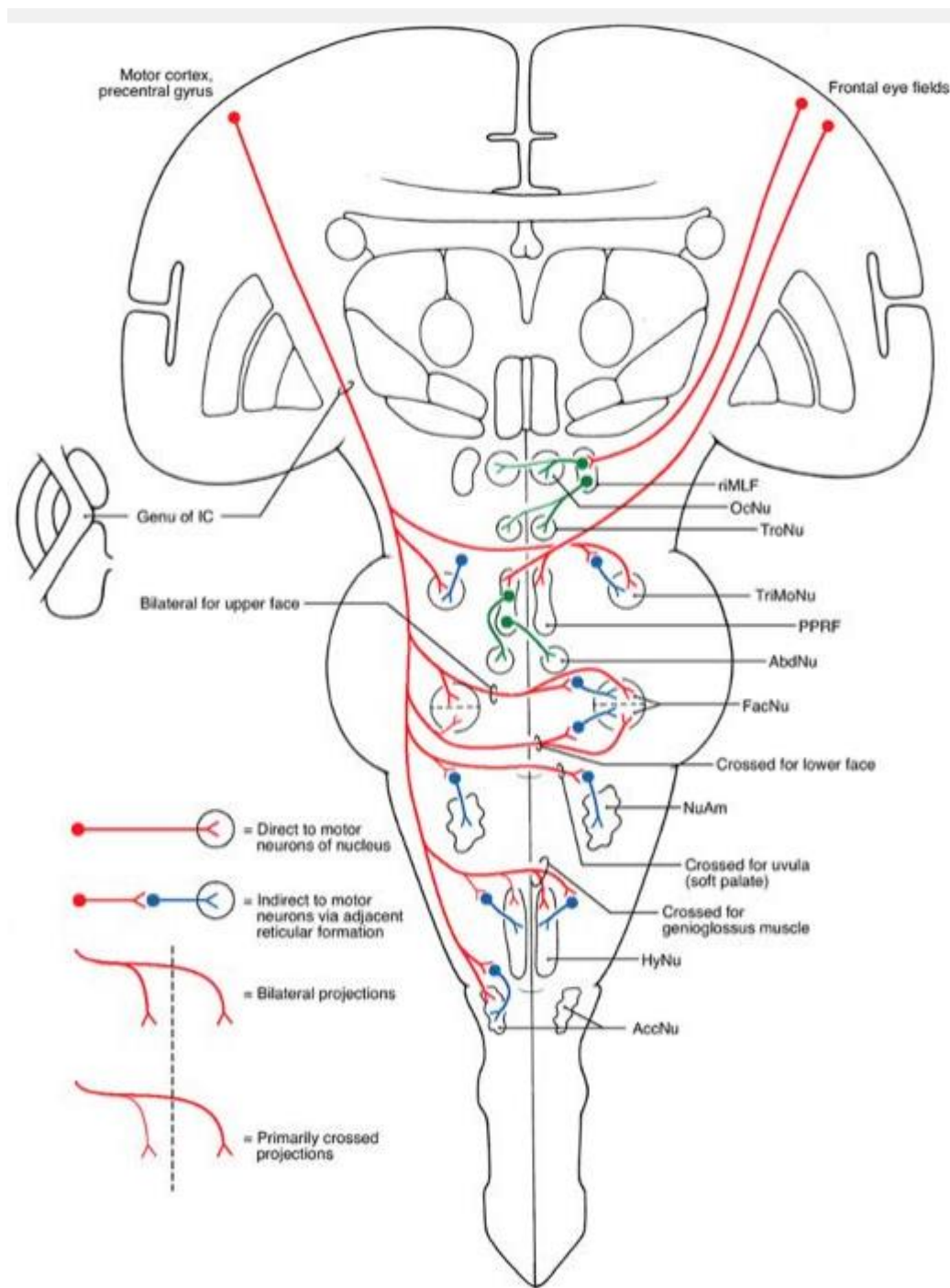


Corticonuclear (corticobulbar) fibers

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Corticonuclear (corticobulbar) fibers – 3 different systems:

FRONTAL EYE FIELDS (areas 6 and 8 in caudal portions middle frontal gyrus) → caudal portions of **anterior limb** of internal capsule → terminate:

- 1) rostral interstitial nucleus of MLF (vertical gaze center) → CN 3, 4 nuclei
- 2) paramedian pontine reticular formation (horizontal gaze center) → CN 6 nuclei.

- **superior colliculus** receives cortical input from area 8 and from parietal eye field (area 7) and projects to riMLF and PPRF

PRECENTRAL GYRUS (motor cortex, area 4) → **genu** of internal capsule → (directly or via adjacent reticular formation nuclei) CN5, 7, 9, 10, 11, 12 motor nuclei

N.B. fibers to motor neurons of **CN7 (lower face)** and **CN12** are primarily **crossed!**

N.B. fibers to motor neurons of **CN11** are primarily **ipsilateral!**

vs. fibers to other motor neurons are equally distributed **bilaterally**

POSTCENTRAL GYRUS (areas 3, 1, and 2) → most rostral portions of **posterior limb** of internal capsule → sensory relay nuclei of some cranial nerves and posterior column system – modulation of sensory information (selective attention / inattention to sensory information)

Neurotransmitter - glutamate (excitatory)

LESIONS

Cortical lesions → transient gaze palsy - eyes deviate toward lesion side (away from side of hemiplegia)

Capsular lesions – contralateral deficits:

- 1) deviation of tongue toward side of weakness
- 2) paralysis of contralateral lower half of face (central facial palsy).
- 3) weakness of contralateral palatal muscles - uvula will deviate toward ipsilateral (lesioned) side on attempted phonation.
- 4) drooping of ipsilateral shoulder + difficulty in turning head (against resistance) to contralateral side

Brainstem lesions (midbrain or pons):

- 1) vertical gaze palsies (midbrain)
- 2) Parinaud syndrome - paralysis of upward gaze
- 3) internuclear ophthalmoplegia (lesion in MLF between motor nuclei of III and VI)
- 4) horizontal gaze palsies (lesion in PPRF)
- 5) one-and-a-half syndrome (lesion is adjacent to midline) – involves:

- a) abducens nucleus
- b) adjacent PPRF
- c) internuclear fibers from ipsilateral abducens that are crossing to enter contralateral MLF, and internuclear fibers from contralateral abducens nucleus that cross to enter MLF on ipsilateral (lesioned) side

Clinically: loss of ipsilateral abduction (lateral rectus) + adduction (medial rectus, “one”) and loss of contralateral adduction (medial rectus, “half”); only remaining horizontal movement is contralateral abduction via intact abducens motor neurons.

BIBLIOGRAPHY for ch. “Brain Stem” → follow this [LINK >>>](#)