RISK MANAGEMENT
TEXAS WOMAN'S UNIVERSITY

Ergonomics for Groundskeepers

Top 5 Ergonomics Risk Factors for Groundkeepers:

1. Manual Material Handling (Green Waste, Brush, Tree Limbs, and Tree Trunks)
2. Hedge Trimming
3. Tree Trimming
4. Debris Maintenance
5. Digging, Shoveling, Trenching, and Irrigation

- Wear the appropriate personal protective equipment (PPE) when working
- Take short, frequent rest breaks throughout the day to avoid exertion
- Stretch to warm up your muscles prior to starting your shift

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
- Take breaks when necessary

Power Zone for Lifting

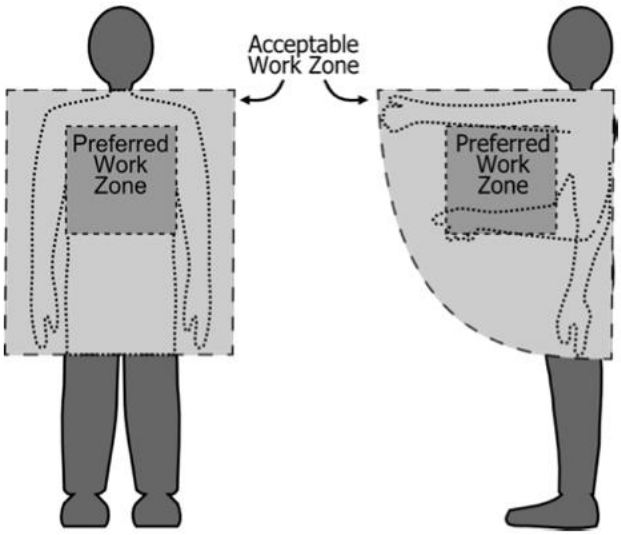
The zone close to the body, between mid-thigh and mid-chest height,
is where the arms and back can lift safely with the least amount of effort.

Layout of Equipment and Materials of Storage Area

- Arrange storage to prevent awkward postures such as bending, twisting, and over-reaching
- Store tools between knee and shoulder height
- Frequently used, heavy items should be stored between knee and waist height
- Larger heavy equipment should be accessible for use without needing to move other items
- Use mechanical aids when placing or moving heavy items that must be stored on the ground (such as a dolly or rolling cart)
- Ladders or step stools should be provided to reach items stored above chest level

Safe Work Zones
To help prevent musculoskeletal disorders, the preferred work zone is between waist and chest height with the body in an upright position.

- Hold tools and equipment controls close to your body
- Work with your body upright or with minimal forward bending
- Stand and face in the direction you are using the tool; do not twist your back
- Use both hands or alternate between left and right



Temperature

- To reduce heat stress, utilize the following:
  - Have access to drinking water
  - Be in a shaded area for breaks
  - Dress appropriately

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

- **S**ize 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
- **M**ove 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
- **A**lways 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

- **R**aise the load, tool, or equipment with your legs
    - Lift smoothly, without jerking
    - Maintain the normal curve of your spine throughout the lift
- **T**urn 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

Manual Material Handling:

Green Waste and Brush: Collecting Cut Material

- Mulch all grass, do not collect clippings. Use appropriate equipment
- Recycle leaf litter in place to increase the organic matter in soil; use it as mulch and decrease manual material handling
- Utilize the wheeled trashcans when necessary

Placing Materials into Transport Vehicles

- Keep the load as light as possible when lifting material into container or vehicle
- Utilize wheeled bins when able to

Removing Materials from Transport Vehicles

- Make sure to tilt the bed of the gator to reduce back strain associated with debris transport and disposal

Moving Large Limbs

- Use lightweight safety helmets with mesh visors to reduce neck/upper body muscle tension and improve visibility while working
- Utilize the appropriate equipment to load chipped material into dump truck and consolidate and transport larger materials such as tree trunks and tree limbs

Materials, Tools, and Equipment – Lifting, Moving, or Transporting

- Use mechanical aids when moving and/or lifting heavy or awkward items
- Use additional staff to provide external assistance or guidance

Hedge Trimming

Risk factors include:

- Awkward back, shoulder, elbow, or wrist postures to reach specific areas of hedges
- Repetitive motions of the upper extremity to cut hedges
- Forceful and sustained muscular exertions of the upper limbs while holding tools
- Vibration from power tools

Equipment

- Use anti-vibration gloves that offer good dexterity
- Lightweight, well balance trimmers will be beneficial for the safety of body mechanics

- Battery powered hedge trimmers are recommended to reduce weight and repetitive motion
- Try to avoid using hedge trimmers with power cords
- Gas powered hedge trimmers are recommended to cut thicker and woodier branches

Tree Trimming

Risk factors include:

- Low back and wrist strain when handling heavy tree limbs and trunks
- Shoulder, elbow, wrist, and hand strain while manually ascending and descending trees
- Repetitive motions and awkward postures when operating handheld powered and non-powered cutting tools

Bringing Tools into the Trees from the Ground

- Do not hand carry tools into the trees, clip light weight hand tools with scabbards to belt
- Pull up other items separately via rope, or have your partner on the ground deliver heavier tools via a pulley system

Trimming Branches Above Shoulder Height – on the ground or up in the trees

- Use extendable pruners and loppers to reach areas above shoulder height while keeping arms in the safe work zone
- Use lightweight pole chainsaws when cutting branches to reduce effort
- Brace the pole of chainsaw against the shoulder and operate with the arms to increase stability and reduce cutting efforts
- Adjust tool handles to provide comfortable grip while cutting

Trimming Branches Lower than Shoulder Height – on the ground or up in the trees

- Use the lightest weight chainsaw for the job
- Ensure proper techniques are used while operating chainsaw (right hand activating throttle trigger and left hand on forward handle)
- Brace the back of the heavier chainsaws against the forward, dominant leg and close to the body to increase control and reduce fatigue
- Adjust tool handles to use safe body mechanics
- Use lightweight safety helmets with mesh visors to reduce neck/upper body muscle tension and improve visibility while working
- Use anti-vibration gloves to reduce vibration exposure to the hands when using gas powered saws

Handling Large Tree Trucks and Cutting Trunks into Smaller Pieces

- Use motorized winches and grapples to automate dragging, lifting, and carrying tree debris
- If manually handling large tree trunks and limbs, cut into smaller sections with a lightweight heavy-duty chainsaw

Debris Maintenance

Risk Factors include:

- Awkward neck, shoulder, and lower back postures
- Repetitive bending while picking up light weight material from ground

Landscape Debris Maintenance and Hardscape Debris Collection

- Utilize automated equipment to collect debris
- Use lightweight, low vibration, handheld backpack blowers when gathering debris
- Use push or self-propelled blowers to clear leaves off of large fields
- Utilize rakes made of lightweight and durable material

Collecting Debris

- Use lightweight hand tools, debris bags with handles, a wheeled container places on its side or other equipment to help with manual debris collection
- Use a grabber or Reacher to pick up lightweight trash

Digging, Shoveling, Trenching, and Irrigation

Risk factors include:

- Repetitive bending and twisting while digging and shoveling
- Repetitive and forceful gripping when using tools and equipment
- Knee compression when working on the ground
- Overexertion when digging by hand for extended periods of time

Automated Digging, Trenching, and Excavating

- Use industrial equipment with appropriate digging attachments or dedicated equipment specific to the job

Digging and Shoveling by Hand

- Select the best shovel for the job with consideration for handle length, blade type, and weight
- Practice safe shoveling techniques
- When working on the ground, change positions every 5-10 minutes and use knee protection to reduce compression
- Utilize fitted boots to make it easier to work in muddy/wet environments
- Use a portable pump to remove water prior to digging and select a shovel with a steel blade and holds when soil is muddy

Maintaining and Repairing Irrigation Systems

- Use a pipe cutting tool to reduce cutting forces

This information is provided by the University of California: Ergonomics Study of Ground Positions