

HOMEBUILDING: FRAMING

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Musculoskeletal disorders (MSDs), such as chronic back pain or shoulder problems, often take time to develop. Forceful exertion, awkward positions, hand-arm and whole-body vibration, contact stress, and repetitive tasks can add up over time to produce an MSD.

This profile can help you identify and control MSD hazards in your job. We recommend that you add the best practices outlined here to your company's health and safety program. The hazards in a particular job, however, may be different than the ones on this profile, so evaluate the risks of your particular activities.

In general, when implementing controls, consider the following ergonomic principles:

- 1. Use handling equipment when possible.** The most effective intervention to control the risk of developing an MSD is to eliminate or reduce the frequency of lifting, carrying, pushing, and pulling. Use material-handling equipment such as carts, dollies, pallet jacks, or manual forklifts.
- 2. Don't lift a load from the floor.** Lifting from the floor or below standing knuckle height can expose your back to significant stresses and reduce your lifting capacity. Avoid this procedure by storing objects above standing knuckle height and below standing shoulder height.
- 3. Avoid working on the floor.** Constantly working on the floor can result in injuries to your back, hips, and knees because it usually requires kneeling and bending your back forward. When possible, raise the work height by using a workbench.
- 4. Minimize work above your shoulder.** High lifting or constant reaching above the shoulder level is harmful for three reasons.
 1. Your muscle strength is reduced because most of the muscle work is performed by your shoulders and arms instead of by the bigger muscles in your back and legs.
 2. Your shoulder and arm muscles fatigue more quickly than your back and leg muscles because of reduced blood flow.
 3. Lifting or removing an object from a high shelf can be dangerous because you could drop the object.
- 5. Move smaller weights often or get help.** Smaller weights put less stress on your back than larger weights, even if the frequency of lifting is increased.
- 6. Exercise programs.** Consider exercise programs. They help to prevent MSDs and promote general good health.

Tasks	What can happen (Hazards/Risks)	Potential Controls
<p>Places beams</p> <ul style="list-style-type: none"> ▶ Installs/places I-beams onto basement walls 	<ul style="list-style-type: none"> ▶ Overexertion injuries from manual lifting, carrying, and positioning I-beams 	<ul style="list-style-type: none"> ▶ Whenever possible, use machines to lift and place beams (e.g., a crane or telescoping forklift with appropriate attachments, or a boom truck). Use a tag line to control the beam from the ground. Don't reach out for it. Let the equipment place the beam. Don't push or pull. ▶ Use cribbing to keep beams from getting stuck or frozen to the ground before placement. ▶ Have delivery people place beams near their final location when space is available.
<p>Frames walls</p> <ul style="list-style-type: none"> ▶ Builds and installs partition walls ▶ Sheets exterior walls ▶ Stands up the walls 	<ul style="list-style-type: none"> ▶ Overexertion injuries from lifting and carrying wood materials ▶ Injuries to the back and knees from prolonged squatting, kneeling, and bending at the waist (greater than 45° angle for more than 2 hours) when constructing wall frames from the floor ▶ Back and shoulder injuries from lifting or moving wall frames 	<ul style="list-style-type: none"> ▶ If using mechanical devices is not feasible, ensure that there are enough workers to lift the wall. Performing a team lift requires cooperation among your work crew when lifting and placing. ▶ Use mechanical devices (such as wall lift jacks, cranes, and boom trucks) to hoist wall frames into place, especially when lifting large wall sections. When using such devices, use tag lines. Let the equipment place the walls. Don't push or pull. ▶ If mechanical devices are not available, break down the partition walls to manageable sections for easier handling. ▶ If possible, consider using a paneling system. The panels can be assembled in a factory, and later shipped to the jobsite for installation. ▶ Avoid cutting materials at or near the floor. Use a bench or sawhorses for cutting materials. ▶ Determine the weight of the load. Use proper lifting techniques. Lift with your legs, don't lift with your back, and keep the load close to your body. See the chapter on "Back Care" in IHSA's <i>Construction Health and Safety Manual</i>. ▶ Pick up garbage and scrap materials as you go to prevent injuries from poor housekeeping. Distribute garbage bins around your site and empty them regularly.

Tasks	What can happen (Hazards/Risks)	Potential Controls
<p>Frames—trusses and roof sheathing</p> <ul style="list-style-type: none"> ▶ Installs roof trusses ▶ Sheathes roof with plywood 	<ul style="list-style-type: none"> ▶ Overexertion injuries from lifting roof trusses and plywood ▶ Back injuries from prolonged bending at the waist while installing plywood 	<ul style="list-style-type: none"> ▶ Attach a handle extension to your screw gun, nail gun, and glue gun to reduce bending and kneeling. ▶ Whenever possible, use a forklift or crane to lift and position trusses and plywood as close to the work area as possible. When using a crane or boom truck, follow all safety procedures for hoisting and rigging. ▶ If possible, build all or part of the roof on the ground, and then hoist it into place. Refer to IHSA's <i>Homebuilding Health and Safety Manual</i> and <i>Residential Roof Truss Installation Procedures</i> for further information. ▶ If possible, when installing trusses conventionally, use scaffolding or specially designed brackets that hang off the top plate. When installed properly, these brackets provide a platform and guardrails that comply with the construction regulations. Such work platforms can also reduce back strain because the work will be at waist level instead of at your feet. ▶ Always ensure that there are enough workers to spread trusses and plywood, which are often long, awkward, and difficult to move without help. ▶ Install runners (made from 2x4s) on the roof. They provide workers with stability and support. ▶ Select light, comfortable, and well-fitting boots with ankle support. ▶ If possible, choose lighter cordless, electrical, or air tools. ▶ Lighten up your tool pouch by carrying only the tools you need for the job. ▶ It's difficult to maintain a comfortable posture when attaching sheathing on a sloped roof. Your ankles, knees, and lower back suffer the most. Straighten up, stretch, and adjust your posture often. See the chapter on "Back Care" in IHSA's <i>Construction Health and Safety Manual</i>.

Tasks	What can happen (Hazards/Risks)	Potential Controls
<p>Frames—joists, bridging, sheathing</p> <ul style="list-style-type: none"> ▶ Builds the first floor ▶ Lays out plates and installs them ▶ Installs floor joists and sheet floors 	<ul style="list-style-type: none"> ▶ Overexertion injuries from lifting and carrying materials (e.g., plywood sheets, floor joists) ▶ Back injuries from prolonged bending at the waist (greater than a 45° angle for more than two hours) while installing floor decks 	<ul style="list-style-type: none"> ▶ Deliver and store work materials near the installation area when space is available. ▶ If you're lifting from below your knees, limit the load weight to a maximum of 50 lb (23 kg). ▶ Avoid cutting materials at or near the floor. Use a bench or sawhorses whenever possible. ▶ Use proper lifting techniques. Lift with your legs, don't lift with your back, and keep the load close to your body. See the chapter on "Back Care" in IHSA's <i>Construction Health and Safety Manual</i>. ▶ Pick up garbage and scrap materials as you go to prevent injuries from poor housekeeping. Distribute garbage bins around your site and empty them regularly.

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1-800-263-5024 | info@ihsa.ca | www.ihsa.ca