

# The Wiring Of The Thorax

By Dr.Jana Ahmed

An Atlas Of Thoracic Neurology



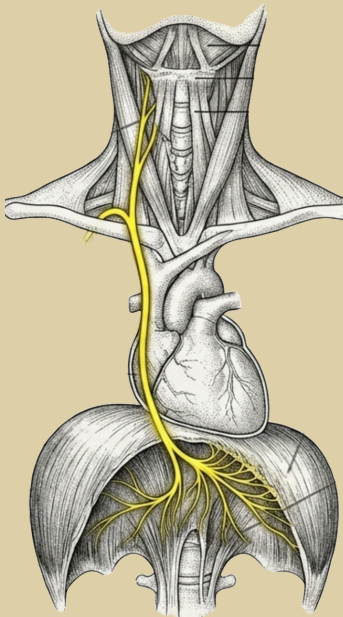
## 1.Phrenic Nerve : The Breath Driver

### Origin

Arises in the neck root and descends vertically into the thorax.

### Function

It is the sole motor supply to the diaphragm.

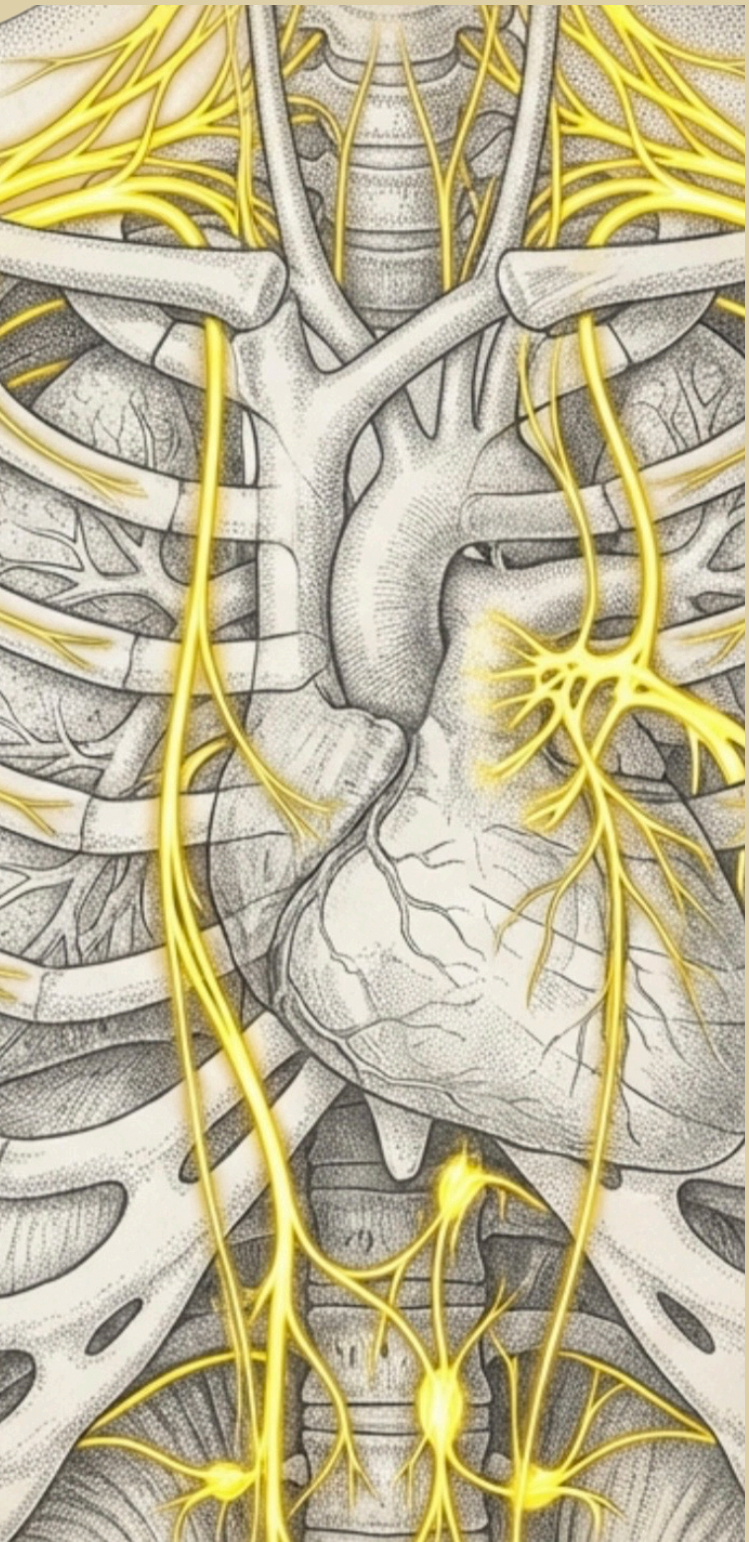


### Pathway

Enters the thoracic inlet in front of the cervical pleura, passing anterior to the lung root.

### Clinical Reality

Complete paralysis of one half of the diaphragm requires total severing of the main phrenic nerve on that side.

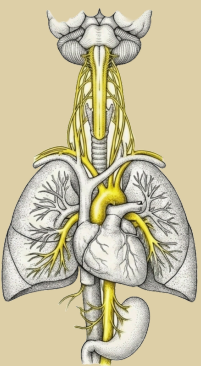


| Rt.Phrenic                                | Lt.Phrenic                                  |
|-------------------------------------------|---------------------------------------------|
| Shorter                                   | Longer                                      |
| Nearly Vertical                           | Curves to the left with the heart concavity |
| Venous mediastinal part                   | Arterial mediastinal part                   |
| Parallel to vagus                         | Crosses lt.vagus near Aortic Arch           |
| Ends in the vena canal opening (T8 Level) | Pierces Lt.Cupola                           |

## 2.Vagus Nerve : The Great Wanderer

### Origin

The 10th cranial nerve arises inside the skull from the medulla oblongata.



### Pathway

It is the longest cranial nerve, traversing the neck, thorax, and abdomen.

### Function

Contains motor fibers (pharynx/larynx), sensory fibers (respiratory/digestive tracts), and critical parasympathetic fibers to the heart and lungs.

| Rt.Vagus                                                                 | Lt.Vagus                                                                                                                                |
|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          |                                                                                                                                         |
| Descends to the right of the trachea. Passes behind the right lung root. | Enters thorax between left common carotid and left subclavian arteries. Crosses over the aortic arch. Passes behind the left lung root. |
| Forms the posterior esophageal plexus.                                   | Forms the anterior esophageal plexus.                                                                                                   |



# The Wiring Of The Thorax

An Atlas Of Thoracic Neurology

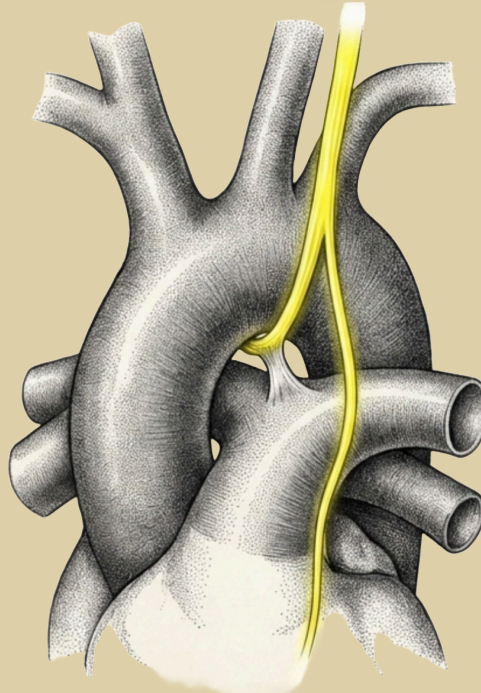
By Dr.Jana Ahmed



## 3.Recurrent Laryngeal Nerves : The Hooking Pathway

### Anatomy

It branches from the Vagus and hooks inferiorly around the aortic arch (specifically at the ligamentum arteriosum) before ascending back to the neck.



### Clinical Topography

Because this nerve dips deep into the superior mediastinum before returning to the voice box, an aortic aneurysm or a tumor in the left lung apex can compress it.

### Symptom

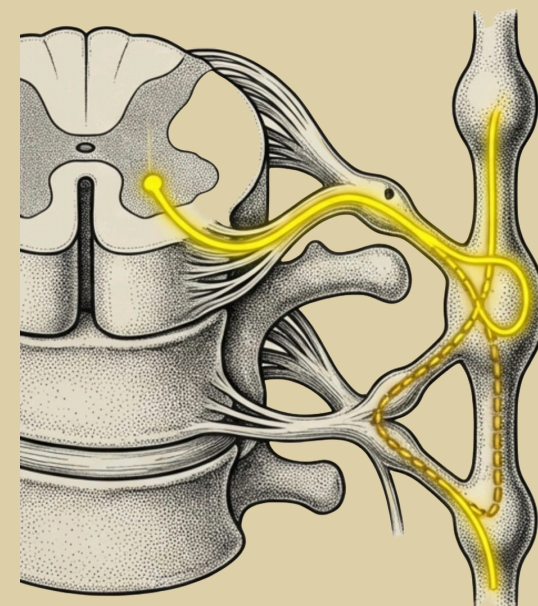
Voice Hoarseness

## 5.Splanchnic Nerves

Lower ganglia send preganglionic efferent fibers through the diaphragm to innervate abdominal viscera.

- **Greatest Splanchnic N.** From 5th-9th ganglia → pierces diaphragm crus → ends in Coeliac Ganglion.
- **Lesser Splanchnic N.** From 9th-10th ganglia → ends in Aorticorenal Ganglion.
- **Least Splanchnic N.** From 11th/12th ganglia → ends in Renal Plexus.

## 4.Sympathetic Chain : Auto-Drive



**Structure** A beaded trunk of paravertebral ganglia running alongside the vertebral column.

### The Input (White Rami)

Carries myelinated, preganglionic fibers from the spinal nerve into the sympathetic ganglion.

### The Output (Grey Rami)

Carries non-myelinated, postganglionic fibers back to the spinal nerve for distribution.

### Visceral Branches

Upper ganglia (1-5) send postganglionic fibers directly to the heart, lungs, aorta, and esophagus.

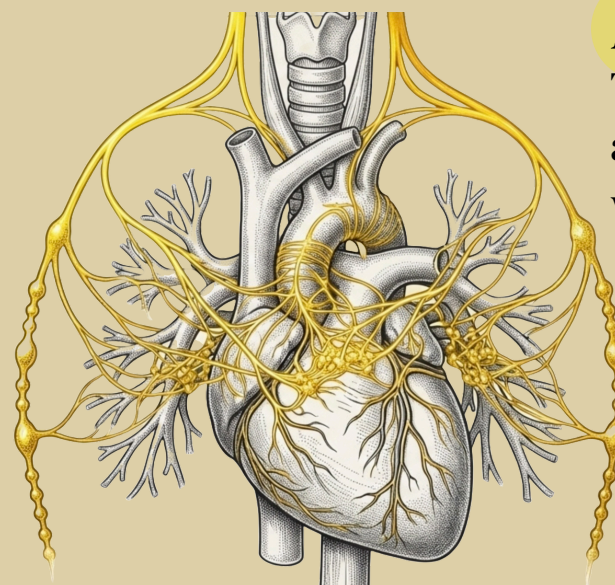
## 6.Autonomic Plexuses

### Intersection

The organs of the thorax do not rely on a single system. They are governed by autonomic plexuses-complex intersections where different neurological directives merge.

### The Mix

Postganglionic sympathetic fibers (for fight-or-flight acceleration) weave together with preganglionic parasympathetic fibers from the Vagus (for rest-and-digest baseline control).



### Key Sites

They form the Deep and superficial Cardiac Plexuses, the Pulmonary Plexuses (at the lung roots), and the Esophageal Plexuses.