Industrial Back Belts and Low-Back Pain
Frequently Asked Questions

Q. Do back belts prevent overexertion back injuries in employees who lift and move materials?
A. According to research, back belts are not effective in preventing musculoskeletal low-back pain. The National Institute for Occupational Safety and Health (NIOSH) studied 8,000 hourly retail workers for two years. This study found that elastic support back belts did not reduce the incidence of back injury claims or low-back pain (Wassell, et al., 2000).

Q. What is the best way to prevent low-back injuries?
A. No single technique will prevent all injuries. The best approach is to use a combination of methods. Implementing an ergonomics program will produce the best long-term results. Remember, no two workplaces are exactly alike; not every one of these controls will be possible at your workplace.

Engineering Controls
Change or modify tools, equipment or machinery to reduce the physical demands of the job. Engineering controls also include the use of assistive devices (e.g., crane, forklift, conveyor) to handle materials.

Work-Practice Controls
Change the way job tasks are performed to reduce the frequency and duration of exposure to risk. One example is reorganizing the order of job tasks to allow muscle recovery between tasks requiring excessive force. Another example is using a different manual technique to reduce force requirements.

Administrative Controls
These include job rotation, job enlargement and gradual introduction to work, such as a pre-shift warm-up and stretching program.

Training Controls
Make employees aware of low-back pain early-warning signs, the importance of early reporting, the biomechanics of the spine, and the risk factors and proper body mechanics when manually handling materials.

Personal Protective Equipment Controls
Examples include kneepads and vibration-dampening gloves.

Q. How do back belts work?
A. There are several theories about how back belts could help protect the lower back when performing strenuous lifting or forceful exertions.

Physically: Some say that the belt puts pressure against the abdominal wall during exertion and increases intra-abdominal pressure (IAP), thereby possibly increasing spine stability. Research has found, however, that the belt does not have the same effect for all movements and muscles.
For example, the belt significantly increased IAP in forward- and side-bending, but not in back extension (Cholewicki, et al., 1999). Another study found no changes in IAP with belt users performing various types of lifts (McGill et al., 1990). A review in 2000 of 33 studies that measured IAP found no evidence that IAP increased when wearing a back belt (Van Poppel, 2000). If IAP is increased with back belt use, it’s unclear whether or not this actually protects the spine.

**Psychologically:** Back belt manufacturers say that the belts help remind the user to lift properly and use good body mechanics. No field studies, however, support this statement.

**Q. What do health and safety authorities say about back belt use?**

A. The U.S. surgeon general, U.S. Department of Defense, NIOSH, Washington State Department of Labor & Industries, and Workers’ Compensation Board of British Columbia have all opposed the use of back belts for the prevention of low-back pain. They all cite scientific evidence that finds no benefit to wearing a belt to prevent back injuries from strenuous or repetitious lifting, pushing or pulling. The Occupational Safety & Health Administration (OSHA) states, “Back belts are not recognized by OSHA as effective engineering controls to prevent back injury. While they may be accepted by individual workers because they feel as if they provide additional support, the effectiveness of back belts in the prevention of low-back injuries has not been proven in the work environment.” Thus, OSHA does not forbid the use of back belts and similar devices, nor does it endorse their use.

**Q. What are the risks of using a back belt?**

A. There are multiple risks:

**Increased Blood Pressure:** Some studies have found an increase in blood pressure when lifting and wearing a belt (Rafacz et al., 1996; Rabinowitz et al., 1998; Marley & Duggasani, 1996). Another study found no significant changes in blood pressure when wearing a back belt while lifting (Bobick et al., 2001). The conflicting research probably has to do with the lifting tasks themselves. Static lifts increased blood pressure; dynamic lifts did not. Loads weighing more than 29 pounds increased blood pressure; loads less than 17 pounds did not. Back belt users should use caution if they are already have high blood pressure and/or are at risk for cardiovascular stress.

**Superman Phenomenon:** Sometimes employees think the belt makes them stronger. One study found that subjects wearing a belt increased the weight of the load they were lifting by 19 percent (McCoy et al., 1988). Employers should be aware of this phenomenon. They should also caution employees against thinking they can safely lift more weight than they’re physically capable of lifting.

**Muscle Weakness:** Many medical professionals are concerned about muscle weakness, or atrophy, when the back belts are worn for long periods. Bracing or splinting an area of the body will restrict movement, and movement is necessary for keeping the muscles active and strong. One field study conducted on 642 baggage handlers found that employees who stopped using a belt had a higher number of lumbar injuries and lost workdays (Reddell et al., 1992). This would suggest that their injuries might have been due to muscle weakness from wearing a belt. Employers should be aware of this risk if employees stop using the belt and continue performing the same lifting tasks.
Q. What are the possible benefits of a back belt?
A. NIOSH conducted a laboratory study that found belts reduced some forward- and side-bending of the trunk, as well as twisting when lifting 21-pound boxes (Giorcelli et al., 2001). Test subjects also lifted the boxes more slowly and used more of a squat lift when wearing the back belt. A back belt may decrease the angle of forward- and side-bending and decrease twisting when lifting, and that may help remind users to use better technique. This testing was performed over a few days. More research is required to know the long-term effects on body mechanics.

Q. What should an employer do if a worker’s physician prescribes a back belt at work?
A. Sometimes a physician will prescribe a corset-like or rigid back brace for patients with degenerative disc disease and/or who are recovering from back surgery, in order to help stabilize the spine. If this is the case, follow the physician’s orders. This type of back belt serves a very different purpose than the industrial back belt discussed here. It is designed to stabilize the spine when moving. In most cases, the back brace is a short-term remedy, since weakening (atrophy) of the abdominal and back muscles (see “Muscle Weakness” above) will eventually occur.
References


