

## Preventing Injuries from Installing Drywall

### Summary

Workers who handle drywall sheets are at high risk of overexertion and fall injuries. NIOSH research has led to recommendations for preventing these injuries.

### Description of Exposure

NIOSH research [Chiou et al. 2000] found that the two main causes of injuries to drywall installers and carpenters are overexertion (37%) and falls (32%). These injuries frequently occur while workers are installing drywall sheets [WDLI 2002]. A NIOSH survey of drywall installers and carpenters found that workers believed their biggest risk of physical stress was from lifting, carrying, or holding drywall [Pan et al. 1999]. The State of Washington [WDLI 2002] also found that overexertion hazards were a major source of injury to drywall installers. Overexertion hazards were responsible for the greatest proportion of costs for medical care, impairment, and pay-loss days in Washington State [Lipscomb et al. 2000]. Installing drywall can cause overexertion injuries,

usually to the back, because drywall sheets are heavy and bulky. Injuries include strains, sprains, or tears and can range from minor to severe.

Workers should be aware that drywall sheets vary by thickness and weight: some sheets weigh less than 55 pounds, and others weigh more than 120 pounds. NIOSH has studied the relationship between lifting heavy objects and subsequent back pain. The NIOSH Lifting Equation [1994] (which is a formula for judging the risk of lifting heavy objects by the likelihood of subsequent back pain) suggests that lifting heavy objects such as drywall poses a high risk of back pain.

Falls are an additional major cause of injury during drywall installation [Lipscomb et al. 2000]. Fall-related injuries for drywall installers and carpenters can be caused by losing balance as a result of lifting, carrying, or holding heavy and bulky drywall sheets, or by other events, such as falls to a lower level from stairs. Poor lighting and a wet or slippery work floor, along with obstruction of peripheral vision due to

handling oversized drywall sheets, can also place drywall installers and carpenters at risk of slip and fall incidents [Pan and Chiou 1999b].

In addition, many workers do not have enough hand grip strength to install drywall without risk of overexertion injury [Pan and Chiou 1999a]. Cold and wet conditions can make it more difficult. Even if a worker has good hand and body strength and uses good installation techniques, continued installation by hand can lead to significant overexertion injuries and loss of balance [Pan et al. 2003].

### Case Studies

The following are three case reports of injuries to workers who were installing drywall at construction sites.

#### Case 1

A drywall carpenter lifted a 12-foot long, 120-pound drywall sheet. As he stepped up to his drywall bench, he slipped and fell forward, twisting and straining his knee, which swelled badly after work [Lipscomb 2004].

## Case 2

A drywall carpenter developed tendonitis from lifting and carrying drywall sheets up the stairs. He had hung drywall earlier in the day and had lifted and carried twelve 10-foot sections of drywall up 20 steps when he began to feel pain in his elbow [Lipscomb 2004].

## Case 3

A drywall carpenter dislocated his shoulder after lifting and hanging multiple 16-foot-long, 125-pound drywall sheets on a ceiling. He and a partner lifted and carried each sheet from a pile, climbed onto their work platform, then lifted the sheet to the ceiling. The injury occurred while securing the eighth sheet of the day [Lipscomb 2004].

## Controls

NIOSH recommends the following to reduce injuries to drywall installers and carpenters from overexertion and falls.

### Pre-job preparation and set-up

- Know the weight of the drywall sheet before starting the job and plan accordingly. For example, a 3/8-inch-thick, 4-×8-foot sheet could weigh 55 pounds; a similarly sized 5/8-inch-thick sheet could weigh 70 pounds.
- Have forklifts, hand trucks, carts, or dollies available to move drywall to work locations.
- Minimize the need to move the drywall sheets. For example, have them delivered to the place where they will be installed—not to a common area for building supplies.
- Make sure that stored materials do not create any safety hazards such as tripping.
- Use work practices that reduce the need for workers to install drywall by hand. For example, have a drywall lift or drywall jacks available at worksites when working alone, installing larger or heavier sheets, or installing ceilings.

### During the job

- Make sure that workers are familiar with and use good lifting and installation techniques such as those listed here.
- Use PVC-dot grip gloves to reduce the grip force needed to lift, carry, and hold drywall sheets (Figure 1).

- Bend the knees instead of the back when lifting, holding, and carrying drywall. Figure 2 shows proper horizontal installation sequences for residential buildings.
- For vertical hanging in commercial buildings, raise the sheet, shift grip to opposite sides of the sheet, then rotate the sheet into a vertical position and secure to the wall.
- Use two workers to lift larger, thicker, and heavier sheets.
- Lift only one sheet at a time.
- Rotate hanging tasks and other installation tasks (making cutouts, taping, installing trim) and schedule frequent rest breaks to reduce overexertion hazards.
- Use a drywall lift or drywall jacks to place and hold a sheet for ceiling installation or to place heavier sheets.
- Use forklifts, hand trucks, carts, or dollies to move drywall to convenient work locations. Use dollies to move sheets through narrow openings.

## Acknowledgments

The principal contributors to this publication were Christopher Pan, Sharon Chiou, and Paul Keane, Division of Safety Research, National Institute for Occupational Safety and Health (NIOSH). NIOSH also acknowledges the Center to Protect Workers' Rights and the Carpenters Joint Apprenticeship Committee of Philadelphia and Vicinity (who conducted focus groups to support their review of this document), W.B.C. Construction company, Duke University, Associated General Contractors of America, and the Gypsum Association.



**Figure 1.** PVC-dot grip style gloves for use with drywall.



**Figure 2.** Proper horizontal installation sequence: (1) Raise edge of sheet, (2) grip with both hands, (3) hold in place with one hand and shift grip to bottom, (4) shift both hands to bottom, and (5) lift into position.

## References

Chiou S, Pan CS, Keane P [2000]. Traumatic injuries among drywall installers, 1992 to 1995. *J Occup Environ Med* 42(11):1101–1108.

Lipscomb HJ, Dement JM, Gaal JS, Cameron W, McDougall V [2000]. Work-related injuries in drywall installation. *Appl Occup Environ Hyg* 15(10):794–802.

Lipscomb H [2004]. Unpublished surveillance data. Duke University, St. Louis Injury Prevention Project (SLIPP), 1999–2002.

Pan CS, Chiou S [1999a]. Analysis of biomechanical stresses during drywall lifting. *Int J Ind Ergonomics* 23:505–511.

Pan CS, Chiou S [1999b]. Slip and fall: fall protection in construction safety. In: Mital A, Ayoub M, Kumar S, Wang MJ, eds. *Industrial and Occupational Ergonomics: Users Encyclopedia (CD ROM)*.

Pan CS, Chiou S, Hendricks S [2003]. The effect of drywall lifting method on workers' balance. *Occup Ergonomics* 4(3):235–249.

Pan CS, Chiou S, Hsiao H, Wassell J [1999]. Assessment of perceived traumatic injury hazards during drywall hanging. *Int J Ind Ergonomics* 25(1):29–37.

NIOSH [1994]. *Applications manual for the revised NIOSH lifting equation*. Cincinnati, OH: U.S. Department of

Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 94-110.

WDLI [2002]. Ergonomics demonstration project: wallboard. Olympia, Washington: Washington State Department of Labor and Industries [[www.lni.wa.gov/wi-sha/ergo/demofnl/wallboard\\_fnl.PDF](http://www.lni.wa.gov/wi-sha/ergo/demofnl/wallboard_fnl.PDF)].

## For More Information

To receive more information about occupational safety and health topics, contact NIOSH at

NIOSH Publications  
4676 Columbia Parkway  
Cincinnati, OH 45226-1998

Telephone: 1-800-35-**NIOSH** (1-800-356-4674)  
Fax: 513-533-8573 ■ E-mail: [pubstaft@cdc.gov](mailto:pubstaft@cdc.gov)

or visit the NIOSH Web site at [www.cdc.gov/niosh](http://www.cdc.gov/niosh)

For a monthly update on news at NIOSH, subscribe to NIOSH eNews by visiting [www.cdc.gov/niosh/eNews](http://www.cdc.gov/niosh/eNews).

### **Preventing Injuries from Installing Drywall**

• This document is in the public domain and may be  
• freely copied or reprinted. NIOSH encourages all  
• readers of the *Workplace Solutions* to make them  
• available to all interested employers and workers.

• As part of the Centers for Disease Control and Preven-  
• tion, NIOSH is the Federal agency responsible for con-  
• ducting research and making recommendations to pre-  
• vent work-related illnesses and injuries. All *Workplace  
• Solutions* are based on research studies that show how  
• worker exposures to hazardous agents or activities can  
• be significantly reduced.

■ **DHHS (NIOSH) Publication No. 2006-147**

**DEPARTMENT OF HEALTH AND HUMAN SERVICES**  
**Centers for Disease Control and Prevention**  
**National Institute for Occupational Safety and Health**

