

## Putting an intervention for overhead drilling on solid ground

### **Overhead drilling: comparing three bases for aligning a drill jig to vertical**

*David Rempel, Demetra Star, Alan Barr, and Ira Janowitz.  
Journal of Safety Research, June 2010.*

#### **Overview**

Repetitive overhead drilling is necessary to mount ductwork, conduit and piping, but the task can be a source of fatigue and musculoskeletal injury for workers who must wield heavy drills in uncomfortable postures for extended periods. In earlier work, the research team created a jig to support an overhead drill; the jig reduced fatigue but, given increased set-up time and limited mobility, also reduced productivity. In this study the researchers created three new rolling bases designed to increase productivity by making the drilling jig easy to move and to align to vertical. Researchers asked 16 workers to test four options – each of three alternative jig models plus the conventional method of climbing a ladder and using a handheld power drill – and rank them on multiple dimensions of usability, fatigue and ease of use.

#### **Key Findings**

- Workers preferred the drill jig with any of the three rolling base designs to the conventional method.
- By reducing the weight of the drill jig, researchers improved its mobility.
- The “Collar Base” jig was rated best overall by users. In this base, the column supporting the drill was allowed to tilt freely within the collar as workers align it to vertical, then secured in place by turning two butterfly nuts.
- The study demonstrates the value of several rounds of redesign and usability testing at real workplace settings before settling on a final design.

#### **For more information, contact:**

David Rempel: david.rempel@ucsf.edu or Alan Barr:  
alan.barr@ucsf.edu.

#### **See abstract:**

<https://bit.ly/3nG9QcH>

©2014, CPWR – The Center for Construction Research and Training. CPWR, the research and training arm of the Building and Construction Trades Dept., AFL-CIO, is uniquely situated to serve construction workers, contractors, practitioners, and the scientific community. This card was made possible by a cooperative agreement with the National Institute for Occupational Safety and Health, NIOSH (OH009762). The contents are solely the responsibility of the authors and do not necessarily represent the official views of NIOSH.



THE CENTER FOR CONSTRUCTION  
RESEARCH AND TRAINING

[WWW.CPWR.COM](http://WWW.CPWR.COM)