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Preventing Overexertion



NATIONAL
SAFETY
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Overexertion Injuries: Causes and Prevention

Presented by
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Des Moines
Water Works
Water You Can Trust for Life

In this Webinar We Will Cover:

- Extent of overexertion Injuries
- What are overexertion injuries?
- How do overexertion injuries occur?
- What are the causes of overexertion injuries?
- What do people say who have had overexertion injuries?
-



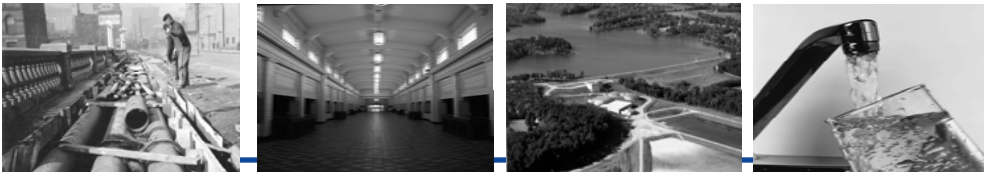
In this Webinar We Will Cover:

- Some helpful guidelines for reducing overexertion risk.
- Effect of Temperature on Overexertion
- Effect of Fatigue on Overexertion
- Effect of Stress on Overexertion
- More Information



Extent of Over Exertion Injuries

- > 3.5 million injuries (all exposures)
- Leading cause of non-fatal injuries
- 2nd leading cause of missing work (after common cold)
- Average costs for these injuries range from over \$13K for wrist injuries to over \$23K for back injuries



What is an Overexertion Injury?

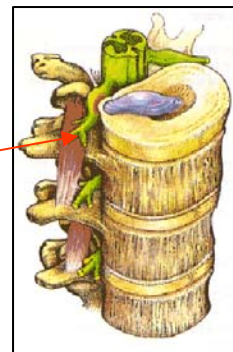
Sprains – stretching or tearing ligament

Strains – stretching or tearing tendons or muscles

Ligaments – very tough connective tissue which connect bone to bone, and hold the tendons in place and stabilize the joints.

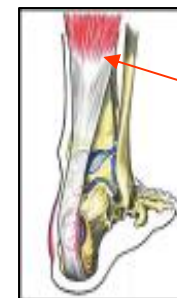


inter-vertebral muscle



Muscles – the tissue responsible for movement of joints. They are attached to bone by tendons, and shorten to create movement of a joint.

Tendons – the tough connective tissue which connects muscle to bone



tendon-muscle junction



How do Overexertion Injuries Occur?

Overexertion occurs when the load, whether lifted, carried, pushed, pulled or otherwise handled, exceeds the limits of the human joint system doing the work.



In this case the “lower back”



Other Overexertion Injuries

- Wrist
- Knee
- Ankle
- Neck
- Groin
- Shoulder



Causes

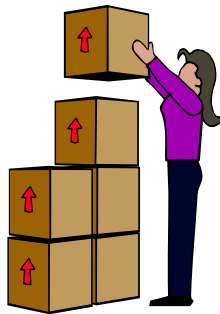
- These injuries can be caused by acute causes or chronic causes
- Generally, Overexertion Injuries are caused by Acute causes
- Ergonomics impacts both but more with chronic causes





Overexertion injuries have been associated with these activities:

- lifting
- repeated bending at the waist
- bending at the waist with twisting
- long term bending at the waist



- pushing/pulling
- carrying
- reaching



- long term poor posture - sitting or standing

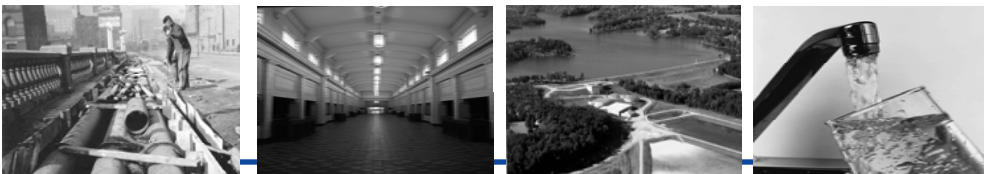
- sitting while absorbing vibration through the body (as in truck driving)



Personal Factors

Some personal factors have been associated with overexertion injuries:

- aging and its loss of body flexibility (becoming stiff)
- poor physical condition
- overweight



What do people say who have had overexertion injuries?

- I was in a hurry
- I was in an awkward position

So...

Perform the task twice:

Once With Your



and Once With Your



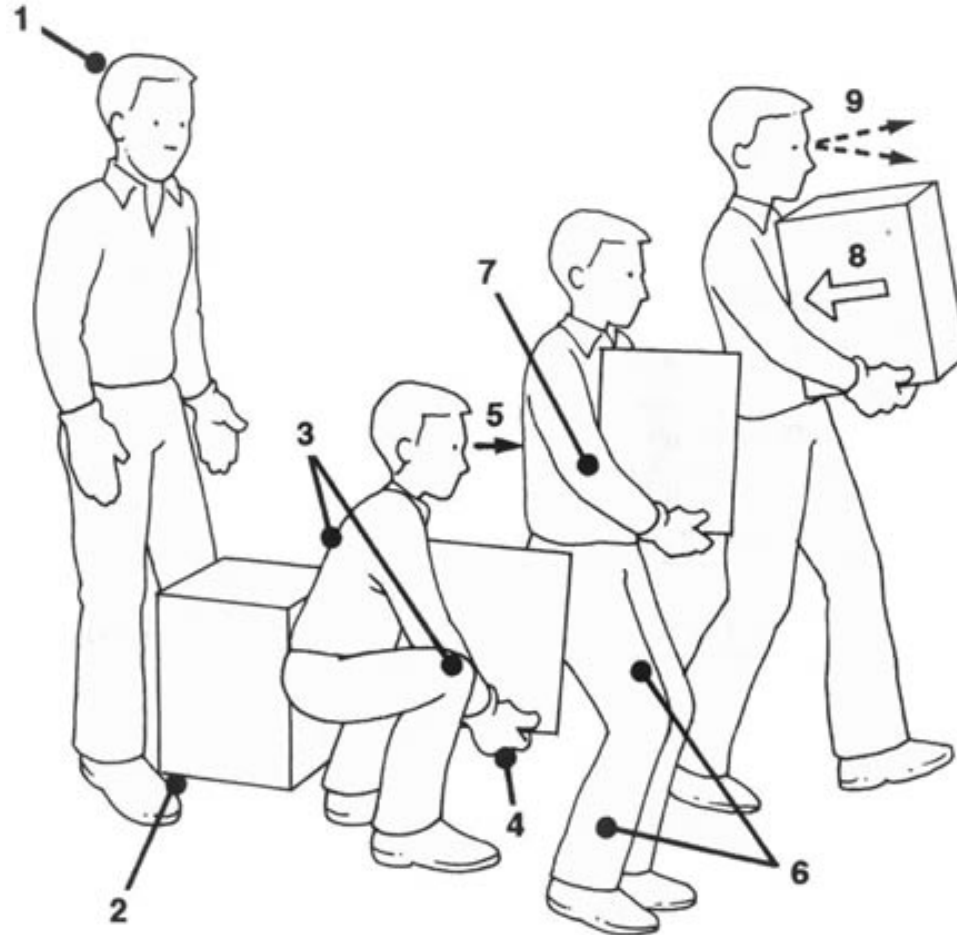
As you think about the task, determine what has to be done to perform it safely and then follow through.



Some Helpful Guidelines for Reducing Overexertion Risk



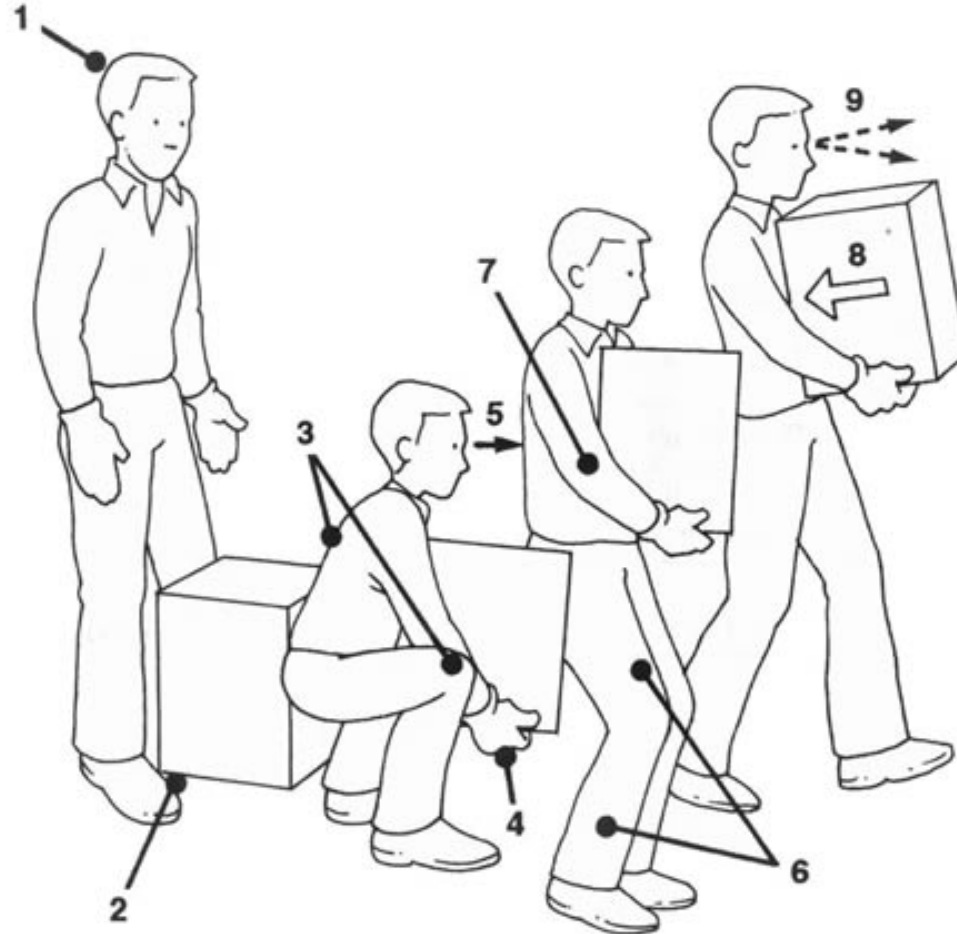
Good Techniques For Lifting:



- Assess the weight of the load (by observing or pushing).



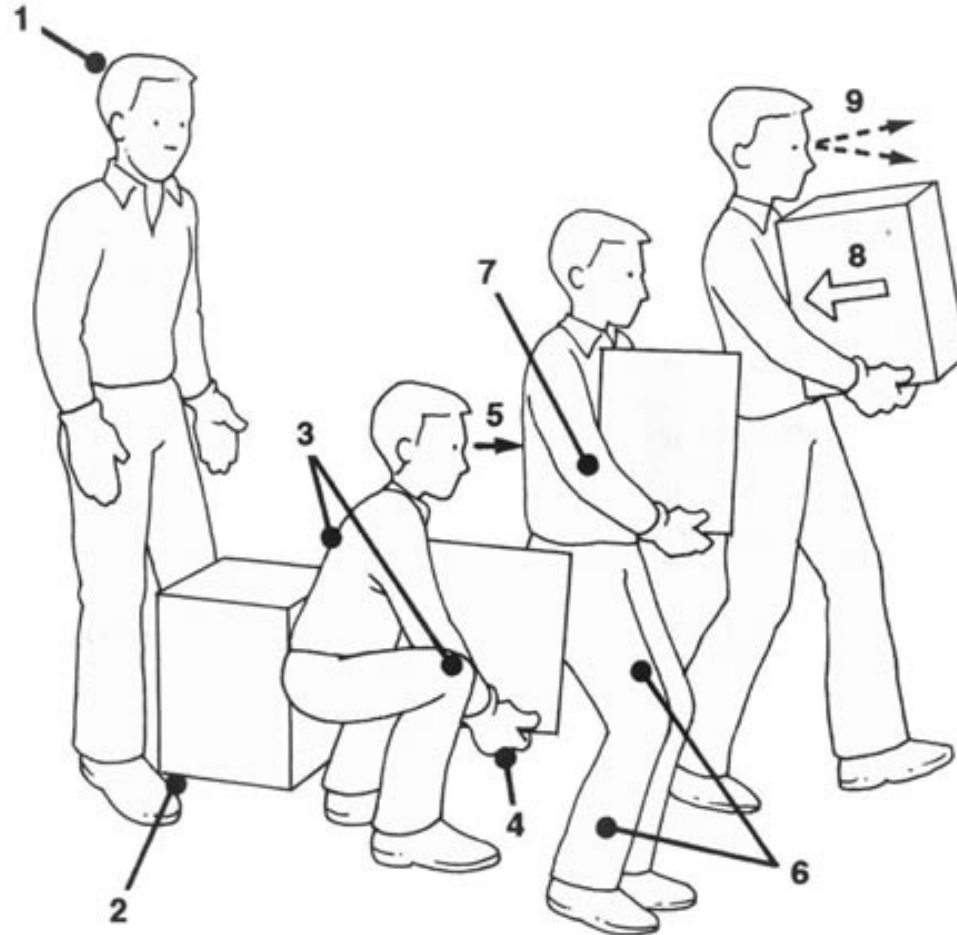
Good Techniques For Lifting:



- Have load so you can get grip



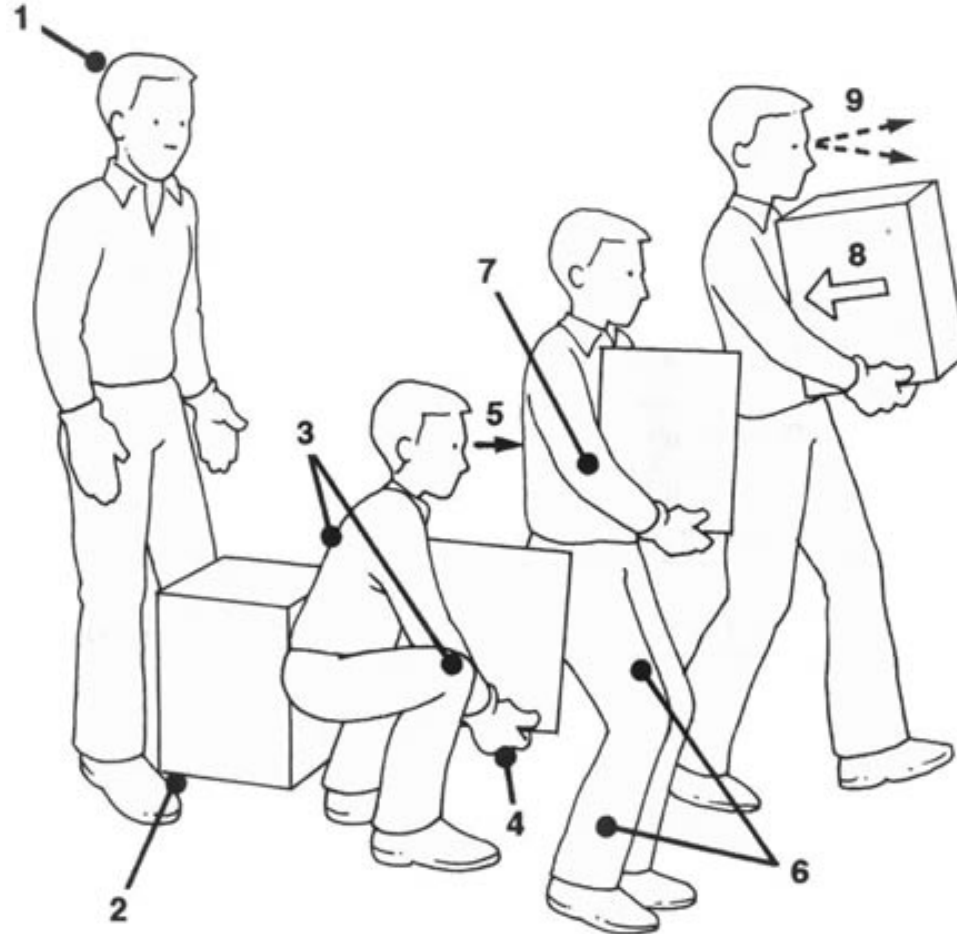
Good Techniques For Lifting:



- Keep back in line and have good grip



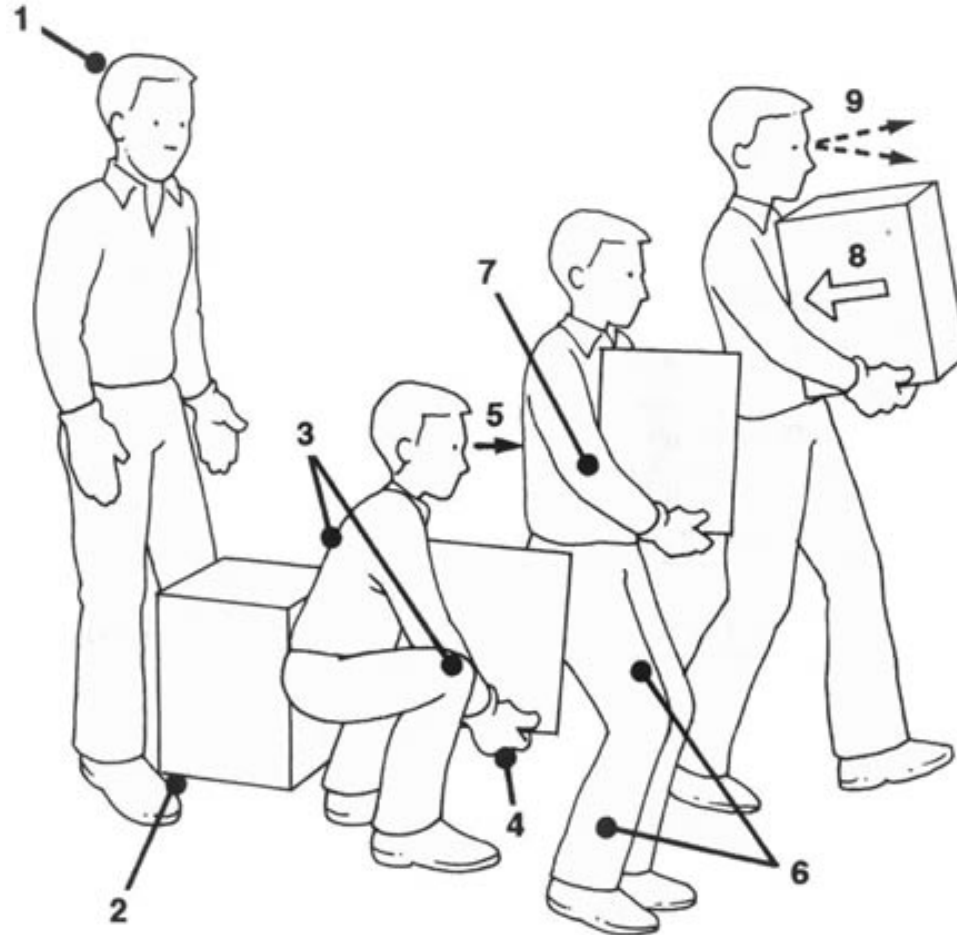
Good Techniques For Lifting:



- Look “up” or forward to keep back in line



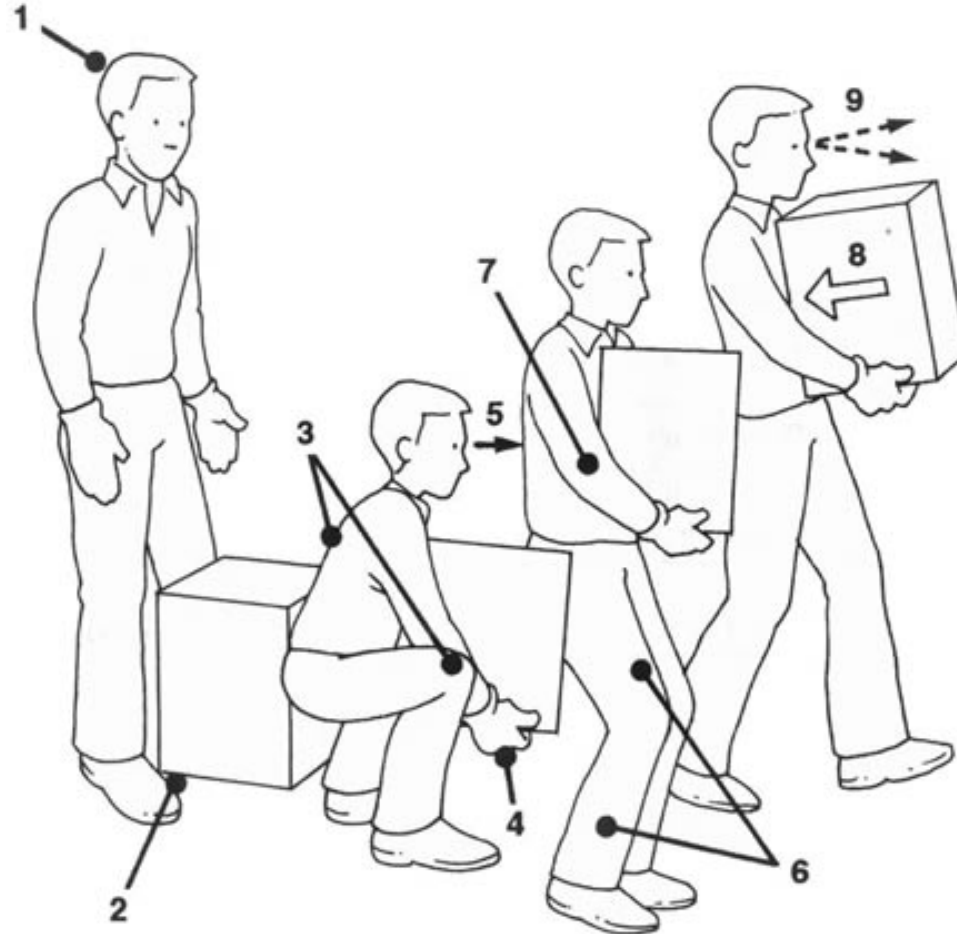
Good Techniques For Lifting:



- Lift with legs & Keep load close



Good Techniques For Lifting:

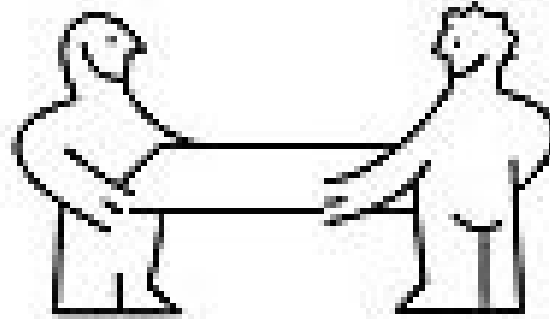
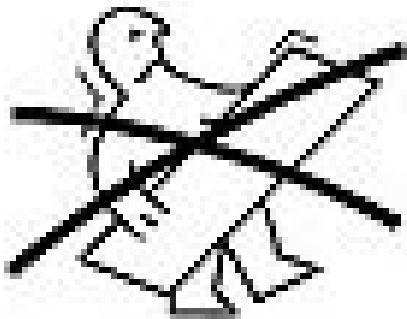


- Stabilize load & Scan ahead



Good Techniques For Lifting:

- Avoid twisting.
- Avoid heavy loads (lighten if possible or break it down).
- Get help with heavy loads.



- Warm up and stretch muscles before lifting



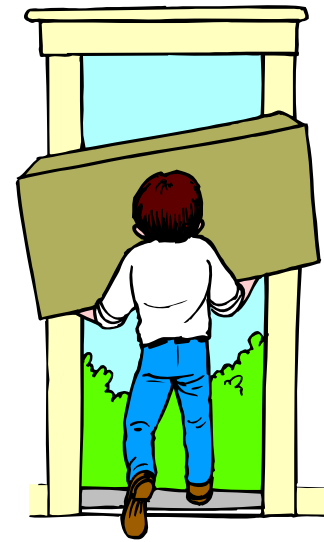
The process of moving materials

- *Reaching* for the load by bending, reaching, or squatting
- *Lifting* the load
- *Transferring* the weight of the load to a carrying position
- *Carrying* the load to the needed location
- *Depositing* the load by
 - lowering it to the ground,
 - throwing it, or
 - handing it to another person



Plan the lift

- How much am I lifting?
- Where is it going?
- What is in the way?
- What is the surface like between me and my destination



Ideas for proper carrying:



If there is a mechanical device like a hand truck or pallet jack... **use it!** (the more you carry something, the greater the chance that you can be **injured**)

If there are no mechanical devices...

Keep the load as close to the body as possible.

Better to take more loads of less weight than try to take it all at once.



Ideas for reducing reaching

Remove obstacles



This bin has fold down door so the worker can get the product with less bending

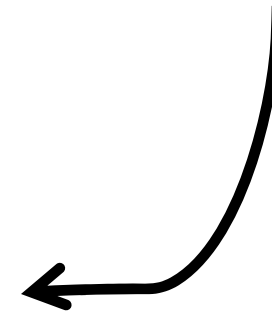


Ideas for reducing reaching

Slide closer

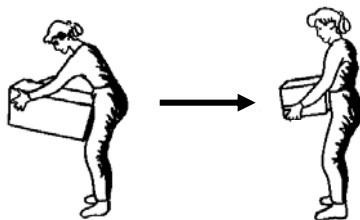
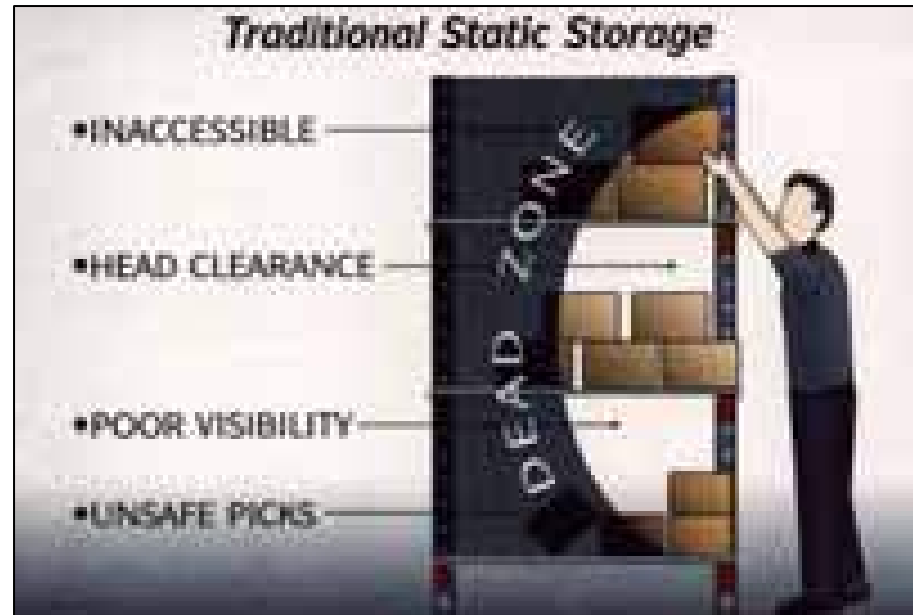


An adjustable height pallet jack with a turntable would allow this worker to turn and raise the load to get the product, instead of reaching.



Ideas for reducing reaching

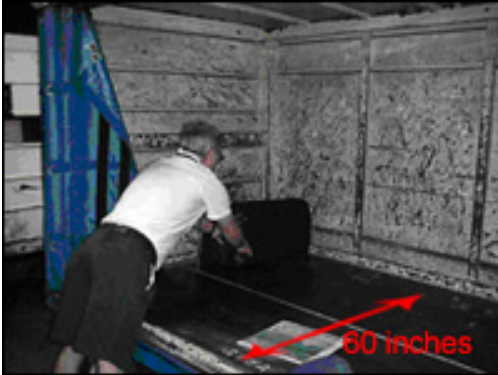
Reduce shelf depth and try to store products between knee and shoulder height



Reduce package size



Ideas for reducing reaching



Slide objects closer

The person in the bottom picture is using a stick with a hook, to pull products closer for access



Reducing reach



Reduce Shelf Depth



Install Gravity Feed Racks



Ideas for reducing lifting hazards



- Use mechanical assistance



- Use a mobile ladder



Ideas for reducing lifting hazards



This is a mobile scissors lift. Products can be removed from pallets or shelves and transported with no lifting.



This is a mobile, height adjustable (electric motor) platform, for transporting products.



Good Ideas for Pushing/Pulling:

If you have the option, push rather than pull.

The handles on the carts to the right have been modified so persons of different heights can push them with their hands at the appropriate height



Reduce bending



Add handles



The manufacturer of this product included cutout handles in the box, so the handler could lift it from a higher level. Also, storing them on one or more pallets raises the level of the handles even more.



Reduce lifting, by sliding



Arrange storage

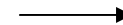
This person has placed a cart just below the level of the shelf, so she can just slide the box onto the cart deck rather than lift it.



Reduce lifting, by sliding



Heavy Battery



Reduce Lifting: Georgia Buggy



NIOSH Lifting Formula

- $RWL = LC \times HM \times VM \times DM \times AM \times FM \times CM$
- Washington State Dept. of Labor & Industries
- Ohio Lifting Guidelines



Calculator for analyzing lifting operations

Company

Evaluator

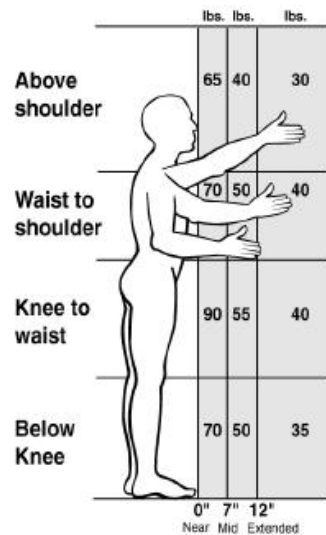
Job

Date

1 Enter the weight of the object lifted.

Weight Lifted
lbs.

2 Circle the number on a rectangle below that corresponds to the position of the person's hands when they begin to lift or lower the objects.



3 Circle the number that corresponds to the times the person lifts per minute and the total number of hours per day spent lifting.

Note: For lifting done less than once every five minutes, use 1.0

How many lifts per minute?	How many hours per day?		
	1 hr or less	1 hr to 2 hrs	2 hrs or more
1 lift every 2-5 min	1.0	0.95	0.85
1 lift every min	0.95	0.9	0.75
2-3 lifts every min	0.9	0.85	0.65
4-5 lifts every min	0.85	0.7	0.45
6-7 lifts every min	0.75	0.5	0.25
8-9 lifts every min	0.6	0.35	0.15
10+ lifts every min	0.3	0.2	0.0

4 Circle 0.85 if the person twists more than 45 degrees while lifting. 0.85

Otherwise circle 1.0

5 Copy below the numbers you have circled in steps 2, 3, and 4.

lbs.	X	Step 2	X	Step 3	X	Step 4	=	Lifting Limit
_____		_____		_____		_____		_____ lbs.

6 Is the Weight Lifted (1) Yes – OK
less than the Lifting Limit (5) No – HAZARD



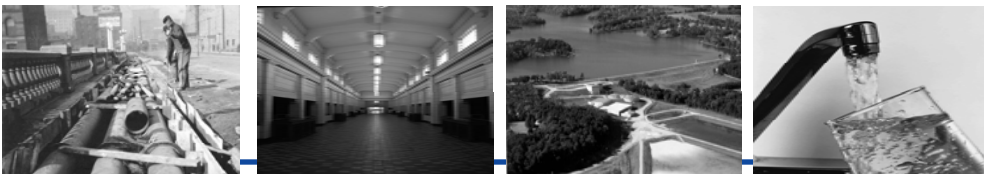
Note: If the job involves lifts of objects with a number of different weights and/or from a number of different locations, use Steps 1 through 5 above to:

1. Analyze the 2 worst case lifts—the heaviest object lifted and the lift done in the most awkward posture.
2. Analyze the most commonly performed lift. In Step 3, use the frequency and duration for all the lifting done in a typical workday.



Temperature Affects Overexertion

- Risks:
- Dehydration
- Cramps
- Heat Exhaustion
- Heat Stroke



Temperature Affects Overexertion

**Permissible Heat Exposure Threshold Limit Values
(Values are given in degrees Centigrade WBGT (Fahrenheit))**

Work- Rest Regimen	Work Load		
	Light	Moderate	Heavy
Continuous work	30.0 (86.0)	26.7 (80.1)	25.0 (77.0)
75% Work, 25% Rest/Hour	30.6 (87.1)	28.0 (82.4)	25.9 (78.6)
50% Work, 50% Rest/Hour	31.4 (88.5)	29.4 (85.0)	27.9 (82.2)
25% Work, 75% Rest/Hour	32.2 (90.0)	31.1 (88.0)	30.0 (86.0)



Workload & Heart rate

Work Load

Heart rate

bpm

Resting

60-70

Low

75-100

Moderate

100-125

High

125-150

Very High

150-175



Fatigue Effect on Overexertion

- Fatigue is often a result of exertion
- Fatigue may contribute to Over Exertion



Stress Effect on Overexertion

- Stress can be a result of exertion
- Stress may contribute to Overexertion



For More Information

- <http://www.ini.wa.gov/safety/>
- www.nsc.org



