



INFORMATION THAT CAN PREVENT INJURIES AND INCREASE PRODUCTIVITY !

Ergonomics

FOR

SMARTIES

Practices for Better ERGONOMICS

- What Is Ergonomics, Anyway?
- Straighten Up and Sit Right!
- Keep Your Body Moving
- Preventing Manual Material Handling Injuries
- Lab Ergonomics



www.nasa.gov

For more information on ergonomics at NASA, visit the NSC website at:
nsc.nasa.gov/ergo.

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Pains and Strains at NASA



Ergonomic-related injuries are the second-most common injury mishap at NASA. Injuries have resulted from both facility maintenance and repair activities and office tasks. Ergonomic injuries are often described with the term Musculoskeletal Disorders (MSDs). Throughout industry, work-related MSDs are among the most frequently reported causes of lost or restricted work time.

Everything from repetitive movements to awkward or static postures to excessive physical exertion can cause injury and diminish productivity. More troubling, these injuries can develop and worsen over time. The good news is work-related MSDs **can** be prevented. You can take steps to make sure your workspace and tools are ergonomically sound and adjust your work practices to reduce the risk of pain or injury.

It's easy to overlook the stress that normal day-to-day activities can put on your body, especially when the safety focus is on more high-risk activities. However, that doesn't mean preventing ergonomic injuries isn't important. This pamphlet provides basic guidelines for avoiding and preventing ergonomic injuries.

Additional resources on ergonomics and many other safety topics are available on the NASA Safety Center (NSC) website at nsc.nasa.gov/ergo.

Section 1

Ergonomics

What Is Ergonomics, Anyway?



Ergonomics is fitting the job to the person to reduce the risk of discomfort or injury and to increase efficiency and effectiveness. This means taking steps to identify potential problem areas and making changes to work environments, tools or practices before injuries occur.

Work-related MSDs affect the muscles, nerves, blood vessels, ligaments and tendons. Workers in many different occupations can be exposed to risk factors such as lifting, bending, reaching, pushing and pulling, working in awkward postures, and performing repetitive tasks.

Implementing ergonomic solutions is effective in reducing the risk of developing work-related MSDs.



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Ergonomics and You

Think about the tasks you do every day. Do you lift heavy objects? Do you perform the same task over and over with no breaks? When sitting at your desk, do you consistently reach for far-away objects? Do you look up or down to view your computer screen? All of these are examples of practices that could lead to ergonomics-related injuries. So, what can be done to adjust these conditions or behaviors? Read on to find out.



Section 2

Desk Jobs



Straighten Up and Sit Right!

You may not realize it, but if you work at a desk job, you also have the potential to develop work-related MSDs. One improvement you can make is adjusting your office chair to encourage a more neutral body position and ensure your joints are naturally aligned.

Sit up straight with your head upright, shoulders relaxed, forearms horizontal, feet flat and back supported.

- Adjust your seat pan so there is a two to three finger distance between the backs of your knees and the edge of your seat. Your feet should be able to rest fully on the floor or on a footrest.
- Make sure the backrest conforms to the natural curvature of your spine. It should offer lumbar support and be adjusted to your height.
- Move the armrests to support your lower arms while keeping your upper arms close to the body. Remember to elevate your hands and wrists while typing.
- Sit up straight with your head upright, shoulders relaxed, forearms horizontal, feet flat and back supported.
- Avoid “tech neck,” i.e. staring down at mobile devices or laptops for prolonged periods. This type of posture adds strain to your spine and could lead to neck pain and headaches.



Ergonomics Pro Tips

Don't Strain! Make sure your computer monitor is at or below eye level and a comfortable distance from your face so you're not leaning forward. The average human head weighs between 10-12 pounds, so leaning forward even slightly can put intense strain on your neck.

- **Don't Reach!** Keep the items you use regularly (keyboard, mouse, phone, important documents, files or books) within the primary work zone.
- **Avoid Awkward Positions!** Use a speaker phone or headset to eliminate awkward postures and employ document holders to ensure documents aren't positioned too far from your computer monitor.
- **Remember to Rest!** Pause every 20 minutes to stand up, rest your muscles and increase blood circulation.

If you think your workstation may not be ergonomically sound, contact your supervisor to schedule an evaluation with your center's industrial hygienist.



Section 3

Exercises

Keep Your Body Moving

Sitting at a desk all day can be a pain in the neck (and back)! Luckily, you can do ergonomic stretches at your workstation to help prevent work-related MSDs and alleviate the everyday pains and strains that come from working in an office. Take some time each day to complete these six easy exercises:



Stretches at your workstation help prevent work-related MSDs.

1. Tilt your head slightly to one side and look down. Hold this position for 15 seconds. Repeat three times on each side.
2. Bring your shoulders up slowly to your ears and hold this position. Rotate shoulders back and down and repeat 10 times.
3. Lock your hands behind your head while sitting back and bring your elbows back as far as possible. Inhale deeply while leaning back and stretching. Hold this position for 20 seconds, then exhale and relax.
4. Hold your arms at your sides and shake them out gently for 10 seconds.
5. Slowly rotate each foot from the ankle while sitting. Rotate three times in one direction and then three times in the other.
6. Hold your arm out in front of you. Pull your hand backward with your other hand, then push downward. Hold this position for 15 seconds. Repeat three times on each hand.



Pause every 20 minutes to stand up, rest your muscles and increase blood circulation.

Section 4

Material Handling

Preventing Manual Material Handling Injuries

Many workers may be exposed to ergonomic risk factors in their roles, but they can't always make changes to work practices or workstation setup without assistance! If you're involved in managing material handling activities, you can help limit the number of mishaps by being proactive and developing an action plan. Successful plans are comprised of four steps:

**1. Anticipation and Recognition**

Perform a thorough examination of the workplace and work practices and look for risk factors in work tasks, worker fatigue or discomfort, and an increase in job error rates.

2. Evaluation

Determine which tasks need to be modified and set priorities for these improvements. Consider ideas workers have for improvements, as well as the frequency and severity of the risk factors, worker symptoms, and any history of injuries.

3. Prevention and Control

Observe how different workers perform the same tasks to generate ideas for better organizing work practices. Make adjustments to the work area or equipment and tools necessary to do the job. Consider providing variety or rotation in jobs to eliminate repetition, allowing workers to alternate between heavy tasks and lighter tasks, and providing recovery time.

4. Follow Up

Once improvements are put in place, assess them to determine if they have worked. Determine if improvements were accepted and implemented by workers. Be sure to check back to find out if the changes reduced or eliminated most or all of the risk factors. Also check to see if any new risk factors emerge as a result of the adjustments or changes.



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Section 5

Lab

Lab Ergonomics

Lab environments contain more than just chemical hazards, they also present ergonomic hazards that can put you at risk for developing MSDs. Follow these tips to avoid common problems.

Be Aware of Posture

- Adjust your chair, workbench or microscope to maintain an upright neutral position.
- Utilize adjustable eyepieces to prevent bending at a microscope.
- Use a chair with good back support and a footrest.
- Remove cabinets and supplies from under chemical hoods and workbenches to avoid awkward positions and allow enough room to work comfortably.

**Keep Arms and Hands Relaxed**

- Keep your shoulders relaxed and elbows close to your sides when working.
- Store frequently used equipment and tools as near as possible to make them easier to access and prevent reaching.
- Elevate your chair rather than reaching up to pipette.
- Select equipment and tools that are the right size for your hands.
- Use arm supports to prevent resting on hard surfaces.

Alternate your work tasks throughout the day.

Reduce the Strain Caused by Repetitive Motions

- Utilize a tube opener tool to easily open tubes with just one hand.
- Use pipettes that require less force to activate or consider electronic pipettes.
- Avoid twisting your wrist while pipetting and alternate hands.
- Take short breaks after every 20 minutes of pipetting.
- Alternate your work tasks throughout the day.

**Avoid Excessive Heavy Lifting**

- Ensure any needed materials, especially heavier items, are located near to where they will most often be utilized.
- If you must lift heavy objects, use the buddy system and stay within your lifting power zone.



Lab environments present unique ergonomic hazards that can put you at risk for developing MSDs.