



**UNIVERSITY OF CALIFORNIA**  
Agriculture and Natural Resources

UC Master Gardener Program

UC Master Gardeners of Napa County

# Las Flores Learning Garden





UC Master Gardeners of Napa County  
<http://napamg.ucanr.edu/>

*Our mission: "To extend research-based knowledge and information on home horticulture, pest management, and sustainable landscape practices to the residents of California and be guided by our core values and strategic initiatives."*



# Welcome to UC Master Gardeners of Napa County Las Flores Learning Garden (LFLG)

- We are a Volunteer organization affiliated with the Univ of Calif. in partnership with the City of Napa.
- Our Mission is to provide researched base Horticultural information to YOU, the Home Gardener.
- Our Goal is to educate and empower the community about:
  - LFLG and our Low-water, low maintenance gardens on-site
  - Ca. Native, pollinator & Succulent/dry gardens on-site
- Provide information about Climate Change and how you can help reduce carbon dioxide in the atmosphere.

# Use These Healthy Soil Practices

- No Tilling or double digging unless absolutely necessary. As that is shown to release carbon and damages the fungi, bacteria in the soil.
- Save water with a drip irrigation instead of sprayers
- Add ½” - 3” of compost on top of the soil that will feed the plants naturally by using organic amendments.
- Keep soil covered year-round with a diversity of plants or cover crops. If left barren, cover the soil with 3-4” of mulch.



# Winter Mulching

## Why mulch?

- Holds soil in place during winter rains
- Maintains temperature
- Conserves water between rains
- Protects from compaction
- Weed control
- Breaks down into organic matter

## What is mulch?

- Shredded bark
- Straw
- Shredded leaves
- Aged compost
- Gravel (Inorganic)



ERIC & SAFETY

DENING

TOOLS



# *Introduction to Gardening Ergonomic Safety*



Presented by :

Dr. Bob Niklewicz PT DHSc CEAS II MG★



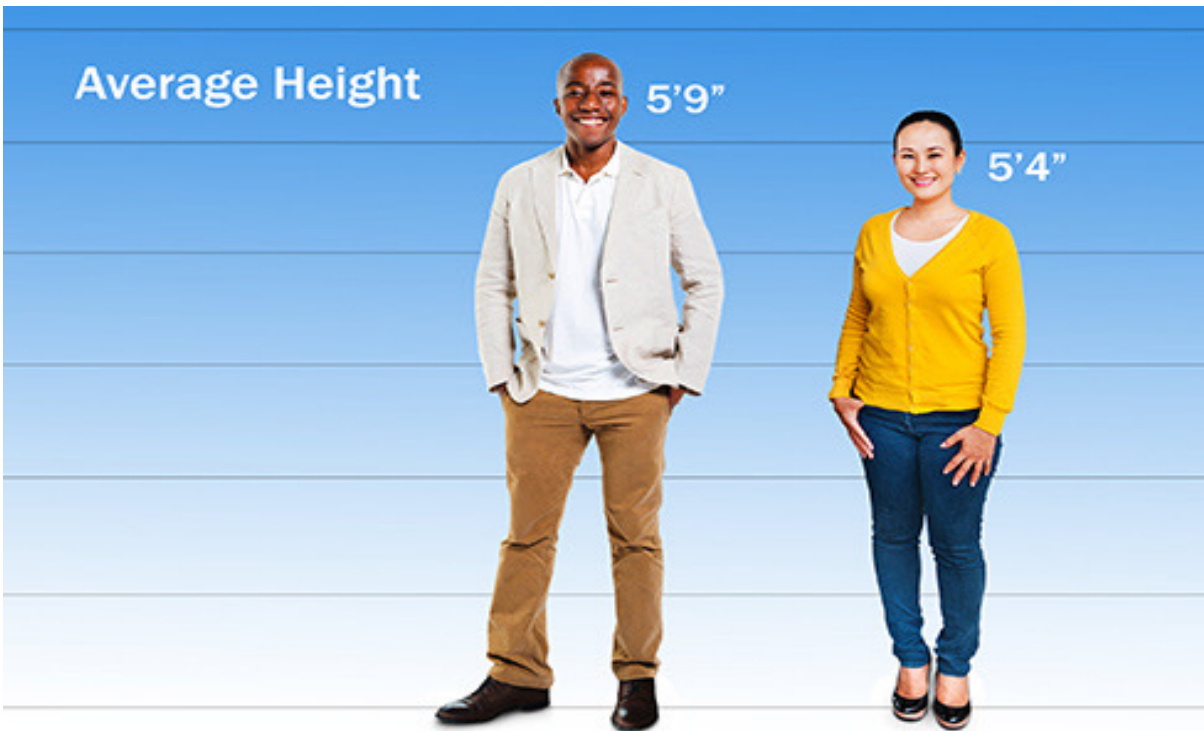
**Ergonomics:** an applied science that coordinates the design of devices, systems, & physical conditions with the capacity of the Worker.”

I will cover the following today

- Basic Body mechanics
- Back, Shoulder & Hand use risk.
- Ergonomic gardening tools options
- Adaptive devices.



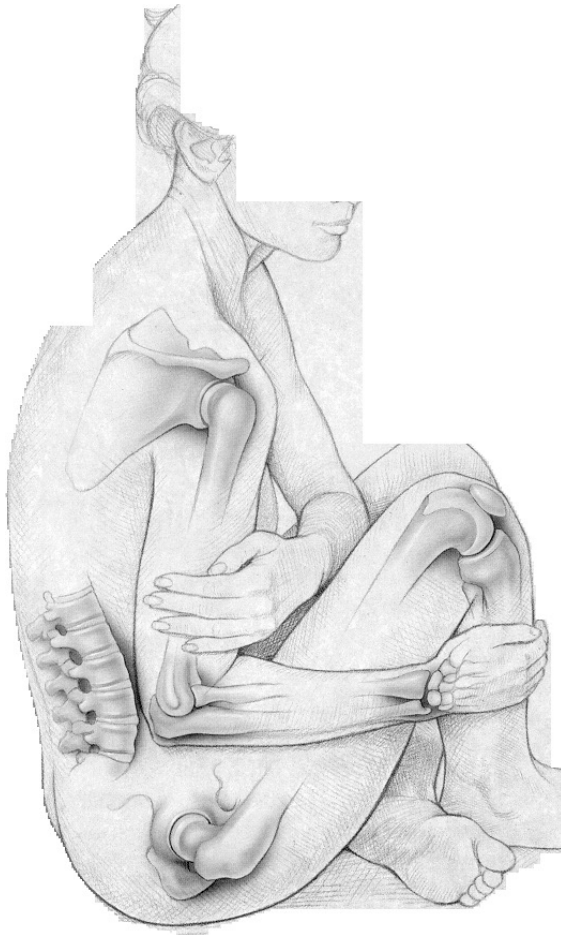
# One size does not fit all people



Source: OSHA

Your job is to use the best fitting tools and body mechanics for YOU to enjoy YOUR garden safely.

# IT IS YOUR BODY!!



- Listen to concepts in the *First* person.
- Be selfish about the need to avoid injury.
- You do not have to hurt to get a nice garden.
- Prevention is easier than treatment.

# The Love of Gardening

**WHAT is the MOTIVATION?**

**What are the Ergonomic RISKS???**



# Motivation



*"You have sprouts. It's something couch potatoes get after sitting for too long."*

# What is an ERGONOMIC Injury?

*Pain and dysfunction as a result of:*

**Postures,** (Static or Awkward) *when*

**Force,**

**Repetition,**

**Contact Stress,**

**or Vibration** *are involved.*

**RISKS=**

# What is an ERGONOMIC Injury?

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**RISKS=**

**Force,**

**Repetition,**

**Contact Stress,**

**or Vibration *are involved.***

***Is there anything here that does NOT happen in a Garden???***

Five **PRIMARY** Risk Factors for injury sources that you will have in the yard.

- Posture–
- Repetition–
- Force–
- Contact Stress–
- Vibration–

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  - **Contact Stress**– Pressure against palm, thighs, knees
  - **Vibration**– Chainsaw, blowers, lawn mower, weed-wacker
- **NOTE:** Just because you are doing any of these, does NOT mean you will get injured. **HOWEVER,**

# IF YOU ADD: Risk Factors Modifiers

- **Duration** of exposure
- **Frequency** of exposure
- **Intensity** of exposure

(how long)

(how often often)

(how MUCH)

- When these are not controlled **INJURY** occurs.

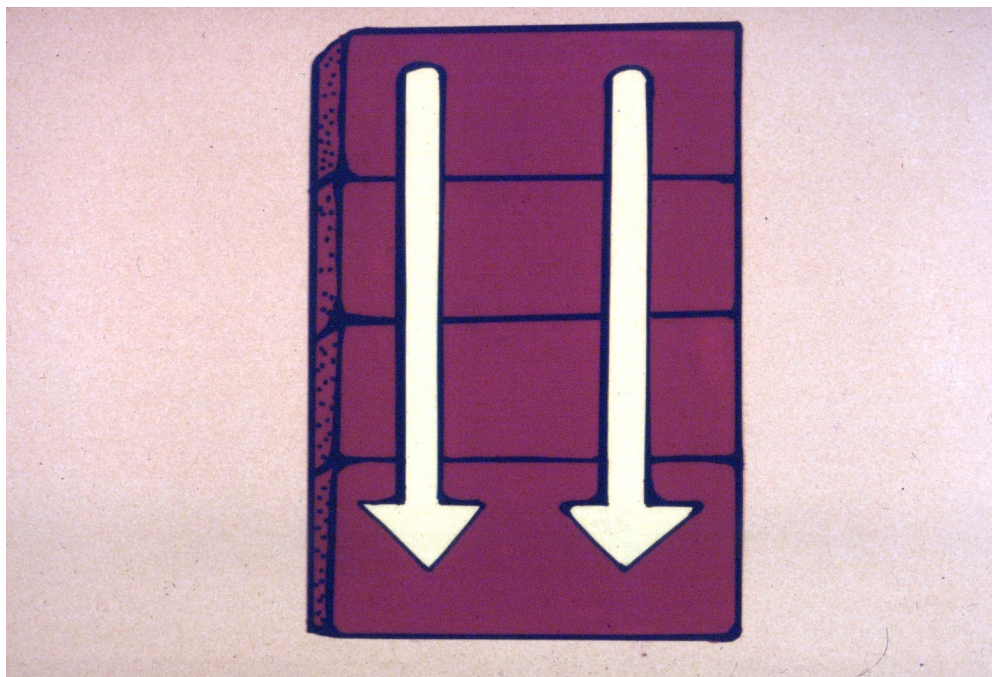
**So we need to talk PREVENTION!**

# Get this Straight NOW!

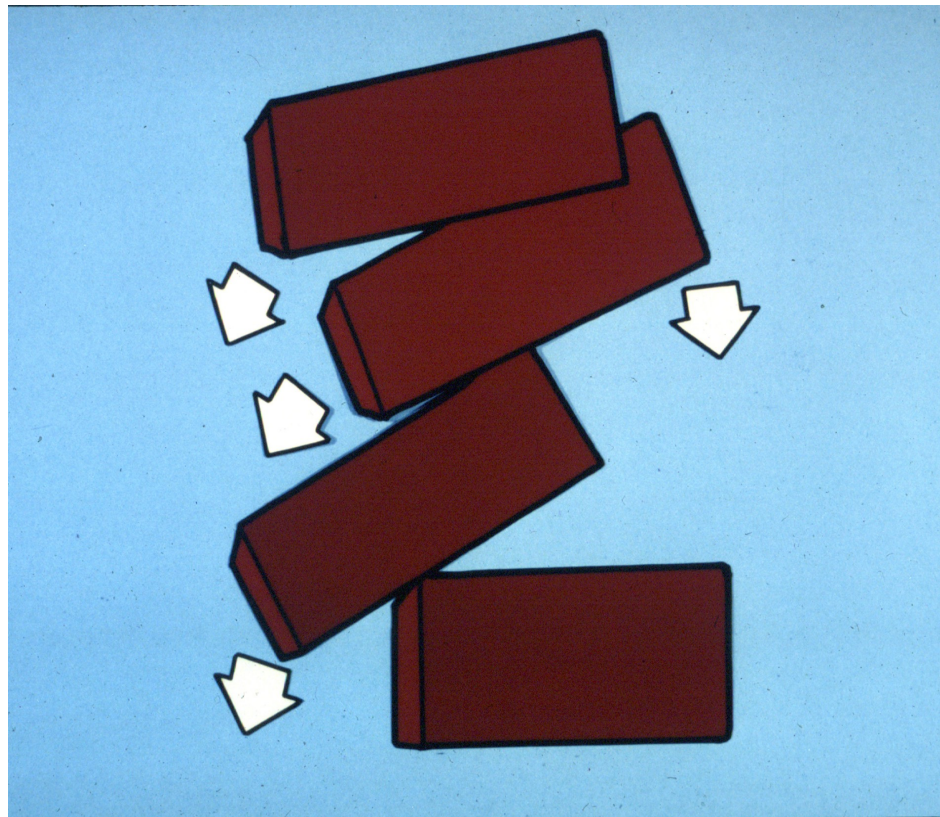
- Injuries can become CHRONIC.
- Once you get injured, it will take time to heal.
- There is no magic “Pill” or “Brace” or new improved “Thing” that will make pain or dysfunction go away fast or safely.
- You will be the ultimate determinate of a successful recovery.

**Prevention is the BEST plan!**

# In Neutral and Balanced



# Out of Balance



# POP QUIZ

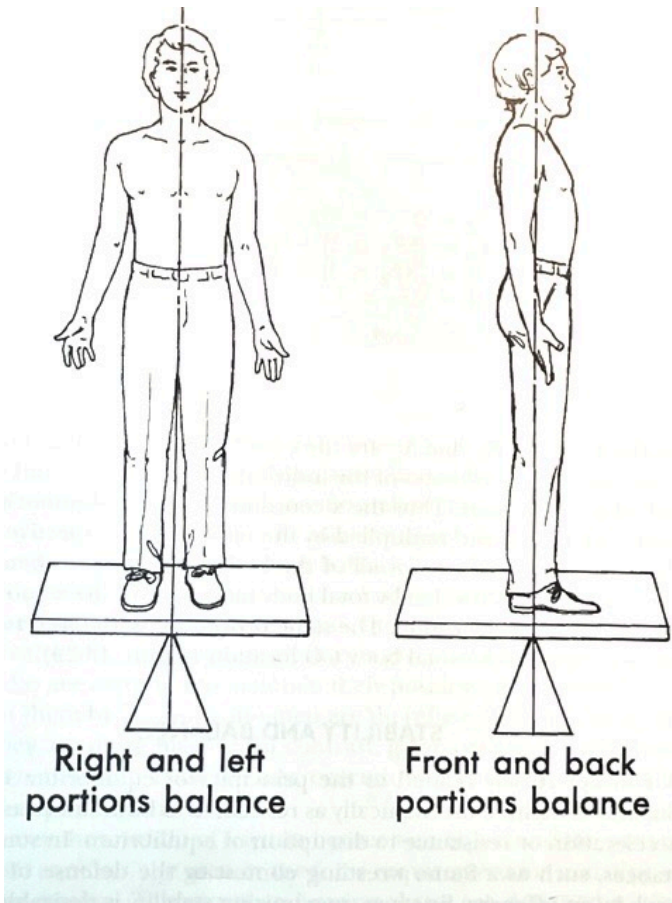
- How many Bones are there in the Human Body?
- How many Muscles are there?
- Does a Muscle: PUSH, PULL or do BOTH?



# Neutral Standing

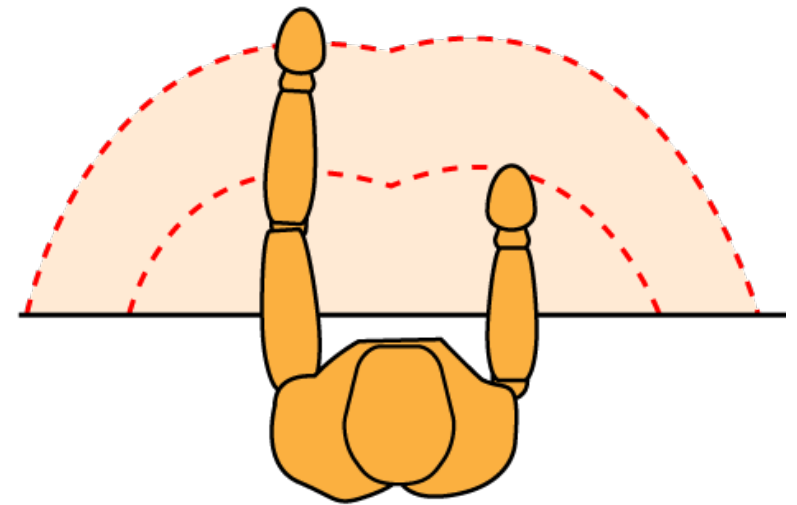
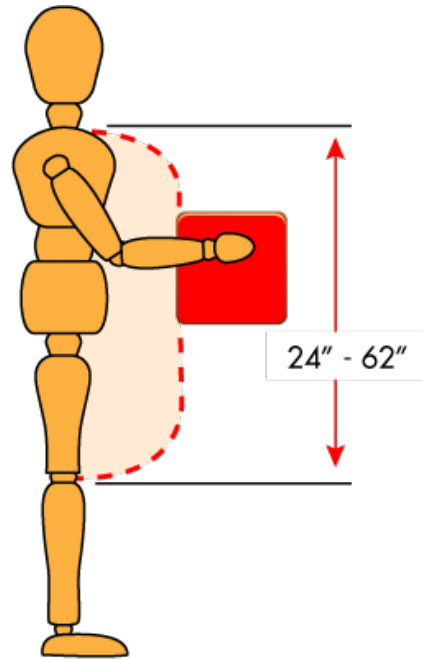
Balanced

Unbalanced





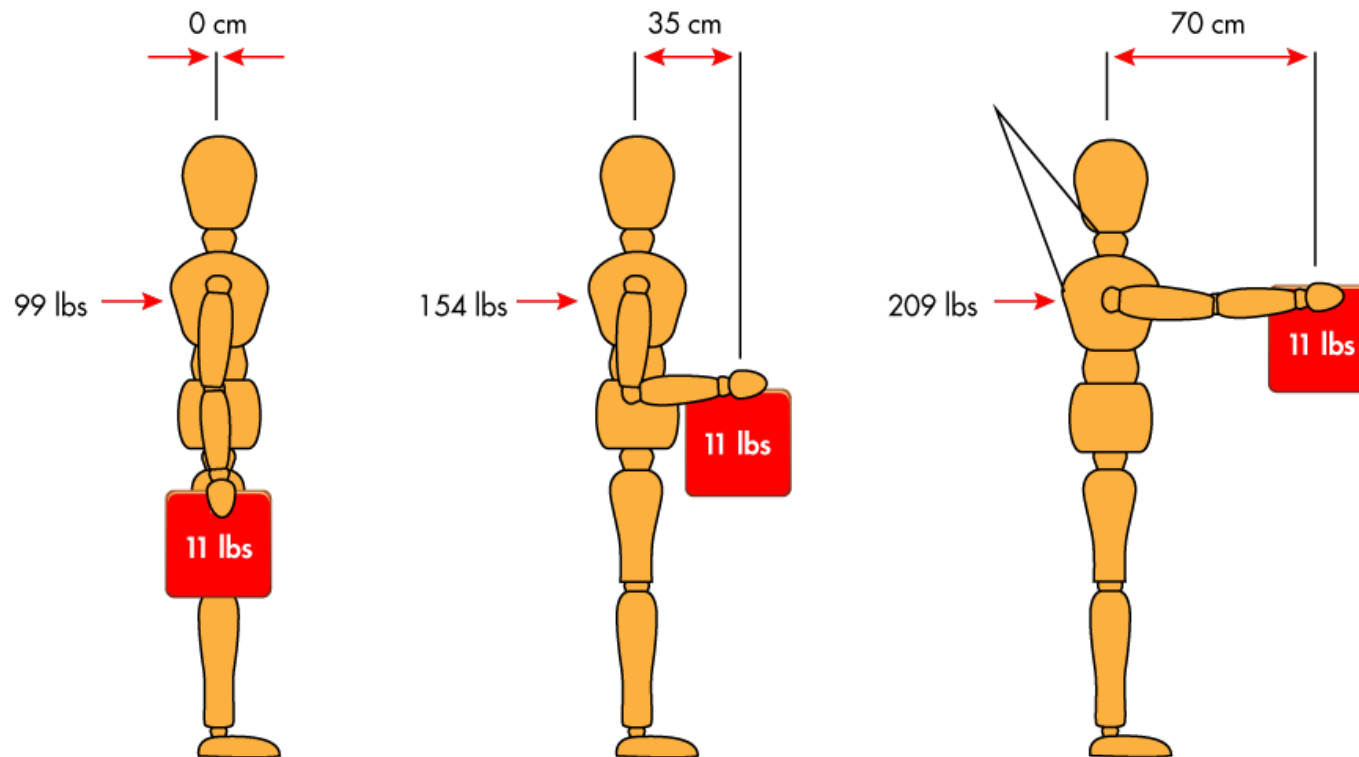
# THE POWER ZONE



**Primary reach** is 0"-12" from the body  
**Secondary reach** is 12"-24" from the body  
**Tertiary reach** is > 24" from the body

Source: Dreamstime.com and Ergonomic Design Eastman Kodak

# Leverage is Everything



Increasing the distance between the hands and the body increases the stress on, among others, the lower back and shoulders.

Source: Ergonomic Design Eastman Kodak

# Leverage





# Being out of Balance is often

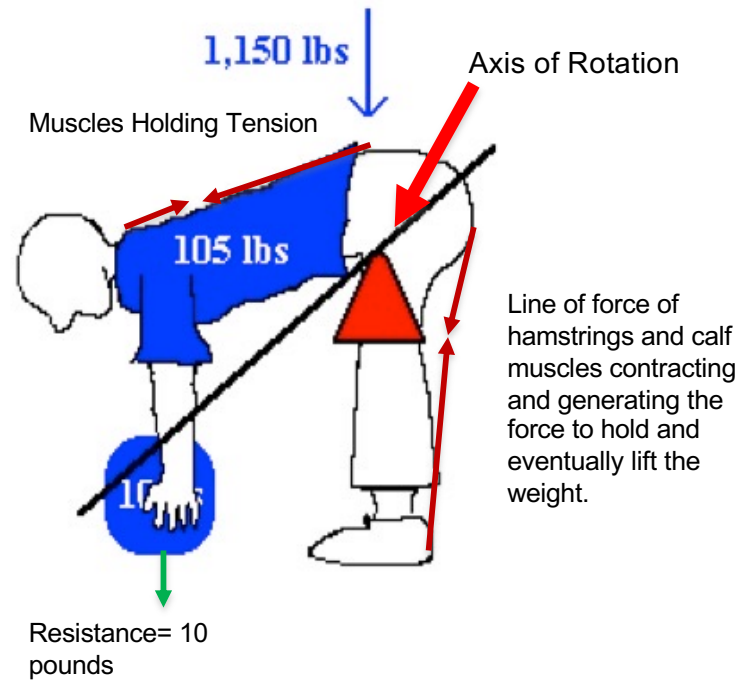
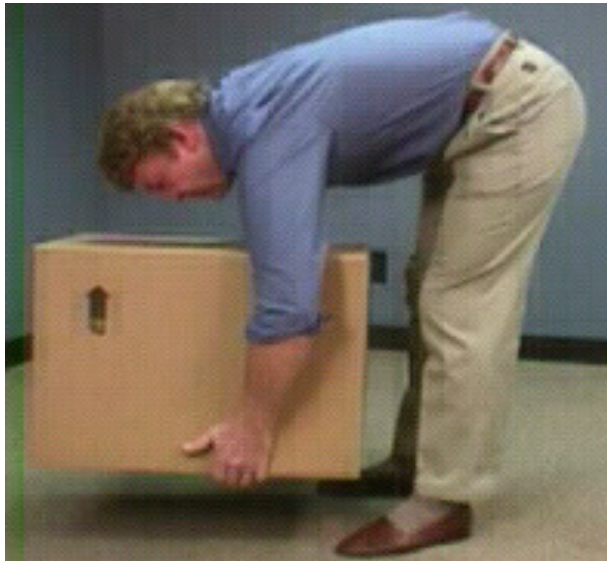
## ***UNFORGIVING***

When you try and enjoy life for a second



Photo Sacramento MG's

# LEVERAGE is happening with Bend/Lift



# “DUNLOP” Lifting Demonstration



Photo: Vectorstock.com



There is often a  
**Lack of AWARENESS**  
by the gardener as to the  
hazards of their tasks.



# Hazard Awareness!



Source: Back School of Atlanta



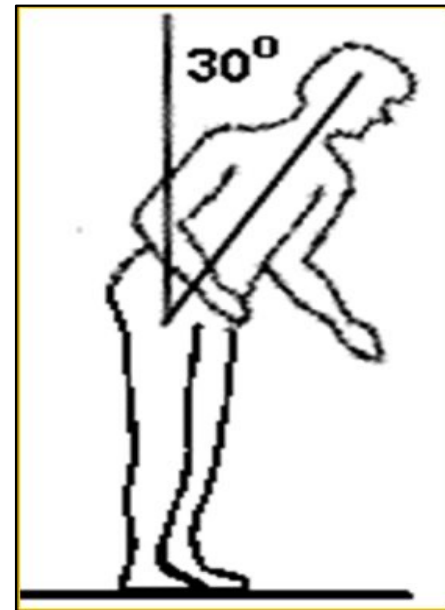
# How About Here?



Photo from: Vectorstock.com



# Do any of these postures look familiar?



# STRAIN Awareness

Unaware of back strain



Awareness





# Hazard Awareness

UNAWARE

AWARE





**DO NOT TWIST** when lifting or moving weight, move your feet.



Photos from Olga Morham



# Be mindful of keeping your back straight & balanced.



Knees straight  
Bent at the waist  
Rounded shoulders  
Hands in front of knees  
= Unhappy Bob



Knees ready to lift  
Back in neutral curve  
Hands in line w/ hips  
Head up  
Bob ready to lift



Successful lift  
Happy Bob

Photos by: Olga Morham

01-28-23

Ergocation LLC

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# PULLING IS A GREATER STRAIN ON THE BACK

Not Good



Photos: Vectorstock.com

Twisting is worse





# PUSHING



Photos: Vectorstock.com

- Force exerted by the body
  - Pushing force
    - Abdominal muscles are more active
    - Balanced trunk
    - Less compressive force on the spine
    - HOWEVER...

# Pushing is preferred over Pulling

- If push is done in good position



\*\*\*\*\*Pushing doesn't work for flexible items like hose or rope! \*\*\*\*\*

Photos: Vectorstock.com



**The Vikings, of course, knew the importance of stretching before an attack.**



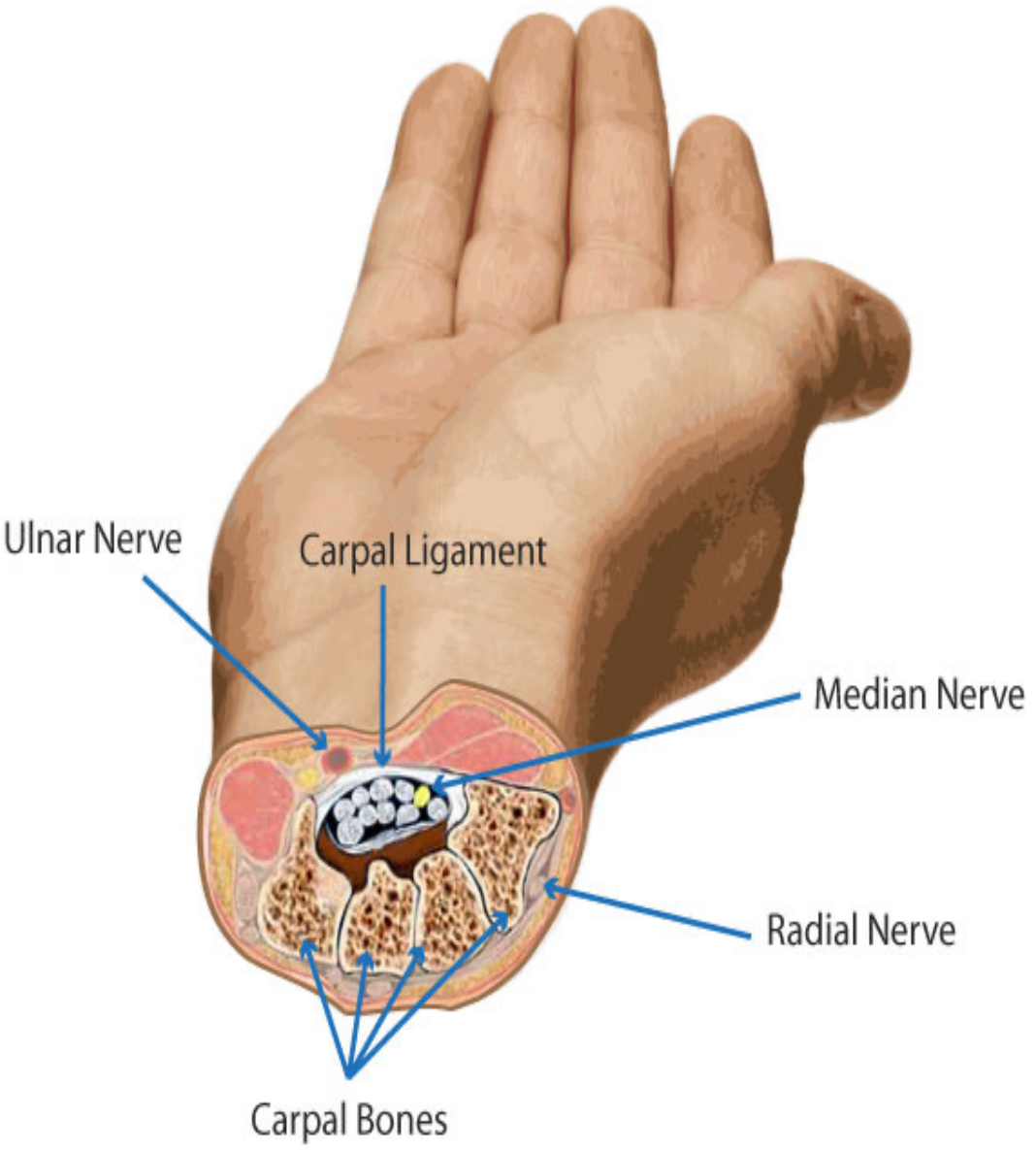
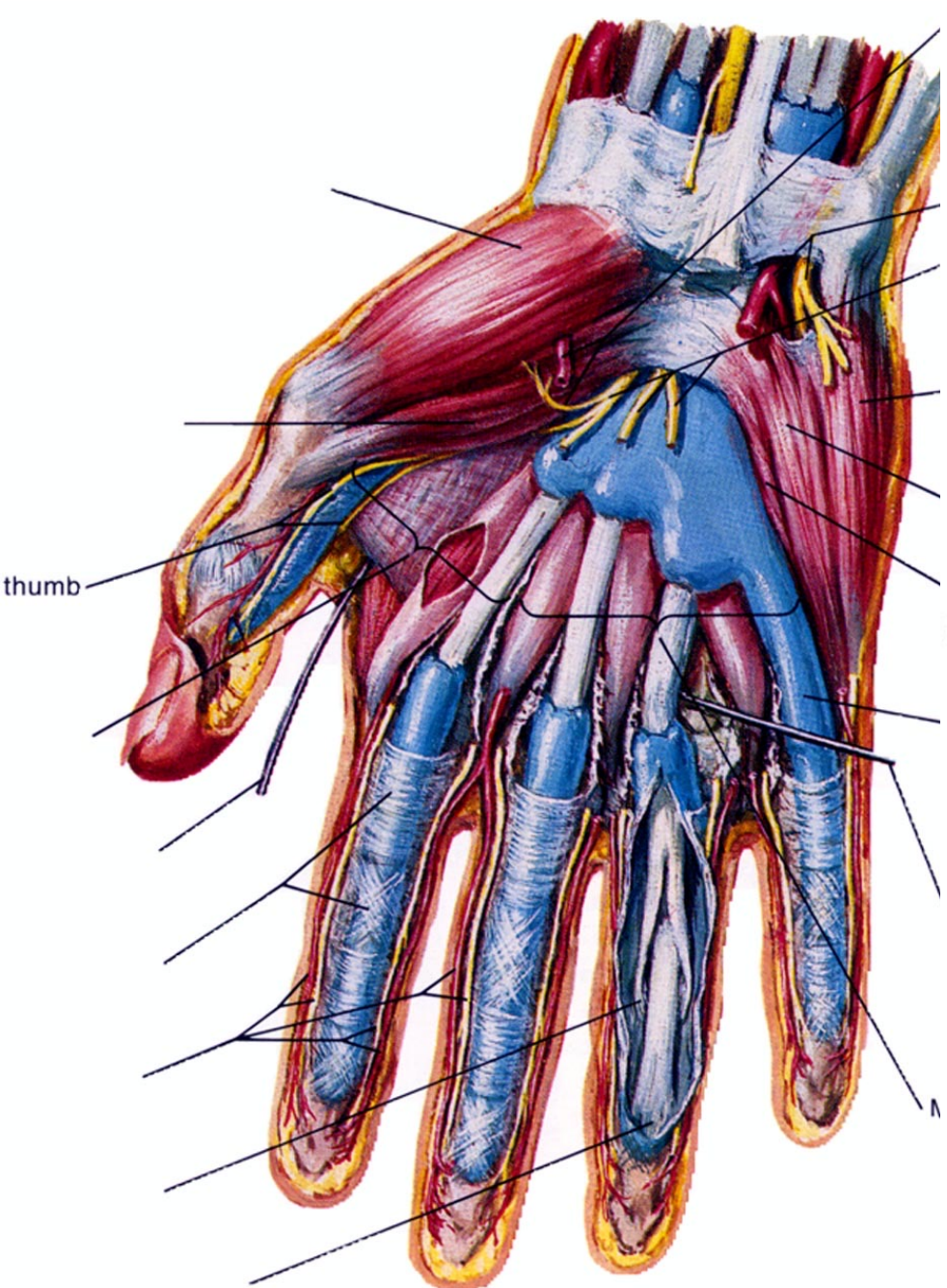
# BACK Warm-Up & Ergo Breaks



# **The WRIST**

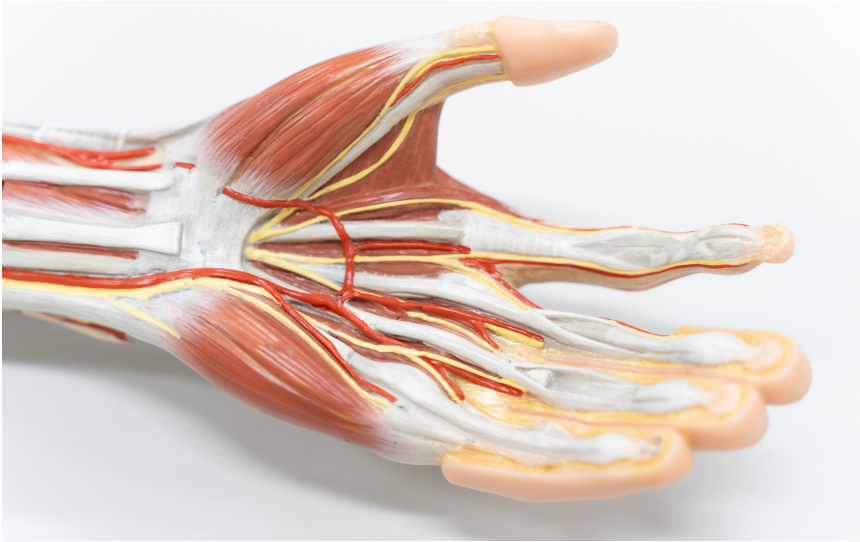
Nature's Multi-use tool

Internal bones and soft tissue of the hand and wrist:

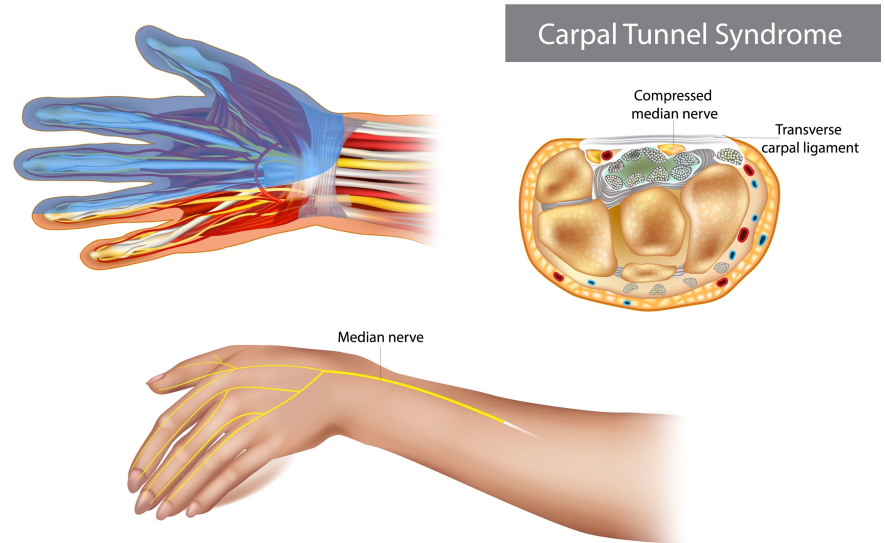




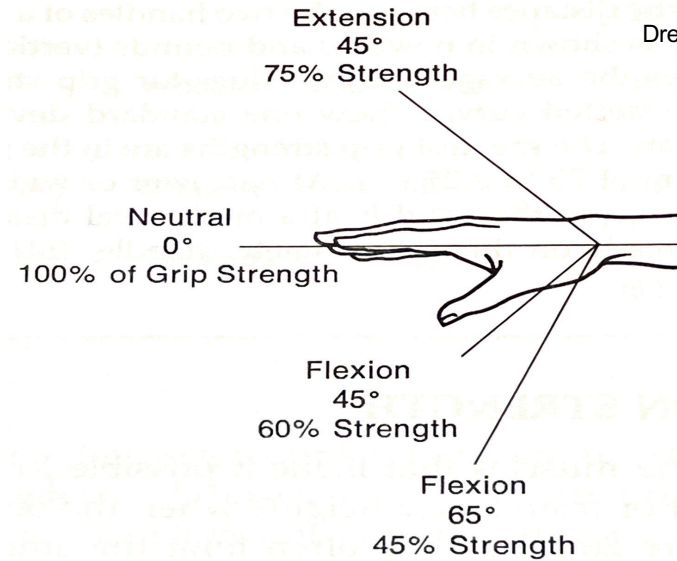
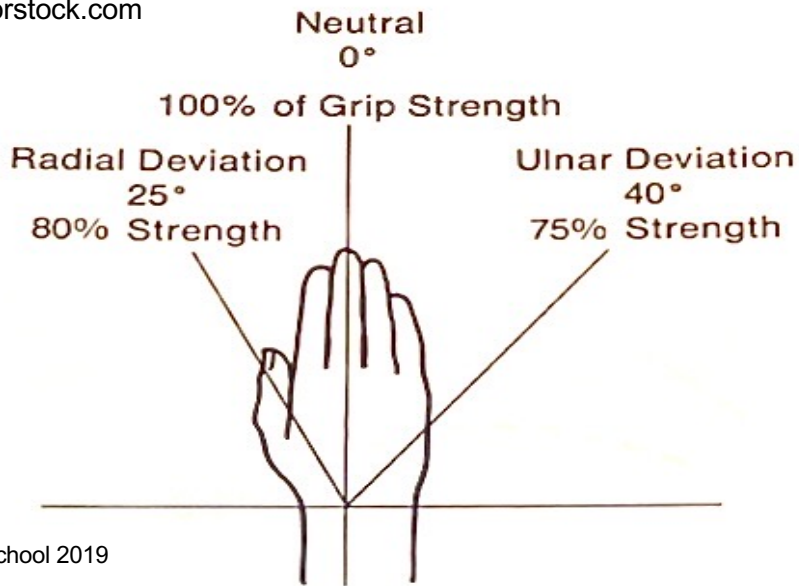
# Wrist & Hand



Vectorstock.com



Dreamstime.com



The Back School 2019

# Awkward Wrist Hand Postures



Thumb-up position is the neutral position for the hands.



This doesn't hurt, it is electric so  
what is the big deal?



Photo: Dreamstime.com

NOT all the same Tools are the same.  
Ergo-wise tools should be considered





# Neutral Wrist





# OPTIONS:



Can you see the difference in wrist/hand positions?



# The Right tool for the right job.

## Smaller tools for smaller hands

Smaller hands require smaller tools..  
They have a non-slip cushioned grip.  
Left & Right handed pruners.

Get **RED** or **Bright** Handles whenever it is possible. WHY?



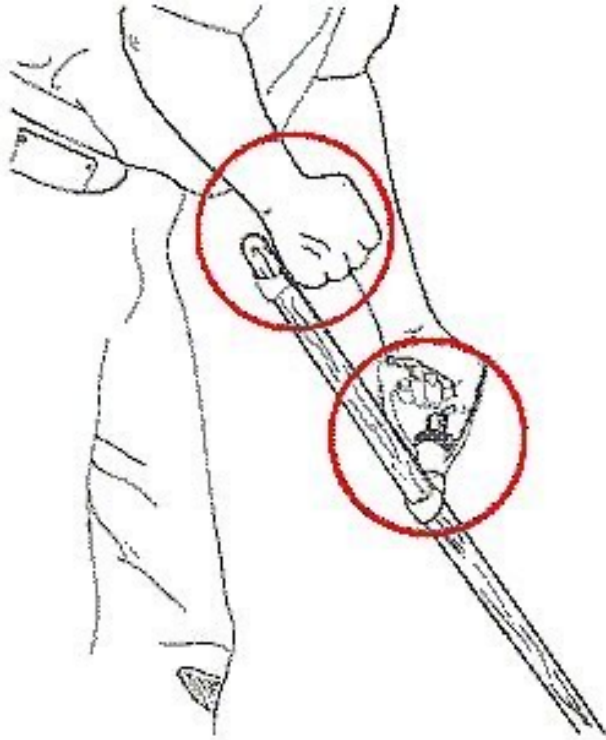
[www.tomboytools.com](http://www.tomboytools.com)

Lightweight and powerful. These will cut through branches up to 2" thick with ease! –LEVERAGE!!!!



[www.merrifieldgardencenter.com](http://www.merrifieldgardencenter.com)

Gizmo's to help the hands and back.



01-28-23



Ergocation LLC



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# Extenders can be used in a variety of situations.



Photos: Thewrightstuff.com





All kinds of stuff that will make things easier.



# What should an Ergo tool do for you?

- Allow you to use the leverage of the larger muscles of your shoulders instead of hands.
- Prevent stress & fatigue to forearms, wrist, hands and back.
- Provides more power to the job via best posture
- Should be comfortable to use.
- *Just because it says “Ergonomic” doesn’t make it so- be careful of what you buy.*

# **GLOVES**

PROTECTING NAUTRE'S MULTI-USE  
TOOL






# Possible Pathogens in Soil

- Tetanus,
- Anthrax,
- STAPH (Staphylococcus aureus),
- E. Coli,
- Listeria,
- STREP (Streptococci),
- Botulism,
- Fungi,
- Animal deposits / remains

# Entry Portals into the body

- Puncture wounds
- Abrasions
- Cuts
- Existing skin lesions
- Inhalation and Digestion
- **(Keep your hands away from your mouth)**

# GLOVES / GRIP

- People lose up to 25% of their grip strength when their wrist is bent. 
- Oversized "Molded" grips are easy to grasp and hold 
- "Form-fitting" grooves only fit one size hand perfectly and should be avoided. 
- spreading of the fingers reduces grip strength, requiring more pressure to maintain control of the tool.



# Glove Solutions for Gardening Situations

Wet – Muddy soil: **Gloves that are RUBBERIZED or LINED**

Dry–Hard soil: **Gloves made of dense material on fingers**

Rocks–Gravel: **Leather gloves**

Delicate plants/ Glove Liners: **Nitrile gloves**

Thorny-Woody stuff: **Full-length gauntlet**

Motorized power tools: **Padded, rubberized glove**

# The RIGHT Glove for the RIGHT Job, even if you are Left-Handed.





# Most Protection

**LEATHER-  
ARM WRAP**

**Used with  
any GLOVE**



**Full length  
leather  
Gauntlet,  
gives most  
protection**



# Cheap, Durable, washable

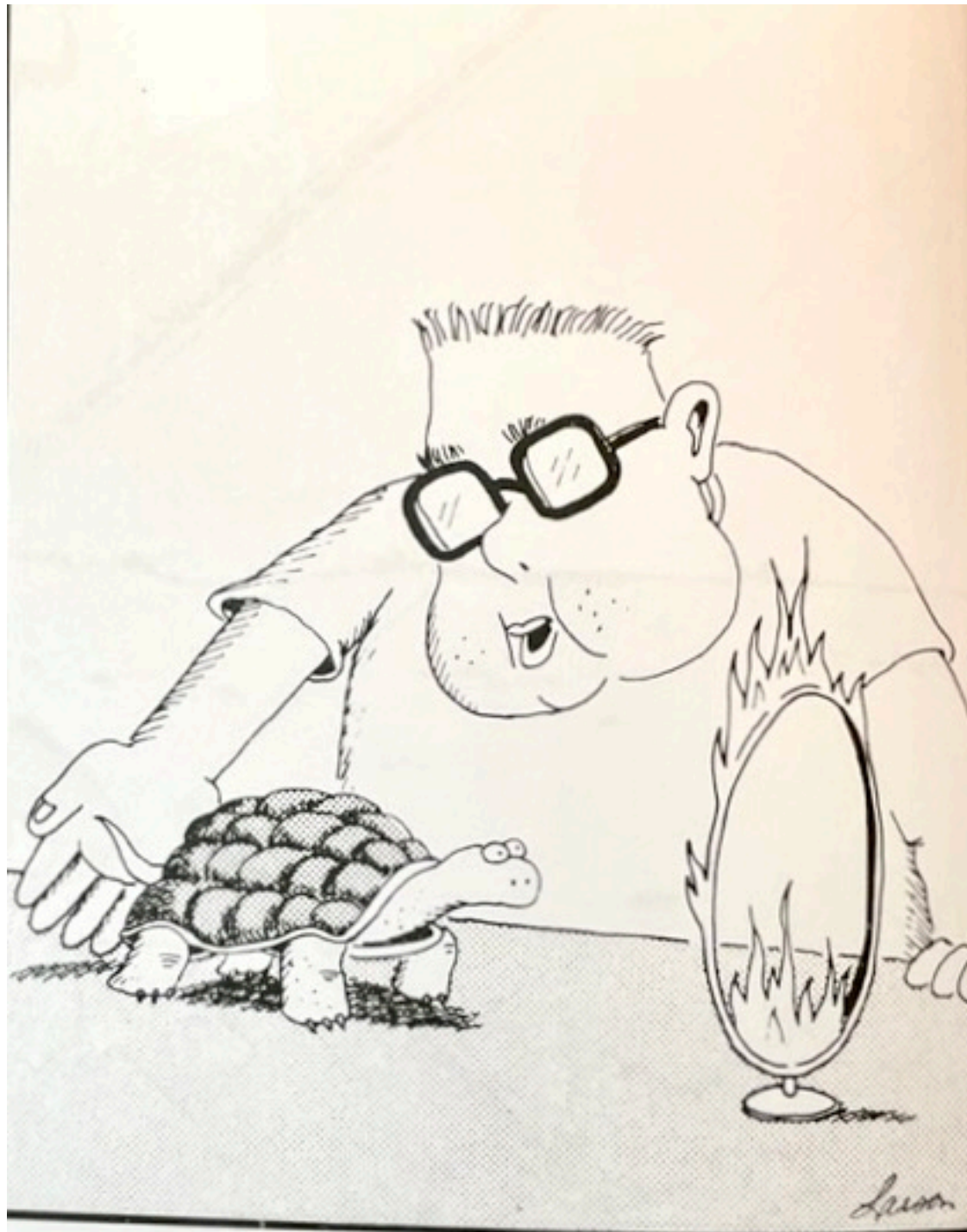




**Heed the Warning!**

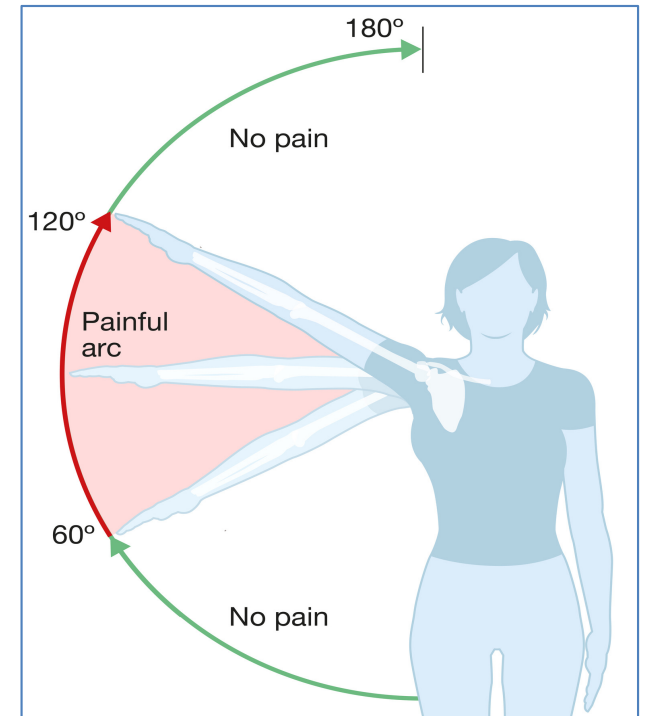
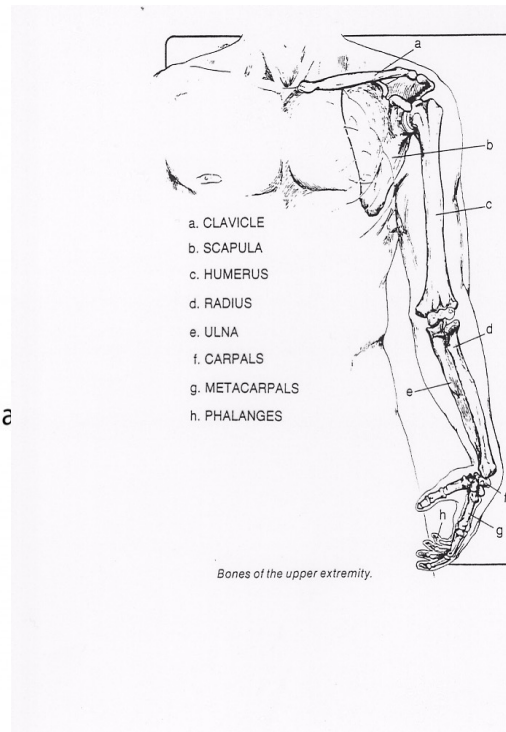
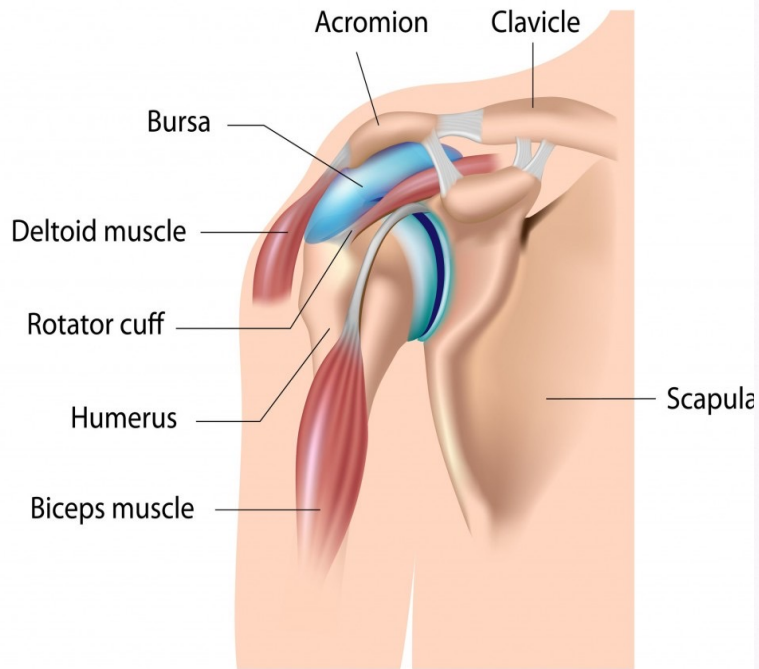
**Protection is Vital**





"Through the hoop, Bob! Through the hoop!"

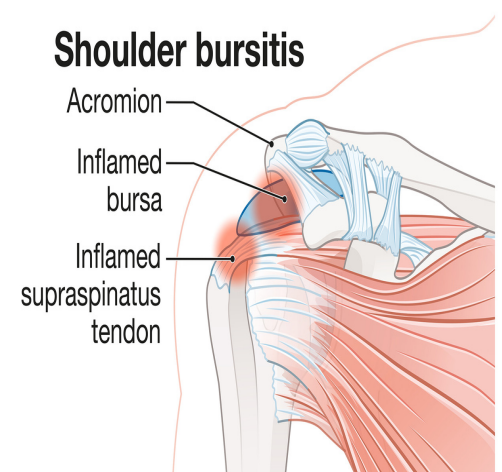
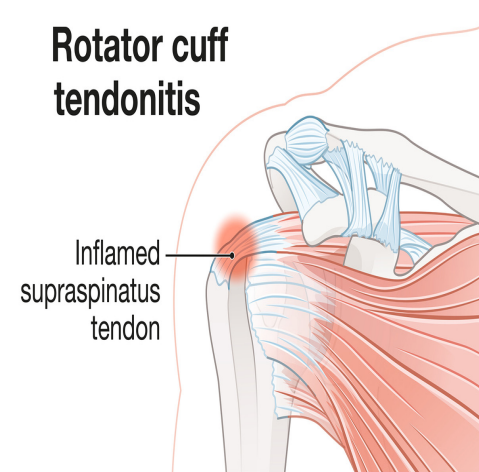
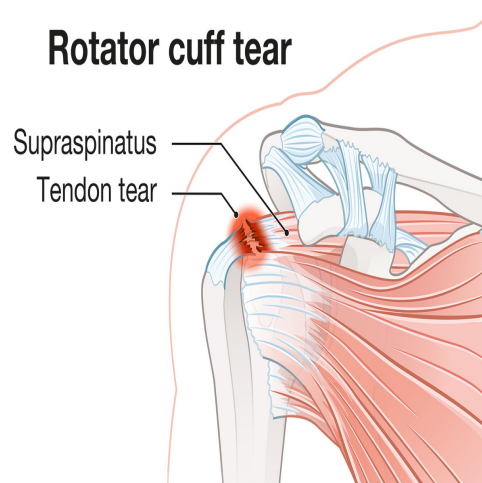
# The Shoulder



# Common Shoulder issues



Drawings: Dreamstime.com





# Above Shoulder Level Reaching is primary risk for the Shoulder



<https://uhs.berkeley.edu/bewellatwork/ergonomics>  
Vectorstock.com and Dreamstime.com



- Try to work below shoulder level to avoid strain to back & shoulders
- Don't reach for more than 5 minutes at a time.
- **Alternate hands**
- USE A ***STEADY LADDER*** whenever it is TOO far to safely reach.

# 24" Loppers– Leverage OR Long Pruners



KSEIBI Photo

# Awkward Reaching Risks-Can Lead to Trouble.



Be Safe, plan ahead,  
don't RUSH!



Photos: Vectorstock.com Dreamstime.com

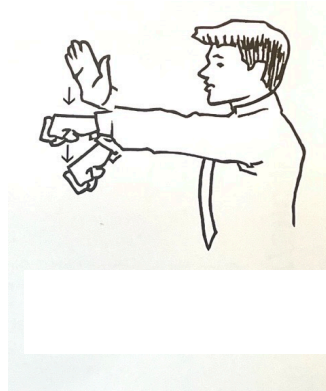
Ladder Must Be On A  
SOLID Base.





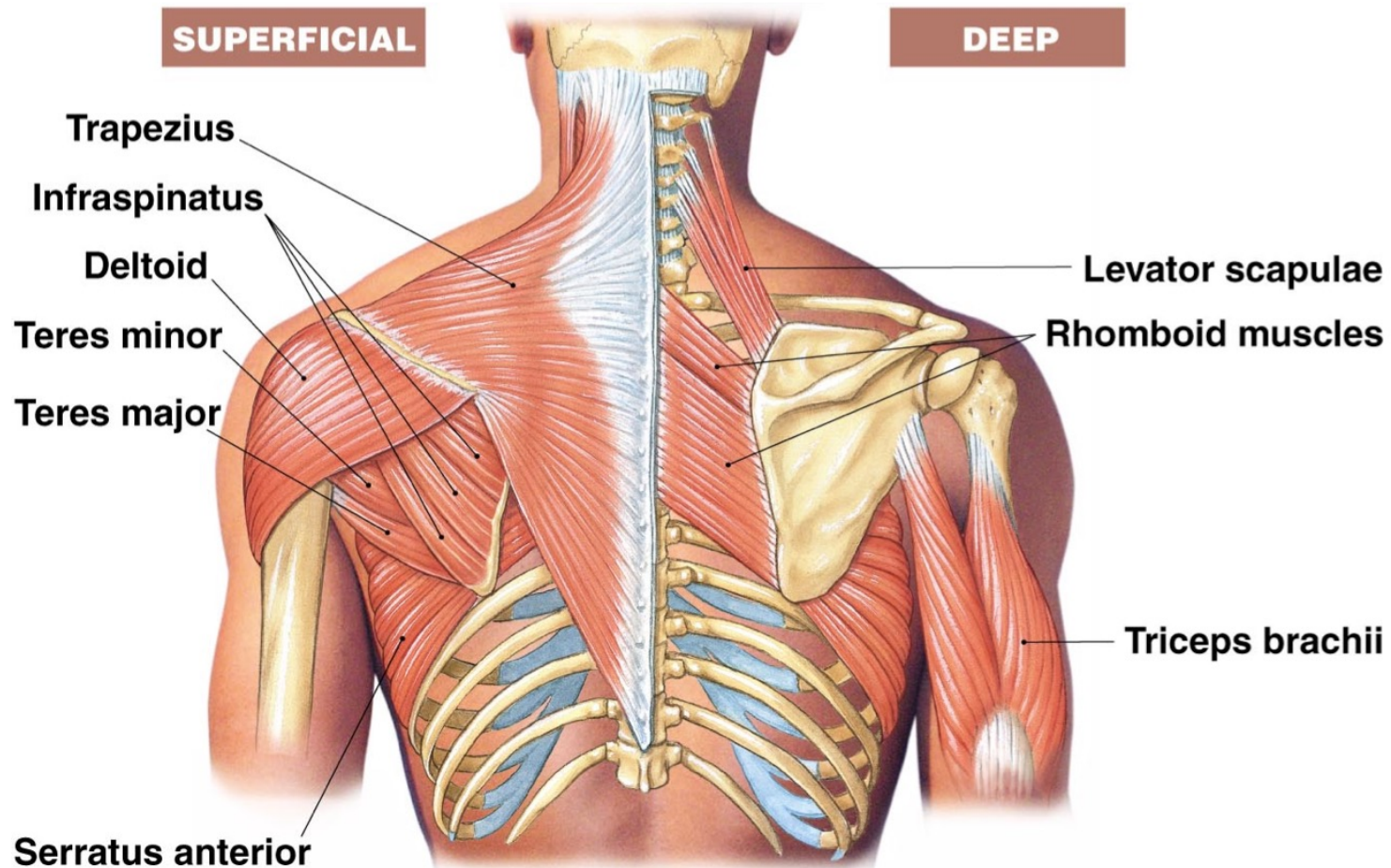


# Hand, Shoulder & Neck Stretches



Photos: Ergocation, Vectorstock.com, Dreamstime.com Backintelligence.com

# Upper Back Muscles

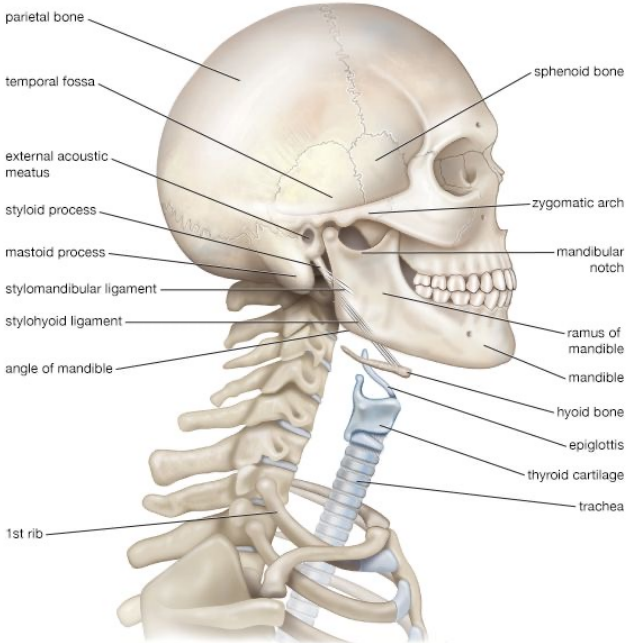
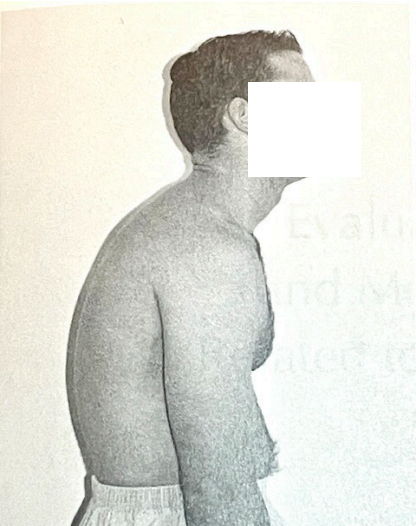


Serratus anterior

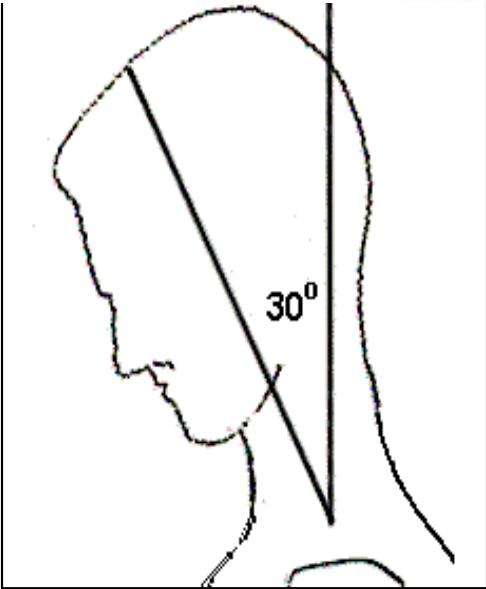
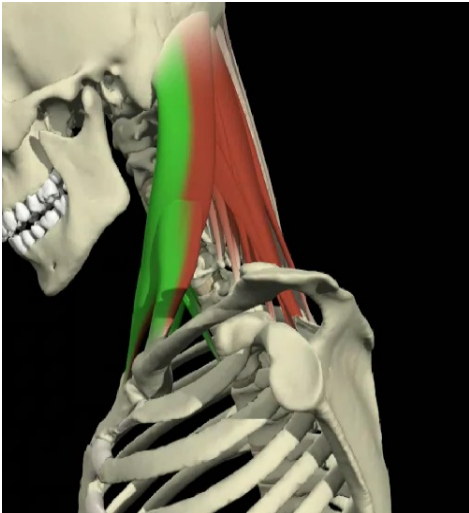
(a) Posterior view

Copyright © 2007 Pearson Education, Inc., publishing as Benjamin Cummings

# Neck Function

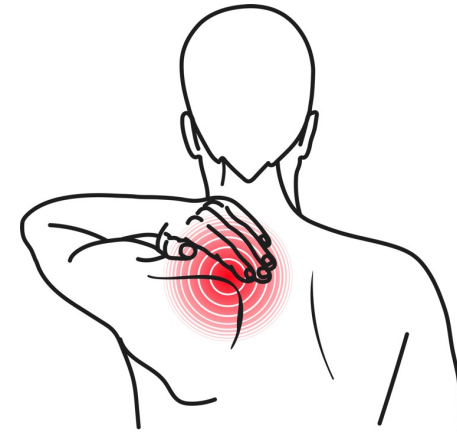
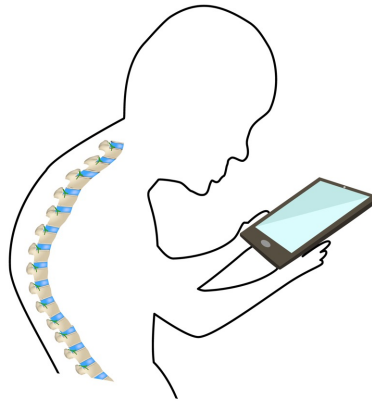


© Encyclopædia Britannica, Inc.





Do ANY of these Postures look familiar to you?



Photos from vectorstock.com & Dreamtimes.com

# Neck Safety

- Keep work close to you to avoid long reaching
- Use long handled tools as needed
- Avoid prolonged neck extension (looking up or when bent forwards looking forwards)
- If you have to work overhead, do it for only 2-3 minutes at a time then rest.

*Think before you cut a branch off over your head!*

# Keeping tools Clean & Sharp

Who sharpens their tools?

Which ones and how often?



# Safety First



# WHY Sharpen Tools?

- Sharp cutters decrease the incidence of plant injury, making clean cuts that can heal well and minimizing areas that invite disease or cause continued cracking, splitting, and vascular damage.
- *Clean, sharpened tools improve life of tool and reduces disease spread.*

●

# SHOVELS & SPADES



# MATERIALS & DEMO

## ***CLEANING:***

- Wire Brush / Scraper
- Steel Wool, Soap pads, Can sprays
- Vinegar for Rust
- Baking Soda & Water
- Oil

## ***SHARPENING:***

- Stone
- Carbide steel
- File(s)
- Angle Grinder



# How To Clean Dirty Tools

- Remove the dirt-Scrap, soak, (1 Tbs Dish soap/5 gal)
- Remove sap- Warm water w/baking soda & soap works well
- Remove Rust: Steel Wool &/or Vinegar soak
- Soak again in Baking Soda warm water-Rinse/Dry
- Disinfect as needed in Alcohol or Sprays
- Preserve in sand/oil bucket, or wipes

# TOOLS That Need to be Sharpened

- Pruners, Anvil or Bypass
- Loppers,
- Chainsaws,
- Shovels,
- Hoes, axes, hatchets,
- Lawn Mowers,

# Sharpening Tools

- **WEAR GLOVES to protect your hands.**
- Need: Sandpaper, bastard file 8"-10", whetstone, or other hard metal sharpener
- **Sharpen your blades:** Any tool you use to plow through dirt should be sharpened at least once a year.
- Sharpen Hand tools as needed.

# Sharpening Tools-TIPS

- Use sharpie marker on beveled edge to mark target and progress
- Disassemble as needed, Make sure you Retighten the nut afterwards.
- Oil edge if badly worn in order not to lose the temper of the steel when filing. (it can get hot)
- **Wipe moving parts with oil**, any light-weight oil, add drop to hinges
- Lightly sand wooden handles and rub out with Linseed oil each year.



# Parts of a Shovel/Spade

- Grip
- Shaft
- Kickplate/shoulder
- Blade
- Tip
- Height, Size and weight

# Cleaning a Spade can be Done



# Cleaning a Shovel





# What else would you need?





# Ground Work

- Do not over-reach for items/weeds
- Keep elbows bent not out straight
- Avoid twisting forearms & back especially with pulling tasks.
- Face your work to avoid twisting.
- Try to keep hand neutral “thumb up”
- Plan ahead moisten the soil the day before to make it easier to dig.

# Cautions

- Keep tools sharp
- Use the right tool for the job
- Be aware of the weather, especially hot days and sun exposure, stay hydrated.
- If you think you have hurt yourself –STOP!!
- Use ice 10 minutes 3-4 x's for the first 2 days.
- *It is YOUR body take care of it even in the yard*

# Key to reducing Ergo injuries

- If it hurts –DON'T do it!!!
- Work slowly and steady
- Take frequent breaks.-*Walk away a couple of minutes, admire what you have done*
- Switch tasks and positions frequently
- ***Muscles will fatigue within 5-30 minutes with repetitive tasks-sooner if there is force added, so pace yourself,***

**AND watch out for African SNAKE RAKES!**







## **Help Us Better Serve You!**



Our follow-up survey provides us the tools we need to grow and improve the quality of our program.

# Thank You!



*QUESTIONS?*

**Thank you for joining us!**  
**Questions?**



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## UC Master Gardeners • Napa County



Visit our website at:  
**[napamg.ucanr.edu](http://napamg.ucanr.edu)**

*Thank You*