

Purpose

This guidance sheet was designed to help employers identify and assess risks of musculoskeletal injury (MSI) due to contact stress. WorkSafeBC's MSI [Worksheet A](#) and [Worksheet B](#) only address contact stress resulting from using a hand or a knee as a hammer. Contact stress also includes direct pressure (e.g., from a square edge or ridge) against the body.

In the Regulation

Section 4.48 of the Occupational Health and Safety Regulation states:

When factors that may expose workers to a risk of MSI have been identified, the employer must ensure that the risk to workers is assessed.

Background

Exposure to contact stress can increase the risk of injury to blood vessels, nerves, and soft tissue in the area of exposure. Contact stress intensifies with increasing force and decreasing contact surface area. Regions in the body where the tendons, nerves, blood vessels, and bones are located close to the surface are the most susceptible to injury. These regions include the sides and back of fingers as well as the sides and centre of the palm, wrist, elbow, shoulder, hip, and knee.

Risk identification

Occupations that may involve exposure to contact stress include trades, manufacturing, housekeeping, and computer work. If there are any jobs at your workplace that have contact stress risk factors, these jobs must be assessed for risk of MSI. Contact stress risk factors include the following:

- Kneeling on a hard floor or against sharp edges
- Leaning against a hard work surface or edge
- Holding tools that end within the hand
- Handling objects with grooved, sharp, or uneven edges, or objects made of hard material that presses on the hand
- Holding down palm-type control buttons or pressing buttons frequently
- Using power tool triggers with sharp edges
- Sitting in chairs that are too high (i.e., the worker's legs are angled downward) without adequate foot support

Risk assessment

The greater the pressure exerted on the body, the greater the magnitude and risk of MSI. Determine the magnitude through subjective reporting by workers exposed to the risk factor, pressure marks on the skin, and any discoloration that may be present. The greater the total contact stress time on a specific part of the body, the greater the risk of MSI.

Sustained exposure can generally be expected to pose a greater risk than intermittent exposures totalling the same duration.

The severity of risk, or the likelihood that a risk factor may lead to an MSI, depends on:

- The magnitude of the risk factor, and
- The influence of other risk factors to which the worker may be exposed

Consider the following points when determining the risk of MSI due to contact stress:

- Are workers exposed to contact stress for prolonged periods (more than two hours spread over a workday)¹?
- Are marks or depressions left on the skin following contact stress?
- Are workers experiencing numbness or tingling sensations?
- Are workers exposed to contact stress in conjunction with other MSI risk factors, such as frequent and/or prolonged exposure to grip force, awkward wrist postures, hand-arm vibration, and cold?

Answering yes to one or more of these questions indicates that the contact stress, on its own or in conjunction with other risk factors, may lead to an MSI.

Risk control

Employers are required to eliminate or minimize the risk of MSI to workers. Controls that can be implemented to reduce the risk of MSI due to contact stress include:

- Using knee pads or gloves to pad the body
- Rounding or padding the edges of sharp or uneven-edged objects or workstations
- Distributing pressure over as wide an area as possible
- Using tools with long handles that don't dig into the palm
- Padding or rounding surfaces with softer material (e.g., wrapped tools, wrist rests, padded edges of work surface) that the body contacts
- Using a jig or fixture to hold an object during precise work to avoid resting elbows on a hard work surface
- Using spring-assisted pliers or scissors to reduce contact stress on the fingers when opening tools

¹ Kodak's Ergonomics Design for People at Work (2nd Edition). Eastman Kodak Company (2004). John Wiley & Sons, Rochester. p. 144.