

Applied Anatomy — Cranial Nerves & Muscles of Mastication

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EXAM-DAY SUMMARY

everything on this page → detail in §§ overleaf

SKULL-BASE EXITS → §1

- I cribriform plate · II optic foramen · VII stylomastoid foramen
- **SOF: III, IV, V₁, VI** — V₁ only, not all of V
- V₂ rotundum · V₃ ovale
- Jugular foramen: IX, X, XI as one bundle
- SOF group hit by: trauma · cavernous sinus thrombosis · DM · PCom aneurysm

CN I OLFACTORY → §2

- Filaments through cribriform plate → smell
- Damaged by **Le Fort II · Le Fort III · nasal fracture**
- Anosmia = loss · hyposmia = weakness
- Ammonia + perfume pungency = **trigeminal**, not I

REFLEX CIRCUITS → §3 §5 §7

- **Light:** afferent **II** → efferent III, both eyes
- Same eye = direct · other eye = consensual
- **Corneal:** afferent nasociliary (V₁) → efferent VII
- **Gag:** abolish with LA to posterior ½ tongue + soft palate (IX)

EYE MUSCLES → §4

- **LR6 SO4** — everything else III
- SR up/up-lat · IR down/down-lat · MR medial · LR lateral
- SO down + medial · IO up + medial
- Levator palpebrae superioris = III

OCULAR PALSISS → §4

- **III:** **divergent squint + ptosis + fixed pupil**; up/down/medial lost
- **IV:** down-and-medial lost → trouble reading, stairs
- **VI:** convergent squint; abduction lost
- All three → diplopia

CN V TRIGEMINAL → §5

- Sensory to all face **except angle of mandible (greater auricular)**
- V₁, V₂ pure sensory; motor only with V₃
- V₁ forehead + middle nose · V₂ upper lip + lateral nose · V₃ lower lip, chin, temple
- V₃: general sensation anterior ⅔ tongue + muscles of mastication
- Herpes: shingles, corneal ulceration if V₁, pre/post-herpetic neuralgia

CN VII — FUNCTIONS → §6

- Stylomastoid foramen → through parotid
- Motor to all muscles of facial expression; efferent corneal reflex
- Secretomotor **all facial glands except parotid** (parotid = IX)
- Chorda tympani → taste anterior ⅔ tongue

CN VII — BRANCHES → §6

- **Temporal frontalis** · **Zygomatic orbicularis oculi** · **Buccal buccinator**, zygomaticus, levator labii sup., depressor labii inf.
- **Marginal mandibular orbicularis oris** · **Cervical platysma**
- Temporal + zygomatic = **efferent limb of corneal reflex**
- Marginal mandibular at risk: neck dissection, submandibular gland excision

FACIAL PALSY: UMN VS LMN → §6

- Upper face = bilateral corticonuclear; lower face = contralateral only
- **UMN:** contralateral lower face, **forehead spared**, blink intact, no corneal ulcer
- **LMN:** ipsilateral whole face, forehead + blink gone, corneal ulceration, taste often lost
- UMN causes: stroke · haemorrhage · tumour
- LMN causes: trauma/parotid tumour/ENT surgery · Bell's · Ramsay Hunt

CN VIII–XII → §7

- **VIII:** balance + hearing → vertigo, tinnitus, deafness
- **IX:** posterior ⅓ tongue (general + taste), pharynx; stylopharyngeus; **secretomotor to parotid**
- **X:** longest CN; oropharynx/larynx/trachea; pharynx + soft palate; unable to cough
- **XI:** sternomastoid + trapezius → weak shrug
- **XII:** motor to tongue

DEVIATIONS + TONGUE → §7

- Jaw (V₃) → **towards** · tongue (XII) → **towards**
- Soft palate (X) → **away from** affected side · XI weak turning away
- Tongue motor = XII throughout
- Anterior ⅔: general V₃ lingual, taste VII chorda tympani; posterior ⅓: IX both

MUSCLES OF MASTICATION → §8

- Masseter · temporalis · medial + lateral pterygoid
- **1st pharyngeal arch** → **all V₃**; maxillary artery (pterygoid part)
- Masseter zygomatic arch → outer ramus/angle; temporalis temporal fossa → coronoid
- Med. pterygoid: max tuberosity + medial surface lat. pterygoid plate → inner angle
- Lat. pterygoid: greater wing + lateral surface lat. pterygoid plate → TMJ disc/capsule

MOVEMENTS + APPLIED → §8

- Close: all except lateral pterygoid · protrude: all except temporalis
- Retrude: temporalis only · side-to-side: all except masseter
- Open: **bilateral lateral pterygoids** → **digastric + suprahyoid**
- Trismus: submasseteric · temporal · pterygomandibular spaces
- Gillies approach (temporalis) · facial artery at masseter's antero-inferior angle
- Digastric: anterior belly V₃ (1st arch) · posterior belly VII (2nd arch)

§1 The twelve cranial nerves — map and skull-base exits

- **The twelve, in order:** I olfactory · II optic · III oculomotor · IV trochlear · V trigeminal · VI abducent · VII facial · VIII vestibulocochlear · IX glossopharyngeal · X vagus · XI accessory · XII hypoglossal
- **Bundled exits:** three groups travel together → one lesion takes the whole group
 - **Superior orbital fissure** (the lecture's "3, 4, 5, 6"): III · IV · **ophthalmic division of V (V₁) only** · VI
 - **Jugular foramen:** IX · X · XI — exit "as one bundle"
 - **Trigeminal split:** V₁ superior orbital fissure · V₂ foramen rotundum · V₃ foramen ovale

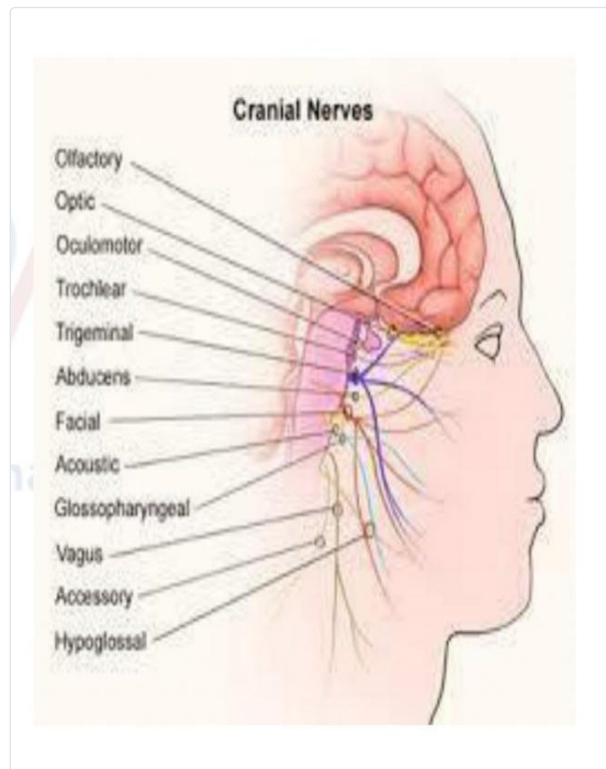


Fig. 1 — The twelve cranial nerves in situ, I (most anterior/superior) → XII. "Acoustic" = vestibulocochlear (VIII).

Table 1 — Where each nerve leaves the skull

Nerve	Exit
I Olfactory	Cribriform plate (fine filaments)
II Optic	Optic foramen
III Oculomotor	Superior orbital fissure
IV Trochlear	Superior orbital fissure
V ₁ Ophthalmic	Superior orbital fissure
V ₂ Maxillary	Foramen rotundum
V ₃ Mandibular	Foramen ovale
VI Abducent	Superior orbital fissure
VII Facial	Stylomastoid foramen → then through parotid gland
VIII Vestibulocochlear	Internal acoustic meatus — <i>not stated in lecture</i>
IX Glossopharyngeal	Jugular foramen
X Vagus	Jugular foramen
XI Accessory	Jugular foramen
XII Hypoglossal	Hypoglossal canal — <i>not stated in lecture</i>

1.1 Damage to the superior orbital fissure group

- **One insult, up to four nerves:** III + IV + V₁ + VI may go together → total ophthalmoplegia + fixed pupil + ptosis + forehead/corneal anaesthesia
- **Causes:** trauma · ★ **cavernous sinus thrombosis** · diabetes mellitus · vascular disease — classically ★ **aneurysm of the posterior communicating artery**

★ EXAM PEARL

The lecture writes the fissure group as "3, 4, 5, 6" — in an exam answer say **V₁ only**, not the whole trigeminal: V₂ leaves by rotundum and V₃ by ovale, so a fissure lesion never numbs the lower lip.

§2 CN I — Olfactory

- **Course:** fine filaments → pierce **cribriform plate** of ethmoid → smell
- **Vulnerability:** unmyelinated filaments crossing a thin perforated plate → shear with any mid-face displacement
- **Deficits:** **anosmia** = total loss of smell · **hyposmia** = weakened smell

KEY POINTS

Mid-face fracture that moves the ethmoid/nasal complex → cribriform plate shear → anosmia. Le Fort II · Le Fort III · nasal fracture.

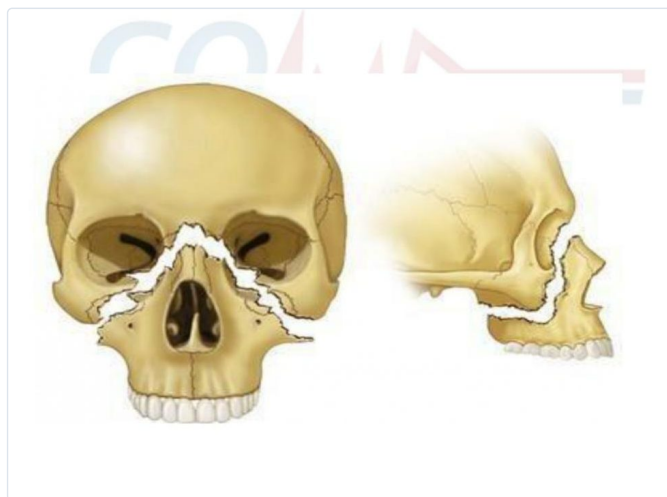


Fig. 2 — Le Fort II ("pyramidal"): fracture line crosses the nasal/ethmoid region → anosmia risk.

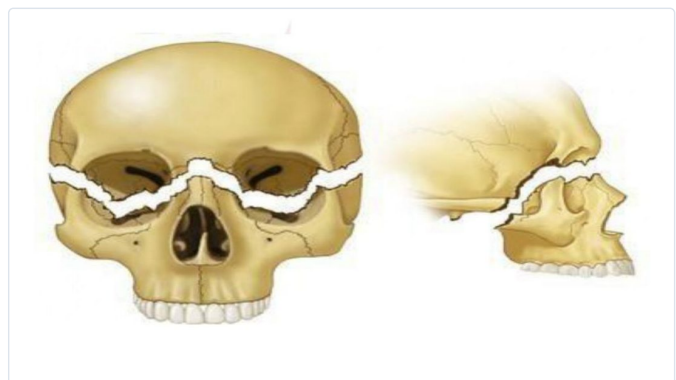


Fig. 3 — Le Fort III (craniofacial dysjunction): whole mid-face separates from the base → anosmia risk.

2.1 What CN I does not smell

- **Caustic / pungent agents:** **ammonia**, and the irritant components of **perfumes** → detected by **trigeminal (V)** free nerve endings in the nasal mucosa, not by CN I
- **Consequence for testing:** a patient with complete anosmia still reacts to ammonia → an apparently "intact" response proves nothing

★ EXAM PEARL

Test olfaction with **non-pungent** odours (coffee, vanilla, cloves). The lecture's line "everything except ammonia and perfumes" is best remembered as: **pungency = V, odour = I** — most of a perfume's actual scent is still CN I, it is the irritant kick that is trigeminal.

§3 CN II — Optic, and the light reflex

- **Not a true nerve:** an **extension of the brain** (CNS tract, meningeal sheaths, no Schwann cells) → exits via **optic foramen**
- **Functions:** field of vision · **afferent limb** of the light (pupillary) reflex
- **Damage** → loss of field of vision · impaired light reflex

3.1 Light (pupillary) reflex

- **Afferent limb:** **optic n (II)** — carries the light sensation in

- **Efferent limb: oculomotor n (III)** — pupillary constriction
- **Bilateral output:** light into **one** eye → **both** pupils constrict
 - **Direct** response = the eye that was lit · **consensual** response = the other eye

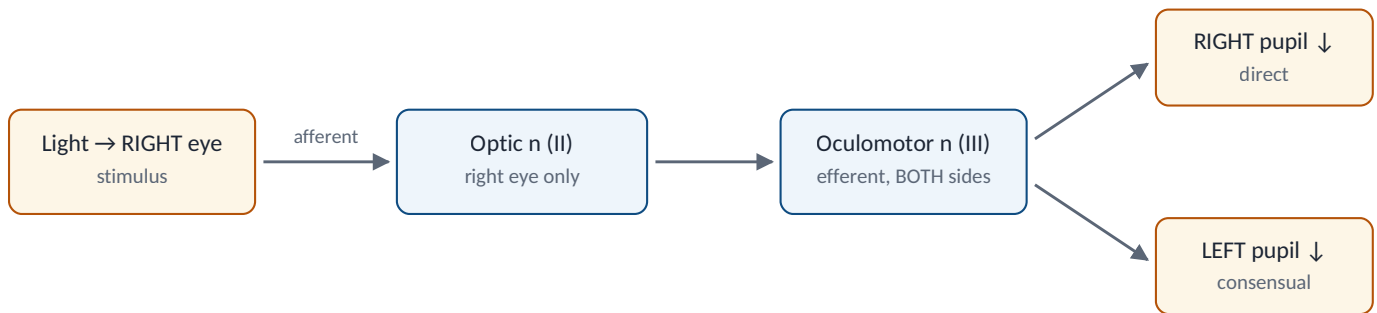


Diagram 1 — Light reflex: afferent II (one eye) → efferent III (both eyes) → direct + consensual constriction.

★ **EXAM PEARL**

Split the reflex to localise the lesion: **II blind eye** → no direct or consensual response when **that** eye is lit, but its pupil still constricts when the other eye is lit (efferent III intact). **III palsy** → that pupil fails whichever eye you light.

§4 Ocular motor nerves — III, IV, VI and eye movement

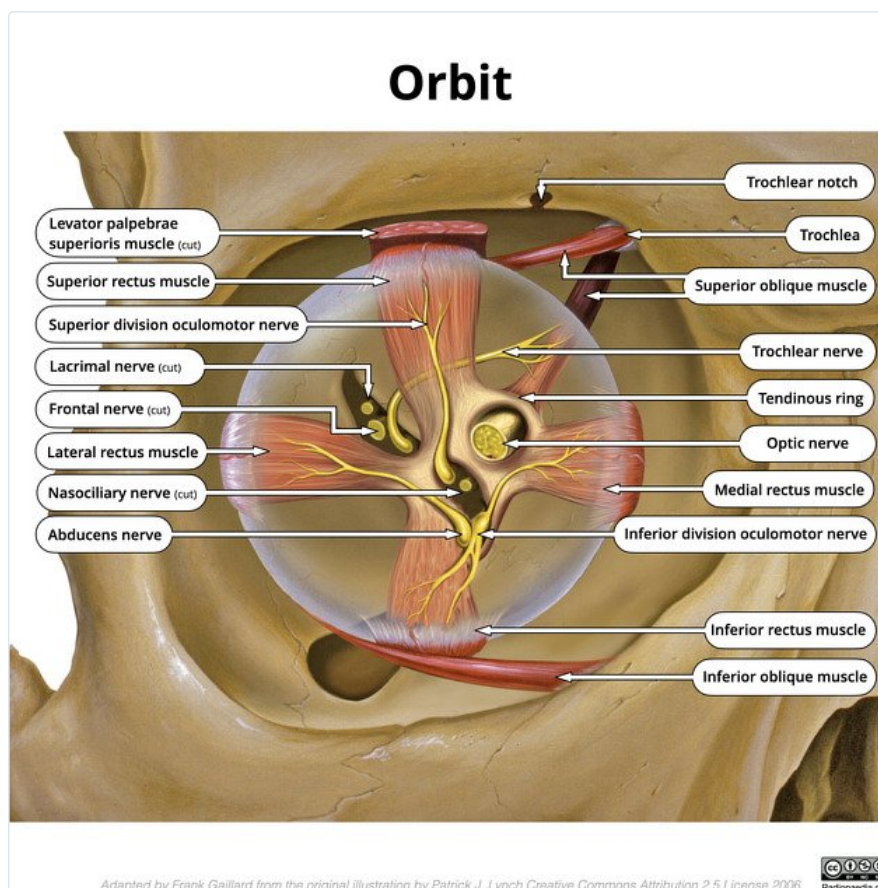


Fig. 4 — Right orbit from in front: the four recti around the tendinous ring, superior oblique through the trochlea, inferior oblique below, with III (superior and inferior divisions), IV, VI and the branches of V₁ (lacrimal, frontal, nasociliary). Adapted by Frank Gaillard from Patrick J. Lynch, CC BY 2.5, Radiopaedia.org.

MNEMONIC

LR6 SO4 — Lateral Rectus = CN VI (abducent) · Superior Oblique = CN IV (trochlear) · **everything else** = CN III.

Table 2 — Extraocular muscles: action and nerve

Muscle	Moves the eye	Nerve
Superior rectus	Upward · upward-laterally	III
Inferior rectus	Downward · downward-laterally	III
Medial rectus	Medially	III
Lateral rectus	Laterally	VI
Superior oblique	Downward · medially	IV
Inferior oblique	Upward · medially	III
Levator palpebrae superioris	Elevates the upper eyelid	III

4.1 Oculomotor n (III)

- **Three jobs:** motor to all extraocular muscles except LR and SO · elevation of the upper eyelid · **efferent limb of the light reflex** (pupillary constriction)
- **Palsy** — ★ **diplopia** · **divergent squint** · **ptosis** · **fixed dilated pupil**
 - paralysis of upward, downward and medial movement → unopposed LR + SO → eye rests "**down and out**"



Fig. 5 — Oculomotor palsy: lid droop and the eye deviated laterally (divergent squint).

CAUTION

The slide says III "carries **sympathetic** fibres raising the upper eyelid". Read it as: III carries **parasympathetic** fibres (pupillary constriction, the reflex's efferent limb) and supplies levator palpebrae superioris directly as skeletal muscle. Sympathetics supply only the small superior tarsal (Müller's) muscle — which is why a Horner's ptosis is *partial* and a III ptosis is *complete*.

4.2 Trochlear n (IV)

- **SO4:** sole supply of superior oblique → eye **downward and medially**
- **Functional load:** reading · ★ **going downstairs** — both need the eye pulled down-and-in
- **Damage:** diplopia + paralysis of downward-medial movement → the patient trips on stairs and loses their place on the page

4.3 Abducent n (VI)

- **LR6:** sole supply of lateral rectus → lateral (abduction) movement
- **Damage:** diplopia · **convergent squint** (unopposed medial rectus) · paralysis of lateral movement



Fig. 6 — Abducent palsy: affected eye cannot abduct → rests medially (convergent squint).

Table 3 — Telling the three ocular palsies apart

	III oculomotor	IV trochlear	VI abducent
Muscles lost	All except LR + SO, plus levator	Superior oblique	Lateral rectus
Movement lost	Up · down · medial	Down-and-medial	Lateral
Squint	Divergent	—	Convergent
Eyelid	Ptosis	—	—
Light reflex	Impaired (efferent limb)	Normal	Normal
Diplopia	Yes	Yes — reading, stairs	Yes

★ **EXAM PEARL**

Squint direction is the single-best-answer giveaway: **divergent = III**, **convergent = VI**. Add ptosis + a dilated pupil and it can only be III.

§5 CN V — Trigeminal

- **Mixed nerve, three divisions:** V₁ ophthalmic (superior orbital fissure) · V₂ maxillary (foramen rotundum) · V₃ mandibular (foramen ovale)
- **Sensory to the whole face EXCEPT** the ★ **angle of the mandible** → **greater auricular n** (cervical plexus, C2–C3)
- **Pure sensory divisions:** V₁ and V₂. Motor fibres travel only with V₃

Table 4 — Trigeminal divisions: territory and content

Division	Exit	Sensory territory	Motor
V₁ Ophthalmic	Superior orbital fissure	Forehead · middle part of the nose · cornea (afferent limb of corneal reflex , via nasociliary branch)	None
V₂ Maxillary	Foramen rotundum	Upper lip · lateral parts of the nose	None
V₃ Mandibular	Foramen ovale	Lower lip · chin · temporal area · general sensation of the anterior ⅔ of the tongue (lingual n)	Muscles of mastication

5.1 Corneal reflex

- **Afferent:** **nasociliary** branch of V₁
- **Efferent:** **facial n (VII)** — temporal + zygomatic branches → orbicularis oculi → blink
- **Bilateral blink:** touching one cornea closes both eyes



Diagram 2 — Corneal reflex: in on V₁ (nasociliary), out on VII. Both eyes blink.

5.2 Damage to V

- **Motor limb** (V_3) → ★ **jaw deviates towards the affected side** on opening (unopposed contralateral lateral pterygoid)
- **Sensory limb** → hypoaesthesia or total anaesthesia of that division's territory
- **V_1 specifically:** shares the superior orbital fissure → see the III/IV/VI causes above (trauma, cavernous sinus thrombosis, DM, PCom aneurysm)
- **Trigeminal neuropathy** — **causes:** trauma · infection (**herpes**) · demyelination · amyloidosis
- **Herpes zoster:** shingles in the dermatome
 - V_1 involved → **corneal ulceration** (anaesthetic cornea + lost blink protection)
 - pre-herpetic and post-herpetic neuralgia

CAUTION

Anaesthetic cornea is a sight-threatening combination: no corneal sensation (V_1) means no protective blink, so ulceration proceeds painlessly. Worse still if VII is also out — no blink at all.

§6 CN VII — Facial

- **Course:** exits **stylomastoid foramen** → passes **through the parotid gland** → divides into five branches on the face
- **Motor:** all **muscles of facial expression** · efferent limb of the corneal reflex
- **Secretomotor:** all **facial glands EXCEPT the parotid** (lacrimal, submandibular, sublingual, nasal/palatine) — parotid is IX
- **Taste:** **chorda tympani** → taste from the **anterior $\frac{2}{3}$ of the tongue** (travels with the lingual n)

MNEMONIC

Branches, top to bottom: **Ten Zebras Bit My Cock** — Temporal · Zygomatic · Buccal · Marginal mandibular · Cervical.

Table 5 — Facial nerve branches, muscles and what they do

Branch	Muscle(s)	Action / test
Temporal (frontal)	Frontalis; orbicularis oculi (with zygomatic)	Wrinkle the forehead · elevate the eyebrows · efferent limb of corneal reflex
Zygomatic	Orbicularis oculi (orbital + palpebral parts); zygomaticus	Tight eye closure · with the temporal branch gives the efferent limb of the corneal reflex
Buccal	Buccinator; zygomaticus; levator labii superioris; depressor labii inferioris	Compress the cheeks (keeps the bolus on the teeth) · elevate mouth corners (<i>smiling muscle</i>) · elevate upper lip · depress lower lip
Marginal mandibular	Orbicularis oris	Closure of the lips (<i>kissing muscle</i>)
Cervical	Platysma	Tenses the skin of the neck

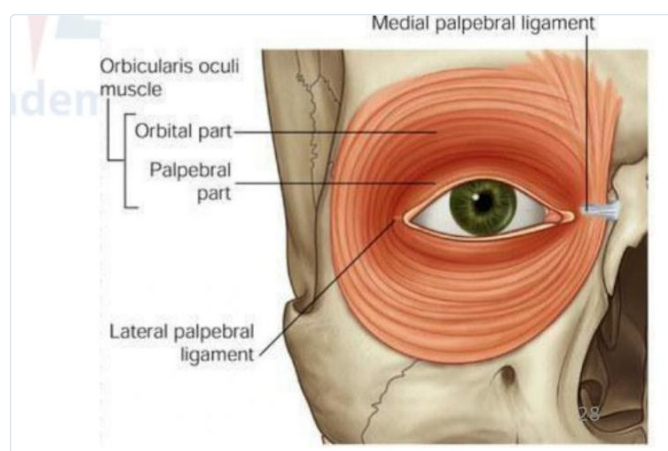


Fig. 7 — Orbicularis oculi: orbital part (forced closure) + palpebral part (blink), anchored by medial and lateral palpebral ligaments.

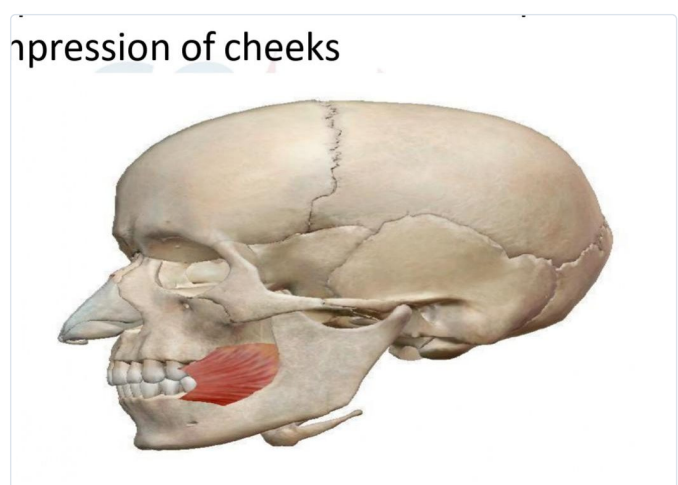


Fig. 8 — Buccinator (buccal branch): compresses the cheek against the teeth.

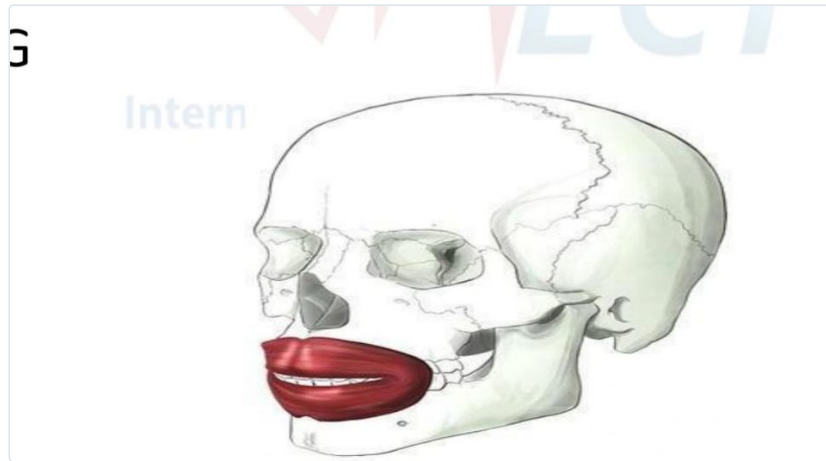


Fig. 9 — Orbicularis oris. The **marginal mandibular** branch is at risk in neck dissection and removal of the submandibular salivary gland.

CAUTION

Marginal mandibular branch — may be injured or removed during **neck dissection** or **excision of the submandibular gland**: it runs superficial to the gland, just below the mandibular border. Result: a visibly asymmetrical lower lip on smiling.

★ EXAM PEARL

Branch-to-muscle assignments overlap between texts. The lecture gives **orbicularis oris** → **marginal mandibular** and **depressor labii inferioris** → **buccal**; most anatomy texts swap these (orbicularis oris mainly buccal; the lower-lip depressors marginal mandibular). Learn the lecture's version for this course, but do not be thrown if the exam stem reverses them — the safe, universally agreed fact is that the **marginal mandibular branch governs the lower lip**.

6.1 Upper vs lower motor neurone lesions

- **The anatomy that explains everything:** neurons supplying the **upper face receive bilateral** corticonuclear fibres · neurons supplying the **lower face receive only contralateral** corticonuclear fibres
- **Therefore:** UMN lesion → the intact opposite hemisphere still drives the upper face → **forehead spared** · LMN lesion → the final common path is cut → **whole half of the face** dies

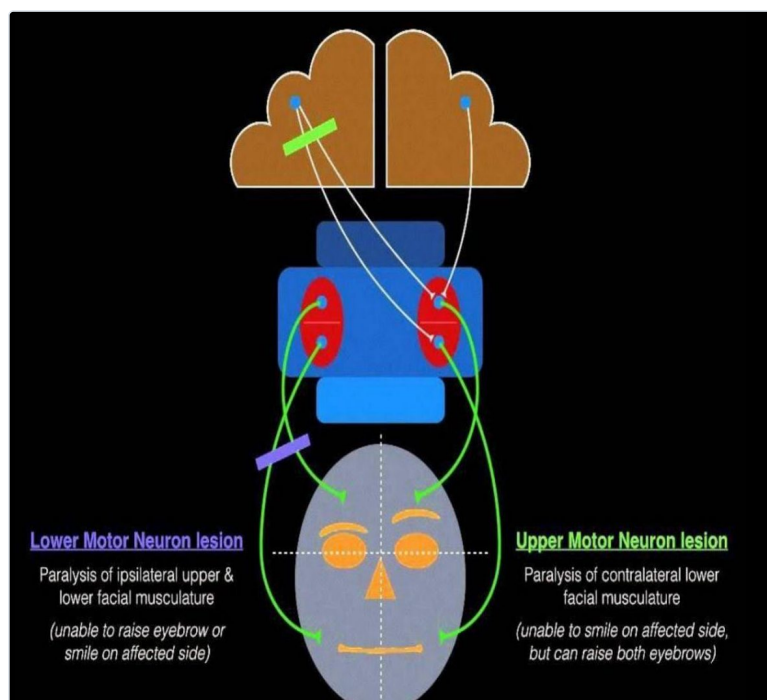


Fig. 10 — Bilateral supply to the upper-face neurons, contralateral only to the lower-face neurons. **LMN** lesion → ipsilateral upper + lower face (cannot raise eyebrow or smile). **UMN** lesion → contralateral lower face only (cannot smile, but raises both eyebrows).

Table 6 — Facial palsy: upper vs lower motor neurone

Feature	UMN (supranuclear)	LMN (infranuclear)
Side affected	Contralateral to the lesion	Ipsilateral to the lesion
Extent	Lower part of the face only	Entire half of the face
Forehead wrinkling	Present bilaterally (frontalis spared)	Absent on the same side
Eye closure / blinking	Present bilaterally	Absent on the same side
Corneal exposure / ulceration	No	Yes
Nasolabial fold	Absent on the opposite side	Absent on the same side
Angle of the mouth	Droops on the opposite side	Droops on the same side; falls → unilateral dribbling
Spontaneous emotional movement	Relatively preserved	Lost
Taste	Unaffected	Frequently also impaired
Causes	Brain stroke · brain haemorrhage · brain tumour	Trauma (parotid tumour, ENT surgery) · Bell's palsy · Ramsay Hunt syndrome



Fig. 11 — Attempted eye closure: UMN lesion (left) closes the eye; LMN lesion (right) cannot.

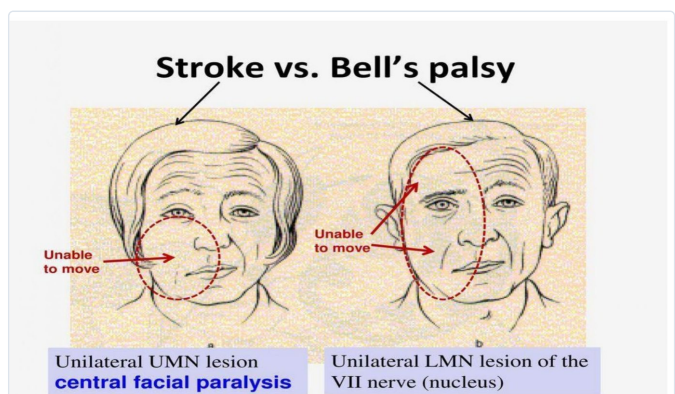


Fig. 12 — Stroke (unilateral UMN, "central facial paralysis") = lower quadrant only; Bell's palsy (unilateral LMN of VII) = whole half of the face.

6.2 Applied — parotid and other causes

- **Malignant parotid tumour**: excision **usually requires removal of the nerve** → permanent LMN palsy, plan for reconstruction/ eye protection
- **Benign parotid tumour**: parotidectomy **usually spares** the nerve
- **Ramsay Hunt syndrome**: herpes zoster of the geniculate ganglion → LMN facial palsy
- **Chvostek sign** (lecture: "Chovestek"): tapping over the facial nerve → facial twitch → sign of **hypocalcaemia in hypoparathyroidism**. Not a palsy — an irritable nerve, and a real risk after thyroid/parathyroid surgery

★ EXAM PEARL

Facial weakness + **spared forehead** = stroke → emergency pathway. Facial weakness + **dead forehead** = Bell's palsy / other LMN cause → steroids and, critically, **eye protection** (drops, taping) because the cornea is now unblinked and anaesthesia of V₁ is not needed for ulceration to follow.

§7 CN VIII to XII — the lower cranial nerves

7.1 Vestibulocochlear n (VIII)

- **Function**: head balance + hearing
- **Damage**: vertigo · tinnitus · loss of hearing

7.2 Glossopharyngeal n (IX)

- **Exit**: jugular foramen — with X and XI as one bundle
- **Sensory**: **posterior ⅓ of the tongue** (general *and* taste — the only region where one nerve does both) · pharynx
- **Motor**: **stylopharyngeus** (its only muscle) · **secretomotor to the parotid gland**

- **Applied — abolishing the gag reflex:** apply **topical local anaesthetic to the posterior ⅓ of the tongue and the soft palate** → blocks the sensory (afferent) side of the reflex
 - directly useful for impressions in a gagging patient, and before any pharyngeal instrumentation

7.3 Vagus n (X)

- **The longest cranial nerve** — the only one that leaves the head and neck
- **Sensory:** oropharynx · larynx · trachea
- **Motor:** pharynx · soft palate
- **Damage:** ★ **soft palate deviates to the unaffected side on saying "aaah"** · unable to cough · impaired gag reflex

7.4 Accessory n (XI)

- **Supplies:** sternomastoid + trapezius
- **Damage:** weakness of shoulder shrugging (trapezius) · difficulty turning the neck **away from** the affected side (sternomastoid rotates the head to the opposite side)
- **Surgical relevance:** superficial in the posterior triangle → at risk in neck dissection and lymph-node biopsy

7.5 Hypoglossal n (XII)

- **Motor supply of the tongue** — all intrinsic and extrinsic muscles
- **Damage:** protruded tongue ★ **deviates towards the affected side** (the working genioglossus pushes its side forward)

Table 7 — Which way does it deviate? The four classic signs

Nerve	Ask the patient to...	Deviates
V ₃ motor	Open the mouth	Jaw → towards the affected side
X vagus	Say "aaah"	Soft palate → away from the affected side
XI accessory	Turn the head against resistance	Weak turning away from the affected side
XII hypoglossal	Stick the tongue out	Tongue → towards the affected side

★ EXAM PEARL

Two out of three point at the lesion — **jaw and tongue deviate towards**, the **soft palate deviates away**. That single exception is what the question is usually testing.

7.6 Tongue innervation — the whole picture

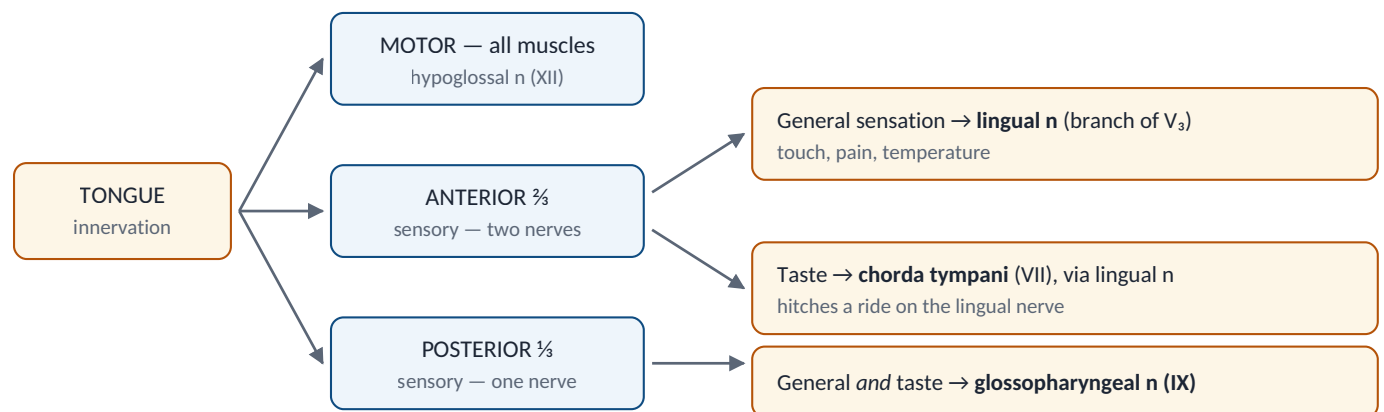


Diagram 3 — Tongue: motor is XII throughout; sensation splits at the sulcus terminalis — anterior ⅔ needs two nerves (V₃ touch, VII taste), posterior ⅓ needs only IX.

KEY POINTS

Anterior ⅔ = **two** nerves (V₃ lingual for feel, VII chorda tympani for taste, travelling together) · posterior ⅓ = **one** nerve (IX does both)
· motor = **XII** for the whole tongue.

§8 Muscles of mastication

- **The four:** masseter · temporalis · lateral pterygoid · medial pterygoid
- **Common origin:** all derived from the mesoderm of the **first pharyngeal arch** → therefore all innervated by the **mandibular n (V₃)**
- **Blood supply:** **maxillary artery** — its **pterygoid (second) part**; the lecture slide says "pterygopalatine part", which is the third part supplying the pterygopalatine fossa

Table 8 — The four muscles: origin, insertion, action

Muscle	Origin	Insertion	Action
Masseter	Lower border of the inner surface of the zygomatic arch	Outer surface of the mandibular ramus at the angle	Elevation only
Temporalis	Temporal fossa, below the inferior temporal line	Anterior border of the inner surface of the coronoid process	Elevation + retraction
Medial pterygoid	Superficial head — maxillary tuberosity Deep head — medial surface of the lateral pterygoid plate	Medial surface of the ramus at the angle of the mandible	Elevation · protrusion · side-to-side
Lateral pterygoid	Superior head — infratemporal crest of the greater wing of sphenoid Inferior head — lateral surface of the lateral pterygoid plate	TMJ disc + anterior aspect of the TMJ capsule, at the pterygoid fovea	Depression · protrusion · side-to-side

Note: the slide labels the second head of lateral pterygoid "deep head"; its own figure — and standard nomenclature — call it the **inferior head**. Medial pterygoid genuinely has superficial and deep heads.

8.1 Which muscle does which movement

Table 9 — Movements of the mandible, and the "EXCEPT" rules

Movement	Muscles
Elevation (closing)	All bilaterally EXCEPT lateral pterygoid
Protrusion	All EXCEPT temporalis
Retrusion	Temporalis only , bilaterally
Side-to-side	All EXCEPT masseter temporalis of the side to which the movement ends · medial + lateral pterygoid of the side from which the movement starts
Depression (opening)	Initiated by bilateral lateral pterygoids → completed by digastric + suprahyoid muscles

MNEMONIC

The three exceptions in one line: **lateral pterygoid cannot close · temporalis cannot protrude · masseter cannot go sideways.**

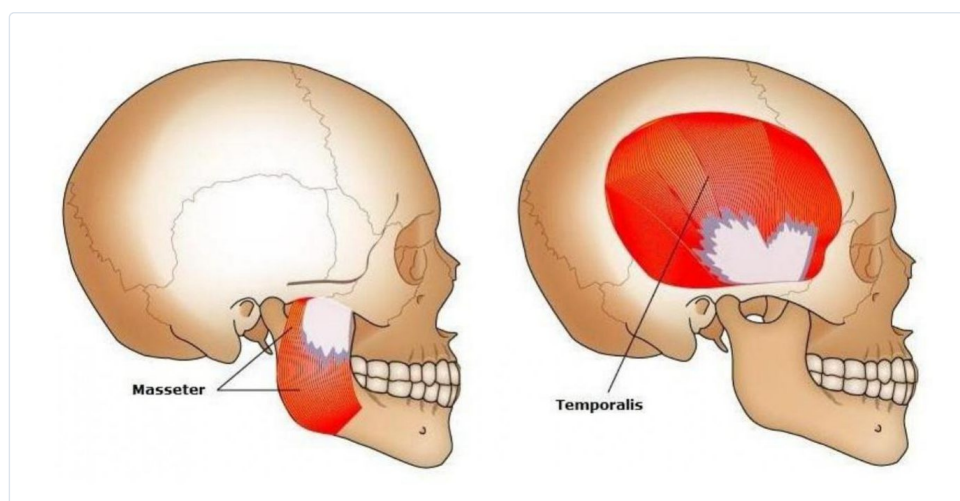


Fig. 13 — Masseter (zygomatic arch → outer ramus/angle) and temporalis (temporal fossa → coronoid process).

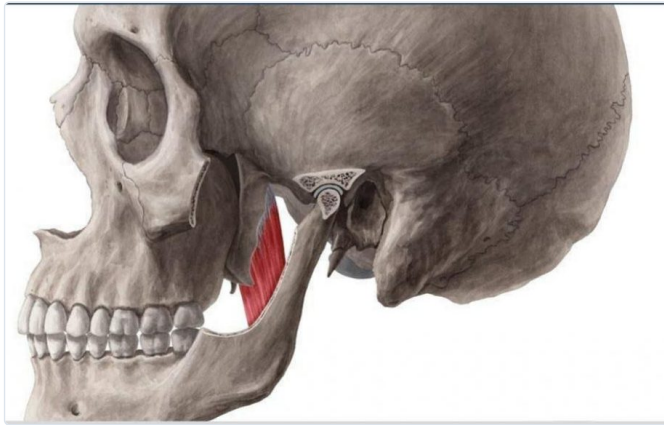


Fig. 14 — Medial pterygoid: slings the angle of the mandible from inside, mirroring masseter outside.

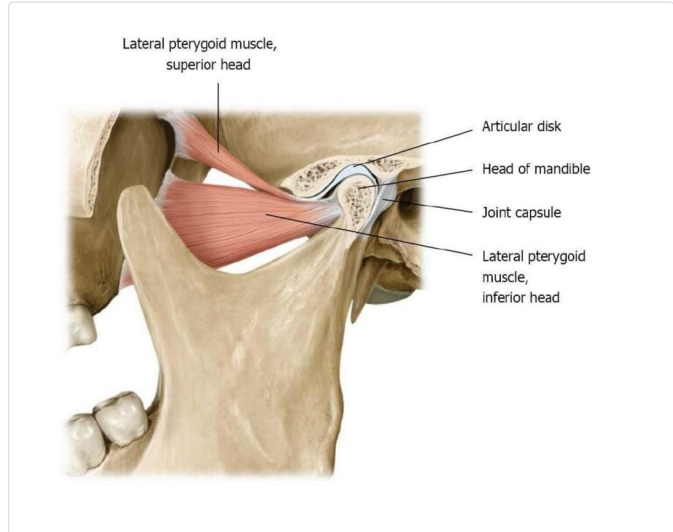


Fig. 15 — Lateral pterygoid: superior and inferior heads → TMJ disc, head of mandible and joint capsule. The only opener of the four.

8.2 Applied anatomy — spaces, approaches and landmarks

- **Masseter** → **submasseteric space**: masseter forms its **lateral boundary**; infection there → ★ **trismus**
- **Masseter** → **facial artery**: the artery crosses the mandible at masseter's **anterior-inferior angle** — the landmark for palpating or clamping it
- **Temporalis** → **Gillies approach**: the temporalis fascia/muscle plane is the **guideline plane** in the **Gillies temporal approach** for reducing a zygomatic fracture — the elevator passes deep to the fascia, superficial to the muscle
- **Temporalis** → **temporal space**: temporal space infection (usually **secondary spread**) → trismus
- **Temporalis** → **coronoid fracture**: the muscle pulls the fractured **tip of the coronoid process up into the temporal space**
- **Medial pterygoid** → **pterygomandibular space**: infection there → trismus (the space the IANB needle enters)

★ EXAM PEARL

Trismus localises the infection: submasseteric (masseter), temporal (temporalis) and pterygomandibular (medial pterygoid) spaces all present with limited opening — because each is bounded by a muscle that *elevates*. Lateral pterygoid, the opener, borders none of them.

8.3 Digastric — the opener's assistant

- **Anterior belly**: 1st branchial arch → innervated by the **mandibular branch of trigeminal** (V_3)
- **Posterior belly**: 2nd branchial arch → innervated by the **facial n** (VII)
- **Why it matters**: one muscle, two arches, two nerves — and it **completes** the depression that the lateral pterygoids begin

KEY POINTS

Arch logic runs the whole lecture: **1st arch** → V_3 (four muscles of mastication, anterior digastric, mylohyoid) · **2nd arch** → VII (all facial expression, posterior digastric, stapedius).