Ergonomics is the study of designing the workplace so that the job best fits the worker. The goal is to reduce the amount of repetition, force, awkward postures or vibration that a worker is exposed to. The worker should be able to accomplish work without undue stress. Work-related Musculoskeletal Disorders (WMSDs) are caused or made worse by work methods and environment (not by such mishaps as slips, trips, falls or motor vehicle accidents).

Common WMSDs:
- Tendonitis
- Epicondylitis ("tennis elbow" or "golfer’s elbow")
- Bursitis
- "Trigger finger"
- Carpal Tunnel Syndrome
- Back strain.

MSDs occur slowly over time due to repeated trauma to the soft tissues (muscles, tendons, ligaments, joints, cartilage) and nerves.

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**REMEMBER:** PREVENTION IS ALWAYS PREFERABLE TO TREATMENT.
Have You Felt Any of These Symptoms?

- Painful aching joints and muscles
- Pain, tingling or numbness
- Shooting or stabbing pains
- Swelling or Inflammation
- Stiffness or difficulty moving
- Burning sensation
- Pain during the night
- Loss of strength and mobility

The Cost of Breaking the “Laws of Work”

The word “Ergonomics” derives from the two Greek words: *ergos* (which means “work”) and *nomos* (which means “laws”). Together, it means “the laws of work.”

If you get caught driving 52 mph in a 35 mph zone, you have broken the law and will get a speeding ticket. You’ll pay a $175 fine to the local courts. Your failure to follow the law will cost you pain, time and money. The same is true for ergonomics. If you fail to follow the recommendations of your medical department representative (MDR) or Industrial Hygienist (IH), your “fine” may be paid through personal injury, disability, medical treatment, increased medical costs, lower morale and loss of productivity. When reading this training, think of what you can do to avoid breaking the “laws of work.”

Did you know that 80% of workers will experience significant back pain at some point in their lives? According to the Academy of Orthopedic Surgeons (2003), back pain is second only to the common cold for why workers call in sick.

REFERENCES

OPNAVINST 5100.23, Navy Safety and Occupational Health Program Manual, Ch. 23
www.navfac.navy.mil/safety (select “Ergonomics”)

Navy Ergonomics Course, CIN: A-493-0085


Order from defenseimagery.mil
  Quality of Life: Back Injury Prevention; PIN: 803503
  Back and Running Safety; PIN 614919

Preventing WMSDs

Step 1: Check Your Posture

Check your posture when standing and walking. Good posture promotes blood flow into the muscles, increases your speed, and makes it much less likely that you’ll develop a WMSD.

Good posture puts your body in line:
- Ears over shoulders
- Shoulders over hips
- Hips over knees
- Knees over ankles
- Elbows by your side

Good posture makes it much less likely that you’ll develop a work-related musculoskeletal disorder.

Step 2: How Are You Sitting?

Improper sitting is one of the worst positions for your back. People who spend their day slouched in a chair or bent over a desk put a great deal of stress on their backs.

Step 3: Are You Working in Awkward Postures?

Have someone take a picture or video of you while you perform routine tasks. Compare the pictures to the “Physical Risk Factor Ergonomic Checklist”, which may be found on the Naval Facilities Engineering Command (NAVFAC) website.

Preventing WMSDs, cont.

Step 4: Do you lift with your “power zone”?

Did you know that can strain your back when lifting up a pencil? Try to avoid any curve in your back when lifting. The “power zone” for lifting is close to the body and between knuckle and shoulder height—like the strike zone in baseball. Lifting heavy objects within the “strike zone” reduces your risk for injury.

For loads greater than 10 lbs:
- Get close to the object and keep your feet 8”–10” apart.
- Bend at the knees, while keeping your back straight.
- Squat down. As you lift, keep the load close to your body.
- If you must turn, don’t twist with your body. Turn with your feet.
- To set the load back down, bend at the knees; keep your back straight; keep the load close to your body and set the object back on the floor.

For loads less than 10 lbs:
- Approach the load, keeping your feet close to it and 8”–10” apart.
- Bend at the hip; bending your forward knee slightly; keeping your back straight.
- Pick up the object. Stand straight up.
- If you must turn, turn with your feet.
- To set the load back down: bend at the hip; back leg parallel to the floor; slight bend in your forward knee. Keep your back straight.
Step 5: Take Breaks and Stretch

- Warm up your muscles before stretching by walking or doing gentle movements.
- Hold each position for 20 – 30 seconds.
- Don’t bounce.
- Remember to breathe.

When You Need an Ergonomic Assessment (Workplace)

Effective ergonomics in the workplace results in increased awareness, fewer injuries, fewer lost work days and healthier people. Conduct an ergonomic assessment (described in OPNAVINST 5100.23, CH-23) when you observe:

- Reduced efficiency and productivity.
- Increased lost days away from work.
- Increases in back or hand injuries.
- Workers making frequent mistakes.
- Increased equipment damage.
- Employees making subtle workplace changes.
- Workers frequently away from their workstations.
- Sailors frequently lifting and carrying too much weight.
- Workers pushing, pulling, lifting or lowering objects while the body is bent, twisted or stretched out.

When You Need an Ergonomic Assessment (Personnel)

You should also conduct an ergonomic assessment when Sailors are visiting medical and reporting the following symptoms:

- Pain at the base of the thumbs.
- Bumps on the wrists that are spongy and painful.
- Numbness, tingling, severe pain or loss of feeling and control in hands, fingers or wrists.
- Pain, swelling or inflammation in elbows, hands, wrists, shoulders, upper arm or muscles.
- Neck aches and headaches.
- Difficulty moving finger; snapping and jerking movements.
- Low back pain, shooting back pin or numbness in the upper legs.
- Insensitivity to the cold and a painful lump on the fleshly surface of the palm below the thumb.
Avoiding Lost Work Time

What can you do to increase employee morale, productivity and reduce time lost from work by injured Sailors?

- Encourage workers to take short breaks.
- Make operating controls clear, easy to read, and readily accessible.
- Train on the proper use of tools and equipment; how to properly lift and carry; and proper posture.
- Adjust the work station to the employee’s height. Provide chairs with adjustments.
- Pad the edges of guards and work tables to protect arms and wrists.
- Change a process or move equipment or supplies to reduce repetition, twisting, turning, bending and stretching.
- Keep tools and equipment clean and well-maintained. Use automation when possible.
- Lower rotational speeds of tools to minimize vibration.
- Improve the lighting, heating and humidity.
- Insulate high-noise operations.
- Use the right tool for the job.
- Provide carrying handles on heavy or awkward loads.
- Use job rotation to reduce the amount of time employees are exposed to heat, cold, noise, and working in awkward conditions.

Try To Avoid These Work Practices

- Kneeling or squatting
- Repeatedly working with your hands above your head, or your elbows above your shoulders
- Working with the back bent forward without support or the ability to vary posture
- Sitting with feet unsupported
- Working with any body part bent or twisted (e.g., neck, back)
- Working with tools that vibrate (jig saw, grinder, sander) more than two hours total per day

FOR MORE INFORMATION

For more information, consult the Navy Ergonomics subject matter expert, Theresa Stack, MS, CPE, Sr. Occupational Ergonomist, at: (619) 532-2536 (DSN 522), email stack@solutions4work.com.