

## ***The Ergonomics of Physical Work***

Manual work must be designed properly so that workers will not overexert themselves and develop muscle strain, **especially in the back**. Performing heavy physical work for long periods causes the rate of breathing and the heart beat to increase. **If a worker is not in good physical condition, he or she is likely to get tired easily while doing heavy physical work.** Whenever possible, it is helpful to use mechanical power to do the heavy work. This does not mean that employers should replace workers with machines, rather, that workers can use machines to perform the most arduous tasks. Mechanical power reduces the risks to the worker and at the same time provides more work opportunities for people with less physical strength. Use the following guidelines for designing jobs that require heavy physical work:

- Heavy work should not exceed the capacity of the individual worker.
- Heavy physical work **should be varied throughout the day** at regular intervals with lighter work.
- **Rest periods** must be included in the day's work.

**Note:** a job that requires **no** physical effort is just as undesirable as a job that only entails heavy physical work. Jobs that require no physical movement are generally tiring and boring.

### **Reduce the weight of the load:**

- repackage to **reduce the size**;
- **reduce the number** of objects carried at one time;
- assign **more people** to lift extra heavy loads.

### **Make the load easier to handle:**

- change the size and shape of the load so that the **centre of gravity is closer to the person** lifting;
- **store the load at or above hip height** to avoid the need to bend;
- use **mechanical means** to raise the load to at least hip height;
- use more than one person or a mechanical device to move the load;
- **drag or roll the load with handling aids** such as carts, ropes, or slings;
- transfer the weight of the load to stronger parts of the body using handgrips, straps or belts.

### **Use storage techniques to make handling materials easier:**

- use wall brackets, shelving or pallet stands of appropriate height;
- load pallets so that heavy articles are around the edges of the pallet and not in the centre. This will help to distribute weight evenly on the pallet. You must ensure, however, that articles do not easily fall off the pallet and injure someone.

### **Minimize the distance a load must be carried:**

- improve the layout of the work area;
- relocate production or storage areas.

**Minimize the number of lifts required:**

- assign more people to the task;
- use mechanical aids;
- rearrange the storage or work area.

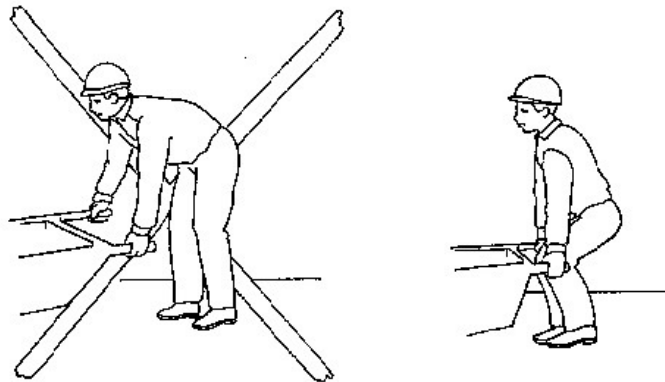
**Minimize twisting of the body:**

- **keep all loads in front of the body;**
- allow enough space for the whole body to turn;
- **turn by moving the feet rather than twisting the body.**

## ***Lift and Carry Ergonomics***

Lifting and carrying are physically strenuous, and there is always a risk of accidents and in particular of injury to the back and arms. To avoid this it is important to be able to estimate the weight of a load, the effect of the handling level and the lifting environment. You must also know how to choose a safe working method and how to use devices and equipment that make your work lighter.

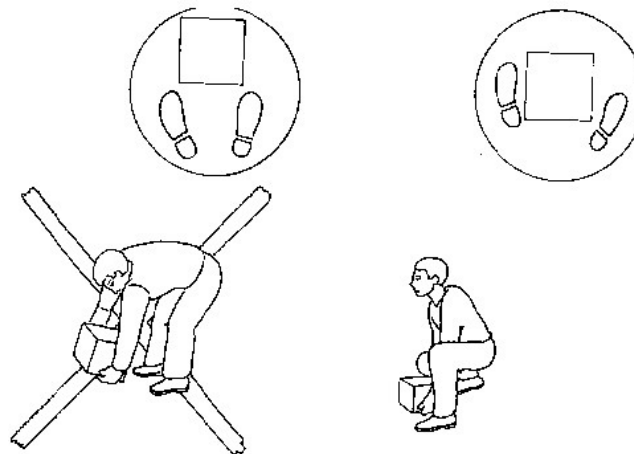
***Position of the back and legs***



**Lift the object close to your body**, otherwise the muscles of the back and the ligaments stretch and the pressure in the intervertebral discs increases.

**Tense your stomach and back muscles** so that your back stays in the same position all the time you are lifting.

### **Position of the legs**



**Stand close to the object.** The closer you can get to the object, the safer it is to lift.

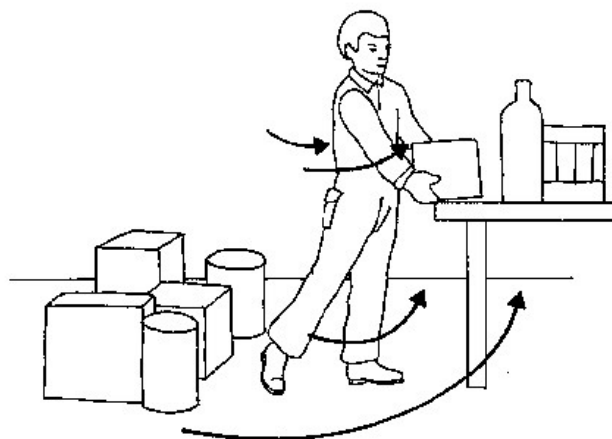
**Keep your feet apart** to maintain your balance well.

### **Position of the arms and grip**

Try to **grasp the object firmly using your whole hands** at right angles to your shoulder. You cannot get a firm grip using only your fingers.

**Lift with both hands if possible.**

### **Lifting to the side**



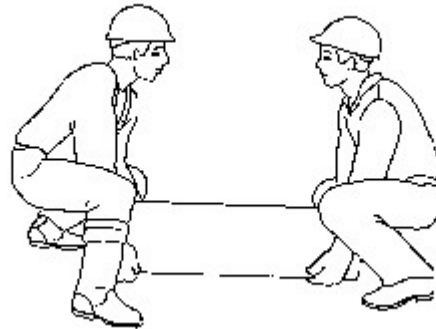
Lifting a weight and twisting the body at the same time increases the risk of back injury. **Place your feet in a walking position**, one foot pointing slightly in the direction of the lift. Lift the object and then shift the weight of the body onto the foot in the turning direction.

### ***Lifting upwards***

If you have to lift something above shoulder level, place your feet in a walking position. First raise the object to chest level. Then begin pushing upwards by moving your feet out in order to get the object moving and shift the weight of your body onto the front foot.

For many people a suitable lifting height level is 70 to 80 centimetres. Lifting something off the floor can be three times as strenuous.

### ***Lifting with others***



People who often lift things together should be more or less equally strong and they should practise lifting things together. **The lifting movements must be made at the same time and at the same speed.**

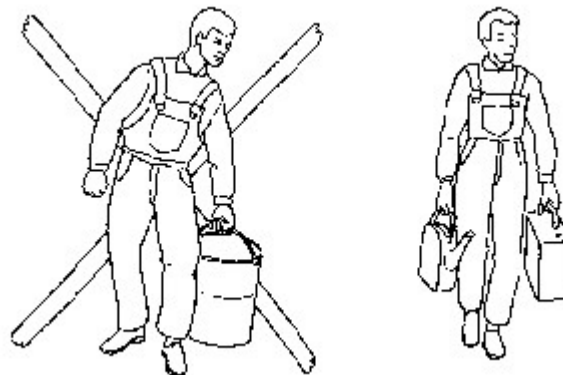
The maximum weights recommended by the International Labour Organization are:

Men: ..... occasionally 55 kg., repeatedly 35 kg.

Women: ..... occasionally 30 kg., repeatedly 20 kg.

**Do not lift anything if you have backache. Once the pain has gone, start lifting with caution and gradually practise.**

### ***Carrying***



Carrying places most strain on the back of the neck and the upper limbs, the heart and the circulation. **Carry objects close to your body.** Minimum effort is then required to keep your balance and to carry the object. A round object is difficult to carry because the weight is far from the body. Good handles or grips make the work easier and bring additional safety. **Spread the weight evenly over both hands.**

**Carrying is always strenuous.** Check whether the object can be shifted on a conveyor belt, wheels or a trolley. Make sure you do not try to shift an object that is too heavy on your own, that there are proper hand grips, that the hand grips are at a suitable distance, that there is room to lift and carry the object, that the floor is not slippery, that there are no obstacles in your way and that there is sufficient lighting. Unless well designed, steps, doors and ramps are dangerous.

## **Take Home Points:**

1. Whenever possible, **use mechanical power** in place of heavy work. Machines can be used by workers to perform the most arduous tasks, not to replace workers.
2. **Heavy work should be varied with lighter work** throughout the day.
3. **Rest periods** must be included in the job.
4. Consider **ergonomic factors**, such as the weight and shape of the load and how often a worker must lift the load, when designing heavy physical job tasks.

**\*\* Keep the Load Close and Keep the Curves \*\***

**\*\* Keep Your Nose Between Your Toes \*\***