

MAJOR PROGRAM POINTS

"WORKING ERGONOMICALLY IN INDUSTRIAL ENVIRONMENTS"

Part of the "GENERAL SAFETY SERIES"

Quality Safety and Health Products, for Today...and Tomorrow

Outline of Major Points Covered in the "Industrial Ergonomics" Course

The following outline summarizes the major points of information presented in the course on "Industrial Ergonomics". The outline can be used to survey the course before taking it on a computer, as well as to review the course when a computer is not available.

- **There are thousands of different types of jobs in today's work world.**
 - Each job is performed in a different work environment, using different materials and tools.
 - And every job makes a different set of demands on our bodies.
- **Using ergonomics you can determine how you can work most effectively and safely based on your own physical makeup.**
- **First, you need to take a look at your work area.**
 - Next, look at the equipment and tools that you use.
 - Finally, take a look at yourself!
- **Your physical size and shape are important considerations when designing work areas and selecting equipment.**
 - Are you tall, or short?
 - Do you have long legs?
 - What about your arms?
- **How closely you and your workplace match up will determine how hard your muscles and joints will be asked to work while you're on the job.**
 - For instance, tools and materials should be arranged so our bodies aren't forced to make unhealthy movements, such as over-stretching, which can cause ergonomic injuries.
 - Workstations should be set up so that we can maintain neutral positions as much as possible.

- **As you would expect, design engineers who develop workstations and tools are hard pressed to make them "fit" everyone perfectly.**
 - They do their best to come close by designing things to fit most people.
 - The fine tuning, however, is left to you and your supervisor.

- **So how do we do this? Examining how our bodies move is the place to start.**

- **The human arm is a good example of a mechanical system that is designed to allow a number of different movements.**
 - The bones provide the framework for the shape of the arm.
 - They're connected by strong bands called ligaments, that hold the bones together.
 - Muscles provide the force to move the bones and hold the arm in various positions.
 - Sturdy cords called tendons are responsible for attaching the muscles to the bone.
 - Woven into this package are the nerves, which deliver information to and from the brain and provide us with our sense of touch.
 - All of these are elements in a system, and we have many of these systems throughout our body.

- **Where we run into problems is that as with any systems, things can "go wrong."**
 - Bones can break.
 - Muscles, ligaments and tendons can get sore, or be strained or torn.
 - Nerves can be squeezed and irritated if they are pressed against surrounding bone.

- **The good news is that we can avoid these problems by minimizing body positions that put a strain on our systems. To start:**
 - We should avoid long sessions of repetitive motion without rest, and overly heavy loads (these are the main contributors to ergonomic health problems).

- **There are also some positive work techniques that we can use to help us stay ergonomically healthy. These include:**
 - Alternating tasks to keep from repeating the same movements over and over.
 - Doing stretching exercises for relief of muscle tension
 - Doing our best to keep our bodies in neutral, non-stressful positions.

- **So how do we work all of this into our jobs, and avoid physical stress? Let's look at the regions of our body that are most susceptible to ergonomic problems.**
 - The hand and wrist.
 - The shoulder and arm.
 - And the back and neck.

- **The most comfortable position for your hand and wrist is its neutral position.**
 - This is where the wrist is kept straight, as if you were "shaking hands."
 - Here, the least possible stress is placed on the wrist.
 - This position should be used wherever it is possible, because other wrist positions can be very stressful, especially when used over lengthy periods.

- **"Extension" can especially be bad for you.**
 - That's bending your wrist up and back.
 - Try it... you can feel the stress.

- **Movement in the opposite direction, "flexion", can cause problems as well.**

- **So can "ulnar deviation", shifting your wrist to the right. And it's opposite, "radial deviation".**

- **"Flipping" your wrist can also cause stress to the system.**

- **You should minimize "pronation" (turning the wrist palm down), and "supination" (rotating the palm up) as well.**

- **But remember, you can only minimize these movements, you can't eliminate them... they're a part of life.**
 - Nevertheless, you should work to keep your wrist straight as much as possible.
- **Ergonomic considerations for the hand and wrist are especially important when working with tools.**
 - Carefully examine each tool that you use for weight and size.
 - If a tool is too heavy or bulky for the task, it will eventually cause fatigue.
- **Avoid tool handles with sharp edges.**
 - Rounded edges are much less irritating to the hand.
- **You should also avoid handles which are too short.**
 - They put direct pressure on the palm of the hand, causing irritation over long periods of time.
 - Instead choose long-handled tools that spread out contact over the length of the palm.
- **Finally, select tools that are balanced so that your wrist can maintain a neutral position.**
 - Tools that force your wrist into an awkward position, such as extension, can cause irritation over extended periods.
- **Power tools are found both in the workplace and in the home.**
 - It's just as important to use ergonomic principles with these tools, since they can put stress on the hand and wrist as well.
- **Remember to choose power tools that are "friendly" to the hand, the right size and weight.**
 - Stay away from tools that vibrate a lot.
 - Over time, this shaking can irritate the nerves in both your hands and your wrists (tools with variable torque controls are easier on the hands.)
- **But if you can't avoid vibrations entirely, you can "insulate" yourself by using heavy gloves or rubber sleeves.**

- **Avoid trigger mechanisms with high spring tension.**
 - They can tire your hands out.
 - Choose models with multiple finger trigger actions if they are available.

- **And remember to keep your equipment clean and in good working condition.**
 - This will make it easy as possible to work with.

- **Ergonomic problems can also affect the arm and shoulder.**
 - Here, positions that cause stress can lead to problems like tendonitis and bursitis.
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- **You can help to prevent these problems by minimizing certain arm positions.**
 - Stay away from "flexion"... raising your arm directly forward.
 - And, extension... reaching backwards.

- **You should also minimize "abduction".**
 - This is pushing your arms out from the side.

- **You don't want to do "adduction" either ... reaching across the body.**

- **Instead, go for the "neutral" position.**
 - Keep your upper arms to the sides and your forearms out at 90 degree angles.
 - This puts the least amount of stress on your joints and muscles.

- **It may not seem like there are many times when we can work with our arms in the neutral position, but in reality there are!**
 - Concentrating on workstation height is the key.

- **Fine tune your workplace to fit your own physical characteristics.**
 - For instance, you may need to raise or lower a chair or adjust the height of your work surface.

- **A temporary support can make your elbows more comfortable.**
 - Do everything you can to put yourself in neutral positions.
- **Where you place your tools and materials is very important as well.**
 - If possible keep them in front of your body.
 - This position encourages neutral movements.
- **Never put supplies where they are hard to reach.**
 - Especially if you need to support yourself with one arm to get something with the other.
- **Avoid "repetition"... extending your arms in the same way, over and over.**
- **Take "mini-breaks" to loosen tight muscles.**
- **And don't use excessive force to perform a task.**
 - Learn to "lighten" the load.
- **Your back and neck can be another source of problems.**
 - They are particularly complicated and fragile parts of the body.
 - Stress to either can lead to painful injuries.
- **Your back can be weakened in many ways:**
 - Through improper lifting.
 - As a result of a fall.
 - Even bad posture.
- **Back injuries can be particularly nasty.**
 - They can disable you for life.
 - But you can help to avoid them by minimizing certain motions.

- **Stay away from flexing and extending your neck.**
 - This occurs when you move your head forward and back.
 - Side-to-side motions are no good either.
 - Both of them can cause back strain when performed for long periods.
 - It's far better to simply adjust your workspace so that you can hold your head up straight.

- **You should also minimize twisting your lower back (the lumbar region).**
 - This can cause serious muscle strain.
 - If you feel yourself twisting to reach something, move it closer.

- **Believe it or not, sitting is one of the most stressful positions for your back.**
 - Sit so that your lumbar region is comfortably supported by the padding of your chair.
 - To get good support you may need to adjust your chair, or place a pillow behind your back.
 - Keep both feet flat on the floor, knees slightly higher than your hips. This position places less stress on your lower back.
 - If your feet tend to dangle, you should rest them on a book or platform.

- **Standing can be just as tiring to your back as it is to your feet and legs.**
 - Remember to keep tools and materials within easy reach.
 - Avoid bending and stooping.

- **Keep work surfaces at a proper height, where it's easy to maintain neutral arm positioning.**
 - If you need to get higher, stand on a small platform or stepstool.

- **Keep yourself comfortable with cushioned insoles and anti-fatigue mats.**
 - Use footrests and switch off feet every now and then.
 - You'll be surprised at how much difference a few little adjustments can make!

- **Using proper lifting procedures is especially important to the ergonomic health of your back and neck.**
 - First, examine the object you want to lift, to make sure you're not biting off more than you can chew.
 - If it looks like you can handle it, get close to the object and bend slowly at the knees...don't bend at the waist!

- **Get a good grip at the sides of the object, coming as close as you can to the neutral arm position of ninety degrees.**
 - Lift slowly with your legs, keeping your back straight and the load against your chest.

- **When you are carrying an object, remember not to twist your back.**
 - Instead, turn with your feet.

- **To set an object down, simply reverse the process.**
 - Again, keep your back straight and bend with your knees.

- **If the object that you need to move is heavy or hard to handle, don't risk back injury, get help!**
 - Lift in unison.
 - Counting out loud is helpful.

- **Some loads may be too heavy for even two people to lift.**
 - In these cases you should get mechanical assistance, such as a cart or dolly.

- **With all the lifting that goes on in the workplace, we also need to remember to stay away from excessive kneeling and bending.**
 - If for some reason you can't raise materials to table level when you need to work with them, use a padded mat to relieve the stress on your knees.
 - Knee-pads can also be a big help.

- **Exercise also plays a part in keeping you ergonomically healthy.**
 - Your body needs exercise to keep your muscles and joints in shape, so that you can perform your job without stress and strain.

- **Start out your day with warm-up stretching, then do limbering exercises during your breaks.**
 - With a little planning you can usually fit them into your schedule.
- **Almost any type of exercise is good medicine, and can do wonders for you at work!**
- **Yes, ergonomics is more complex than it appears.**
 - But with a little common sense and clear thinking, the ergonomic puzzle can be solved.

*** * * SUMMARY * * ***

- **Know how ergonomic issues affect you, and what you can do to avoid ergonomic injuries.**
- **Keep your body in neutral positions... arms, wrists, neck, shoulders and back.**
- **Choose tools that are designed for the job you are doing.**
- **Use correct lifting procedures.**
- **Be active! Keep yourself in good condition and exercise when you can.**
- **Good ergonomics is key to working safely and efficiently. You can help eliminate those aches and pains by paying attention to your body mechanics...as well as your work environment.**
- **So the next time you do a job, take the ergonomic approach. Your body will be glad you did!**