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
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 cannot 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

Treatment

Observation  Back braces  Surgery
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
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

Roundback is caused by wedge-shaped thoracic vertebrae.
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
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)