Biomechanical Evaluation of Concrete Block Handling Tool

Ashish Nimbarte (West Virginia University), Christopher Moore (West Virginia University), Yun Sun (West Virginia University), Justin Meador (West Virginia University)

The physically demanding nature of the masonry work, expose masons to a number of well-recognized physical risk factors for work-related musculoskeletal disorders. A few interventions are available to reduce masons' exposure to these risk factors. One such intervention is the use of assist tool (Versa-Lok-Lifter) for lifting and lowering the heavy concrete masonry unit (CMU) blocks. Although this tool is claimed to make the lifting and maneuvering of CMU block easier and safer, currently no quantitative data is available evaluating its effectiveness. In this ongoing investigation, 3D kinematics and musculoskeletal loading of major body joints were was evaluated during simulated block lifting and lowering tasks from floor to three different heights (7", 14", and 21") performed with and without the assist tool. So far five individuals participated in this study. Eight camera optical motion analysis system configured with two ground reaction force plates was used for kinematic data collection. With the use of tool, on an average the range of motion of the knee, hip and trunk joints decreased by 46.5%, 41.7%, and 46.4%, respectively. The peak flexion of knee, hip and trunk joints decreased by 51.9%, 39.9%, and 46.4%, respectively and the corresponding moments decreased by 44.8%, 15.9%, and 19.6%, respectively.

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3577 Parkway Lane, Suite 200
Norcross, GA 30092

Phone: (770) 449-0460
Fax: (770) 441-3295

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