues with employees and supervisors.





Roles and Responsibilities

Postal Service will provide a safe and healthy work environment for employees. Commitment to safety and health is a top priority. This Ergonomic Risk Reduction Process is designed to develop and implement a system to make realistic improvements so tasks are completed safely and efficiently.

Supervisor Responsibilities

You have the following responsibilities within the ergonomic process if you are a supervisor:

- Provide a safe and healthful work environment where commitment to safety and health is on the same level as quality and productivity.
- Ensure that all your employees are trained in and are following approved standard operating procedures.
- Support the Site Core Team and work with employees on their suggestions for ergonomics improvements.
- Communicate with management, safety representatives and/or Ergonomic Core Team members to ensure injuries and illnesses are recognized promptly and symptoms or work area concerns are addressed in a timely manner by the appropriate process.
- Recognize potential ergonomic concerns, identify improvements, or request additional technical support for evaluation.

- Observe and reinforce safe work practices and proper ergonomic work techniques.
- Ensure your employees have received training in proper ergonomic work techniques that can be applied in the workplace.
- Display personal commitment to the implementation and maintenance of the ergonomic process.
- Share ERRP Successes with your employees.

Employee Roles & Responsibilities

All postal employees share the following roles and responsibilities:

- Maintain a safe and healthy work environment where commitment to safety and health is on the same level as quality and productivity.
- Display personal commitment to the implementation and maintenance of the ergonomic process.
- Attend training in ergonomics and proper work techniques that can be applied in the workplace.
- Communicate with supervisors and members of the Ergonomic Core Team to ensure injuries/illnesses are recognized promptly and symptoms or work area concerns are addressed in a timely manner by the appropriate process.
- Actively participate in assessment to address opportunities for ergonomic improvements.
- Apply 10 ergonomic principles to daily job activities focusing on positions, posture and equipment.
- Assure all work tasks are performed within restrictions as specified by a health care provider.

Ergonomic Core Team

- Set priorities and schedules for reviewing ergonomic risk factor reduction opportunities based on site Injury and Illness past history data.
- Conduct ergonomic assessments.
- Recognize and analyze potential risks in current processes using various problem identification techniques.
- Recommend and implement ergonomic solutions utilizing unique and creative problem solving methods.
- Communicate process to fellow employees.
- Ensure employees use equipment as it was designed by referencing applicable Standard Operating Procedures (SOP's) and Job Safety Analysis (JSA's).
- Respond to requests for ergonomic input from fellow employees.
- Observe and reinforce safe work practices and proper ergonomic work techniques.



The ERRP Core Team at work.

Problem-solving

Certain techniques can be used to increase the likelihood of success. A few of the more important ones include:

Studying and analyzing

It is important to thoroughly study jobs, collect data, and perform tests. It is not sufficient to say, "I *feel* this is better." It's more effective to say, "The results of analysis show that..."

Root Causes

When you do a careful study of a problem, identify the "root cause" of the problem. The root cause is not immediately evident and it is easy to spend time and money focusing on the wrong issue. You may need to analyze to isolate the root cause.

Prioritize

We want to get the most out of our efforts. So, we need to carefully prioritize problems.

Brainstorming

It is important to identify as many ideas as possible even if they seem unrealistic or unconventional at first. Experience shows that a casual remark or a joke can lead to an excellent idea. Do not be judgmental.

(Finding fault with ideas is easy. Coming up with ideas is the hard part. Pay special attention to stimulating discussions and listing as many ideas as possible.)

Process Change

Processing mail is a complex operation because it involves receiving a variety of mail from a variety of sources and then sending it to a variety of places.

There is always room for improvement. It may be that an ergonomics issue could be improved by performing a task at another point in the operation. You don't want to fix something that is better completed elsewhere in the process or shouldn't be performed at all.

Big Picture

A postal facility is a complex operation where many tasks and pieces of equipment are intertwined. You must ask how an intended change affects activities elsewhere in the operation.

Focus on Habits

Some problems are easy to identify, but hard to change since they are a habit. Some habits are organizational, while others are personal. We should make our best efforts to change these habits.

A special problem is work method, especially on highly repetitive jobs. If you have made a certain motion countless times, your muscles can develop a type of "memory" that makes your actions automatic.

Participation

The best way to make improvements is to involve everyone in discussions, meetings, communications, etc. Participation can lead to better ideas and better implementation.

Continuous Improvement

It is difficult to design the *perfect* work station. Compromises are common. Our goal should be to continuously seek *improvements* where we can.



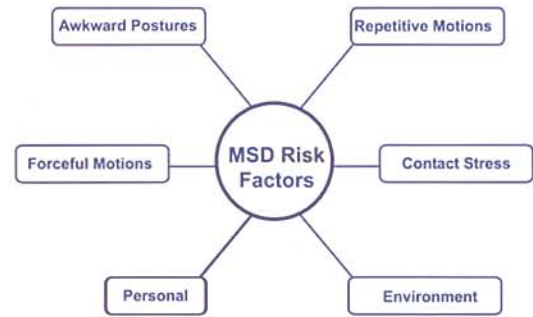
Focus on Employees - The goals of ergonomics are to reduce wear and tear on employees and to "work smarter, not harder".



Tearing off stretch wrapping is an example of a task that involves repetitive, awkward, and forceful motions. Perhaps using ergonomic principles and good problem-solving skills, we can find an easier way to do this job. Maybe it would be eliminated entirely.

What are MSD's?

Musculoskeletal Disorders (MSD) is a term used to describe injuries to the muscles, tendons, ligaments, peripheral nerves, structures, bones or associated vascular systems of the body. These injuries may occur to any part of the body (hands, arms, back, etc.)



Risk depends on magnitude, frequency and duration AND Number of risk factors present

Ergonomic Risk Factors

Several risk factors have been associated with the development of MSDs. The presence of risk factors in work activities are common and do not necessarily indicate a concern. The issue is how much and for how long.

Awkward Postures

The position of the body during work, e.g., bending, reaching, twisting, standing. The body is strongest when the joints are in their neutral posture. Deviations from this position will greatly affect the body's available strength.

Forceful Motions

The force acting on the body during work, e.g., pushing, pulling, lifting, torque reaction, weight. The external force can translate to a much larger internal force in the body (e.g., a 40 lb. load in the hands can produce a load of over 800 lbs. on the spine).

Repetitive Motions

The number of times a joint is moved and the overall duration of a task, e.g., number of pinch grips per minute, number of lifts.

Contact stress

The physical contact between the body and the work surface. Contact stress can result in restrictions of blood circulation and increases in tendon friction.

Environment

This includes lighting, glare, noise levels, temperature, vibration and humidity. The environmental effects can dramatically increase the physical effort required to do a job.

Personal Risk Factors

People are different and respond differently to the presence of ergonomic risks.

Controlling Personal Risk Factors

Balance stress on joints by exercising opposing muscles off the job. Stretch muscles before using them to prevent injuries. Don't ignore pain. Choose safe exercises. Always check with health care provider before starting new exercise programs.

Personal Risk Factors

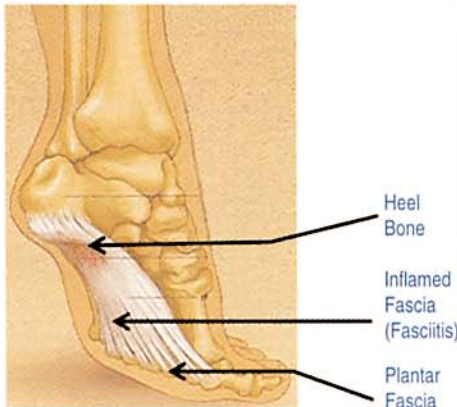
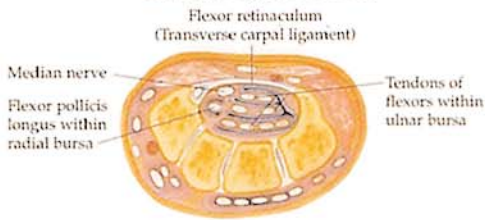
1. Health Status - There are a variety of conditions related to a person's health status that can increase susceptibility to an MSD related injury. It is difficult, if not impossible, to control these personal risk factors through job design.

- Weight
- Arthritis
- Certain Medications
- Smoking
- Diabetes
- Physical Capabilities

2. Home Activity - Examples of home activities that can produce ergonomics risk factors are:

- Knitting - Pinch grips, awkward wrist postures, repetition
- Bowling - High forces, awkward body postures
- Lifting groceries from the trunk - Bending and reaching while lifting
- Golfing - Awkward wrist postures, torso twisting
- Driving a car - Vibration, awkward wrist postures (manual shift), lifting legs (accelerator and clutch)
- Shoveling snow - Bent back, high forces, slippery surfaces
- Home office - Awkward postures, visual strain, repetition
- Video games - Repetition, awkward postures

Cross-Section of Wrist



Ergonomic risk factors may affect the body in many ways. These disorders can occur naturally and may be unrelated to a working situation. Several of the MSDs that may affect the body are described here.

Most of us will experience an MSD of one type or another in our lifetime, whether from work or at home. Most of the time they are minor and will go away after a short time. The primary goal is to keep the little things from becoming big ones. If you catch them early you can treat them very simply with ice packs, ibuprofen, and rest the part of the body involved.

Carpal Tunnel Syndrome

Internal swelling of the wrist causing pressure on the nerve to the hand. Symptoms may include: loss of strength, pain, tingling, and numbing of several fingers.

Tendonitis/Tenosynovitis

An irritation in the tendon or tendon sheath. Symptoms may include: pain, inflammation and swelling of affected areas.

Epicondylitis (Tennis or Golfers Elbow)

Irritation of tendon attachments at the elbow causing pain. May be associated with repeated or forceful rotation of the forearm.

Rotator Cuff Syndrome

Torn tendon in the shoulder. Results in pain, discomfort, weakness and limited range of motion.

Vibration Syndrome

Result of excessive exposure to vibration. Symptoms include: numbness, tingling and pain in the fingers, worse in cold weather, eventual whitening of the knuckles and finger tips.

Trigger Finger

Irritation of tendon and tendon sheath in finger joint, causes a locking of the finger joint, pain and discomfort.

Compressed Disc

Swelling of the spinal disc due to mechanical stress. Disc swelling may cause spinal cord nerve compression causing a migration of symptoms to other body parts.

Spinal Disc Herniation

Breakdown of the spinal disc due to repeated mechanical stress causing a bulging of the disc nucleus. May cause spinal cord compression, pain, loss of mobility.

Visual Strain

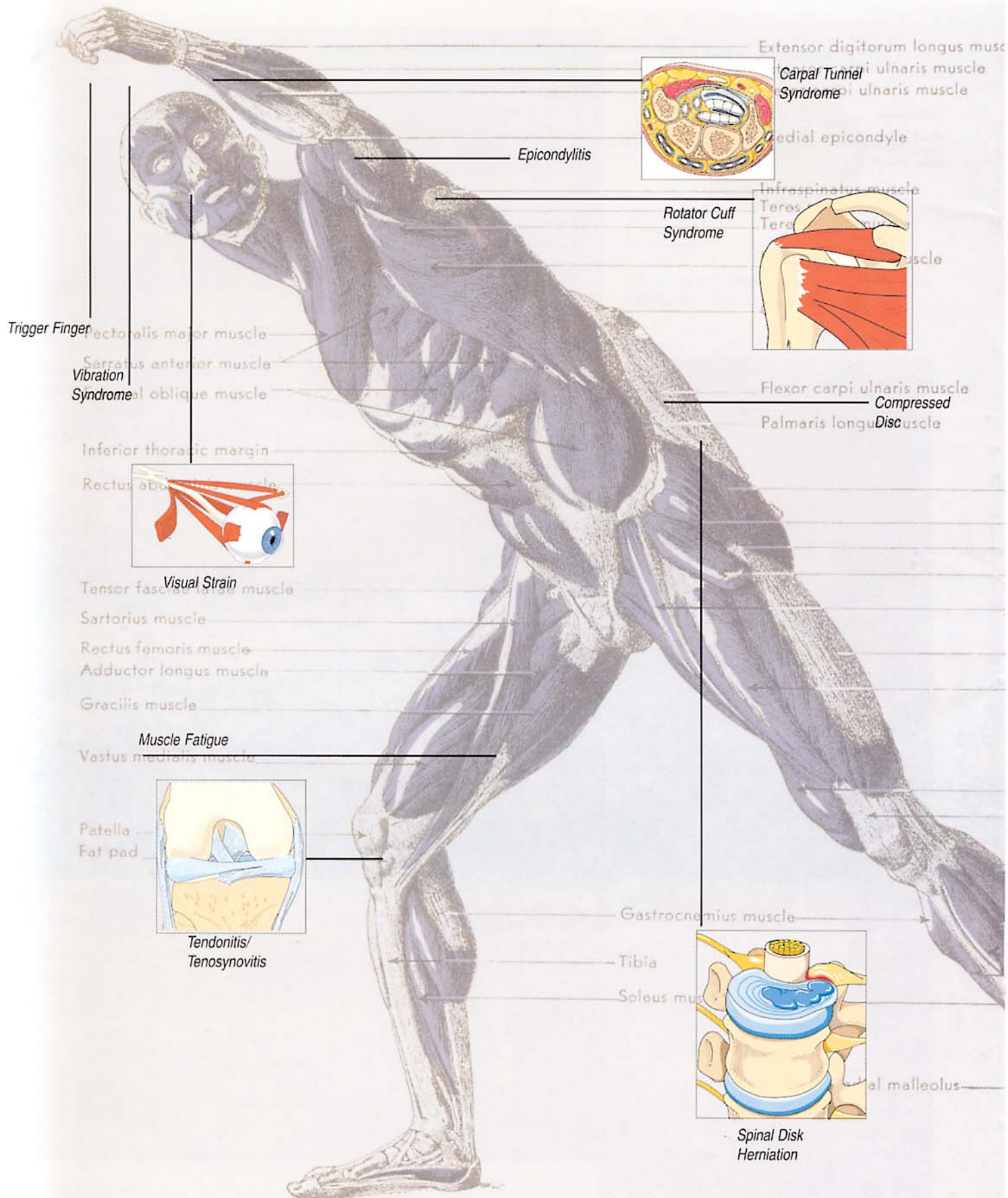
A temporary soreness in the eye muscles, often causes blurred vision. Commonly associated with visual inspection tasks or extended computer work.

Muscle Fatigue

A temporary discomfort and soreness in the muscles. Symptoms will subside with rest to the affected area.

Plantar Fasciitis (sometimes called heel spurs)

A type of tendonitis, or swelling of the fascia. Can be caused by standing for long periods on hard surfaces. Also often associated with extreme overweight conditions.



Extensor digitorum longus muscle

Flexor carpi ulnaris muscle

Flexor digitorum profundus muscle

Medial epicondyle

Infraspinatus muscle

Teres major muscle

Teres minor muscle

Triceps brachii muscle

Latissimus dorsi muscle

Flexor carpi ulnaris muscle

Palmaris longus muscle

Compressed Disc

Spinal Disk Herniation

Calcaneal malleolus

Soleus muscle

Tibia

Gastrocnemius muscle

Patella

Fat pad

Tendonitis/Tenosynovitis

Muscle Fatigue

Gracilis muscle

Adductor longus muscle

Rectus femoris muscle

Sartorius muscle

Tensor fasciae latae muscle

Visual Strain

Rectus abdominis muscle

Inferior thoracic margin

External oblique muscle

Serratus anterior muscle

Pectoralis major muscle

Trigger Finger

Vibration Syndrome

Epicondylitis

Rotator Cuff Syndrome

Carpal Tunnel Syndrome

Medial epicondyle

Infraspinatus muscle

Teres major muscle

Teres minor muscle

Triceps brachii muscle

Latissimus dorsi muscle

Flexor carpi ulnaris muscle

Palmaris longus muscle

Compressed Disc

Spinal Disk Herniation

Calcaneal malleolus

Soleus muscle

Tibia

Gastrocnemius muscle

Patella

Fat pad

Tendonitis/Tenosynovitis

Principles of Ergonomics

The following pages outline several key concepts in ergonomics. These principles help provide an understanding of how the body works and show ways to minimize the potential for injury. These principles apply to everyone and can be used to reduce the amount of effort exerted at work and home. Note that in general they apply only to sustained work.

1. Use Neutral Postures

Working in awkward, contorted postures increases physical stress on the body and reduces its strength, thereby making it more difficult to do a task. The optimal "neutral" posture is one that provides the most strength, the most control over movements, and the least physical stress on the joint and surrounding tissue.

The key postures are shown in the illustration. Keep in mind the concern is for sustained work. Occasional variations are fine, even beneficial.

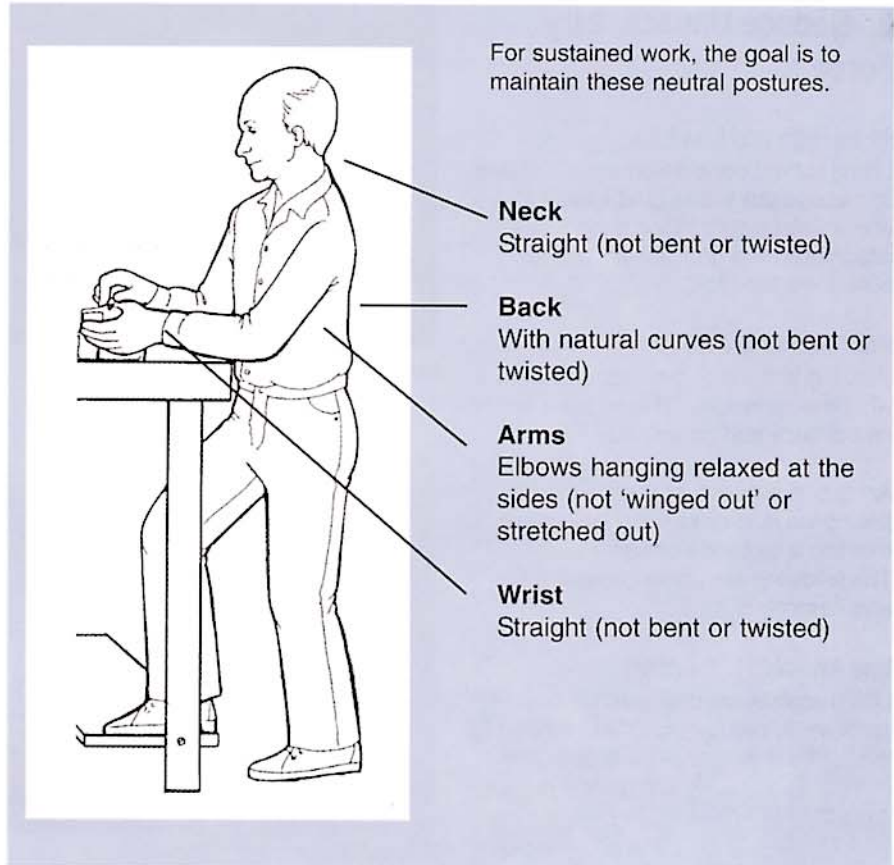
Keep the neck properly aligned

The neck should not be bent or twisted. In particular, the head should not be tilted back or crooked sideways for extended periods.

Keep elbows in and shoulders relaxed. The elbows should be held comfortably at the sides of the body. The shoulders should be relaxed and not hunched. Working with the elbows winged out can add strain to the shoulders and cause fatigue and discomfort, interfering with your ability to do your job well and can contribute to long-term shoulder injury.

Maintain the "S-curve" of the spine

The spinal column is curved roughly in the shape of an 'S'. It is important to maintain this natural S-curve to prevent chronic back injuries and to optimize the working posture. For the lower back, this involves maintaining some degree of a slight "sway back" whether sitting or



standing. Bending forward or otherwise flattening the slight sway back puts pressure on the sensitive discs of the lower back, which can ultimately lead to severe back injury.

Twisting of the back is similarly important. Twisting the torso, especially while handling a load, places stress on the spine and knees.

Keep wrists in neutral

The hand should be in the same plane as the forearm, not bent or twisted. Working for sustained periods with a bent or twisted wrist can cause injury to sensitive tissue. Moreover, awkward wrist postures can reduce your grip strength and your dexterity.



2. Reduce Unnecessary Force

Avoid High and Low Lifts

Lifting is best done below the shoulders and above the knees (and *ideally* at about waist height.) One good way to accomplish this goal is not stack containers too high.

Push Rather Than Pull

Pushing is the recommended method whenever possible. This reduces strain on the back and upper body.

Another basic area of ergonomics is finding ways to reduce the amount of exertion it takes to perform a task. The following are some general tips and strategies:

Use Available Lift Assists

Lifting assists are designed for one purpose, to reduce the effort required to manually lift or handle an object. The use of lifting assists can greatly reduce the risk of injury.

Avoid High and Low Lifts

Lifting is best done below the shoulders and above the knees (and *ideally* at about waist height.) One good way to accomplish this goal is not stack containers too high.

Slide Don't Lift

When handling heavy or awkward items it is important to let gravity do its part. Whenever possible, slide items into place rather than lifting.

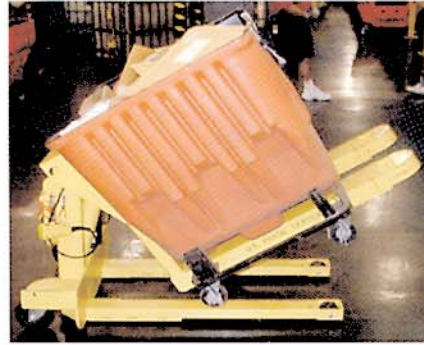
Use Power Grips, Avoid Pinch Grips

To optimize the strength of the hands it is best to wrap the fingers and thumb fully around an object using a power grip. To minimize pinch grips, increase the size of items being gripped.

Keep the Wrist Straight

To reduce wrist stress and increase hand strength keep the wrist straight. A straight wrist can provide over 60% more available strength than a bent wrist.

This results in less fatigue and less pain at the end of the day. Think about where this tip may be used to improve techniques at work and at home.



New hamper tilters make it easier to access mail.



The AFSM 100 is designed to enable you to slide the full trays.



Do not load flat trays on end. They can be very difficult to unload.



Do not stack containers too high. Remember that they are much harder to unload than they are to load.



Heavy containers should never be pulled. This can place considerable long-term stress on your shoulder.



Pushing is the recommended method.

Use Two Hands

Using two hands when lifting can cut wrist stress dramatically

Keep the Load Close to the Body

To reduce the back and shoulder efforts keep the load close. Every inch closer can have a dramatic effect on the level of muscle effort and joint stress.

Don't Twist

Twisting the torso while handling a load places stress on the spine and knees. Some experts have estimated that twisting while lifting may increase the risk of back injury by up to six times. Twisting typically occurs when lifts are being performed between two adjacent work areas.

Employees lifting heavy items or performing material handling operations should be particularly careful about their lifting technique.

Minimize Reaches

The arms are approximately 13% of total body weight (26 lbs for a 200 lb. person). The spine must balance this weight in addition to the load in the hands with every forward reach.

The further the reach the greater the spinal force. Any part of the workstation design that creates an excessive reach should where possible be eliminated, relocated, or redesigned to get the body closer to the work. This

includes conveyors, containers and other items that may obstruct access.

Minimize Bending

Continuous bending can be hard on your back. In general, the best working height to prevent leaning is about *elbow height*. Since this height varies among individuals, it often is difficult to find the best workstation design.



Example of a Twisted Back



Example of a Neutral Back



Example of an Awkwardly Bent Wrist



Example of a Neutral Wrist

Example of Neutral Back:

Repetitive twisting can be hard on your back. Taking a step is better.

Example of Neutral Wrist:

This example from the AFCS operation shows two different work methods. The one at left involves an awkwardly bent wrist. The method at right helps keep the wrist straight in its neutral posture.

3. Keep Everything in Easy Reach

An essential aspect of task design is keeping products, parts, and tools that are frequently needed within easy reach. The basic rule is to keep in mind the reach envelope.

Frequently used materials should be kept within the reach envelope of the full arm. Things that are almost constantly in use should be within easy reach envelopes of the forearms.

A useful rule of thumb is that reach should be established to accommodate smaller-statured people. The idea is that if shorter people can reach, so can everyone else (there is an opposite rule later regarding clearance).

4. Work at Proper Heights

A common workplace problem is a mismatch in heights between people and the work that they are doing. This leads to poor postures and related fatigue, discomfort, and potential damage to sensitive tissue in the joints.

Design for elbow height

Generally, work is best done at about elbow height, whether sitting or standing. This is true for most mail work as well as computer keyboards.

Consider the exceptions

The nature of the work also affects the proper height. Heavier work, requiring upper body strength, should be lower than elbow height. Lighter work, such as precision work or inspection tasks, should be higher.

Avoid extremes

Many times, when it is not practical to design every height to be optimal, it may be feasible at least to avoid the extremes; that is, avoid working below knee level or above the shoulders. For example, racks often can be modified by removing or blocking off the extremely high and low rungs.



Reach envelope

Note that this envelope is a semi-circle, not the rectangle typically used for work surfaces.



Before - Long reach across conveyor



After - Remove barrier in front of conveyor



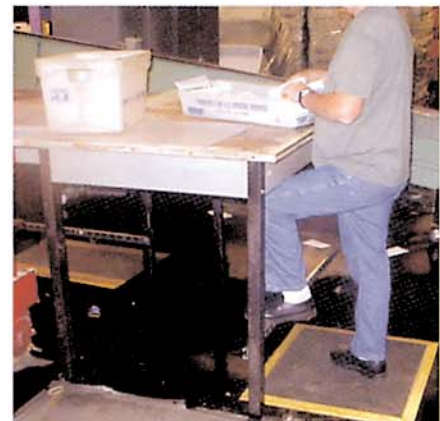
Before - High reach to top of shelf.



After - Shelves adjusted (Note: This height still is not ideal, but is better. Also, the lowest shelf was raised up.)



Before - Bending at a low work surface



After - work surface was raised to provide a good work surface at about elbow height.

5. Reduce Repetitive Motions

It is good to seek ways to reduce the number of motions it takes to perform a task. It can lessen the wear and tear on your body as well as reduce time wasters. General examples include:

Good work methods

Good work technique can result in smoother motion, and fewer motions. Use power tools and equipment — improve layouts to reduce reaching and bending.

Slide items

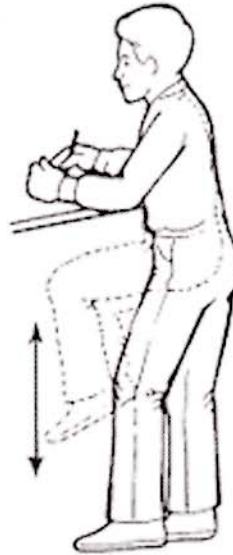
Rather than lifting items up and putting them down you should attempt to slide them.

Double Handling

Why do work twice? We should identify any instances where mail is handled twice and use good problem-solving skills to identify better ways.

Static Posture

Staying constantly in one posture or continuously tensing a particular muscle group is known as “static” work (Static means “stationary”). Static postures can be improved by designing the work space to provide an opportunity for movement or by using various types of supports to rest tensed muscles for example, arm rests on chairs.

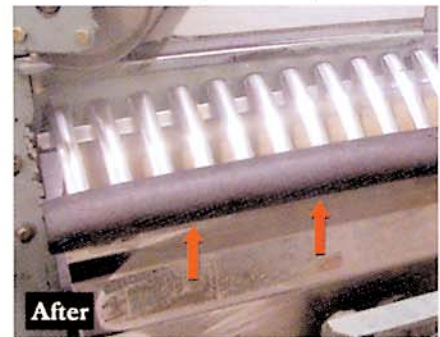


7. Minimize Contact Stress

Direct pressure against the body or “contact stress” is a common issue in many workstations. In addition to being uncomfortable and interfering with your ability to work, it can inhibit nerve function and blood flow. Resting the wrists or forearms on the cornered edges of workstations, keyboards, or bins results in an increase in the mechanical stress on the muscles and tendons and can partially restrict blood flow to the hands. To distribute the pressure it is necessary to provide padding or round off the edges where this occurs.



Before - Leaning on a hard edge



After - inexpensive pipe wrap

6. Minimize Strain and Fatigue

Soreness and fatigue can be due to a buildup of the muscle's natural waste product in the tissue. To reduce the likelihood of muscle soreness and fatigue it is necessary to increase blood flow to the affected areas.



Before - In the Vehicle Maintenance Facility (VMF), mechanics often work with their arms overhead, such as here to hold the catalytic converter in place.



After - The mechanics connected a hook to a vise grip to hold the catalytic converter in place and enable the mechanic to reduce the time needed to accomplish the task.

Standing for long periods of time on hard surfaces is a related issue. Items that can help include: good footwear, cushioning insoles, and anti-fatigue mats where feasible.



8. Provide Clearance

It is important to have both adequate work space and easy access to everything that is needed with no barriers in the way. A common problem in the industrial workplace is insufficient space for the knees, although every part of the body can be affected - head, torso, feet, and hands.

Design for tall people

In general, the goal is to make sure that tall people have enough clearance. Clearance in this case means room for head, knees, elbows, and feet. If tall people can fit, then so can everyone else.

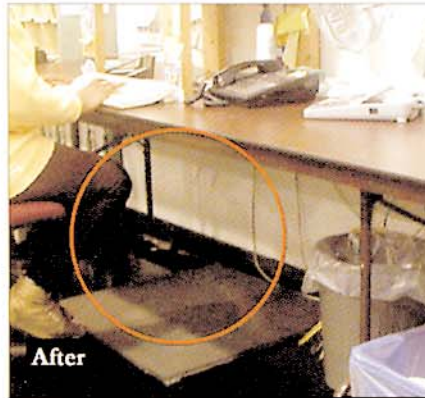


Provide kneespace

A common problem is lack of knee or thigh clearance on desks, workbenches, or other types of equipment where people sit. As a consequence, people resort to working in contorted, uncomfortable postures that create fatigue and inhibit productivity.



Before - Using a desk with (unnecessary) file drawers did not provide sufficient knee clearance and created long reaches.



After - Switching to folding tables created plenty of knee space and with the casters on the chair, enable use of a larger work area.

Maintainability

Probably the single biggest problem that maintenance personnel encounter in their tasks is lack of clearance. Many activities would be simple to perform, if they could only reach an item and work on it with easy access.



AFSM 100's control panels were designed with easy access in mind for maintenance personnel.



A lift gate was designed into the AFSM 100's end buffer zone to provide easy access to the control panels for maintenance personnel.



Maintenance personnel have a variety of ergonomics issues, including contact stress and a lack of clearance. Many of these problems are unavoidable, but the goal of ergonomics is to review all tasks and identify improvements when possible.



The DBCS equipment was designed with ergonomics in mind. Clearance is provided by wide door panels and equipment that swings out to be more accessible.

9. Move, Exercise, and Stretch.

The human body needs to be exercised and stretched. To be healthy you need to stretch each joint to the full range of motion periodically throughout the day. Your heart rate needs to rise for a period of time every day. Your muscles need to be loaded on occasion.

Stretching and Warm-ups

Stretching and massaging the affected muscles can increase the blood flow and oxygen supply to the muscles. For best results, this should be completed prior to physical activities, especially strenuous ones. Even a short routine of a few minutes can make a big difference.



10. Pay Attention to the Environment

The environment can have a significant effect on physical capacity. When it is excessively hot or humid we tend to move slower and become tired faster. Cold environments can cause a tightening of the muscles, which also limit the body's ability to perform some tasks.

These issues are less significant in a postal operation than they are in many other industries, but it is important to understand the concepts in a general way. To minimize the environmental effects at work and home use the following guidelines:

Heat/Humidity

Drink plenty of fluids, pace the work, and follow proper rest break procedures. Do not perform unnecessary activities and use available fans and/or cooling methods.

Cold

Dress warmly, stretch muscles to loosen up, stay dry, and minimize areas of exposed skin.

Whole Body Vibration

Isolate seats or stands from vibration sources. Minimize exposure time where possible.

Hand and Arm Vibration from Tools

Hold tools lightly, use vibration damping gloves or tool wraps, keep hands warm and dry, and direct cold air tool exhaust away from hands.



Vibration is an issue in the Vehicle Maintenance Facilities (VMFs) when using impact wrenches and power tools. Vibration dampening gloves are one approach to help.

Noise

Use appropriate hearing protection, attempt to eliminate or isolate noisy operations, and do not create unnecessary noise.

Exposure to noise increases our mental workload that in turn affects heart rate levels and can reduce the capacity for physical activities.

Lighting and Glare

Improve the light source, use task lighting as appropriate. Use diffuse lighting sources to reduce glare. Do not place computer monitors in front of unshaded windows.



Room lighting is often too bright. In the room above, one bank of lights was simply dimmed to reduce glare.

Computer Ergonomics

As technology changes people are spending more time at desks using computers, phones, and other office equipment.

Just as we design our automobiles to have adjustable seats, controls, and displays within the reach of the driver, offices should have comfortable seating, displays, keyboards, phones, files, and other equipment within reach of the employee. The techniques for ensuring comfort in the office are described below. These techniques should also be applied in the home office.

Utilize Good Ergonomics Practices in the Office

Minimize Glare

Glare is the result of strong contrasts in light levels within the visual field.

To avoid glare try the following:

- Do not position monitor in front of unshaded windows;
- Close shades to prevent reflections;
- Use glare guards or hoods over the screen;
- Dim the lights;
- Use task lighting;
- Keep the screen clean.

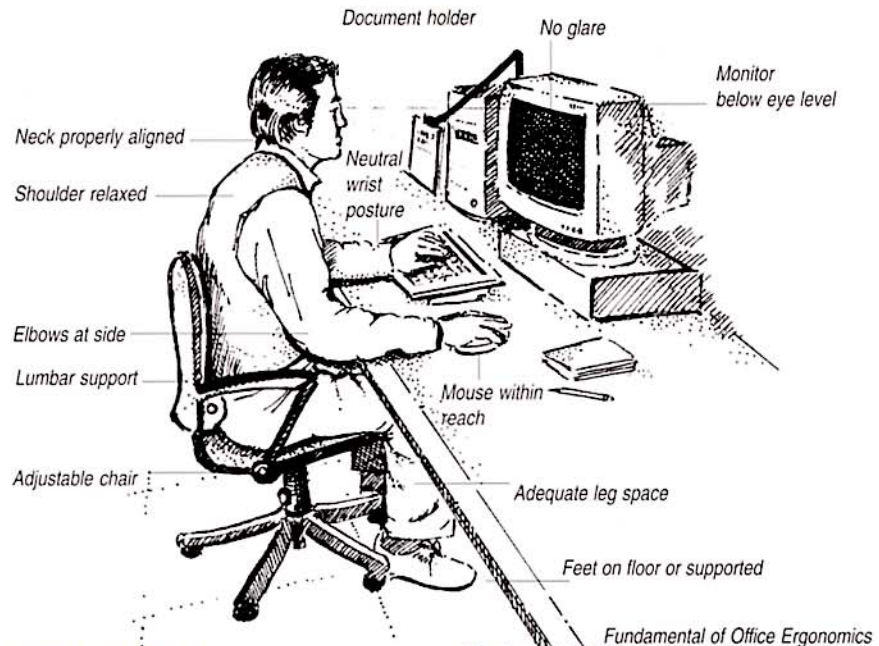
Avoid Varied Focal Distances

To reduce the potential for effort and fatigue it is necessary to minimize frequent changes of the focal point. This can typically occur during data entry operations. Use a document holder for data entry tasks.

Set Monitor at Proper Position

Proper monitor position is important at reducing visual strain and neck fatigue. While viewing the screen never twist the neck or look upward. The monitor and keyboard should be positioned directly in front of the body.

The monitor should be approximately one arm's length away with the top of the screen at eye level. A monitor stand, stack of papers, or telephone book may be used to raise the monitor if necessary. Tilt the monitor down to avoid glare if necessary.



Adjust Your Chair

Proper chair adjustment is directly related to the potential for comfort and low stress posture. To realize the benefits of an adjustable chair it must be adjusted.

When adjusted properly the chair should provide good lower back support, rest the feet on the floor (or footrest), provide a comfortable reach to the workstation, and position the elbows at approximately work surface height.

If the chair does not provide adequate lower back support, then consider the use of a small pillow or similar cushioning placed on the seat back.

Adjust Posture

To stimulate blood flow and minimize the effects of static working postures it is necessary to occasionally change body posture. This may include a series of stretches, getting up to retrieve a fax, or simply a change in sitting style.

Provide Adequate Knee Clearance

To reduce lower body fatigue, minimize reaches to the workstation, and provide postural flexibility it is necessary to ensure adequate knee, leg, and foot clearance under the work surface.

Avoid storing boxes, computers, books, pocketbooks, and papers under the work surface.

Keyboard Placement

Proper keyboard position allows typing with the palms supported and wrists in a straight posture. Obtaining this position requires a series of chair and keyboard tray adjustments. For best results the elbow should be at a height approximately equal to that of the keyboard.

Proper Phone Use

Avoid placing the phone in the crook of the neck. As an alternative, use the speaker phone feature or a headset for extended phone use.

Keep the Mouse Close

To minimize shoulder and neck stress, position the mouse within comfortable reach or use a mouse tray to get the mouse closer.

- Feet on floor or supported
- Adequate leg space
- Adjustable chair
- Lumbar support
- Monitor below eye level
- Mouse within reach
- No glare
- Document holder
- Neutral wrist posture

What You Can Do

Use the Best Method

There is a right way and a wrong way to do just about anything. At work, doing things the right way can mean the difference between good health and injury. If there is ever a question regarding proper work methods or equipment use, ask your supervisor for help.

Look for Opportunities to Improve the Job Design

The employee performing the job is closest to the task and has a detailed understanding of the job. A knowledgeable employee is a valuable resource throughout the entire process.

Help Each Other

If someone is having difficulty with a job, offer the appropriate assistance. This may include reminding them of proper work technique, alerting a supervisor or referring them to this handbook.

Promote Change

In order to improve the work process we must make changes. Sometimes changes can be made immediately, some must wait for the appropriate steps. Occasionally these changes may not work very well at the beginning. However, with constructive input and patience we can make the necessary changes to be successful.

Understand the Process

For ergonomics to work, it is necessary to abide by the principles and standard operating procedures which have been established. These procedures are for the protection of all employees. If there is anything that is unclear contact the supervisor.

Maintain Good Health

Studies have shown that by performing occasional abdominal exercises the risks of back injuries are greatly reduced. By increasing strength, the percentage of effort required to complete a job is reduced.

Apply Ergonomics Principles at Home and at Work

To reduce the potential for injury, it is important that the principles defined here are considered throughout daily activities.

Remember...
Ergonomics is a continuous process.

How to Minimize risk factors at work and at home

Use the concepts contained in this booklet to reduce any risk factors that you may be exposed to.

Think about technique; warm-up, and stretch the appropriate muscle groups, strive to achieve neutral postures and take appropriate rest pauses to allow muscle/tendon groups to recover.

The risk factors described are not necessarily more hazardous at work than they are at home.

A job will always involve physical activities; this does not mean that all jobs have injury potential.

It is the magnitude and the combined contribution of the risk factors which will determine whether or not an ergonomics concern exists.



Ergonomics Starts and ends with YOU

