

# Neural Regulation of Respiration

## > Respiratory Center

- DRG :- Mainly causes Inspiration
- VRG :- Mainly Expiration (in forced breathing)
- Pneumotaxic center :- Controls Rate & Depth of breathing

Dorsal Respiratory Group → controls Inspiration  
→ controls Rhythm of Respiration.

→ Most of neurons are located within Nucleus Tractus Solitarius (NTS)

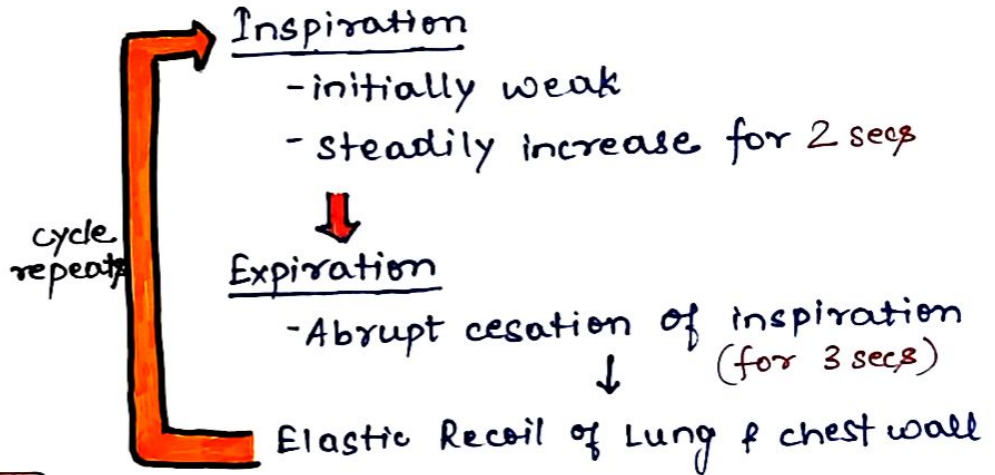
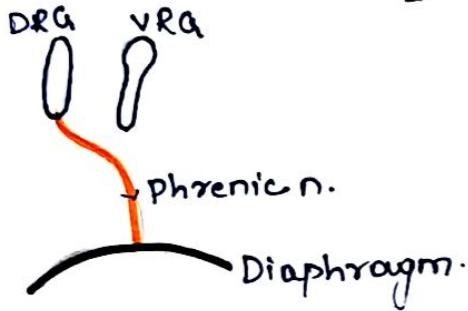
→ Receives sensory signals from

- peripheral chemoreceptors
- Baroreceptors
- Lung stretch receptors

→ DRG mainly generates Basic Rhythm of Respiration

↓  
Inspiratory "Ramp" Signal  
(During Quiet Breathing)

# Inspiratory 'Ramp' Signal



## Ventral Respiratory Group

→ Found in **Nucleus Ambiguus** & **Nucleus retroambiguus** (Rostrally)

→ Quiet Breathing

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VRG - Inactive

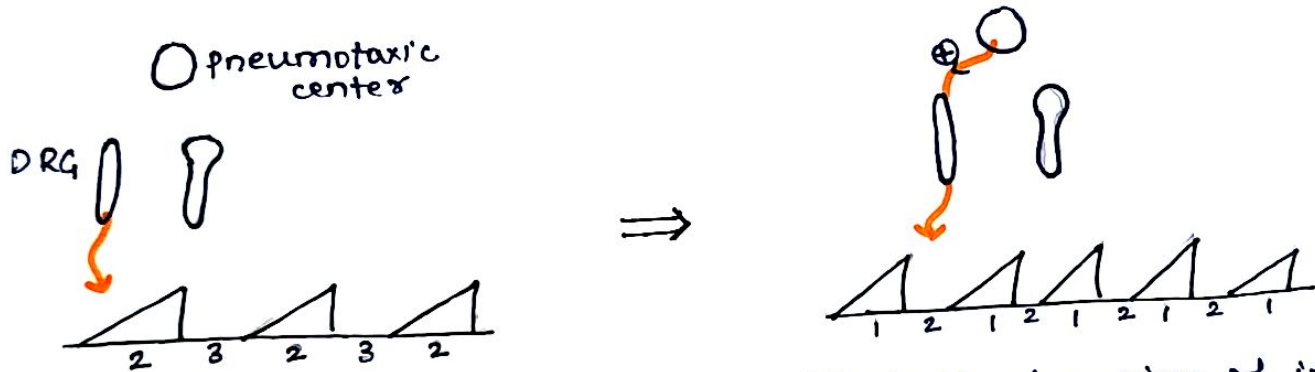
→ Forced Breathing

↓  
VRG - active

↓  
Both Insp. & Exp. (mainly) signals → Abdominal muscles

## Pneumotaxic Center

- Located in **Nucleus parabrachialis** of upper pons
- Transmit signal to Inspiratory Area (**DRG**)
- Main function ⇒ "switch off" of inspiratory ramp



- ⇒ Limits duration of inspiration
- ⇒ ↑ Respiratory Rate  
(upto 30-40 breaths/min)

## Apneustic Center

- Lower pons
- Tonically active
- Apneustic center → DRG → prevent switch off of Inspiratory ramp.

<u>DRG</u> Inspiratory ramp	<u>VRG</u> Forced breathing
<u>Pneum. center</u> "switch off" of Inspiratory Ramp	<u>Apneustic center</u> prevents "switch-off"

