



RISK MANAGEMENT

TEXAS WOMAN'S UNIVERSITY

Ergonomics for Maintenance Workers

Maintenance workers keep everything on campus running when it breaks down. However, they are susceptible to musculoskeletal injuries. Their job includes electrical, plumbing, carpentry, painting, or HVAC, which all require pulling/pushing or lifting heavy items. Below are tips to help mitigate any discomfort and prevent musculoskeletal disorders in the future. If you are feeling discomfort, request an [ergonomic assessment](#).

Body Mechanics

- Minimize injuries by properly selecting the material and equipment required for the task at hand
- Assess the load (weight, size, and shape) to determine the best means for moving it
- Utilize a team lift if the appropriate equipment is not available
- Plan your path to prevent slips or falls
- Use proper body mechanics when lifting, pulling, or pushing. Do not lift with your back; use your legs
- Perform recommended stretches prior to starting shift to eliminate discomfort or injuries
- Avoid twisting, especially when bending forward while lifting. Turn by moving the feet rather than twisting the torso
- Take breaks when necessary

Storage

- Make sure to organize your workstation appropriately to avoid the risk of falling or slipping
- Clear your path from trip hazards, such as cords or debris
- Inspect your working tools conditions before use

Power Zone

- Lift items close to your body between mid-thigh and mid-chest height.

Staging

- Proper staging includes placing materials as close as possible to your workspace and storing materials at ideal heights so you can utilize the power zone to take materials from the storage

S.M.A.R.T. Lifting Technique

- **Size up the load, tool, or equipment**
 - Assess the size, weight, and shape. Remove obstacles from the load
 - Remove obstacles from your path
 - Determine if assistance is required
- **Move the load, tool, or equipment as close to your body as possible**
 - The whole hand should be used to ensure a firm grip
 - Position yourself as close as possible
- **Always bend your knees**
 - Maintain balance
 - Keep feet apart and in a comfortable position
 - Minimize bending at the waist
 - Bend your knees to a semi-squat
- **Raise the load, tool, or equipment with your legs**
 - Lift smoothly, without jerking
 - Maintain the normal curve of your spine throughout the lift
- **Turn your feet in the direction that you want to move the load, tool, or equipment**
 - Avoid unnecessary bending, twisting, and reaching
 - Change direction by turning your feet, not your back
 - To set down a load, squat down and keep your head up. Let your legs do the work

Selecting Your Tools

- Select tools with handles that are properly sized and shaped for your hand. The handle should be padded and made of non-slip material (i.e., dycem nonslip)
 - To maximize grip strength while using tools, the distance between the tool handles should be kept between 2.5 to 3.5 inches
- Use powered or ratcheting tools, when possible, for repetitive tasks
- Ensure the powered tools have a variable speed, torque limiters, or stop bars to prevent over-tightening and wrenching on your hands
- Select tools that are light and fit well in your hand. Tools such as pliers or punches that extend into your palm should be rounded or padded
- Use spring-loaded pliers, snips, and crimpers for tasks that must be done frequently
- Ensure tools, such as screwdrivers, have appropriately-sized and shaped handles
- Replace tools that are damaged
- Rotate tasks when using a hand tool for an extended period of time
- Use fitted gloves to protect your hands from contact stress
- Wear proper anti-vibration gloves when using power tools and use only as much finger force as necessary to provide proper control of the tool

- Replace one-finger activated tools with lever arms, air-operated push start methods, or thumb-switching tools
- Minimize the time of continuous use when operating a vibrating tool. Appropriate operating times will vary depend on the magnitude of vibration; however, limiting sessions to 10 to 15 minutes of continuous use with no more than 2 hours of total operating time per day is generally recognized as a prudent work/rest schedule. Other means of dampening or reducing vibration should still be observed even during shortened sessions.

Tool Belt

- Arrange tools on belt so that the weight is evenly distributed
- Use padded belts and suspenders to evenly distribute the weight between the shoulders and the waist, thus reducing contact stress
- Reduce the weight of the tool belt by reducing the number of tools carried to those necessary for the task
- Use a backpack-style bag to distribute the weight of tools over the body and improve posture if tools must be carried for extended distances

Plan Your Day

- Schedule your day appropriately, such as performing heavier tasks when you have more energy
- Rotate job tasks, such as moving an employee who spends most of their day attaching fixtures or other overhead tasks to a loading and moving job where the arms are down at their sides. While on the lifting task the hands, shoulders, and arms can rest if the loads are lifted not too large and proper hand holds are provided
- Take 5-minute breaks when appropriate
- Drink plenty of water
- Work in teams where appropriate
 - If you are trying to raise a heavy item above shoulder height, use a mechanical lift
 - If there is no mechanical lift, ask for assistance
- Wear the appropriate PPE
- Wear gloves to improve coupling and protect your hands from contact stress and cuts
- Wear knee pads when kneeling is required
- Sit on a stool while working on lower areas to reduce crouching or kneeling