Oculomotor, Trochlear, and Abducens Nerves

SCRUBS

STUDENT COLLABORATIVE RESOURCES FOR UNDERSTANDING AND BRODY SUCCESS

Bryce Pugh, BSOM 2027

Resources used
Coursepack Illustration Supplement - BSOM

Mission Statement

SCRUBS is a student-driven initiative that aims to develop supplemental resources for current and future cohorts that will pass through Brody. Members of **SCRUBS** participate in a variety of sub-committees working to create resources for students, by students. These resources aim to offer unique perspectives from students that have walked in the same shoes, developing resources that we wish we had been exposed to during our time in the course.

The hope is this organization will become a staple of the Brody student body, exemplifying the unique collaborative community that Brody offers. If this is a mission that aligns with your goals and you have the desire to help those that will come behind you, as well as a goal to leave your mark on Brody as a whole, we invite you to join the team!

Disclaimer

The resources that are included in this document are made by students and not the faculty. As such, there is the possibility for errors in our development, although this is mitigated via a team approach to development with multiple stages of vetting. If there is a contradiction with the coursework presented within your course, please go by the course documents. Additionally, **SCRUBS** aims to supply ***supplemental resources***, however these are in no way replacements to the instruction of the Brody faculty. Use these resources as a supplement, but not as your primary source for course material.

Cribriform foramina
CN I (olfactory n.)

Optic canal
CN II (optic n.)

Superior orbital fissure
CN III (oculomotor n.)
CN IV (trochlear n.)
CN V_1 (ophthalmic n.)
CN VI (abducent n.)

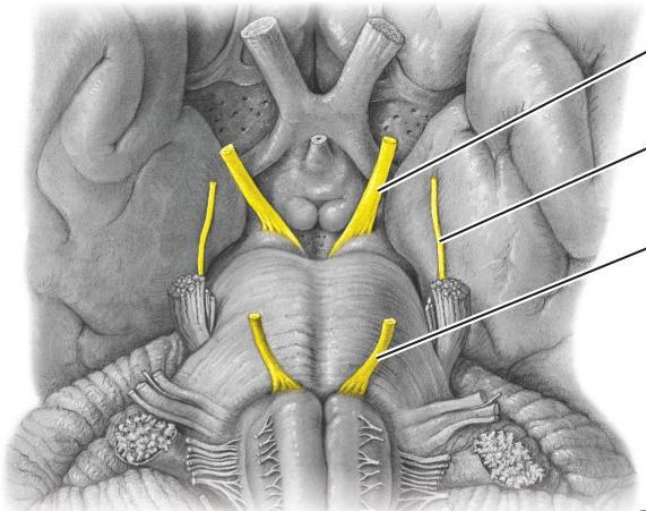
Foramen rotundum
CN V_2 (maxillary n.)

Foramen ovale
CN V_3 (mandibular n.)

Internal acoustic meatus
CN VII (facial n.)
CN VIII (vestibulocochlear n.)

Jugular foramen
CN IX (glossopharyngeal n.)
CN X (vagus n.)
CN XI (spinal accessory n.)

Hypoglossal canal
CN XII (hypoglossal n.)



Oculomotor nerve (CN III)

Trochlear nerve (CN IV)

Abducent nerve (CN VI)

Optic ne

Superior divisi

Cavernous Sinus

Cavernous Sinus

- Dural venous sinus
- Infection – affect nerves

Oh TOM the CAT

Superior

Medial

Lateral

Carotid (internal)

Abducens

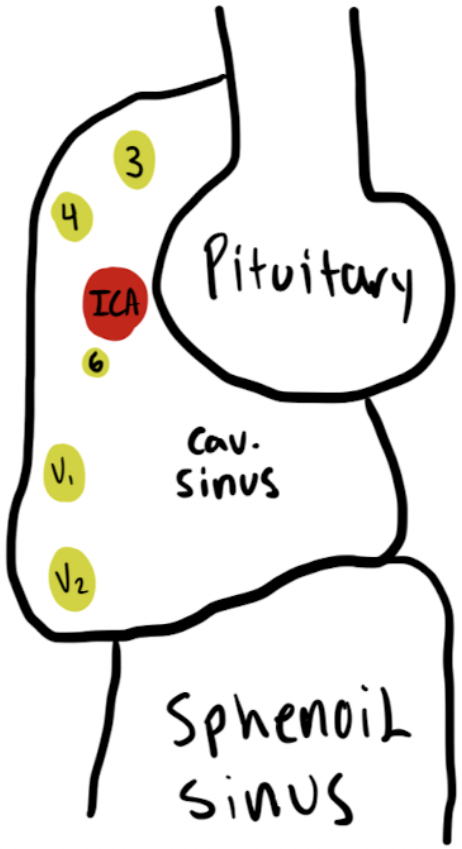
Oculomotor

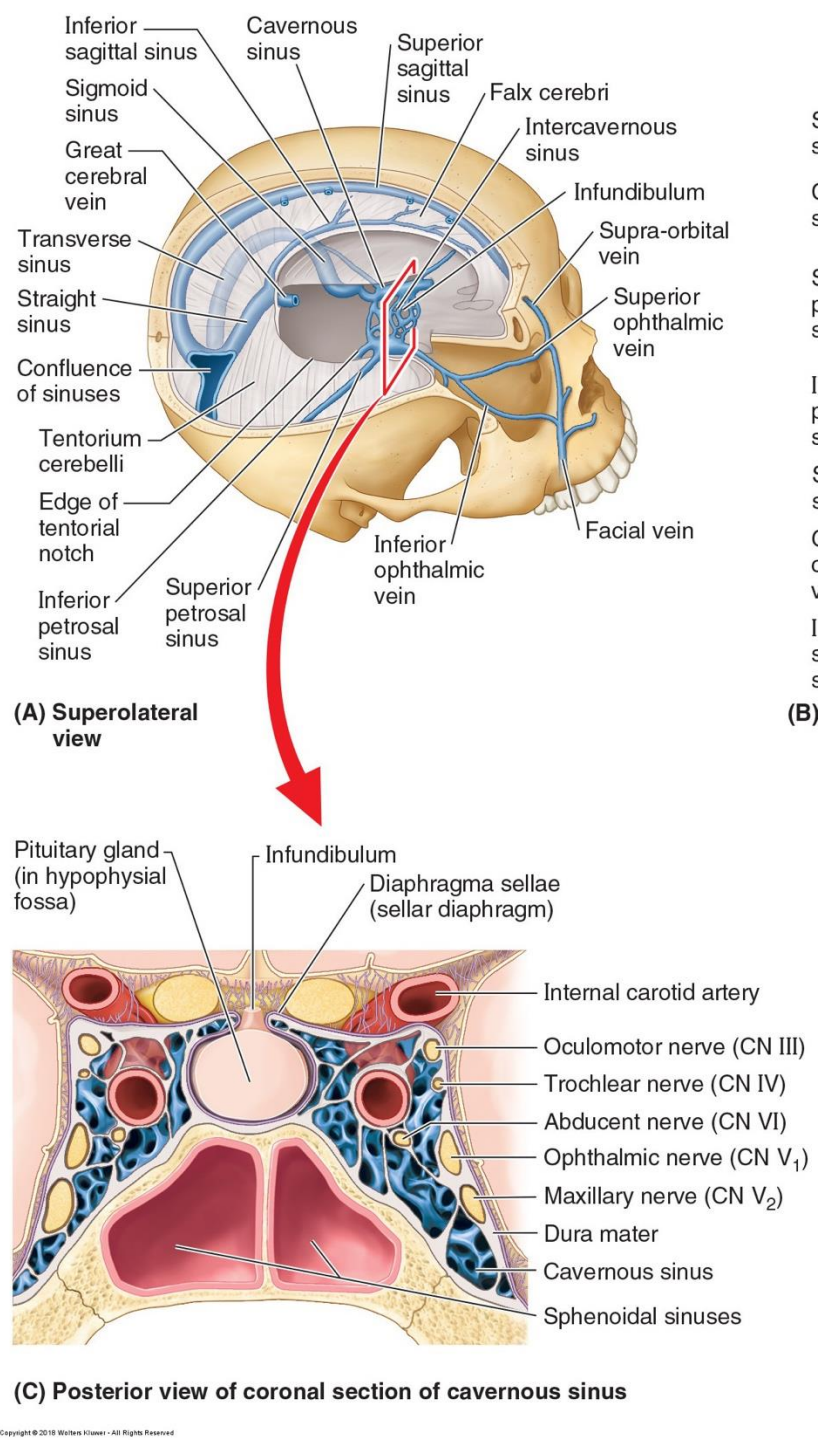
Trochlear

Ophthalmic (V_1)

Maxillary (V_2)

★CN's 3-6 (except V_3)

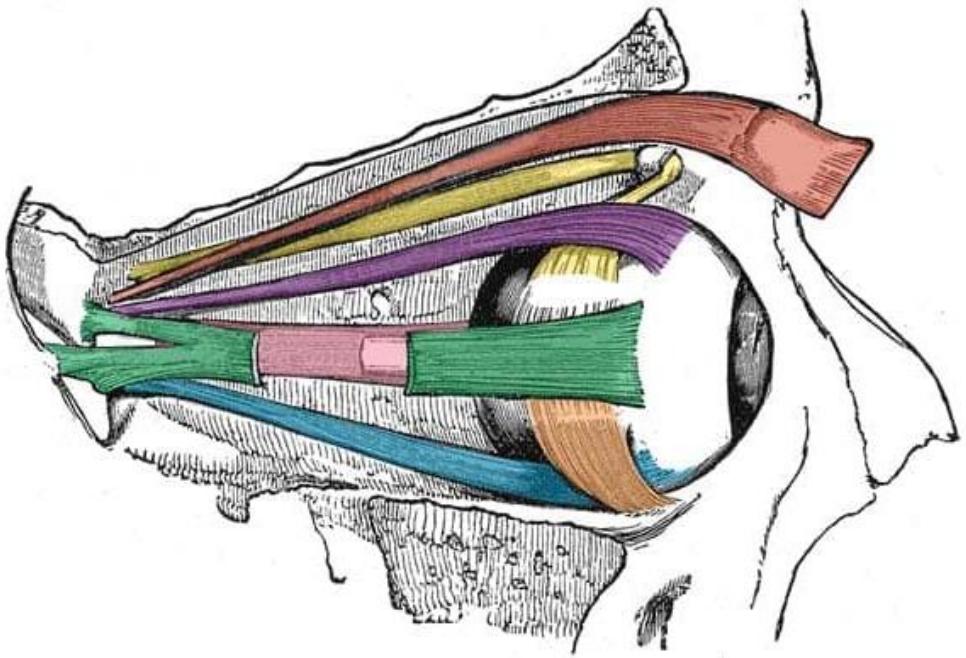


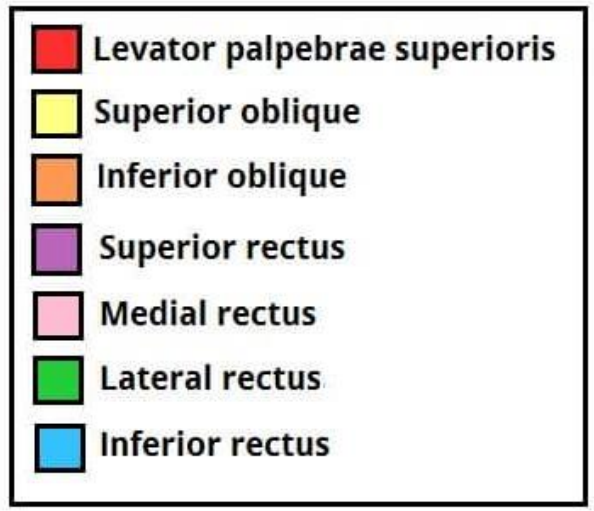


Muscles of the Eye

Eye Muscles

- **Trochlear Nerve (CNIV)**
  - Sup. Oblique
- **Abducens Nerve (CNVI)**
  - Lat. Rectus
- **Oculomotor Nerve (CNIII)**
  - Levator Palpebrae Superioris
  - Inf. Oblique
  - Sup. Rectus
  - Med. Rectus
  - Inf. Rectus





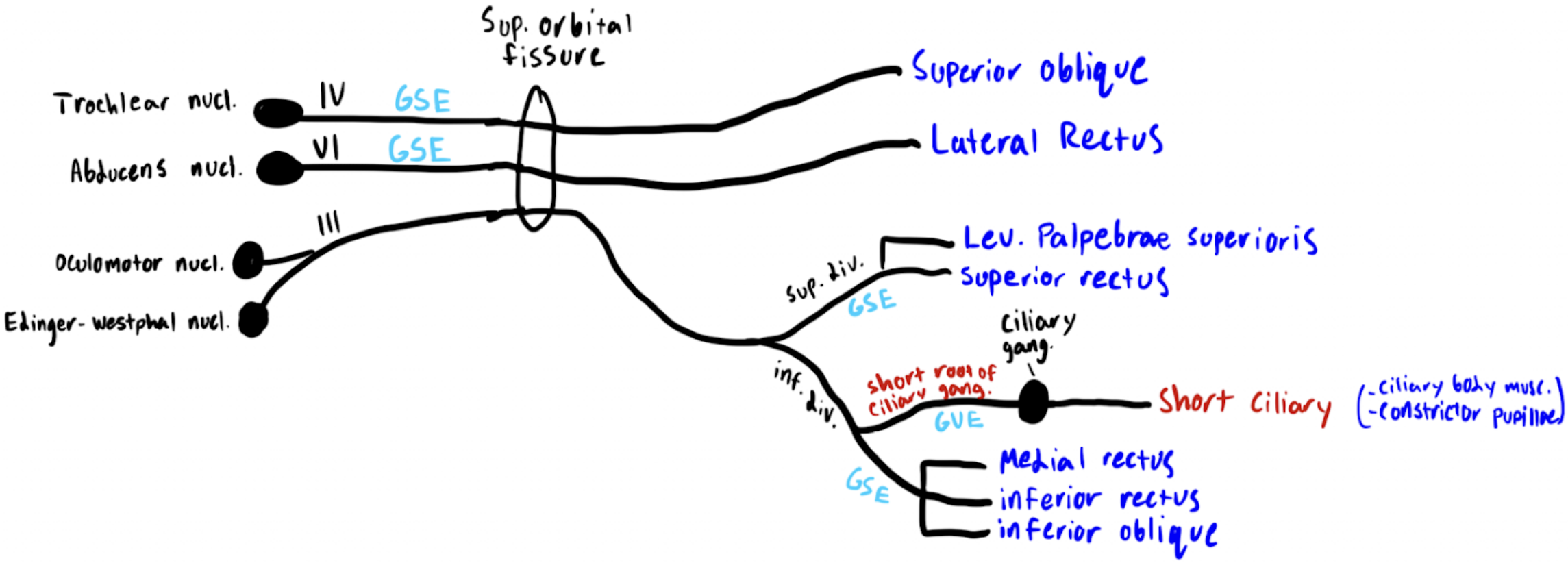
© teachmeanatomy
The #1 Applied Human Anatomy Site on the We

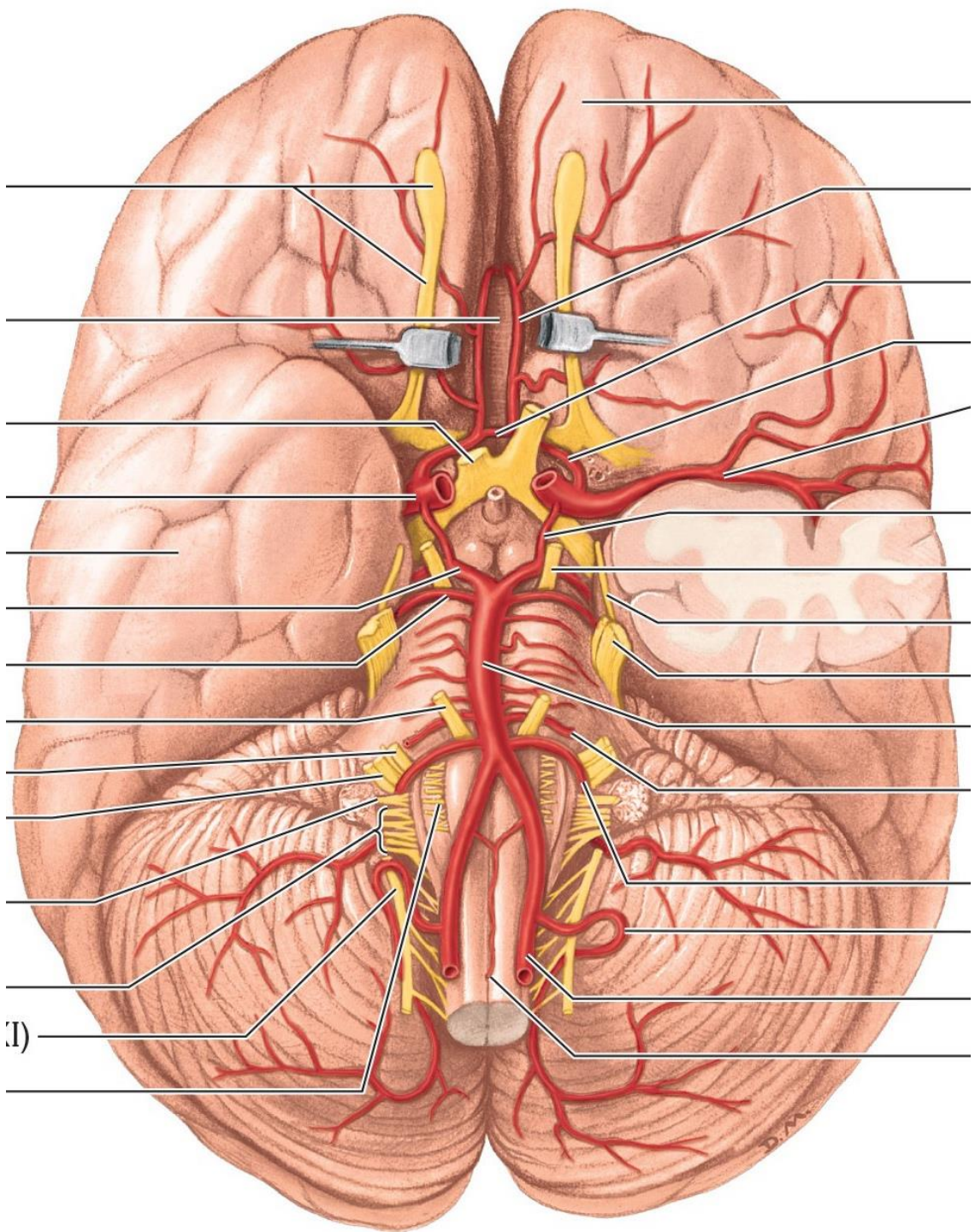
Abducens n. innervates the muscles that ABDUCTS the eye
Trochlear n. innervates the muscle that wraps around the trochlea

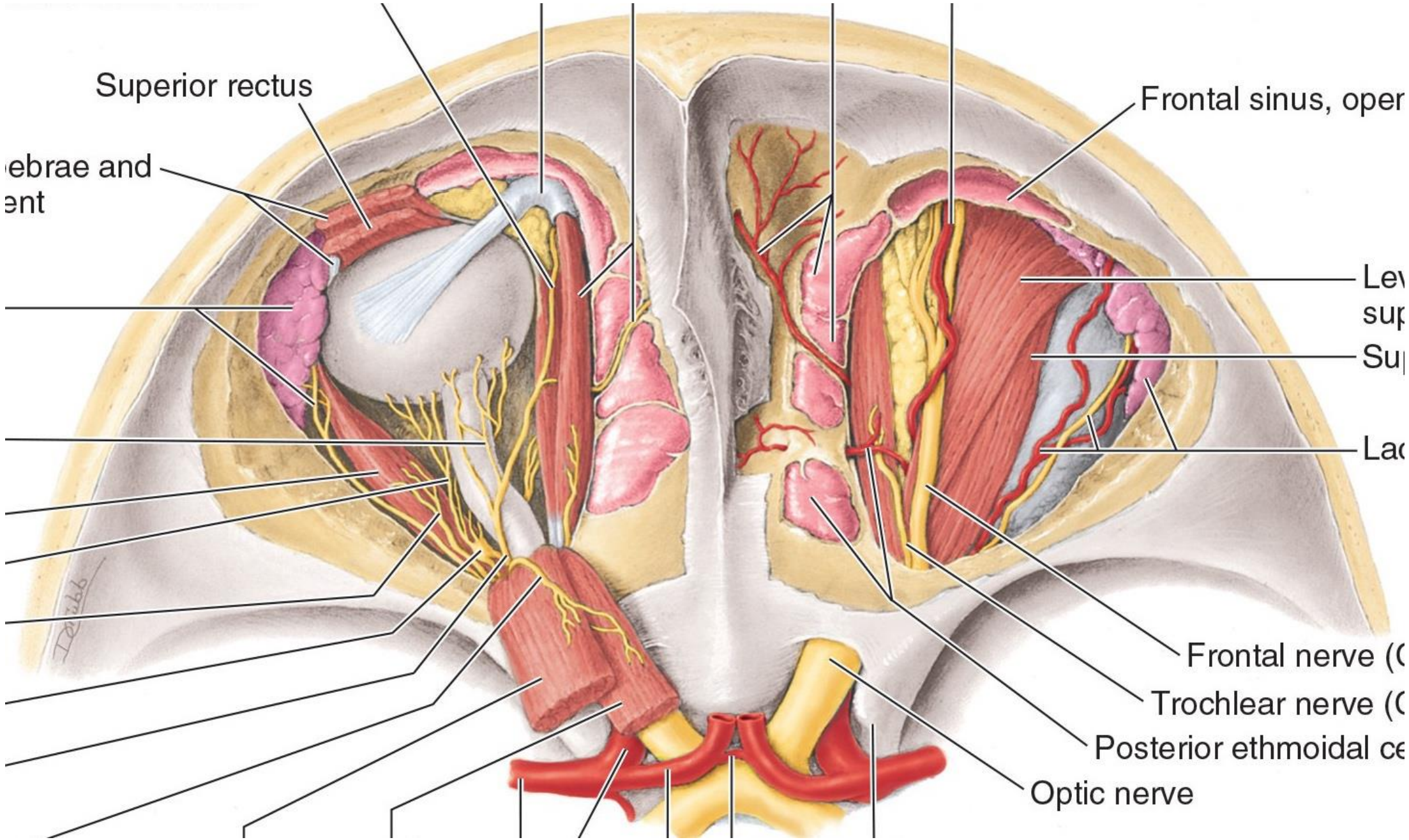
Eye Nerves

Pathways

- Ciliary ganglion <u>structurally</u> on V1
- Sympathetic to dilator pupillae
- Parasymp. to constrictor pupillae & ciliary body





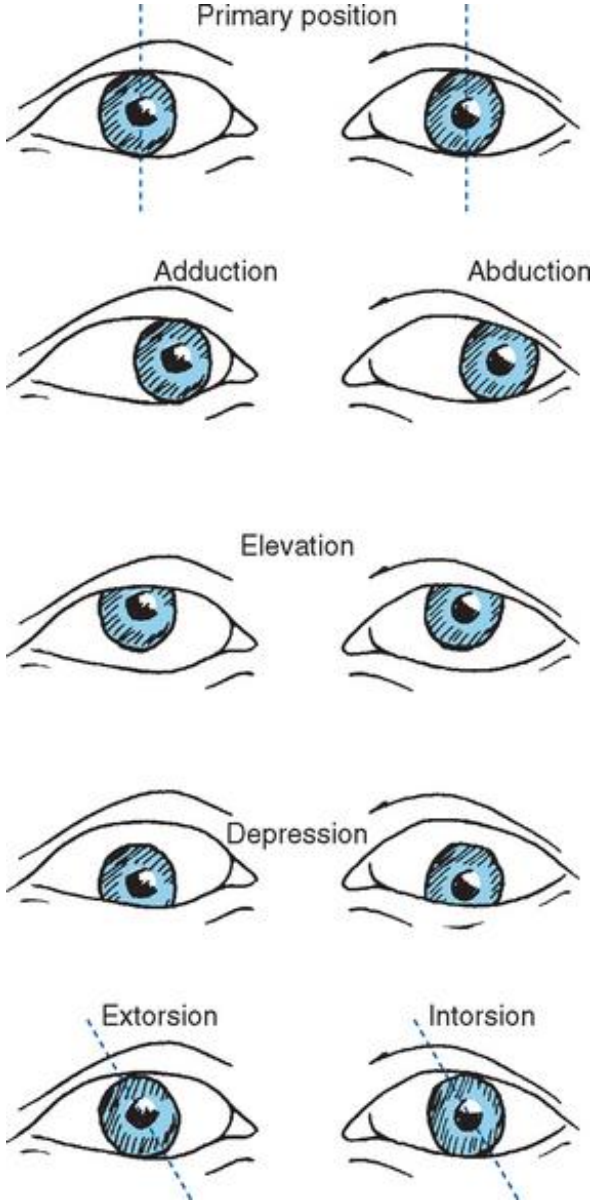

Superior rectus
ebrae and
ent
Frontal sinus, oper
Lev
sup
Su
Lac
Frontal nerve (C
Trochlear nerve (C
Posterior ethmoidal ce
Optic nerve

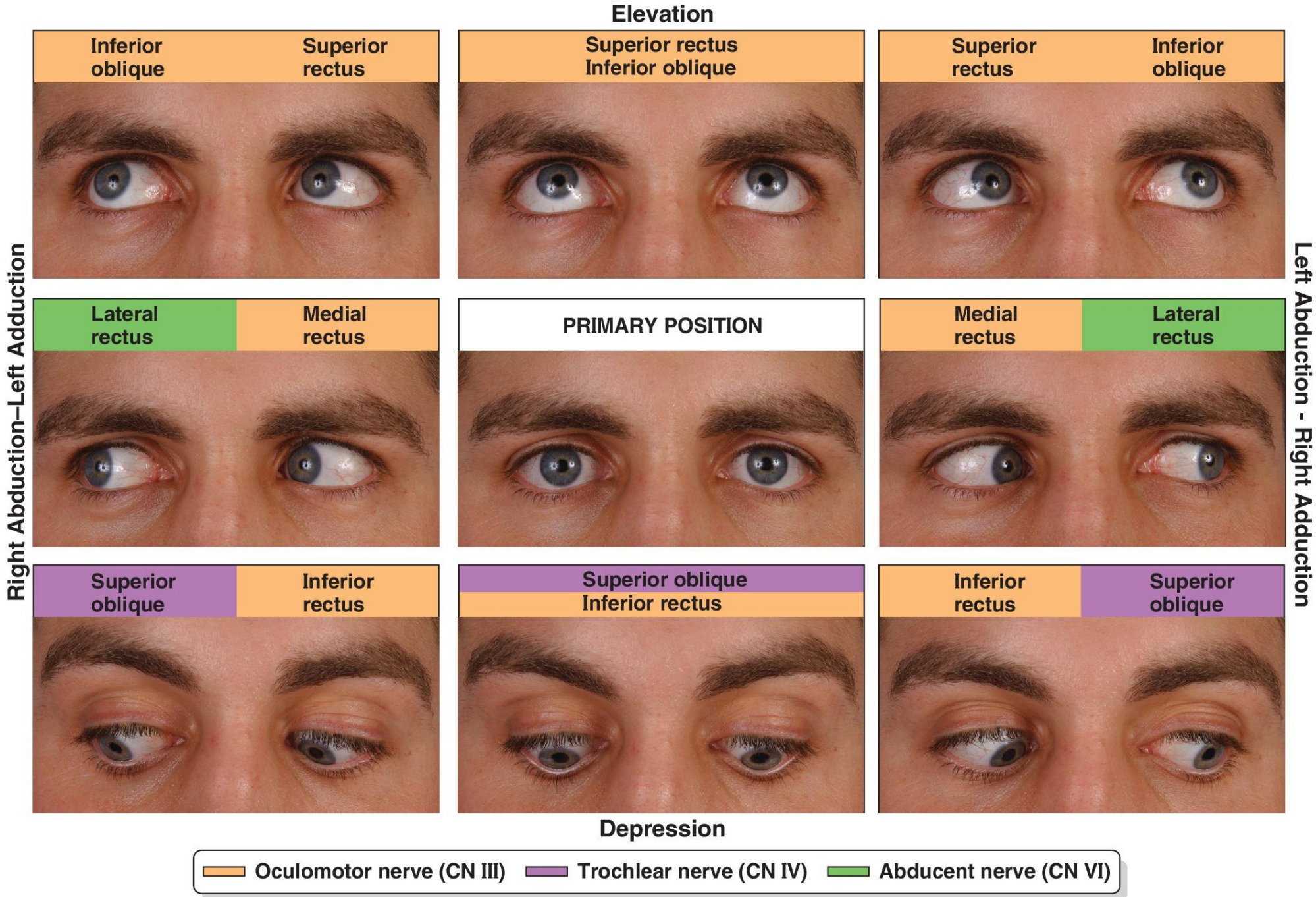
Movements of the Eye

Movements of the Eye

- 3 axes: vertical, horizontal, anteroposterior (sagittal)
- Med/Lat rectus only adduction/abduction
- Other muscles <u>not parallel to axis of eyeball</u>
  - Each acts on all 3 axes

Muscle	Primary Fxn	Secondary Fxn	Tertiary Fxn
Sup. Rect.	Elevate	Adduct	Med. Rotate
Inf. Rect.	Depress	Adduct	Lat. Rotate
Sup. Obl.	Depress	Abduct	Med. Rotate
Inf. Obl	Elevate	Abduct	Lat. Rotate.



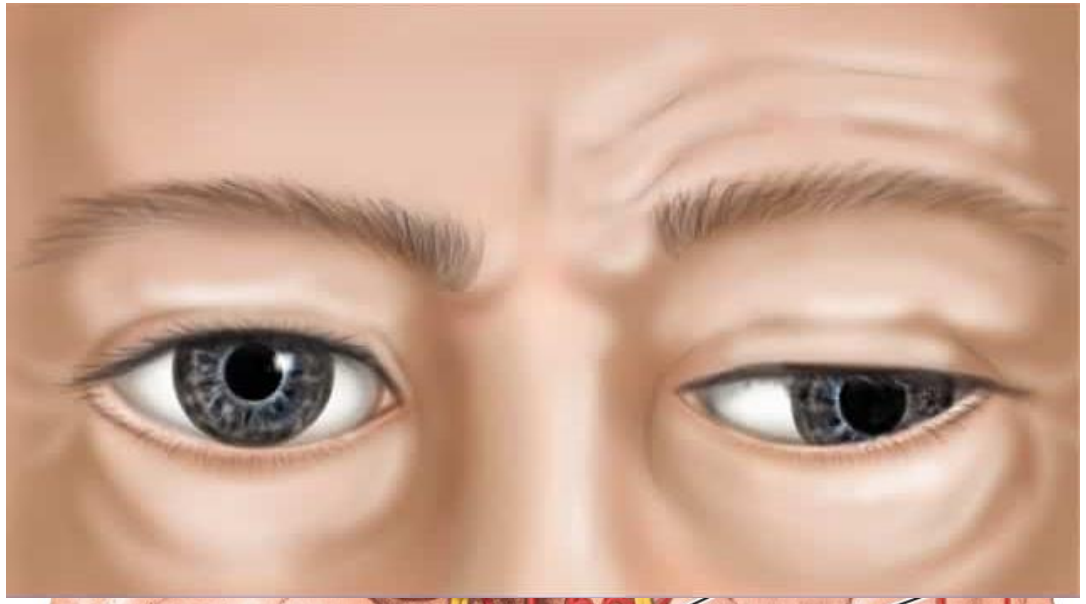


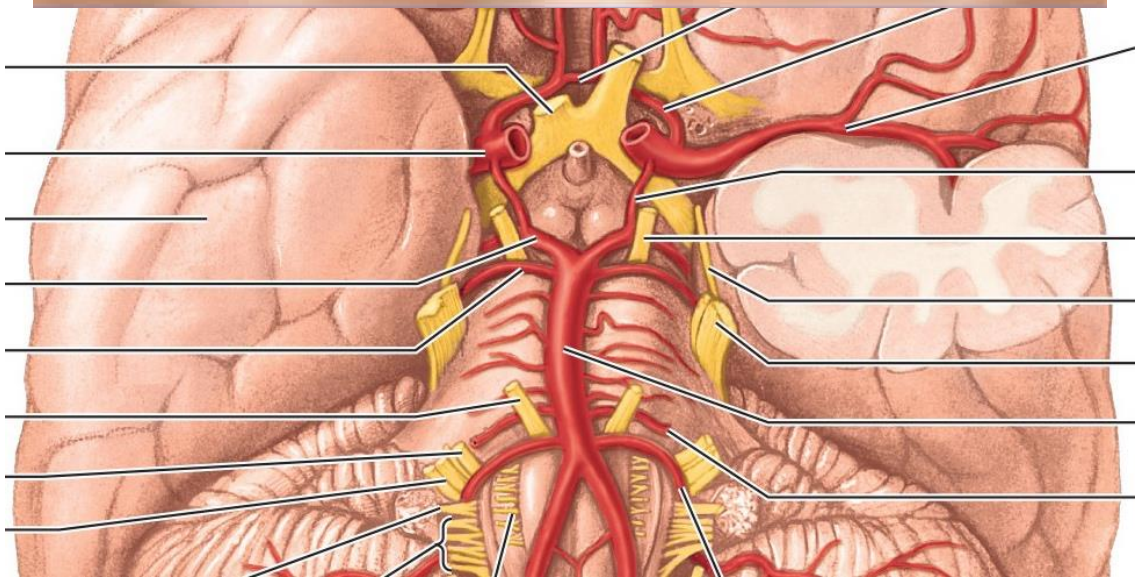
Copyright © 2018 Wolters Kluwer - All Rights Reserved

Clinical Anatomy

Clinical Correlations

- **Oculomotor nerve**
  - Aneurysm in nearby vessels (PCA) = compression
  - Can't elevate/adduct affected eye
    - "down and out"
  - Double vision (diplopia)
  - Drooped eyelid (ptosis)
  - Dilated & unresponsive pupil (mydriasis)
- **Trochlear nerve**
  - Limit depression of eyeball
  - **Difficulty walking down stairs**
- **Abducens nerve**
  - Involved in skull-base fractures
  - Prevent abduction of eye





Clinical Correlations

- **Horner's syndrome**:
  - From injury to cervical symp. nerves
  - Loss of "sympathetic tone"
    - Constricted pupils (miosis)
    - Eyelid dropping
    - Vasodilation (flushing)
    - Drying of face (anhidrosis)