أَعُوذُ بِاللَّهِ مِنَ الشَّيْطَانِ الرَّجِيمِ

بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

GROSS ANATOMY OF
THE ABDUCENS NERVE (CN VI)

By

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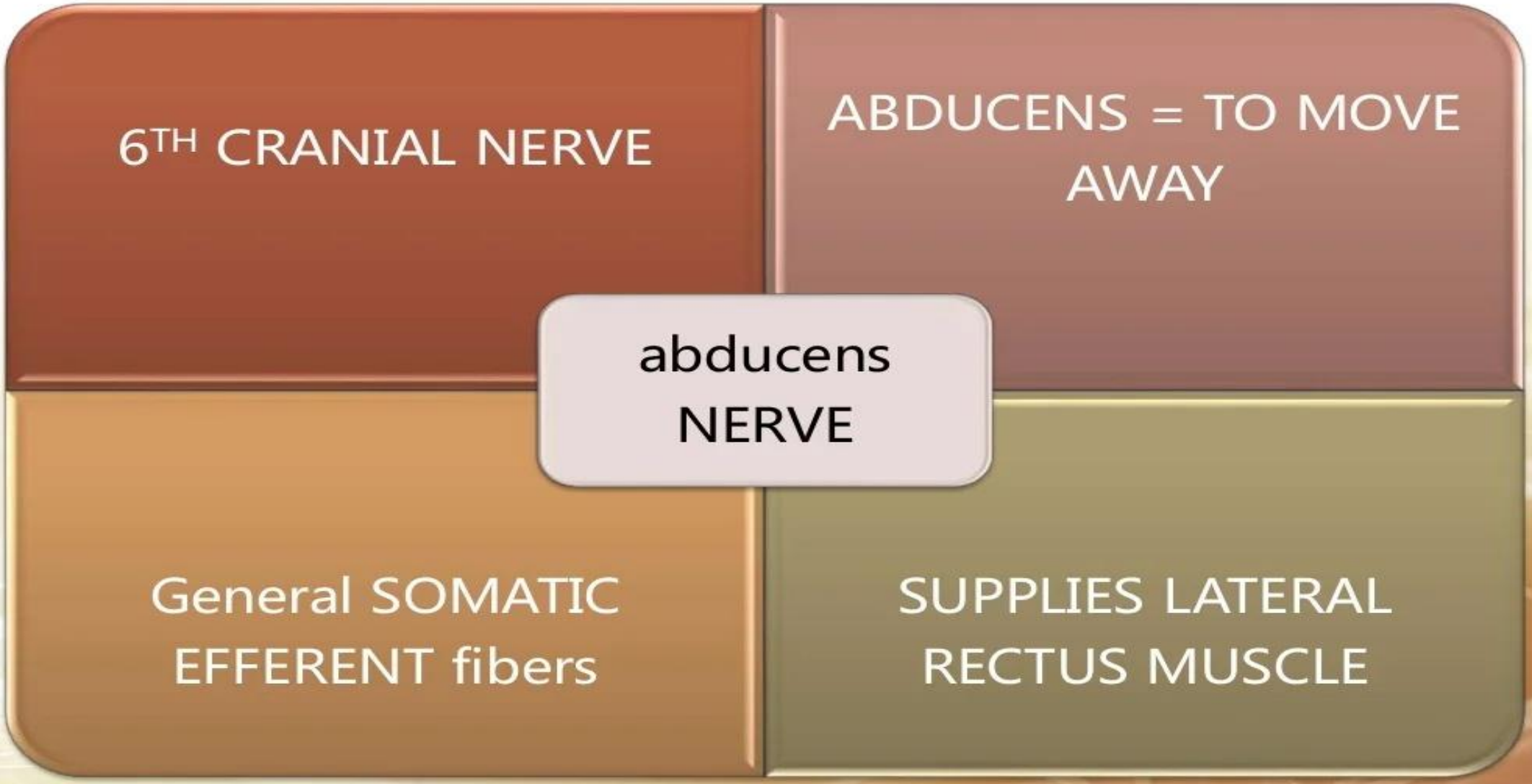
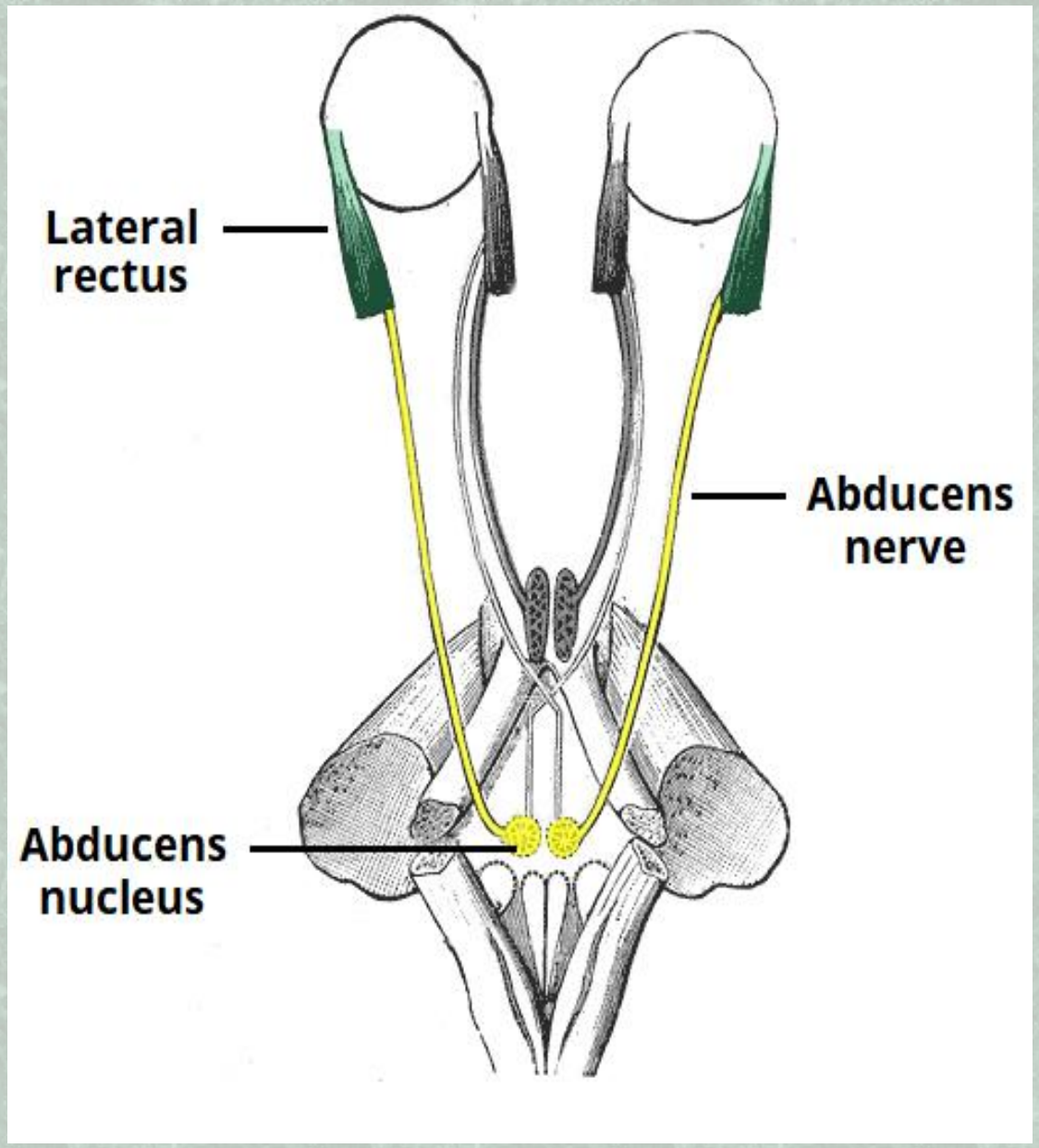
INTRODUCTION



- The **abducens nerve** is the sixth paired cranial nerve. It has a purely somatic motor function – providing innervation to the lateral rectus muscle.



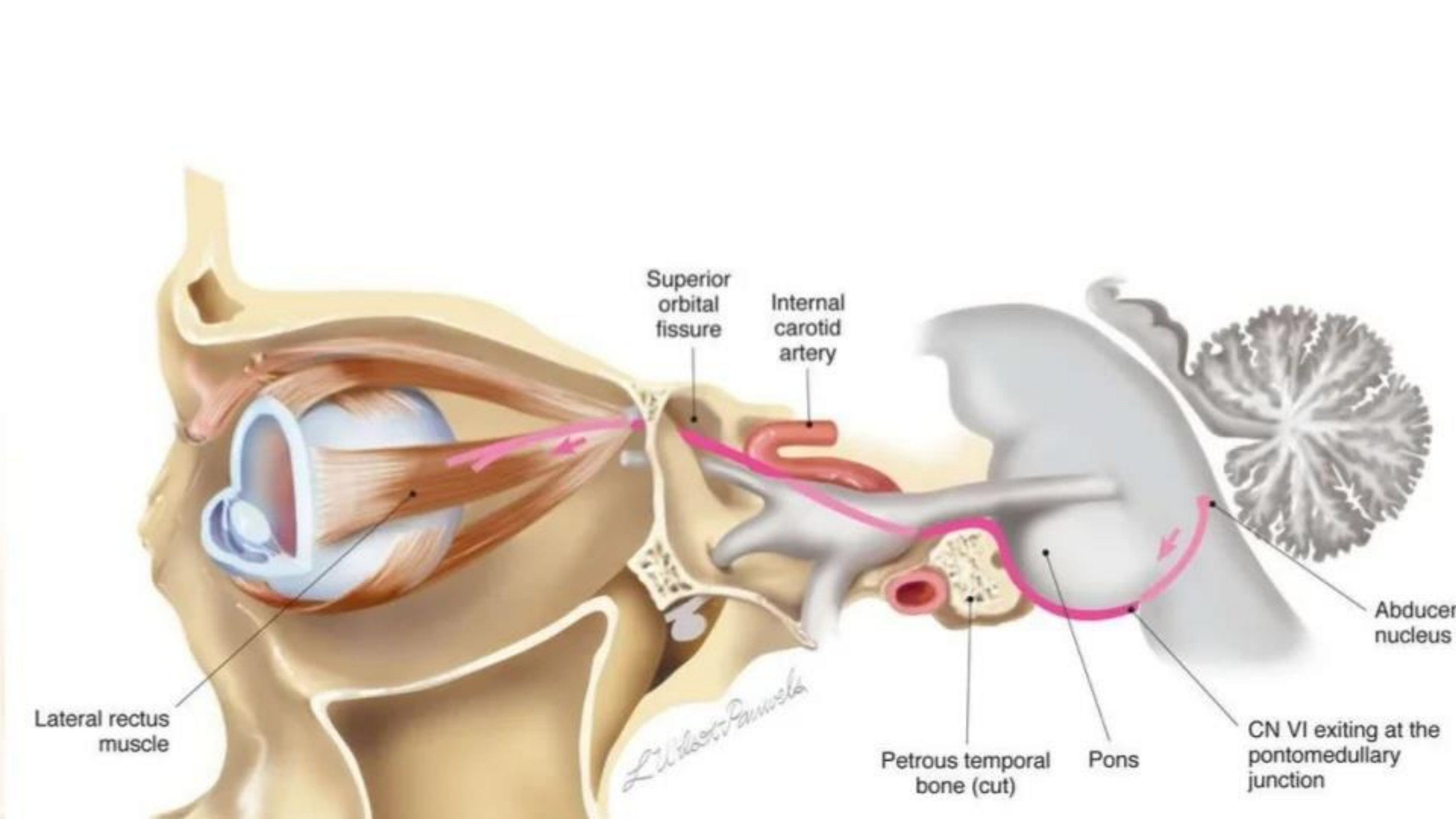
Schematic of the anatomical course of the abducens nerve

ABDUCENS NERVE (CN VI)

- Cranial nerve 6 is a general somatic efferent nerve which innervates the lateral rectus muscle (extraocular). The abducens nerve originates from the brainstem and exits the skull via the superior orbital fissure.

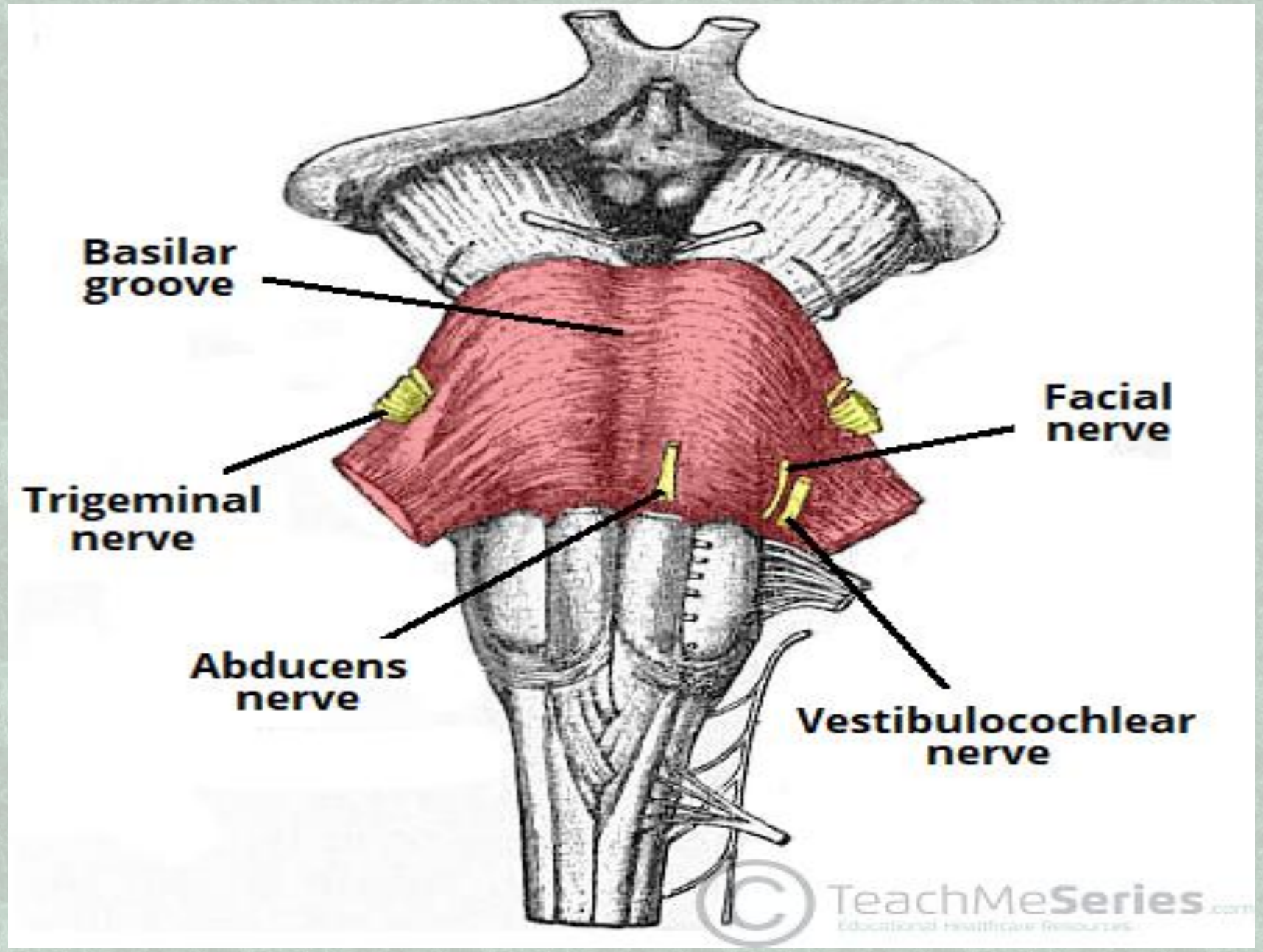
KEY FACTS ABOUT THE ABDUCENS NERVE (CN VI)	
Type	GSE
Nucleus	Nucleus of abducens nerve
Field of innervation	Motor: Lateral rectus muscle

Although it may seem the least relevant, the abducens nerve plays a very important role in eye movement. Just ask anyone with strabismus.

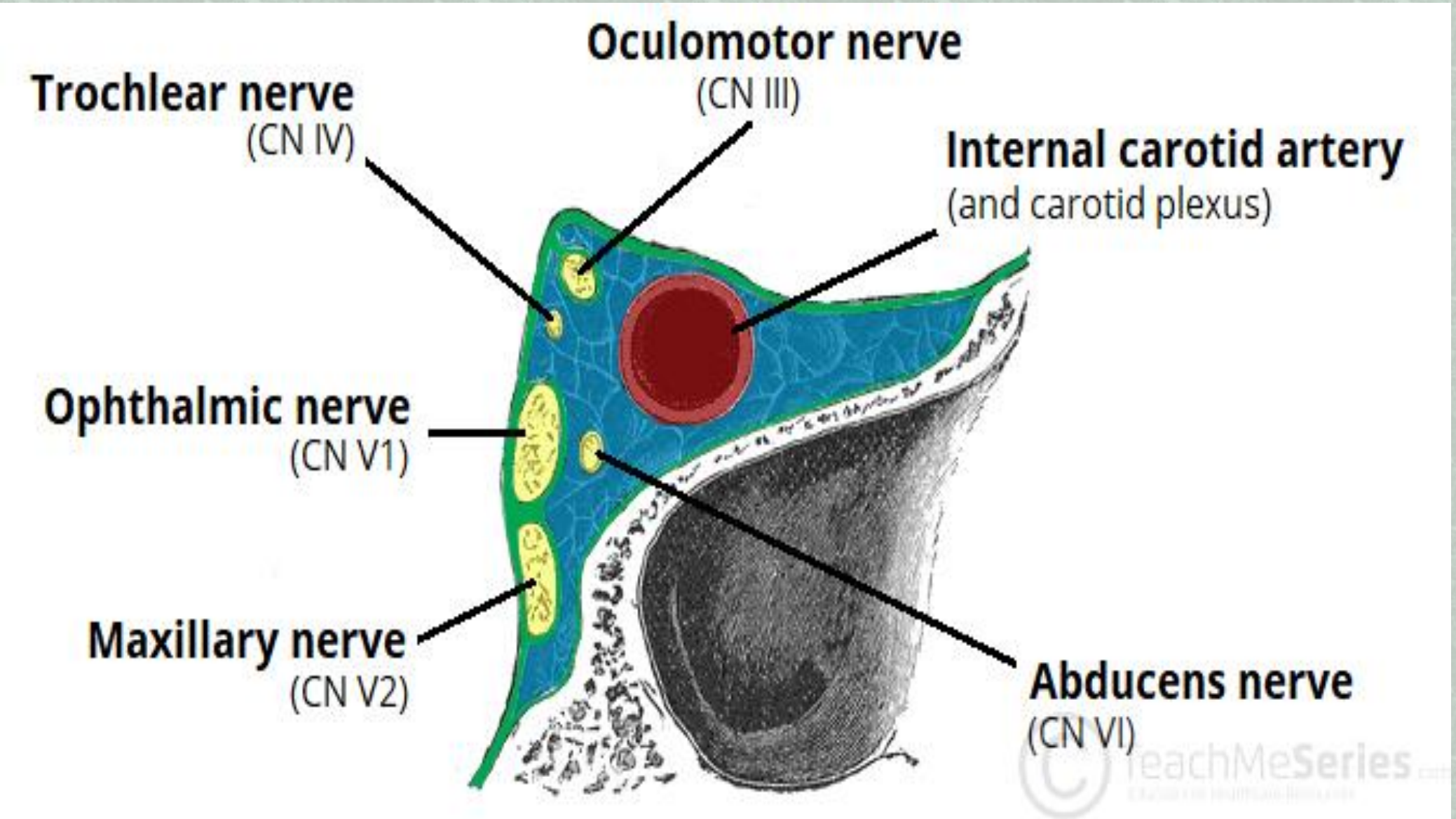

Superior orbital fissure
Internal carotid artery
Abducer nucleus
Lateral rectus muscle
Petrous temporal bone (cut)
Pons
CN VI exiting at the pontomedullary junction

ANATOMICAL COURSE

- The abducens nerve arises from the abducens nucleus in the **pons** of the brainstem. It exits the brainstem at the junction of the pons and the medulla.
- It then enters the subarachnoid space and pierces the dura mater to travel in an area known as **Dorello's canal**.
- At the tip of petrous temporal bone, the abducens nerve leaves Dorello's canal and enters the **cavernous sinus** (a dural venous sinus). It travels through the cavernous sinus and enters the bony orbit via the superior orbital fissure.
- Within the bony orbit, the abducens nerve terminates by innervating the **lateral rectus** muscle.



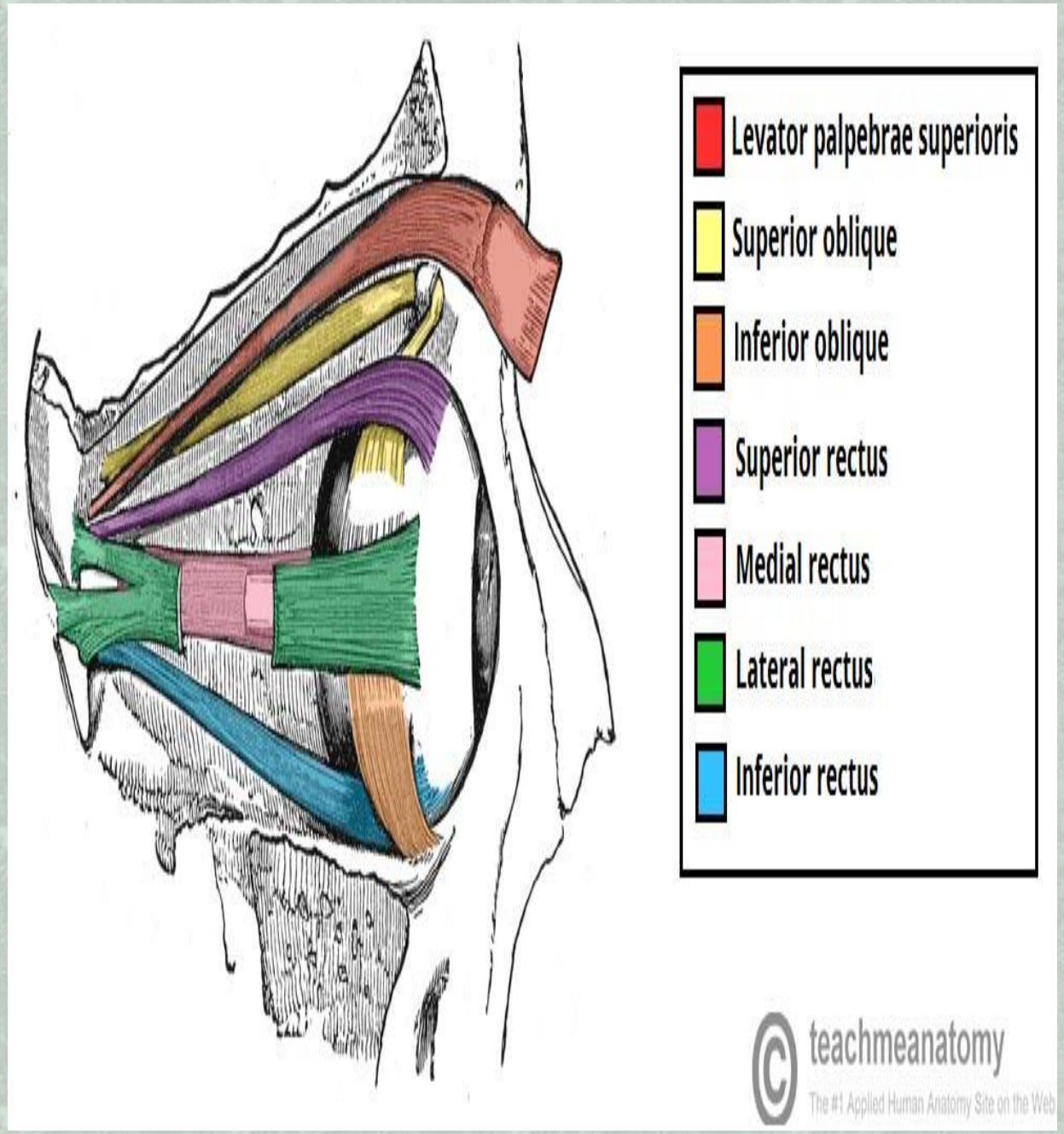
VENTRAL (ANTERIOR) SURFACE OF THE PONS.



Coronal section demonstrating the contents of the right cavernous sinus

MOTOR FUNCTION

- The abducens nerve provides innervation to the **lateral rectus** muscle – one of the extraocular muscles.
- The lateral rectus originates from the lateral part of the common tendinous ring, and attaches to the anterolateral aspect of the sclera. It acts to **abduct the eyeball** (i.e. to rotate the gaze away from the midline).



ANATOMICAL LANDMARKS

SUPERFICIAL EMERGENCE

POSTERIOR CRANIAL FOSSA

MIDDLE CRANIAL FOSSA

CAVERNOUS SINUS

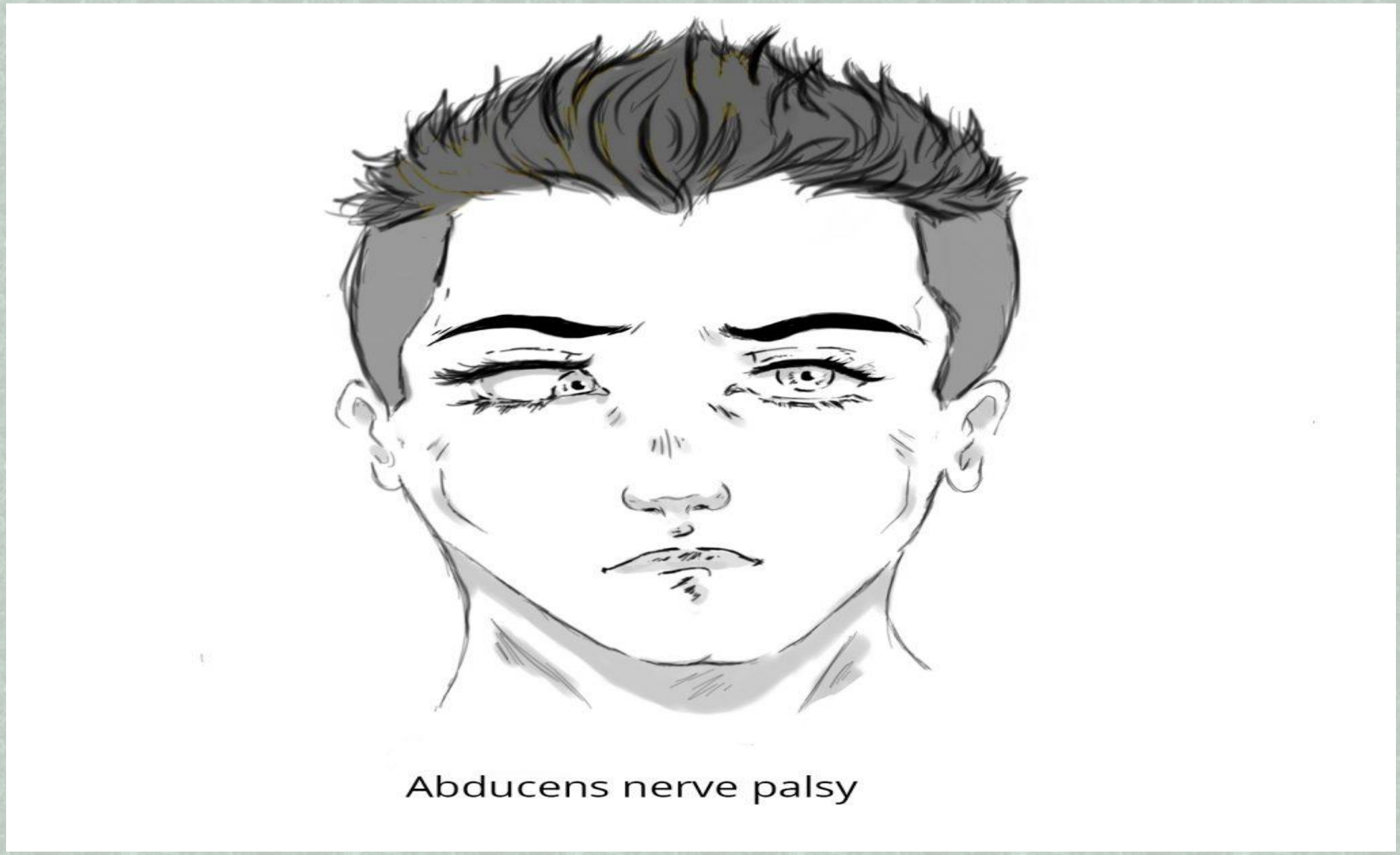
SUPERIOR ORBITAL FISSURE

CLINICAL RELEVANCE
EXAMINATION OF THE ABDUCENS NERVE

- The **abducens nerve** is examined in conjunction with the oculomotor and trochlear nerves by testing the movements of the eye.
- The patient is asked to follow a point with their eyes (commonly the tip of a pen) without moving their head. The target is moved in an ‘H-shape’ and the patient is asked to report any blurring of vision or **diplopia** (double vision).

CLINICAL RELEVANCE
ABDUCENS NERVE PALSY

- Abducens nerve palsy can be caused by any structural pathology which leads to downwards pressure on the brainstem (e.g. space-occupying lesion). This can stretch the nerve from its origin at the junction of the pons and medulla.
- Other causes include diabetic neuropathy and thrombophlebitis of the cavernous sinus (in these cases, it is rare for the abducens nerve to be affected in isolation).
- Clinical features of abducens nerve palsy include **diplopia**, the affected eye resting in adduction (due to unopposed activity of the medial rectus), and inability to abduct the eye. The patient may attempt to compensate by rotating their head to allow the eye to look sideways.



Right abducens nerve palsy, characterised by the resting position of the pupil in adduction.

THANK YOU