

# ERGONOMICS

SAFE LIFTING

&

GRIPPING TECHNIQUES

Presented by CEsafety



## SAFE LIFTING GUIDELINES

- Our company is committed to providing a safe and healthy work environment and to preventing occupational injuries and illnesses, including those arising from ergonomic deficiencies.
- To meet this goal the proper interface between employees and their work environment must be ensured. Manual lifting tasks constitute one such interface.
- To reduce the risk of injuries and illnesses from lifting, as a part of its safety and occupational health program we have established a manual lifting limit of 50 pounds under ideal conditions.

## General Guidelines:

- The safety of a manual lift depends not only on weight of the load, but also on: the horizontal distance of the load from the employee, the vertical distance traveled the frequency of the lift, and the dimensions and weight distribution of the load.
- While detailed formulas are available for incorporating these factors in estimating the safety of a given lift (NIOSH Lifting Guidelines), a simplified 'rule of thumb' is needed in order to be readily and widely used.

## MANUAL LIFTING RISK FACTORS:

- Limitations on safe lifting are governed by a combination of job and personal risk factors, including:
  - bending motions
  - twisting motions, specially under load
  - reaches away from the body (specially >8 inches)
  - lifting/lowering - from below knuckle height (approx. 30 inches)
    - above shoulder
    - loads >7.5 lbs. When multiple risk factors present
    - loads >30 lbs. Under reasonable conditions.
  - Push/pull forces >50 pounds
  - carrying loads >30 pounds

## Manual Lifting Factors Risk (cont'd).

- repetitive lifting - single motions or performed more than 50% of the time. Production standard exceeds 500 units per shift.
- Loads with awkward size, shape, or weight distribution.
- Employees who have:
  - chronic back problems
  - no training on back injury prevention
  - poor muscle strength or balance

Thus the following general guidelines are recommended for ALL manual lifting tasks:

## FIFTY (50) POUNDS:

- Fifty pound limit under good lifting conditions:
  - upright
  - untwisted posture
  - balanced load close to the body
  - good grasp (handles, etc.)

## **THIRTY(30) POUNDS:**

- Thirty pound limit for less than good lifting conditions (or less than 30 pounds for poor conditions).
  - Distance to be traveled
  - unbalanced or asymmetrical load
  - awkward posture involved

## **Job Safety Hazard Analysis:**

- Your safety representatives should evaluate all of the jobs tasks to determine which specific jobs are considered at high risk for back injury or other materials handling hazards. CESafety can be used as a resource for assistance and guidance in performing the analysis.

## Loads Exceeding Recommended Guidelines:

- All tasks exceeding the guidelines should have a Physical Demands Description performed by CE safety.
- Such tasks will be described, explained and limitations placed as to what constitutes a safe lift in each circumstance.

## Training:

- Employees should review the Manual Lifting Guideline annually and have this documented on their training records.
- Employees on high risk jobs (as deemed by the safety representatives) should receive annual back injury prevention training and have this documented on training records. Training should include general back health, principles of safe materials handling, and a review of the lifting guidelines.

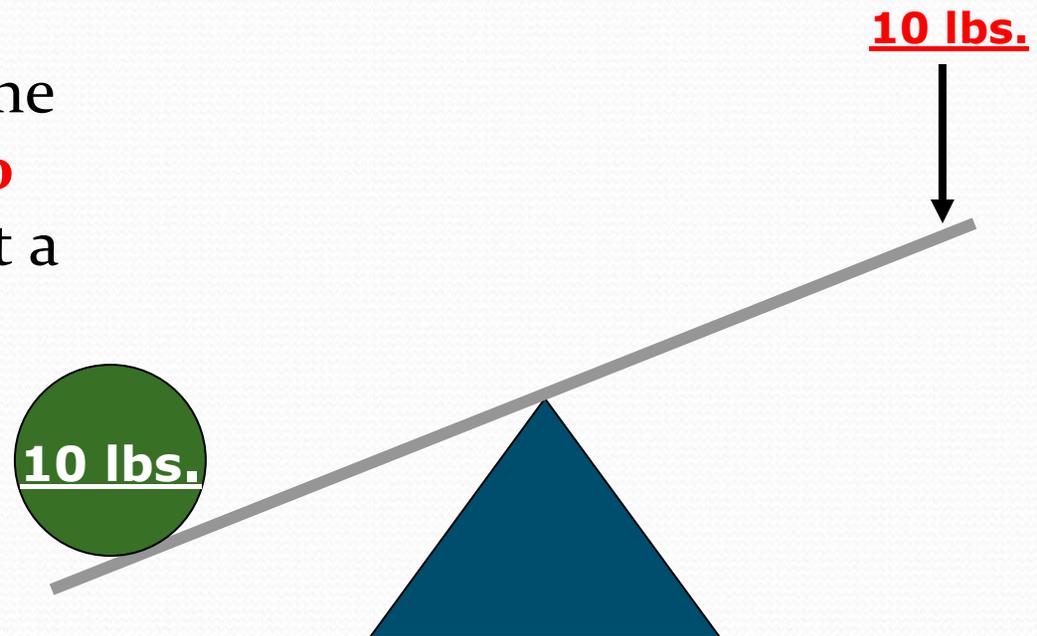
# Understanding the Forces on the Spine

## The Statistics on Lower Back Injuries

- “According to the Bureau of Labor Statistics in the United States, more than one million workers suffer back injuries each year, and back injuries account for one of every five workplace injuries or illnesses.”
- WSIB in Ontario reports that almost 45% of all WSIB claims are based on ergonomic injuries. Injuries such as pulled back muscles, rotator cuff, carpal tunnel.
- These two statistics are alarming which is why we are here today to talk about saving your back.

# Understanding the Forces on the Spine

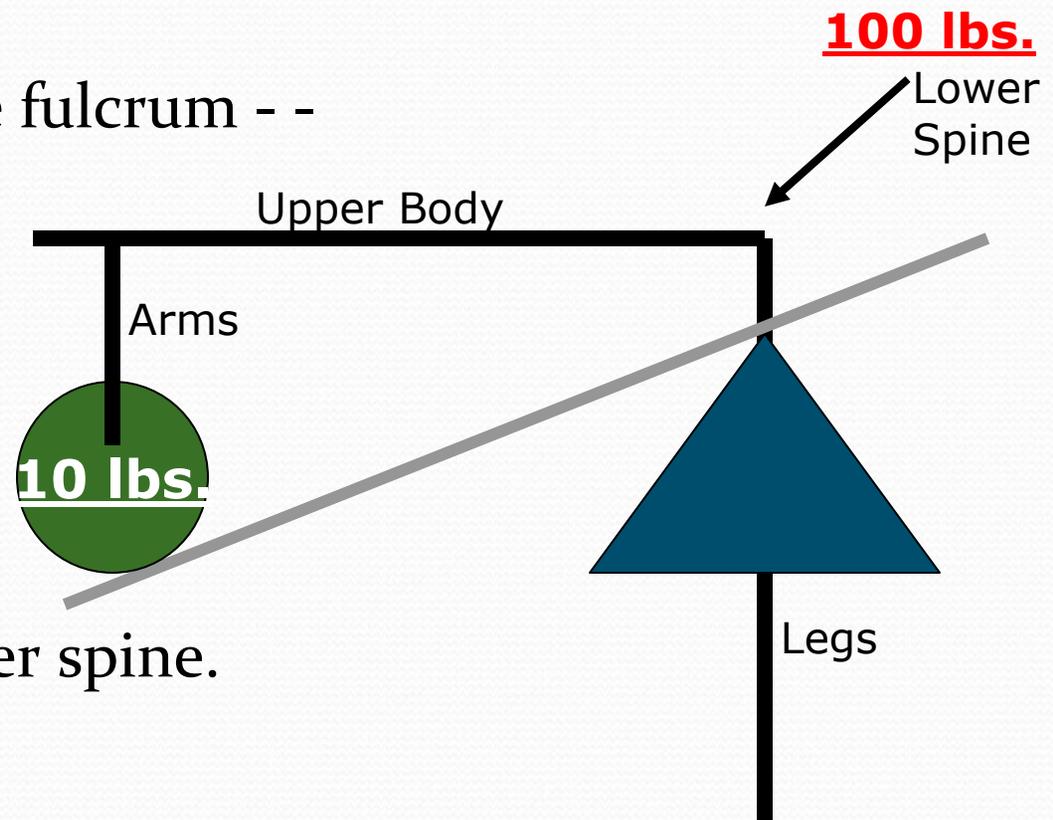
- Think of the spine as a lever.
- With the fulcrum in the center, it only takes **10 pounds** of force to lift a 10 pound object.



- If you shift the fulcrum to one side, it takes more force to lift the 10 pounds.

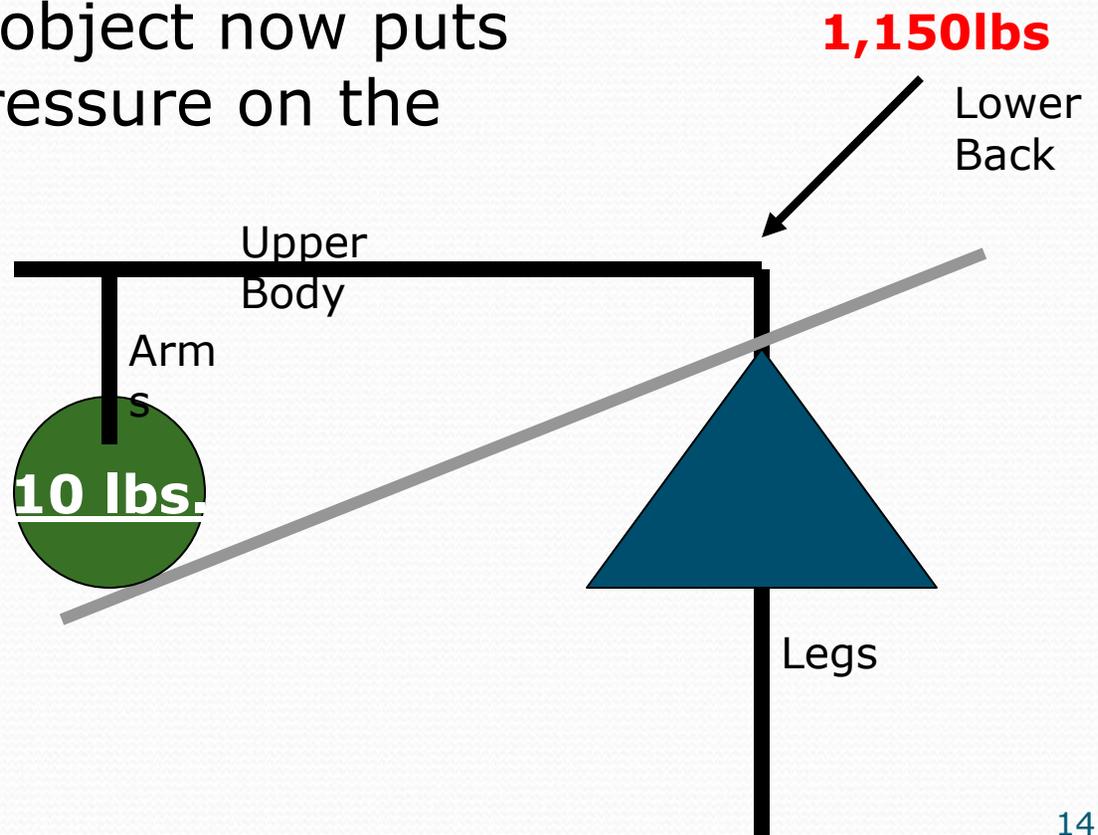
- Your waist acts as the fulcrum - -
- with a **10:1** ratio!

- Lifting the 10
- pound object now
- puts **100 pounds** of
- pressure on your lower spine.

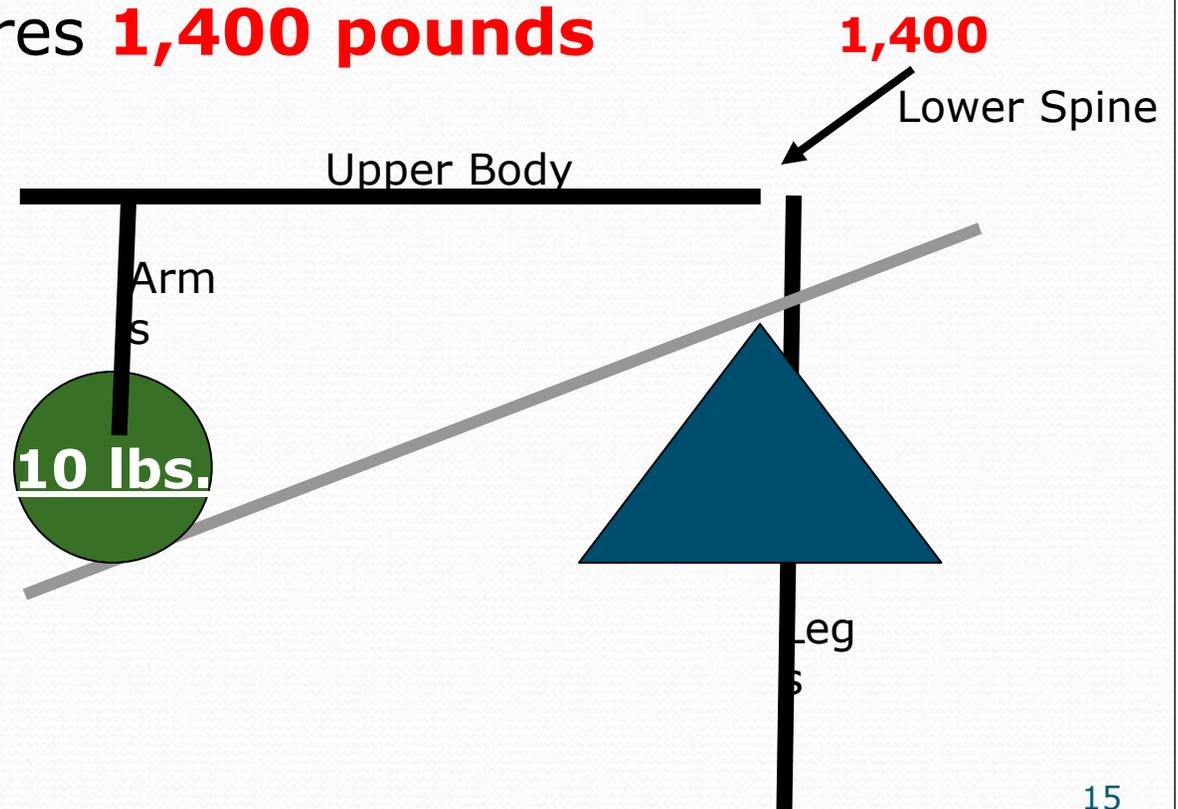


When you factor in an extra 105 pounds (the weight of the average person from the waist up), lifting the 10 pound object now puts **1,150 pounds** of pressure on the lower spine

[(105 pounds of body weight + 10 pound object) times ratio of 10].



If you are 25 pounds overweight, it adds an additional 250 pounds of pressure on the lower spine. Now, it requires **1,400 pounds** of pressure be exerted on the lower spine to lift a 10 pound object.



- Frequently, someone's back "goes out" just from bending over and picking up a pencil (or other small object).
- With an understanding of the forces exerted on the spine, we realize that the weight of the pencil is not the problem.
- We can now understand the necessity of getting the object close to the body for lifting and bending the knees and using the strong leg muscles for lifting. Good lifting form (bending the knees and lifting with the legs) is necessary even for small objects. Proper lifting technique greatly reduces the amount of force applied to the lower spine. 

## PRINCIPLES OF A SAFE LIFT: Step 1

- **Get a firm footing:**

Keep your feet apart (about shoulder width) for a stable base with toes pointed slightly outward.

## Step 2:

- **Bend your knees.**

Don't bend at the waist. Keep the upper body erect.

### Step 3:

- **Tighten stomach muscles.**

Abdominal muscles support your spine when you lift, off-setting the force of the load.



### Step 4:

- **Lift with your legs.**
- Let your powerful leg muscles do the work, not your weaker back muscles. Lift slowly and smoothly and avoid jerking.

## Step 5:

- **Keep the load close.**

The closer the load is to your spine, the less force it exerts on your back. Avoid long reaches or static postures.

## Step 6:

- **Keep your back upright.**

Whether you are lifting or putting down the load, don't add the weight of your body to the load. Avoid twisting. Take a few steps to position yourself correctly.

## Two Person Lifts:

- When the load is deemed to be excessive or awkward for one person, a two person lift should be considered.
- If used, this lift must be well coordinated. Each person must apply and release pressure at the same time to avoid injury.



## Lift assists:

- When loads are excessive, then other engineering methods should be examined.
- Use a cart, lift truck, a hoist, come along or any other safe lifting device.
- If you are not sure if the lift you are about to try is safe to attempt or not, check with your safety representative, supervisor or manager.
- No one will punish you for asking the question “Is this safe to do?”



## Unusual Situations:

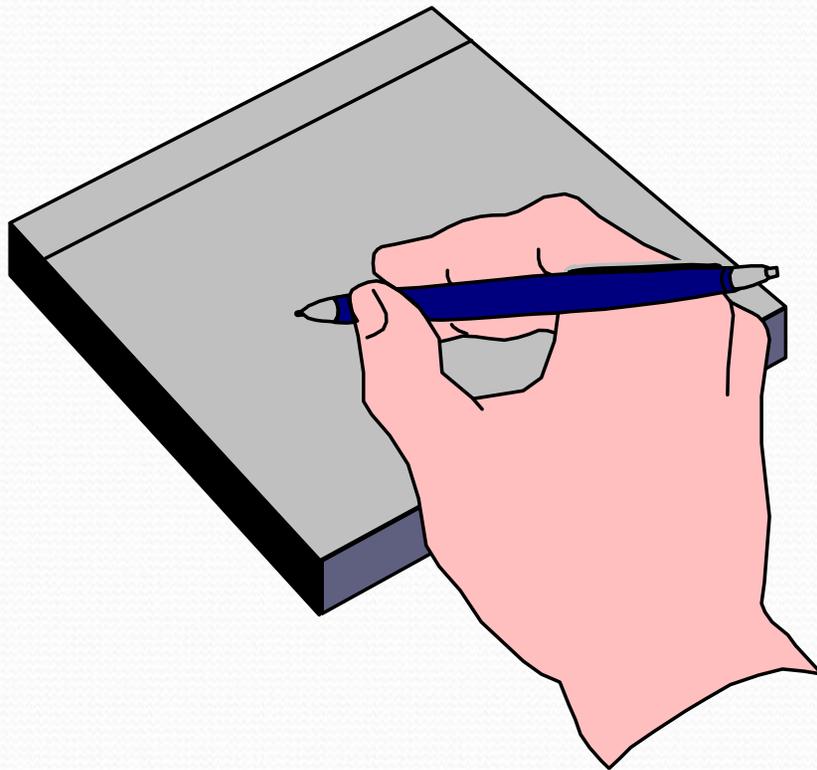
- If the answer to any of the following is “YES”, then the employee should re-examine the particular task and consult with their Supervisor, safety committee resource or Bill Godkin of CEsafety to determine the safest way to move the material...

- Does the task fall outside the 25 Kg. safe lifting guidelines?
- Is there an operating procedure for performing this task?
- Is this being done for the very first time?
- Is there a high potential for injury even if using normal precautions?
- Does the task require mechanical assistance such as pry bars, rollers, or come-alongs?
- Does the task require rigging?
- Do the employees assigned to the job have lack of sufficient training or knowledge to accomplish the job without incident?

# GRIPPING GUIDELINES

- Your hands grip and your wrists bend and twist millions of times annually. Certain movements may increase your chances of developing repetitive motion disorders.
- By making small changes in how you work, you can help to avoid problems down the road.

## • RISK FACTORS



- Harmful Positions:
- Twisting the hand from side to side
- Bending the wrist forward or backward
- Pinching motions
- Pressing/putting force on the palm of the hand.

- **RISK FACTORS (CONT'D):**

- Excessive Force from gripping, rotating , pinching or leaning on the hand.
- Vibration from power tools.
- Frequent, repetitive motions.

## Work safely:

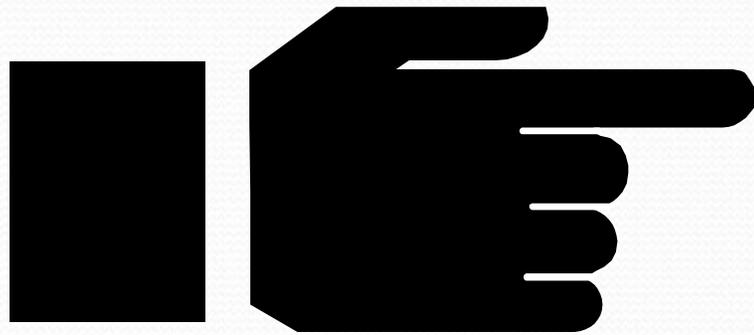
- Use your whole hand as much as possible when grasping objects.
- Position the work within easy reach to avoid bending the wrists.
- Wear gloves or use vibration dampening devices when required.



## Use the best tools for the job:

- Handles or levers should extend the full length of your hand to avoid pressure on your palm.
- Choose in-line or pistol-grip tools, depending on the position of the work.
- Single-handled tools, levers and bars should have a grip diameter that comfortably fits in your hand (1.25 to 2"). Pliers or cutters should range between 2.5 and 3" to comfortably fit your hand. Proper grip size reduces force during use.
- Textured or cushioned handles provide an easier grip.
- Push button power tools have less kickback than trigger start tools.

## Think NEUTRAL:



- Avoid twisting your wrist too far on either side.
- Avoid bending your wrist too far up or down.
- Avoid pinch grips on heavy objects.
- Avoid pressure on the palm.

## More Information

- If you are uncertain about a lift or have questions about any of this presentation, contact your safety committee or Bill Godkin of CE safety.
- Remember, don't put yourself or a co-worker at risk. Get or offer assistance with a lift.