

# Chapter 3: Yard Work & Gardening

Yard work and gardening may be your hobby, your passion or simply weekend chores. It can be a great source of relaxation & therapy for your mind and body when done with ergonomics in mind.

*4 hours in the garden can pose more ergonomic stress to your body than a full work week..*

- Back aches from bending at the waist to plant, clear brush or lift bags of soil
- Tingling hands from prolonged grasping and squeezing of pruning shears
- Sore and irritated elbows from hacking away brush and weeds with a trimmer
- Loss of grip strength or hand function after using a vibrating weed whacker all day

*Are your joints withering while your lawn and garden are flourishing?*

Consider cultivating some good ergonomics techniques so you can enjoy those yard and garden activities and the out-of-doors well into the future.



# Yard Work and Ergonomic Risks

The *Ergonomic Risk Factors* that contribute to musculoskeletal problems...

- Excessive or prolonged forward trunk bending to work at ground level
- Awkward hand/wrist postures due to tool handle size, shape or design
- Forceful lifting, carrying and placing of heavy loads
- Overhead use of arms and shoulders working on trees and tall shrubs
- High impact forceful motions when digging, picking or tilling
- Squatting and kneeling on knee joints
- Vibration from power tools such as mowers, weed whackers or clippers



# *Ergonomic Risks?*

*...not for the garden snail*

Kneeling, squatting and bending wouldn't be such a problem if you were like one of those pesky garden snails... *spineless invertebrate that can effortlessly conform to any posture or position.*

Unfortunately, as an adult you have 230 movable joints, including 26 movable vertebrae with a finite range of motion- all of which can be pushed to the limit when doing yard work.

You've got to protect these joints and treat them with the same TLC you give your lawn and garden.



# Yard Work & Gardening

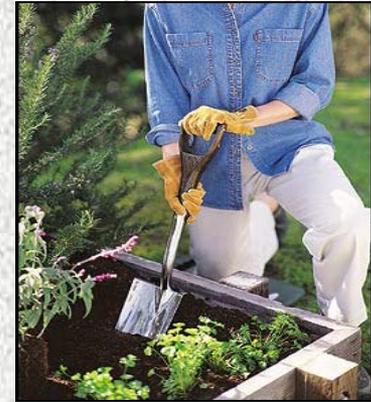
## *Essential Tips & Techniques*

- Know your limits- don't let your determination to complete a project push you where your body shouldn't go
- Keep your gardening tools sharpened to reduce the force you must use
- Wear gloves to reduce grip forces and vibration
  - open tip gloves for hand grip tools (shovels, rakes)
  - close tip gloves for protection from the elements (pruning roses, handling stone)
  - impact/vibration resistant gloves (picking earth, mowing or weed whacking)
- Look for gardening tools that...
  - can be held with your wrist in a handshake / thumbs up position
  - have cushioned handle grips (or apply a foam sleeve/friction tape) to reduce grip force
  - include ratchet-action spring features (trimmers, loppers, sheers) to reduce squeezing that are right for the job!
- Avoid moving heavy weights by...
  - using a wagon or wheel barrel to move material
  - using a tarp or even a plastic snow sled to collect leaves, haul bags of soil or move rocks



# Yard Work & Gardening

## *More Essential Tips*



- Avoid prolonged or repeated bending at the waist
  - use tools (rake, shovel, watering wand, pruning shears) with handles that are long enough to fit your size and the task
  - apply adjustable handles or adapt “T” or “D” shaped handles to fit your size
  - adjust the length of your lawn mower handle
  - use a kneeling bench or rolling stool to sit on when working at ground level
- Use knee pads, carpet samples or foam pads to cushion your joints when kneeling
- Use electric motors versus gas motor tools (mowers, cutters, weeders) to reduce vibration, noise and improve your air quality – there are lots of cordless tools available!
- Take frequent breaks, alter your body postures and pace yourself- there’s always tomorrow to finish things up if you’re still in one piece!

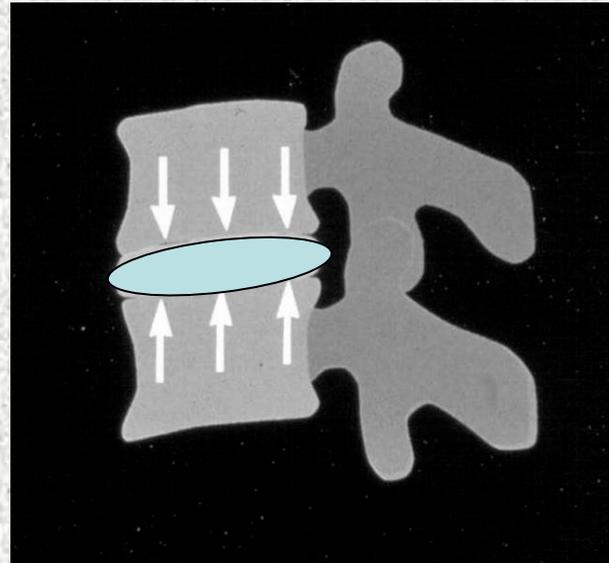
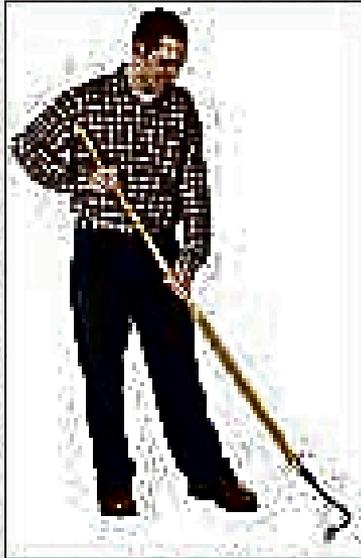
# Basic rules of spine (trunk) postures



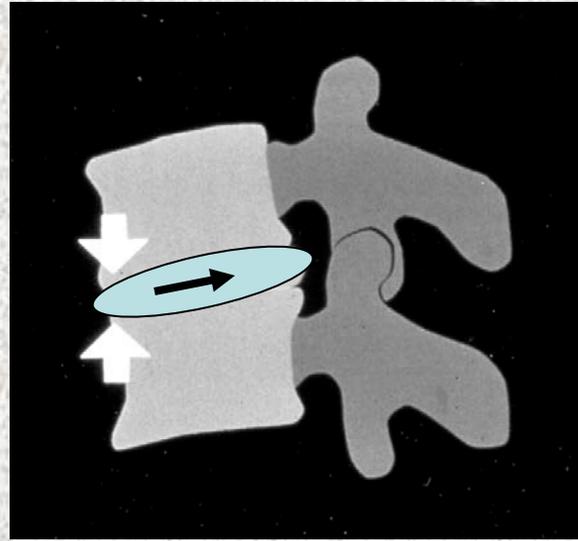
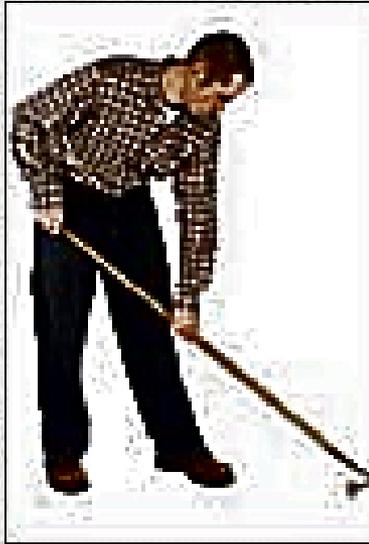
This is the neutral posture of the spine with a nice inward curve in the low back (lumbar).

In this near erect posture, the load on the spine is minimal.

However, when we bend the spine forward or rearward we increase the load significantly which may cause degenerative problems over time.



When standing erect doing yard work (using tools that are long enough for your height), the pressure on the discs (think of lozenges filled with fluid) are evenly distributed - this is **GOOD!**



When bending forward with your trunk bent in a “C” shape, pressure on the discs increase and are unevenly distributed. As a result significant pressures are exerted on the front of the discs (squeezing that soft lozenge) which may result in the material bulging out the back... this is **NOT GOOD!**

Avoid bending the trunk to perform ground-level work  
*...it's all in the technique of using the body efficiently*



This gardener is weeding with his low back in extreme flexion (bending with “C” shaped spine)

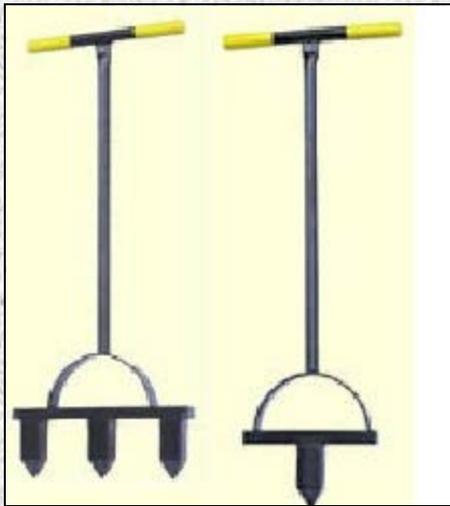


This professional gardener can work at and below ground level (slope) while clearing brush with his back straight and a nice inward arch...by bending at the knees

Avoid bent trunk postures for even short periods  
*...it puts excessive compression force on the low back*



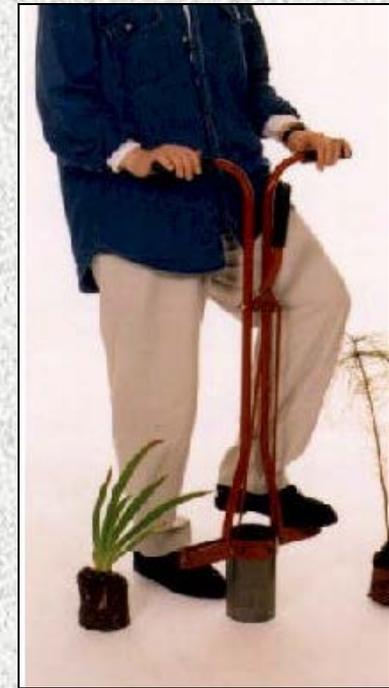
# Use long handled, vertical or curved tools *...to minimize forward trunk bending*



Vertical Hole Diggers for seeding and planting versus bending to dig holes



Long handle and curved head on this weeder reduces the amount of bending required



Vertical Hole Diggers for seeding and planting versus bending to dig holes

Use long handled, vertical or curved tools  
*...to minimize forward trunk bending*



This rake has an adjustable length handle to fit your size. It also has a pivoting rake head so you can pull or push leaves or debris.

Avoid squatting postures for long periods  
*...it's very stressful on the knees and thigh muscles*



Brief episodes of squatting to lift materials or pull a few weeds is fine but for long episodes of squatting while working at ground level is not advised

Use *Diagonal Half-kneeling* technique  
...to minimize bending/squatting when working at ground level



Use *Diagonal Half-kneeling* technique  
... and padded knee rest



Portable knee rest but could  
be a rolled towel, a carpet  
sample or a piece of foam

One knee supported on the ground preferably  
with a padded rest can reduce pressures on  
the knee joints by as much as 40% over a  
conventional squat.

# Look at all the new tools to make ground level work easier!



Kneeler with side rails for getting up and down  
Flips over to serve as a bench for sitting in the garden



Low height rocker stool with seat pad and tool pouch



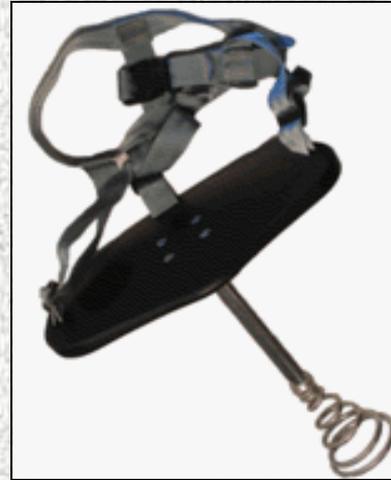
Low height tractor cart (activated with feet) for working at ground level with handy tool bin below

# Use kneelers, stools and mobile chairs

*...to minimize bending/squatting when working at ground level*



Mobile seat and tool caddy



A wearable gardening stool...  
originally a Swiss milking stool



# Latest knee pads & mats for ground level work

Large gel mat for  
resting both knees



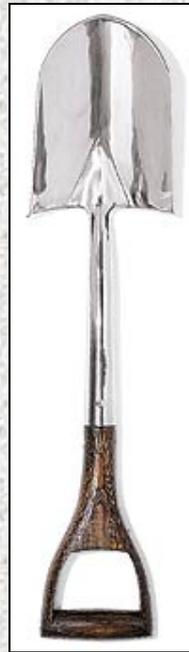
Gardening knee pads:  
Waterproof and  
extra thick for working  
on uneven terrain with  
Neoprene straps that don't  
pinch behind the knee



2 in 1 Gel Kneepads  
Change out front pads for  
smooth or rough terrain

# Use small or short tools for ground level work *...to avoid awkward postures and motions*

Mini How - fork and rake with adjustable handles and easy grip

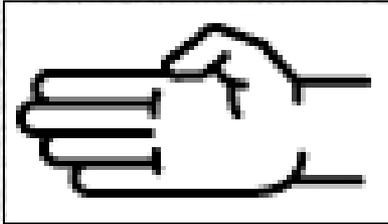


Small hand tools

The “Trowel”  
- short shovel  
& trowel  
combination

# Some basic rules of thumb... *and hand!*

## Good

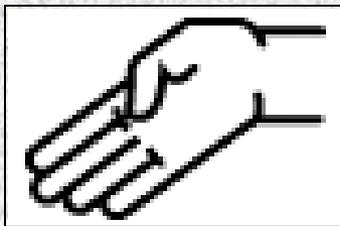


This is a neutral “thumbs up” or “hand shake” wrist position for using garden tools and equipment

## Good- *handshake*



## Not Good



This is an awkward hand/wrist posture- the wrist is bent sideways which puts stress on the wrist and elbow

## Not Good- *bent wrist*



# Use tools with good handle designs and grips *...to ease arthritic joints and grip fatigue*



Handle adaptors for rakes and shovels to improve posture and grip



Customized handles to improve posture and grip



# Tools with good *ergo* handle designs and grips



Carbon/Teflon blades and shock absorbing handle grips



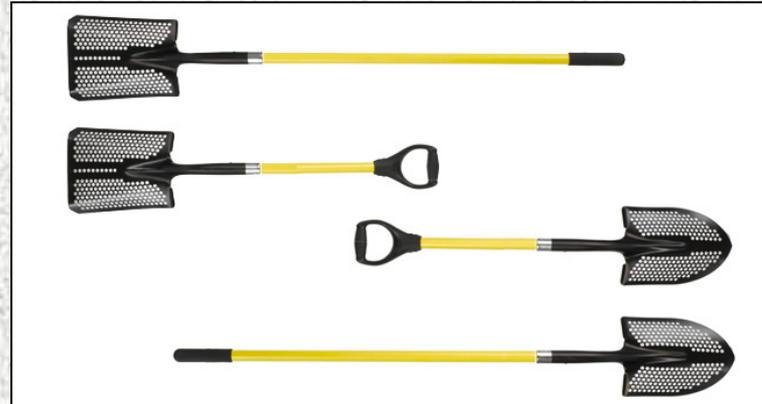
Gel handle grip with serrated edge for cutting through roots or opening bags

Small garden tools with handshake grip handles

# Use tools with good quality construction *...they perform better and last longer*



Stainless steel blades are lighter, more maneuverable don't rust and release earth easily.

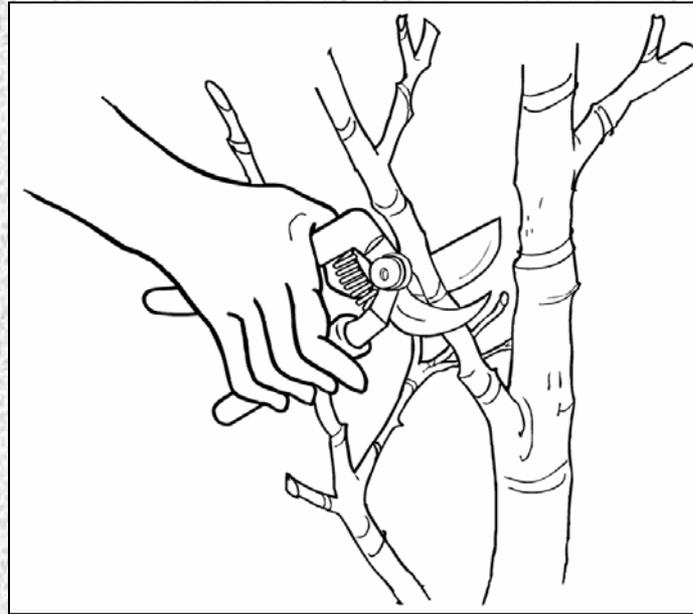


Light weight perforated shovels for wet work- slides easily through and releases wet clay soil.



Carbon steel and Teflon coated blades for lighter and more efficient motions

# Awkward Grip and Hand Force



For most average size people, lopping and pruning require awkward grips due to the wide handle breadth and forceful hand motions to cut through the branches of different thicknesses.

*What to do?*

# Use the right size tool... for your hand size, grip strength and the task



Loppers and pruners with gel packed handle grips



Mini-grip Pruners  
Fit smaller hand size  
Cut up to 1" thick branches



Ratcheting pruners with good grip to cut up to 1.5" thick branches

# More of the right tools...



Yardshark hedge trimmers with light aluminum, and carbon blades for easy cuts



Loppers with adjustable handle length

Ratcheting loppers for easy cuts up to 2" thick branches



Long handled loppers to get to those high places



# Awkward Postures Working Over Head

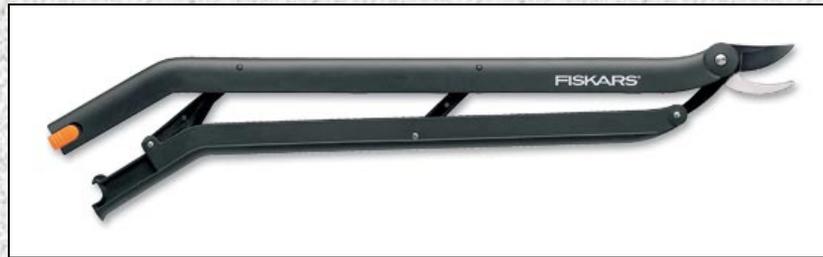


Trimming and pruning trees or high shrubs are a special challenge

- Involves awkward arm, shoulder and head/neck postures
- Requires use of force
- Can be unsafe if you don't have stable footing or are using a ladder on uneven or soft ground

# Use long handles tools and safety ladders *...to minimize overextended and unsafe postures*

Long handled loppers to  
get to those high places



Step stools and ladders to  
get to those high places safely

# A world of specialized gloves

*... to improve grip and provide protection*



Breathable and stretchable garden gloves with easy grip palm and finger surface that also reduces friction

Bionic garden gloves with leather and stretch neoprene motion zones and anatomically designed padding (must be sized)



**TIP:** Most off-the-shelf leather garden gloves are stiff and unrelenting. Cloth gloves are more pliable but don't provide needed protection. Both styles of gloves actually decrease your grip strength. Today, new and improved materials have given way to new glove designs that provide both enhanced grip and protection...check these out!

# There are gloves to reduce impact and vibration *...when using whackers, mowers, saws and trimmers*



Closed tip gloves for mowing, whacking and trimming



Anti-vibration and impact gloves reduce muscle/tendon strain, nerve dysfunction and injury. Chase and Thor brands are among the best of those studied



Open tip for grip and dexterity for hammering, shoveling, raking and sheering

Use electric tools over gas/oil  
*...to reduce vibration, noise and air pollution*



**Electric 13" Mini-Mower**



**Electric Standard Mower**

# Alternative electric tools over gas/oil

Electric  
chipper/shredder



2 in 1 electric  
shears and clippers  
lightweight with  
on/off switch & no  
holding trigger



Electric tiller



Electric edger



Electric weed  
whacker/trimmer

# Watering techniques

*... to minimize awkward postures and motions*



Watering cans can be heavy and awkward to handle so use both hands



Hoses are easier to handle and you don't run out of water!

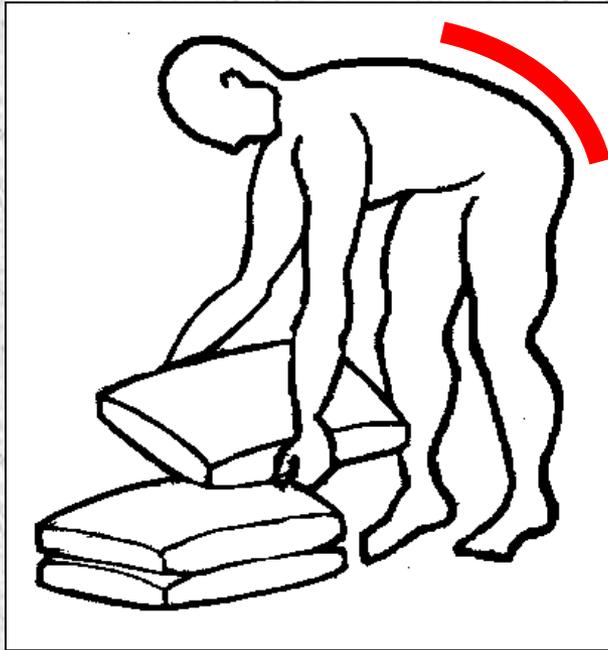


Sprinkler systems are better yet for regular watering and you don't have to be present to complete the task

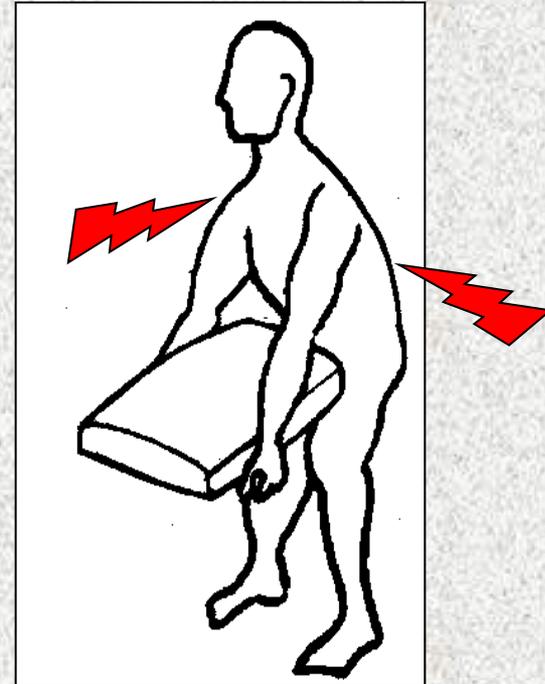


Hand held watering wands allow you to get to those hard to reach hanging baskets or beds

# Basics on lifting/moving heavy materials



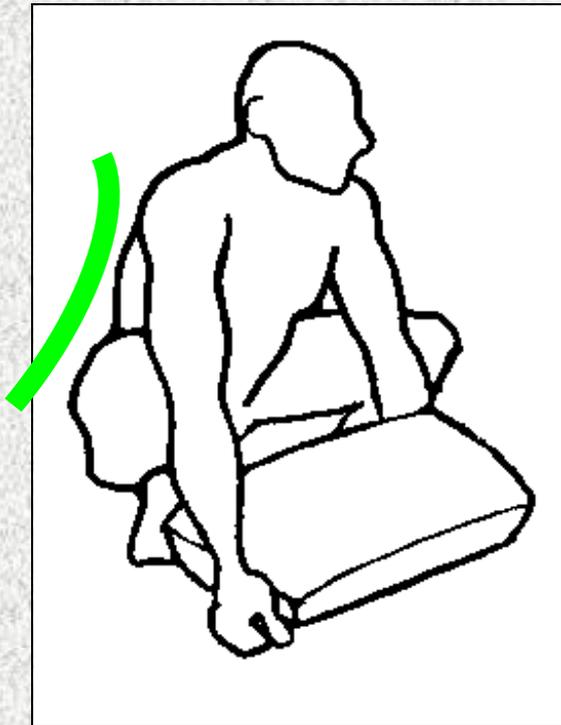
**Avoid bending your back into the “C” shape to lift heavy items!**



**Avoid using your arms and shoulders to lift heavy items engage those legs too!**

# Bending to Lift and Move Heavy Materials

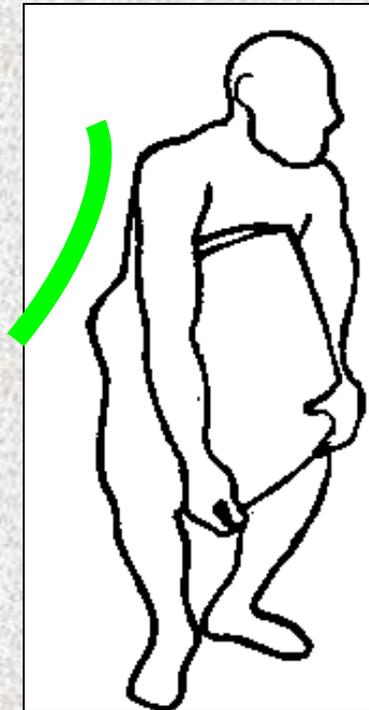
*...the Power Lift technique*



*Spine is kept straight with slight arch in low back*

## **Rule One:**

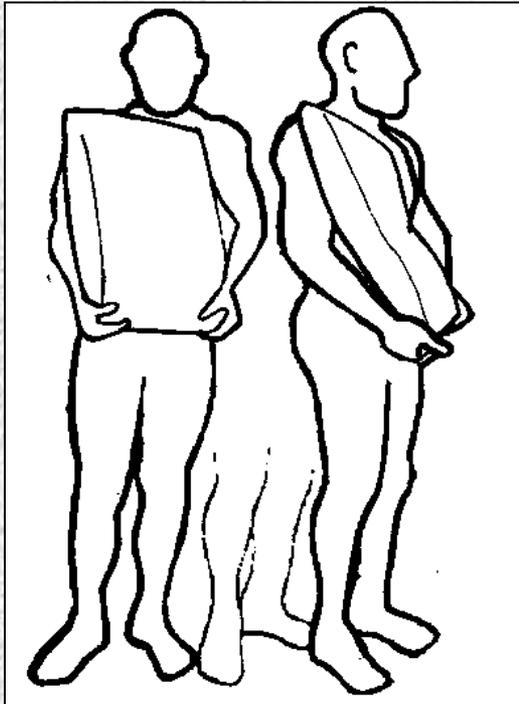
**Get close and straddle the load  
Spread your feet apart and squat  
or get down on one knee**



## **Rule Two:**

**Bend at your knees and hips  
Keep your back straight  
Use the large muscles of your legs to elevate the load and then recruit your arms and upper body  
Keep the lift smooth and gradual** 35

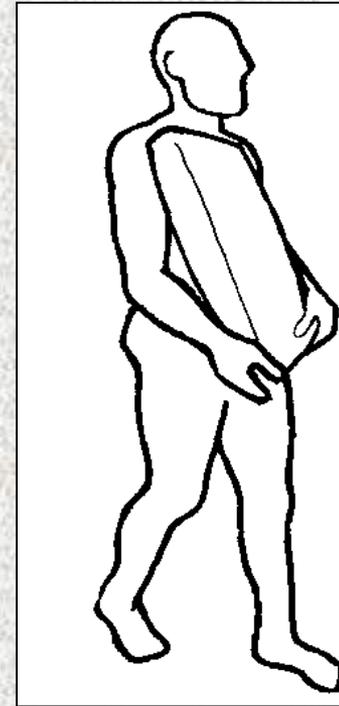
# The Power Lift Technique



## **Rule Three:**

**When moving or placing the load, move with your feet.**

**Avoid planting your feet when turning the twisting motion puts stress on knees, hips and low back**



## **Rule Four:**

**When carrying the load, grip it with both hands holding the load close to your body at about waist height and always keep a watch for obstacles in your path.**

# Use carts, wagons and wheelbarrows *...to minimize heavy lifting and hauling*



# The 3 wheeler wheelbarrow

*...now she's hauling!*



You can buy the 2-wheel adaptor kits in many large hardware outlets to convert your existing wheelbarrow

# More carts, wagons and wheelbarrows *...to minimize heavy lifting and bending*



Large 2-wheel cart with removable tub that slides on and off the frame



Flexi-cart collapsible canvas cart

Both of these carts can be lowered/tilted to ground level to rake or slide materials into the carrier to minimize bending, lifting or shoveling...a real step saver!

[www.eco-gardening.com](http://www.eco-gardening.com)

# Use tubs, totes and mobile bins for lighter loads



# Necessity is the mother of invention

*...use a make-shift hauler for short-term projects*

A \$10 plastic sled will help haul very heavy materials on flat surfaces around the yard.

An inexpensive vinyl tarp with metal grommet holes to attach a rope also works.



*Don't forget the most basic tools that can make a big difference in your gardening experience!*



A tote bag will organize your tools, prevent you from misplacing them as you move around and keeps your gloves and a bottle of water always handy!



You may not give it much thought but a hat should be an essential tool worn to protect from the sun's gazillion UV rays. Heatstroke, sunburn or skin cancer are no laughing matter!

# Where to find more information



## Resources- ergonomic guidelines for gardening

[www.ini.wa.gov.ergobank](http://www.ini.wa.gov.ergobank) - ergonomic guidelines for gardening

[www.indianahandcenter.com/erg\\_garden](http://www.indianahandcenter.com/erg_garden) - article safe gardening

[www.2.kumc.edu/coa/senior\\_press](http://www.2.kumc.edu/coa/senior_press) - article safe gardening

[www.usernomics.com](http://www.usernomics.com) - ergonomic guidelines for gardening

[www.gardengatemagazine.com](http://www.gardengatemagazine.com) - tips for ergonomic gardening

[www.working-well.org](http://www.working-well.org) - tips for ergonomic gardening

[www.agrabilityproject.org.assistivetech/tips/handtools](http://www.agrabilityproject.org.assistivetech/tips/handtools) - selecting hand tools

[www.chiropractic.on.ca](http://www.chiropractic.on.ca) - tips for back safety gardening

## Sources- ergonomic tools for gardening

[www.fiskars.com](http://www.fiskars.com) - ergonomic gardening tools

[www.mainstsupply.com](http://www.mainstsupply.com) - ergonomic gardening tools

[www.oxo.com](http://www.oxo.com) - ergonomic gardening tools

[www.smithandhawaken.com](http://www.smithandhawaken.com) - ergonomic gardening tools

[www.eco-gradener.com](http://www.eco-gradener.com) - ergonomic gardening tools

[www.goodgrips.com](http://www.goodgrips.com) - ergonomic gardening tools

[www.chaseergo.com](http://www.chaseergo.com) - ergonomic gloves