

REGULATION OF BLOOD PRESSURE

◦ SHORT TERM CONTROL (secs - mints)

◦ INTERMEDIATE TERM CONTROL (mints - hrs)

◦ LONG TERM CONTROL (days)

SHORT TERM REGULATION OF B.P.

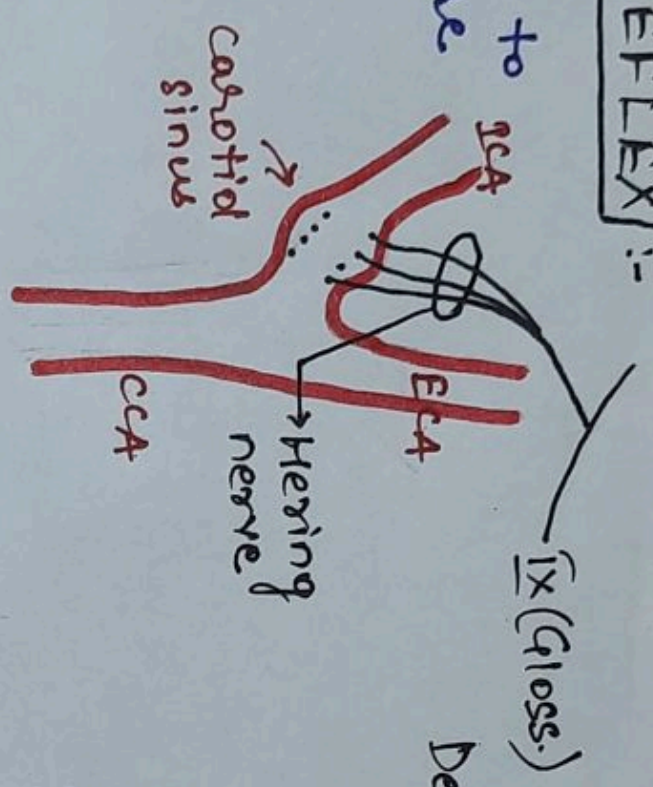
Baroreceptor
Reflex

Chemoreceptor
Reflex

CNS ischemic
Response

BARORECEPTOR REFLEX :-

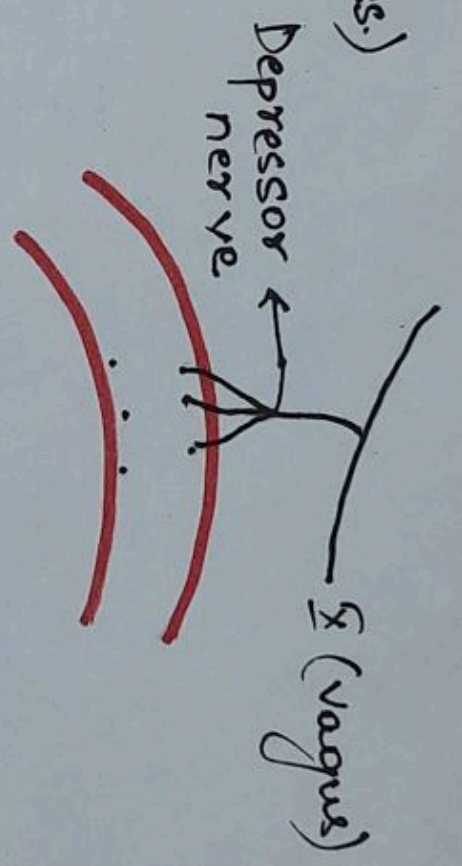
Receptor sensitive to change in pressure



Carotid Baroreceptors

Location :- Carotid sinus

Innervation :- Branch of Glossoph. nerve

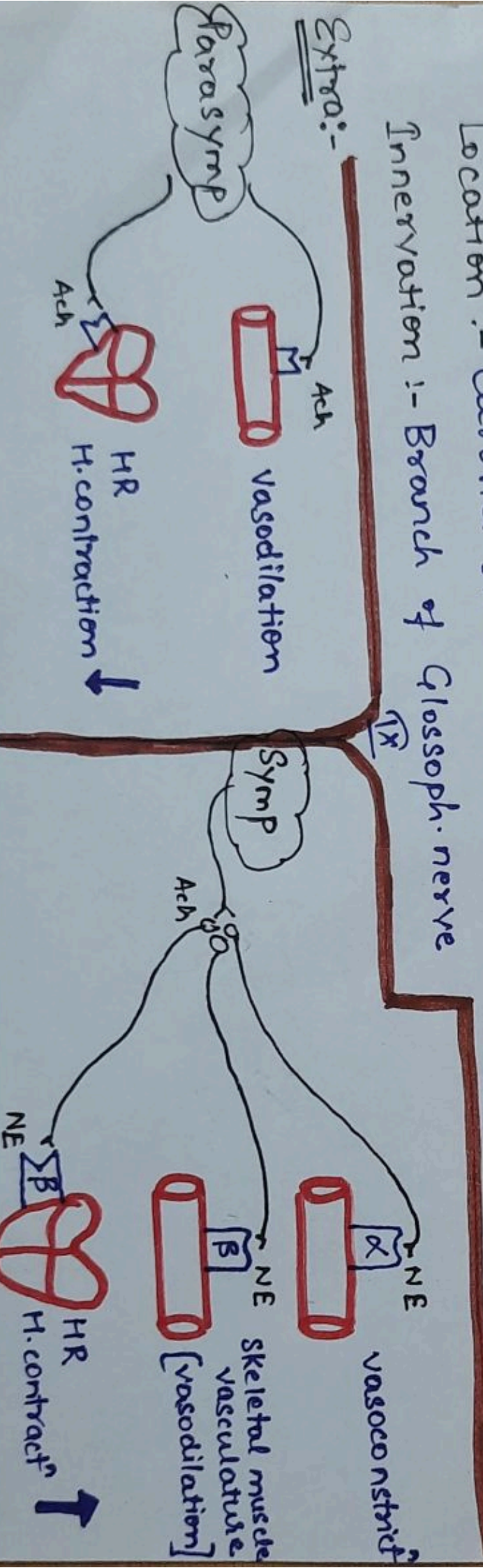


Aortic Arch Baroreceptors

Location :- Arch of aorta

Innervation :- Br. of vagus nerve

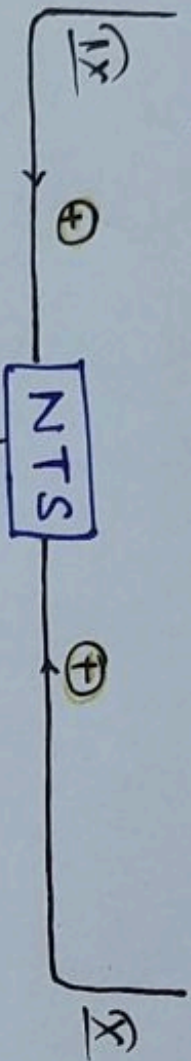
Extra:-



Pathway:-

Carotid sinus
Baroreceptor

BP ↑
Stretch
Aorta
Baroreceptor



Depressor area
↓
pressor area

Vasomotor center

Sympath. fibres
⊖

Blood vessels

→ Vasodilation

PR

Cardiac vagal center
or
cardiac inhibitory center
[Nucleus ambiguus]

Parasymp. ⊕

Heart

→ Heart rate ↓
→ Heart contraction ↓

CO

BP returns to Normal

Components of Baroreflex :- (Aka Pressure Buffer System)

Stimulus - Increased Arterial B.P. ($\uparrow/\downarrow$)

Receptor - Baroreceptors [Carotid sinus; Aortic Arch]

Afferent nerve - $\uparrow$ Hering n. (IX CN) from carotid sinus
 $\circ$ Depressor n. (X CN) from arch of aorta

Integrating center - NTS (Vasomotor center; CVG)

Efferent nerve - $\bullet$ Sympathetic (Decreased activity)
 $\bullet$ Parasymp/Vagus (Increased activity)

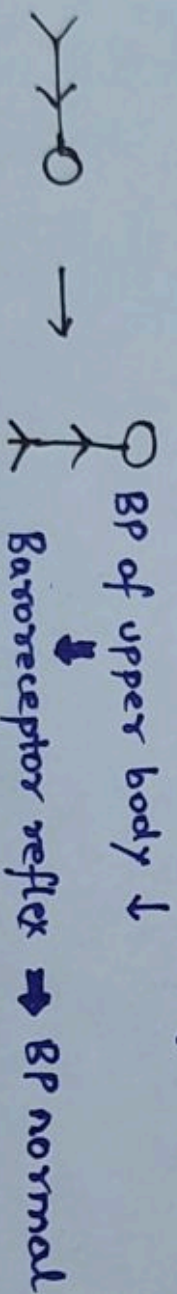
Effector organs - Heart & Blood vessels

Physiological effects - $\bullet$ Heart rate $\downarrow$; cardiac contractility $\downarrow$

POINTS :-

- $\bullet$ Vasodilation

② Seen when person stands up after being lying down



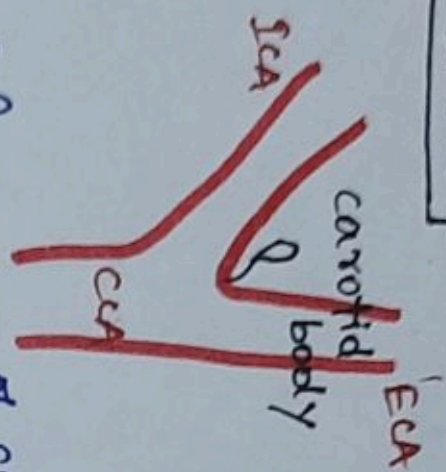
③ Baroreceptor reflex responds more to changing pressure than stationary pressure

④ Unimportant in long term regulation (Bcz, it soon gets adopted)

CHEMORECEPTOR REFLEX:-

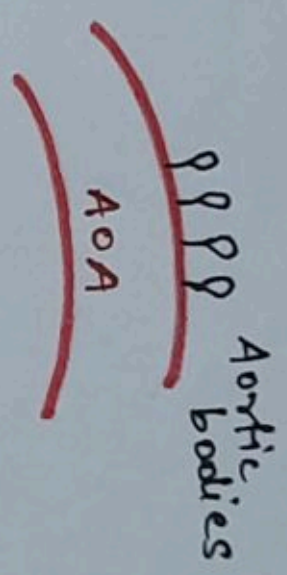
Receptor sensitive to

- $\downarrow pO_2$
- $\uparrow pCO_2$
- $\uparrow H^+$



Location:- Bifurcation of CCA

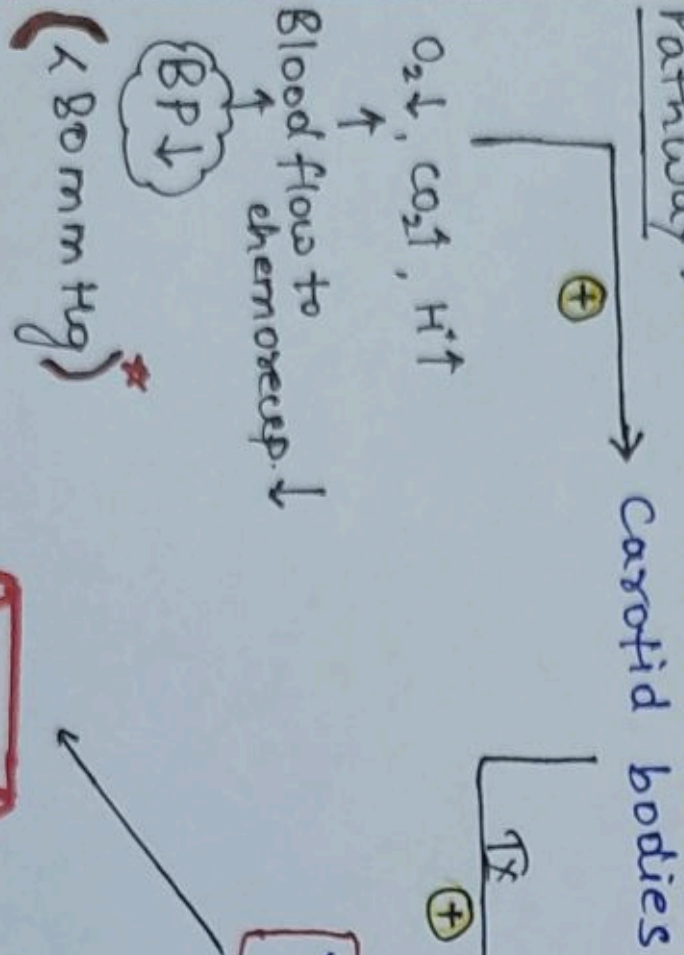
Innervation:- 9th CN



Location:- Arch of Aorta

Innervation:- 10th CN

Pathway:-



Aortic bodies → (+)

vasoconstriction

symp. (+)



{ BP returns to (N) }

CNS Ischemic response:-

(Severe Hypotension)

Mean Arterial Press $< 50 \text{ mmHg}$

Hypoperfusion at CNS

Vasomotor center

$\oplus$ | symp

BP $\uparrow$. Vasoconstriction
HR $\uparrow$ & contraction $\uparrow$

Acts only at emergency
K/a 'last ditch response'

Cushing Reaction (Special type of CNS ischemic response)

Intracranial lesion

(CSF press $>$ Arterial press)

compression of
microvasculature

Hypoxia @ VMC

symp.

BP $\uparrow$

(Already stimulated)
VMC

cardiac vagal center

vagus

HR $\downarrow$

Baroreceptor Reflex

Cushing triad :-

- ① BP $\uparrow$
- ② HR $\downarrow$
- ③ Irregular ventilation