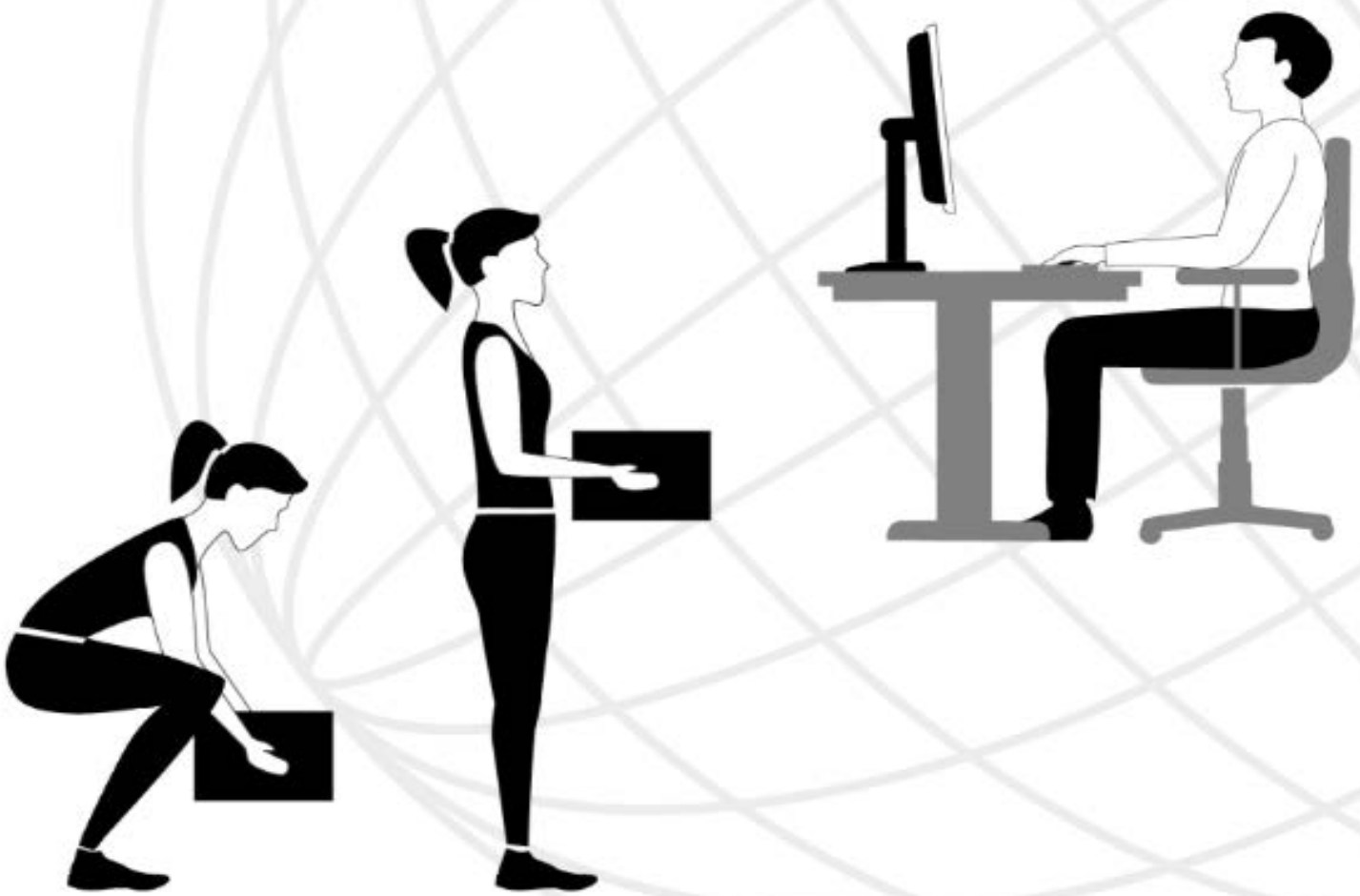
ERGONOMIC PRINCIPLES EVERY BUSINESS NEEDS TO KNOW

For Office and Material Handling Success



WORKSITE INTERNATIONAL
Solutions for a healthier workplace

By Alison Heller-Ono, MSPT, CDA, CIE, CPE, Certified Management Consultant

Dedicated to employers who believe in the power of ergonomics to create a healthier, happier and productive workforce.

Disclaimer:

The contents of this guide are based on ergonomic theory and practice found in confirmed research both web and hard copy. Web links are provided as additional resources but may change and become unreliable.

Following the methods suggested offers no guarantee injuries will be prevented or productivity improved. For additional advice, seek the consultation of a Board Certified Professional Ergonomist or call Worksite International at 888-288-4463.

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Introduction

This book is designed to provide your business with:

- A general background of and definition of ergonomics in the workplace.
- Discussion points on implementing an ergonomics program within your organization's existing safety program or as a standalone safety initiative.
- Understand the application of ergonomics in the office and in industry.
- Methods to work with stakeholders to implement change.
- Evaluation strategies and methods to conduct an "in-house" ergonomic evaluation.
- Tools and resources to be used when seeking remedies to identified ergonomic risk factors.

A sound ergonomics program is foundational to good organizational health. If your organization doesn't have an ergonomics program, you will need to set one up before you start conducting ergonomic evaluations.

This guide provides details on the program components and goals of an ergonomics process based on best practices and 25 years of research. It begins with a solid policy reflective of current ergonomic regulations and guidelines and must be accepted by leadership at a moral, legal and fiscal level for best results.

Preventive ergonomic analysis is an important activity in any workplace which values employee health and safety. If you are an in-house ergonomics evaluator, I recommend you perform evaluations on healthy employees with no or low symptoms. This serves as the cornerstone of a great ergonomics program. It allows you to identify early warning signs and respond in a timely manner. However, once employees begin to report progressive symptoms, or an existing non-industrial medical or workers' compensation condition, I recommend you work with a qualified (3rd party) ergonomics expert to conduct the evaluation as these are often medical-legal cases.

Understanding the onset of musculoskeletal symptoms and identifying root causation in the workplace is often beyond the scope of an in-house evaluator. Typically, these evaluations are performed by a board-certified ergonomist and/or healthcare professional

like a PT, OT or Chiropractor with special credentials as a Certified Ergonomist (i.e. CPE or CIE).

Ergonomics is tremendously valuable across the continuum of work health. From wellness to prevention to workers' compensation and disability management (ADAAA). Your ergonomics program combined with your actions will save your company thousands of dollars in claims prevention and medical management, boost productivity while promoting employee health and wellness.

For best results, focus on engagement at all levels, from top leadership, to management and supervisors, to employees. Everyone in the company should know about and participate in the company's ergonomics process at some level. Only then will you reap the tremendous rewards it has to offer.

Figure 1. Ergonomics is applicable through the continuum of work health.

About the Author

Alison Heller-Ono, MSPT, CDA, CASp, CIE and CPE
Certified Management Consultant®

Alison Heller-Ono, President/CEO of Worksite International, Inc. is passionate about how people work!

As a pioneer in the ergonomics consulting industry since 1993, Alison has used her expertise, experience, know-how and savvy to change the way people work from employee to employee, organization to organization resulting in improved employee health and organizational productivity.

As a trusted advisor and valued consultant to her clients, Alison has a distinguished career highlighted by a comprehensive body of work in ergonomics.

Alison has worked diligently to assure validation in the methods and theories utilized by Worksite International through periodic peer reviews and publication. She is a highly respected, recognized and sought after global speaker and trainer having presented on 3 continents.

Alison is revered and admired by her peers who often attend her speaking events to hear her thought-provoking ideas and trend setting presentations. Alison Heller-Ono will educate, entertain and inform you in new ways of working for a healthy and productive work-life!

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- Twitter (https://twitter.com/ErgoAli)

1. Definition: What is “Ergonomics?”

Several definitions are provided to define “ergonomics.”

1. Ergonomics is “the study of people's efficiency in their working environment.”
2. Ergonomics is the study of designing equipment and devices that fit the human body, its movements, and its cognitive abilities.
3. Ergonomics is an applied science concerned with designing and arranging things people use so people and things interact most efficiently and safely.

Objects can be considered “ergonomic” or “ergonomically designed.” Consider the following ways ergonomics can be used:

Parts of Speech	Word	Definition
Adjective	Ergonomic	The ergonomic chair is adjustable.
Adverb	Ergonomically	The workstation is ergonomically adjusted.
Noun	Ergonomist (Practitioner)	The ergonomist performed a good evaluation.

The **International Ergonomics Association** (http://www.iea.cc) defines ergonomics as follows:

Ergonomics (or human factors) is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design to optimize human well-being and overall system performance.

Ergonomics is employed to fulfill the two goals of health and productivity. It is relevant in the design of such things as safe furniture and easy-to-use interfaces to machines and equipment. Proper ergonomic design is necessary to prevent repetitive strain injuries, which can develop over time and can lead to long-term disability.

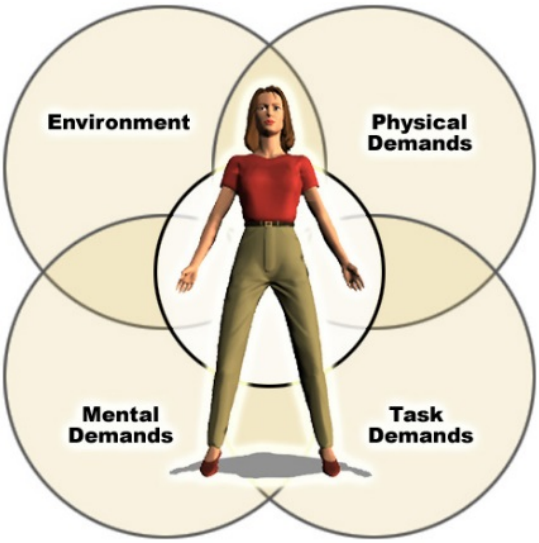

Figure 2. Ergonomics is an applied science taking into consideration the physical, mental, organizational and environmental demands of work.

2. Assuring Ergonomic Program Compliance

There is no federal ergonomics regulation. However, if an employer is in violation of obvious ergonomics principles, Fed OSHA relies on the General Duty Clause (https://www.osha.gov/laws-regs/oshact/section5-duties) to site employers for violations as it pertains to ergonomics in the workplace. Only the state of California has its own ergonomics regulation (since 1997), known as Cal-OSHA 5110 (https://www.dir.ca.gov/title8/5110.html).

Employers are responsible for providing a safe and healthful workplace for their workers. In the workplace, the number and severity of musculoskeletal disorders (MSDs) resulting from physical overexertion, and their associated costs, can be substantially reduced by applying ergonomic principles.

Implementing an ergonomics process is effective in reducing the risk of developing MSDs in high-risk industries as diverse as construction, food processing, firefighting, office jobs, healthcare, transportation and warehousing. The following are important elements of an ergonomics process:

1. **Provide Management Support** - A strong commitment by management is critical to the overall success of an ergonomics process. Management should define clear goals and objectives for the ergonomics process, discuss them with their workers, assign responsibilities to designated staff members, and communicate clearly with the workforce.

2. **Involve Workers -** A participatory ergonomic approach, where workers are directly involved in worksite assessments, solution development and implementation is the essence of a successful ergonomics process. Workers can:

    a. Identify and provide important information about hazards in their workplaces.
    b. Assist in the ergonomics process by voicing their concerns.
    c. Make suggestions for reducing exposure to risk factors.
    d. Provide feedback by evaluating the changes made as a result of an ergonomic assessment.

3. **Provide Training -** Training is an important element in the ergonomics process. It ensures workers are aware of ergonomics and its benefits, become informed about ergonomics related concerns in the workplace, and understand the importance of reporting early symptoms of MSDs. In addition, it's a great way to notify employees about the ergonomics process and how to request an evaluation when needed.

4. **Identify Problems -** An important step in the ergonomics process is to identify and assess ergonomic problems in the workplace before they result in MSDs. Offering employees, a way to request an evaluation using an "ergonomic evaluation request form" is a great way to document concerns and monitor who is coming into the program. The more formalized you are in monitoring, recording and measuring the ergonomic concerns, the more likely you are to correct them.

5. **Encourage Early Reporting of MSD Symptoms** - Early reporting can accelerate the job assessment and improvement process, helping to prevent or reduce the progression of symptoms, the development of serious injuries, and subsequent lost-time claims.

6. **Implement Solutions to Control Hazards** - There are many possible solutions that can be implemented to reduce, control or eliminate workplace MSDs. Solutions are often categorized into engineering controls and administrative controls.

7. **Evaluate Progress -** Established evaluation and corrective action procedures are required to periodically assess the effectiveness of the ergonomics process and to ensure its continuous improvement and long-term success. As an ergonomics process is first developing, assessments should include determining whether goals set for the ergonomics process have been met and determining the success of the implemented ergonomic solutions.

Note: An ergonomics process uses the principles of a safety and health program to address MSD hazards. Such a process should be viewed as an ongoing function that is incorporated into the daily operations, rather than as an individual project.

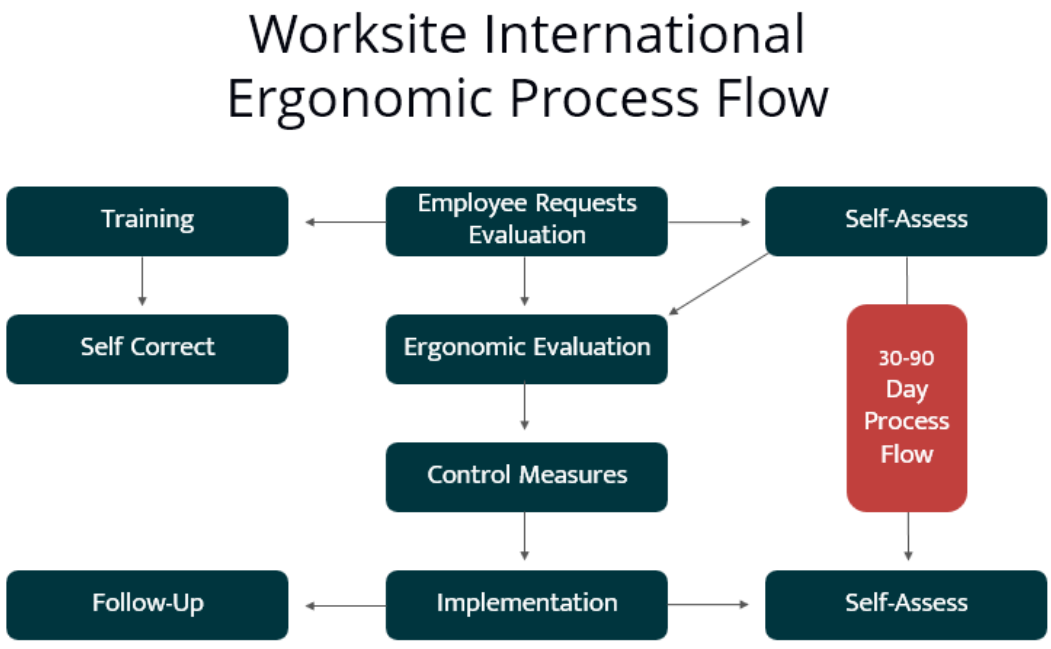

Figure 3. A sample ergonomics process flow model.

Figure 4. Ergonomics is a "human-centered" science incorporating the influence of tasks, tools, technology, the organization and the environment on the human.

Ergonomics is a key element in any safety program as these processes are geared directly at line employees who are performing the greatest number of tasks that can put them at risk for on-the-job injuries and illnesses. The end goal of any safety program is to reduce work related accidents and illnesses while enhancing production and ultimately, profitability in all its forms.

3. Ergonomic Program Goals

Ergonomic programs typically address the following goals and elements:

- Reduction in injuries and illnesses
- Reduction in absenteeism
- Reduction in employee turnover
- Increased productivity and work efficiency
- Improved quality of work
- Improved employee morale and engagement

Short-term goals may be established as a means of meeting the permanent goals.

Typical Ergonomic Program Elements include:

- Management Leadership and Employee Participation
- Hazard Identification and Information
- Job Hazard Analysis and Control
- Training
- Medical Management
- Program Evaluation
- Record keeping and Retention

For more information about developing an ergonomics program, visit (https://www.osha.gov/dte/grant_materials/fy14/sh-26336-sh4/Sample-Ergonomics-Program-Reading-Material.pdf).

4. How Will an Ergonomics Program Help Your Organization?

Ergonomic programs and protocols should be included if your company routinely experiences musculoskeletal disorders as part of your loss history. The ergonomic program should be integrated with your current safety program and, in general terms, be focused in two areas:

1. Manual Material Handling (MMH) Exposures and Controls
    a. Lifting, moving, loading type operations associated with postural and forceful exertion
    b. Twisting, pushing and pulling operations
    c. RMI's (Repetitive Motion Injuries)
2. Office Ergonomic exposures and controls
    a. Office / workstation environments
    b. RMIs
    c. Awkward postures at the computer workstation
    d. Modern ergonomic chairs, adjustable workstations and other accessories

The value of an ergonomic based safety program can be measured by productivity and lost time.

Accidents cost everyone money. For every dollar spent on the direct costs of a workers' compensation injury or illness, companies may spend upwards of three to four dollars in indirect costs. Some of those indirect costs include:

- Productive time lost by an injured employee
- Productive time lost by employees and supervisors to make up for an absent employee
- Time and cost for repair or replacement of any damaged equipment or materials
- Cleanup and startup of operations interrupted by the accident
- Staff time to investigate and then manage the insurance claim
- Increased workers' compensation insurance rates

A well-run safety program will provide several positive outcomes for your policyholders including:

- More efficiently run operations
- Less employee turnover
- Improved employee morale and job satisfaction
- Reduced susceptibility to unnecessary legal entanglements
- Enhanced bottom line margin which can make their products or services more competitive in the marketplace

5. Regulatory Information and Free Resources

OSHA recognizes the benefit of distributing, via the Internet, information about ergonomics to help prevent MSDs in the workplace. The agency offers a series of eTools that provide stand-alone, interactive, web-based information to address ergonomic hazards. Some tools address general ergonomic hazards and others target specific industries.

There are numerous OSHA Industry-specific e-Tools (http://www.osha.gov/SLTC/ergonomics/outreach.html#etools) targeting many of the areas below.

- Ergonomic Solutions for Electrical Contractors
- Baggage Handling
- Beverage Delivery
- Computer Workstations
- Grocery Warehousing
- Healthcare
- Poultry Processing
- Printing
- Sewing (English and Spanish)

In addition, NIOSH has a free ergonomics "primer" PDF downloadable publication (http://www.cdc.gov/niosh/docs/97-117/pdfs/97-117.pdf).

6. Setting measurable objectives for Your Ergonomics Program

Great care should be taken to identify and set measurable goals around the ergonomics program.

It is very important to gain leadership's commitment to action in addressing the issues you bring to their attention. Lack of management buy-in sets the stage for program failure. It takes all levels of leadership, management and employees to drive a successful ergonomics program.

Examples of acceptable objectives are:

1. Assure all employees including supervisors/managers attend ergonomics training at least once every 3 years to learn about your program and its goals, how to use it, and what to expect.

2. Track your evaluations in a database which monitors recommendations made, including purchases.
3. Track preventive evals over time and measure whether any of these convert to workers' compensation claims.
4. Perform ergonomic evaluations for employees with high risk exposures like repetitive motion or material handling tasks with forceful exertions.
5. Implement control measures which are practical, feasible and affordable to reduce the risk of injury to employees.
6. Follow up with employees after evaluations to assure successful outcomes.

Work with your management team to develop appropriate goals that tie in with your current loss control reports, workers' compensation claims, and your organizational culture.

Write a few goals you would like to achieve as you launch your ergonomics program and how you want to measure the success.

Ergonomic Program Goals	How we will measure the goal
1.	
2.	
3.	
4.	
5.	
6.	

7. Measuring for Fit with the Science of Anthropometry

Anthropometry is the "measure of man." It is the study of human body measurements and capabilities. It is the science of the measurement of body size.

Anthropometrics data is based on various populations throughout the world. i.e. men, women, nationalities. Everyone is unique in our characteristics of height, weight, reach and body dimension.

Most of us fall between the 5th percentile and the 95th percentile for height and weight. But there are those that fall below the 5th percentile or exceed the 95th percentile. Men and women have different anthropometrics. Fitting the work area to our characteristics is what defines good ergonomics and explains why "one size doesn't fit all."

When we measure an individual or a population, keep in mind the following:

Static: measurements are taken when the body is in a fixed position such as sitting or standing.

- Standing eye height
- Seated wrist height

Dynamic: measurements are taken when the body is performing a physical activity such as a forward or overhead reach.

When designing a work area or creating criteria for a job, it is important to understand the constraints that surround human design. These include the following:

- **Clearance:** Adequate headroom, legroom, elbow room. Handles opened large enough for the fingers or palm. Attempt to fit 95th % male to meet remainder of population.
- **Reach:** Maximum acceptable dimension of the object. I.E. the ability to see over an obstruction, to be able to grasp and operate controls. Determined by 5th% female to meet remainder of population.

- **Posture:** Working posture is partially determined by their relationship to their workstation as well as vision and reach.
- **Strength:** Set strength based on the weakest user.

When performing an office or material handling ergonomic evaluation, measuring the employee, the worksite and essential tools helps to understand the "fit" of the work environment to the employee. When the fit is not quite right, problems develop. These are inconsistencies and incongruences which lead to awkward postures, over exertion or an overall poor match between the employee and the worksite.

Human measurements should be taken in the most desirable position in which the work should be performed. This means measuring in neutral seated or standing postures. All other measurements should be taken at the non-altered height or distance. Then, by comparing the measurements, one can see where change is needed.

As a rule of thumb in office ergonomics, when measuring an employee seated in their chair:

- **Establish neutral posture:** With feet on floor, hips and knees at 90 degrees so weight is distributed over buttock and thighs, elbows at 70-90 degrees to upper arm.
- **Actual measurement:** Take the measurement of the fixed height surfaces and tools before any changes are made.

Adjustments are made to *match* neutral posture to the work environment for the best fit. Changes are made when there is not a match or fit in the preferred posture.

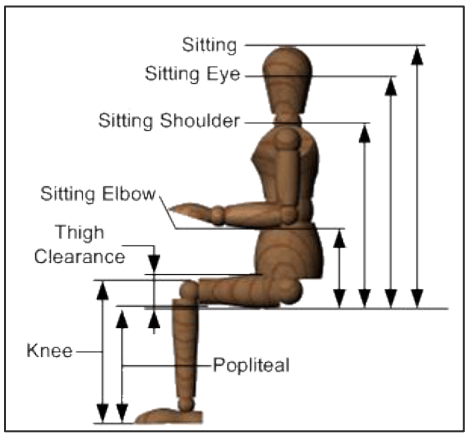

Figure 5. An example of an anthropometric diagram for seated measures.

Here are several common anthropometric office measures with their significance.

Area of Measurement	Measurement	Significance
Chair	Floor to back of knee height	Determines seat pan height
Keyboard	Floor to seated wrist height	Determines keyboard height
	Floor to seated elbow height	Determines keyboard tray height
	Floor to keyboard height	Determines actual Keyboard height (relative to neutral seated posture; adjust as needed)
Work Surface	Measure work surface height	Determines whether surface height is appropriate for employee Desk height = elbow height + 1"- 2"
Monitor	Measure floor to seated/standing eye height	Determines appropriate monitor height for seated/standing view
	Measure floor to desk height + desk to monitor first line of type height	Determines monitor placement relative to seated/standing eye height
Chair Fitting	Measure seat pan to forearm height	Determines armrest height
	Measure from buttock to back of knee	Determines seat length
	Measure from seat pan to shoulder	Determines seat back height
	Measure standing elbow to elbow height	Determines seat width or armrest width
Standing Workstation	Measure floor to standing elbow height	Determines work surface height in standing for keyboard/mouse placement
Monitor Glare Screen	Measure across diagonal of screen	Determines size of monitor screen and size of glare screen, if needed

Establish neutral posture first and take all anthropometric measurements from that position. The keyboard should be set (at or) slightly below elbow height [Gerr Study, 2002].

Use the above measurements when conducting an office ergonomic assessment to validate your findings instead of guessing at what changes you think should be made. Being objective using measurements is essential in conducting a reliable ergonomic assessment whether in the office or in industry.

8. Basic Ergonomic Evaluation Tools to Get Started in the Office

Conducting a Preventive Office Ergonomic Evaluation

Ergonomic Evaluation Procedure

1. Introduce yourself to the employee. Gather basic information about employee, their concerns, stature, vision and the type of workstation used.
2. Observe employee for a few minutes. Look for how they are sitting, placement of keyboard and monitor relative to their posture, reach for the keyboard and mouse, wrist and hand placement, phone placement, document placement for inputting.
3. Establish neutral seated posture in the chair. Make necessary adjustments to assure feet on

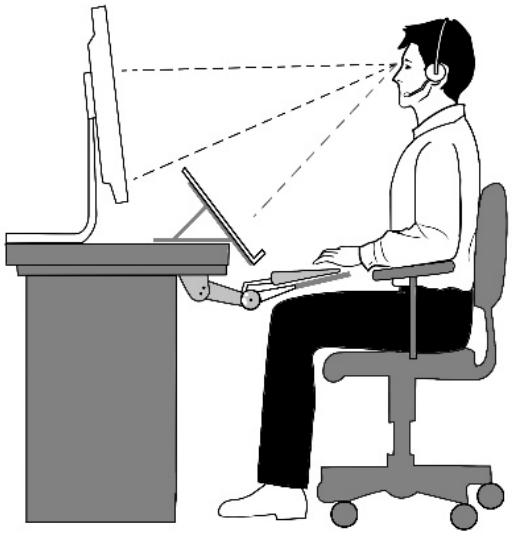

Figure 6. A typical preferred seated ergonomic workstation set up model.

the floor (or footring) and elbows close to trunk,
back supported and head straight ahead.

4. Determine fit to the keyboard, mouse, monitor and other tools used routinely relative to neutral seated (and standing) posture.

5. Measure relationships as needed; look for incongruences and awkward postures.

6. Make quick fixes to allow for best neutral seated posture possible; identify areas for improvement and recommendations to allow neutral posture.

7. Educate the employee on how to adjust and place all equipment for best fit. Adjust as needed and able.

Be pragmatic in your approach. Observe employee working postures (while working) for several minutes. Observe for awkward motion patterns and non-neutral postures.

Assess seating including the quality of the chair employee has been provided with. Assure it is safe to use; assure all mechanical parts are working and the foam/fabric is intact and good quality. Review all the features and adjust to fit.

Once the chair is set for neutral posture and the employee is comfortable, assess the relationship to all other areas.

9. Understanding Neutral and Non-Neutral Postures

Principles of Neutral Posture:

- Maximum muscle force producible in neutral postures is greater than maximum muscle force producible in awkward postures.
- Fatigue occurs sooner when working in awkward postures.
- Working in extreme awkward postures (near extreme ranges of motion) causes stress on muscles and joints.

> "Chairs are foundational to good office ergonomics. If the chair isn't right, the ergonomics will never be right. "
>
> Alison Heller-Ono MSPT, CDA, CIE, CPE

A neutral posture is achieved when the muscles are at their resting length and the joint is naturally aligned. For most joints, the neutral posture is associated with the midrange of motion for that joint. When a joint is not in its neutral posture, its muscles and tendons are either contracted or elongated. Joints in neutral postures have maximum control and force production [Basmajian and De Luca 1985; Chaffin et al. 2006].

Neutral postures also minimize the stress applied to muscles, tendons, nerves, and bones. Therefore, it is most desirable to work in neutral. A posture is considered "awkward" when it moves away from the neutral posture toward the extremes in range of motion.

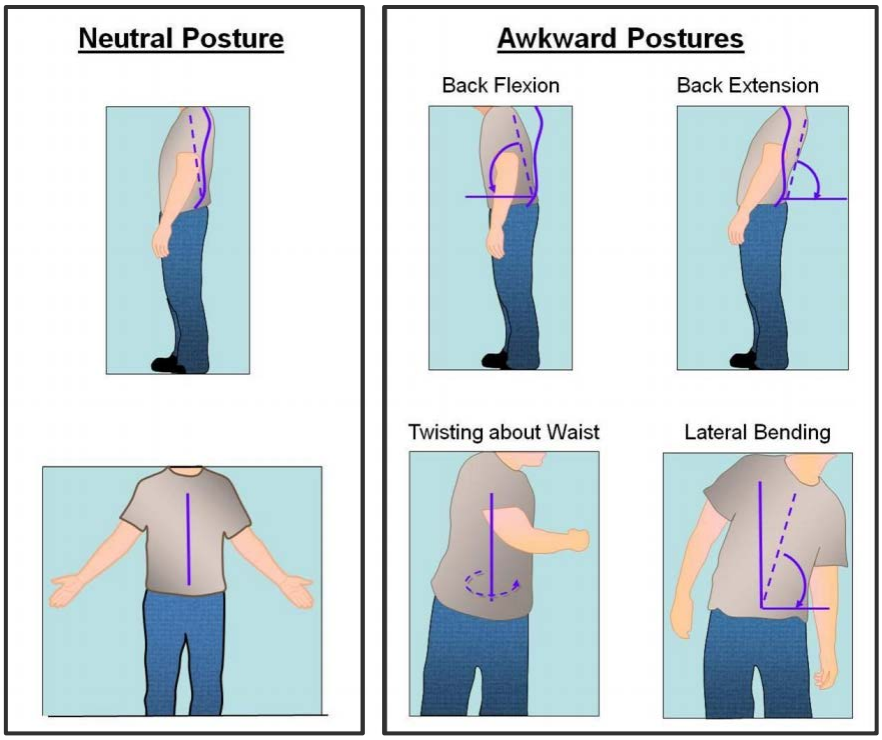

Figure 7. Neutral and awkward back postures.

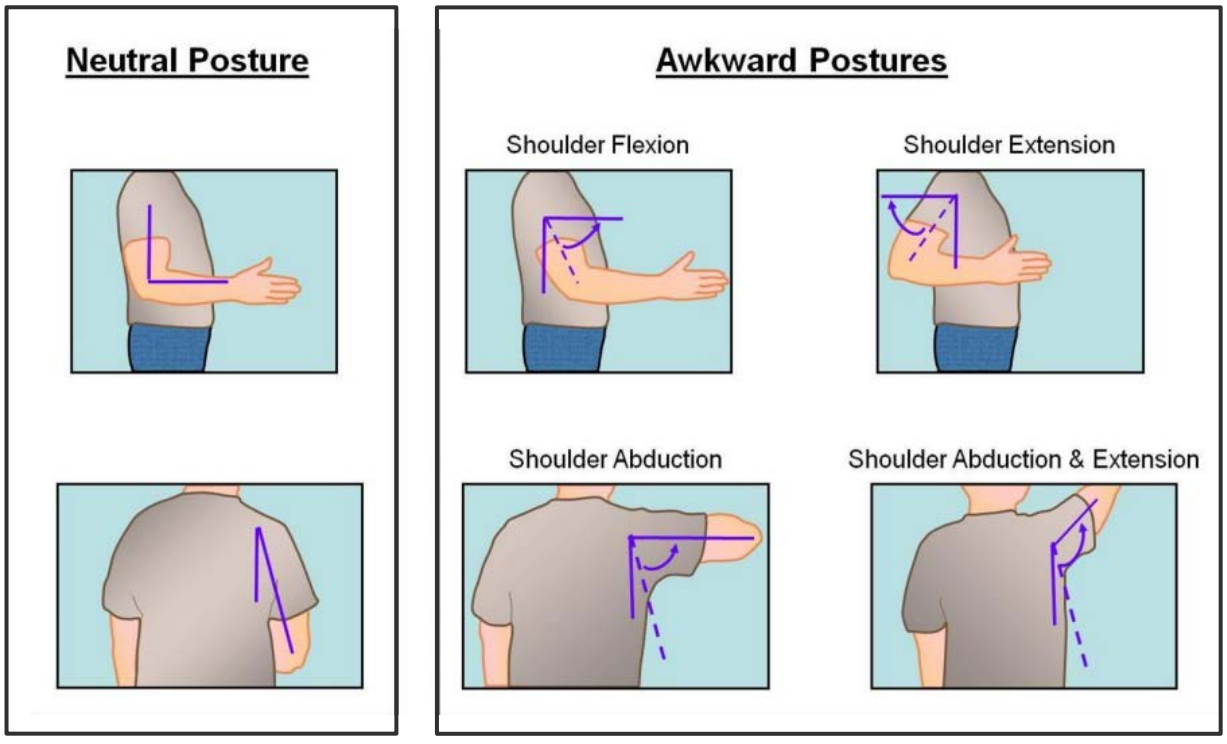

Figure 8. Neutral and awkward shoulder postures.

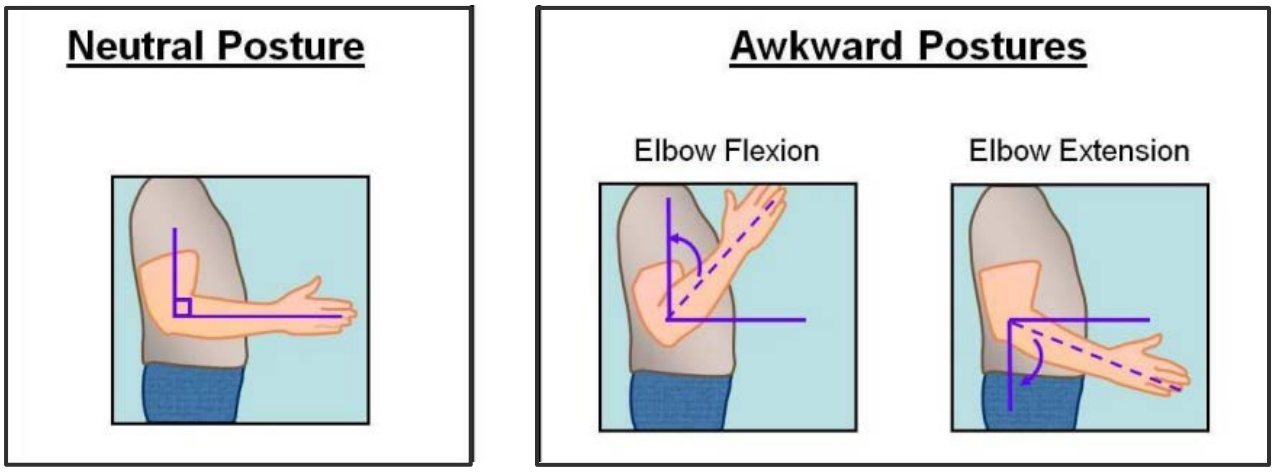

Figure 9. Neutral and awkward elbow postures.

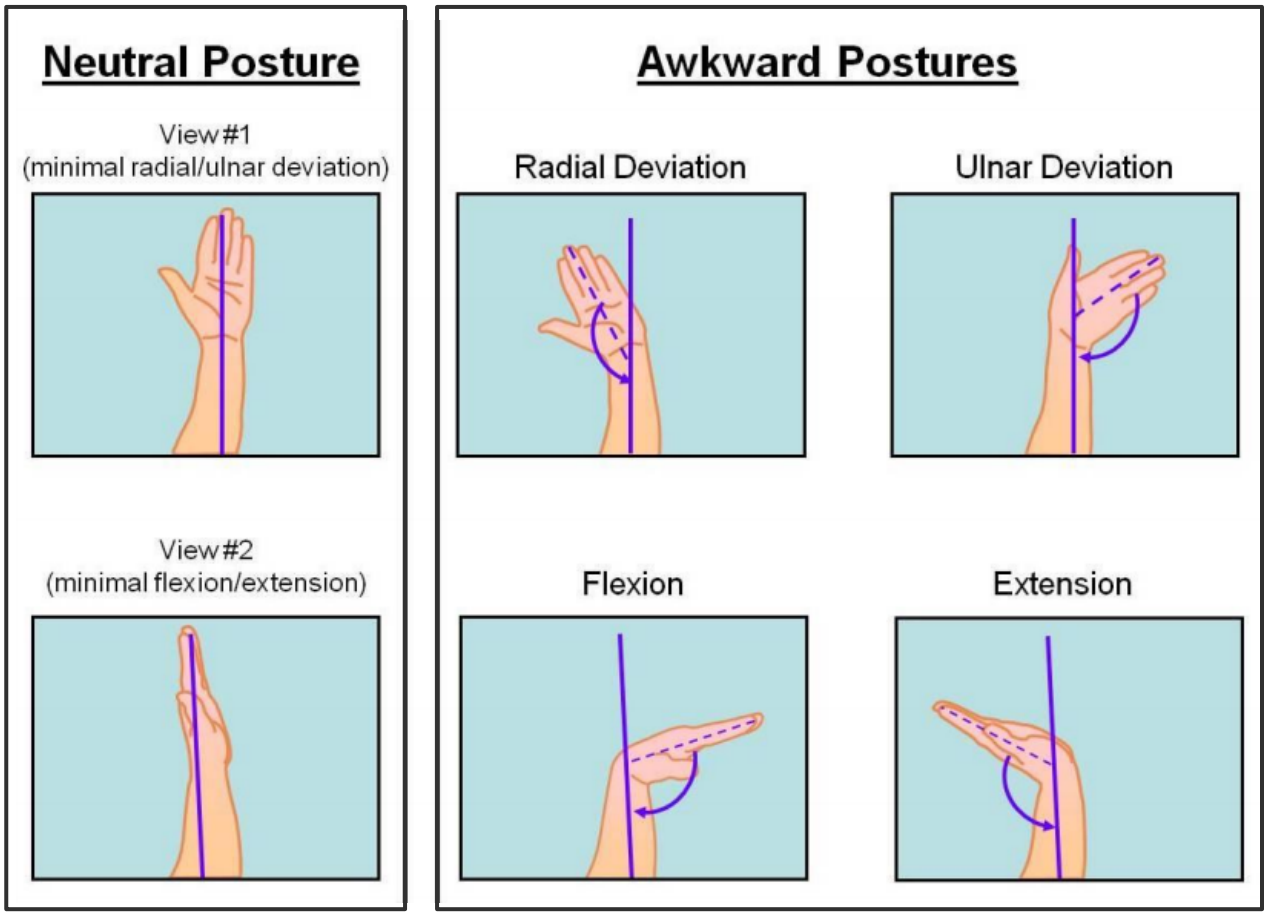

Figure 10. Neutral and awkward wrist postures.

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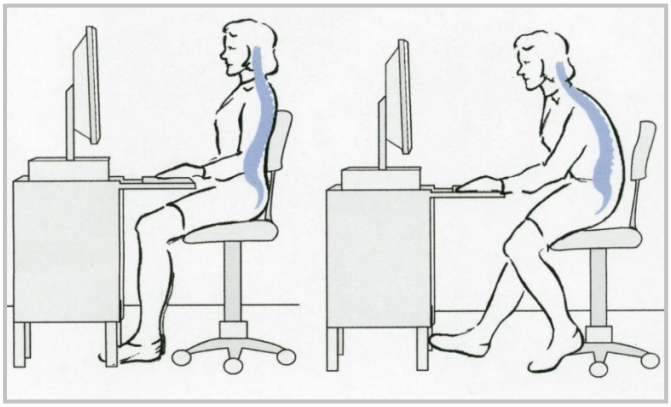
10. Understanding Common Office Ergonomic Concerns

The area of discomfort employees report is very important in understanding what to evaluate in an office environment. Discomfort is not normal. Employees often experience discomfort in association with a work task or tool use. Below are some common areas of discomfort and what to evaluate in the office.

Area of Discomfort	Evaluate
Neck area	Monitor placement (height and depth); document placement; cradling the phone; looking over shoulder and down; rotation
Upper and mid back	Monitor placement, reach to keyboard/mouse; sitting posture; unsupported sitting; chair design and fit
Lower back	Chair design and fit, lumbar and back rest height, unsupported sitting; feet not on floor
Shoulder/Arm	Reach to keyboard and mouse; unsupportive postures; no armrest use; leaning on desktop; shoulder elevation
Elbow/Forearm	Wrist angle at keyboard/mouse; leaning on desk; keyboard size; excessive gripping with pointing device
Wrist/Hand/Fingers	Keyboard/mouse mechanics; size of devices; awkward wrist and hand angles; excessive thumb or finger use; poised postures at devices



Correct seated posture | Incorrect seated posture

Figure 11. Preserve neutral posture by setting up the chair correctly first. Then align all other areas.

Assess Working Postures

The workstation is designed or arranged for doing computer tasks, so it allows employee's...

1. **Head** and **neck** to be upright, or in-line with the torso (not bent down/back). If "no" refers to Monitors, Chairs and Work Surfaces.

   ☐ Yes ☐ No

2. **Head**, **neck**, and **trunk** to face forward (not twisted). If "no" refer to Monitors or Chairs.

   ☐ Yes ☐ No

3. **Trunk** to be perpendicular to floor (may lean back into backrest but not forward). If "no" refer to Chairs or Monitors.

   ☐ Yes ☐ No

4. **Shoulders** and **upper arms** to be in-line with the torso, generally about perpendicular to the floor and relaxed (not elevated or stretched forward). If "no" refer to Chairs.

   ☐ Yes ☐ No

5. **Upper arms** and **elbows** to be close to the body (not extended outward). If "no" refer to Chairs, Work Surfaces, Keyboards, and Pointers.

   ☐ Yes ☐ No

6. **Forearms**, **wrists,** and **hands** to be straight and in-line (forearm at about 90 degrees to the upper arm). If "no" refer to Chairs, Keyboards, Pointers.

   ☐ Yes ☐ No

7. **Wrists** and **hands** to be straight (not bent up/down or sideways toward the little finger). If "no" refer to Keyboards or Pointers.

   ☐ Yes ☐ No

8. **Thighs** to be parallel to the floor and the **lower legs** to be perpendicular to floor (thighs may be slightly elevated above knees). If "no" refer to Chairs or Work Surfaces.

   ☐ Yes ☐ No

9. **Feet** rest flat on the floor or are supported by a stable footrest. If "no" refer to Chairs, Work Surfaces.

   ☐ Yes ☐ No

Assess Seating

Consider these points when evaluating the employee's chair…

1. **Backrest** provides support for the lower back (lumbar area).
   ☐ Yes ☐ No
2. **Seat width** and **depth** accommodate the specific user (seat pan not too big/small).
   ☐ Yes ☐ No
3. **Seat front** does not press against the back of employee's knees and lower legs (seat pan not too long).
   ☐ Yes ☐ No
4. **Seat** has cushioning and is rounded with a "waterfall" front (no sharp edge).
   ☐ Yes ☐ No
5. **Armrests,** if used, support both forearms while performing computer tasks and do not interfere with movement.
   ☐ Yes ☐ No

A "no" answer to any of these questions should prompt a review of the chair.

To assess chair quality and competency for ongoing, safe use, consider the following:

1. Age of the chair (caution if 10 or more years old)
2. Number of shifts used; single or multiple users (multiple shifts reduces warranty)
3. Cushion and fabric quality
4. Mechanics of the chair operate safely and as intended
5. Perceived end-user comfort
6. Overall quality and competency

Failure in one or more areas is problematic. Either repair the chair if it is under warranty or remove it from operation and replace it promptly.

To easily assess chair quality and competency, download the Worksite International Chair Assessment Tool at (http://www.worksiteinternational.com/Chair-Assessment-System-Try-it.html)

Figure 12. Observe for neutral, forward tilt or recline options on the chair for good ergonomic adjustability.

Following the chair assessment and observations of seated work postures, check the Keyboard and Input Device.

Assess Keyboard/Input Device

Consider these points when evaluating the keyboard or pointing device. The keyboard/input device is designed or arranged for doing computer tasks so the…

1. **Keyboard/input device platform(s)** is stable and large enough to hold a keyboard and in input device.
   ☐ Yes ☐ No
2. **Input device** (mouse or trackball) is located right next to the keyboard so it can be operated without reaching.
   ☐ Yes ☐ No
3. **Input device** is easy to activate, and the shape/size fits employee's hand (not too big/small).
   ☐ Yes ☐ No
4. **Wrists** and **hands** do not rest on sharp or hard edges.
   ☐ Yes ☐ No

"No" answers to any of these questions should prompt a review of keyboards, pointers, or Wrist Rests.

In general, workers should avoid leaning on their wrists with keyboard and mouse use, whether it is on a wrist rest or the desk surface. Instead, the chair armrests should be adjusted to fit. If the armrests can't be positioned to provide forearm support, go back to your chair evaluation. Contact stress on a wrist rest or desk edge or surface is not recommended.

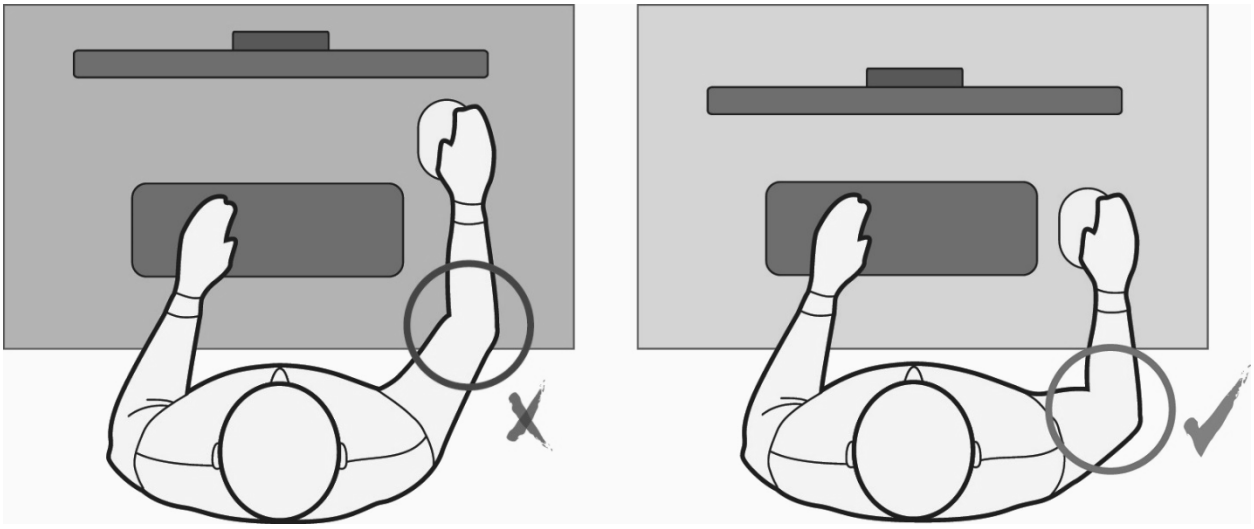


Figure 13. Proper keyboard and mouse placement allows the elbows close to the trunk with wrist in line with forearm. Minimal shoulder rotation should occur.

Monitor placement should be directly in front of the employee with no noticeable head/neck rotation or elevation to view through bifocals. If you see the chin in an upward position or downward position, the monitor is too high or too low. Here are additional considerations:

Evaluate Monitor Placement

Consider these points when evaluating the monitor. The monitor is designed or arranged for computer tasks so the...

1. **Top** of the screen is at or below eye level, so it can be read without bending the head or neck down/back.

   ☐ Yes ☐ No

2. **User with bifocals/trifocals** can read the screen without bending the head or neck backward.

   ☐ Yes ☐ No

3. **Monitor distance** allows the screen to be read without leaning head, neck or trunk forward/backward.

   ☐ Yes ☐ No

4. **Monitor position** is directly in front to avoid twisting the head or neck.

   ☐ Yes ☐ No

5. **Glare** (for example, from windows, lights) is not reflected on the screen which can cause an awkward posture to clearly see information on the screen.

   ☐ Yes ☐ No

   "No" answers to any of these questions should prompt a review of Monitors or Lighting/Glare.

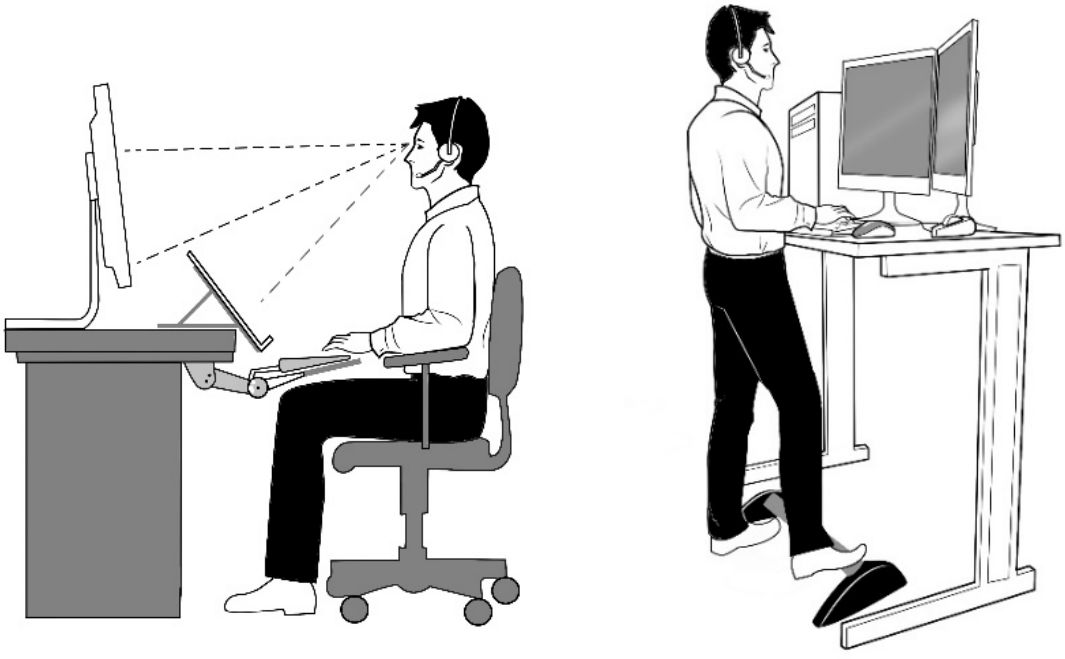


Figure 14. Proper monitor placement should be set within visual comfort and across from seated or standing eye height.

Assess the work surface and layout of equipment, tools and accessories to assure placement within near reach zones.

Assess Work Area

Consider these points when evaluating the desk and workstation. The work area is designed or arranged for doing computer tasks so the...

1. **Thighs** have sufficient clearance space between the top of the thighs and the computer table/keyboard platform (things are not trapped).

   ☐ Yes ☐ No

2. **Legs** and **feet** have sufficient clearance space under the work surface, to get close enough to the keyboard/input device.

   ☐ Yes ☐ No

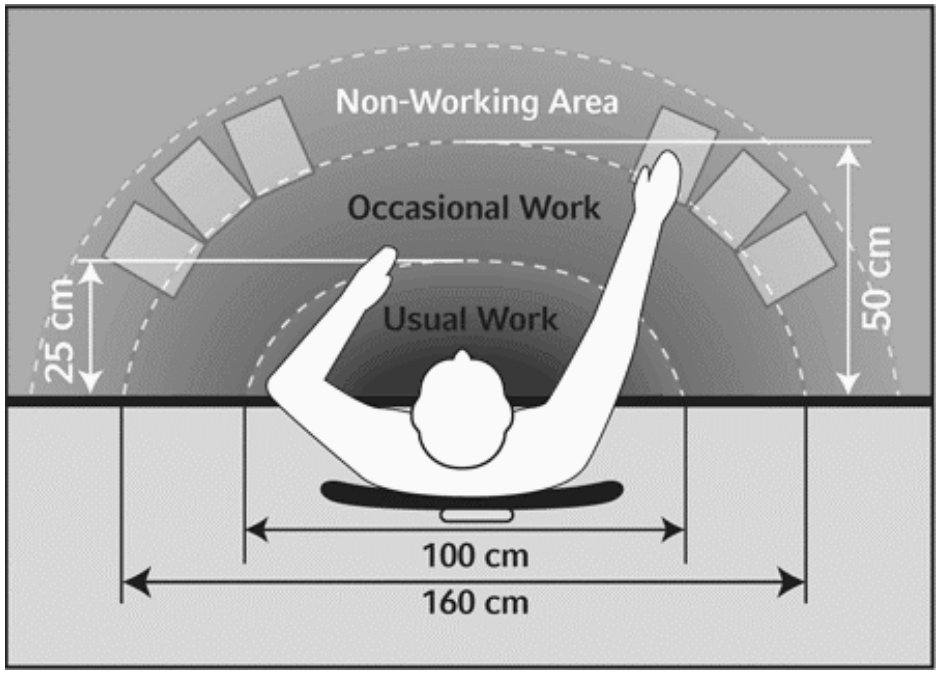


Figure 15. Set up common tools and materials within near reach for usual work or arms reach for occasional work. Non-essential items should be beyond the arms reach zone or the non-working area.

Click here to download the OSHA computer workstation checklist shown in this diagram: (https://www.osha.gov/SLTC/etools/computerworkstations/checklist_evaluation.html)

The last step is to assure proper use and availability of a document holder, telephone and headset and wrist supports, if needed. Here are some considerations:

Common Accessories

Check to see if the...

1. **Document holder**, if provided, is stable and large enough to hold documents.
   ☐ Yes ☐ No
2. **Document holder**, if provided, is placed at about the same height and distance as the monitor screen or inline between monitor and keyboard so there is little head movement, or need to re-focus, when viewing the document to the screen.
   ☐ Yes ☐ No
3. **Wrist/palm rest**, if provided, is padded and free of sharp or square edges that push on wrists.
   ☐ Yes ☐ No
4. **Wrist/palm rest**, if provided, allows keep forearms, wrists, and hands straight and in-line when using the keyboard/input device. Rest during pauses only, not while typing.
   ☐ Yes ☐ No
5. **Telephone** can be used with head upright (not bent) and shoulders relaxes (not elevated) if performing computer tasks at the same time.
   ☐ Yes ☐ No

"No" answers to any of these questions should prompt a review of Work Surfaces, Document Holders, Wrist Rests or Telephones.

As you assess and correct, continue to engage with the employee to assure they understand why the changes were made and how to do it themselves once you leave. It is of no good if the employee doesn't grasp the "why and the how" to be accountable to their own workstation ergonomics.

In general, make sure the workstation and equipment have sufficient adjustability, so the employee is in a safe working posture and can make occasional changes in postures while performing computer tasks. All equipment should be working effectively and in good condition. Organize computer tasks in a way that allows the employee to vary their tasks with other work activities or to take micro-breaks or recovery pauses while at the computer workstation.

11. Workstation Set Up Guidelines

This section provides suggestions to help establish workstation furniture and accessories guidelines for general use. Criteria is provided for petite, average and tall/obese individuals to use in an office environment. Guidelines are included for chairs, work surface height, keyboard, pointing device, keyboard tray use and monitor use.

The information provided are general recommendations based on our extensive evaluation experience assessing thousands of office workers and are intended for “healthy” populations.

As always, an ergonomic assessment is recommended to validate, measure and more accurately select the furniture and ergonomic accessories appropriate for each person’s needs whether healthy, injured or disabled.

Workstation Criteria	Petite 5'2 or less	Average 5'2 -5'10	Tall/Obese 5'10 or more
Chairs Minimum suggested features for seated workstation	Seat pan width 16"-18" W	Seat pan width 18"-22" W	Seat pan width 22"- 27" W
	Low- mid back height	Mid to high back height	Adjustable seat depth
	Optional: adjustable seat depth	Adjustable seat depth	High Back height
	4- way armrests to include height, width (horizontal); fore/aft and pivot	4- way armrests to include height, width (horizontal); fore/aft and pivot	4- way armrests to include height, width (horizontal); fore/aft and pivot
	Shorter cylinder 15"-20."	Standard cylinder 16"-21", 17"-22"	Standard cylinder, 17"-22"
	Independent seat pan and back tilt to include forward tilt	Multi-positioning chair to include recline to neutral	Multi-positioning chair to include recline to neutral
			Cylinder support >275 lbs.
Work Surface Any size for single, two tasks, three task designs	Height adjustable range 22"-47"H Seated Fixed: 25"-27"H	Height adjustable range 22"-47"H Seated Fixed: 27"-29"H	Height adjustable range 25"-50"H Seated Fixed: 29"- 31" H

Workstation Criteria	Petite 5'2 or less	Average 5'2 -5'10	Tall/Obese 5'10 or more
Keyboard If standard keyboard design not acceptable	Compact without ten keys or split adjustable with/without ten keys; 13"-16" L	Split adjustable with/without ten keys; Natural Wave type; 16"-18" L	Full split with/without ten keys; Natural Wave type; 18"-20" L
Pointing Device If standard 2 buttons, scroll mouse unacceptable.	Notebook size; small semi vertical or standard symmetrical Hand size 6.5" L or less	Standard symmetrical mouse, Medium Semi-vertical or vertical mouse Hand size 7" - 7.5" L	Large Semi-vertical or Vertical mouse. Hand size 7.5" or greater
Keyboard Tray Used with Fixed height desk, if desk height is above neutral seated elbow height. May use footrest for elevated seat height to reach desk.	Type: Single surface for keyboard adjacent to mouse or mouse above ten keys, if no ten- key use	Type: Single surface for keyboard adjacent to mouse or mouse above ten keys, if no ten- key use	Work on desktop
	Typically: 25"-27" L	Typically: 25"-27" L	
	Easy articulation for height, angle and retraction.	Easy articulation for height, angle and retraction. Or- work on desktop	
Monitor: 22" or > For normal vision. If bifocal use for monitor viewing, then keep low. Angle as desired.	Place on desktop or raise 2", if needed Use Monitor Arm	Raise 4"-6." Use Monitor Arm	Raise 6"-10" Use Monitor Arm

12. Safe Work Practices in the Office

Reinforce safe work practices with the employee which include performing as many of the do's and don'ts for office workers:

DO...

- ☐ Report any concerns to your supervisor early.
- ☐ Assure your monitor is positioned across from or slightly below your seated eye height.
- ☐ While performing deskwork or computer work, be conscious of your sitting posture, your chair position, and how your arms are aligned with your work surface to assure neutral alignment.
- ☐ Keep your wrists in neutral and avoid excessive deviations when typing or performing manual tasks.
- ☐ Position the keyboard at or slightly below elbow height to support an open elbow angle.
- ☐ Adjust your chair as your tasks change through the day. Use forward tilt for desk work; recline while on the telephone conversing, maintain lumbar support.
- ☐ Use a headset for telephone work.
- ☐ Keep your work area well organized. Avoid cluttering the area around your legs and feet.
- ☐ Keep commonly used items within near reach (14" to 24") and arranged in a half circle around you.
- ☐ Set up your document holder between the keyboard and monitor for easy viewing.
- ☐ Monitor how hard you are gripping your hand tools or keying and lighten up.
- ☐ Float your hands and wrists over the keyboard. Lift from the elbow to reach the mouse.
- ☐ Move from the shoulders when typing and using the mouse to activate large muscle groups.
- ☐ Change your position often (every 30 minutes to hourly). Without a standing desk: Stand for 15 sec. 4 x an hour.

- ☐ If your desk is height adjustable, stand up to 30 minutes for every 60 minutes seated or 2.5-4 hours' total/day.
- ☐ Alternate your work tasks throughout your workday.
- ☐ Recognize early signs of muscle fatigue and stretch or change your task.
- ☐ Rest your eye muscles periodically by changing the distance at which you are viewing.
- ☐ Maintain good flexibility and strength. Stretch while at work and walk around the department. Stretch every 30 minutes for up to 5 minutes during a repetitive task.
- ☐ Ice an area if it is aching during or after work for at least 20 minutes/day.

DON'T…

- ☐ Sit in the same position for more than 60 minutes.
- ☐ Wait until you feel pain or discomfort to stop an activity.
- ☐ Sit with slouched posture over your desk.
- ☐ Do a repetitive task all at once.
- ☐ Pinch or grip your mouse excessively or pound your keyboard.
- ☐ Cradle the phone between your neck and shoulder.
- ☐ Keep your body, arms or legs in an awkward position for any length of time.
- ☐ Poise your wrists in extension or lean your hands or forearms on a hard edge or wrist rest while using the keyboard.
- ☐ Hold onto your mouse or leave your hands at the keyboard if you are not actively using the tools.
- ☐ Poise with your fingers hovered over your mouse or move your mouse with your thumb.
- ☐ Over reach with your fingers, arms or back.
- ☐ *Complain if you haven't done all that you can to work in comfort.*

13. Conducting a Material Handling Evaluation

Material handling is commonplace in most industries regardless of whether it is in the office, manufacturing or other setting. We all must lift. However, it is the postural technique used when lifting that is most critical; not necessarily the weight of the load, which is also important.

Employers should design lifting tasks with inherent "safety nets", such as limiting the weight lifted to 51 lbs. or less. It is essential to reduce the compressive forces on the spine.

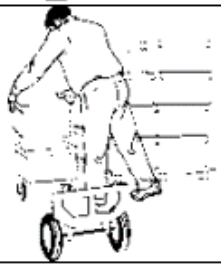
Analyzing a material handling task can be quite complex. However, keep in mind these basic questions to target what needs to change.

1. How much weight must be lifted?
2. How often is the weight lifted?
3. Where is the weight lifted from and to?
4. Is the weight lifted within the capacity of the individual performing the lift?

When it comes to manual material handling, try to target the most high-risk tasks by looking for heavy, frequent and awkward lifting activity. Washington State Division of Labor and Industry has some simple evaluation tools to help identify high risk areas to target. For the full assessment, download the Caution Zone checklist. (http://www.lni.wa.gov/safety/SprainsStrains/evaltools/CautionZones2.pdf).

Heavy, Frequent or Awkward Lifting (A simple scale can be used to determine the weight of materials)

10. Lifting object weighing more than 70 pounds once per day or more than 55 pounds more than 10 times per day. ☐



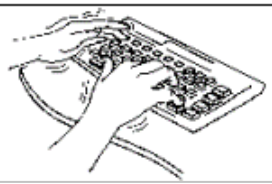
11. Lifting objects weighing more than 10 pounds if done more than twice per minute, more than 2 hours total per day. ☐

12. Lifting objects weighing more than 25 pounds above the shoulders, below the knees or at arms length more than 25 times per day. ☐

In addition to material handling, assess whether the task also includes highly repetitive motion tasks.

Highly Repetitive Motion

7. Repeating the same motion with the neck, shoulders, elbows, wrists, or hands (excluding keying activities) with little or no variation every few seconds, more than 2 hours total per day. ☐

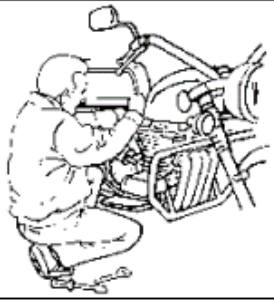


8. Performing intensive keying more than 4 hours total per day. ☐

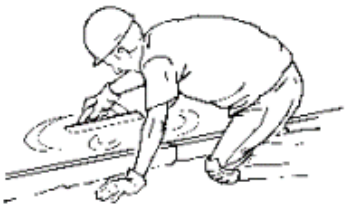
Awkward Posture

1. Working with the hand(s) above the head, or the elbow(s) above the shoulders more than 2 hours total per day. ☐

2. Working with the neck or back bent more than 30 degrees (without support and without the ability to vary posture) more than 2 hours total per day. ☐



3. Squatting more than 2 hours total per day. ☐



4. Kneeling more than 2 hours total per day. ☐

Assess the postures the employee works in when performing the material handling tasks. Look for awkward postures with and or without loads. Awkward postures are those that require the employee to be out of neutral spinal alignment and include reaching overhead, behind, out to the side and twisting, while bending.

The combination of force, repetition and awkward postures is the driver behind most manual material handling accidents. It is not enough to train employees in safe lifting. The task must be designed to be as safe as possible. This includes addressing the following:

- Assure the load weighs less than 51 lbs.; better if it is less than 35 lbs.

Assure the load is lifted close within the Power Zone, at the body's center of gravity (belly button!). Whenever possible, use a material handling assistive device like a hand truck, pallet jack, or two-person lift.

Avoid repetitive lifting for more than 2 hours/day.

14. NIOSH Lifting Equation

The NIOSH lifting equation (http://ergo-plus.com/niosh-lifting-equation-calculator/) is a tool used by occupational health and safety professionals to assess manual material handling risk associated with lifting and lowering tasks in the workplace. The lifting equation relies on measurements taken based on the location of the load before the lift and after the lift to calculate the compressive loads on the spine.

The primary product of the NIOSH lifting equation is the Recommended Weight Limit (RWL), which defines the maximum acceptable weight (load) that nearly all healthy employees could lift over the course of an 8-hour shift without increasing the risk of musculoskeletal disorders (MSD) to the lower back. In addition, a Lifting Index (LI) is calculated to provide a relative estimate of the level of physical stress and MSD risk associated with the manual lifting tasks evaluated.

The Recommended Weight Limit answers the question, "Is this weight too heavy for the task?"

The Lifting Index answers the question, "How significant is the risk?" Ultimately, the closer to 1.0, the safer the lift becomes with the goal of making it less than 1.0.

The RWL and LI can be used to guide lifting task design in the following ways:

1. The individual multipliers determining the RWL can be used to identify specific weaknesses in the design.

2. The LI can be used to estimate the relative physical stress and injury risk for a task or job. The higher the LI value, the smaller the percentage of workers capable of safely performing these job demands. Thus, injury risk of two or more job designs could be compared.

3. The LI can also be used to prioritize ergonomic redesign efforts. Jobs can be ranked by LI and a control strategy can be implemented based on a priority order of the jobs or individual lifting tasks.

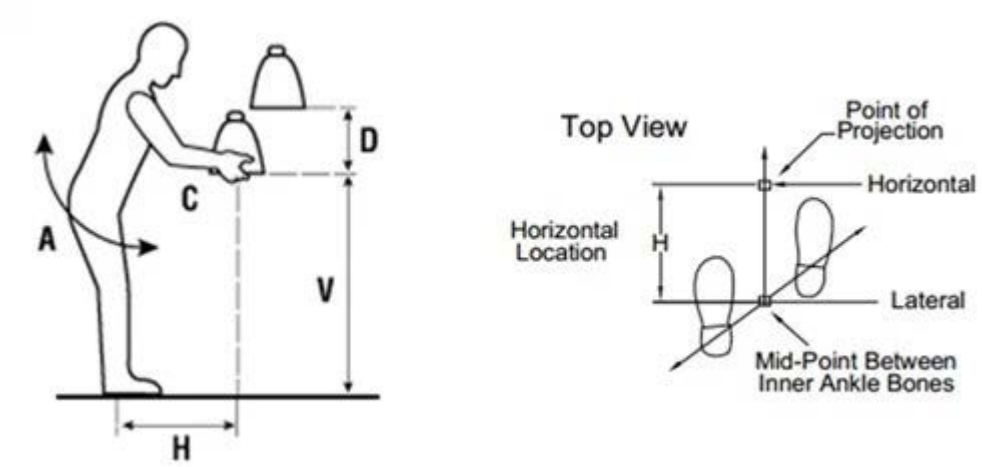


Figure 16. Typical measurements used in the NIOSH formula.

The variables assessed in the NIOSH Lifting Equation include:

1. Horizontal location (H)
2. Vertical location (V)
3. Travel distance (D)
4. Angle of Asymmetry (A)
5. Coupling of the hands to the object (C)
6. Frequency of the lift
7. Average load
8. Maximum load
9. Duration of the lift

A "load constant" (LC) of 23 kg (about 51 lbs.) was established by NIOSH as a load that, under **ideal** conditions, is safe for 75% of females and 90% of males. The **recommended weight limit** is calculated by using the NIOSH lifting equation.

For example, the guidelines suggest that men should be able to safely carry a load of **25kg** if held close to the body at around waist height. However, the maximum weight to lift at arm's length and above shoulder height are reduced to 5kg or about 12 lbs.

The Liberty Mutual MMH Tables (commonly known as **"Snook Tables"**) outline design goals for various lifting, lowering, pushing, pulling, and carrying tasks based on research by Dr. Stover Snook and Dr. Vincent Ciriello at the Liberty Mutual Research Institute for Safety.

A good rule to follow is the closer the load is to your center of gravity, or power zone, the safer the lift will be. It's not necessarily the weight of the load, but the posture when the lift is performed. Avoid bending the back while the legs are straight. Rather, keep the back straight, in neutral and bend at the hips and knees whenever possible.

Recently, NIOSH has designed a free app to calculate the NIOSH lifting equation using y our phone. To download it, visit (https://www.cdc.gov/niosh/topics/ergonomics/nlecalc.html.)

To understand the impact of leverage and moment on the back and other body parts, watch these videos (https://www.youtube.com/watch?v=ENSb6BsM_q8).

To learn more about the NIOSH lifting equation, visit:

- Ergonomics Plus website (http://ergo-plus.com/niosh-lifting-equation-calculator/)
- Canadian Center for Occupational Health and Safety (https://www.ccohs.ca/oshanswers/ergonomics/niosh/calculating_rwl.html)
- Oregon OSHA also has a lifting calculator app (http://osha.oregon.gov/OSHAPubs/apps/liftcalc/lifting-calculator-app.html)

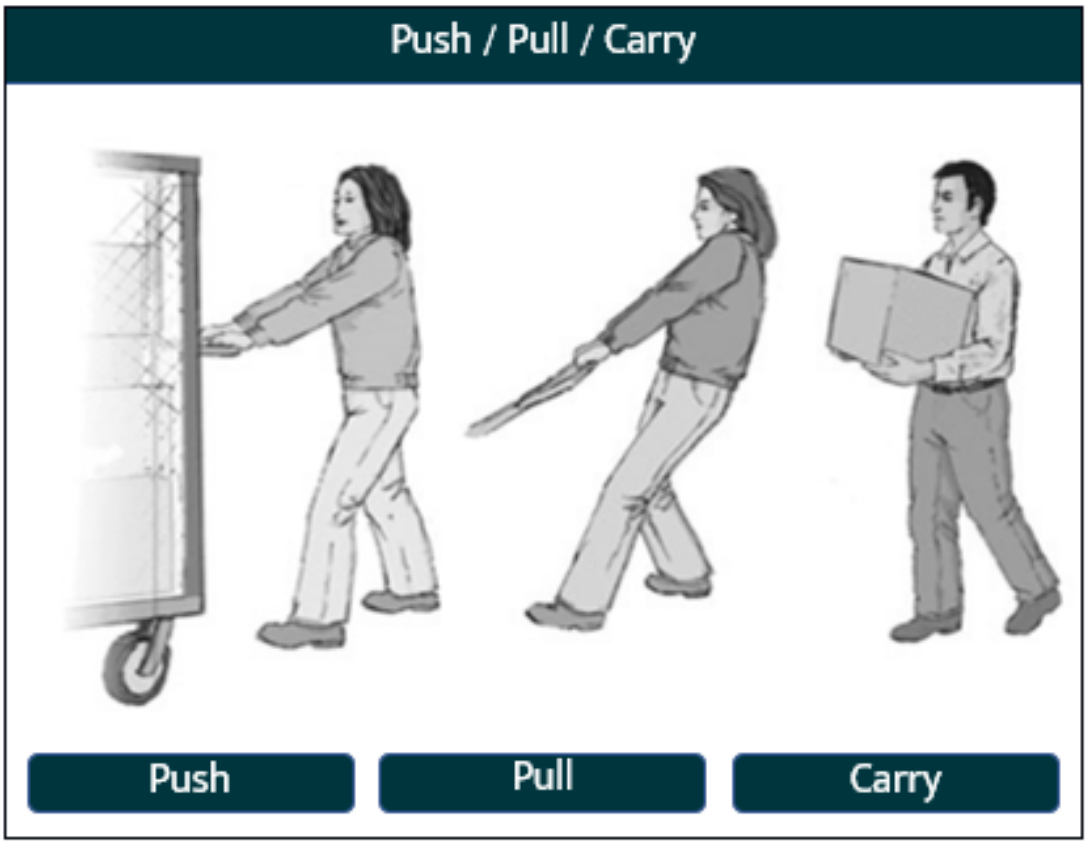


Figure 17. The WorkSafeBC calculator is a handy tool to measure push, pull and carry exertion to assure the task is designed within safe limits.

15. Assessing Pushing, Pulling and Carrying Tasks

Excessive force used during push, pull, or carry tasks and the posture in which the task is performed can result in injury. Issues to be mindful of requiring excessive push/pull task are based on the height at which the hands are positioned to perform the task; the weight of the load when measured in the cart; the diameter and condition of wheels or casters. Using excessive force during these tasks can cause musculoskeletal injury. Use this calculator to estimate these suggested maximums:

- Force that can be used during pushing and pulling
- Weight that can be carried

Adjust the values to match your unique situation.

This calculator is based on data from a manual handling study commonly referred to as the Snook tables (http://worksafebcmedia.com/misc/calculator/ppcc/#terms-modal). The purpose of this calculator is to help users assess forceful exertion during push, pull, or carry tasks.

16. Manual Material Handling Safe Work Practices

Modifying how a lift is performed is a critical part of managing the exposure. Employees must know how to lift properly with or without modifications. In many cases, however, the employer expects the employee to perform the lift correctly, yet the work environment has not been modified to support safe lifting postures.

Here are some common do's and don'ts for safe work practices in material handling:

DO...

- ☐ Stretch and get warmed up before performing manual handling tasks.
- ☐ While carrying out manual handling tasks, be aware of how your body is aligned.
- ☐ Prepare for the task by removing obstacles in your path and by sizing up the load.
- ☐ Maintain neutral postures for different body parts as much as possible.
- ☐ Be close to the load you are handling.
- ☐ Bend your hips and knees instead of bending your back. Keep your low back locked in its natural arched position.
- ☐ Pivot or move your feet instead of twisting or leaning your body to the side.
- ☐ Be well balanced by keeping your feet as wide as your shoulders.
- ☐ Alternate your work tasks throughout the day whenever possible.
- ☐ Recognize early signs of muscle fatigue, and stretch, change position or change your task.
- ☐ Straighten up frequently and stretch your back backwards, if you cannot avoid bending over.

- ☐ Wear comfortable, cushioned and well supportive shoes.
- ☐ Get help if the load is too bulky or heavy.
- ☐ Have one person direct the lift in a team lift.
- ☐ Push a cart rather than pulling it.
- ☐ Avoid lifting or carrying by using mechanical help such as carts, hand trucks and forklifts whenever possible.
- ☐ If using adjustable mechanical aides, adjust the height of the cart or table to be level with the task height. i.e. If moving from waist height loads, set cart or table to same height
- ☐ Take the time to develop safe working habits by thinking about your body mechanics and the task at hand before tackling it.
- ☐ Keep yourself in good physical condition.

DON'T

- ☐ Wait until you feel pain or discomfort to stop an activity.
- ☐ Lift, carry, push or pull a load with your back bent or stooped over.
- ☐ Twist or lean your body to the side while performing a manual-handling task.
- ☐ Handle a load too far away from you.
- ☐ Over reach when moving an object from a high shelf.
- ☐ Jerk as you lift.
- ☐ Lift or carry a load that you cannot handle safely.
- ☐ Perform the same task for more than 30 minutes without a brief interruption.
- ☐ *Complain if you haven't done all you can to work in comfort.*

17. Creating Recommendations for a Successful Outcome

The goal of every ergonomic evaluation, whether it is office or industrial, is to leave the employee in a better way than before your assessment. In essence, you want to identify solutions to mitigate or eliminate the ergonomic risk factors to the extent feasible.... Always!

A variety of solutions are available to management and employees when seeking to correct for ergonomic risk factors in the office or industrial environment. Target the “low hanging fruit” to show success as soon as possible. Determining which solutions will be most effective in eliminating the risk factors is critical with respect to financial and operational feasibility. It is important that management engage employees in the implementation of solutions for the best possible outcome. A hierarchy of controls is presented:

Eliminate or minimize to the extent feasible, the risk through Engineering Controls

- Purchases
- Facility retrofits
- Facility, Workstation or Tool redesign
- Adjustable fixtures

Modify work routines through Administrative Controls

- Job rotation
- Task rotation
- Stretch breaks
- Task interruption or pacing

Other Alternatives

- Make Quick Fixes whenever possible and observe the outcome of the action
- Modify employee work practices through Training and Education
- Consider Personal Protective Equipment

18. Easy Ergonomic Recommendations in the Workplace

Industrial (Engineering Controls)

1. Raising (or lowering) production/assembly tables to a height sufficient to keep employees from bending over too far or reaching too high (above shoulders or out of their "power lift zone");
2. Use of automated pallet stacking or other assist (typically vacuum lift) machinery vs having employees lift and move fifty 30-pound boxes 6 times a day;
3. Using a two-wheel hand truck to move large boxes vs. picking it up and carrying said box with no mechanical assistance;
4. Using rollers to push/pull merchandise or product vs. brute strength to move the item(s) – i.e. a roller table for production areas;

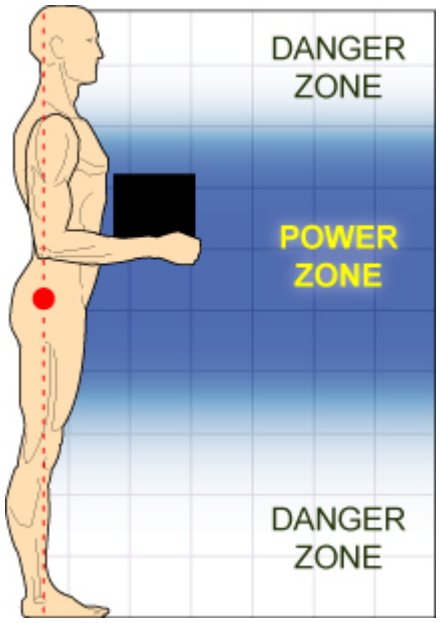


Figure 18. The power zone for lifting is close to the body, between mid- thigh and mid-chest height. This zone is where the arms and back can lift the most with the least amount of effort.

Office (Engineering Controls)

1. Eliminate back pain by adjusting the chair to provide better support to the spine and lower extremities.
2. Eliminate neck discomfort by elevating computer monitors using monitor blocks for fixed height adjustment or monitor arms (valet) for adjustable height/depth.
3. Eliminate neck discomfort associated with telephone use and cradling the phone by providing a shoulder rest or telephone headset (corded or cordless).
4. Eliminate screen glare with a glare screen.

5. Eliminate leaning on the hard edge of the desk and awkward wrist postures with a wrist rest.

6. Eliminate awkward neck postures by using in line copy holders or slant/posture boards.

7. Eliminate awkward wrist, arm and shoulder problems of reaching for keyboards by installing adjustable height and angle keyboard trays.

8. Eliminate the risk of Carpal Tunnel Syndrome with alternative keyboards or voice recognition software.

9. Eliminate seated postural fatigue by providing a sit/stand workstation.

10. Eliminate wrist/hand problems with an alternative pointing device and alternative placement of that device.

11. Eliminate eye fatigue and irritation by addressing lighting issues with desktop task lighting, adjusting window blinds and eye exam for computer lenses if needed.

Additional Resources

This guide is intended to give you a framework to assist your organization with reducing work injuries related to over exertion (force), repetition and postural risk factors typically occurring in the office and industrial/manufacturing environment. The guide serves as a starting point for ergonomics program design and management along with basic office and industrial ergonomic evaluation principles and practices.

Develop objective and measurable actions to take following review of this guide. Demonstrating improvement is critical to the success of your ergonomics program.

When the exposure to ergonomic risk factors combined with a complex environment are beyond the scope of your skill and experience level, contact Worksite International, Inc. to assist you with more complex office and industrial work environments. Using a professional to assist you is part of your responsibilities in recognizing when the problem is outside your level of experience, knowledge and expertise.

If you would like to learn more about becoming a **Certified Office Ergonomics Evaluator (COEE)** using the Worksite International system of ergonomic analysis, ask us about our "DIY: Train the Evaluator™" (http://www.worksiteinternational.com/our-services.html#ergonomics-training) workshop. This training program can be delivered onsite at your organization to give you in-house expertise to deal with basic ergonomic issues commonly experienced in most workplaces.

If you would like to audit your current ergonomics program (http://worksiteinternational.com/ergonomics-process-design-and-managememt-program.html#Ergonomics-Process-Audit) or utilize our ergonomics process tool kit, please visit our member portal (http://www.worksiteinternational-secure.com/).

For further questions or comments regarding "Ergonomic Principles Every Business Needs to Know", or if you need assistance with your ergonomic program design, management

(http://www.worksiteinternational.com/ergonomics-process-design-and-managememt-program.html) and ergonomic analysis (http://www.worksiteinternational.com/media-17/Four-Types-EWA/4-Levels-of-Expert-EWA-2016-Final.pdf), please contact:

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ABOUT WORKSITE INTERNATIONAL

WORKSITE INTERNATIONAL'S APPROACH

Since 1993, **WORKSITE INTERNATIONAL** has provided organizations with ergonomics and workers' compensation solutions to improve workplace health, safety and profitability. We have helped our clients and their employees to become more valuable, better trained and more productive, contributing more significantly to corporate goals and bottom-line profits.

OUR CLIENTS INCLUDE ALL MAJOR INDUSTRIES:

- Agricultural
- Healthcare
- Bio-Technology
- Manufacturing
- High Technology
- Service-based
- Education
- Insurance and Financial Institutions

Our private industry clients include such corporate giants as **Kaiser Permanente, Oracle, Seagate Technology, HSBC, Safety National and Everest National Insurance.** Our public sector clients range from small cities, like the **City of Newark**, California, to larger public agencies such as the **City of Reno,** Nevada, the **Monterey County Sheriff's Department,** the **County of Santa Clara** and the **US Attorney's Office.**

PARTIAL LIST OF OTHER CLIENTS:

- Monterey Regional Waste District
- City of Salinas
- County of Monterey
- Navidad Medical Center
- Everest National Insurance

Our work with our clients is participatory in nature, involving all levels of personnel, from employees to administrators, to foster behavioral and cultural changes in an organization's approach to managing its own health and safety.

- Vegetable Growers Supply
- County of Monterey Courts
- Ocean Mist Farms
- Kaiser Permanente
- Employers Insurance

At **WORKSITE INTERNATIONAL,** we facilitate and mentor key personnel to take control of work injury drivers within the organization, and manage them from the inside out . This brings maximum benefits in reducing your workers' compensation costs and improving employee performance. Our client outcomes demonstrate a Return on Investment of $3.00 to $10.00 for every dollar invested in ergonomics and workers' compensation management.

Our experience and results demonstrate that reduced workers' compensation costs, claims and organizational change require a high level of internal commitment by an organization and its most important asset, its people. Through each person, each system and process, **WORKSITE INTERNATIONAL** helps to create powerful change in a company's approach to workplace injury, illness and disability by transforming it into an ability-driven, performance-based organization.

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