

Ergonomics Force Risk Factors

There are six Ergonomic Risk factors: Force, Vibration, Contact Stress, Awkward Postures, Repetition, and Temperature. This worksheet and quiz focus on the "force" risk factor as it applies to ergonomics.

Forceful Exertions

It is not difficult to understand why jobs that require employees to apply a lot of physical effort may involve significant exposure to ergonomic risk factors and pose an increased risk of injury. Performing forceful exertions requires an application of considerable contraction forces by the muscles, which causes them to fatigue rapidly. The more force that must be applied in the exertion, the more quickly the muscles will fatigue or become strained.

Contributing tasks include:

- Physically handling material
- Lifting, unbalanced loads
- High gripping forces
- Carrying loads improperly or great distances

Forceful-exertion-related injuries can affect any tissue or joint. Tasks that require forceful exertions require the muscle(s) to contract significantly, which causes them to fatigue rapidly. The more force that must be applied in the exertion, the quicker the muscles will fatigue or become strained. Excessive or prolonged exposure to forceful exertions also leads to overuse of muscles and may result in muscle strain, soreness and damage.

Ergonomics Force Risk Factors

Lifting and carrying heavy objects are examples of tasks that require forceful muscle exertion. Other tasks may also require the same types of force.

These include:

- Jobs that require employees to pick up small items with their fingers
- Manually driving in screws
- Pushing and pulling wrenches
- Picking up material that is not balanced

Simply put, forceful exertions like these take more out of a person than tasks that do not require much physical effort. Ask your employees the following questions:

- Are workers complaining of fatigue, discomfort, muscle pain, swelling or restricted motion?
- Is the pain visible in their facial expressions when they perform certain job tasks?
- Are there quality control issues such as increased error rates, production stoppages, and delays?
- Are workers modifying hand tools and equipment?
- Is there higher employee turnover and absenteeism in particular jobs or departments?

Best Practice Tips

Engineering Controls

Implement physical change to the workplace. This eliminates/reduces the hazard on the job/task.

- Use mechanical assists: equipment replacement, additions or enhancements
- Automate the process if possible
- Slow the pace of the machine
- Reduce the amount of force needed by reducing the weight of the loads– reduce carton capacity
- Balance contents of a load for stability

- Redesign or rearrange the workstation layout and space to minimize the reach and lift distances, keep objects to be manually lifted off of the floor
- Redesign workflow
- Reposition a work table to eliminate a long/excessive reach and enable working in neutral postures
- Redesign tools to enable neutral postures

Personal Protective Equipment

Back belts, back support belts, or weight lifting belts are not considered PPE. Many studies have shown that the use of back belts may not prevent strains. Please consider engineering controls, training, and proper lifting methods before considering any type of PPE.

Administrative & Work Practice Controls:

- Increase the number of workers performing the job task
- Provide workers with work-rest allowances
- Convert work tasks- push instead of pull; use large wheels on carts
- Require that heavy loads are only lifted by two people to limit force exertion
- Establish systems so workers are rotated away from tasks to minimize the duration of continual exertion, repetitive motions, and awkward postures
- Design a job rotation system in which employees rotate between jobs that use different muscle groups
- Staff “floaters” to provide periodic breaks between scheduled breaks
- Properly use and maintain pneumatic and power tools

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Please complete the Ergonomics Quiz in a separate document.