

Measuring When Masonry Lift Teams are Most Effective

The Effect of Lift Teams on Kinematics and Muscle Activity of the Upper Extremity and Trunk in Bricklayers

Dan Anton, Ryan Mizner and Jennifer A. Hess.

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Overview

Physical therapists, chiropractors and other health care providers involved in occupational injury prevention frequently instruct construction workers in proper lifting technique, but no single method is suited to all situations. Lifting-related musculoskeletal disorders (MSDs) are especially prevalent among bricklayers: 75% of bricklayers report symptoms of MSD in the lower back. Researchers measured motion and muscle activity of 18 bricklayers while laying 12-inch concrete blocks alone and in two-person lift teams. The research team measured shoulder and trunk motions using a 3-D motion capture system, and muscle activity in the lower back, shoulder and forearm – sites where bricklayers frequently suffer MSDs – using surface electromyography (EMG).

Key Findings

- The study contributed to the idea that there is no single “proper lifting technique” for reducing the risk of musculoskeletal injury. Regions of the body at risk for musculoskeletal injury during masonry work vary with the height of the work. Furthermore, workers in lift teams engage different muscle groups than those lifting and placing block individually.
- When placing concrete block at floor level, bricklayers working in lift teams can reduce low back exertion, and excessive bending at the waist. They can also reduce muscle activity in the low back and shoulder (trapezius) by using teams when laying block between knee and waist height.
- Lift teams are not recommended above waist height. At work heights around shoulder level, working in lift teams placed greater demands on shoulder and forearm muscles than working alone.
- Lift teams are a work practice control, the least effective type of ergonomic intervention. Engineering controls like mechanical lifting devices, adjustable-height scaffolds, and lightweight materials are better options for reducing exposure to heavy lifting.

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See abstract:

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