
SPINAL CORD LESIONS
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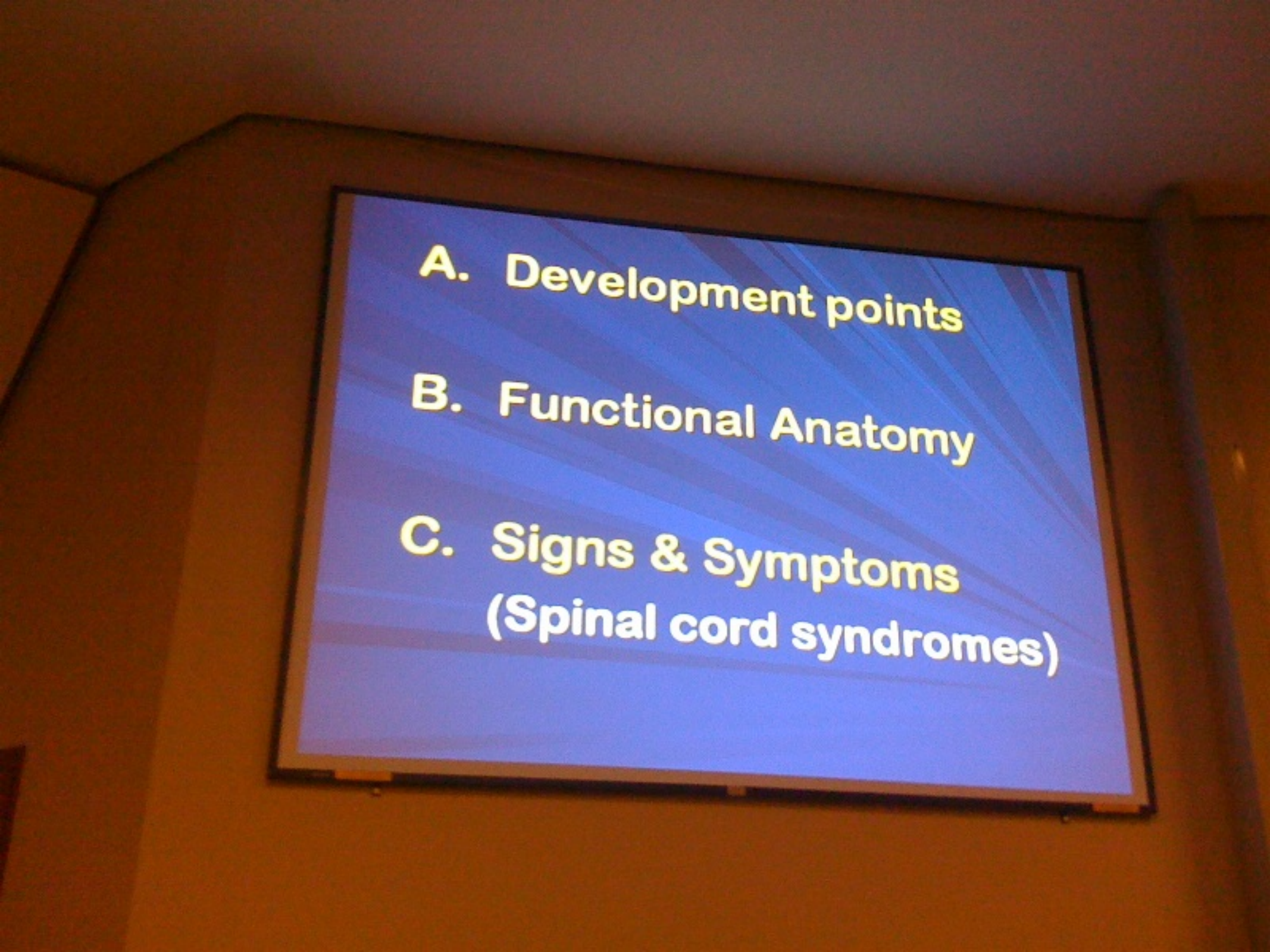
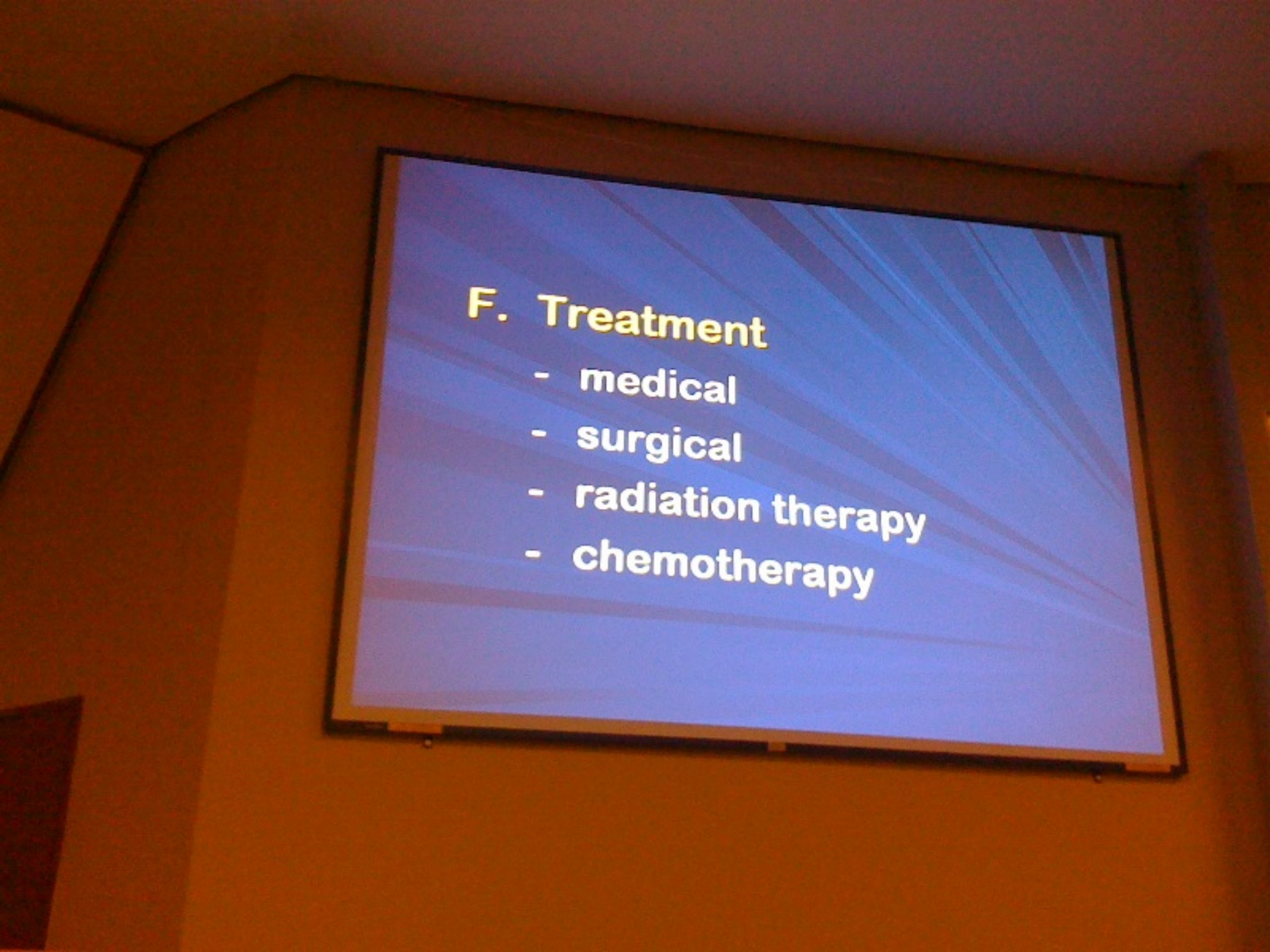

A. Development points
B. Functional Anatomy
C. Signs & Symptoms
(Spinal cord syndromes)

D. Pathological Conditions

- congenital
- acquired
  - traumatic
  - infective
  - tumorous conditions 1° & 2°

E. Investigations

- X-rays
- CT scans
- MRI scans


F. Treatment
- medical
- surgical
- radiation therapy
- chemotherapy

A. Developmental Points

- The spinal cord develops from neuro-ectoderm layer (like the brain)
- The vertebral bodies, muscles and ligaments forming the spinal canal develop from the para-axial mesoderm.
- In the uterus, the spinal cord extends the entire spinal canal.
- At birth, the spinal cord ends at the lower border of L3.
- In the adult stage, the spinal cord ends at the lower border of L1.

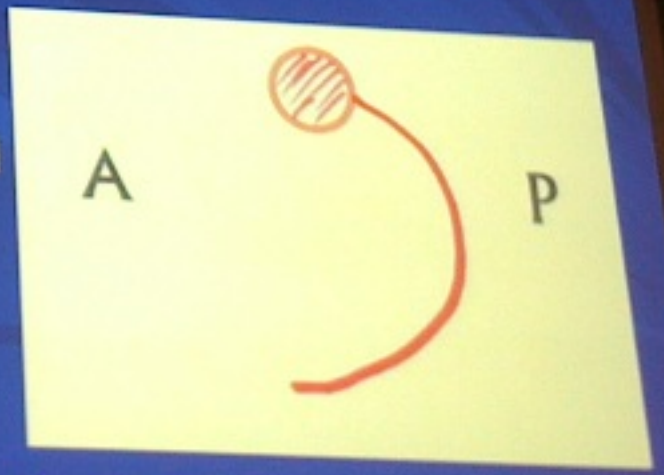
(Hence it is safe to do a lumbar puncture at the L4 L5 interspace ±1 interspace)

Spinal canal curvatures:-

a) The primary curvature represents the intra-uterine position:

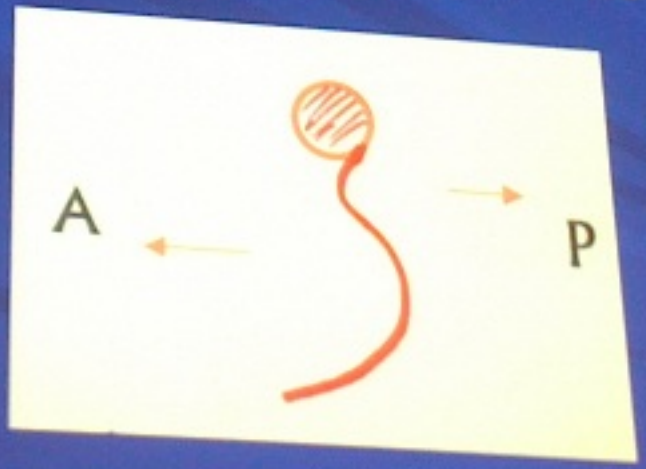
Concave forward

(anterior)

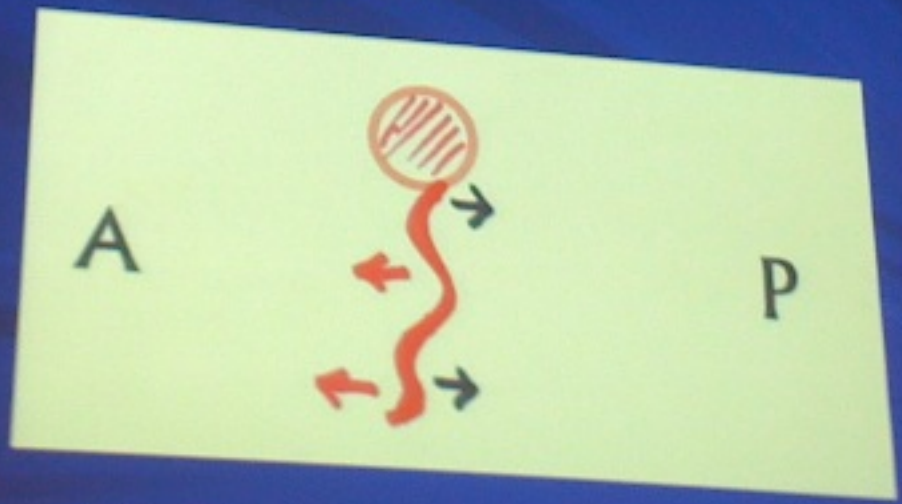


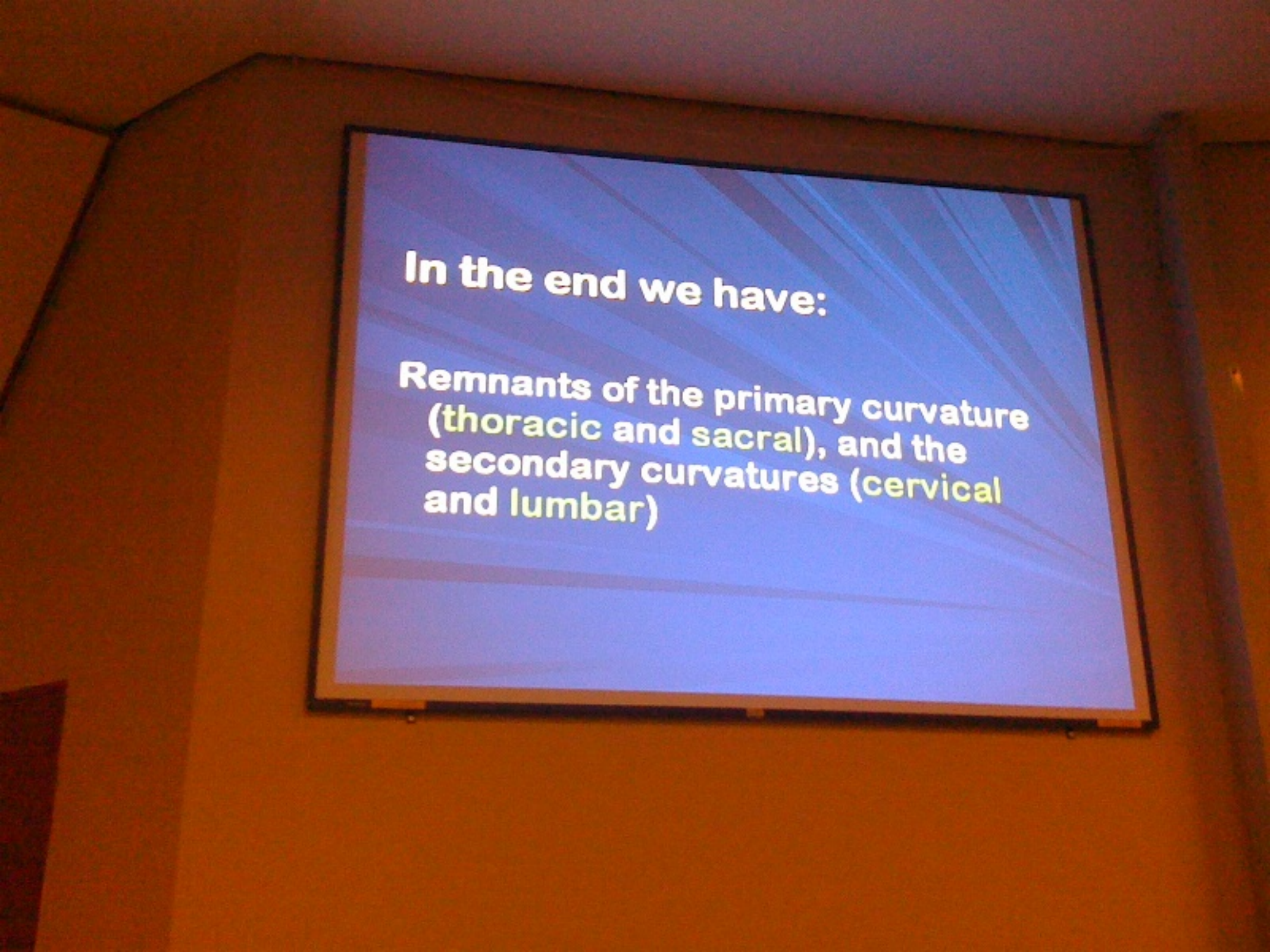
b) Secondary curvatures:

(i) The cervical curvature (convex anterior) develops when the infant starts to sit up, i.e. supports its head up



(ii) The lumbar curvature (2° curvature-convex anterior) develops as the child starts to stand and walk




In the end we have:
Remnants of the primary curvature (thoracic and sacral), and the secondary curvatures (cervical and lumbar)

Summary

Cervical - 7

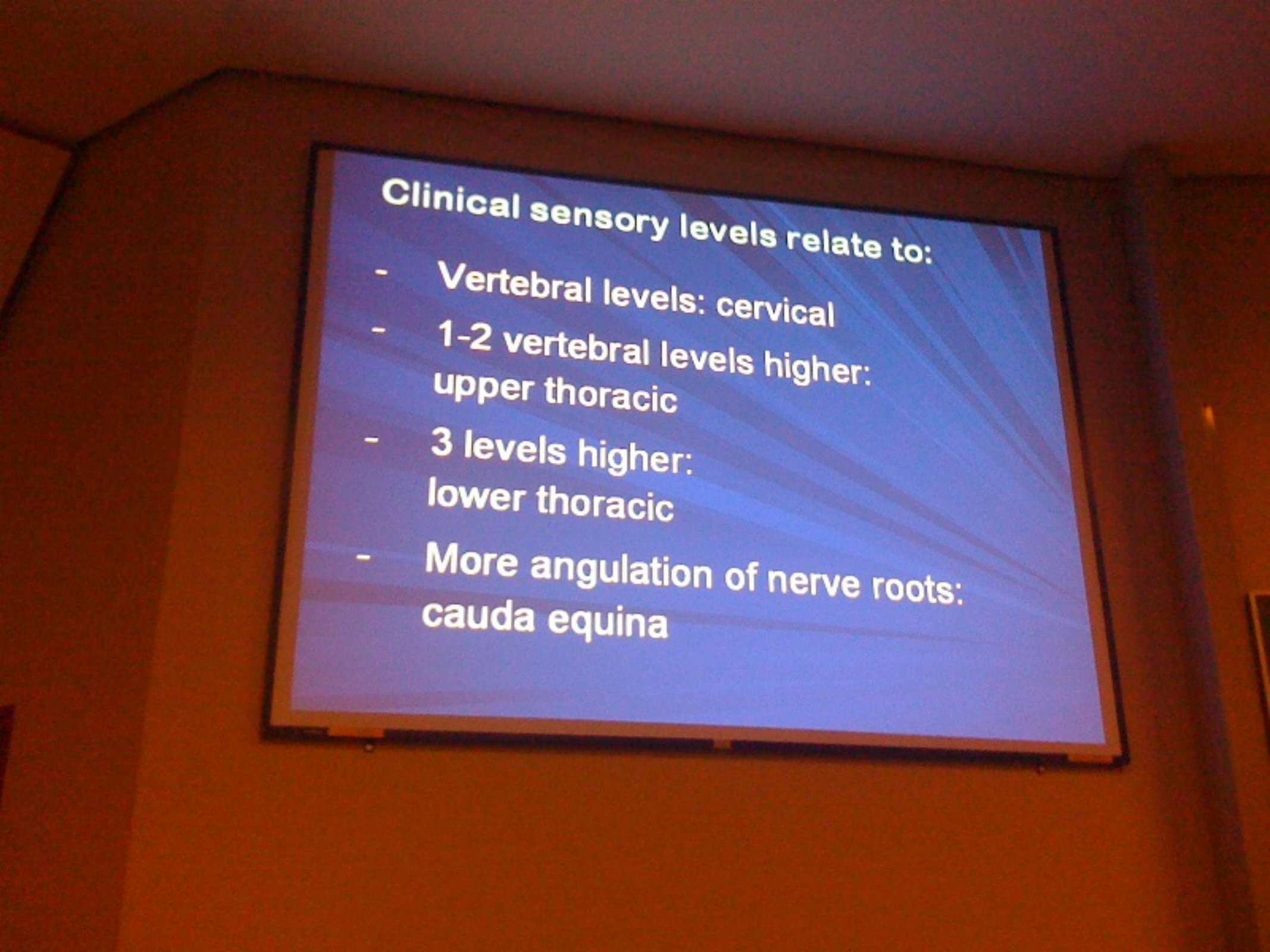
Thoracic - 12

Lumbar - 5

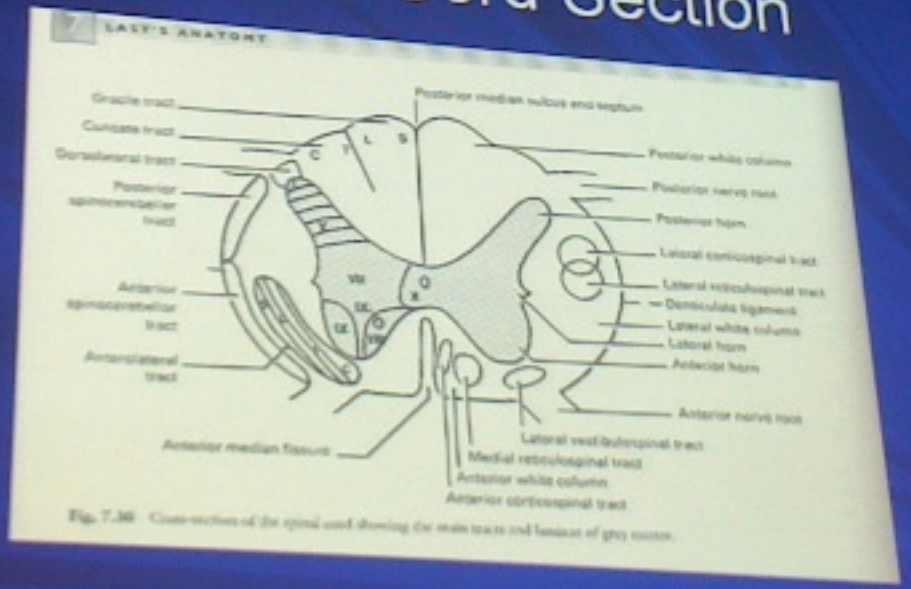
Sacral - 5

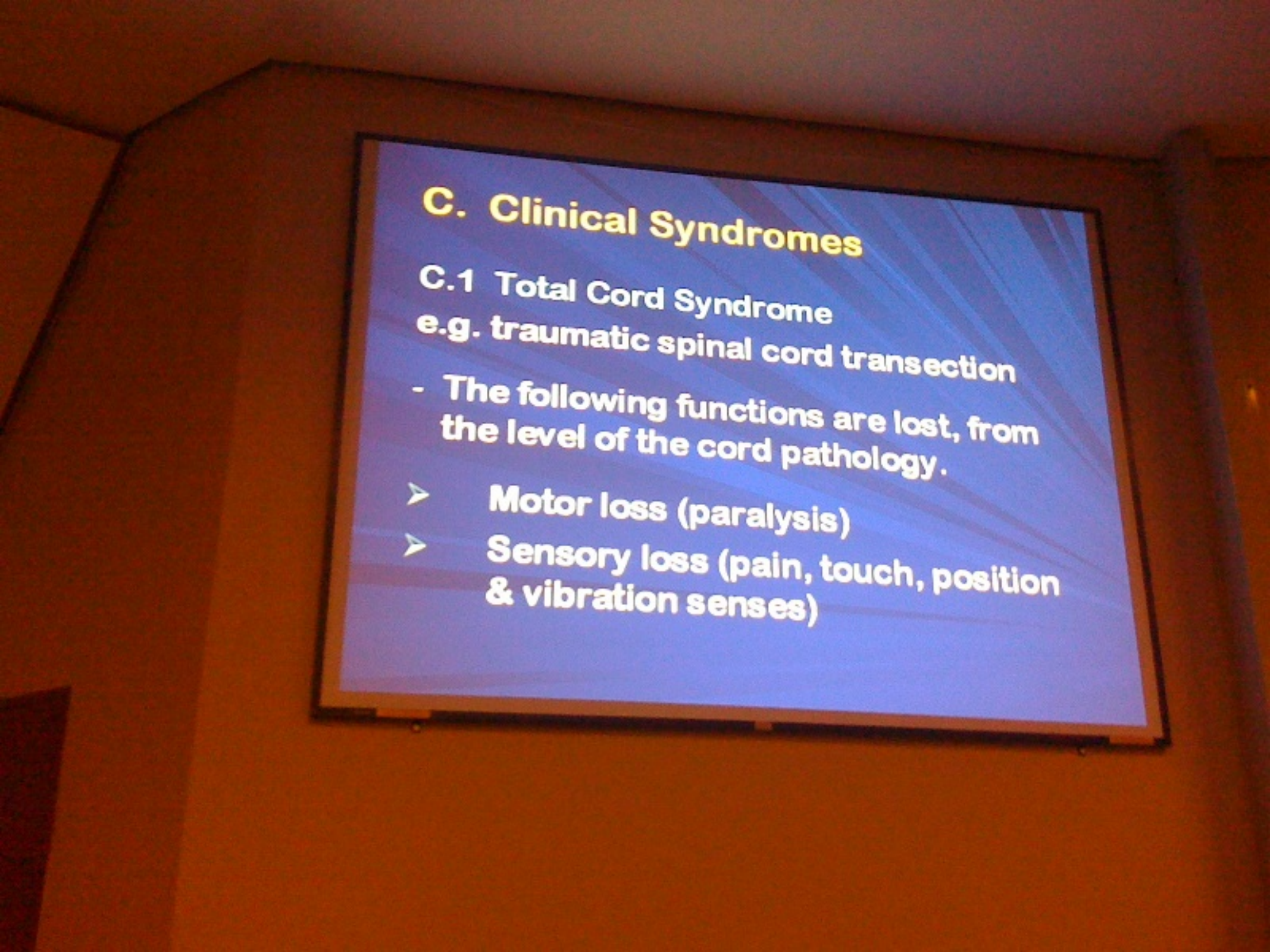
Coccyx - 3

B. Functional Anatomy

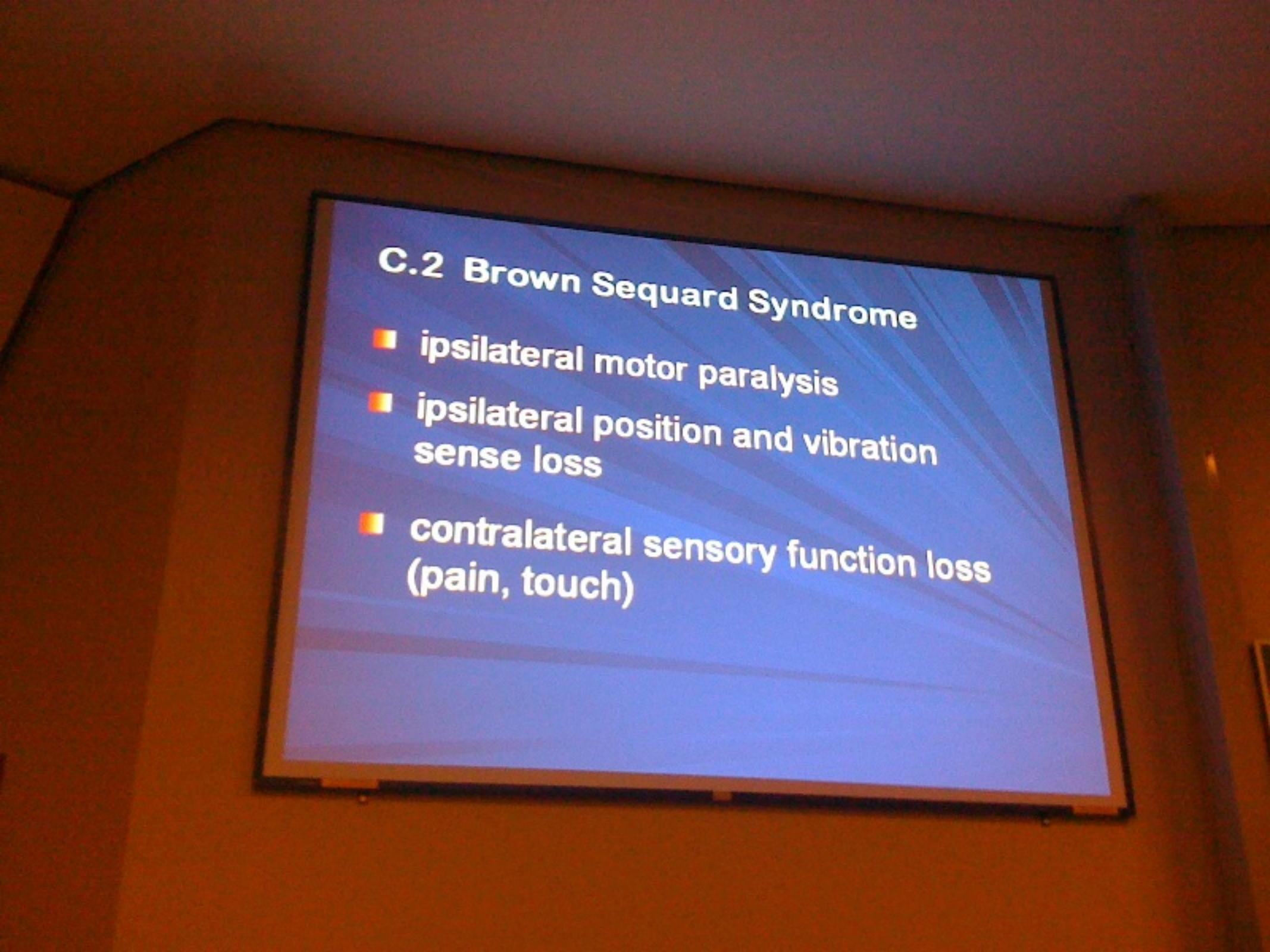

Clinical sensory levels relate to:
- Vertebral levels: cervical
- 1-2 vertebral levels higher: upper thoracic
- 3 levels higher: lower thoracic
- More angulation of nerve roots: cauda equina

Thoracic Cord Section




C. Clinical Syndromes
C.1 Total Cord Syndrome
e.g. traumatic spinal cord transection
- The following functions are lost, from the level of the cord pathology.
Motor loss (paralysis)
Sensory loss (pain, touch, position & vibration senses)

- Sympathetic function loss,
  e.g. skin features;
  Cardiovascular features,
  if high cord lesion
  e.g. ↓BP; ↓PR; warm extremities
- Bladder sensation & function loss
- Rectal sensation & function loss
- Upper motor neurone lesion vs.
  lower motor neurone lesion


C.2 Brown Sequard Syndrome
ipsilateral motor paralysis
ipsilateral position and vibration sense loss
contralateral sensory function loss (pain, touch)

C.3 Anterior Cord Syndrome

- Only the dorsal column function is preserved

C.4 Posterior Cord Syndrome

- dorsal column function is largely affected

Note: Spinal Shock

= absence of all reflexes for the first few days after trauma

In cervical cord lesions, the end of spinal shock is heralded by the return of the bulbocavernosus reflex, and the anal wink reflex.

D. Pathology of Spinal Cord

- 1. Congenital: e.g. scoliosis, lordosis and kyphosis; spinal bifida, etc.
- II. Acquired:
  - (a) Infective (acute pyogenic and chronic, e.g. TB)
  - (b) Tumours - 1° vertebral tumours
    - 1° spinal cord tumours
    - 2° vertebral tumours e.g. Ca lung and prostate
  - (c) Degenerative: e.g. cervical spondylosis; demyelinating cord conditions, etc.

E. Investigations of Spinal Pathology

- GENERAL:
  - FBC, ESR, U & E, LFT
  - Chest X-rays
  - Abdominal Sonar
- SPECIFIC:
  - Plain X-rays
  - CT Spine
  - MRI spine

F. Management

- SURGICAL
  - Removal of pathological mass;
  - Decompression of nerve tissue;
  - Spine Stabilisation
- MEDICAL
  - Antimicrobials (e.g antibiotics)
  - Chemotherapy (for malignancies)
- RADIATION
  - 2° metastases

(DXT = deep x-ray therapy)

- REHABILITATION
  - Physiotherapy
  - Occupational therapy
  - Psychotherapy