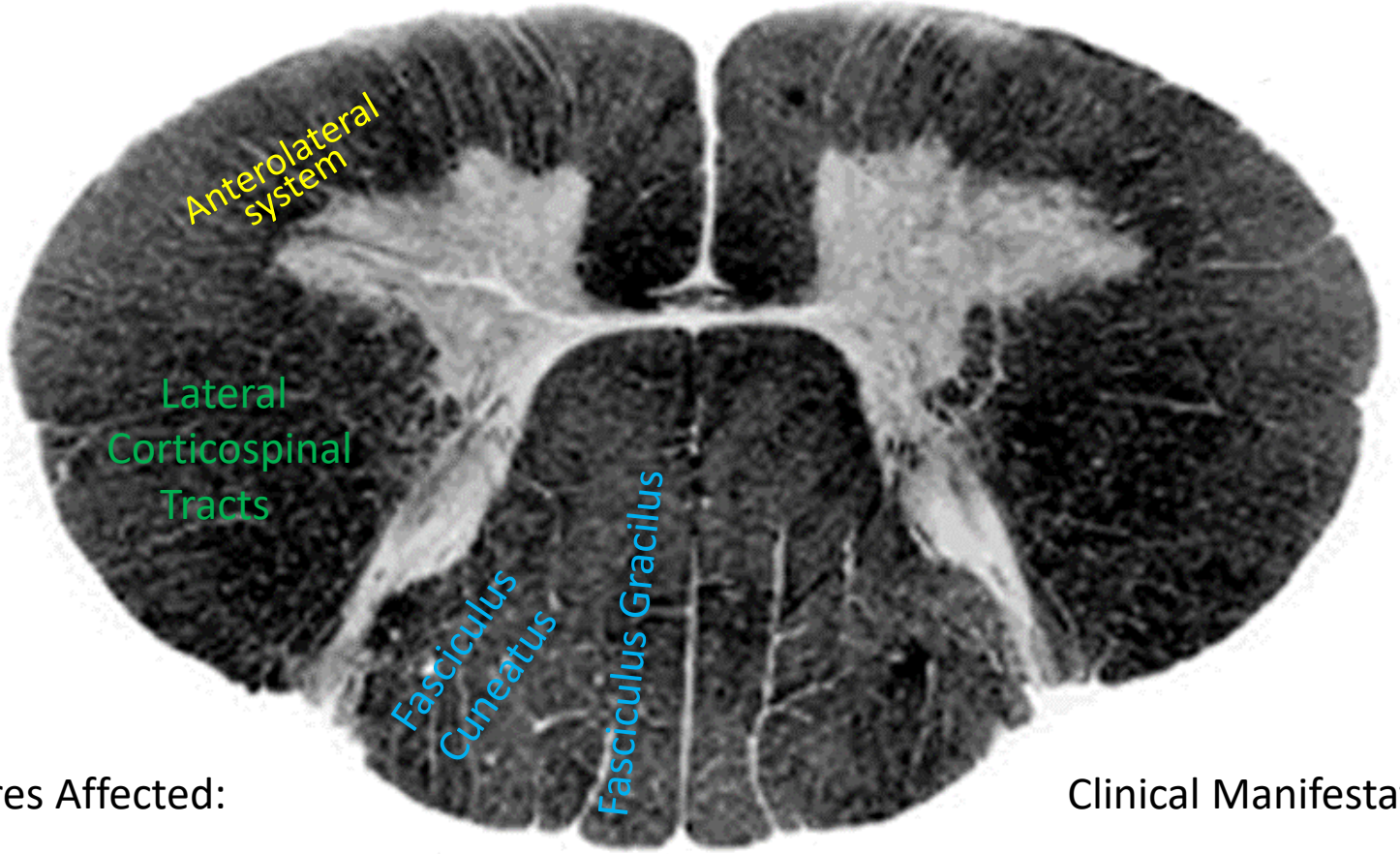
Regional Lesions in the Spinal Cord and Brainstem

B. Puder, PhD

Spinal Cord Hemisection or Brown-Sequard Syndrome

Cervical Section



Structures Affected:

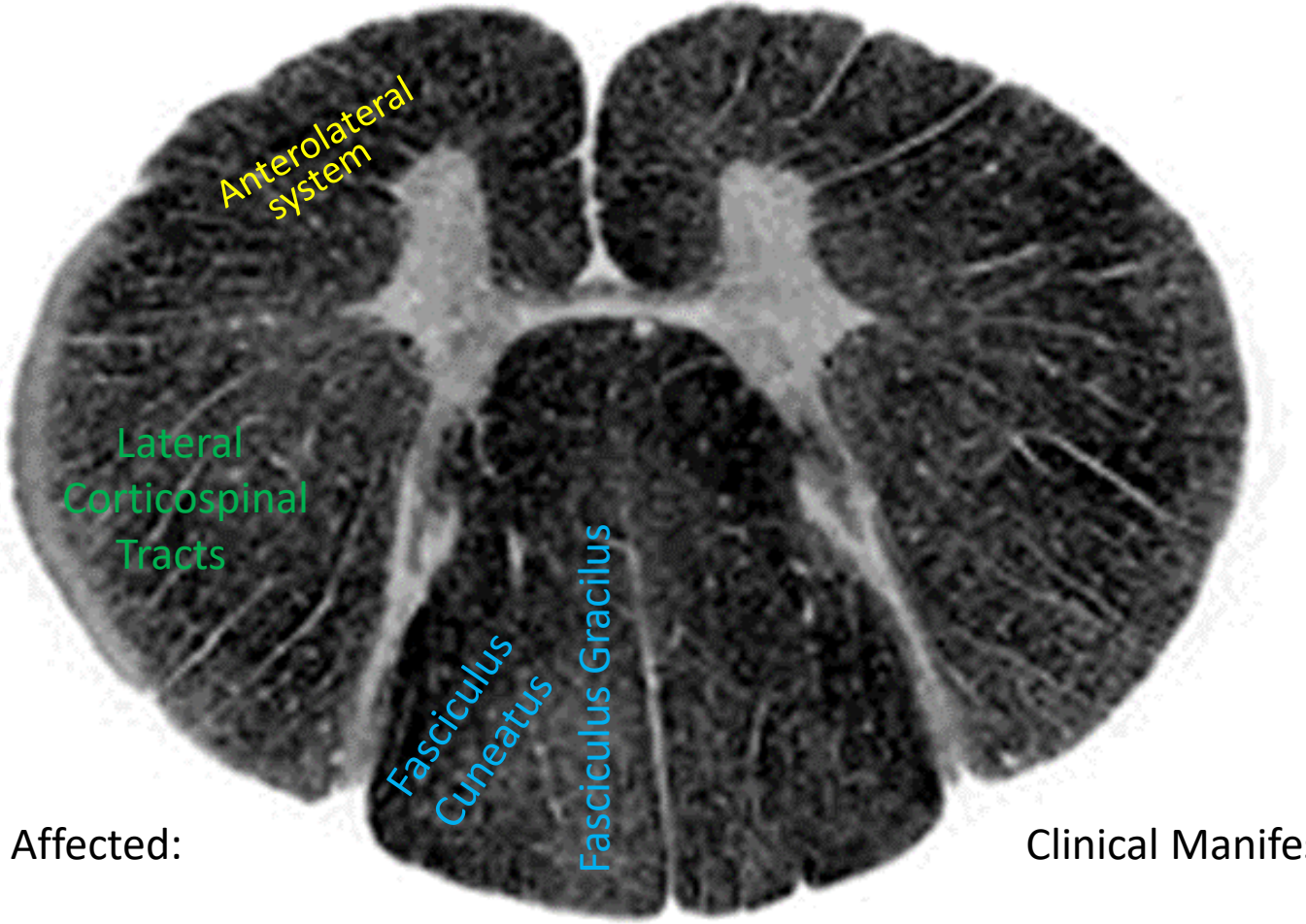
1. Fasciculus Gracilus & Fasciculus Cuneatus
2. Lateral Corticospinal tracts
3. Anterolateral system(spinothalamic tracts)

Clinical Manifestations

1. Ipsilateral loss of fine touch, positional and vibratory sense below this cervical level
2. Ipsilateral spastic paresis, hypertonia/reflexia, below this cervical level
3. Contralateral loss of pain and temperature below this cervical section

Spinal Cord Hemisection or Brown-Sequard Syndrome

Thoracic Section



Structures Affected:

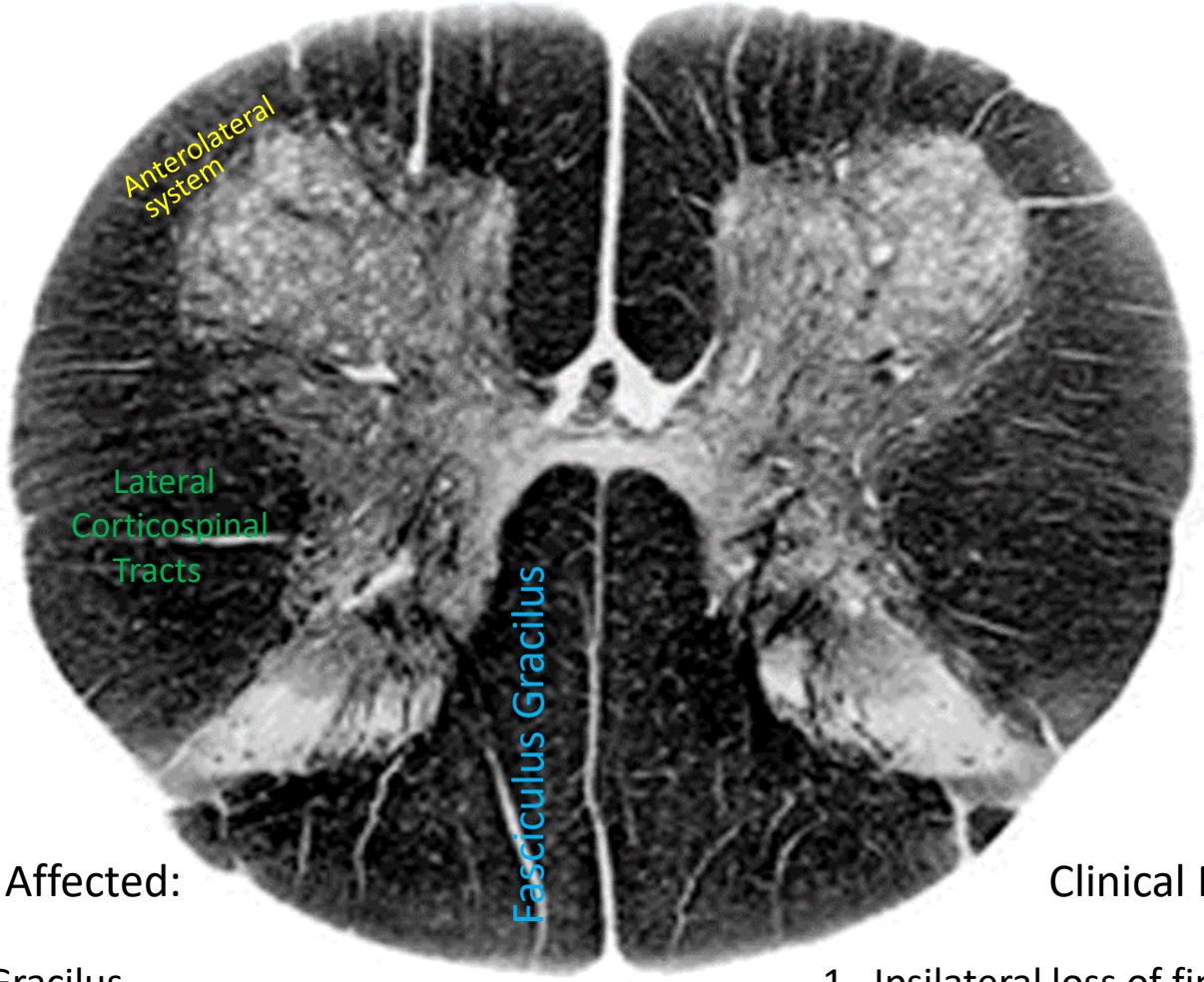
1. Fasciculus Gracilus & Fasciculus Cuneatus
2. Lateral Corticospinal tracts
3. Anterolateral system (spinothalamic tracts)

Clinical Manifestations

1. Ipsilateral loss of fine touch, positional and vibratory sense below this thoracic level
2. Ipsilateral spastic paresis, hypertonia/reflexia, below this thoracic level
3. Contralateral loss of pain and temperature below this thoracic section

Spinal Cord Hemisection or Brown-Sequard Syndrome

Lumbar Section



Structures Affected:

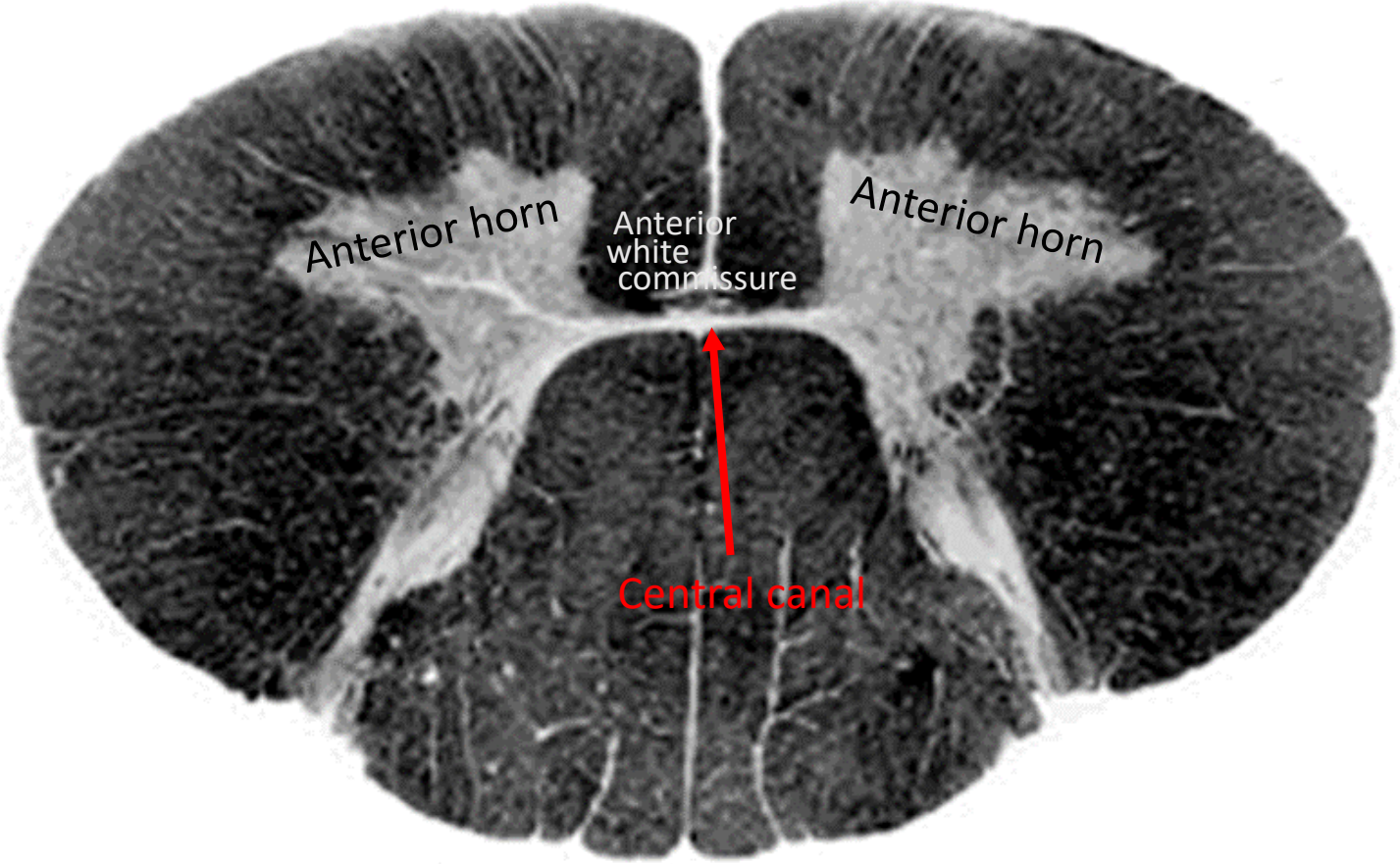
1. Fasciculus Gracilus
2. Lateral Corticospinal tracts
3. Anterolateral system (spinothalamic tracts)

Clinical Manifestations

1. Ipsilateral loss of fine touch, positional and vibratory sense below this lumbar level
2. Ipsilateral spastic paresis, hypertonia/reflexia, below this lumbar level
3. Contralateral loss of pain and temperature below this lumbar section

Syringomyelia

Cervical Section



Structures Affected:

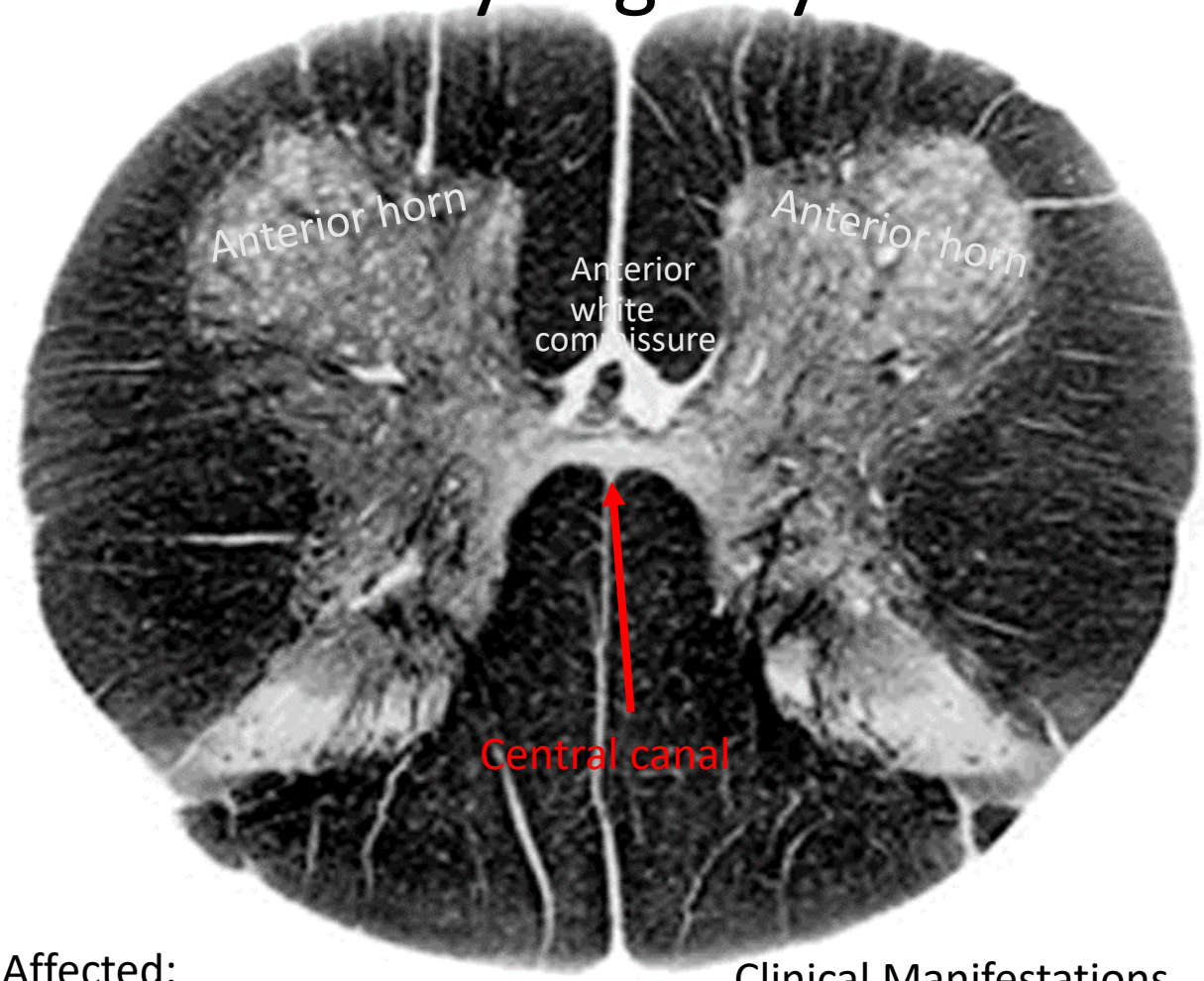
1. Anterior white commissure
2. Anterior horn

Clinical Manifestations

1. Bilateral loss of pain and temperature at this cervical level ONLY
2. Bilateral flaccid paralysis, hypotonia, hyporeflexia to this cervical level ONLY

Syringomyelia

Lumbar
Section



Structures Affected:

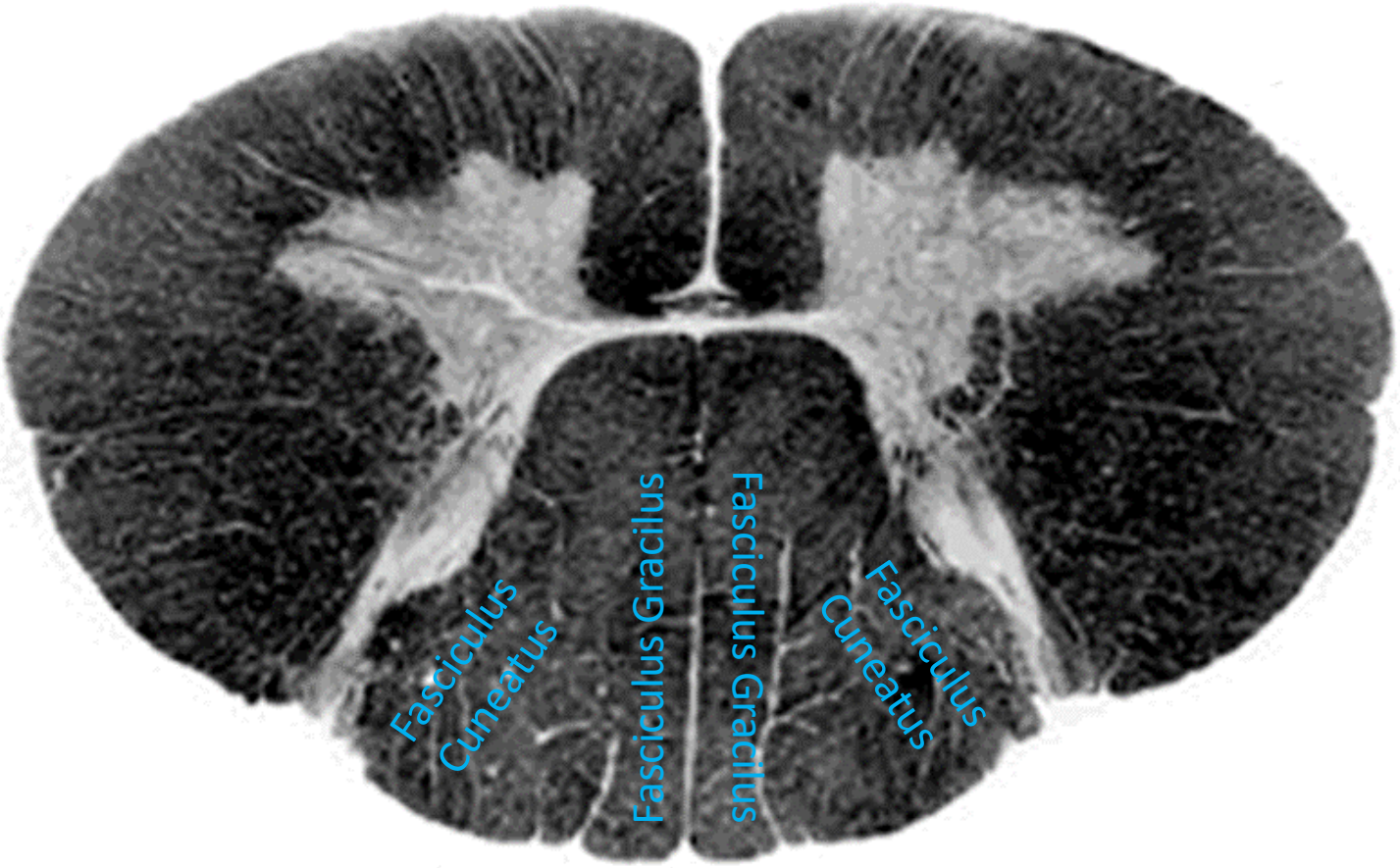
1. Anterior white commissure
2. Anterior horn

Clinical Manifestations

1. Bilateral loss of pain and temperature at this Lumbar level ONLY
2. Bilateral flaccid paralysis, hypotonia, hyporeflexia to this Lumbar level ONLY

Posterior Column Disease
(Tabes Doralis)

Cervical Section



Structures Affected:

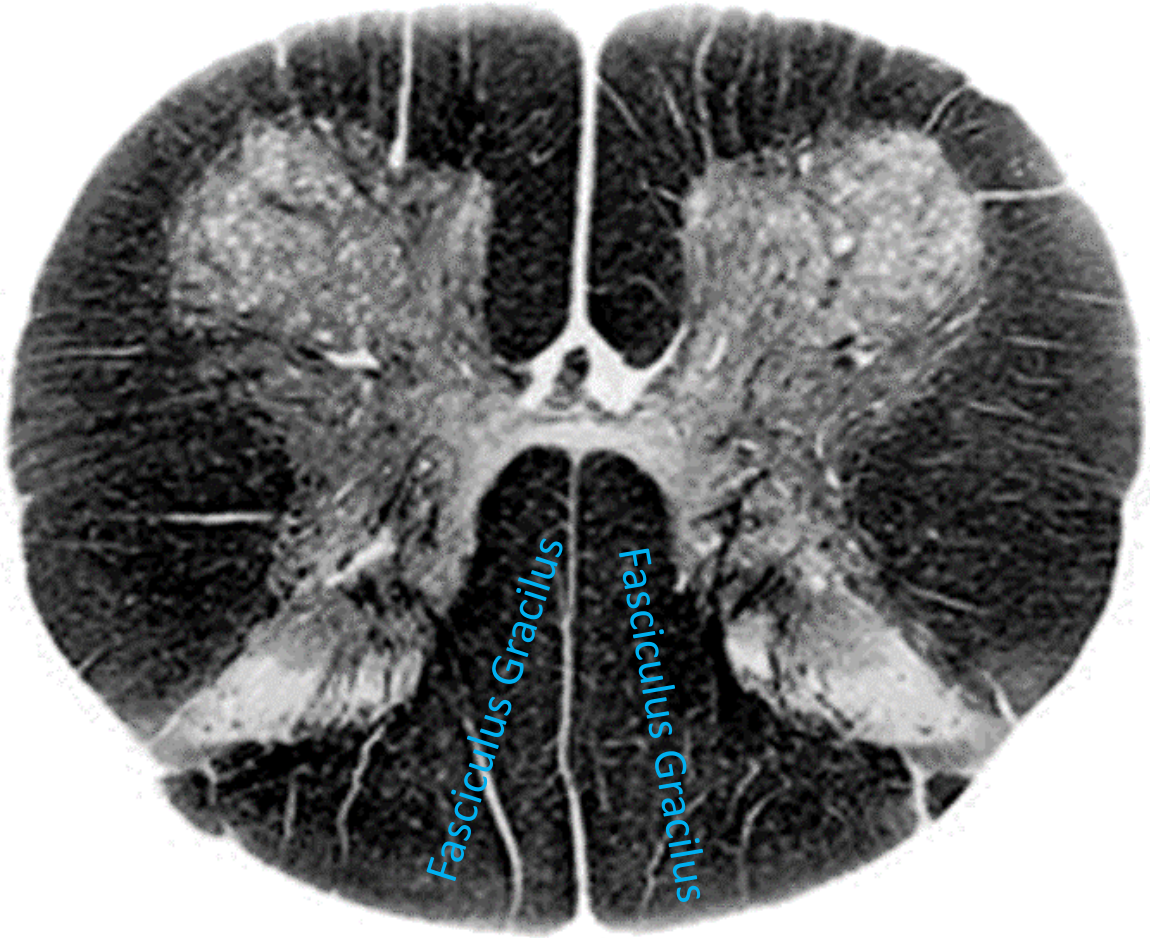
1. Posterior funiculi (fasciculi cuneatus & gracilus)

Clinical Manifestations:

1. Bilateral loss of fine touch, positional and vibratory sense below this cervical level

Posterior Column Disease
(Tabes Doralis)

Lumbar
Section



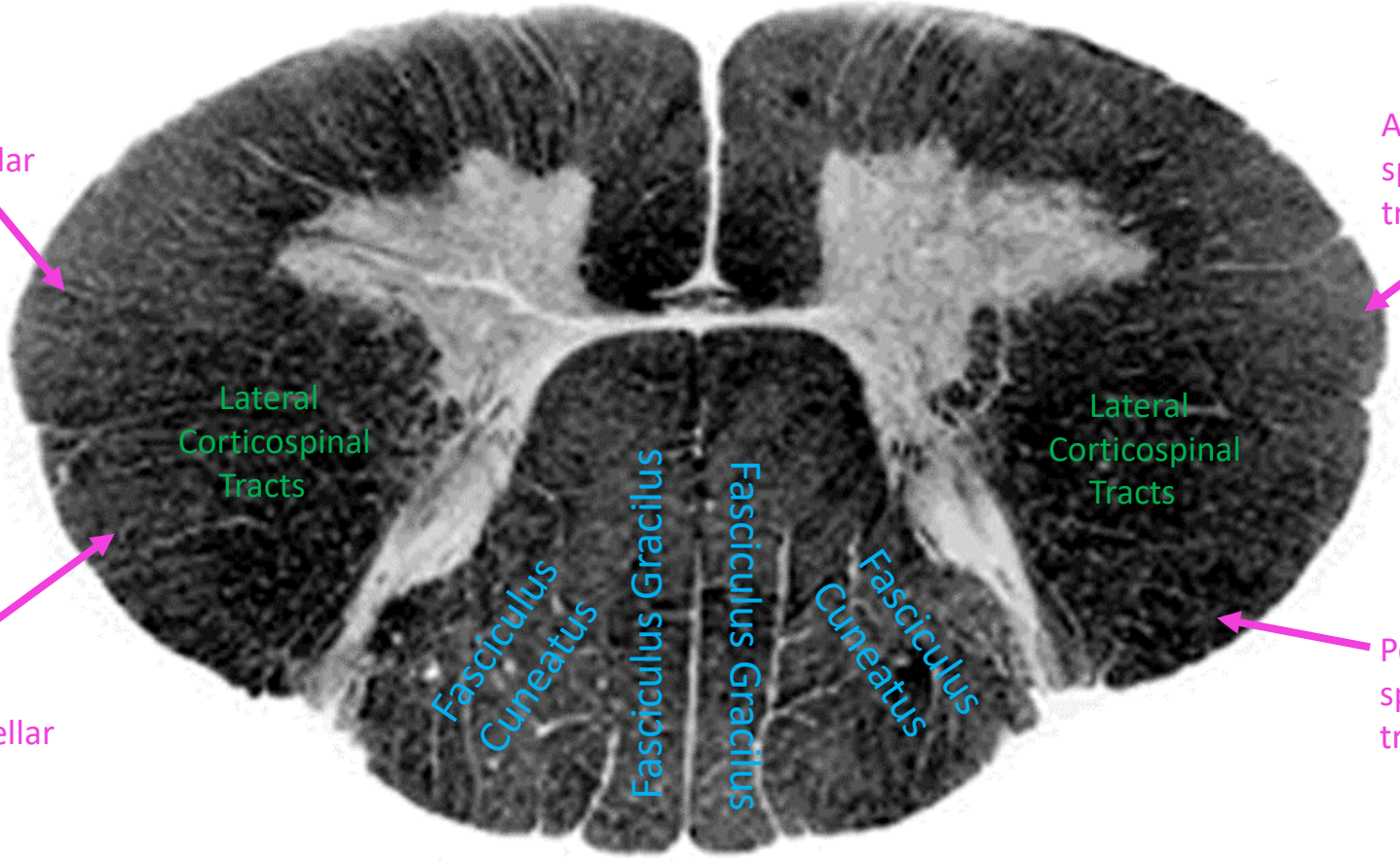
Structures Affected:

1. Posterior funiculi (fasciculi gracilus)

Clinical Manifestations:

1. Bilateral loss of fine touch, positional and vibratory sense below this lumbar level

Vitamin B12 Neuropathy



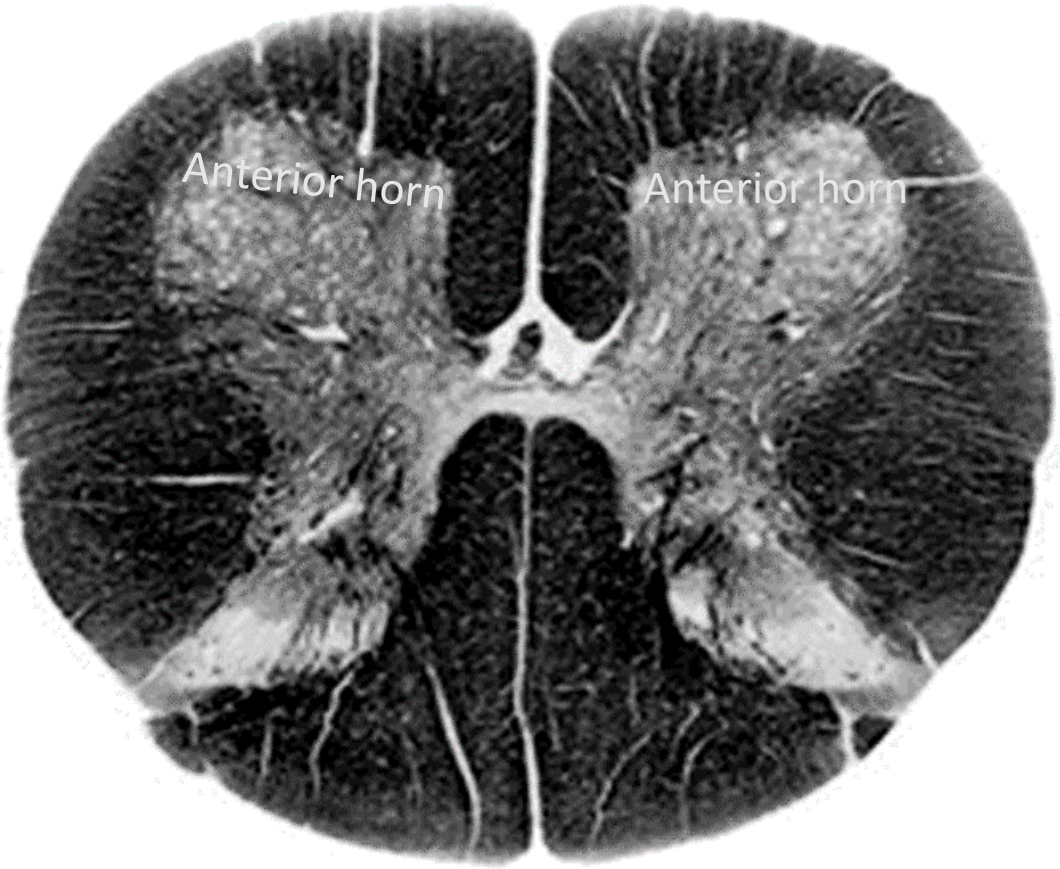
Structures Affected:

1. Posterior funiculi (fasciculi cuneatus & gracilus)
2. Anterior and Posterior Spinocerebellar tracts
3. Lateral corticospinal tracts

Clinical Manifestations:

1. Bilateral loss of fine touch, positional and vibratory sense below this cervical level
2. Ataxia (loss of motor coordination)
3. Bilateral spastic paresis, hypertonia/reflexia below this cervical level

Poliomyelitis



Lumbar
Section

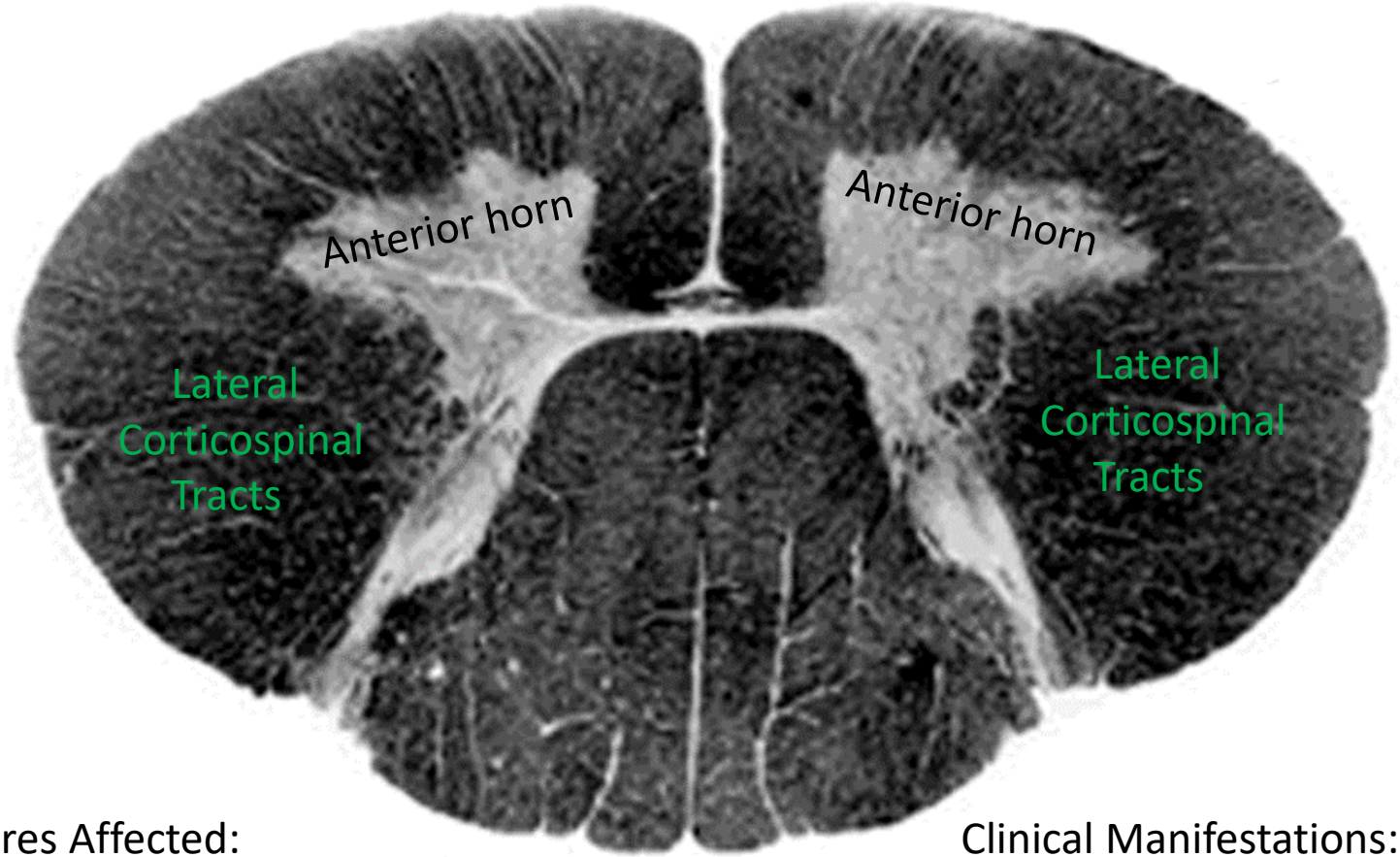
Structures Affected:

1. Anterior horns
(lower motor neurons)

Clinical Manifestations:

1. Bilateral flaccid paralysis hypotonia/reflexia, atrophy at this lumbar section ONLY

Amyotrophic Lateral Sclerosis (ALS) – NOT the Pain/Temp Pathway
a.k.a. Lou Gehrig's disease



Cervical
Section

Structures Affected:

1. Anterior horns
(lower motor neurons)

2. Lateral corticospinal tracts

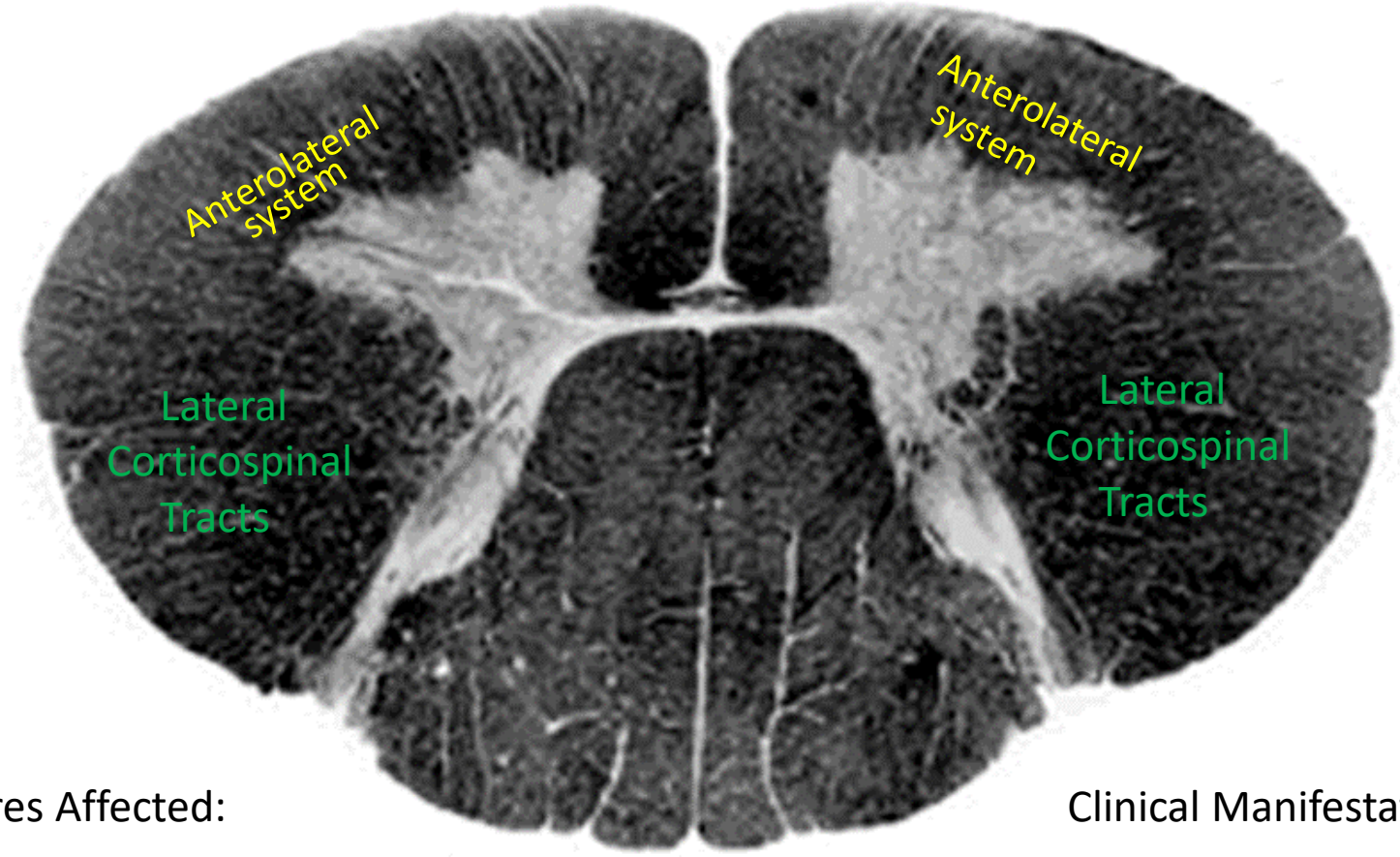
Clinical Manifestations:

1. Bilateral flaccid paralysis hypotonia/reflexia, atrophy at this cervical section ONLY

2. Bilateral spastic paresis, hypertonia/reflexia below this cervical level

Anterior Spinal Artery Thrombosis

Cervical Section



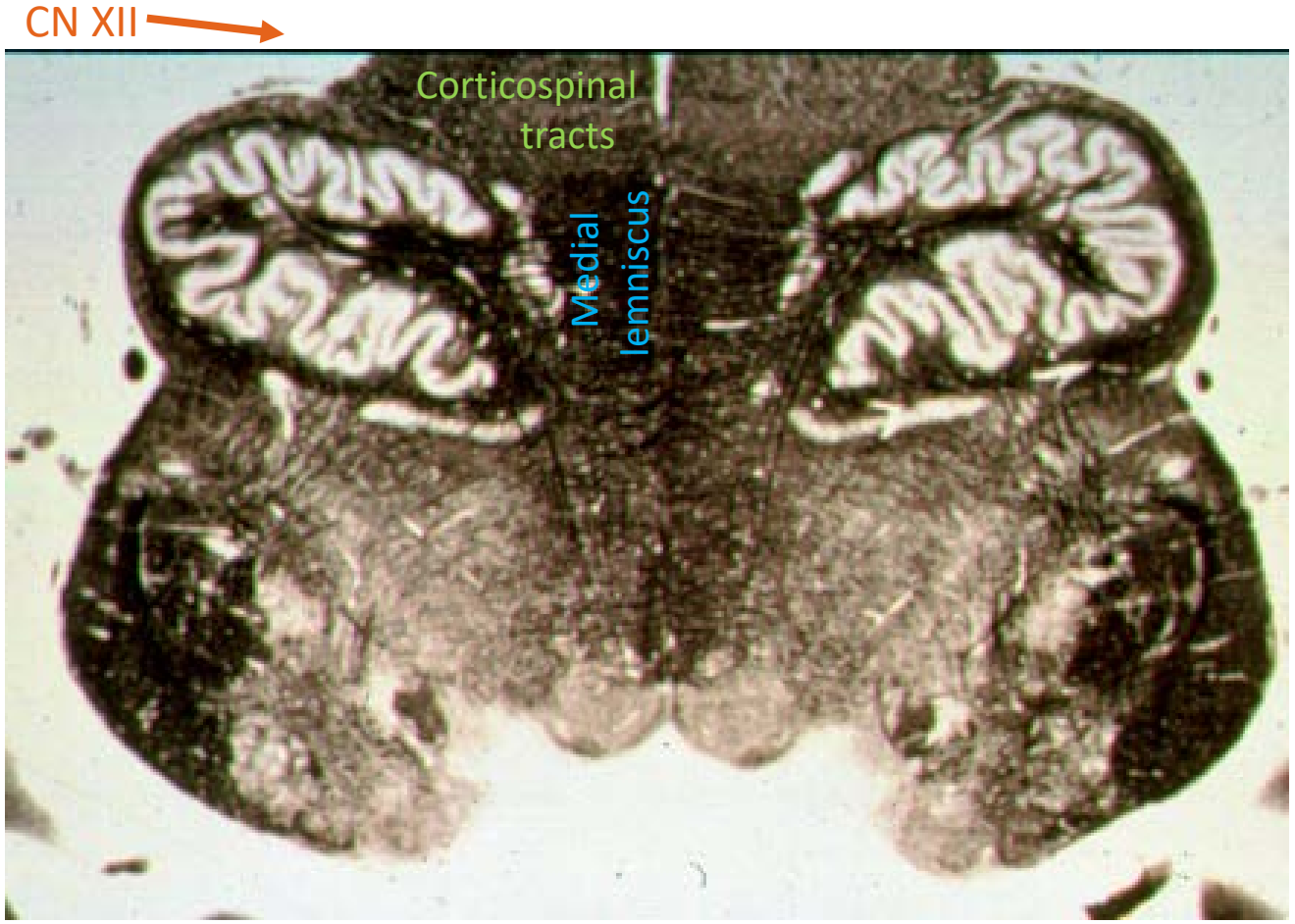
Structures Affected:

1. Anterolateral system(spinothalamic tracts)
2. Lateral Corticospinal tracts

Clinical Manifestations

1. Bilateral loss of pain and temperature below this cervical section
2. Bilateral spastic paresis, hypertonia/reflexia, below this cervical level

Medial Medullary Syndrome



Structures Affected:

1. Corticospinal tracts
2. Medial lemniscus
3. Hypoglossal nerve

Clinical Manifestations:

1. Contralateral spastic paresis, hypertonia/reflexia, neck and below (body)
2. Contralateral loss of fine touch, positional and vibratory sense neck and below (body)
3. Ipsilateral atrophy of the tongue

Lateral Medullary Syndrome
a.k.a. Wallenberg's syndrome, PICA syndrome

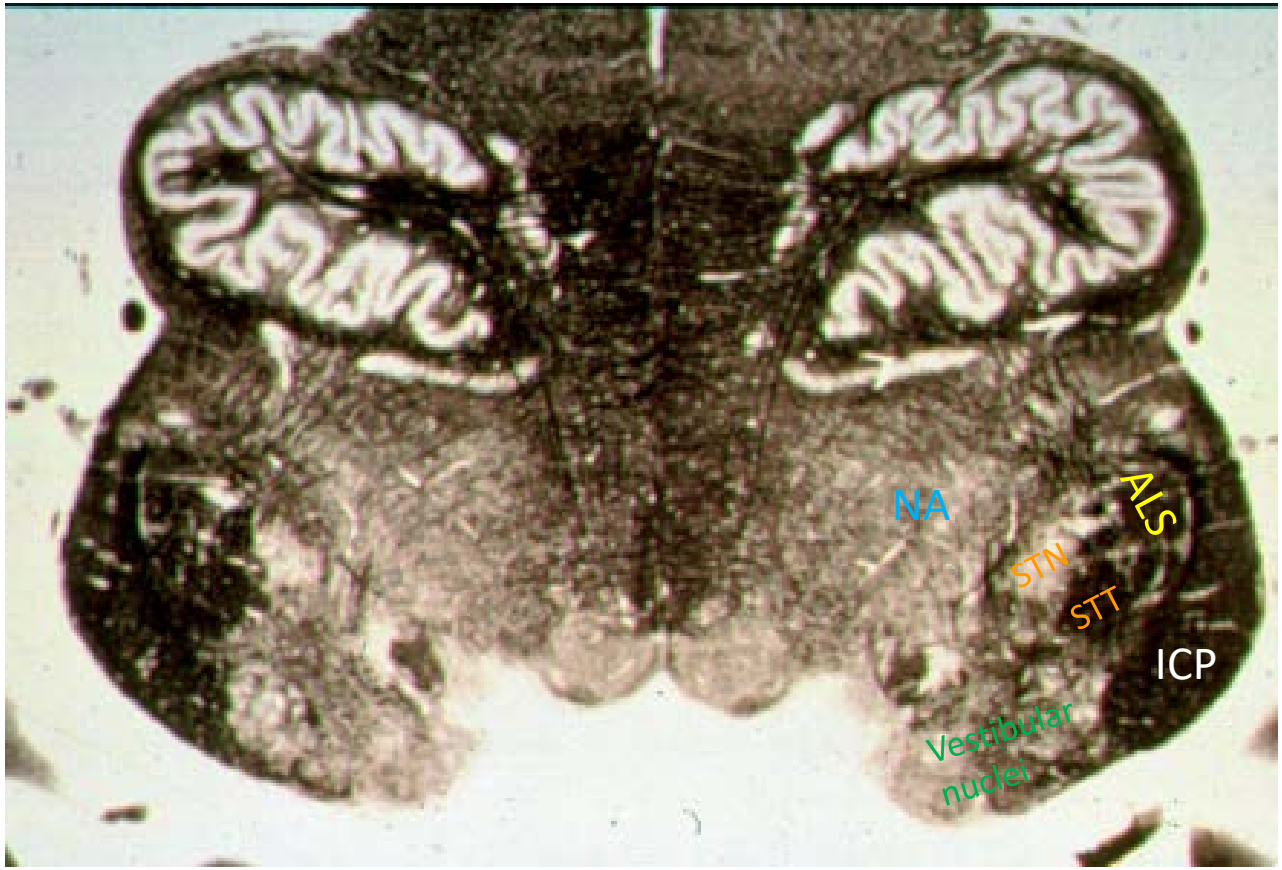
Structures Affected:

1. Anterolateral system (ALS)

2. Spinal Trigeminal Nucleus & Tract (STN & STT)

3. Nucleus Ambiguus (NA)

4. Inferior cerebellar peduncle (ICP)



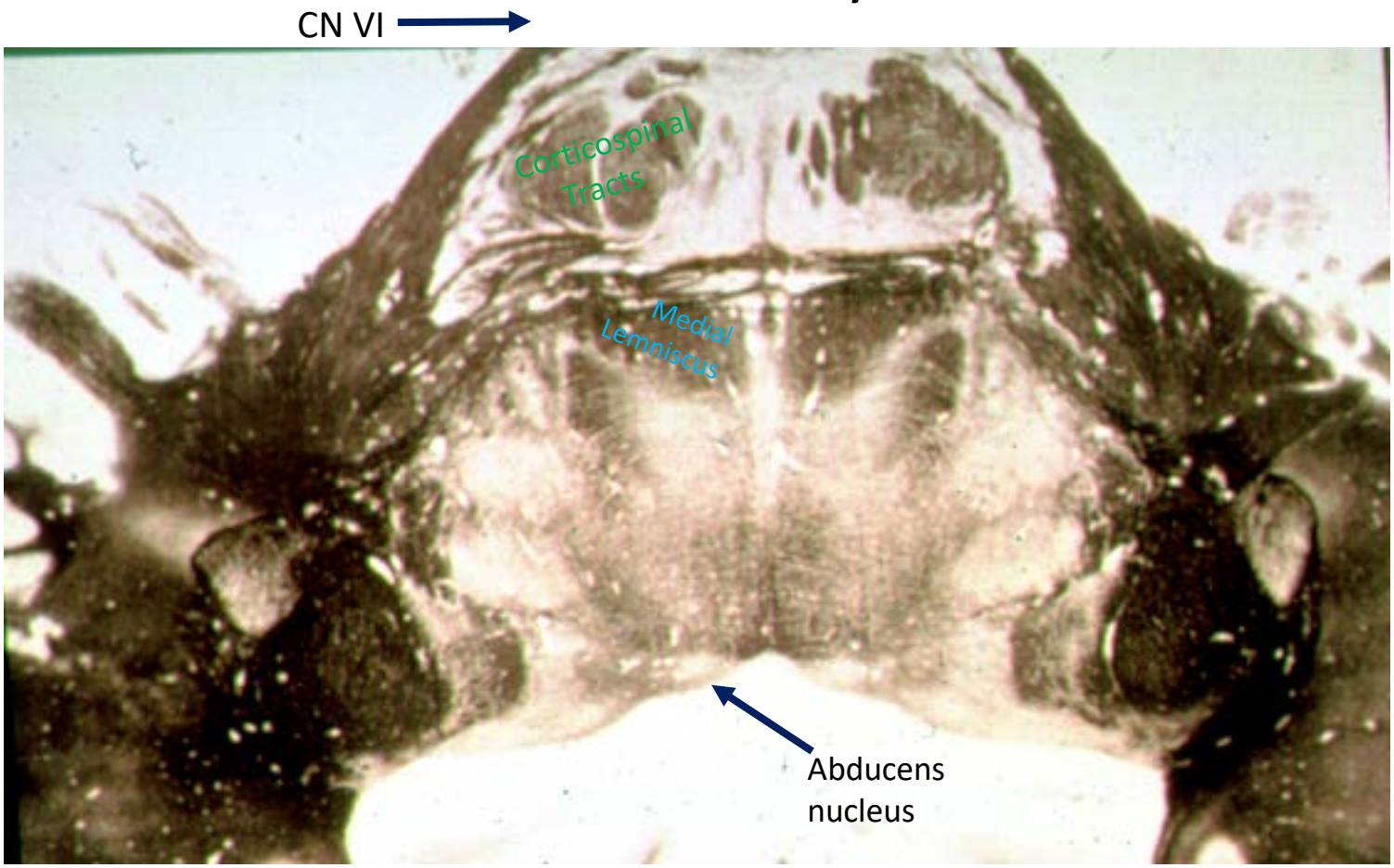
5. Vestibular nuclei

6. Descending Hypothalamospinal tracts

Clinical Manifestations:

1. Contralateral loss of pain & temperature from the body
2. Ipsilateral loss of pain & temperature from the face
3. Ipsilateral dysarthria & dysphagia & loss of gag reflex
4. Ipsilateral ataxia
5. Vertigo, nausea, nystagmus,
6. Ipilateral Horner's syndrome: ptosis, miosis, hemianhydrosis

Medial Pontine Syndrome



Structures Affected:

1. Corticospinal tracts
2. Medial lemniscus
3. Abducens nerve

Clinical Manifestations:

1. Contralateral spastic paresis, hypertonia/reflexia, neck and below (body)
2. Contralateral loss of fine touch, positional and vibratory sense neck and below (body)
3. Ipsilateral medial strabismus

Medial Midbrain Syndrome
a.k.a. Weber's syndrome, or Superior Alternating Hemiplegia

Structures Affected:

1. Corticospinal tracts

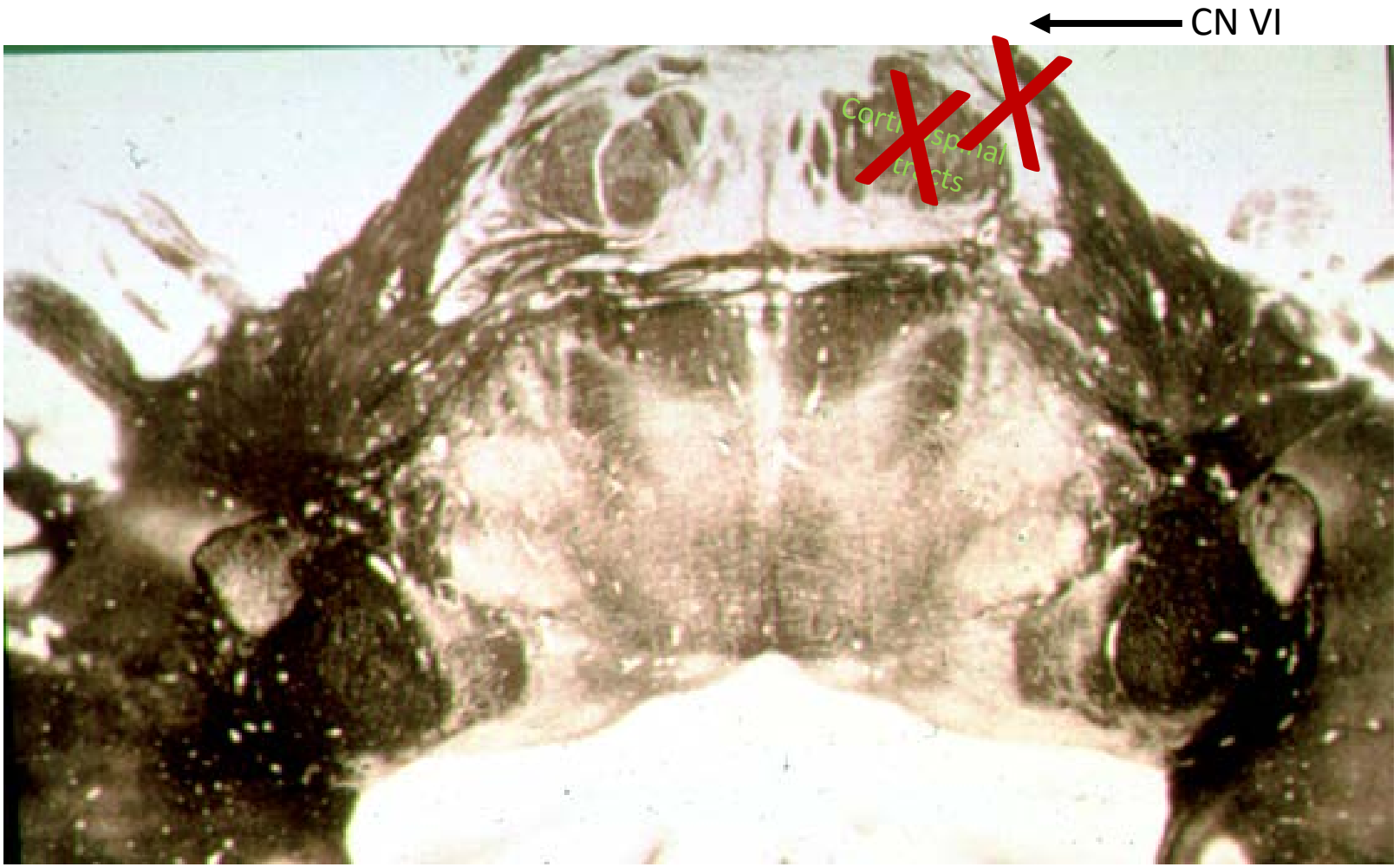
2. Occulomotor nerve

Clinical Manifestations:

1. Contralateral spastic paresis, hypertonia/reflexia, neck and below (body)

2. Ipsilateral lateral strabismus

Middle Alternating Hemiplegia



Structures Affected:

1. Corticospinal tracts

2. Abducens nerve

Clinical Manifestations:

1. Contralateral spastic paresis, hypertonia/reflexia, neck and below (body)

2. Ipsilateral medial strabismus

Inferior Alternating Hemiplegia

Structures Affected:

1. Corticospinal tracts
2. Hypoglossal nerve

Clinical Manifestations:

1. Contralateral spastic paresis, hypertonia/reflexia, neck and below (body)
2. Ipsilateral atrophy of the tongue