

Ergonomic Principles and Gardening

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Ergonomics

- Definition: The study of doing tasks in the safest and most efficient way. Tools that are developed with ergonomics in mind take into account how a person naturally moves their body.

Ergonomics, continued

- The goal of ergonomics is to reduce physical impact on the body by matching the physical demands of the task with the capabilities of the person completing the task.

Ergonomic gardening tools

- Principles of ergonomic gardening tools:
 1. The tool fits you without modifications (ie. Fits your height or your grip)
 2. The tool is long enough for you- adding length to the tool may be beneficial
 3. The tool feels comfortable when you are using it.

The importance of joint protection

- What is joint protection?
 - The use of strategies to reduce the risk for development of muscle pain and stress on the tendons and joints
 - Important whether you have issues with your joints or not (joint protection can assist with decreasing the risk for development of joint problems)
 - Examples.....

Joint protection strategies

- 1) Keeping your back straight--- this can be accomplished by using long handled tools and making sure that tools are the proper height
- 2) When weeding, kneel on one knee not both. Kneeling on both causes you to round at your back.
- 3) Bend from your hips when you are sitting or kneeling, not from your back as this can put pressure on your spine and the discs between your spinal bones.

Joint protection strategies, cont.

- 4) Cushioned grips and grip handles can prevent wrists from being pushed forward and prevent arthritis, carpal tunnel syndrome, and wrist injuries
- Those with arthritis (RA or OA) need to be careful with avoiding strain at the MP joints that can lead to ulnar drift

Examples of ergonomic hand held tools



Tool for hand weakness or carpal tunnel issues



Joint protection strategies, cont.

- Keeping good alignment of your joints allows you to continue to work with less muscle fatigue as the muscles are working in alignment
- Always avoid twisting, lifting with your back, internally rotating at your shoulders, and bending at your wrists
- The hand has 25% less grip force when the wrist is bent!

Back protection

- ***Bending and Lifting***
- Bending at your knees rather than your back reducing forces by 50% as you don't have to lift the weight of your body.
- Stand upright when working at ground level or when using long-handled gardening tools.
- Contract your abdominal muscles when bending over to lift something heavy.
- Keep distance between your feet to increase balance and stability
- Garden in raised beds if possible. Move close to the object you are working on.

Shoulder Protection

- *Reaching*
- Work below shoulder level whenever possible to avoid strain on your back and shoulders (as well as on your heart).
- Use a ladder to bring yourself up to the level you are working.
- If working overhead, do not do for more than 5 minutes to avoid pressure on your back, shoulders, and heart
- Use both arms whenever possible.

To summarize:

- Always use the largest muscle possible for the job (ie. Quads over small paraspinal muscles, or biceps and forearm muscles over wrist and finger muscles).
- Chin up, bottom down!
- Joint protection can keep you doing what you love to do and is therefore critical to any job.

Example of the tenodesis motion of the hand

- Have participants close their hand into fist with their wrist bent vs. extended for example
- Example of trying to write with the wrist in a flexed position

“Rules of Thumb” to select gardening tools

- Find the right grip. Make a circle with your index finger and thumb. That is the size that the grip of your tools should be. Larger grips are easier to hold.
- Use tools with long handles. This reduces bending, reducing the risk of back injuries.
- Choose the tool with the lightest weight possible but still sturdy.
- Keep your back and joints straight. This lessens the risk of repetitive stress injuries.
- Use tools with grips that are soft and non-slip.

“Rules of thumb,” cont.

- Wear non-slip gardening gloves. This can prevent tool slippage in hands and help to keep a good grip. Gardening gloves can keep arthritic hands warm and prevent blisters or sores from forming (especially important for those with diabetes or circulation problems).

“Rules of thumb,” cont.

- In hand tools, look for tools that can support a 1 or 2 hand grip as 2 hands may be required at times.
- Look for tools with a firm but thick handle
- Tools that have a forearm brace make your forearm do some of the work and take the pressure off of the smaller finger joints, also improves wrist alignment
- Built up handles require less use of force!

“Rules of thumb,” cont.

- - See more at:

<http://greenthumbs.cedwvu.org/factsheets/ergonomics.php#sthash.hsr2OBUR.dpuf>

- Green Thumbs/Healthy Joints:

1-800-841-8436

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Assistive Technology in the Garden

- What is assistive tech?

The use of low tech or high tech tools to help someone with a disability or impairment be able to complete tasks

Examples of AT in the garden include

1) Hand held click seeders that use vibration to plant seeds (can avoid picking up small seeds with fingers)

Assistive Tech in the Garden, cont.

- 2) Foam tubing or co-ban/vet wrap can be placed around the handles of tools to assist people with arthritis, CTS, or decreased hand sensation
- 3) Wheel caddies to move tools, plants, and soil
- 4) Rubber pads under knees to protect joints
- 5) Use a sprinkler or a sprinkler system rather than carry heavy cans of water

Assistive tech in the Garden, cont.

- 6) Wear a carpenter's apron to carry items rather than carrying with hands

Arthritis and Gardening

- Wear gardening gloves to cushion joints
- Buy larger gloves and put foam padding in the finger tips to cushion joints
- Digging in the dirt can offer pain relief for sore, stiff hands due to the warmth and moisture of the dirt
- Stretch before gardening!
- Spread out gardening tasks over several days to avoid fatigue

Arthritis and Gardening, cont.

- Use gardening containers or raised beds to avoid pressure on joints
- Change positions *before* fatigue sets in, especially important for those with RA
- Work with wrists in a neutral position (handshake position)
- Internal rotation of the shoulder places abnormal forces on the shoulder

Gardening with a joint replacement

- Listen to your body- stop if you have pain
- Adhere to your surgeon's recommendations- surgeons often have their own protocols and know what the inside of your joint looks like- when in doubt, call and get permission
- General rule of thumb
 - Hip joint replacements
 - Knee joint replacements
 - Shoulder joint replacements

Gardening with circulatory challenges

- Avoid injury, skin tears, blisters etc.
- Wear long sleeves to protect skin
- Proper footwear
- Sunscreen
- Tetanus shots are important for all gardeners

Examples of ergonomic gardening



Examples of ergonomic gardening



Resources



North Coast Medical

<http://www.beabletodo.com>

Colored tubing, various sizes: SKU:
NC35012, NC35013, NC35014 and
NC35015

Cylindrical foam: SKU: NC35005

Resources, cont.



Walt Nicke's Garden Talk
<http://www.gardentalk.com>
A.M. Leonard
<http://www.amleo.com>



Resources, etc.

Weed Zinger

Arthritissupplies.com

Allows you to weed without bending at your back

References

- Greenthumbs.cedwvu.org
- Working-well.org/articles/pdf/Gardening
- Arthritissupplies.com
- American OT Association (AOTA) aota.org