Ergonomics Hazards

The word ergonomics is derived from the Greek language Ergon is Greek for work;

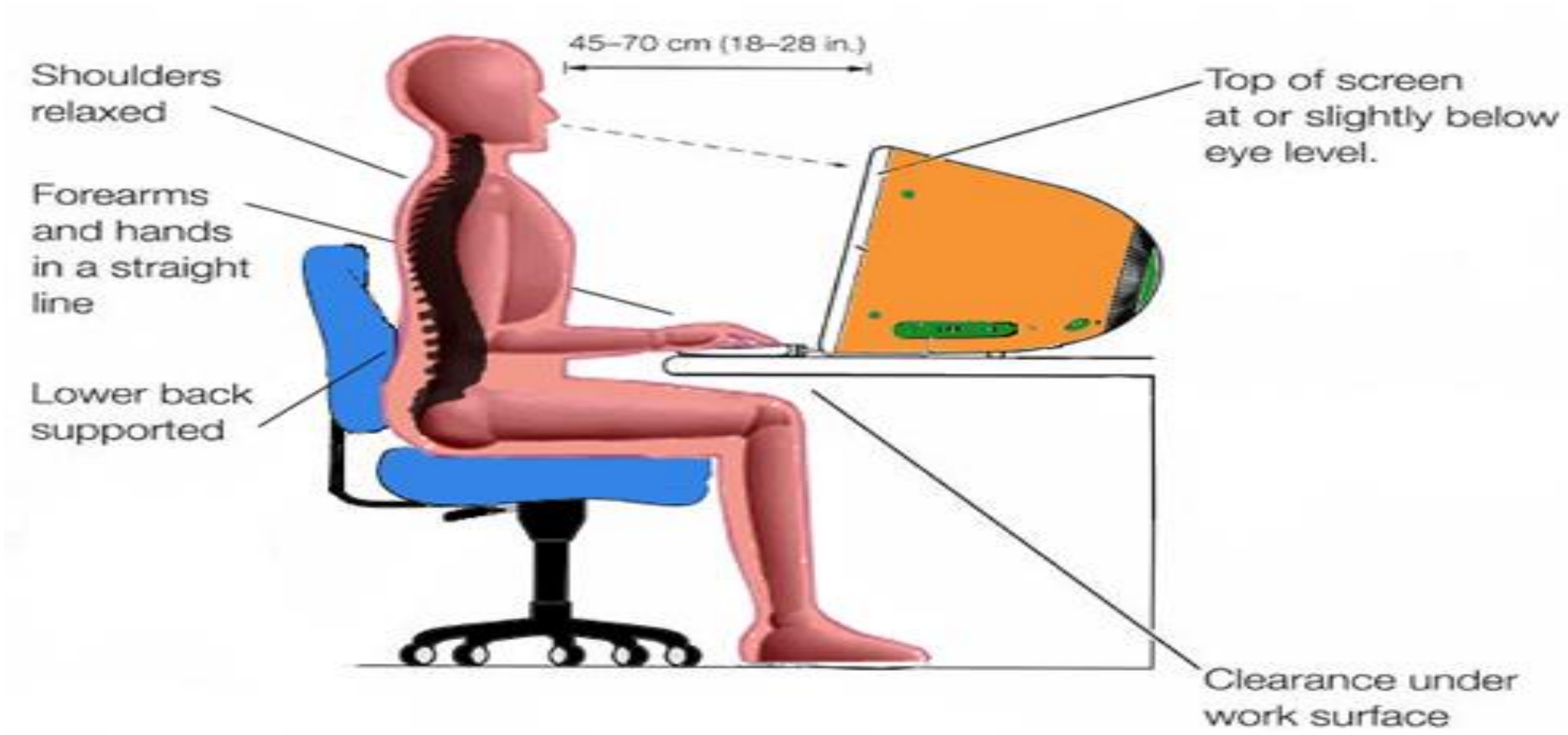
and nomos means laws

This topic discusses the **physical condition of the workplace** such as the workstation, work equipment and posture during work.

Advanced and sophisticated equipment used at the workplace often pose risks to their users and expose them to body injuries in the long run.

Basically, these injuries show their effects only **after some time.**

Ergonomics


45–70 cm (18–28 in.)
Shoulders relaxed
Forearms and hands in a straight line
Lower back supported
Top of screen at or slightly below eye level.
Clearance under work surface

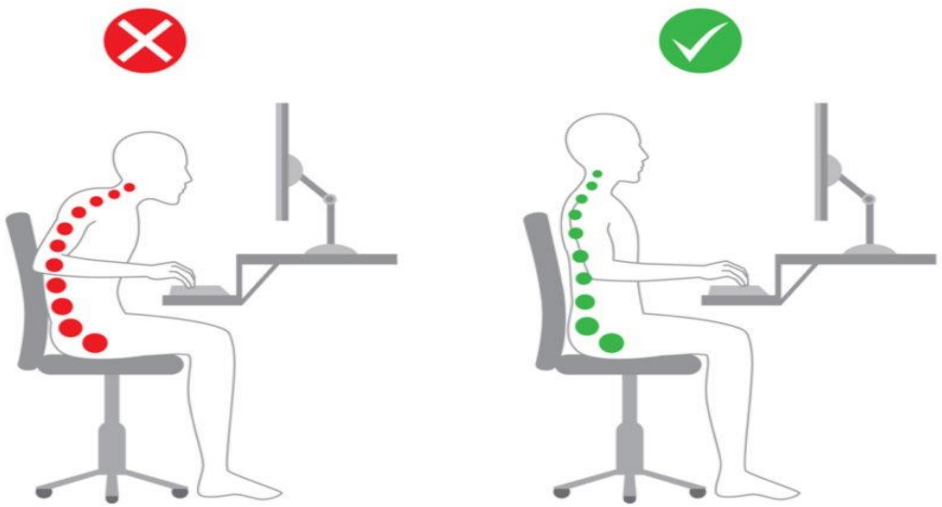
- Ergonomics is also defined as the **’systematic application of knowledge about the physiological, physical, and social attributes of human beings in the design and use of all things which affect a person's working conditions**: equipment and machinery, the work environment and layout, the job itself, training and the organization of work’

- In other words, ergonomics seeks to adjust tasks to the worker through equipment design and work procedure.

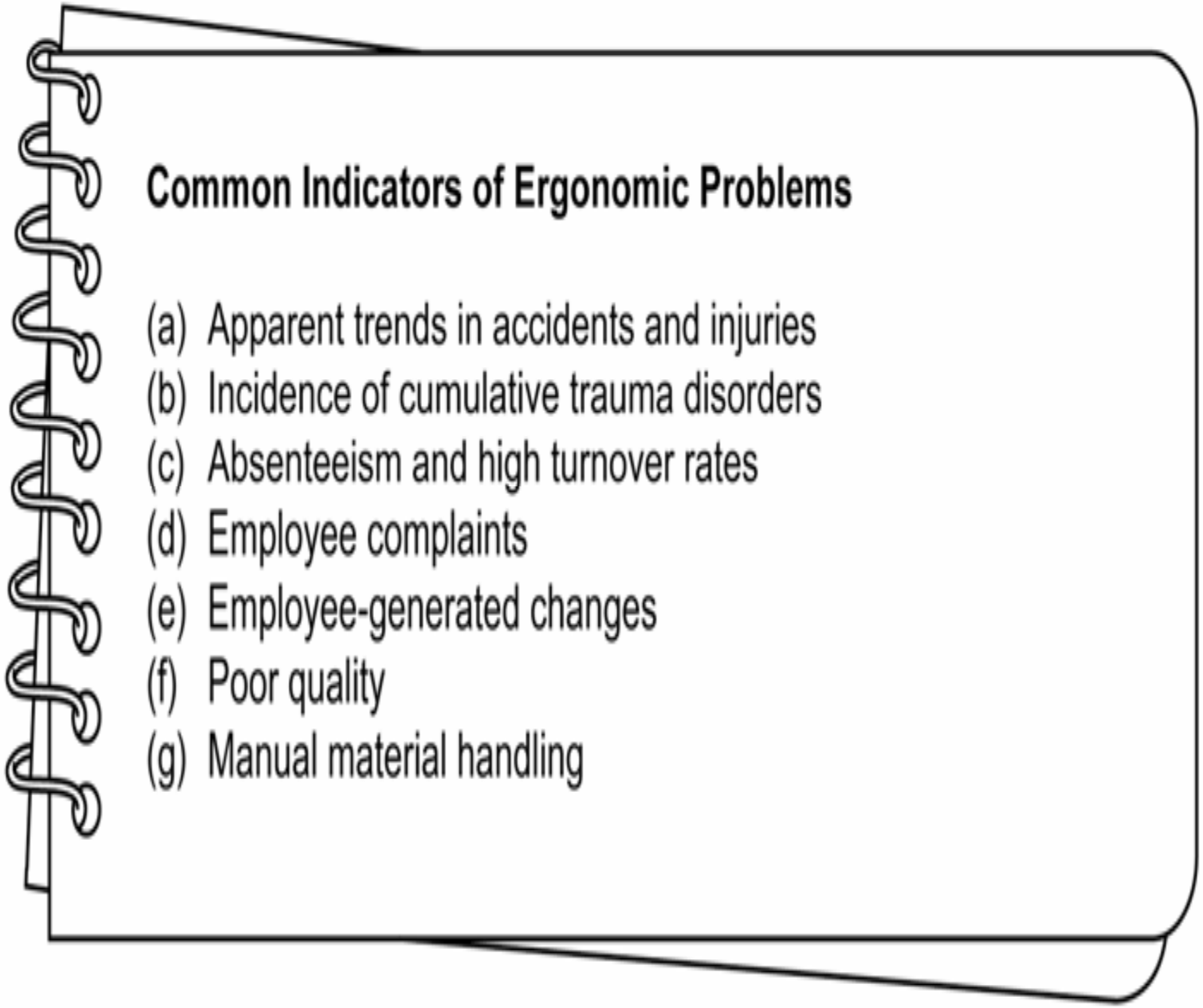
What is meant by ergonomics and how important is it to workers?

Various industries are now using **ergonomics** increasingly in order to enhance human productivity, quality of working environment, and occupational safety and health.

Studies have shown that people working at ergonomic workstations or using ergonomic equipment are less likely to experience fatigue, discomfort, or stress.



Ergonomic problems indicators-7



(a) Apparent Trends in Accidents and Injuries

By examining accident reports, **record-keeping documents**, first-aid logs سجلات الإسعافات الأولية, insurance forms. A high incidence rate of a specific type of injury typically indicates that an ergonomic problem exists.

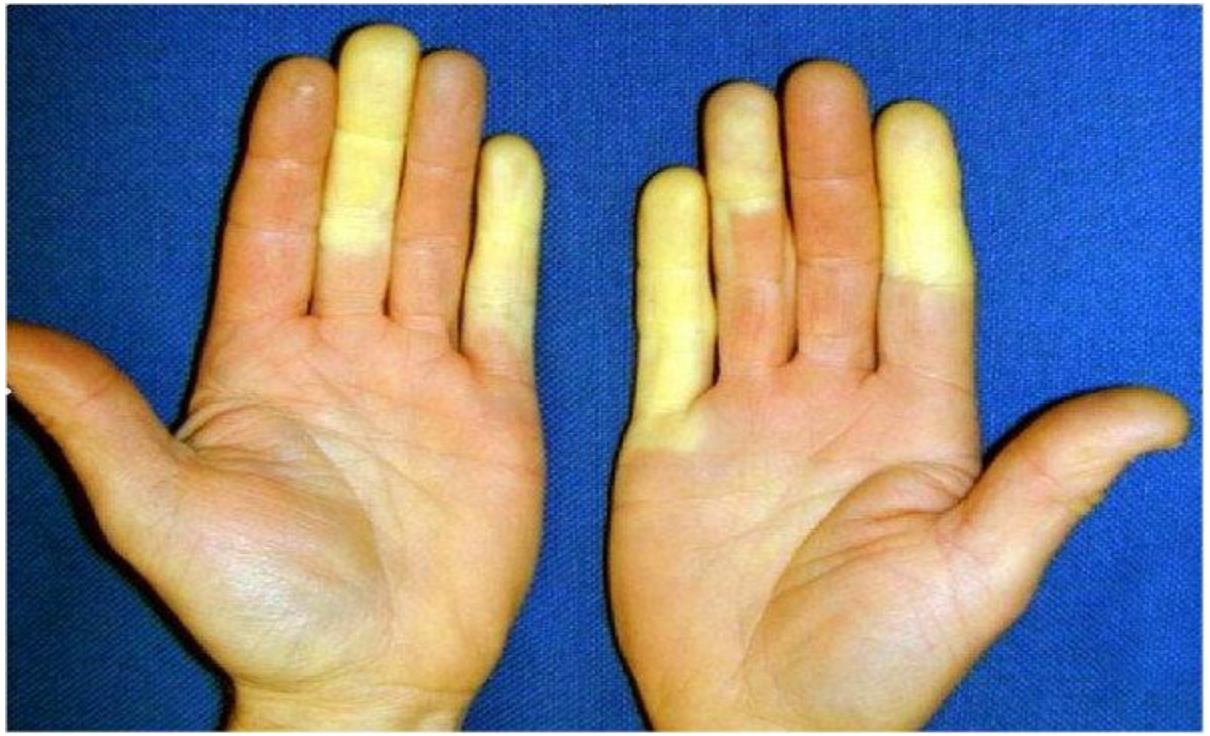
(b) Incidence of Cumulative Trauma Disorders (CTDs)

Factors associated with CTDs include a high level of repetitive work, greater than normal levels of hand force, awkward posture, high levels of vibration, high levels of mechanical stress, extreme temperatures, and repeated hand-grasping. For example, a worker who uses a concrete/asphalt breaker frequently is exposed to **White Finger Syndrome** due to high vibration.

Vibration white finger (VWF)

Vibration white finger (VWF) is a long-term condition that can result from prolonged use of vibrating tools, either for occupational or recreational use.

VWF is a vascular condition, which means that it affects the blood vessels in the body. It most commonly affects the extremities, such as the fingers and thumbs.



- According to one **2019** case report in the European Research Journal, an episode of VWF may begin as a result of repeated exposure to vibration. Emotional stress can also trigger it.

- During an episode of VWF, the fingers may appear drained of blood and become white. These symptoms could last anywhere from a few minutes to several hours.

- In time, exposure to vibrating tools can go on to affect the muscles, bones, joints, and nervous system. This condition is collectively known as hand-arm vibration syndrome.

(c) Absenteeism and High Turnover Rates

High absentee rates and high turnover rates can be indicators of ergonomic problems. People who are uncomfortable on the job to the point of physical stress are more likely to miss work or leave for less stressful conditions.

(d) Employee Complaints

A high incidence of employee complaints about physical stress or poor workplace design can indicate the presence of ergonomic problems. For example, a typist might complain that her chair is too high causing physical stress to legs and back.

(e) Employee-Generated Changes

Employees tend to adapt the workplace to their needs. For example, workers may place additional padding on their chairs, modify protective equipment, install additional lights.

(f) Poor Quality

Poor quality, although not necessarily caused by ergonomic problems, may be the result of ergonomics.

(g) Manual Material Handling

The incidence of **musculoskeletal injuries** is typically higher in situations that involve **a lot of manual material handling**. Musculoskeletal injuries increase significantly when the job involves one or more of the following:

Lifting large and bulky objects

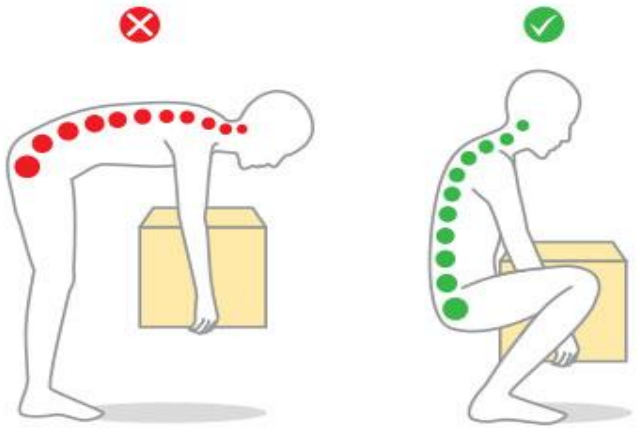
Lifting objects **from the floor**

Lifting frequently

Lifting heavy objects inappropriately and not receiving proper training can lead to musculoskeletal injuries. When such conditions exist, the company has ergonomic problems.

Safe lifting:



Mechanical assistance

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AVOID *STOOPING* & *TWISTING*

The following rules must be taken into consideration when adapting the job to the worker:

1. Nerve conduction velocity, hand-grip strength, muscle mass, range of motion, and flexibility all begin to diminish upon reaching the age of **45**.

2. Weight and mass tend to increase throughout the age of the early fifties **(50)**

3. Height begins to slowly diminish from the age of **30**

4. Lower back pain is more common in people **45** years of age and older

5. Visual acuity at close range diminishes with **age**.

HAZARD PREVENTION AND CONTROL

In dealing with ergonomic problems, it is more cost-effective for employers to take proactive actions to prevent ergonomic stress.

Engineering solutions, where feasible, **are the preferred method** for ergonomic hazard prevention and control

The focus of an ergonomics programme is to make the job fit the person not to make the person fit the job.

This is accomplished by **redesigning** the workstation, **work methods**, or **tools** to reduce the demands of the job**, including high force, repetitive motion, and awkward postures.**

3 examples of engineering controls that have proven to be effective and achievable.

No.	Example	Explanation
1.	Workstation Design	Workstations should be designed to accommodate the persons who actually use them; it is not sufficient to design for the average or typical worker. Workstations should be easily adjustable and should be either designed or selected to fit a specific task, so that they are comfortable for the workers who use them. The work space should be large enough to allow for the full range of required movements, especially where knives, saws, hooks, and similar tools are used.

2.	Design of Work Methods	Traditional work method analysis considers static postures and repetition rates. This should be supplemented by addressing the force levels and the hand, arm and leg postures involved. The tasks should be altered to reduce these and the other stresses associated with cumulative trauma disorders (CTDs).

3.	**Tool Design and Handles**	Tools should be selected and designed to minimise the risks of upper extremity CTDs and back injuries. Examples of criteria for selecting tools include the following: (a) Designing tools to be used by either hand, or providing tools for both left- and right-handed workers. (b) Selecting pneumatic and power tools that exhibit minimal vibration and maintaining them in accordance with manufacturer's specifications. (c) Using handles and grips that distribute the pressure over the fleshy part of the palm, so that the tool does not dig into the palm.

Apart from engineering controls, the following steps can be used to prevent and control ergonomic problems

(a) Periodic Health Surveillance

Periodic health checks (every two to three years) should be conducted on all workers who are assigned to positions involving exposure of a particular body part to ergonomic stress.

(b) Ergonomics Programme

An effective ergonomics programme must include **continuous training and education.**

The purpose of training and education is to ensure that employees are sufficiently informed about the ergonomic hazards to which they may be exposed and thus able to participate actively in their own protection.

The Education Programme must expose workers to:

1. Types of CTDs and preventive measures;
2. Causes of CTDs;
3. Early signs and symptoms of CTDs; and
4. Treatments for CTDs.

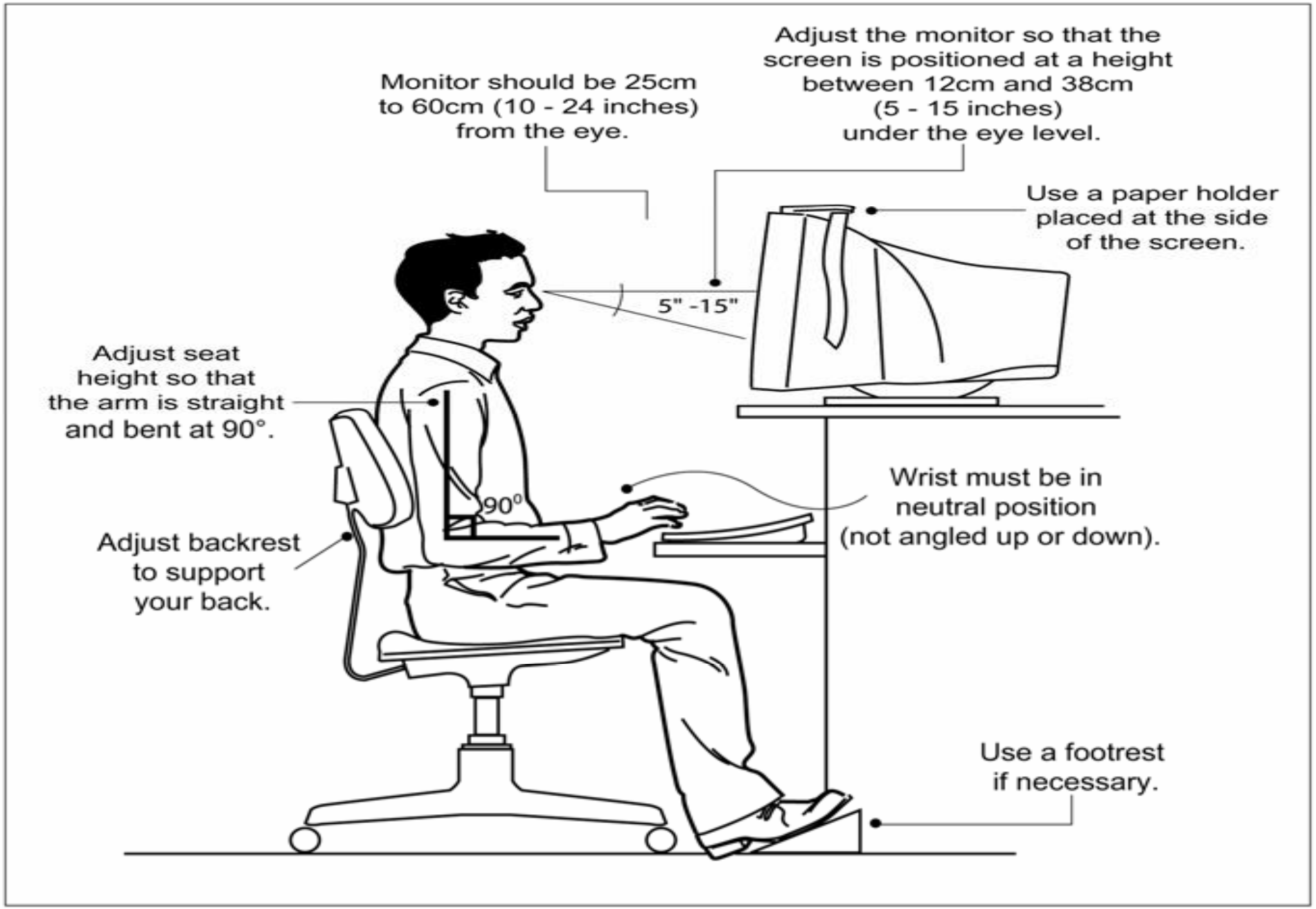
Through such education and training programmes, CTDs can be detected at an early stage, hence reducing their effects.

(c) Early Report of CTD Symptoms

Employees should be encouraged to report early signs and symptoms of CTDs to the in-plant health facility. This allows for timely and appropriate evaluation and treatment by employers.

Types of work which may increase physical stress:

(a) Seated repetitive work with light parts
(b) Seated work with larger parts
(c) Seated control work
(d) Standing work
(e) Standing for heavy lifting and/or carrying work in one place or in motion
(f) Work with hands above chest height
(g) Work with hand tools
(h) Work with video display terminals (VDTs)


Adjust the monitor so that the screen is positioned at a height between 12cm and 38cm (5 - 15 inches) under the eye level.
Monitor should be 25cm to 60cm (10 - 24 inches) from the eye.
Use a paper holder placed at the side of the screen.
5" -15"
Adjust seat height so that the arm is straight and bent at 90°.
90°
Wrist must be in neutral position (not angled up or down).
Adjust backrest to support your back.
Use a footrest if necessary.

Summary

1. Ergonomics is important to ensure the quality of life of workers, prevent productivity from declining and enhance work performance

2. It takes some time for workers who are exposed to illnesses due to inappropriate workstations, work processes and work equipment to realize that they have actually fallen ill

3. Employers must take proactive measures and implement ergonomics programmes to educate workers on ways to overcome ergonomic risks, and provide **suitable workstations, equipment and processes.**