

# Back Safety

**Definition, Cause, and Prevention of Low Back Injuries in Offices**

The logo for PHSC (Professional Health and Safety Council) features the letters 'PHSC' in a large, white, pixelated font. The background consists of horizontal blue and white stripes.

Dr. Henry Romero, CPE, CSP

PO Box 891073

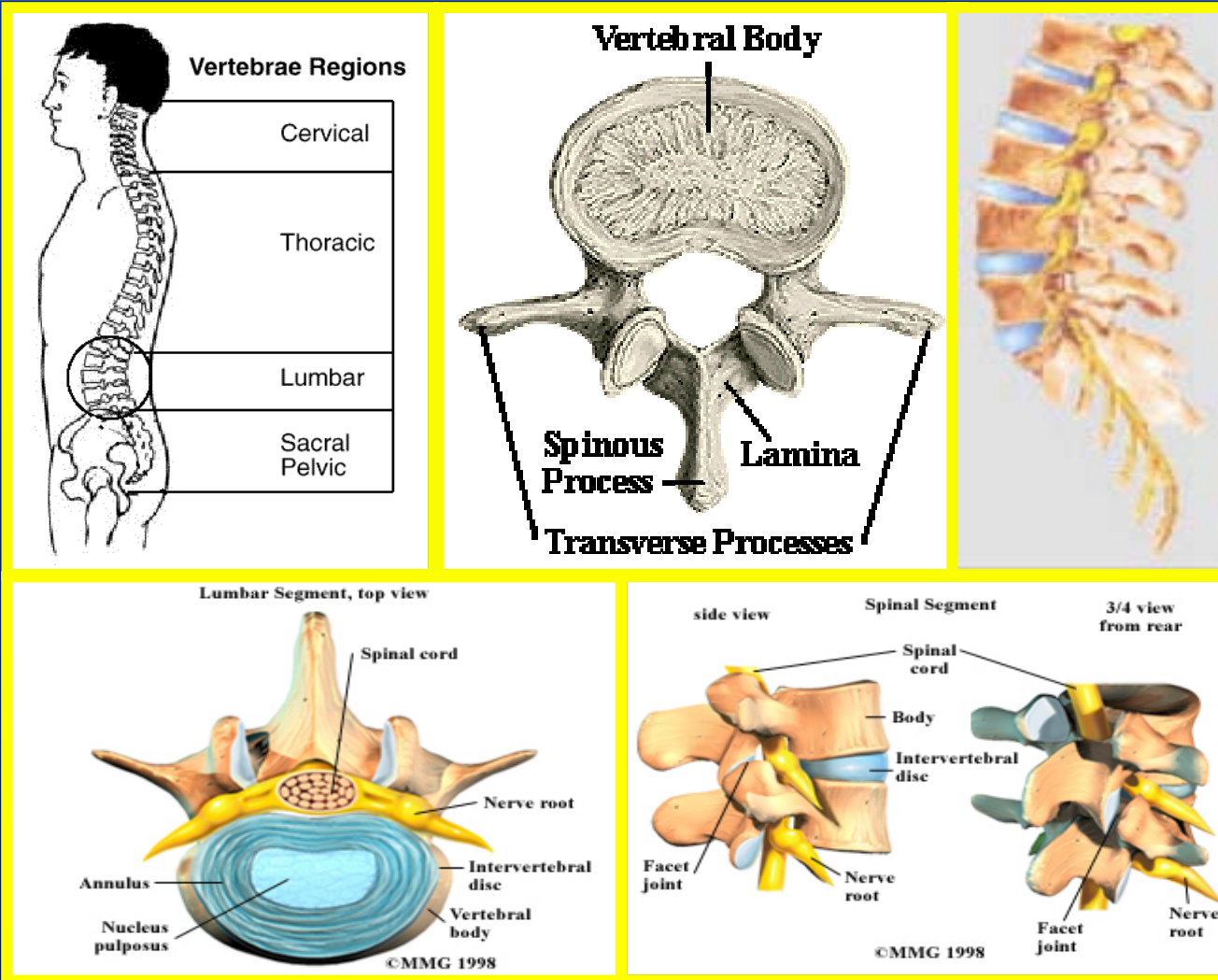
Houston, TX 77289

713-385-8836

Hromero@ergodoc.com

<http://www.ergodoc.com>

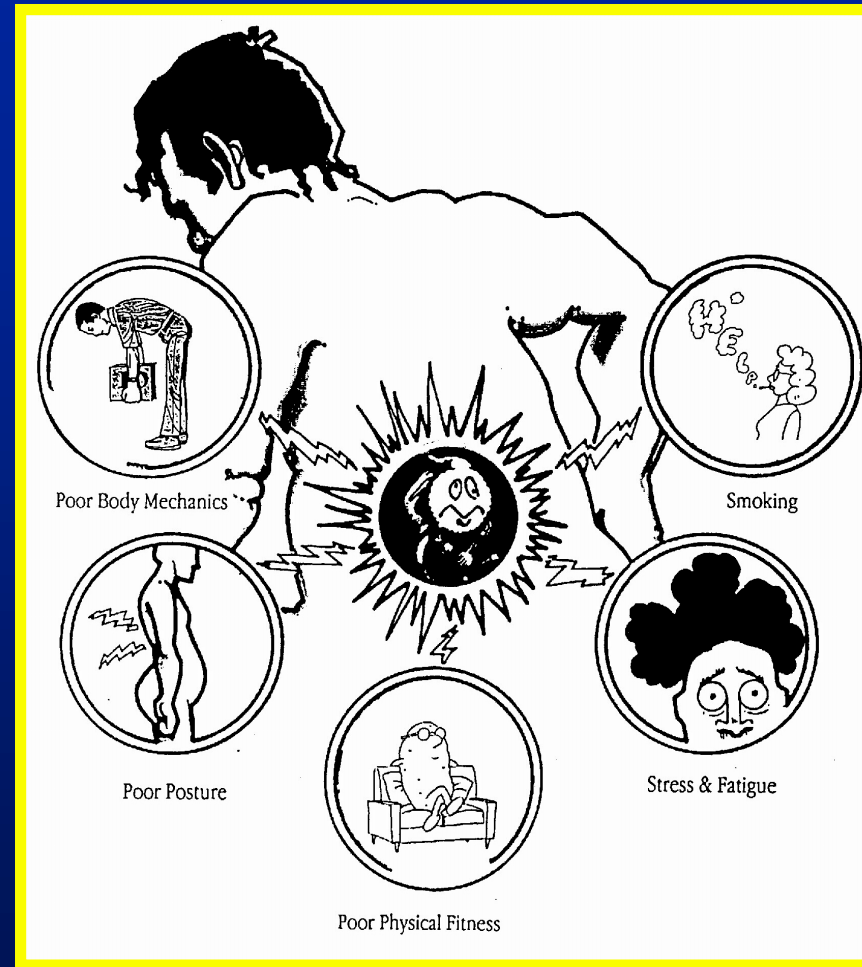
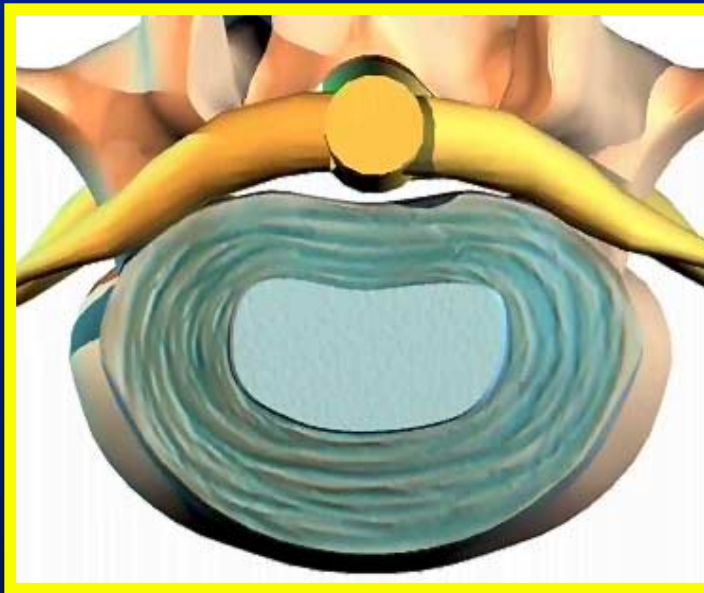
# The Human Spine



Dr. Henry Romero, CPE, CSP  
 PO Box 891073, Houston, TX 77289, 713-385-8836  
 Hromero@ergodoc.com <http://www.ergodoc.com>

# Causes of Back Pain

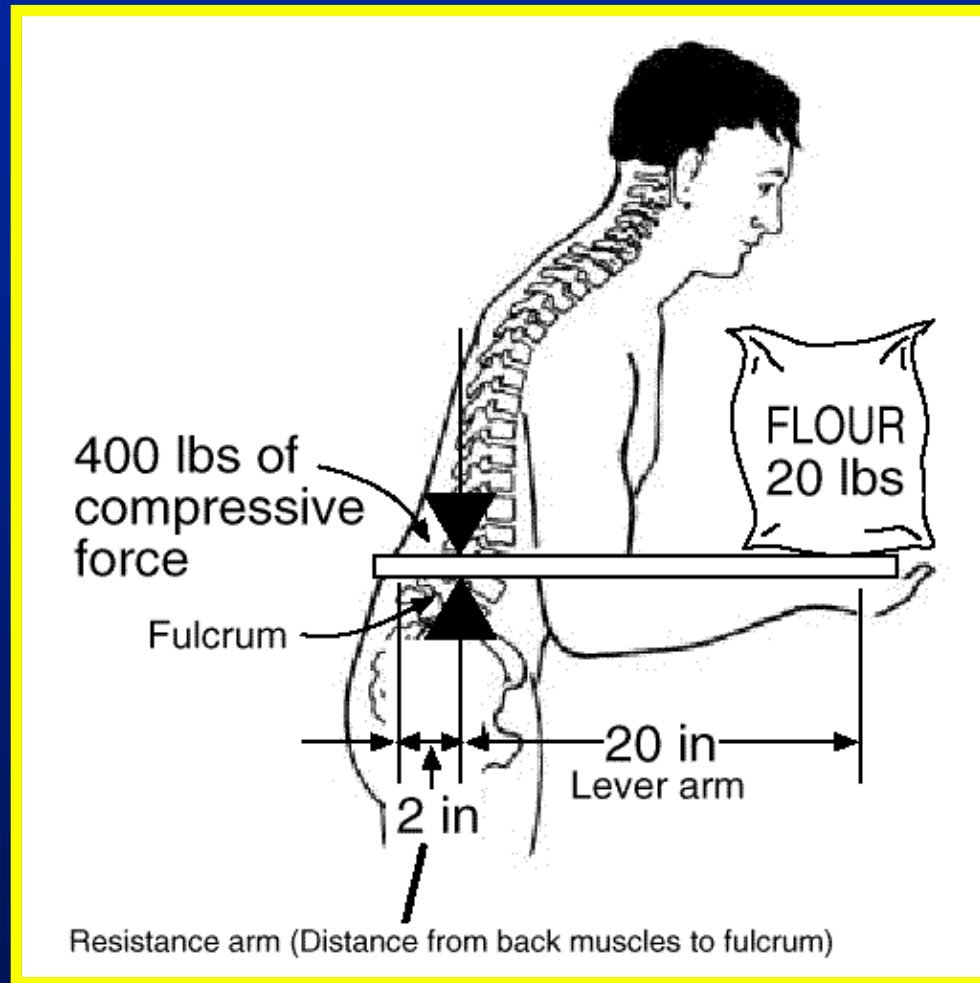
- ◆ Many causes of back pain are not occupationally induced
- ◆ Majority of causes are lifestyle related



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Dr. Henry Romero, CPE, CSP  
PO Box 891073, Houston, TX 77289, 713-385-8836  
Hromero@ergodoc.com <http://www.ergodoc.com>

# Compressive Force Example



Dr. Henry Romero, CPE, CSP  
PO Box 891073, Houston, TX 77289, 713-385-8836  
Hromero@ergodoc.com <http://www.ergodoc.com>

# Back/Torso Risk Analysis

Risk	Criteria
Low	Non-neutral back postures occur in < 33% of task steps and no lifting of objects over 20 pounds occurs
Medium	Objects weighing more than 20 pounds are lifted and/or Non-neutral back postures occur in 33% to 65% of task steps
High	Non-neutral back postures occur in $\geq 66\%$ of task steps <i>note: forward bending greater than 20 degrees is considered non-neutral.</i>

Risk	Criteria Seated
Low	Forward bending 0 to 9 degrees (note: seated and reclined is OK)
Medium	Forward bending 10 to 19 degrees
High	Forward bending $\geq 20$ degrees
Risk	Criteria Standing
Low	Forward bending 0 to 9 degrees
Medium	Backward bending -9 to 0 degrees Forward bending 10 to 19 degrees
High	Backward bending beyond -10 degrees Forward bending $\geq 20$ degrees

Risk	Criteria
Low	< 250 kg
Medium	250 to 450 kg
High	> 450 kg

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 Hromero@ergodoc.com <http://www.ergodoc.com>

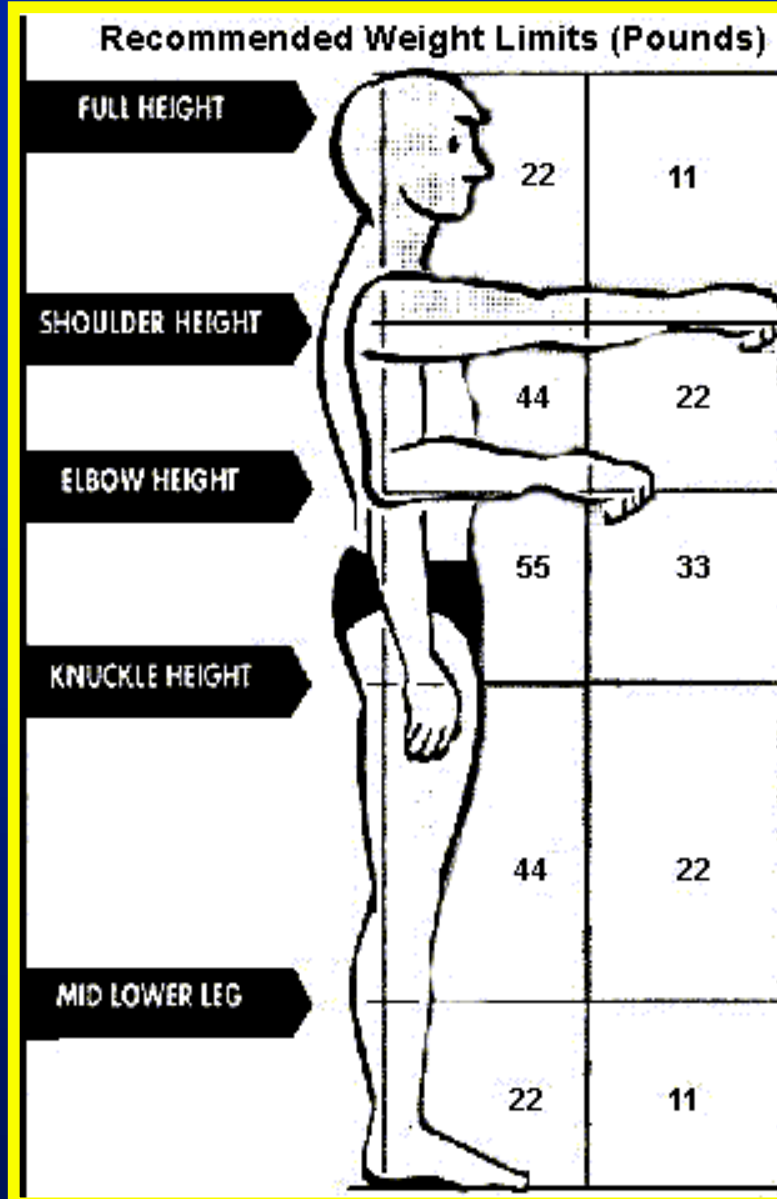
# Risk Factors for Low Back Pain

- ◆ Characteristics of the load (weight, geometry, handles, etc)
- ◆ Frequency of the movements (number of lifts per minute)
- ◆ Time to complete the task (less time = jerky movements)
- ◆ Not using mechanical assists
- ◆ Physical condition including body weight, age, aerobic capacity, and flexibility
- ◆ Proper lifting technique (smooth, even movements with bent knees and looking forward)
- ◆ Personal Protective Equipment (clothing, gloves, etc.)
- ◆ Psychosocial factors (e.g., stress, job dissatisfaction)
- ◆ Temperature or thermal stress
- ◆ Slippery Surfaces
- ◆ Housekeeping
- ◆ Humidity
- ◆ Workplace design

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Dr. Henry Romero, CPE, CSP  
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Hromero@ergodoc.com <http://www.ergodoc.com>

# Manual Material Handling Guide



**PHSC**

Dr. Henry Romero, CPE, CSP  
 PO Box 891073, Houston, TX 77289, 713-385-8836  
 Hromero@ergodoc.com <http://www.ergodoc.com>

# Recommendations for Preventing Back Injuries

- ◆ Best way to reduce the risk of a lifting injury is try and find a way to avoid the lift
- ◆ Ensure proper housekeeping prior to the lift
- ◆ Lifting less than 75% of your physical capacity
- ◆ Make sure you use proper lifting techniques
- ◆ Stay in good physical condition
- ◆ Incorporate regular stretching programs
- ◆ Get help from another person or use a mechanical device for loads that exceed or meet physical capacities or are particularly asymmetric
- ◆ Store heavy loads around waist height
- ◆ Where possible, push instead of pull
- ◆ Keep the frequency of the lifts low, especially for heavy loads

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Dr. Henry Romero, CPE, CSP  
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Hromero@ergodoc.com <http://www.ergodoc.com>

# Proper Lifting Technique

Most back problems occur over a period of time. Careful attention to lifting on the job and at home and regular exercise to maintain fitness and strength will help you maintain a healthy back. The following principles will assist in lowering your risk of back injury due to lifting.

- ◆ Size up the load. Test it to see if you can lift it safely. Can you grasp it securely? Good handholds (cut-outs, handles) will make the load easier to lift. Make sure the load is balanced in your hands.
- ◆ Get as close to the load as possible before lifting it. If possible, slide the load towards you before picking it up.
- ◆ Make sure your footing is secure. Do not lift objects that obscure vision and footing.



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Dr. Henry Romero, CPE, CSP  
PO Box 891073, Houston, TX 77289, 713-385-8836  
Hromero@ergodoc.com <http://www.ergodoc.com>

# Proper Lifting Technique (cont)

- ◆ Do not twist while lifting! Move your feet so that they point in the direction of the lift as you turn.
- ◆ Lift smoothly, but not slowly. Do not jerk the load.
- ◆ Organize the work so as to avoid lifting from the floor or above shoulder level. Items to be handled should be between knee and shoulder height.
- ◆ Keep the load as close to your body as possible. If the load is large and cannot be placed between your knees as they are bent, bend at the hips and waist with your knees relaxed. It is more important to keep the load close than it is to bend your knees. One solution to lifting a larger load is to get another person to help you. A better solution is to use mechanical assistance (hand trucks, carts) to avoid lifting altogether. **GET HELP WITH LARGE LOADS**

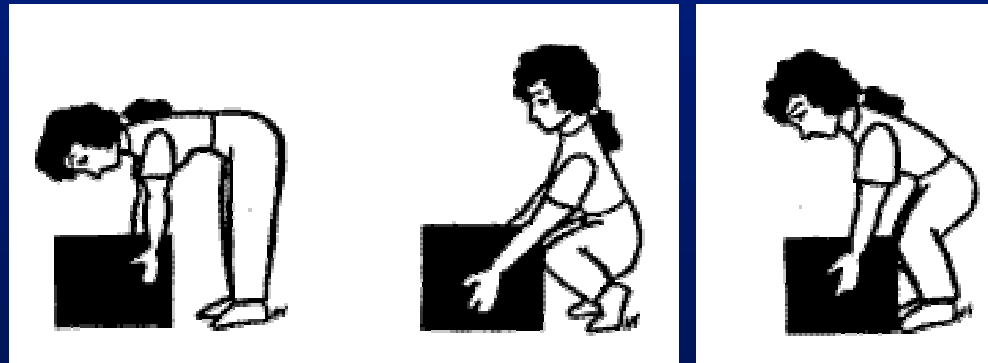


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# Proper Lifting Technique (cont)

- ◆ If you have a lot of lifting to do during the day, try not to do it all at once. Alternate lifting tasks with lighter work to give your body a chance to recover. Remember, mechanical assistance is just as important for repetitive lifting as it is for heavy lifting.
- ◆ Use the same principles when lowering or placing the load after lifting. Place carefully.
- ◆ Try to avoid carrying the load more than 10 feet without getting mechanical assistance. Use a dolly or cart.



Poor

Good

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# Leverage Zones

- ◆ Green Zone
  - Elbow at side
  - Greatest strength
- ◆ Yellow Zone
  - Elbow at 45 degrees
  - Up to 6 times the stress on the lower back
- ◆ Red Zone
  - Arm straight out
  - Up to 50 times the stress on the lower back
  - AVOID!



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PO Box 891073, Houston, TX 77289, 713-385-8836  
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# Compound Motions

- ◆ Twisting while bending
- ◆ Especially stressful on the lower back
- ◆ Either alone is potentially stressful
- ◆ Point toes in the direction of the motion
  - Unloading supplies
  - Reaching into a car



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# Sideways Bending

- ◆ Down Stairs
  - Angle your body 30 degrees to the stair rail
  - Always glide lifeline hand over the rail
  - Place full foot on each step
  - If carrying load, be sure to move sideways down stairs and ensure placement of foot prior to putting weight
- ◆ Reaching at shoulder height or above
- ◆ Under a desk or table
- ◆ When pulling a cart (pushing is better!)



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# Guidelines for Materials Handling Safety

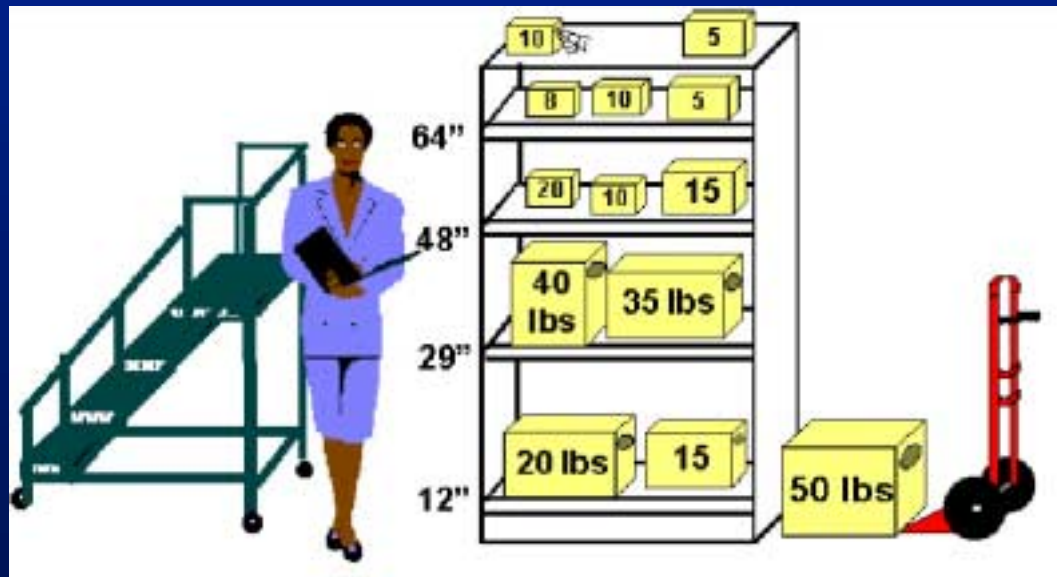
- ◆ Use mechanical aids hoists, lifts tables, conveyors, forklifts, etc
- ◆ Provide the best work height to reduce vertical travel of the lift
- ◆ Reduce object weight
- ◆ Reduce distances in reaching and carrying objects
- ◆ Avoid twisting at the spine
- ◆ Make objects easier to handle
- ◆ Lower frequency and provide for job rotation
- ◆ Always use proper lifting technique



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# Guidelines for Occasional Materials Handling

- ◆ Select the appropriate individuals for the job
- ◆ Teach and encourage proper lifting technique
- ◆ Design the job to remove the need for lifting
- ◆ Follow the same recommendations for designing repetitive manual materials handling tasks



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# Carts

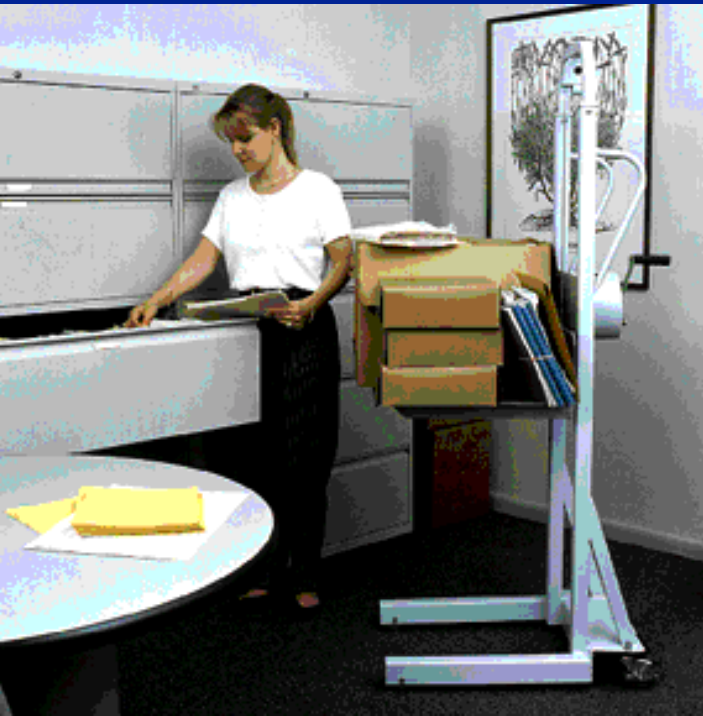
- ◆ When using a handtruck or pushcart, remember:
  - It is easier and safer to push than to pull.
  - Stay close to the load, try not to lean over, and keep your back straight or slightly arched.
  - Use both hands to control the handtruck or pushcart.
  - Use tie-down straps, if necessary, to secure the load.
  - Avoid stairs and inclines. If you must take a load to another floor, use a freight elevator.
  - Never "horse around" with handtrucks and pushcarts.



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# Work Positioners and Lifts

- ◆ Mechanical assists exist and should be used



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# Back Belt Facts

- ◆ Back supports do not reduce injuries
- ◆ Back supports do not allow you to lift heavier loads
- ◆ Stiffer belts do not protect better
- ◆ Use of back supports does not increase high blood pressure
- ◆ Back belts, back supports and back splints are not the same thing
- ◆ One size does not fit all



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## Back Belt Facts (cont)

- ◆ Back supports can cause muscle atrophy
- ◆ Back supports used with a comprehensive education program might reduce the incidence of back injuries
- ◆ Back belts cannot be considered personal protective equipment
- ◆ Professional ergonomists and physiologists do not recommend the use of back belts



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# Back Belt User's Guide

- ◆ All wearers should be medically screened to make sure more serious back conditions do not exist
- ◆ Supports must not take the place of engineering changes
- ◆ An exercise program should be required of all wearers



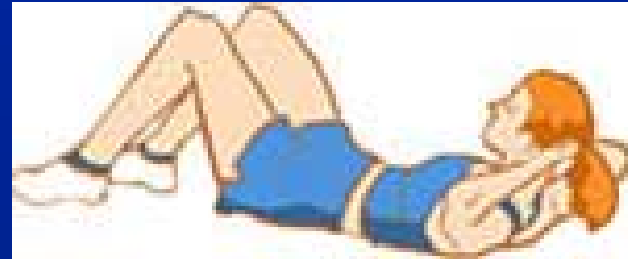
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# Three Key Exercises to Good Back Health

## Partial situp:

Lift your shoulders off the floor, hold for 5 seconds, and lower.



## Pelvic lift:

On your back with knees bent, lift your pelvis off the floor. Then extend your right leg, keeping your mid-back on the floor. Hold 5 seconds, lower, and repeat with left leg.

## Table pose:

Lift your left arm and right leg so that they're in line with your spine. Hold 5 seconds, lower, and repeat with right arm and left leg.



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# Fatigue Relieving Breaks

- ◆ Needs to consist of several frequent, short breaks versus two or three long breaks
- ◆ Should consist of appropriate stretching exercises
- ◆ Might consider rotating to a job that allows for using different muscle groups



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# Ergonomics is a Team Effort

Everyone is responsible for  
making the workplace safe  
and injury-free

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