



# Unit 3

## Intergration of Ergonomics at Workplace

### Learning Outcomes

**By the end of this unit the learner will be able to:**

- ✓ Use change management techniques effectively
- ✓ Describe the basic principles of ergonomics
- ✓ Outline ergonomic practices for sitting, standing, lifting, carrying, pushing, and pulling
- ✓ Design an ergonomic workstation

## Unit 3

### Integration of Ergonomic at Workplace

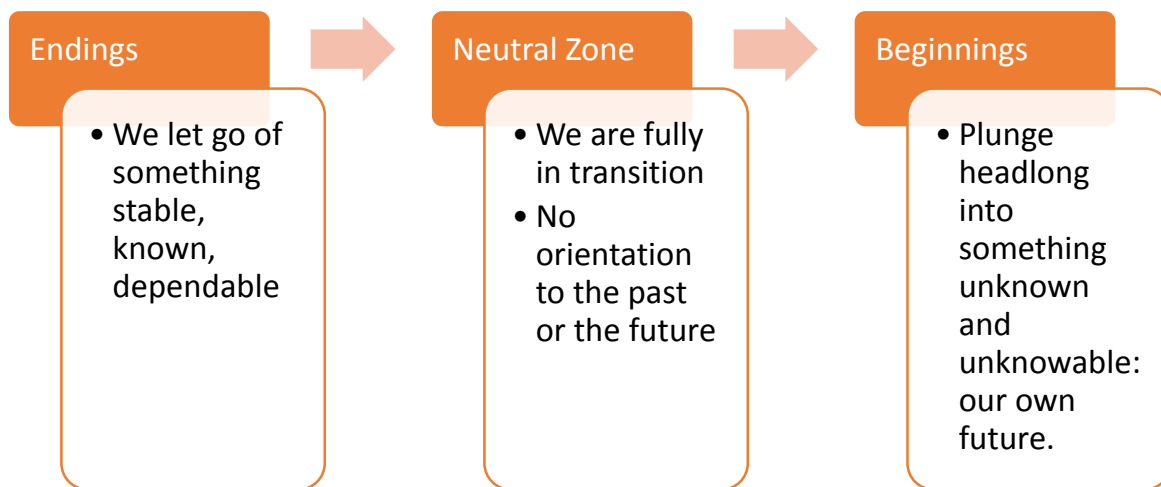
#### Obtaining Employee Buy-In

##### Change Management 101

So far, we have covered a plan to identify, evaluate, and address ergonomic hazards in the workplace. However, all of your organization’s ergonomic efforts will not succeed without the cooperation of the employees who will be affected by the changes. It is important to involve all company employees in this process whenever possible.

**Dr. William Bridges** has contributed significantly to research about how change affects us. He believes it isn’t the change that is the problem; the change is a situation. People have difficulty with the transition, which can be described as a three-part process. The transition isn’t optional, and we must all go through those three stages if we want to make the change stick.

The three stages each of us goes through in accommodating ourselves to any change are:



##### Endings

All change begins with an ending. We may try hard to intellectualize it, thinking that if we understand it, we can deal with it. However, we don't always have the skills to deal with emotional reservations. Like

the organ reject theory, our minds may know that the change is good for us, but the body still rejects it. Intellectually, we may accept a change, but emotionally, we may still resist it.

Change is sometimes perceived as exciting, stimulating, and motivating. Jack Welch, the former CEO of GE and a popular consultant, talks about change with excitement. He believes in seizing the opportunity and being open to what's ahead.

Change is often viewed as loss. An ending can be a loss, but a loss can be celebrated. It simply means that we are letting go of one thing to grasp on to another. Failing to identify and get ready for loss is the biggest difficulty for people in transition.

### **Transitions/Neutral Zone**

This is a time to complete endings and begin new patterns. People in this stage may have a strong need for support from others. Major transitions can unleash powerful conflicting forces in people.

Western culture often tries to avoid this phase of the experience and jump to new beginnings. The neutral zone is treated like a busy street to be crossed as quickly as possible. However, it is important to take the time to complete endings and integrate new patterns effectively.

### **Beginnings**

Organizations think about beginnings long before people do. There is often conflict between the organization's motivation and the critical mass to make it happen, so it is essential to get people involved, especially those who are leaders and have influence.

At this stage, people need drawing leadership (with a vision and purpose) rather than pushing management (focusing on goals and plans). Explain why ergonomic changes are being made and what benefits people can hope to see.

### **Insights**

**Think of a change you have experienced.**

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**Did you feel threatened at the time? Did it open up new insights, opportunities, or possibilities?**

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**What did you do that helped you accept the change and move on? What things did other people do that helped?**

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**Do you remember feeling like you were confused or angry?**

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**Did you have moments of anticipation and energy?**

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**Do you have some success stories to share, some times that change brought better things than you had expected?**

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## **Tips for Successful Implementation**

When it comes time to make changes to improve the ergonomics of your workplace, there are a few other things that you can do to make the adjustment as easy as possible.

**Give people as much input and control as possible.**

People will be more likely to accept changes and make them work if they have helped design those changes, and if they have a say in how the changes are implemented.

For example, let's say that one of the ergonomic hazards identified is excessive noise in a particular area of the workplace. Workers have said that they feel ear protection will help resolve the hazard, as the noise is from a machine and cannot be reduced. Ear protection is then implemented, with the choice of a few different methods (ear plugs and ear muffs in different designs).

**Implement changes gradually.**

If possible, implement changes over a period of time, rather than making many changes at once. As well, try to break changes down into small phases. This is especially important when making job design or policy changes.

**Make the changes easy.**

Make it as easy as possible for employees to implement and adapt to the change. Make sure that managers and other support resources are hands-on and monitoring the changes. Training, coaching, and other education efforts may also be necessary.

**Be clear.**

Be absolutely clear about what changes will be made and what you expect from employees. If changes are being made to job procedures, for example, checklists and manuals may need to be updated. If new equipment is being used, new signs should also be installed.

**Continue following up with employees.**

After changes are made, organizational leaders need to make sure that the changes are sticking. If people are reverting back to their old methods, find out why this is happening so that real changes can be made. Sometimes, it may take several tries to get it right!

## Reviewing Your Ergonomics Program

Another important part of successful implementation and ergonomic hazard management is review and evaluation. This will help you verify that the changes made were the right ones and that they are sticking.

We suggest a follow-up schedule like this:

- Check in by managers and supervisors immediately after a change is made
- Close supervision over the first few weeks of a change, gradually tapering off
- Check in by ergonomics team and/or managers three months after a change is made
- Yearly review of all ergonomic efforts

However, unscheduled ergonomic reviews may need to take place if:

- New equipment is added
- There is a change in job responsibilities that causes a new hazard
- There is a new pattern of incidents
- An issue is raised by a staff member

Things that you want to look for include:

- Were the original hazards resolved or mitigated?
- If not, why not?
- Were new hazards created?
- What caused this? How will they be addressed?
- How do employees feel overall?
- Has anything changed in the industry that may impact our efforts? If so, what has happened and what might be the causes?

You can use the same tools that you used for assessments, including:

- Checklists
- Lifting calculators
- Symptom surveys
- Employee interviews

This will help you ensure that you are being thorough. It will also ensure that you are comparing relevant data.

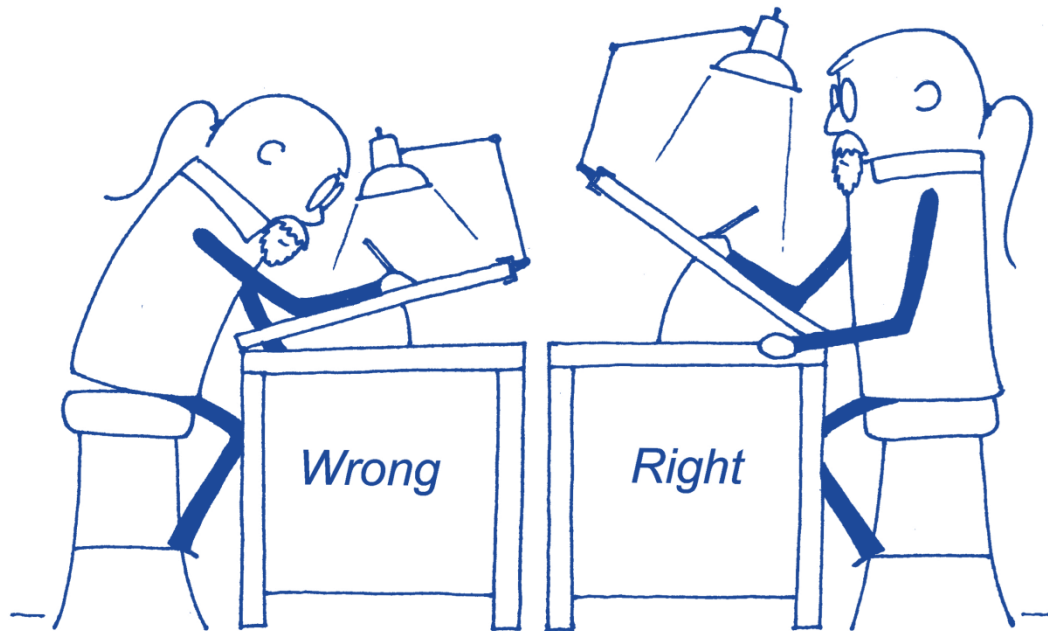
## Basic Ergonomic Principles

Today, we will explore some ways to make various tasks more ergonomic. To begin, let's explore some basic principles of ergonomics to help you understand the reasoning behind our suggestions.

### The Human Body is Part Machine...

The science of ergonomics tries to help you adjust other factors (like the environment or the task) so that your body does the least work possible. Remember that the human body is designed to work in a particular way. **Joints are their strongest when in a neutral position.**

Notice how the slope of the reading surface makes a big difference in the artist's posture here:



### To help keep your joints in a neutral position, try to:

- Avoid bending, reaching, and twisting whenever possible.
- Remember that sudden forces put far more pressure on the body than slow, steady movements.
- Change position when possible. Take a break and stretch!
- Don't do too much at once.
- Listen to your body and put your health first.

### ...And Part Human!

People are unique. Height, weight, hand size, arm span, foot size, stride, head circumference, dominant side, and many other factors can all differ between individuals. Make sure that your ergonomic efforts (such as hand grips, ear protectors, goggles, etc.) are designed with the appropriate target population in mind. One size may fit 95% of the population, but the other 5% may need special accommodation.

## Optimal Sitting and Standing

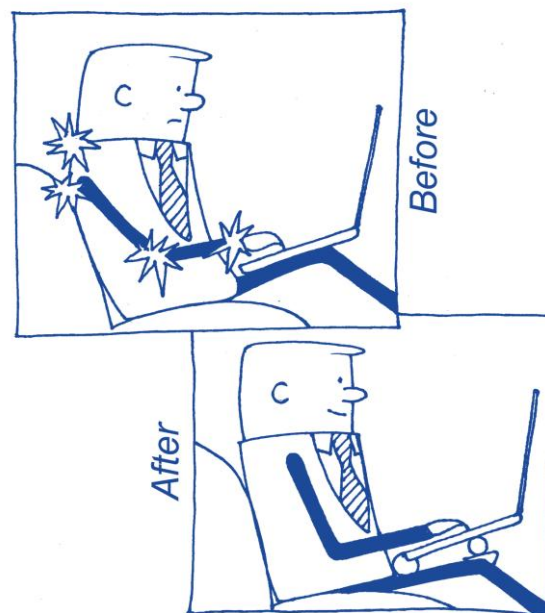
### Best Practices for Sitting

Many of us spend long hours sitting in vehicles, at desks, and in front of the television. Our bodies were not designed for this – we were once an active population of farmers and hunters!

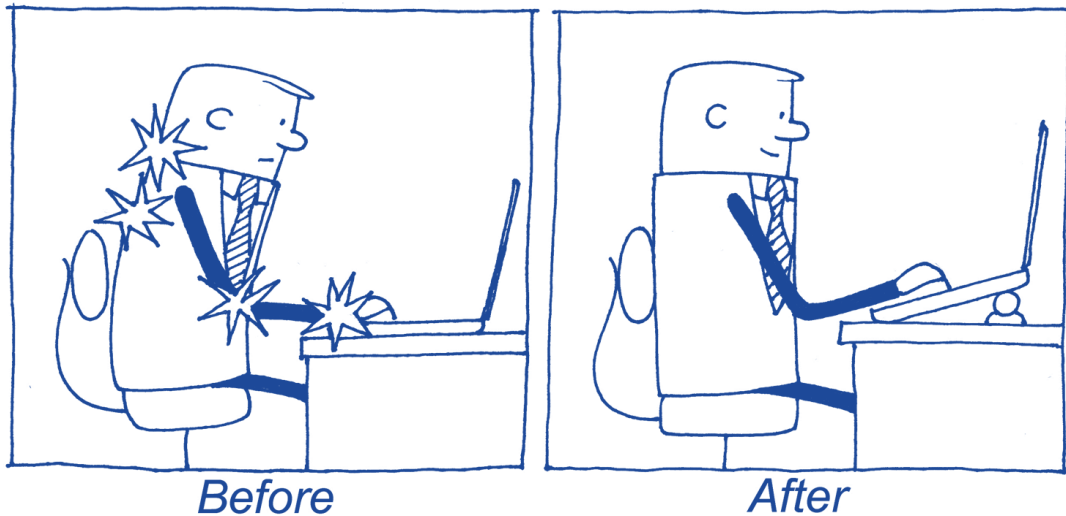
Sitting does have its advantages; most importantly, our bodies are supported by what we are sitting on. Therefore, it's important to ensure that your furniture supports your body in the right way. (More on that later!) However, sitting for long periods of time can make muscles tense. It can also cause problems if you must bend or twist.

To help mitigate this, vary sitting and standing activities, and be sure to take breaks to stretch frequently. Be aware of the position that your joints are in. Here are two examples.

### Example One

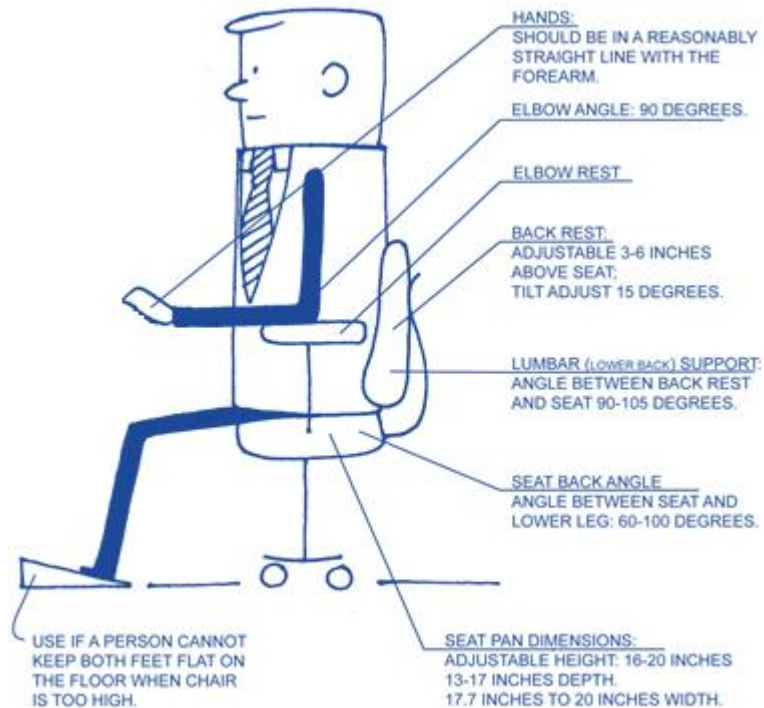


### Example Two



### Ergonomic Chairs

As well, ensure your chair meets these ergonomic guidelines:



Ideally, chairs should also have wheels, so that the person can turn easily without bending their body. Other factors to consider:

- Have your work surface sloped so that you do not have to bend your neck very much.
- Make sure you have plenty of legroom to stretch.
- Design your workspace so that frequently used items are closest to you (called the reach envelope).
- Ensure that the task you are working on is at the correct height, as shown below.

Eye Use	Hand and Arm Use	Recommended Height of Work Material
Frequent	Frequent	0 to six inches above elbow height
Infrequent	Frequent	Six to 12 inches below elbow height
Frequent	Infrequent	4 to 12 inches below eye height

### Best Practices for Standing

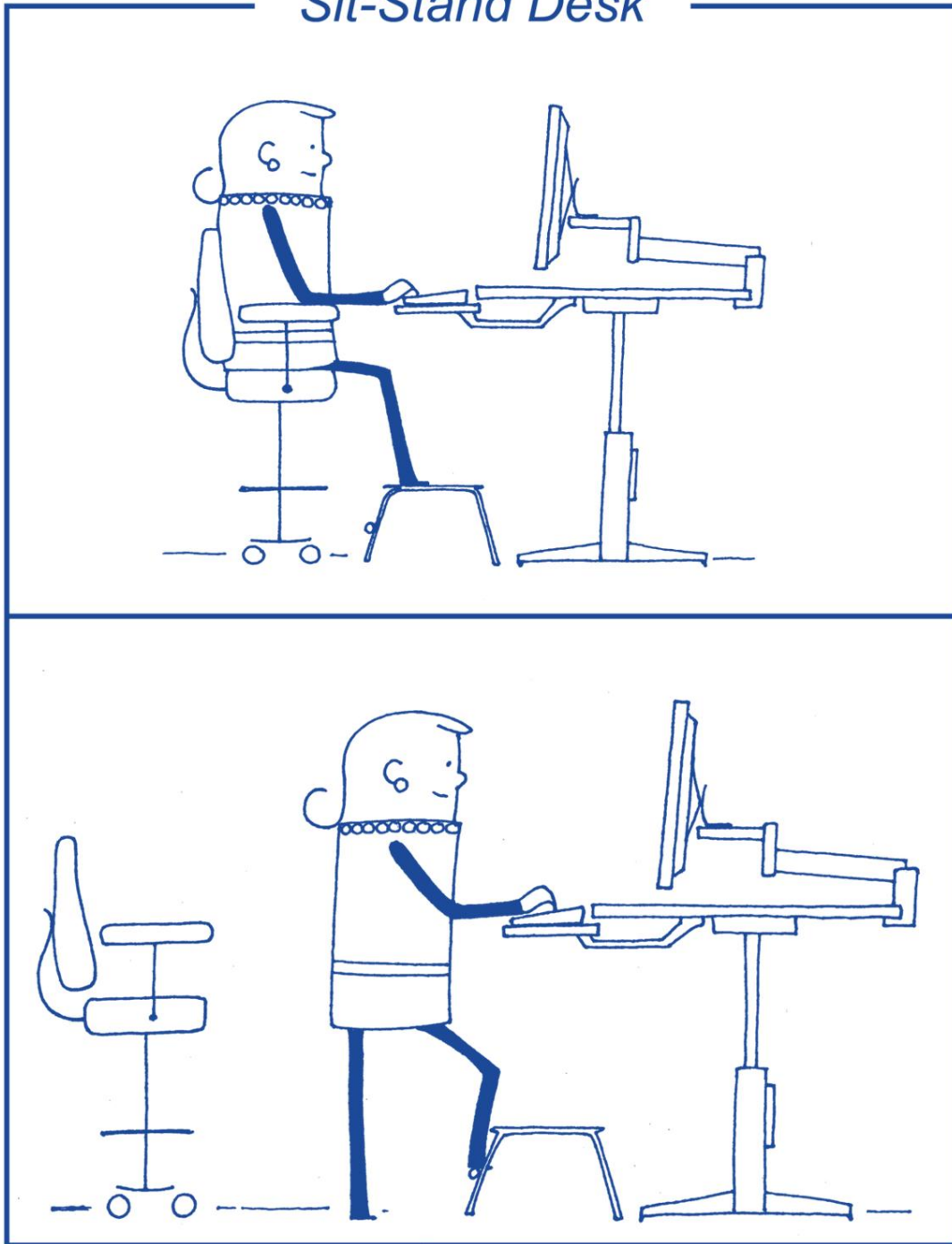
While standing can tire leg, back, and neck muscles, it is the ideal position if the worker must move around frequently or perform heavy manual labor. Like sitting, the worker should take breaks to sit or walk and give the sitting muscle groups a break. As well, keep these tips in mind:

- Ensure that the task you are working on is at the correct height, as shown in the table on the previous page.
- Try to avoid standing in confined spaces; make sure you have plenty of room to stretch.
- Try to avoid using platforms. They often pose a trip hazard and create a safety issue.
- Design the workspace so that reaching, twisting, and bending is minimized.
- Use a pedestal stool or a custom chair to make breaks easy.

### The Best of Both Worlds

Sit-stand workstations are becoming an increasingly popular ergonomic choice. These adjustable workstations can easily be configured so that the user can sit or stand while working.

## Sit-Stand Desk





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**How can we reduce the impact of the disadvantages?**

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## Safe Lifting and Transporting

### Lifting Safely

According to the United States Bureau of Labor Statistics, a large percentage of workplace injuries result from improper heavy lifting. (Source: <http://www.bls.gov/iif/oshfaq1.htm#q09>) Understanding and using proper lifting techniques can make the exertion a lot more ergonomic and easier on your body in the short-term, and prevent injuries in the long-term.

### Guidelines for Safe Lifting

Some basic guidelines:

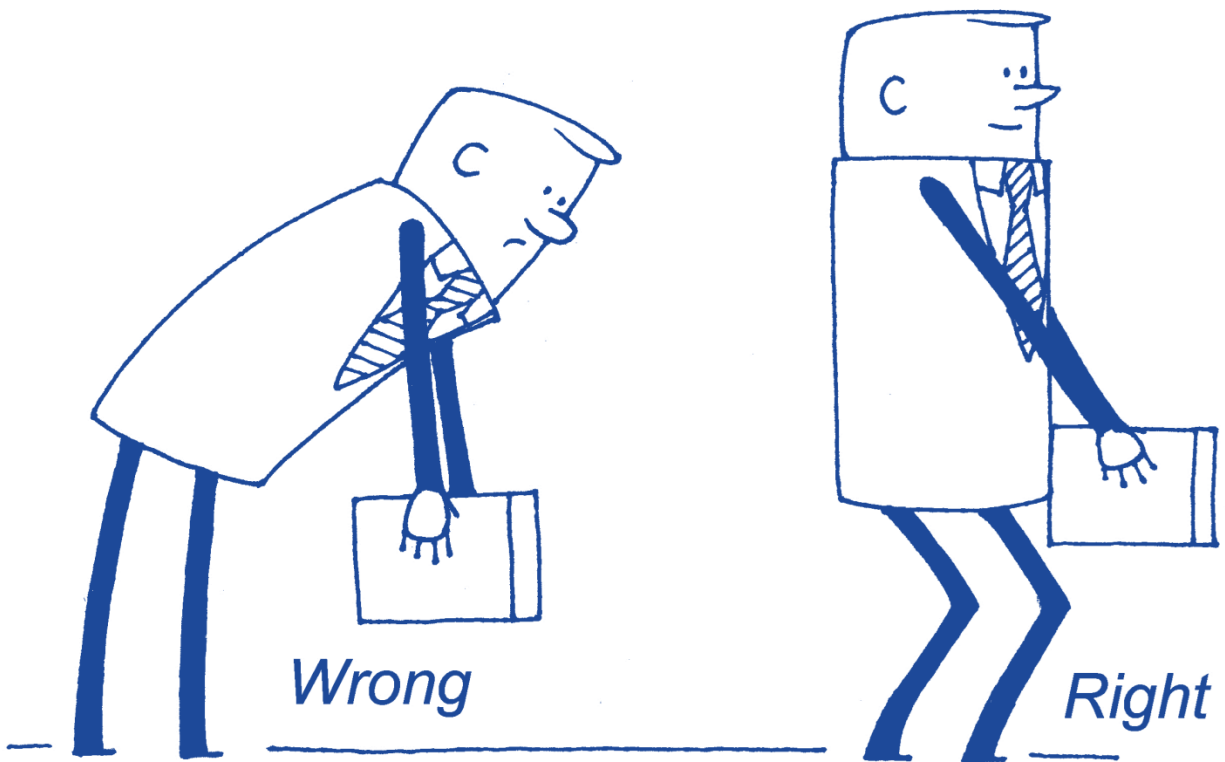
- Avoid lifting awkwardly shaped and/or tall loads.
- Keep the load close to you.
- Use both hands and lift with your body.
- Ensure the load has proper handles.
- Get help or use transporting tools (such as a forklift) when necessary.
- Do not twist when lifting.
- Take frequent breaks to rest and stretch.
- Alternate lifting with light tasks.

Here are some guidelines for specific lifting tasks, as provided by the Washington State Department of Labor & Industries.

Description	Amount	Recommended Max. Frequency	Other Notes
Heavy Lift	75 pounds	Once per day	
	55 pounds	10 times per day	
Awkward Lift	25 pounds	25 times per day	With load above shoulders, below knees, or at arm's length
Frequent Lift	10 pounds	2 hours per day	Twice per minute

(Source: [http://www.lni.wa.gov/Safety/TrainTools/Online/Courses/courseinfo.asp?P\\_ID=102](http://www.lni.wa.gov/Safety/TrainTools/Online/Courses/courseinfo.asp?P_ID=102))

**Example**



## Transporting Materials Safely

Ideally, we want to design workplaces so that a minimum of lifting, carrying, pushing, and pulling is necessary. However, that isn't always reasonable! Let's look at some other safe methods of transporting materials.

### Carrying Materials

Only carry materials when they are fairly light and the distance is short. Otherwise, use a device like a trolley to transport them. As well, observe good lifting practices:

- Avoid carrying awkwardly shaped and/or tall loads.
- Keep the load close to you.
- Use both hands.
- Ensure that the load has proper handles.
- Do not twist when carrying.
- Take frequent breaks to rest and stretch.
- Alternate carrying with light tasks.

### Pushing and Pulling

Pushing and pulling materials can exert a tremendous force on the body. Always limit pushing and pulling activities and be sure to take breaks. When pushing or pulling, use your body to perform the task. This means leaning forward and propelling yourself with your feet when pushing, and the opposite when pulling.

In addition, the workplace should be designed to minimize these activities and to make the activities as easy as possible. This includes:

- Keeping equipment well maintained
- Having a variety of tools available (motorized and non-motorized) so that the best tool for the job can be chosen
- Ensuring that all tools have proper handgrips and safety devices
- Ensuring that floors are clean and even with proper surfaces