

Intercostal Nerves, Dissection, Clinical Anatomy

Intercostal Nerves

- There are **11 pairs of intercostal nerves** and one **subcostal nerve (T12)**.
- They are the **anterior primary rami** of **T1–T11 spinal nerves**, each lying in its corresponding **intercostal space**.
- Each nerve is **mixed (motor, sensory and sympathetic)**.
- **Course:** Runs forward in the **costal groove**, between the **internal intercostal** and **innermost intercostal muscles**, accompanied by **intercostal vessels** arranged as **V–A–N** (from above downward).
- **Branches:**
 - **Rami communicantes** ? join the **sympathetic trunk**.
 - **Collateral branch** ? runs near upper border of rib below, supplies intercostal muscles.
 - **Lateral cutaneous branch** ? divides into anterior and posterior branches to the skin.
 - **Anterior cutaneous branch** ? emerges near sternum to supply skin of front of thorax and abdomen.
 - **Muscular branches** ? to intercostal and abdominal muscles.
 - **Pleural and peritoneal branches** ? to parietal pleura and peritoneum.

- **First intercostal nerve:** mainly joins the **brachial plexus**.
- **Second intercostal nerve:** gives **intercostobrachial nerve** supplying skin of **axilla and upper arm**.
- **Lower six intercostal nerves (T7–T11):** continue to supply the **anterior abdominal wall**.

Dissection

- Make an incision through the **skin and superficial fascia** over the intercostal space.
- Reflect the **external intercostal muscle** to expose the **intercostal vessels and nerve** in the **costal groove**.
- Observe the arrangement of **vein, artery and nerve (V–A–N)** from above downward.
- Identify the **collateral branch** along the upper border of the rib below.
- Trace the **lateral cutaneous branch** emerging through the muscles to the skin.
- Note the communication of intercostal nerves with the **sympathetic chain** posteriorly.

Clinical Anatomy

1. Intercostal Neuralgia

- Caused by inflammation or irritation of an intercostal nerve.
- Produces **sharp, radiating pain** along the intercostal space, often following **herpes zoster infection**.

- Pain is aggravated by cough or deep breathing.

2. Herpes Zoster (Shingles)

- Reactivation of latent **varicella–zoster virus** in a dorsal root ganglion ? painful vesicular eruption over the corresponding dermatome.
- Demonstrates the **segmental distribution of intercostal nerves**.

3. Intercostal Nerve Block

- Used for **postoperative or fracture pain relief**.
- Local anaesthetic is injected **near the inferior border of the rib above** the nerve (to avoid pleural puncture).
- Usually performed at multiple levels for effective analgesia.

4. Pleuritic Pain and Referred Pain

- **Parietal pleura** is supplied by intercostal nerves; hence pleuritic inflammation causes localized chest pain.
- Irritation of **lower intercostal nerves** may refer pain to the **anterior abdominal wall**.

5. Clinical Relations with Thoracotomy and Chest Drains

- During thoracotomy or intercostal drain insertion, incisions should be made **just above the upper border of a rib** to avoid injuring the neurovascular bundle in the costal groove.

Summary of Function:

- Intercostal nerves are vital for **motor supply** to intercostal muscles and **sensory supply** to the skin of thorax and abdomen.
- Their clinical importance extends to **segmental pain patterns, surgical approaches, and nerve blocks for analgesia**