



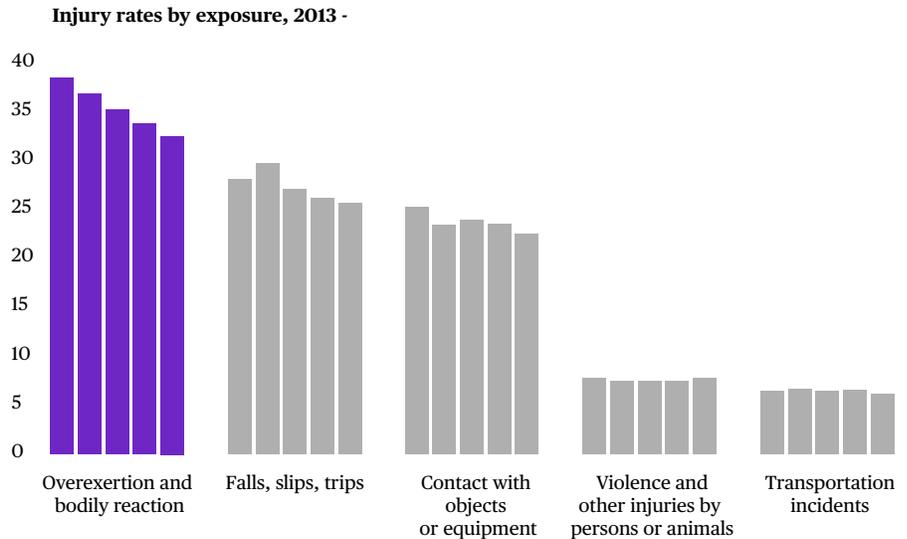
# Ergonomics Can Deliver Significant Savings for the Construction Industry

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Although the injury rate declined between 2013 and 2017, **Overexertion injuries** remain a leading cause of non-fatal injuries.



Source: US Bureau of Labor Statistics, US Department of Labor, 2018

Statistics from the US Bureau of Statistics indicate that overexertion injuries are among the leading causes of non-fatal injuries for industry as a whole, and construction is no exception. Information and research in reducing ergonomic-related injuries in the manufacturing industry is more advanced due to the nature of manufacturing tasks. Manufacturing tasks tend to be repetitive in nature, and manufacturing environments are static and far less fluid than construction sites. The construction industry offers different challenges in that repetitive tasks are less frequent and construction work tends to be much more varied, making task-specific research and controls more complex. When you combine this with the fact that construction workforces are also much more transient than in other industries, controlling ergonomic hazards in the construction industry is a difficult task. Nevertheless, ergonomic principles should be considered when evaluating and mitigating risk on a construction worksite.

**The key advantages of incorporating ergonomic principles on construction sites include:**

- Cleaner jobs
- Reduce slip, trip, and fall exposures
- Improve morale
- Reduce material handling touches
- Reduce soft tissue injuries
- Reduce Cumulative Trauma Disorders (CTDs)
- Reduce labor cost
- Increase productivity
- Improve lean efficiencies

## Ergonomic Principles at Work

Ergonomics is the science of fitting the work and the environment to the worker. For example, ergonomics consultants will help companies design work processes and workstations to fit within the constraints of human abilities so that employees will interact with the environment more effectively and safely.

Proper ergonomics, along with safe lifting practices and the use of material handling aids, can help to reduce overexertion injuries. Although OSHA does not have a specific standard addressing ergonomics, employers who expose their workers to overexertion hazards can be cited under the General Duty Clause of the Occupational Safety and Health Act, which requires employers to provide a working environment free of recognized serious hazards.

### An Overview of Overexertion

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Overexertion injuries are typically related to lifting, pushing, pulling, holding, or carrying. Strains, sprains, and tears are by far the most common types of injury resulting from overexertion, followed by soreness and pain. The back is the body part most frequently affected by overexertion injuries, followed by the shoulder, arm, wrist, and knee. Overexertion was claimed to be the cause of lower back pain by over 60 percent of the people suffering from it.

Some of the most common injuries in construction are the result of job demands that push the human body beyond its natural limits. Workers who must often lift, stoop, kneel, twist, grip, stretch, reach overhead, or work in other awkward positions to do a job are at risk of developing a work-related musculoskeletal disorder (WMSD). These can include back problems, carpal tunnel syndrome, tendinitis, rotator cuff tears, sprains, and strains. Material handling is possibly the most serious workplace safety problem. Manual material handling accidents consistently account for at least 47 percent of all workers compensation claims.

Many people in construction believe that sprains and strains are just an unavoidable part of the business. But new tools and improved processes that can make work less risky and increase productivity are now available. A sound ergonomics program can help risk managers apply these tools and reduce injuries to their workers.

#### Types of Construction Practices That Lead to Overexertion-Related injury:

- Heavy, frequent, or awkward lifting
- Awkward hand grip
- Repetitive tasks such as hammering or drilling
- Postures using excessive force
- Hand-intensive work

### How Ergonomic Principles Can Help Reduce Overexertion-Related Injuries

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#### Start with a Job Hazard Analysis

A job hazard analysis is a technique that breaks each job down into individual tasks to identify the hazards. The analysis focuses on the relationship between the worker, the task, the tools, and the work environment. The job hazard analysis can identify tasks that require excessive material handling, awkward positions, and repetitive tasks that can contribute to overexertion and cumulative task-related injury. The information from the analysis can help you identify opportunities for incorporating ergonomic principles into your jobsites.

## Change Material Storage Techniques

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Changing the way materials are stored on a jobsite is a simple way to improve ergonomics and reduce overexertion injuries.

By placing construction materials on the ground/floor you create a situation where moving that material requires manual labor.

Storing materials on pallets, racks, or dunnage instead of on the ground or floor greatly reduces the need to manually move or relocate construction materials.

Using racks and other storage devices with wheels makes moving materials safer, reducing injury and improving productivity. Employees can move the materials by mechanical means, further reducing or eliminating manual labor.

In this photo, the miter saw is located on the floor. Elevating workstations helps reduce bending and stooping. In addition, having a trash barrel adjacent to the work station helps reduce housekeeping problems.

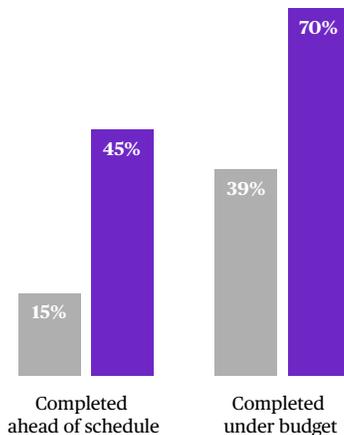


## Use The Right Tools

The right tools can also reduce bending and stooping. In the photo below, the employee is tying rebar by hand. In the second photo a rebar-tying tool with extension handle reduces the need to bend to complete the task.



**Construction projects that incorporated lean principles** were significantly more likely to be completed ahead of schedule and below budget.



## Incorporate Lean Principles

The goal of ergonomics in fitting the workplace and tasks to the worker is to design work processes and provide tools that reduce physical stress on the human body. In doing so, the work process and workplace become safer, injuries are reduced. In addition, the work process itself often becomes more efficient and productivity can improve. Ergonomic principles can be applied not just to specific job tasks but to an entire process. This approach is called “Lean,” and it was first used in manufacturing.

Henry Ford, in inventing the assembly line for the Model T, reduced inefficiencies in the manufacturing process by incorporating what are now called Lean principles. After World War II, Toyota Manufacturing pioneered the current Lean approach with the “Toyota Production System,” which many now call “just in time” manufacturing. As a result, Toyota was able to improve the quality of both products and processes, increase efficiency, and reduce production costs. Today, Lean principles are used in many industries including manufacturing, food services, and construction. In particular, one program, called “Nothing Hits the Ground” is being used by a number of construction firms. The program focuses on common causes of injury in construction, including poor housekeeping, improper work height, and improper material handling.

The Lean manufacturing principals must, of course, be adapted for the construction environment in which every project and every projects team is different. Studies by the Lean Construction Institute, however, found that projects which incorporated Lean principles were significantly more likely to be completed ahead of schedule and below budget.

Adopting a management strategy that focuses on improving the ergonomic safety can help construction companies reduce their exposure, decrease costs, and improve productivity.

In addition, reducing overexertion claims through the use of ergonomics can produce big savings. According to the Bureau of Labor Statistics, 63 percent of sprain/strain/team claims result from overexertion. About one-third of those claims are back claims which usually cost between \$40,000 – \$80,000. A 2016 study by the University of Oklahoma concluded that one-third of back injuries could be prevented through better workplace design.

In addition by reducing the number of times materials are touched or moved, improving the housekeeping at job sites, and incorporating ergonomic principals into work processes and workstations, companies are able to reduce the number of injuries from slips/trips/falls and lacerations.

There is no one easy solution to the problem of overexertion and cumulative-related injuries in construction. By adopting a management strategy that focuses on improving the ergonomic safety for material handling tasks and adopting some of the simple suggestions noted above construction companies can reduce their exposure, decrease costs, and improve productivity.

### Six Things You and Your Employees Can Do to Reduce Overexertion

- Consider changing material handling practices on your projects. Promote the use of pallets, pipe racks, and other devices that reduce manual labor. Use mechanized equipment first
- Consider the overall weight and configurations of lifted items before lifting
- Stretch to warm up before work
- Handle material in the power zone
- Bend with the knees
- Avoid lifting objects in excess of 50 lbs

### References

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- Bureau of Labor Statistics - Lost worktime injuries and illnesses – 2018
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