



**PAIN AND MUSCULOSKELETAL DISORDER INCIDENCE
AMONG SOUTHEASTERN LOGGERS**

Personnel: safety

November 2013

INTRODUCTION: Traumatic injury prevention has been the focus of logging safety and health in the United States—for good reason, since logging is one of the most dangerous U.S. occupations, as measured by the fatality rate and the incidence of injury and illness. In contrast, musculoskeletal disorders (MSDs) are the leading cause of occupational injury in the U.S. but have not been a focus of loss control in logging. MSDs (sprains and strains) occur when the demands of the job exceed the capabilities of the person doing the job, and individual differences greatly influence how MSDs develop.

Generally, risk factors include: high forcefulness of exertion, awkward postures, high frequency or repetition of tasks, duration of tasks, vibration, mechanical pressure, exposure to cold, lack of rest, and psychosocial factors (job insecurity, high productivity demands, surges in workload, etc.). Ergonomic risk factors are likely on both mechanized and non-mechanized operations. In addition, procedures used to avoid traumatic injury hazards may not control ergonomic risk hazards.

European logging has recognized ergonomic hazards. The European Network of Forest Entrepreneurs (ENFE) reviewed ergonomic hazards related to mechanized logging and developed tools for contractors and operators.

Only a handful of studies in North America have addressed the ergonomic hazards, pain incidence, or MSD incidence among logging machine operators. In the U.S. in 2011, logging had 4.8 reportable and 3.6 lost-time (including restricted activity) injuries per 100 workers (www.bls.gov). Of those lost-time cases, 17% were classified as musculoskeletal disorders (MSDs), but it is believed that MSDs are significantly under-reported in Bureau of Labor Statistics and Workers' Compensation claims data.

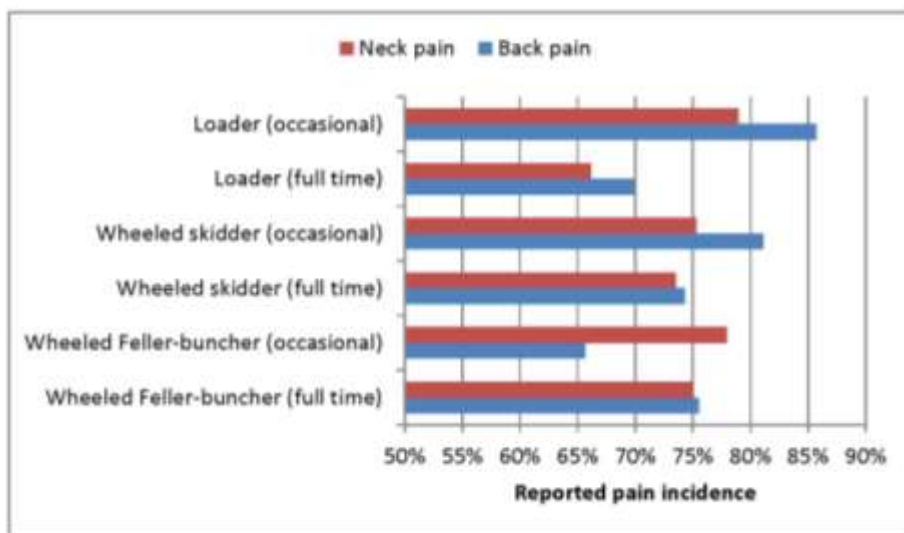


Fig. 1: Reported pain incidence for machine operators. “Occasional” operators report monthly or weekly use of that machine. Full-time included only reported daily use of that machine.

We developed a survey to investigate the incidence rate of MSDs among Southeastern loggers. We also explored the relationship of exposure to job-related risk factors (whole body vibration, repetitive movements of the hands and feet, awkward postures, etc.) and neck and back pain. The survey collected demographic information, machine use and preference, time spent in particular postures, and pain experienced over the previous year. The survey was distributed at logging training classes and logging council meetings in four Southeastern states (Alabama, Georgia, Mississippi, and Tennessee).

FINDINGS: The 157 survey respondents were all male, with an average age of 44 (range 19-67), and the vast majority (97%) were machine operators. Of the machine operators, 11% reported a diagnosed MSD, 74% reported at least mild back pain over the past year, and 72% reported at least mild neck pain. There were only slight differences in pain reports by machine use (*Fig. 1*). About half of survey respondents indicated that they knew someone who changed jobs (51%) or someone who left logging (54%) because of pain or discomfort during work.

We related incidence of neck and back pain to the job-related risk factors. An operator who experienced neck twisting for more than four hours per day would be three times more likely to report neck pain than one who did not. Other factors indicating significant risk for neck pain include time spent in cab, repetitive hand motions, and repetitive foot motions. While the incidence of back pain was high, none of the risk factors we measured were related to reports of back pain. The high incidence of back and neck pain among the respondents could reflect that the most significant factor related to neck and back pain was simply being a logging machine operator.

Southeastern loggers are clearly exposed to ergonomic risk factors for the development of MSDs. Older respondents reported pain more frequently. We believe the data indicate that, as operators spend more time on the job, they may self-select for jobs that cause less pain. In view of the number of people that leave jobs for pain-related reasons (54%), this reality may present significant concerns for recruitment and retention of operators.

Fitness (Body Mass Index, BMI) may also play a role in pain and in development of MSDs. Most operators in the sample were overweight (35%) or obese (49%), with a median BMI of 30.5 (obese). Added weight increases the strain of the musculoskeletal system, making overweight workers more susceptible to MSDs, as well as to other types of injuries.

RECOMMENDATIONS: Ergonomic risks can be controlled as part of a comprehensive safety program. A program that encourages the early reporting of signs and symptoms can help to avoid the development of MSDs. Pain, discomfort, numbness, or tingling can all be early signs that could be an issue in workstation layout, work positions, or duration of activities. Regular machine inspections should include inspection, maintenance, and repair of seating and operator controls. Another aspect of ergonomics is machine selection, in which it would be beneficial to involve the operator to ensure that cab adjustments can be made to “fit” him and that controls are accessible while maintaining good postures and neutral hand, leg, and foot positions.

Determine how to encourage breaks from long durations of the same activity. While stretching can relieve muscle stress, simply changing position or introducing other productive tasks into the shift may serve the same purpose. Encourage operators to implement simple adjustments in seating supports and controls that improve comfort (lumbar pillows, seat adjustments, control adjustments, etc.).

Wellness or fitness programs could reduce the risk of MSDs specifically but would also have benefits in increased productivity and reduced absenteeism. Any encouragement of physical activity and weight loss among coworkers will have long-lasting benefits.

RESOURCES:

- NIOSH <http://www.cdc.gov/niosh/topics/ergonomics/>
- OSHA https://www.osha.gov/dts/osta/otm/otm_vii/otm_vii_1.html
- ENFE http://publikationer.slu.se/Filer/ergo_guidelines.pdf

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