

# Postural Deviations

Kinesiology

RHS 341

Lecture **11**

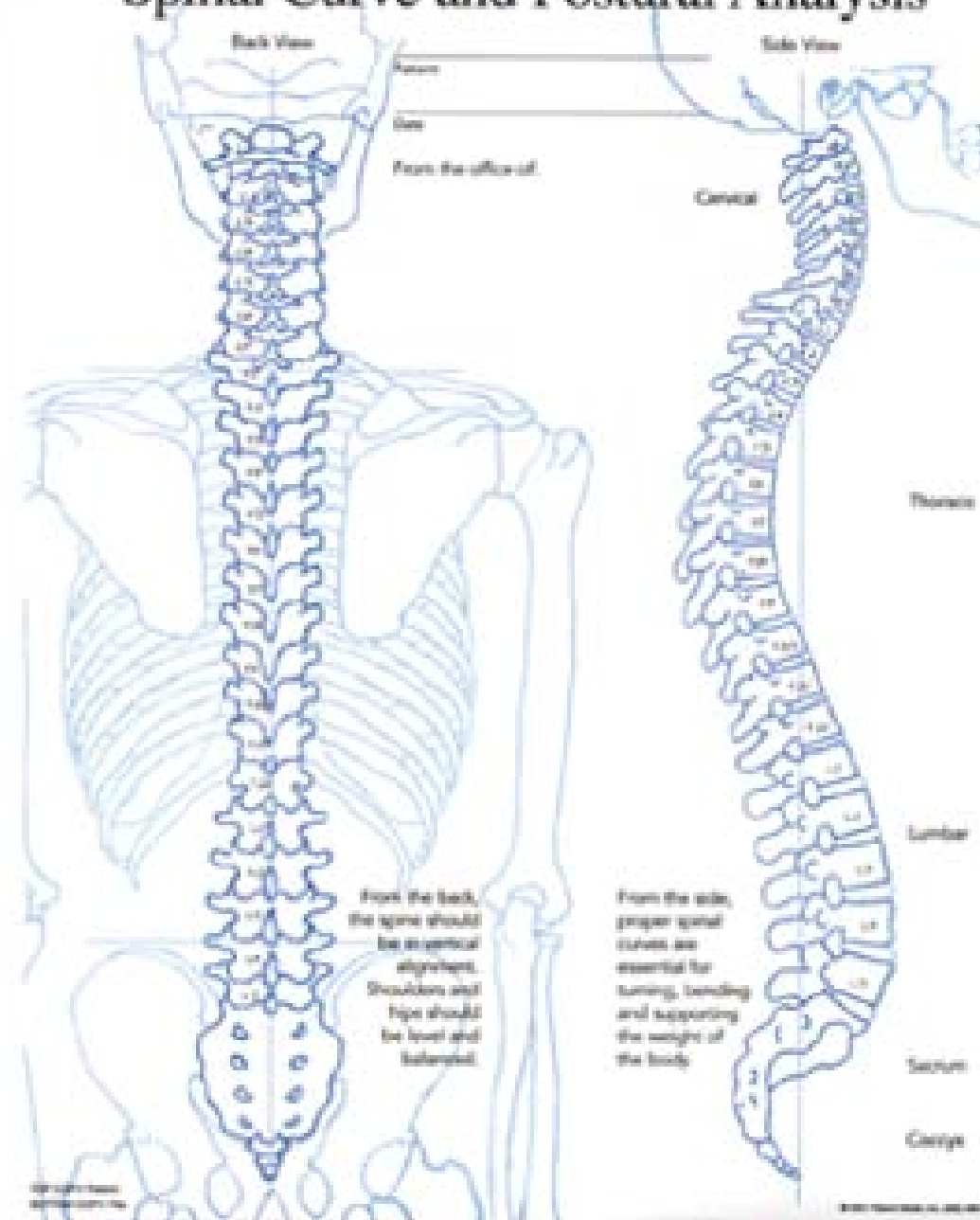
Dr. Einas Al-Eisa

# Faulty posture

**Postural deviation** can happen with either an ***increase*** or ***decrease*** of the normal body curves, leading to:

- Uneven pressure within the joint surfaces
- Ligaments will be under strain
- Muscles may need to work harder (to hold the body upright)
- Pain may occur

# Spinal Curve and Postural Analysis



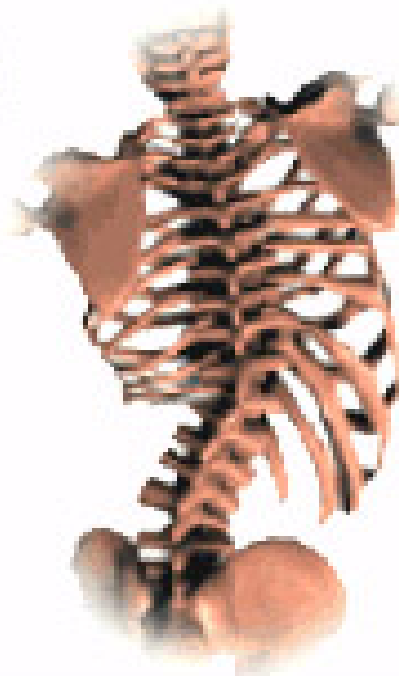
# Postural assessment

- **In standing:** straight vertical alignment of the body from the top of the head, through the body's center, to the bottom of the feet
- **From a side view:** imagine a vertical line through the ear, shoulder, hip, knee, and ankle. In addition, the three natural curves in the back can be imagined

# Postural assessment

- **From a back view:** the spine and head are straight, not curved to the right or left
- **From the front:** appears equal heights of shoulders, hips, and knees. The head is held straight, not tilted or turned to one side

# What is Scoliosis



# Scoliosis

- = lateral curvature of the spine:
- The scoliotic curve may be:
  - a single curve (C shaped)

Or

- two curves (S shaped)

# Scoliosis Types

## 1. Idiopathic scoliosis:

- The most common type
- Unknown cause
- Sometimes called “**adolescent**” scoliosis because it occurs most often in adolescents (80% of all idiopathic scoliosis cases)
- The other 20% are either “**infantile**” (from birth to 3 years old), or “**juvenile**” (from 3 to 9 years old)



# Scoliosis Types

## 2. Degenerative scoliosis:

- Sometimes called “**adult**” scoliosis because it is associated with aging (develops as the person gets older)
- Due to degeneration of the intervertebral discs and facet joints

# Scoliosis

## Types

### 3. Neuromuscular (myopathic) scoliosis:

- Patients often can not walk as a result of a neuromuscular condition
- Develops due to:
  - weakness of the spinal muscles (e.g., muscular dystrophy)
  - neurological problem (e.g., cerebral palsy)

# Scoliosis Types

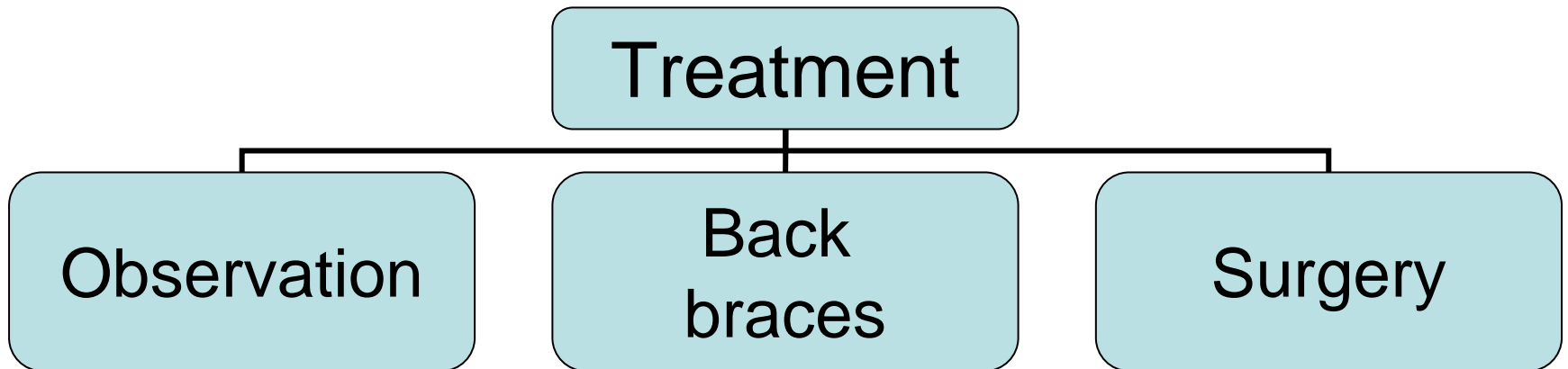
## 4. Congenital scoliosis:

- Rare
- Develops in infancy
- Due to congenital malformation of the spine

# Diagnosis?



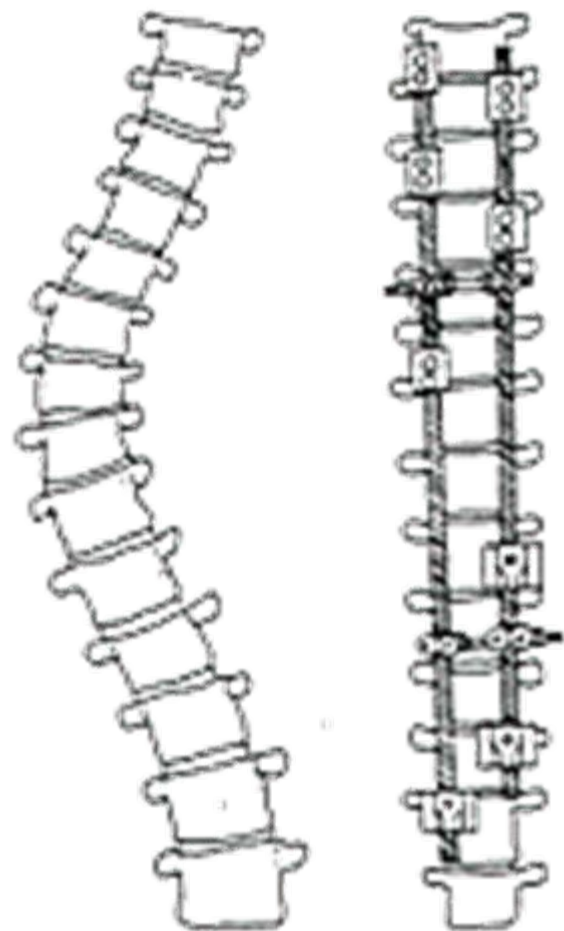
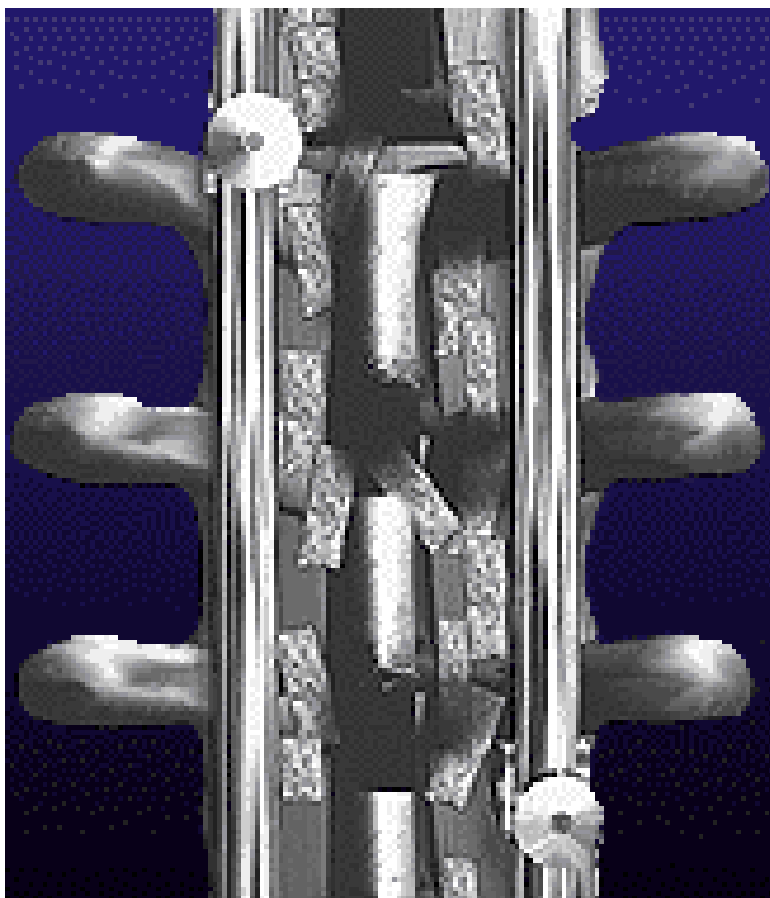
# Scoliosis

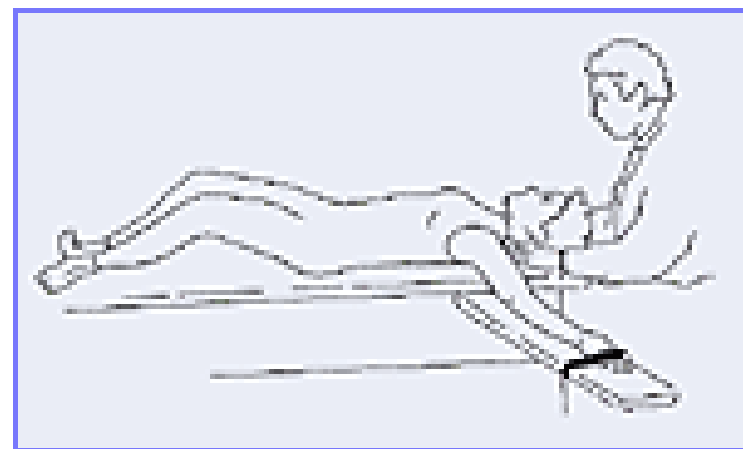
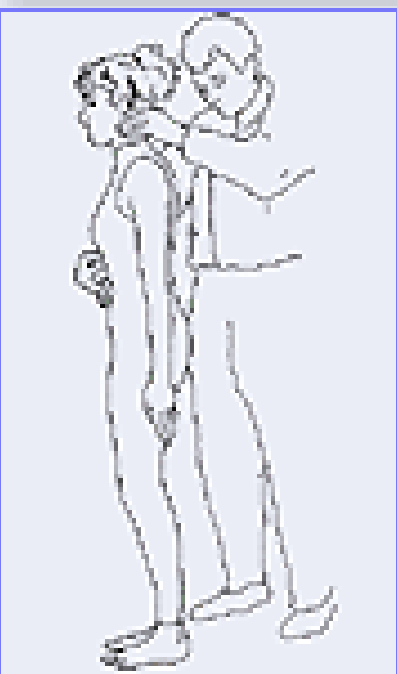
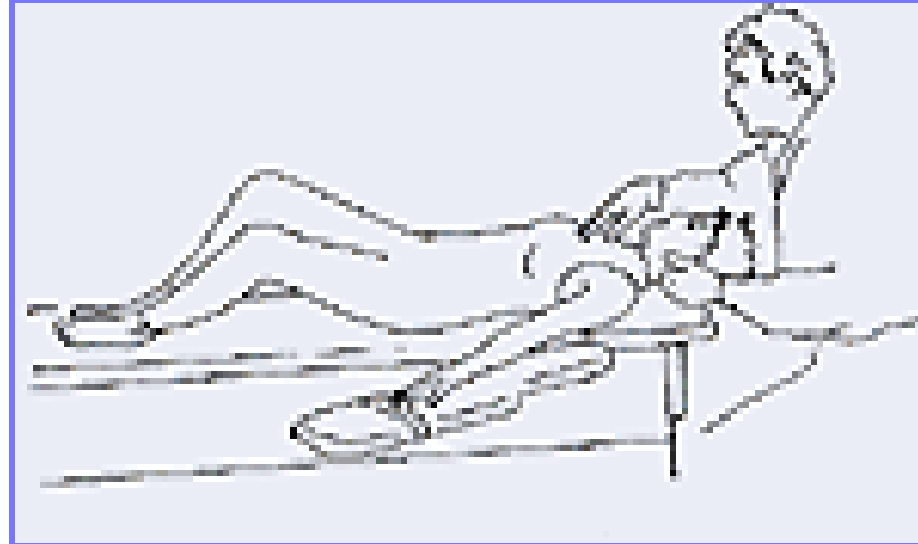
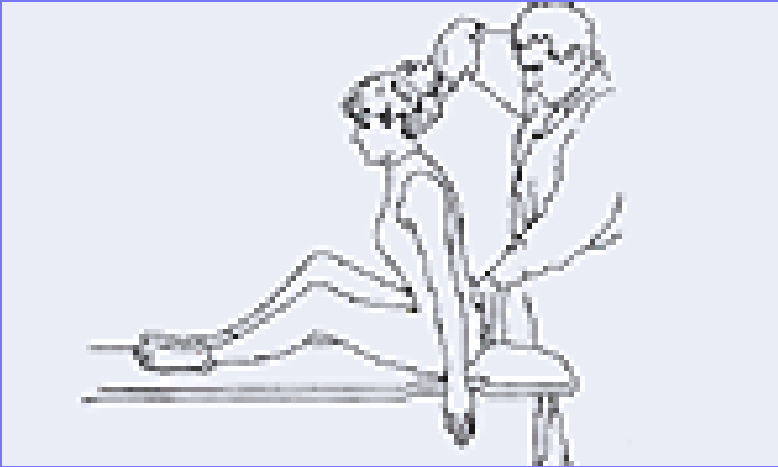




**Bracing**

# Surgery







# Kyphosis

- = an increase in the posterior curvature of the thoracic spine
- May result in a noticeable *round back deformity*
- More common in females than males

# Kyphosis Types

## 1. Postural kyphosis:

- Most commonly, kyphosis develops as a result of poor posture
- Not associated with serious pain
- Physical therapy may play a great role in:
  - patient education
  - prescription of proper exercises

# Kyphosis Types

## 2. Congenital kyphosis:

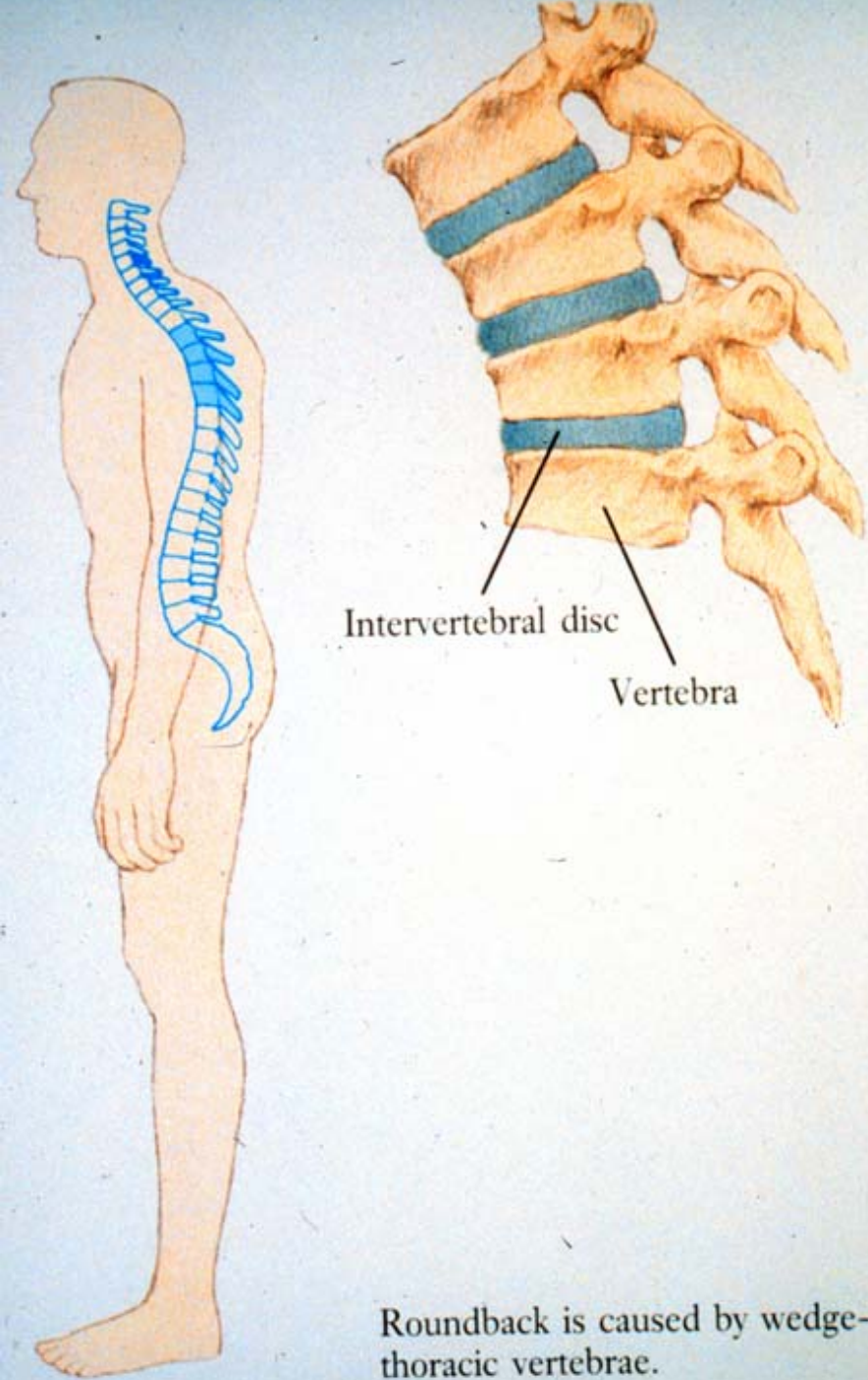
- Occurs at birth
- Due to congenital anomaly such as incomplete formation of the spine
- Usually requires surgery

# Kyphosis Types

## 3. Sheuermann's kyphosis:

- Due to the wedge-shaped vertebral bodies in the thoracic region of the spine
- Associated with back pain
- Risk factors include: heredity and osteoporosis

# Kyphosis



# Kyphosis Types

## **4. Degenerative kyphosis:**

- Due to degenerative changes and weakness of the ligaments supporting the spine

# Lordosis

- = an increase in the anterior curvature of the lumbar spine
- Associated with pregnancy, obesity, or kyphosis

# Treatment of poor posture

## **Primary Goals**

- To stop the progression of abnormal curvature
- To prevent deformity
- Treat the cause (if possible)



# Physical therapy role

- **Relieve muscle spasm** using:
  - ultrasound
  - trigger point therapy
  - transcutaneous electrical nerve stimulation (TENS)
  - thermal therapy

# Physical therapy role

- **Increase tissue flexibility** using:
  - manual therapy
  - joint mobilizing techniques
- Improve balance using muscular **strengthening** exercises

# Physical therapy role

- Physical therapy alone ***can not reverse*** a mature curvature
- Physical therapy is ***effective in pain relief*** and ***improvement of strength and mobility***

# Physical therapy role

- Detection of postural errors
- Patient education
- Relief of abnormal tension and pain
- Regaining strength and mobility
- Establishment of neuromuscular control

# Postural re-education

- **Poor posture** involves:
  - A faulty relationship of the various parts of the body which produces increased strain on the supporting structures
  - Inadequate balance over the base of support

# Self motivation

- Patients must gain an appreciation that a balanced posture:
  - is an asset!
  - is attractive and improves self confidence
  - makes movement more efficient
  - reduces fatigue

# Establishment of neuromuscular control

- Although posture is automatic or reflex function, correction needs to be done at two levels:
  1. Conscious control
  2. Automatic control

# 1. Conscious control

- When the patient learns about the position of his body in space, then develops a **new motor skill through regular practice**
- Start with **correcting the “static” posture** (from which movements takes place)

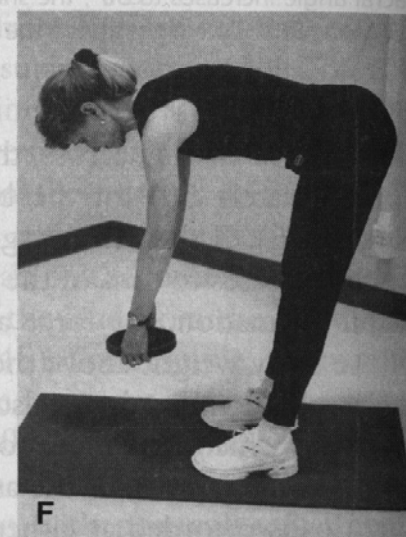
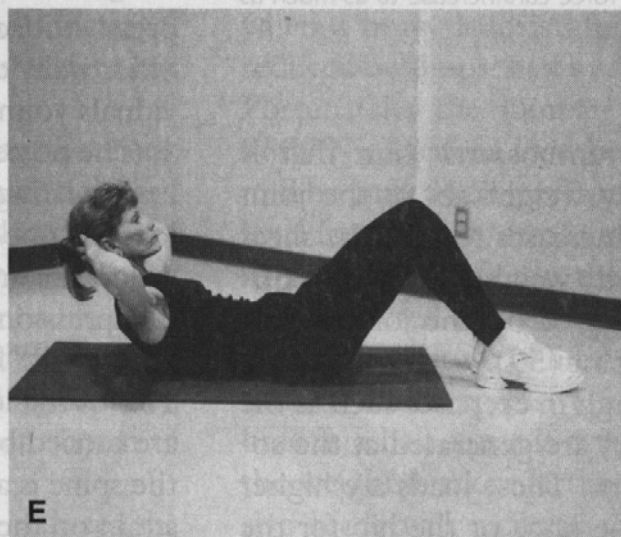
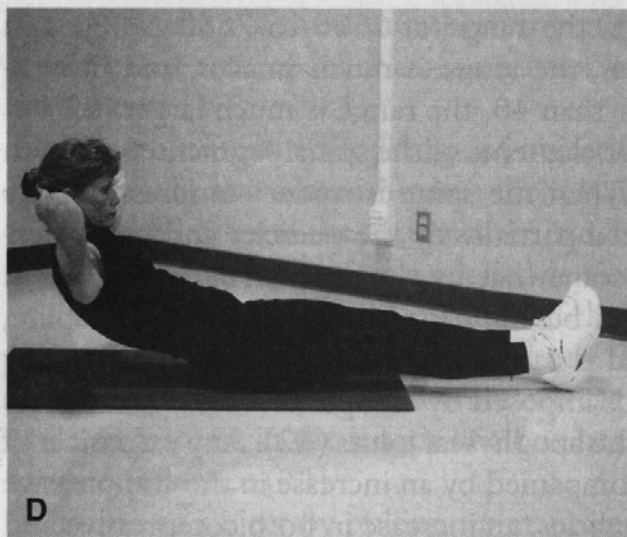
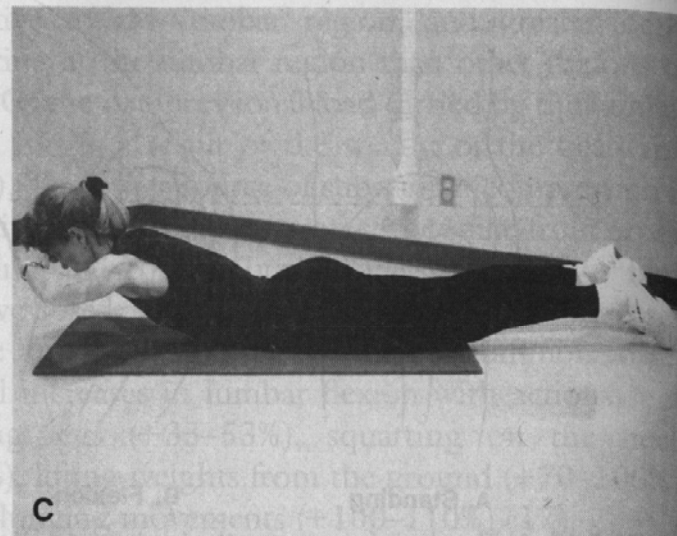
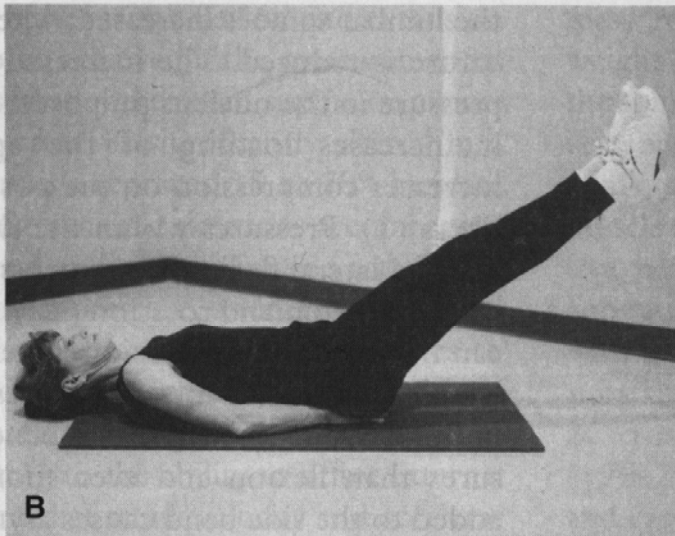
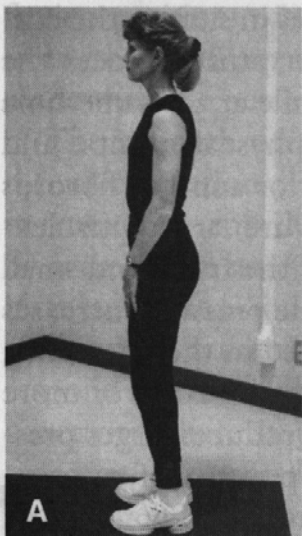


# 1. Conscious control

- Emphasis should be put on a **correct base** with weight evenly divided between both sides, and a **systematic correction of all segments** involved in the posture
- Example, in standing, the emphasis will be on the correct balance of the pelvis over the feet, the trunk on the pelvis, and the head on the trunk

# 1. Conscious control

- Use a long mirror for reinforcement (new posture may feel uncomfortable)
- Build kinesthetic and visual awareness gradually



**LOWEST**

**HIGHEST**

**FIGURE 7-16** The representative postures or movements are shown in order of calculated load on the lumbar vertebrae using a miniaturized pressure transducer. The standing posture imposed the least amount of load (686 N) **(A)**, followed by the double straight-leg raise (1176 N) **(B)**, back hyperextension (1470 N) **(C)**, sit-ups with knees straight (1715 N) **(D)**, sit-ups with knees bent (1764 N) **(E)**, and bending forward with weight in the hands (1813 N) **(F)**. (Adapted with permission from Nachemson, A. [1976]. Lumbar intradiscal pressure. In M. Jayson [Ed.]. *The Lumbar Spine and Back Pain*. Kent: Pitman Medical.)

## 2. Automatic control

- When performing a movement, the person's attention will be on the purpose of the movement
- Automatic dynamic control allows the body to move from a static position (more or less) to a position of readiness for movement

## 2. Automatic control

- Provides both general and local stability
- Adjustments are made to maintain balance and to overcome natural forces such as gravity (proprioceptive control)

