



# Trigeminal Neuralgia

**Neuro Quiz # 75**

**START**

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# CONTENT OUTLINE

Please click on any of the following links to proceed to that question/topic.

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**Trigeminal Neuralgia**

TITLE SLIDE

# QUESTION 1

Which of the following statements about the anatomy of the Trigeminal nerve is FALSE?

Please click on any of the following links to proceed to that question/topic.

[A: The trigeminal nerve is made up of three branches: the Oculomotor, the Maxillary & the Mandibular](#)

[B: The sensation from the face is relayed in the Gasserian ganglion that is located outside the brain stem](#)

[C: The Mandibular nerve innervates the muscles of mastication](#)

[D: It divides into three branches each of which exits the cranium through different foramens](#)

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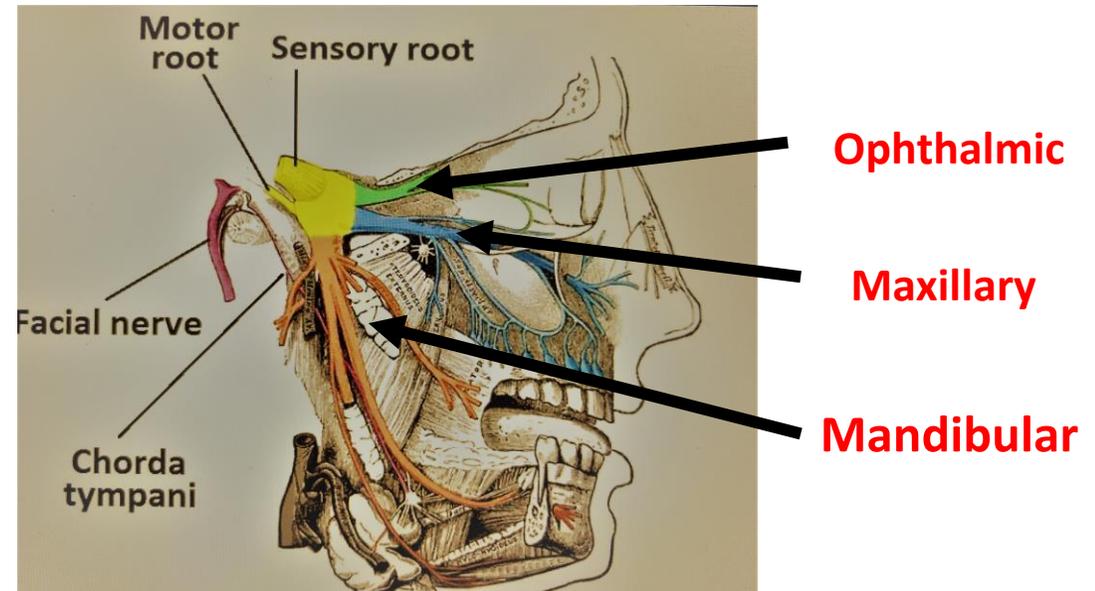
# Great Job!! Correct.

## EXPLANATION

*A. The trigeminal nerve is made up of three branches: the oculomotor, the maxillary & the mandibular*

The first branch is 'Ophthalmic', and not Oculomotor nerve

Oculomotor is the cranial nerve III



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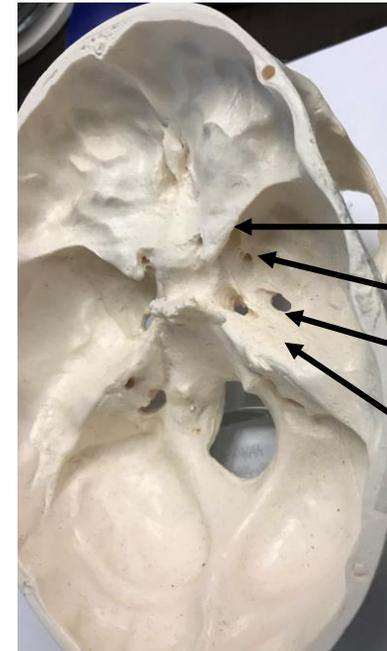
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## EXPLANATION

*B. The sensation from the face is relayed in the Gasserian ganglion that is located outside the brain stem*

This is correct.

The trigeminal ganglion or Gasserian ganglion is located in the Meckel's cave and the three branches Ophthalmic, Maxillary and Mandibular, arise from it.



Superior Orbital Fissure – Ophthalmic N

Foramen Rotundum – Maxillary N

Foramen Ovale – Mandibular N

Meckel's cave

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## EXPLANATION

*C. The mandibular nerve innervates the muscles of mastication*

The Mandibular N, which is the 3<sup>rd</sup> division of the trigeminal nerve is motor to the muscles of mastication

- Masseter
- Temporalis
- Medial and Lateral Pterygoids

It also supplies the tensor veli palatini, the mylohyoid, the anterior belly of the digastric and the tensor tympani

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## EXPLANATION

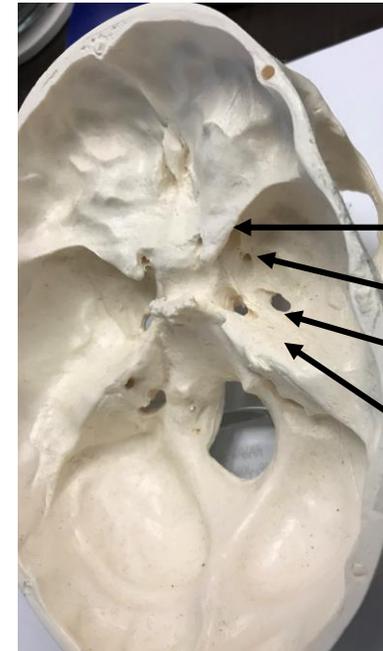
*D. It divides into three branches each of which exits the cranium through different foramens*

The three branches of the trigeminal nerve separate from the trigeminal ganglion and exit the cranium through three separate foramens

Superior orbital fissure – Ophthalmic N

Foramen rotundum – Maxillary N

Foramen ovale – Mandibular N



Superior Orbital Fissure – Ophthalmic N

Foramen Rotundum – Maxillary N

Foramen Ovale – Mandibular N

Meckel's cave

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## QUESTION 2

Which of the following statements about the patho-physiology of Trigeminal neuralgia (TN) is TRUE?

Please click on any of the following links to proceed to that question/topic.

[A: TN presents as sharp pain over the face and is usually bilateral](#)

[B: The pain often leaves the patient with uncontrollable facial twitching](#)

[C: TN is a result of irritation of cranial nerve V, most commonly precipitated by facial injury or a tumor](#)

[D: The compression of the nerve as it exits the cranium is a likely cause of TN](#)

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# Sorry! Incorrect.

## EXPLANATION

*A. TN presents as sharp pain over the face and is usually bilateral*

TN presents as an acute, sharp, lancinating pain, but is usually unilateral.

It is bilateral in only 3% of people and is rarely active on both sides at the same time.

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# Great Job!! Correct.

## EXPLANATION

*B. The pain often leaves the patient with uncontrollable facial twitching*

After a bout of pain, the face may twitch uncontrollably

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## EXPLANATION

*C. TN is a result of irritation of cranial nerve V, most commonly precipitated by facial injury or a tumor*

TN can be caused by vascular compression and/or multiple sclerosis which cause deterioration of the myelin sheath

Neuropathic facial pain may rarely be caused by overlying tumor or injury

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## EXPLANATION

*D. The compression of the nerve as it exits the cranium is a likely cause of TN*

TN can be caused by compression of a blood vessel crossing the trigeminal nerve as it exits the brain stem and pressing on it.

This compression causes the wearing away or damage to the protective coating around the nerve (the myelin sheath).

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## QUESTION 3

Which of the following statements about managing Trigeminal Neuralgia (TN) is CORRECT?

Please click on any of the following links to proceed to that question/topic.

[A: The diagnosis is mainly clinical as the presentation of TN is very typical](#)

[B: A radiofrequency electrode is passed through a fine burr hole in the temporal bone to ablate the trigeminal ganglion](#)

[C: Surgical management of TN is usually reserved for those who do not respond to medications](#)

[D: The mainstay of treatment of TN is anti-inflammatory medications](#)

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# Sorry! Incorrect.

## EXPLANATION

*A. The diagnosis is mainly clinical as the presentation of TN is very typical*

Although, TN presents with sharp, hemifacial pain, other causes for facial pain including post-herpetic neuralgia, cluster headaches, and temporomandibular joint disorder must be ruled out

Most people with TN may eventually undergo an MRI scan to rule out a tumor or multiple sclerosis as the cause of their pain, if they do not respond to medical treatment.

This scan may show a blood vessel compressing the nerve. Special MRI imaging procedures can reveal the presence and severity of compression of the nerve by a blood vessel.

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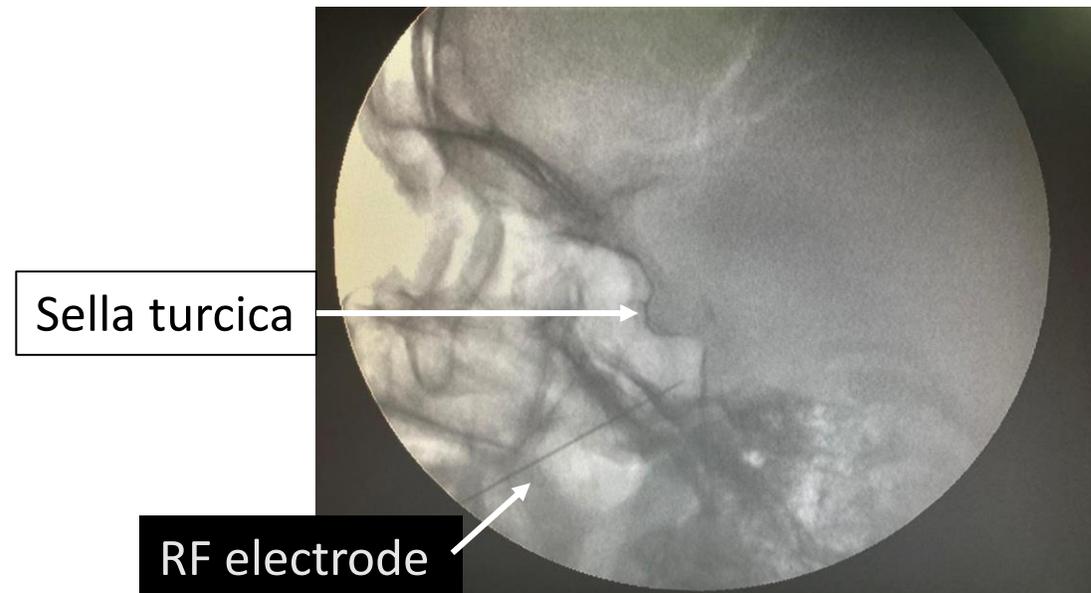
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## EXPLANATION

*B: A radiofrequency needle is passed through a fine burr hole in the temporal bone, to ablate the trigeminal ganglion*

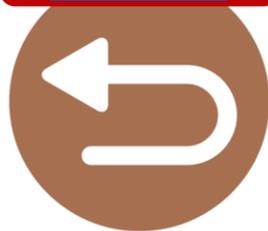
Radio-frequency Thermocoagulation of the trigeminal ganglion is one of the methods used to treat TN

The electrode is passed through the cheek and directed through the Foramen Ovale to reach the ganglion, and NOT through a burr hole



Picture Courtesy: Dr S Michael,  
Anesthesiologist, Coimbatore, India

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# Great Job!! Correct.

## EXPLANATION

*C. Surgical management of TN is usually reserved for those who do not respond to medications*

The mainstay of managing TN is pharmacological.

Surgery is considered if it fails or for tumor or micro vascular decompression.

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# Sorry! Incorrect.

## EXPLANATION

*D. The mainstay of treatment of TN is anti-inflammatory medications*

The mainstay of medical treatment for TN is anti-convulsant medication, such as carbamazepine, lamotrigine, or gabapentin.

Acetaminophen or non-steroidal anti-inflammatory drugs may be used to relieve acute pain

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## QUESTION 4

A 50 y F with Trigeminal neuralgia is having a Left retro-sigmoid craniotomy for microvascular decompression of the Trigeminal nerve. Which of the following muscles is most appropriate to monitor during the surgery?

Please click on any of the following links to proceed to that question/topic.

[A: Orbicularis Oculi](#)

[B: Muscles of the tongue](#)

[C: Masseter](#)

[D: Orbicularis Oris](#)

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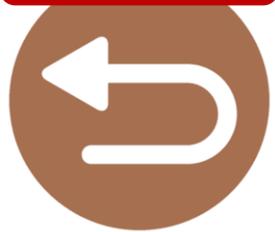
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## EXPLANATION

*A. Orbicularis Oculi*

Orbicularis Oculi is supplied by Facial N (VII)

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## EXPLANATION

*B. Muscles of the tongue*

All the intrinsic muscles of the tongue are supplied by the Hypoglossal N (XII)

All the extrinsic muscles of the tongue are supplied by Hypoglossal N, except Palatoglossus, which is supplied by Vagus N (X)

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# Great Job!! Correct.

## EXPLANATION

*C. Masseter*

Masseter is one of the muscles of mastication, which is supplied by the Mandibular branch of cranial nerve V.

The cranial nerve V can be monitored by masseter and temporalis muscles

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## EXPLANATION

*D. Orbicularis Oris*

Orbicularis oris is one of the muscles of facial expression and supplied by the Facial N (VII)

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## QUESTION 5

During the microvascular decompression of Trigeminal nerve for Trigeminal neuralgia, which of the following groups of cranial nerves are most appropriate to monitor

Please click on any of the following links to proceed to that question/topic.

[A: Trigeminal \(V\) & Facial \(VII\)](#)

[B: Trigeminal \(V\) & Auditory \(VIII\)](#)

[C: Trigeminal \(V\) & Hypoglossal \(XII\)](#)

[D: Trigeminal \(V\), Facial \(VII\) & Auditory \(VIII\)](#)

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## EXPLANATION

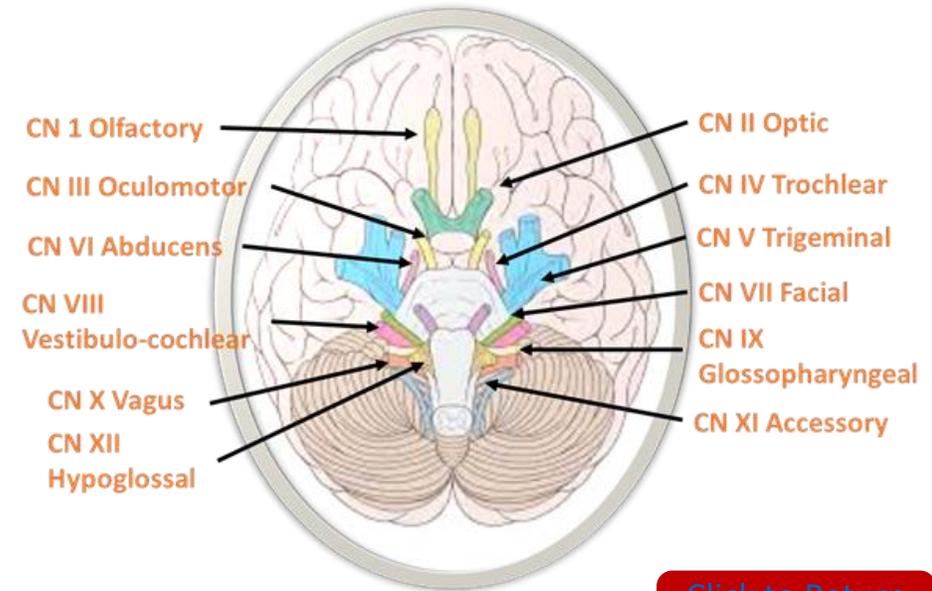
### A. Trigeminal (V) & Facial (VII)

The brain stem may be injured by direct manipulation, positioning or ischemia

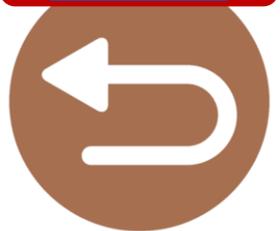
V is resilient to surgical & ischemic insults

VII is standard of care in posterior fossa surgeries

Auditory brainstem response (ABR – VIII) is also used to evaluate brainstem injuries



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## EXPLANATION

*B. Trigeminal (V) & Auditory (VIII)*

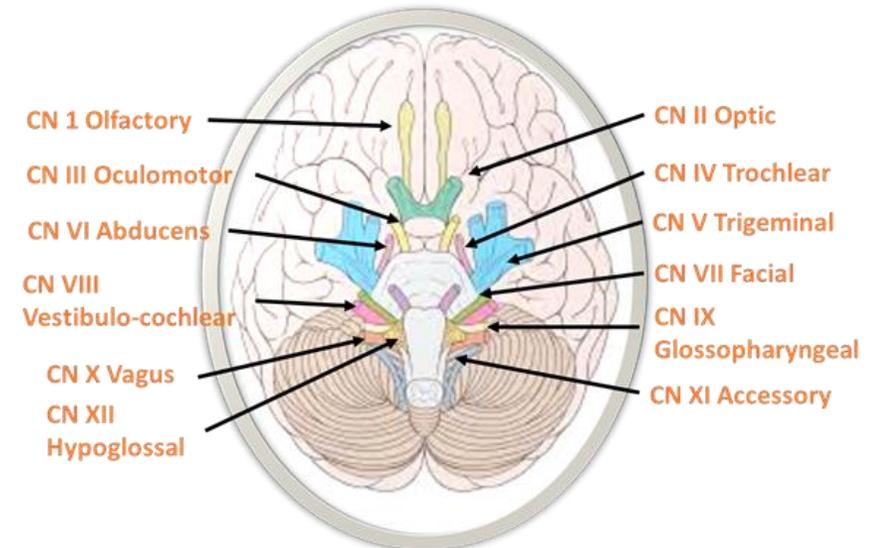
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Cheek JC: Posterior fossa intraoperative monitoring, J Clin Neurophysiol 10:412, 1993



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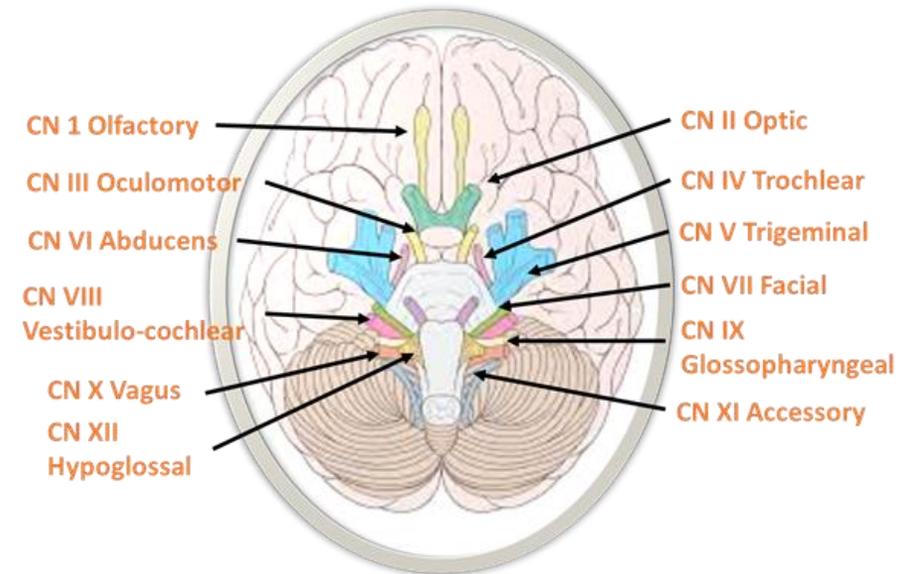
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## EXPLANATION

*C. Trigeminal (V) & Hypoglossal (XII)*

XII is located remote from V and not usually monitored for posterior fossa surgery

It supplies the muscles of the tongue



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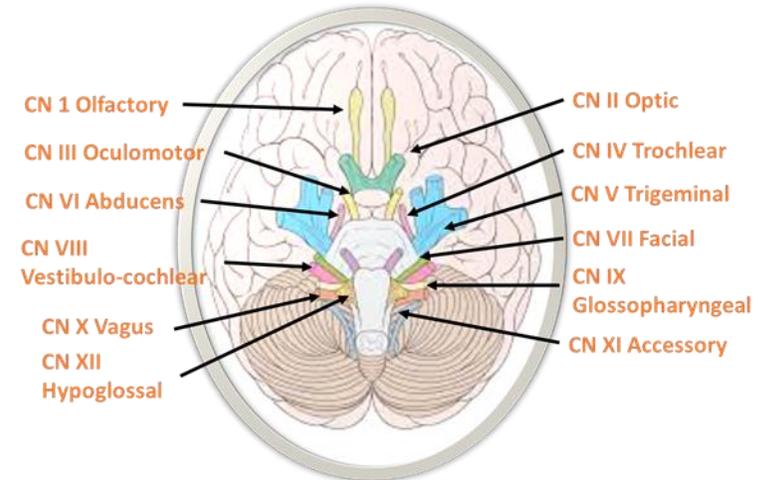
## EXPLANATION

*D. Trigeminal (V), Facial (VII) & Auditory (VIII)*

Monitoring the VII & VIII is more sensitive to detect impending injury to the brain stem, as

- The brain stem may be injured by direct manipulation, positioning or ischemia
- V is resilient to surgical & ischemic insults
- The proximity of these three nerve to each other

The neuromonitoring of choice during microvascular decompression are V, VII & VIII



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Kawaguchi M, Ohnishi H, Sakamoto T, et al: Intraoperative electro-physiologic monitoring of cranial motor nerves in skull base surgery, Surg Neurol 43:177, 1995