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DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Centers for Disease Control and Prevention

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Agency Forms Undergoing Paperwork Reduction Act Review

The Centers for Disease Control and Prevention (CDC) publishes a list of information collection requests under review by the Office of Management and Budget (OMB) in compliance with the Paperwork Reduction Act (44 U.S.C. Chapter 35). To request a copy of these requests, call (404) 639-7570 or send an email to [omb@cdc.gov](mailto:omb@cdc.gov). Send written comments to CDC Desk Officer, Office of Management and Budget, Washington, DC or by fax to (202) 395-5806. Written comments should be received within 30 days of this notice.

**Proposed Project**

Interventions to Reduce Shoulder MSDs in Overhead Assembly - New  
- National Institute for Occupational Safety and Health (NIOSH),  
Centers for Disease Control and Prevention (CDC).

## Background and Brief Description

The mission of the National Institute for Occupational Safety and Health (NIOSH) is to promote safety and health at work for all people through research and prevention. Under Public Law 91-596, sections 20 and 22 (Section 20-22, Occupational Safety and Health Act of 1970), NIOSH has the responsibility to conduct research to advance the health and safety of workers. In this capacity, NIOSH proposes to conduct a study to assess the effectiveness and cost-benefit of occupational safety and health (OSH) interventions to prevent musculoskeletal disorders among workers in the Manufacturing sector.

Musculoskeletal disorders (MSDs) represent a major proportion of injury/ illness incidence and cost in the U.S. Manufacturing (MNF) sector. In 2008, 29% of non-fatal injuries and illnesses involving days away from work (DAW) in the MNF sector involved MSDs and the MNF sector had some of the highest rates of MSD DAW cases. The rate for the motor vehicle manufacturing sub-sector (NAICS 3361) was among the highest of MNF sub sectors, with MSD DAW rates that were higher than the general manufacturing MSD DAW rates from 2003-2007. In automotive manufacturing overhead conveyance of the vehicle chassis requires assembly line employees to use tools in working postures with the arms elevated. These postures are believed to be associated with symptoms of upper limb discomfort,

fatigue, and impingement syndromes (Fischer et al., 2007). Overhead working posture, independent of the force or load exerted with the hands, may play a role in the development in these conditions. However, recent studies suggest a more significant role of localized shoulder muscle fatigue in contributing to these disorders. Fatigue of the shoulder muscles may result in changes in normal shoulder kinematics (motion) that affect risk for shoulder impingement disorders (Ebaugh et. al., 2006; Chopp et al., 2010).

The U.S. Manufacturing sector has faced a number of challenges including an overall decline in jobs, an aging workforce, and changes in organizational management systems. Studies have indicated that the average age of industrial workers is increasing and that older workers may differ from younger workers in work capacity, injury risk, severity of injuries, and speed of recovery (Kenny et al., 2008; Gall et al., 2004; Restrepo et al., 2006). As the average age of the industrial population increases and newer systems of work organization (such as lean manufacturing) are changing the nature of labor-intensive work, prevention of MSDs will be more critical to protecting older workers and maintaining productivity.

This study will evaluate the efficacy of two intervention strategies for reducing musculoskeletal symptoms and pain in the shoulder attributable to overhead assembly work in automotive manufacturing. These interventions are, (1) an articulating spring-tensioned tool support device that unloads from the worker the

weight of the tool that would otherwise be manually supported, and, (2) a targeted exercise program intended to increase individual employees' strength and endurance in the shoulder and upper arm stabilizing muscle group. As a primary prevention strategy, the tool support engineering control approach is preferred; however, a cost-efficient opportunity exists to concurrently evaluate the efficacy of a preventive exercise program intervention. Both of these intervention approaches have been used in the Manufacturing sector, and preliminary evidence suggests that both approaches may have merit. However, high quality evidence demonstrating their effectiveness, by way of controlled trials, is lacking. This project will be conducted as a partnership between NIOSH and Toyota Motors Engineering & Manufacturing North America, Inc. (TEMA), with the intervention evaluation study taking place at the Toyota Motor Manufacturing Kentucky, Inc. (TMMK) manufacturing facility in Georgetown, Kentucky. The prospective intervention evaluation study will be conducted using a group-randomized controlled trial multi-time series design. Four groups of 25-30 employees will be established to test the two intervention treatment conditions (tool support, exercise program), a combined intervention treatment condition, and a control condition. The four groups will be comprised of employees working on two vehicle assembly lines in different parts of the facility, on two work shifts (first and second shift). Individual randomization to treatment condition is

not feasible, so a group-randomization (by work unit) will be used to assign the four groups to treatment and control conditions. Observations will be made over the 10-month study period and questionnaires will include the Shoulder Rating Questionnaire (SRQ), Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire, a Standardized Nordic Questionnaire for body part discomfort, and a Work Organization Questionnaire. In addition to the questionnaires a shoulder-specific functional capacity evaluation test battery will be administered at 90 and 210 days, immediately pre- and post-intervention, to confirm the efficacy of the targeted exercise program in improving shoulder capacity.

In summary, this study will evaluate the effectiveness of two interventions to reduce musculoskeletal symptoms and pain in the shoulder associated with repetitive overhead work in the manufacturing industry and will disseminate the results of evidence-based prevention practices to the greatest audience possible. NIOSH expects to complete data collection in 2014. There are no costs to respondents other than their time. The total estimated annual burden hours are 472.

ESTIMATED ANNUALIZED BURDEN HOURS

Type of Respondent	Form Name	No. of Respondents	No. of Responses per Respondent	Average Burden per Response (in hours)
Employees	Informed Consent Form	125	1	5/60
	Consent of Photographic Image Release	125	1	2/60
	PAR-Q (Physical Activity Readiness)	125	1	2/60
	Shoulder Rating Questionnaire (SRQ)	125	10	4/60
	Disabilities of the Arm Shoulder and Hand (DASH)	125	10	6/60
	Standardized Nordic Questionnaire for Musculoskeletal Symptoms Instrument	125	10	4/60
	Work Org Questionnaire	125	3	26/60

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