

PREVENTION OF STRAINS, SPRAINS, AND MATERIAL HANDLING INJURIES IN CONSTRUCTION

**INSERT SPEAKER NAME, TITLE, AND
ORGANIZATION INFORMATION**

*Through the OSHA Alliance Program, this presentation was developed by members of the Alliance Program Construction Roundtable for informational purposes only. It does not necessarily reflect the official views of OSHA or the U.S. Department of Labor. (June 2010)



Overview

- OSHA Alliance Program and Construction Roundtable
- U.S. Construction Injury Statistics
- Planning the Work
- Safe Practices
 - Working at Ground Level
 - Working Overhead
 - Lifting
 - Tools
- Resources

The Alliance Program

OSHA's Alliances:

- Established by OSHA's National, Regional, Area Offices
- Formed with a variety of organizations, including associations, unions, consulates, community and faith-based groups, and educational institutions, and government agencies
- Develop and disseminate compliance assistance products
- Educate workers and employers about their rights and responsibilities
- Do not include an enforcement component

OSHA Alliance Program Construction Roundtable

- Purpose
- Participants
- Products

Toolbox Talk: Ladder Safety Choosing the Right Ladder



Always choose the correct ladder for the job or task to be performed.

There are many types of ladders, ranging from simple wooden job-built ladders to specialty ladders used for specific jobs. Ladders may be made of timber, aluminum, or fiberglass. There are three main types of ladders used in the construction industry: 1) extension, 2) step, and 3) multi-purpose.

Keep the following in mind when choosing the right ladder for your job:

- For indoor use, stepladders or multi-purpose ladders are usually recommended. For outdoor work, taller stepladders, multi-purpose, or extension ladders are generally more appropriate.
- Do not use aluminum ladders when working around electricity. Choose a ladder made out of non-conductive material for electrical work, such as when working near overhead power lines.
- Make sure that the ladder is the proper length to do the job safely.
- Choose a ladder that is designed for how you intend to use it. For example, do not use step ladders in a folded and leaned position in place of a straight ladder.
- Choose a ladder that is capable of supporting your weight and the weight of any materials you will be using. See the chart below.

Type	Weight Rating	Duty Rating
1-AA	375 pounds	Super Heavy Duty
1-A	300 pounds	Extra Heavy Duty
1	250 pounds	Heavy Duty Industrial
2	225 pounds	Medium Duty Commercial
3	200 pounds	Light Duty Household



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Picture of Toolbox Talks: Ladder Safety

OSHA Alliance Program Construction Roundtable – Web Page

*Screen Capture of OSHA's Alliance Program
Construction Roundtable Web Page*

U.S. Construction Injury Statistics¹

- 371,700 non-fatal injuries per year (9.7% of total private industry workforce)
- Sprains and strains 32.8%
- Back 23.5%
- Upper Extremities 23.5%
- Lower Extremities 25.4%
- Overexertion 17.4%
- 28% of workers missed 31 days or more

¹ Bureau of Labor Statistics-2007

Reducing Sprains, Strains, and Material Handling Injuries Requires Planning



Plan the Work

- Instruct workers to notify their supervisor if they feel a task is beyond their capability or if they feel pain while performing a task
- Have workers start with stretching, gently moving through a range of motions
- Do a Job Hazard Analysis to identify hazardous tasks.

Job Hazard Analysis

A job hazard analysis is a technique that breaks each job down into individual tasks to identify the hazards.

It focuses on the relationship between the worker, the task, the tools, and the work environment.

Job Hazard Analysis Example: Drywalling

<u>Task</u>	<u>Hazard</u>	<u>Protection/Prevention</u>
Carrying sheets of drywall	Back strain	Have materials delivered to levels by supplier Anyone working alone will use a panel lifter
Attaching drywall	Injuries to lower back	Use scaffolding Use drill extension

Planning - Material Handling

- Are there heavy materials that will be handled on site?
- Do workers lift more than 50 pounds without help?
- Are there handles to help carry materials?
- Are the carts or dollies available?
- Do any of the job task require lifting overhead or working on items above shoulder height?
- Where will the materials be staged?

Planning - Tools

- Are tools sharp and in good condition?
- Which tools vibrate?
- Do all tools have proper handles?
- Which tools require bending of the wrist?

Planning - Repetitive Work

Which tasks use the same motion over and over for more than 1 hour each day?

Planning - Awkward Positions

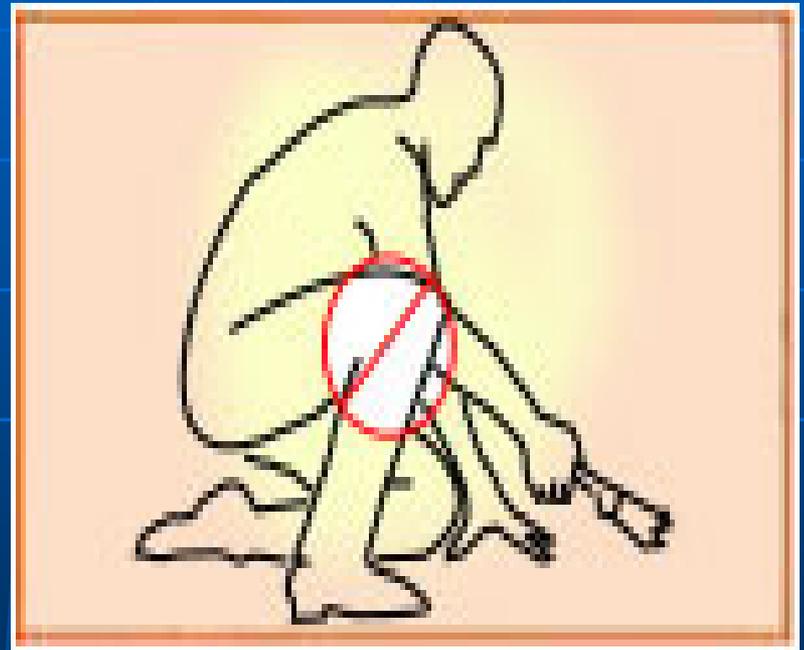
- Which jobs require work above shoulder level?
- Which jobs require work at floor level?
- Which jobs require workers to stay in one position for a long time?
- Which jobs require a lot of bending and twisting?

Planning - Walking and Working Surfaces

- Are working and walking surfaces clean and dry?
- Are working and walking surfaces unobstructed?
- Are working and walking surfaces even?
- Are aisles clear and wide enough for carts, dollies, forklifts to pass through?

Working at Ground Level

- Prolonged or repeated work activities in the crouching/kneeling position causes reduced blood flow to the lower extremities and contact pressure injuries to the part of the knee coming into contact with hard surfaces.
- Bending, stooping, kneeling, or squatting can stress your lower back or knees.



Working at Ground Level - Motorized Concrete Screeds

Screed concrete standing up instead of bending over



Working at Ground Level - Change Positions

Change positions when working at ground level and use knee pads



Working at Ground Level - Stand-up Screw Guns

Fasten sub-floor standing up instead of stooping over



Working at Ground Level - Tie Rebar Standing Up

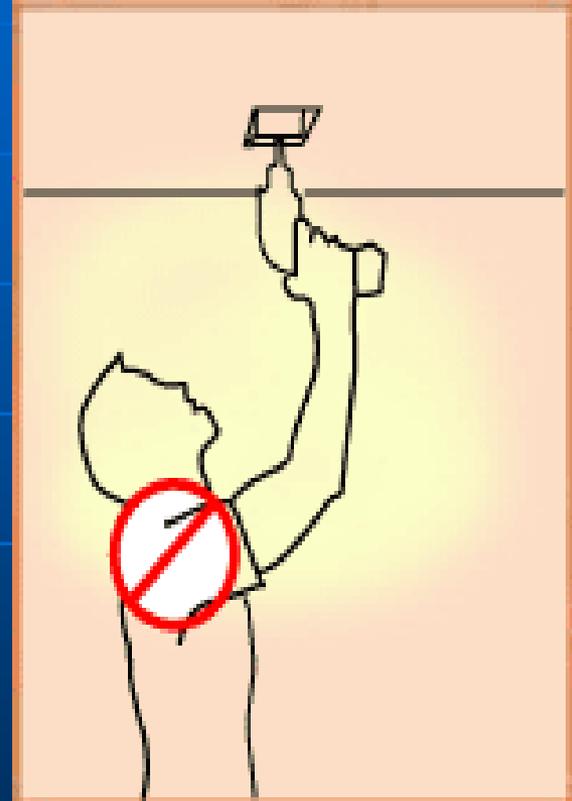
Tie rebar standing up
instead of stooping over



Working Overhead

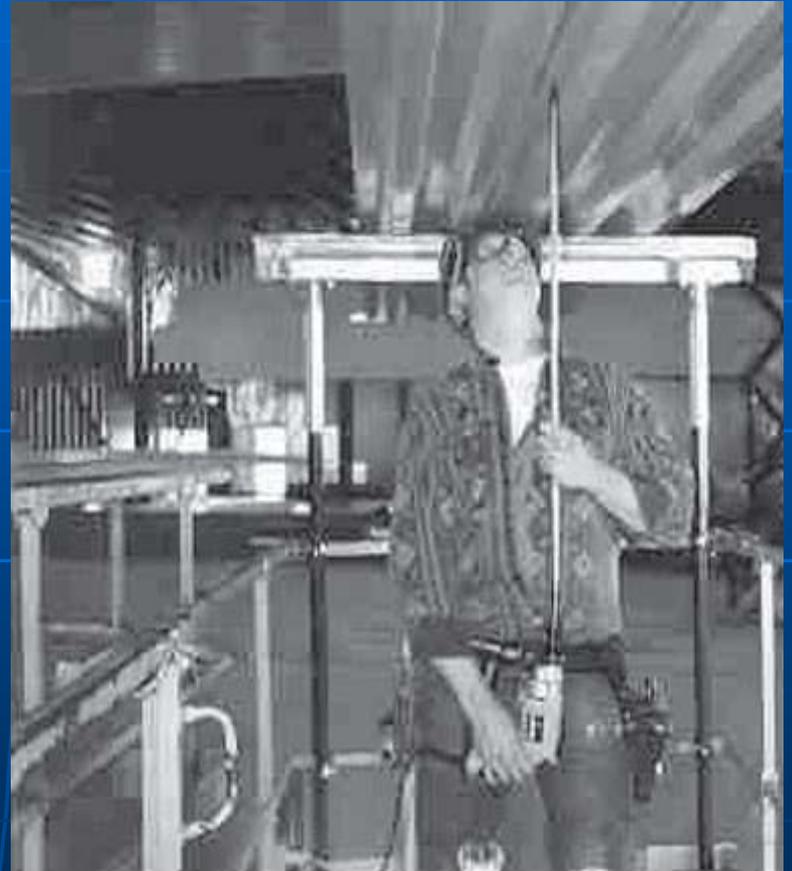
Working with the elbow above shoulder height for prolonged periods can trap nerves and blood vessels under bone and muscle

Repeatedly lifting or applying force with arms above shoulder level can strain the muscles and tendons of the shoulder and neck



Overhead Work - Extension Shafts for Drills

Using a shaft extension
on a hand drill eliminates
need to reach



Overhead Work - Pneumatic Drywall Finishing

Finish drywall standing up,
less wrist and arm
movement



Principles of Manual Lifting

- Keep load close to your body
- Keep load in front of you
- Lift with your legs



Manual Lifting - Power Zone

The power zone for lifting is close to the body, between mid-thigh and mid-chest height.



Lifting, Holding, and Handling Materials - Deliver Grout Mechanically



Deliver grout mechanically instead of with buckets or wheelbarrows

Lifting, Holding, and Handling Materials - Use Mechanical Equipment for Digging

Use a trencher or backhoe for digging trenches



Lifting, Holding, and Handling Materials - Use Mechanized Equipment to Stage Materials

Use a lull or aerial lift to stage materials at high levels or onto the bed of trucks



Lifting, Holding, and Handling Materials - Lift from Power Zone

- Lift from power zone, mid thigh to mid chest
- Use two or more people to lift heavy objects
- Use mechanical equipment to lift and move materials
- Grasping devices can be helpful when lifting



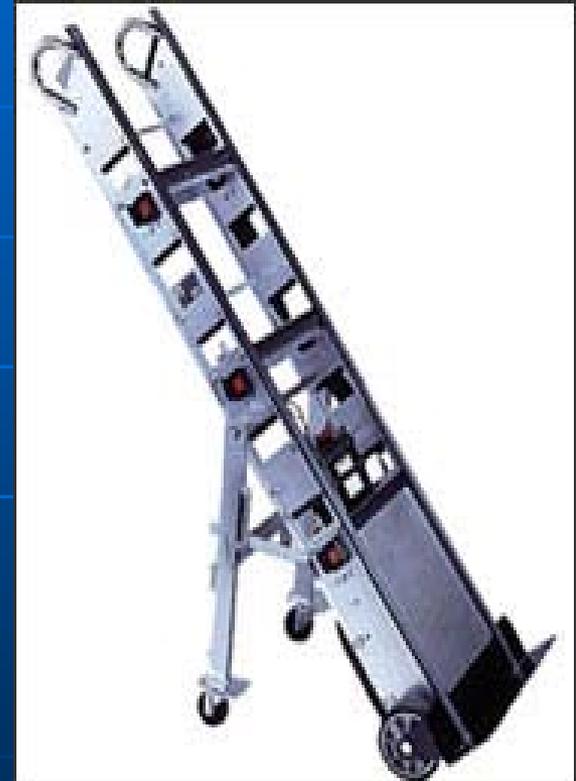
Lifting, Holding, and Handling Materials - Use Dollies or Carts

Use a plank cart to transport planks rather than carrying by hand



Lifting, Holding, and Handling Materials - Use Manual Hand Trucks

Manual hand trucks can be used to move materials over long distances. Stair climbing hand trucks can be used to move materials up and down stairs.



Lifting, Holding, and Handling Materials - Use Wall Jack

Small crews can benefit from the use of wall jacks when lifting partitions into place



Lifting, Holding, and Handling Materials - Use Motorized Lift for Plywood, Lumber, and Masonry

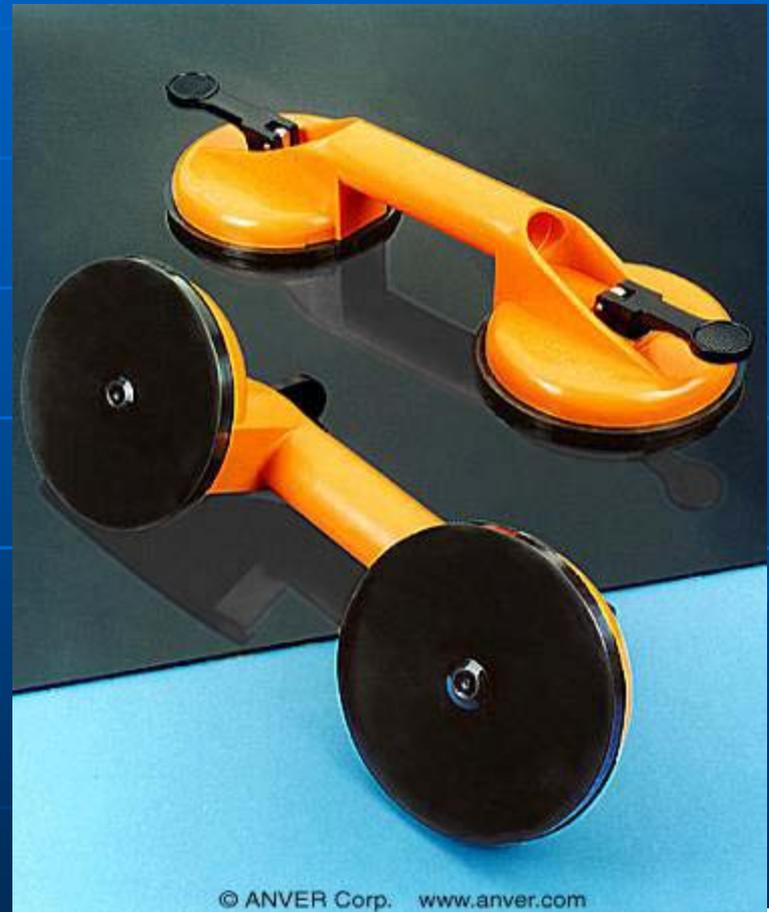
Motorized Lift Reduces Material Handling and Stress on Back



Lifting, Holding, and Handling Materials - Use Vacuum Handles or Vacuum Lifters

Use vacuum handles to pick up sheets of material

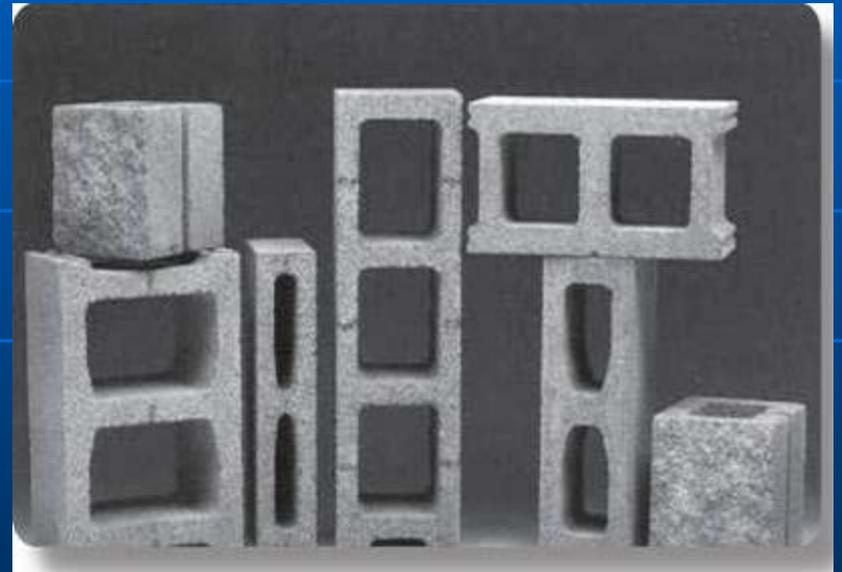
Eliminates handling sharp edges and bending or stretching across large sheets.



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Lifting, Holding, and Handling Materials - Specify Lightweight Concrete Block

Designer can specify
lightweight concrete block
whenever structurally
feasible



Hands and Wrist

Performing hand-intensive tasks with a bent wrist, either up and down or side to side, creates considerable stress on the tendons and their sheaths as they are bent across the harder bones and ligaments that make up the outside structure of the wrist.



Tools - Properly Designed Tools

Reduce stress to fingers,
hand, and forearm



Tools - Power Caulking Guns

Reduce stress to fingers,
hand, and forearm



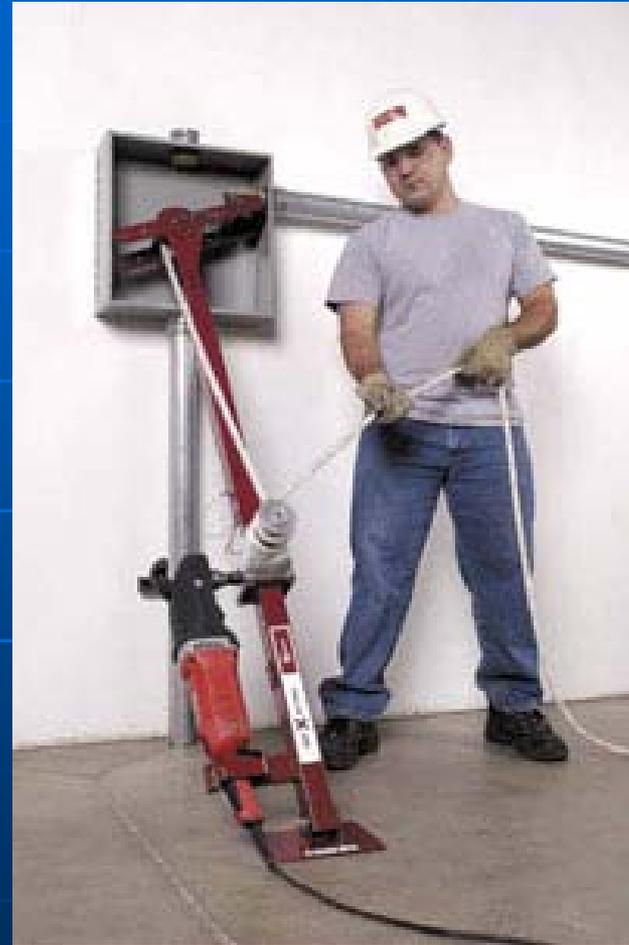
Tools - Battery Operated Cable Cutters

Powered cable cutters reduce the strain from using hand powered cutting tools



Tools - Mechanical Wire Pullers

Reduces the strain that would occur from pulling wire manually.



Tools - Low Vibration Tools

High Vibration Tools Can
Damage Blood Vessels
and Nerves in hand



Additional Resources

- Choosing Safer Hand Tools in Construction
<http://www.lhsfna.org/files/handtools1.pdf>
- OSHA Ergonomics Page
<http://www.osha.gov/SLTC/ergonomics/index.html>
- Construction Ideas-Reducing Soft Tissue Injuries
http://www.worksafebc.com/publications/health_and_safety/bulletins/constructive_ideas/default.asp
- Ergonomic Survival Guide for Carpenters and Framers
http://www.dir.ca.gov/dosh/dosh_publications/erg_CarpFramer.html
- Ergonomic Survival Guide for Electricians
http://www.dir.ca.gov/dosh/dosh_publications/ElectriciansErgo.pdf
- Ergonomic survival Guide for Laborers
http://www.dir.ca.gov/dosh/dosh_publications/Erg_Laborer.pdf

Additional Resources

- Simple Solutions: Ergonomics for Construction Workers
<http://www.cdc.gov/niosh/docs/2007-122/>
- OSHA Ergonomics etool for Electricians
<http://www.osha.gov/SLTC/etools/electricalcontractors>
- www.lhsfna.org/ergonomicsandconstruction
- Job Hazard Analysis, OSHA 3071