

# Job Analysis and Ergonomic Analysis: First Steps in Reducing Injuries and Costs

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Critical first steps in workplace musculoskeletal injury prevention can include the identification of the physical demands associated with a position (or even a job task) and the ergonomic risks associated with that position or job task. Determination of these factors requires collaboration between employers, frontline staff, health care providers, and insurance carriers, and can help reduce injuries (and associated costs) in the workplace through a variety of interventions. A job analysis focuses on observation and objective measurements designed to collect qualitative and quantitative information regarding a position, or in some cases, one or several job tasks. Direct observation by an unbiased party is crucial, as it eliminates sources of error. Once observations and measurements are completed, a written report is generated. The report describes the essential functions for the position and the physical demands related to those functions. An essential function for a plumber might read: "Installs and/or repairs plumbing fixtures such as toilets, sinks, showers, faucets, drains, and hot and cold water lines, repairing or replacing piping, hardware and other components (as needed) to complete repairs." A physical demand associated with a plumbing position might read: "Occasional 2-hand lifting of 53 lbs. from 10 in. to 54 in." Other information, such as the physical demand level for the position, the hours and shifts worked, and personal protective equipment (PPE) used on the job are also typically included. A job analysis can be useful to:

- Establish essential functions, which are often described as the reasons why the position exists.
- Quantify the physical demands (such as lifting, carrying, pushing, and walking) necessary to perform the job or task.
- Design post-offer, pre-employment screening protocols, which allow employers to hire physically capable employees with less risk of injury.
- Create functional job descriptions, which include detailed physical demands.
- Design job-specific and task-specific hands-on injury prevention programs.
- Assist employers and health care providers in making return-to-work decisions.
- Allow healthcare providers performing functional capacity evaluations and designing work-conditioning programs to more accurately simulate job tasks, thereby improving the quality and outcomes of these services.

An ergonomic analysis does not detail the physical demands associated with a task. Rather, it identifies and quantifies physical demands that may pose an increased risk of injury for staff performing a task or job. Therefore, it is extremely relevant and useful in nearly all aspects of injury prevention and controlling costs associated with on-the-job musculoskeletal injuries.

According to the Occupational Safety and Health Administration (OSHA), ergonomic risk factors include:

- Force, like lifting, pushing/pulling, or pinching
- Awkward postures, like bending or looking down
- Repetition
- Vibration, as when using a jackhammer or certain power tools
- Contact stress, which is defined as a concentrated force over a small area of the body

Once risk factors are quantified, modifications designed to reduce these risk factors, and thus reduce the risk of injury, are identified and included in a written report. Ergonomic modifications fall into three broad categories:

- Engineering controls, which reduce risk through physical changes of the work environment or tools used on the job.
- Administrative controls, such as job rotation or job task enlargement, which both increase the variety of work that an employee performs. These approaches are particularly useful when repetition is present.
- Work Practice controls, which attempt to modify employees' behavior, as when teaching proper lifting techniques.

Beyond using an ergonomic analysis to identify risk factors for a position or task, an ergonomic analysis can be used to shed light on causation (or lack thereof) of a work-related injury. It can also be useful to reduce the risk of re-injury when a previously injured employee prepares to return to work.

Those with ergonomic training and certifications, such as the Certified Ergonomics Assessment Specialist (CEAS) certification, typically perform both Job and Ergonomic Analyses. For more information on either service, do not hesitate to contact a qualified member of Accelerated's Industrial Rehabilitation team. As Chinese philosopher Lao-Tzu stated, "A journey of a thousand miles begins with a single step." In terms of injury prevention, a job analysis, an ergonomic analysis, or maybe both might be that first step.

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Mark Bell, PT, CEAS II, has been an Illinois-licensed physical therapist for 18 years. He currently specializes in ergonomics and injury prevention services, including job and ergonomic analyses, post-offer screen design, and injury prevention education. Over the last 3 years, Mark has helped customers such as Nicor, People's Gas, Central Grocers, and the Park District Risk Management Association successfully reduce injuries. Clinically, Mark performs functional capacity evaluations and post-offer screens. In his spare time, Mark enjoys running and home brewing beer.