Exposure Risks for Work-Related Musculoskeletal Disorders and Other Illnesses in Construction

Work-related *musculoskeletal disorders* (WMSDs; *see* MSDs in Glossary) are very common in the construction industry (*see* pages 47 and 48). They are injuries of the muscles, tendons, joints, and nerves that are caused or aggravated by work. Examples of WMSDs are joint sprains, muscle strains such as back or neck strain, inflamed tendons (called "tendonitis") such as tennis elbow or rotator cuff syndrome, carpal tunnel syndrome, and herniated discs of the neck or lower back. Work-related back injuries and illnesses are often caused by repeated exposures to activities such as lifting and carrying materials, sudden movements, whole body vibration (WBV), bending or twisting, repetitive and forceful hand activity, and working in a cramped space for long periods of time.¹⁻³

Based on O*NET exposure scores (*see* page 33), many construction occupations require bending or twisting of the body and repetitive motions. For example, brickmasons use bending, twisting, and other repetitive motions during most of their work, followed closely by drywall installers and insulation workers (chart 34a). Many construction jobs also involve kneeling, crouching, stooping, and crawling, which can lead to WMSDs as well. Carpet and tile installers and roofers spend more than half of their work time in these positions (chart 34b). Overall, it is estimated that more than 40% of workers in construction production occupations need to kneel, crouch, stoop, or crawl for at least half of their work time.⁴

In addition, nearly 62% of workers in construction production occupations are required to work in cramped spaces or awkward positions at least once a month.⁴ Heating and air conditioning mechanics, insulation workers, and elevator installers have to work in such spaces or positions once a week or more (chart 34c). Also, some construction jobs entail exposure to WBV, such as operating engineers who may be exposed almost every day (chart 34d). Cumulative long-term exposure to WBV may contribute to injuries and disorders of the lower back, as well as disorders of the gastrointestinal system and urogenital system, especially among women.⁵

Most construction workers need to use their hands to handle, control, and feel objects, tools, and controls at work. Almost 75% of workers in construction production occupations may be involved in such activities in more than half of their work time (chart 34e). Brickmasons, drywall installers, and insulation workers typically spend more time than any other occupations in these activities. Such exposure can cause hand injuries, as well as increase the risk of skin conditions like dermatitis when hands are exposed to various types of chemicals or construction materials.⁶

Construction jobs often require regular outdoor work. Outdoor workers exposed to sunlight have an increased risk of skin cancer and other types of cancer (e.g., lip, stomach, leukemia, and lymphoma).⁷ In addition, nearly all production occupations in construction require working in very hot or very cold temperatures at least once a month, with almost half (44%) exposed weekly (chart 34f). Roofers, power-line installers, and ironworkers are exposed to extreme temperatures more frequently than other construction occupations. High temperatures are a serious hazard for construction workers and can lead to decreased job performance and increased risk of injury, as well as heat stroke.⁸

^{1.} Nordander C, Ohlsson K, Akesson I, Arvidsson I, Balogh I, Hansson GA, Strömberg U, Rittner R, & Skerfving S. 2009. Risk of musculoskeletal disorders among females and males in repetitive/constrained work. *Ergonomics*, 52(10):1226-1239.

^{2.} Panel on Musculoskeletal Disorders and the Workplace, Commission on Behavioral and Social Sciences and Education, National Research Council and Institute of Medicine. 2001. Musculoskeletal Disorders and the Workplace: Low Back and Upper Extremities. Washington, DC: National Academy Press.

^{3.} Podniece Z. 2008. A European Campaign on Musculoskeletal Disorders. Work-Related Musculoskeletal Disorders: Prevention Report. Luxembourg: European Agency for Safety and Health at Work, Office for Official Publications of the European Communities.

^{4.} Exposure percentages were estimated by CPWR Data Center using O*NET exposure scores for detailed occupations combined with data from the U.S. Bureau of Labor Statistics. 2010-2020 Employment Projections. (Table 1.9. 2010-20 Industry-occupation matrix data, by industry). <u>ftp://ftp.bls.gov/pub/special.requests/ep/ind-occ.matrix/ind_xls/ind_230000.xls</u> (Accessed June 2012).

^{5.} Kittusamy NK & Buchholz B. 2004. Whole-body vibration and postural stress among operators of construction equipment: A literature review. Journal of Safety Research, 35(3):255-261.

^{6.} Centers for Disease Control and Prevention. 2012. Workplace Safety & Health Topics: Skin Exposures & Effects. http://www.cdc.gov/niosh/topics/skin/#contact (Accessed June 2012).

^{7.} The Skin Cancer Foundation. 2011. The Sun: A Construction Site Hazard for Outdoor Workers. http://www.skincancer.org/prevention/are-you-at-risk/the-sun-construction-site-hazard (Accessed June 2012).

^{8.} Occupational Safety and Health Administration. Occupational Heat Exposure. http://www.osha.gov/SLTC/heatstress/index.html (Accessed June 2012).





34c. Cramped work space/awkward positions at work, selected occupations



34e. Percentage of construction workers using hands to handle, control, or feel objects, tools, or controls, by exposure level (Production workers)



93 Exposure score



34b. Kneeling, crouching, stooping, or crawling at work,

34d. Exposure to whole body vibration at work, selected occupations



34f. Percentage of construction workers exposed to very hot or very cold temperatures, by exposure level (Production workers)

Note: Charts 34a and 34b - Exposure scores: 0 = Never; 25 = Less than half the time; 50 = About half the time; 75 = More than half the time; and 100 = Continually or almost continually.

Charts $34\dot{a}$ and 34d - Exposure scores: 0 = Never; 25 = Once a year or more but not every month; 50 = Once a month or more but not every week; 75 = Once a week or more but not every day; and 100 = Every day.

Source: Charts 34a-34d - O*NET OnLine. 2010. Work Context: Physical Work Conditions. http://www.onetonline.org/find/descriptor/browse/Work_Context/4.C.2/ (Accessed May 2012). Charts 34e and 34f - O*NET OnLine. 2010. Work Context: Physical Work Conditions. http://www.onetonline.org/find/descriptor/browse/Work_Context/4.C.2/ (Accessed May 2012) and U.S. Bureau of Labor Statistics, 2010-2020 Employment Projections. (Table 1.9. 2010-20 Industry-occupation matrix data, by industry), ftp://ftp.bls.gov/pub/special.requests/ep/ind-occ.matrix/ind_xls/ind_230000.xls (Accessed February 2013). Calculations by CPWR Data Center.