Back Safety and Safe Lifting

Back safety

Learning goals:

- Learn safe body mechanics (lifting, standing, sitting, lying)
- Get your back in shape (exercises for strength, flexibility)

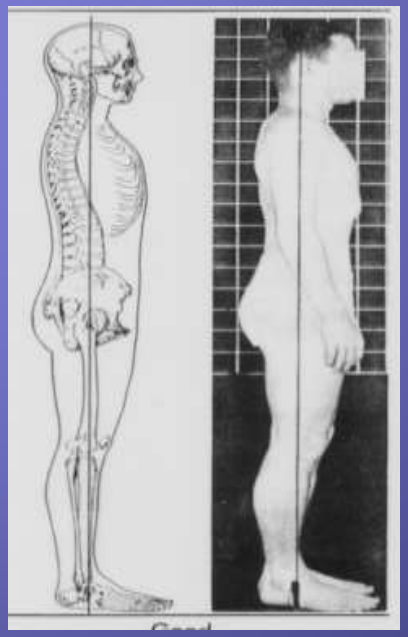
Back safety

Definitions

- **Manual handling:** force exerted to lift, lower, push, pull, carry or otherwise move, hold or restrain something
- **Manual handling injury:** sprains, strains or fractures to muscles, tendons, ligaments and joints

Common causes of back injury/pain

- **Traumatic injury (auto, industrial or sports accident)**
- **Poor posture and alignment: makes movement difficult and awkward**
  - Any posture that compromises the natural curve of the spine puts strain on the supporting back muscles and weakens them
  - Without proper support, the vertebrae are forced to carry weight they are not meant to carry: premature spinal degeneration
  - Also makes movement difficult and awkward, increasing the chances of injury



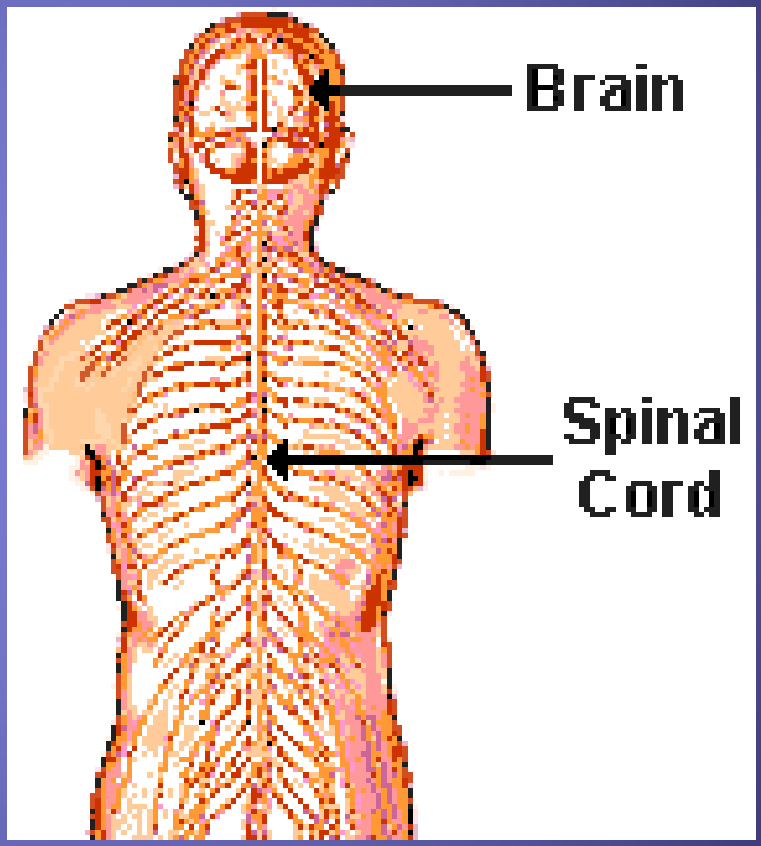
Common causes of back injury/pain

- Overexertion: failure to ease off activity or change position, ignoring twinges
- Cumulative strain: excess body weight, repetitive movements, working in awkward positions, age (wear and tear)
- Emotional stress: Causes muscle contraction, contracted muscles do not allow for proper circulation

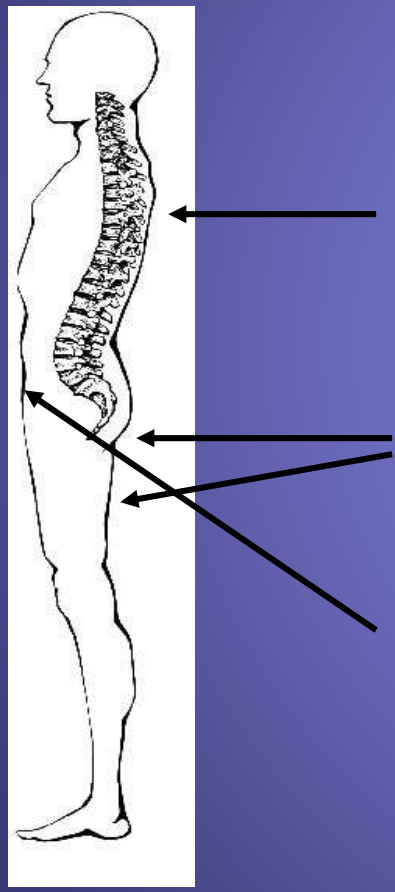
Back anatomy

Spinal Cord

- Central nervous system (with brain)
- Pair of spinal nerves exit below each vertebrae
- Cervical nerves go to the arms; lumbar area to the legs



Back anatomy



Muscles

- Spinal (back) muscles: stabilize spine- ***not made for lifting***
- Buttock and thigh muscles: ***strong and durable***
- Stomach muscles: ***also used in lifting*** when they are weakened back muscles tighten

Muscles

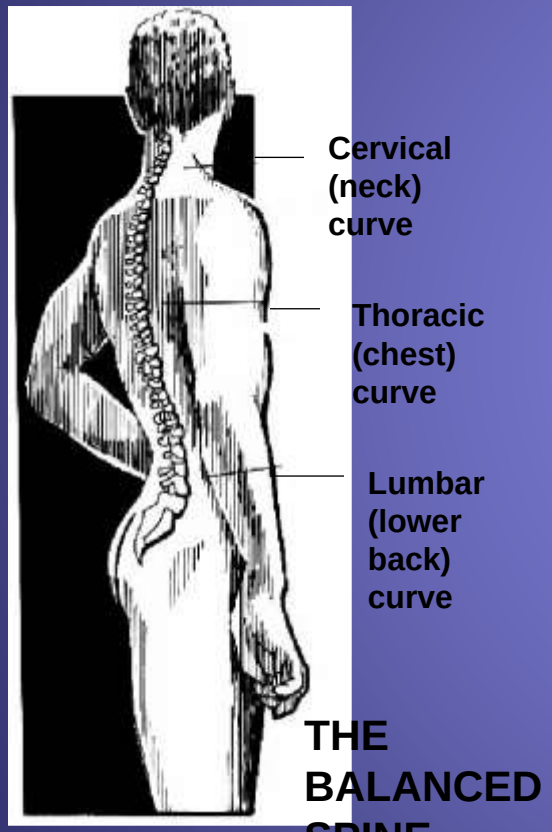
Dynamic muscle work:

- Involves muscle contraction and movement
- Blood flushes out lactic acid which causes muscle fatigue (can work for lengthy periods)
- Lifting and stacking boxes an example

Static muscle work

- Muscles hold the body without movement
- Sustained contraction halts blood flow to muscles: lactic acid builds up, causes fatigue
- Bending over workbench, sitting at computer are examples

Spinal balance



THE BALANCED SPINE

- Spine is aligned in three “S” shaped curves
- Balanced to keep weight evenly distributed on spine
- Proper balance places least amount of stress on spine
- Vertebrae pushed out of line causes pain, invites injury

Posture is important.

Posture

Standing

- “Stack” ears, shoulders, hips, knees and ankles in a straight line
- Tuck in chin
- Shoulders back and down
- Suck in gut: a pot belly can act as a load and pull spine out of balance

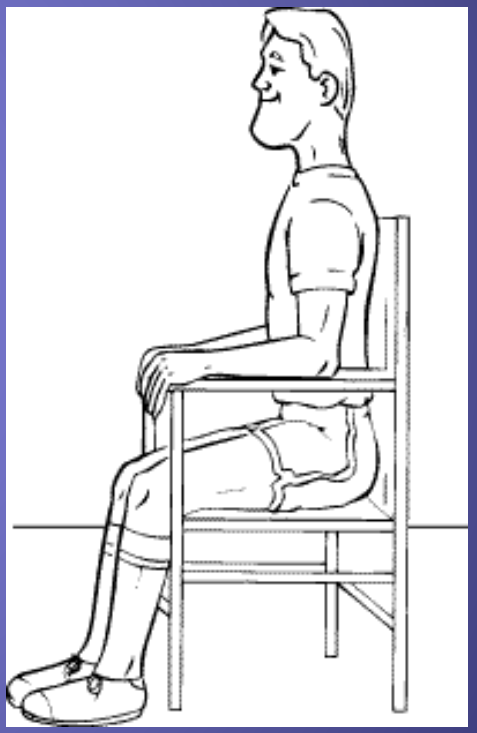
Posture

If standing for long periods, elevate one foot to reduce stress in lower back

Posture

Sitting

- Sit with ankles, knees, thighs and elbows at right angles
- Keep head balanced over shoulders
- Keep shoulders relaxed (not hunched)
- Sit back in chair for support



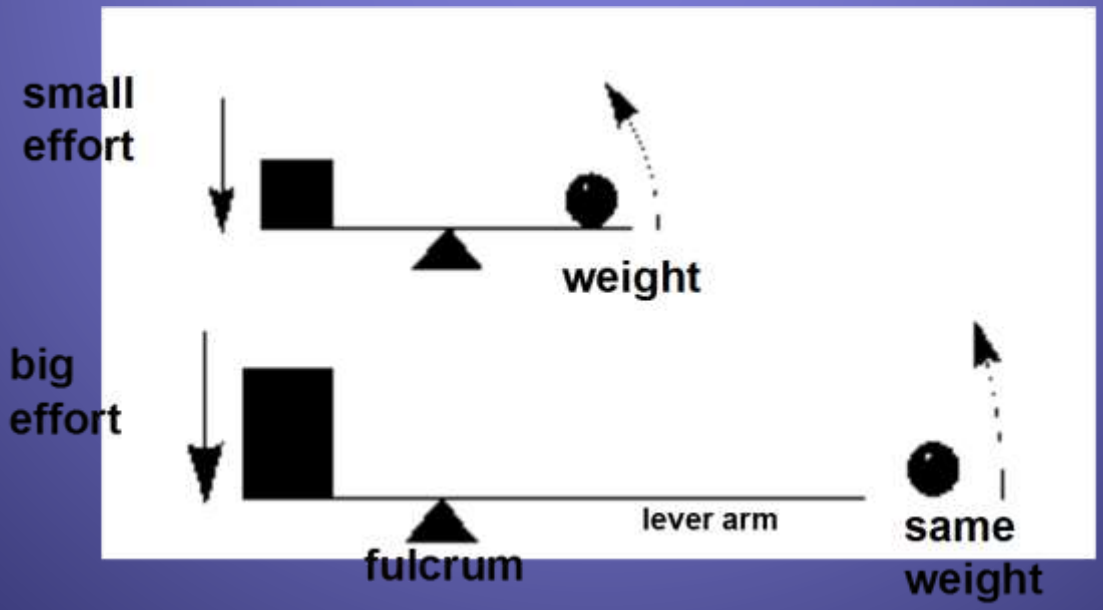
Safe body mechanics

Body mechanics:
The relationship between your posture and your movement

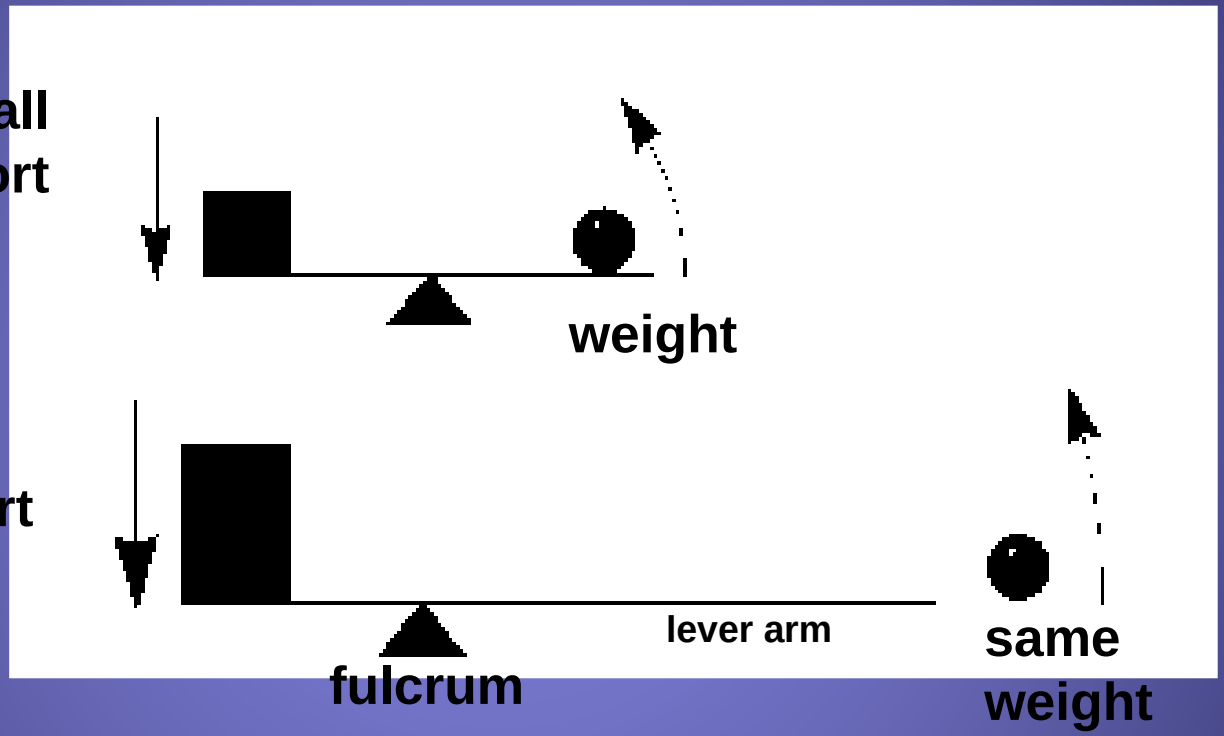
Good body mechanics avoids putting undue strain on your back

Safe body mechanics

Use the Principles of levers: A weight, a short distance from the fulcrum requires less effort to move than the same weight a farther distance from the fulcrum

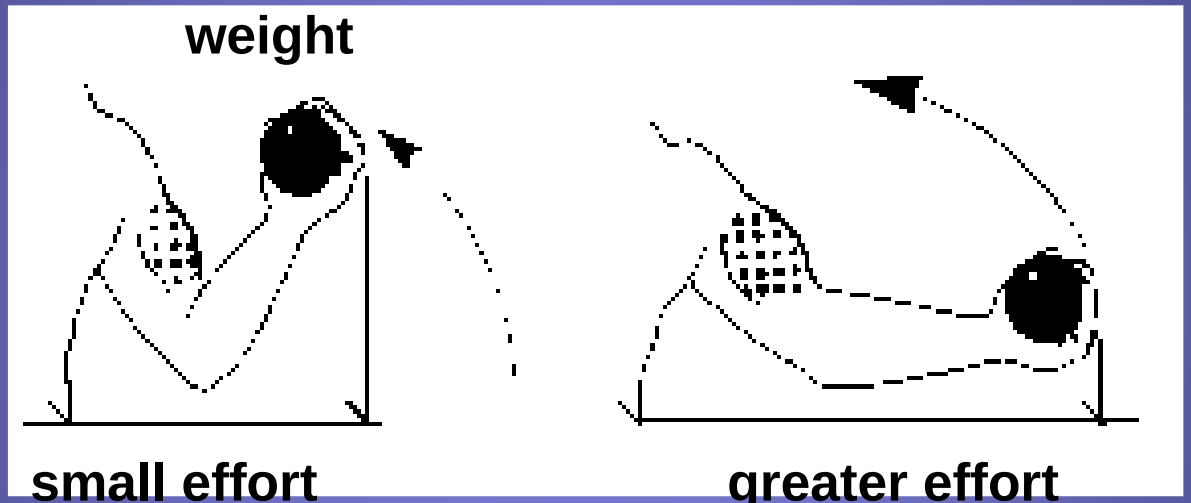


Principles of levers



If the load is further away, there will be a greater strain on the person doing the lifting

Principles of levers

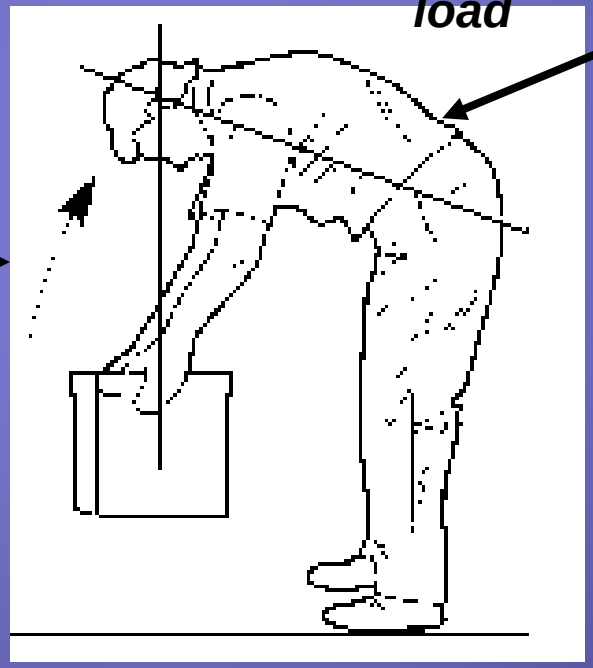


If the load is further away, the greater the strain on the person doing the lifting

Principles of levers

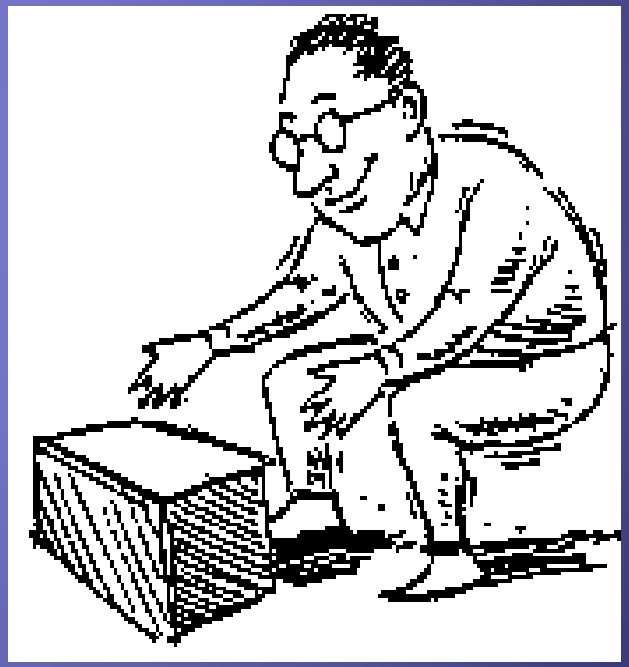
The lower back becomes a fulcrum supporting the weight of the body plus the load

The worst lifting situation occurs when the body is used like a lever and extended over the load



Techniques for safe lifting

Get a firm footing: keep feet shoulder width apart, toes out, distribute weight evenly on soles of both feet



This stance adds stability and reduces stress on muscles

Techniques for safe lifting

Bend your knees: not your waist

When the knees are bent, the weight come first onto the thighs and hips, not the spine

Techniques for safe lifting

Bending at the waist puts tremendous pressure on the vertebrae

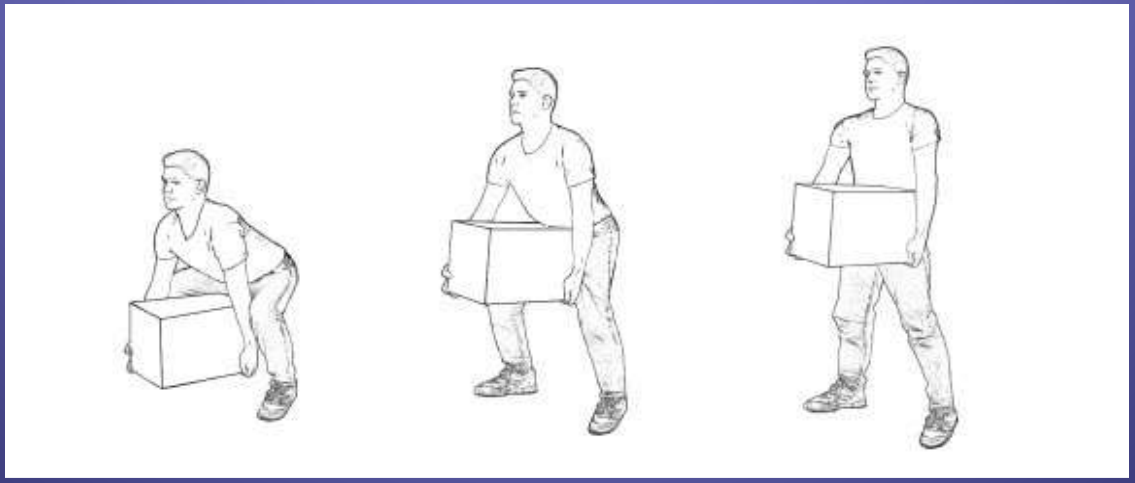
Techniques for safe lifting

- You can also lower your body down on one knee and glide the object up into your body to get a good grip before pushing your body upward.

Techniques for safe lifting

Techniques for safe lifting

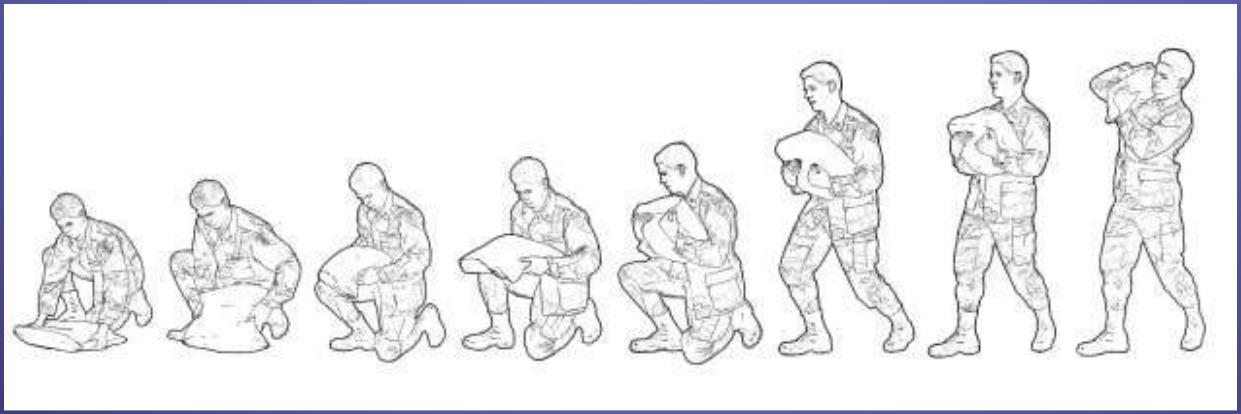
- ***Tighten stomach muscles****: they support spine when lifting, reducing force of the load*
- ***Get a good grip****: use both hands*
- ***“Hug” the load****: hold it as close as possible to your body; the closer it is to your spine, the less force it exerts on your back*



Techniques for safe lifting

Lift with your legs

- Gradually straighten to a standing position
- Lift steadily and smoothly without jerking



Carrying

- **Keep back straight**: to help shift weight onto the legs

Techniques for safe lifting

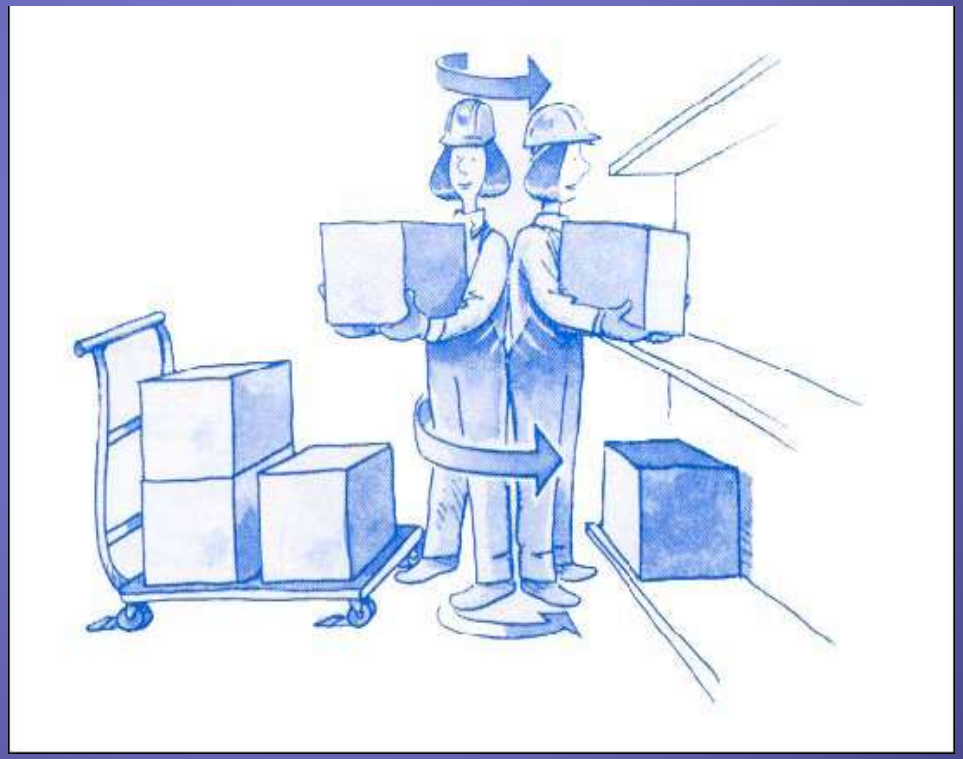
Avoid twisting

Twisting can overload the spine and cause injury to the feet, knees and torso.

Your feet knees and torso should always be in the same direction

Techniques for safe lifting

Pivot with your feet, not your back.



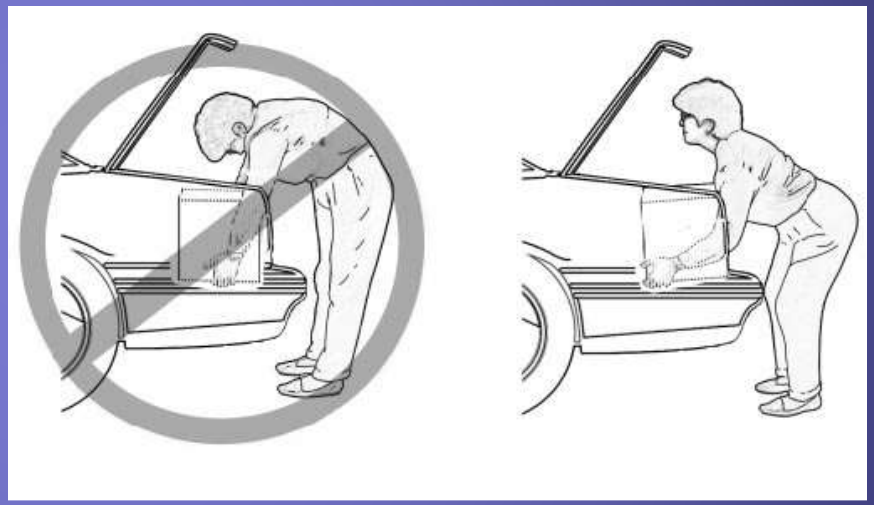
Techniques for safe lifting

- **Use the same technique to set down the load.**

Lifting awkward loads

Reaching into a bin or car trunk:

- Stand with feet shoulder distance apart
- Slightly bend knees and squat, **bending at hip joints**, not waist
- Slide the load as close to your body as possible
- Raise yourself with leg and hip muscles
- If possible, rest knees against edge for support



Hard to reach loads

- Do not reach above the shoulders: use a stepstool or ladder
- Test the weight before removing from shelf
- Slide it toward you and hug it close to your body

Hard to reach loads

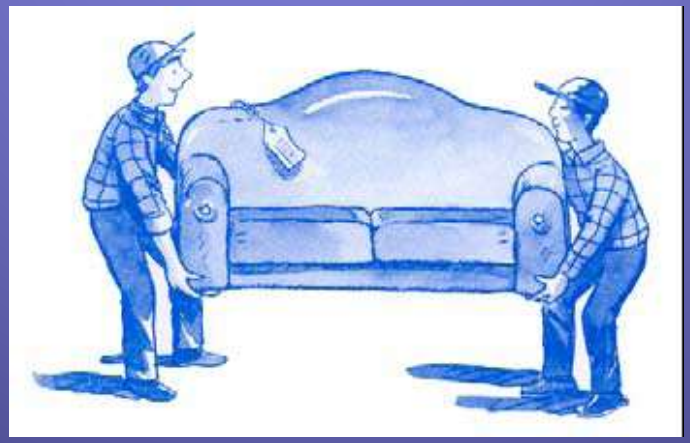
- ✓Don’t reach above shoulders

- ✓Place item on lower shelf

Two person loads

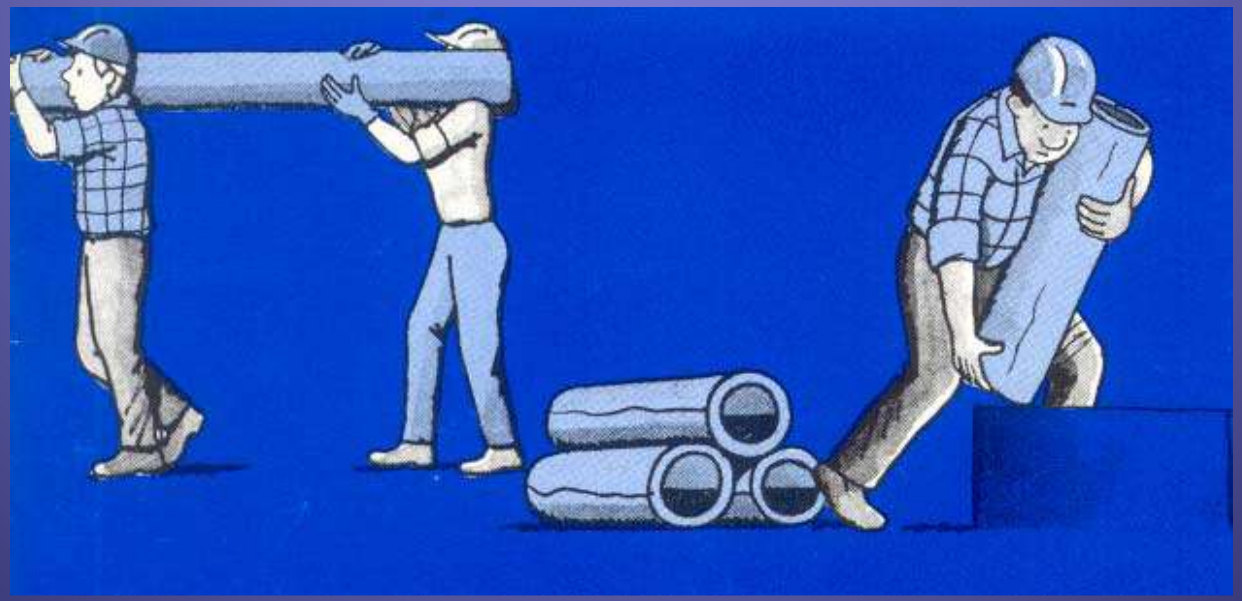
(Team lifting)

- Both persons should be about the same height.
- One person should charge of the lift, so that you are working together not against each other.
- Lift together, walk in step and lower the load together.



Two-person long load

- Shoulder on the same side
- Keep load level
- Walk in step

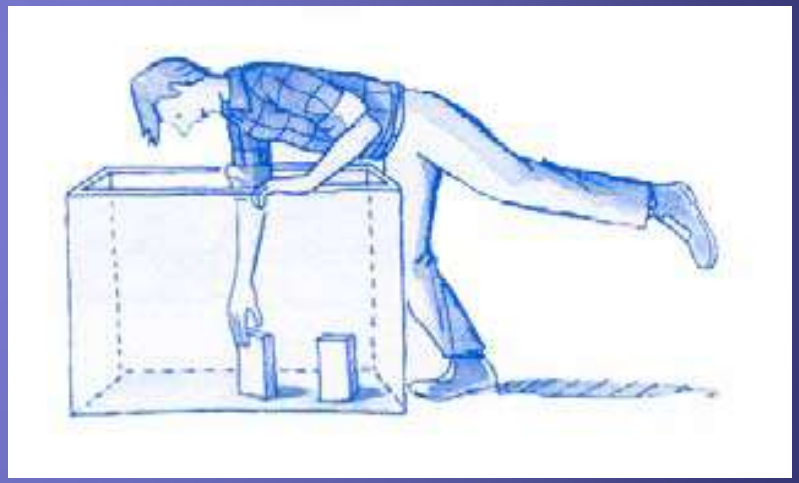


Loading truck or shelf

Put the load on the edge and push it into place.

Awkward location

- Don’t force your body to conform to the workspace
- Use the *golfer’s lift* to pick up light, small loads when you can’t bend your knees or get close to the object.
- Swing one leg straight out behind you.
- Keep your back straight while your body leans forward.
- To help support your body, place one hand on your knee or on a nearby solid object.



Awkward loads

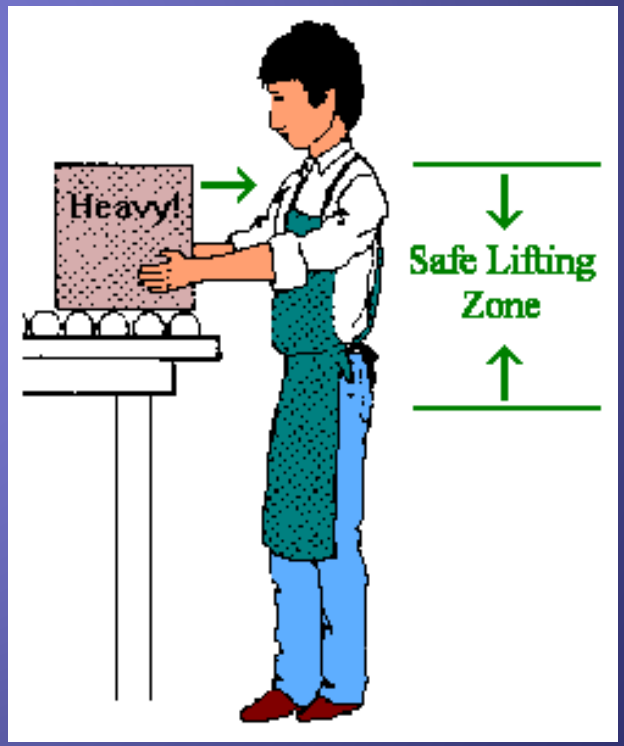
- Instead of lifting, *push* a load

Push, don't pull!

Repetitive lifting

If you must lift many items:

Design workspace so items to lift are in your safe lift zone



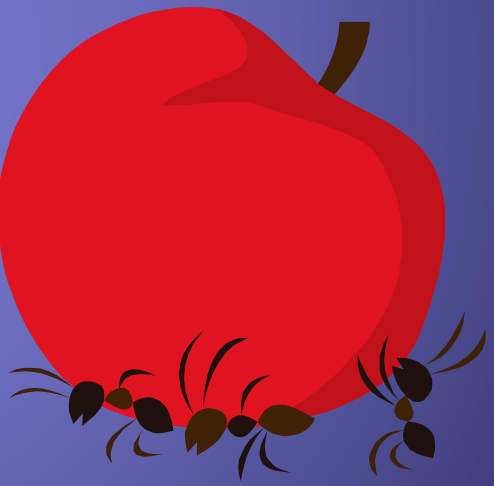
Repetitive lifting

Use mechanical assistance or get help!

Safe lifting

Don't:

- ✓ Lift anything that exceeds 1/3 - 1/2 your body weight
- ✓ Lift from the floor if possible
- ✓ Twist and lift
- ✓ Lift with one hand (unbalanced)
- ✓ Lift loads across or over obstacles
- ✓ Lift while reaching or stretching
- ✓ Lift from an uncomfortable posture
- ✓ Fight to recover a dropped object



Exercise

Benefits:

- Muscle strength helps maintain natural curves
- Keeps back strong and supple
- Warm muscles increase ease of movement

Exercise

- More energy: increased blood and oxygen flow flushes out lactic acid
- Cool down exercises decrease potential stiffness

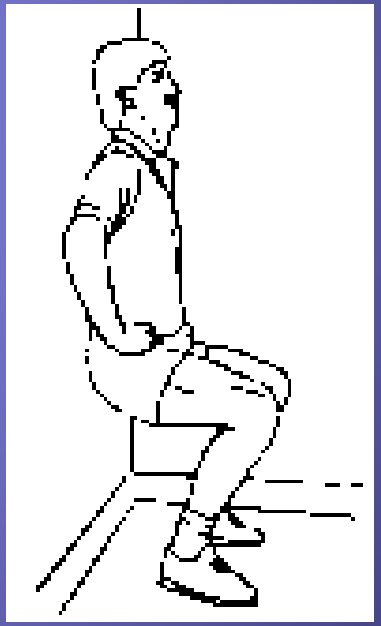
Exercise “dos”

- ✓ *Change* your posture/position often
- ✓ *Stretch* frequently throughout the day
- ✓ Keep body *flexible* (not rigid or fixed)
- ✓ *Warm up* before any strenuous work or lifting
- ✓ Move *slowly* and *gently*
- ✓ *Stop* if there is any discomfort

Exercise

Wall slides to strengthen back, hip, and leg muscles

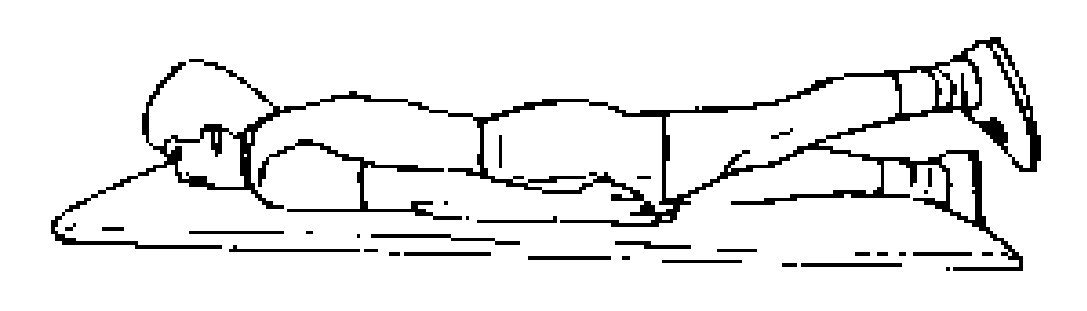
Stand with your back against a wall and feet shoulder-width apart. Slide down into a crouch with knees bent to about 90 degrees. Count to five and slide back up the wall. Repeat 5 times.



Exercise

Leg raises to strengthen back and hip muscles.

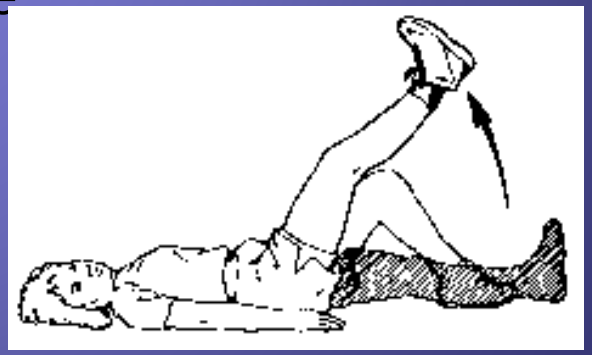
Lie on your stomach. Tighten the muscles in one leg and raise it from the floor. Hold your leg up for a count of 10 and return it to the floor. Do the same with the other leg. Repeat five times with each leg.



Exercise

Leg raises to strengthen stomach and hip muscles

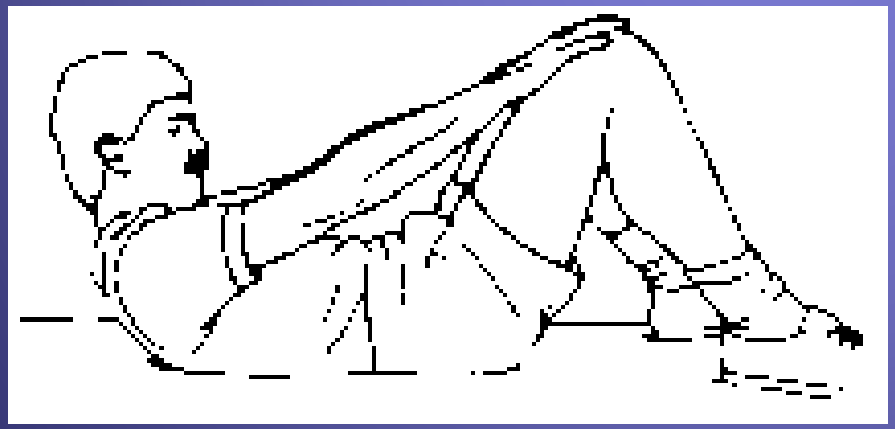
Lie on your back with your arms at your sides. Lift one leg off the floor. Hold your leg up for a count of 10 and return it to the floor. Do the same with the other leg. Repeat five times with each leg. If that is too difficult, keep one knee bent and the foot flat on the ground while raising the leg.



Exercise

Partial sit-up to strengthen stomach muscles

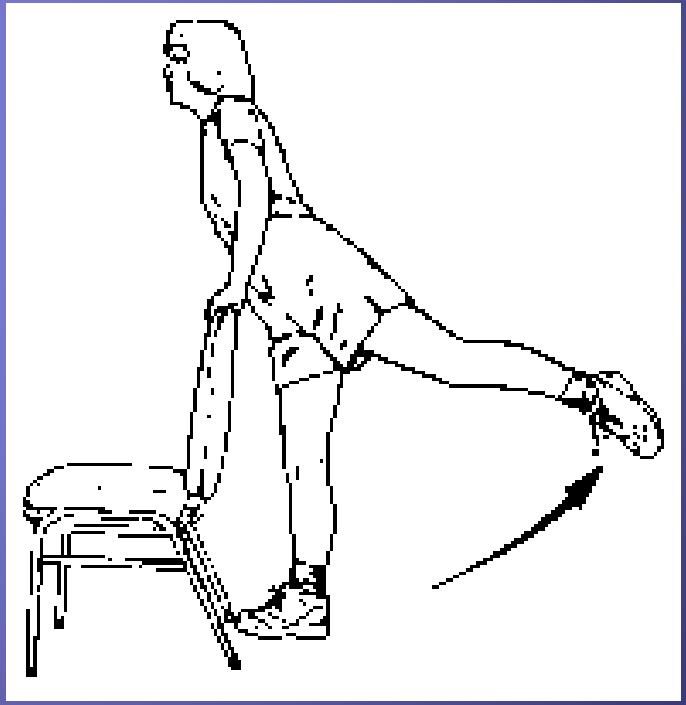
Lie on your back with knees bent and feet flat on floor. Slowly raise your head and shoulders off the floor and reach with both hands toward your knees. Count to 10. Repeat five times.



Exercise

Back leg swing to strengthen hip and back muscles

Stand behind a chair with your hands on the back of the chair. Lift one leg back and up while keeping the knee straight. Return slowly. Raise other leg and return. Repeat five times with each leg.



Exercise

Stretch

Stand with your feet slightly apart. Place your hands in the small of your back. Keep your knees straight. Bend backwards at the waist as far as possible and hold the position for one or two seconds.