

Welding—Musculoskeletal disorders

Explain dangers

Welding presents workers with several hazards. The most common are:

- Metal fumes
- Welding arc light (both visible light and invisible ultraviolet light)
- Particles getting in your eyes
- Burns
- Noise

Welding also comes with the risk of developing a musculoskeletal disorder (MSD). Most studies have found that the main contributing factors to MSDs come from work conditions:

- Maintaining awkward postures from squatting, kneeling, or bending over due to the confined or tight locations
- Lifting heavy equipment or materials
- Keeping your neck bent or keeping your shoulders raised for a long time
- Experiencing increased stress on your neck from supporting the heavy weight of a hard hat and welding mask
- Being exposed to hand-arm vibration

These conditions can lead to MSDs such as back, shoulder, neck, knee, or upper-extremity problems. They can also contribute to the occupational disease hand-arm vibration syndrome (HAVS). This is a permanent disease.

Identify controls

You can prevent MSDs associated with welding by reducing or eliminating:

1. **Forceful exertion** (e.g., heavy lifting)
2. **Awkward postures** (e.g., body positions where you do not move for a long time)
3. **Hand-arm vibration exposures**

REDUCING FORCEFUL EXERTION

- Use auto-darkening lenses. They darken as soon as the arc is struck, eliminating the need to keep opening and closing your helmet. This reduces neck strain.

- Use mechanical lifting equipment whenever you can, particularly when loading or unloading material.
- Pre-assemble parts and use material handling equipment to help reduce unnecessary lifting.
- Use height-adjustable mobile lift tables for transporting material into the workshop. You can also use these tables to support material when you are loading machines. Use a smaller table for smaller sheets of metal or machines such as a punch press. Use a larger table for the “break and bending presses” as well as incoming materials.
- When you have to lift, ask someone to help you.

REDUCING AWKWARD POSTURES

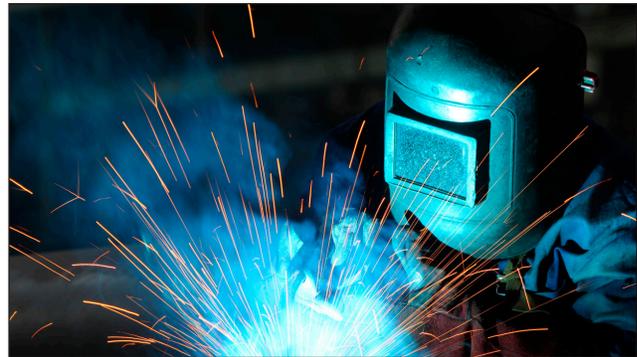
- Position the work at a height between your waist and your shoulder.
- Use lifting and turning tables with wheels.
- Use welding guns that have swivels and can be used in either hand.
- Sit on a work stool when the work is low.
- Use a worktable or workbench instead of bending over to work on the ground.
- Use a rotating clamp for pipe.
- Put your welding leads on pulleys.
- Take stretch breaks throughout the day to relieve discomfort and get the muscles moving.

REDUCING HAND-ARM VIBRATION EXPOSURES WHEN GRINDING

- Use grinders that have lower vibration levels. The Ministry of Labour, Immigration, Training, and Skills Development uses hand-arm vibration exposure limits recommended by the American Conference of Governmental Industrial Hygienists. They advise that average daily exposure limits should remain below 2.5m/s^2 to keep risk low. However, they should never exceed 5m/s^2 as the health risks associated with vibration exposure are high.
- Install vibration dampeners or isolators.

Welding—Musculoskeletal disorders *continued*

- Ensure that tools and accessories are maintained and in good operating condition (e.g., balanced, sharp cutting blades and bits, etc.).
- Use jigs and anti-vibration handles that prevent you from holding onto vibrating surfaces, reduce required grip strength, or lessen the weight of the tool.
- Reduce grip or push forces to lessen the amount of vibration passing into your hands.
- Reduce the exposure to vibration by performing alternate tasks in addition to working with vibrating tools.
- Take frequent work breaks when using vibrating tools.
- Make sure that you have received sufficient training and information regarding hand-arm vibration, which should include the following topics:
 - Health effects
 - Methods for detecting and reporting signs of injury
 - Sources of exposure and strategies for decreasing exposure, including safe work practices with vibrating tools
 - Effects of smoking on circulation and HAVS risk
- Stay warm at work. Pay special attention to keeping your hands warm. Wear warm gloves and extra clothing when working in the cold. Cold temperatures reduce blood flow in the extremities.
- Avoid smoking, particularly prior to or while operating vibrating tools or equipment. Smoking constricts the blood vessels, which affects blood flow.
- Consider using anti-vibration gloves that meet the requirements of ISO 10819:2013. However, do not rely on anti-vibration gloves to protect yourself from hand-arm vibration because the reduction in vibration magnitude is minor.



Demonstrate

More than half of the injuries to welders involve the back, neck, shoulders, arms, and hands. Ask workers to describe any problems they have had to these parts of the body.

Discuss how those problems can be avoided.