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

Picture of Toolbox Talks: Ladder Safety
OSHA established the Alliance Program Construction Roundtable to bring Construction-related Alliance Program participants together to discuss and share information on workplace safety and health. Through the Alliance Program Construction Roundtable, participants develop and share construction-related compliance assistance tools and other resources for workers and employers.

Construction Roundtable Representatives (as of November 9, 2009 meeting)

- American Fire Sprinkler Association
- American Industrial Hygiene Association
- American Pipeline Contractors Association
- American Society of Safety Engineers (ASSE)
U.S. Construction Injury Statistics

- 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

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.
<table>
<thead>
<tr>
<th>Task</th>
<th>Hazard</th>
<th>Protection/Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrying sheets of</td>
<td>Back strain</td>
<td>Have materials delivered to levels by supplier</td>
</tr>
<tr>
<td>drywall</td>
<td></td>
<td>Anyone working alone will use a panel lifter</td>
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<tr>
<td>Attaching drywall</td>
<td>Injuries to lower back</td>
<td>Use scaffolding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use drill extension</td>
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</table>
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 tasks 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.
Lifting, Holding, and Handling Materials - Specify Lightweight Concrete Block

Designer can specify lightweight concrete block whenever structurally feasible.
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

- OSHA Ergonomics Page

- Construction Ideas-Reducing Soft Tissue Injuries

- 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