

Neural Regulation of Respiration

→ Respiratory Centres

- 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.
Nucleus Tractus Solitarius (NTS)

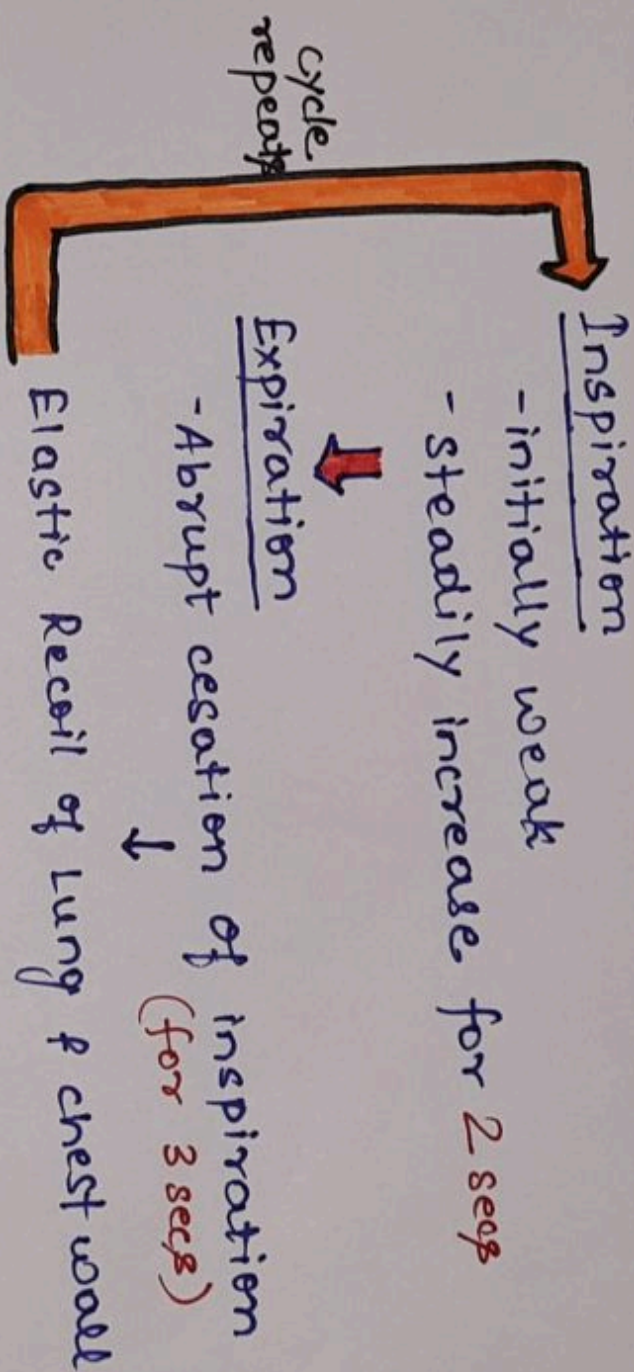
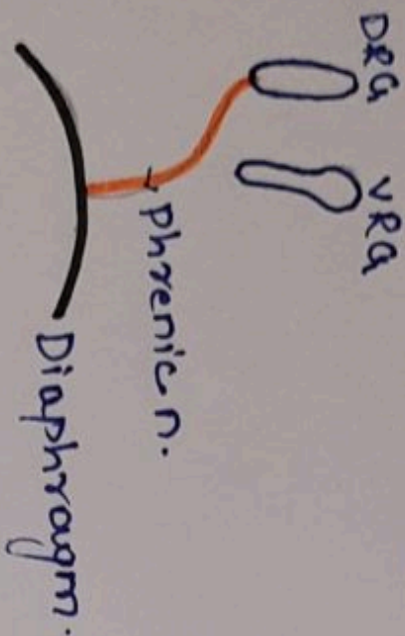
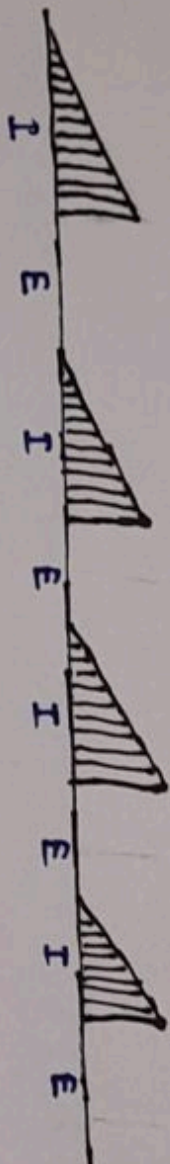
- Most of neurons are located within
- Receives sensory signals from

peripheral chemoreceptors
Baroreceptors
Lung stretch receptors

- DRG mainly generates Basic Rhythm of Respiration

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Inspiratory "Ramp" Signal
(During Quiet Breathing)

Inspiratory "Ramp" Signal



Ventral Respiratory Group

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

→ Quiet Breathing

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VRG - inactive

→ Forced Breathing

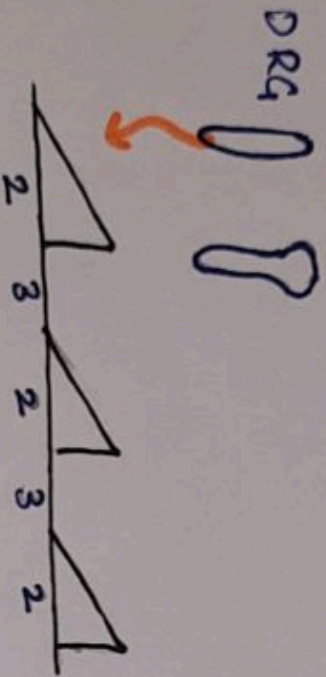
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VRG - active

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

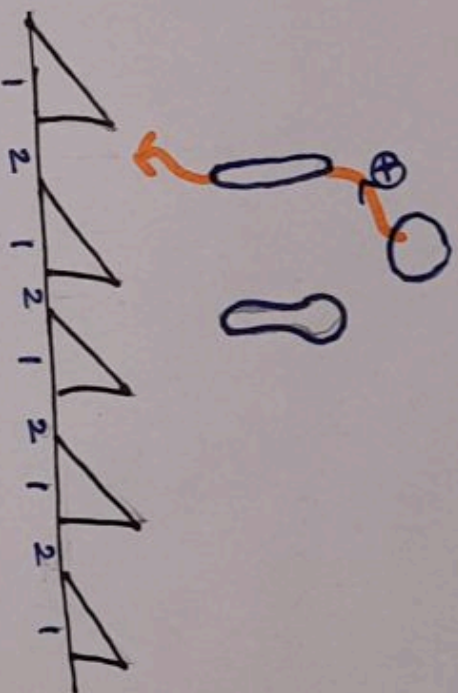
Pneumotaxic Center

- Located in **Nucleus parabrachialis** of upper pons
- Transmit signal to Inspiratory Area (DRA)
- Main function $\Rightarrow$ "Switch off" of inspiratory ramp

O Pneumotaxic center



$\Rightarrow$



$\Rightarrow$ Limits duration of inspiration

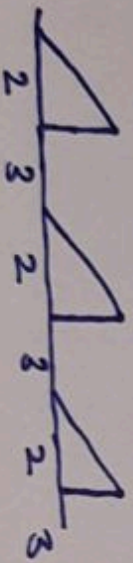
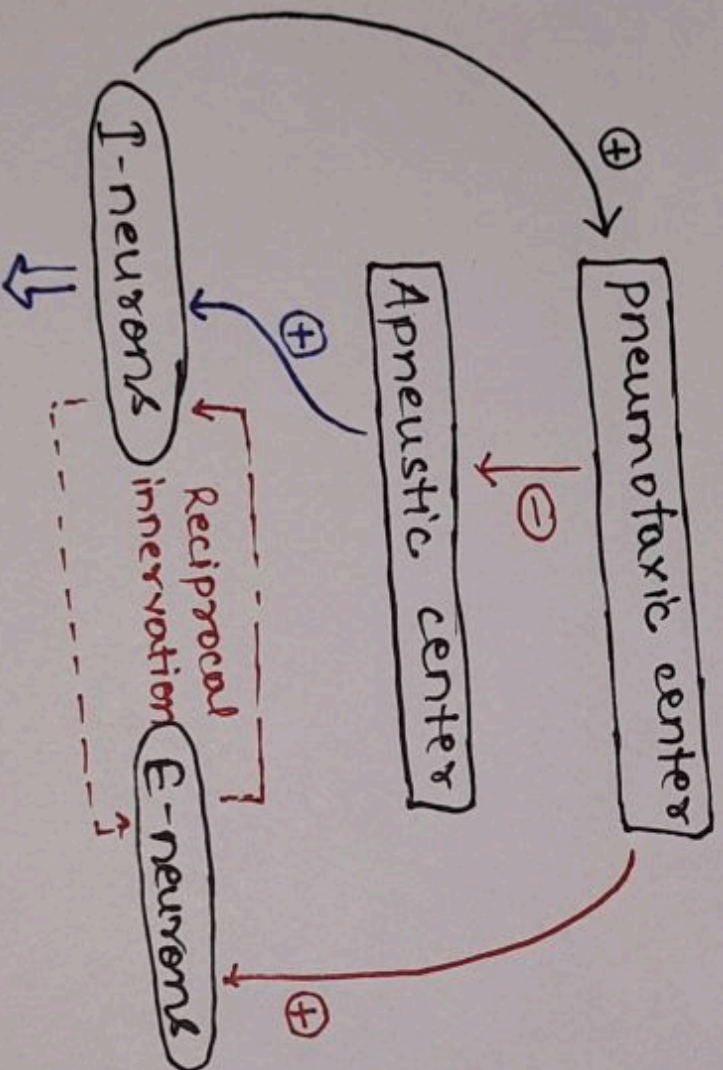
$\Rightarrow$ $\uparrow$ Respiratory Rate

(upto 30-40 breaths/min)

Apneustic Center

- Lower pons
- Tonically active
- Apneustic center $\rightarrow$ DRG $\rightarrow$ prevent switch off of Inspiratory ramp.

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



Hering-Breuer Inflation Reflex :-

