



## 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.

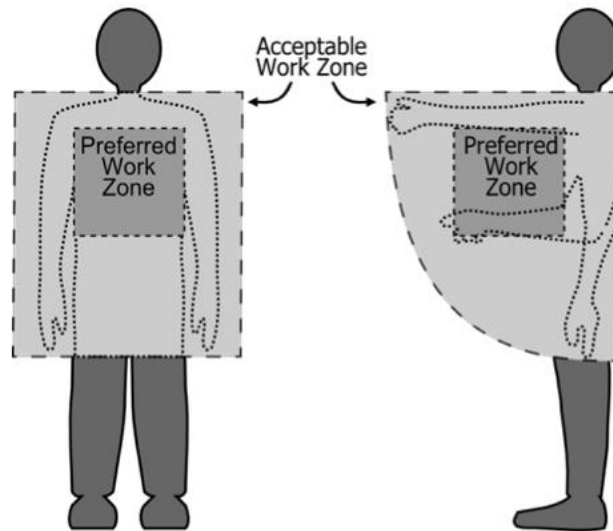
### Layout of Equipment and Materials of Storage Area

- 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

- 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

- **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](#)