SUMMARY OF AUTONOMIC FUNCTIONS

SYMPATHETIC

EMERGENCY - Fight Flight Fright
HOMEOSTATIC - Temperature regulation
  Stimulate sweat glands (SUDOMOTOR)
  Erects hairs in skin (PILOMOTOR)
  Selectively constricts blood vessels (VASOMOTOR)
SPECIFIC
  Stimulates suprarenal gland
  Speeds the heart & increases blood pressure
  Bronchial dilatation
  Inhibits the gut & closes sphincters
  Stimulates ejaculation
  Special in head & neck
    Dilates the pupil
    Raises eyelids
SUMMARY OF AUTONOMIC FUNCTIONS

PARASYMPATHETIC

NON - EMERGENCY (at rest)
Stimulates glands (salivary, mucus) to secrete
Slows the heart & minimises blood pressure
Bronchial constriction
Stimulates gut peristalsis & opens sphincters
Contracts the bladder & uterus
Causes erection of penis
Special in head & neck
    Constricts the pupil
    Accommodates the eye
**HITCHHIKING PRINCIPLE**

- Cranial nerve going all the way
- Parasympathetic hitchhiking most of the way
- Sympathetic joining along the way but leaving before the end
- A sensory cranial nerve picking up parasympathetics or sympathetics to take them to their destination

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**Autonomic vs Somatic**

- **Autonomic**
  - All motor
  - Sympathetic
  - Parasympathetic
  - 2 Neurones

- **Somatic**
  - Cell body (in DRG)
  - Mixed nerve
  - Single neurones

**Sympathetic Distribution Beyond Chain**

- **Homeostatic (skin)**: sudomotor, pilomotor, vasomotor on spinal & cranial nerves
- **Homeostatic (other)**: vasomotor only, on any convenient nerve or vessel
- **Specific (to organs)**
  - Direct to heart & lungs
  - Splanchnics to gut, adrenals, genitals
  - Superior cervical ganglion to head
CENTRAL SYMPATHETIC CONNECTIONS

RULE FOR SYNAPSING
All sympathetic nerves synapse before leaving the chain unless destined for GUT or ADRENAL

GRC = Grey ramus communicans
WRC = White ramus communicans

●●● = Postganglionic sympathetic nerves
●● = Preganglionic sympathetic nerves

= Somatic nerves

Cervical sympathetic ganglia
(All branches are postganglionic)

Into skull via internal carotid artery
On external carotid artery
On inf. thyroid artery
On vertebral artery

Superior
C1
C2
C3
C4
Superior cardiac branch
Middle
C5
C6
Middle cardiac branch
Inferior
C7
C8
Inferior cardiac branch

Somatic branches
(Vasomotor
d Sudomotor
Pilomotor)

Visceral branches

Vascular branches
2 SPECIAL SYMPATHETICS
Long ciliary ns for pupil dilatation via nasociliary (Va)
Levator palpebrae superioris via superior div of III

PARASYMPATHETIC CRANIOSACRAL OUTFLOW

PARASYMPATHETIC

Note that there are 4 specific ganglia in the head
but in the rest of the body there are small peripheral
ganglia on or near the end-organs.

The vagus reaches to the left side of the transverse
colon and then the secral outflow takes over
2 SPECIAL PARASYMPATHETICS
* Short ciliary ns for pupil constriction via inferior div of III
* Short ciliary ns for accommodation via inferior div of III
TYPES OF GANGLIA

SENSORY GANGLION has cell bodies only and no synapses. Examples:
- Posterior (dorsal) root
- Trigeminal
- Glossopharyngeal
- Geniculate
- Vagal

SYMPATHETIC GANGLION has either a synapse or a fibre passing through it to synapse later. Examples:
- Sympathetic chain
- Sympathetic peripheral ganglia (coeliac, renal, superior mesenteric)

PARASYMPATHETIC GANGLION has parasympathetic nerves synapsing and both a somatic sensory and a sympathetic nerve passing through it. Examples:
- Ciliary
- Pterygopalatine
- Submandibular
- Otic