

HEAD & NECK BY NUMBERS

THIRD EDITION

Copyright © 2013, Anatomy Numbers (Phoenix, AZ) All rights reserved

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage and retrieval system, without permission in writing from the publisher.

Anatomy Numbers

PO Box 16179

Bellemont, AZ

86015

For ordering information, please go to: AnatomyNumbers.com

Instructions for Students

Each figure has two components: a list of anatomical terms on the lefthand page and a black and white figure on the righthand page. The anatomical terms are numbered and correlate with some part of the figure. As directed by your instructor, copy the number to the matching structure on the diagram. **DO NOT** write the anatomical terms on the diagram! When the diagram is only labeled with numbers, you can fold back the anatomical term page and quiz yourself.

Table of Contents

Figure 1: Surface Anatomy of Face & Anatomical Nomenclature.....	4
Figure 2: Anterior View of the Skull.....	6
Figure 3: Lateral View of the Skull	8
Figure 4: Detailed Views of Mandible & Temporal Bone.....	10
Figure 5: Inferior View of Skull	12
Figure 6: Floor of the Cranium.....	14
Figure 7: Muscles of Facial Expression	16
Figure 8: Facial Expression Identification	18
Figure 9: Muscles of Mastication	20
Figure 10: Anterior Neck Muscles.....	22
Figure 11: Lateral Neck Muscles.....	24
Figure 12: Pharyngeal Muscles.....	26
Figure 13: Arteries of the Head.....	28
Figure 14: Branches of the Maxillary Artery	30
Figure 15: Venous Drainage of the Head.....	32
Figure 16: Cranial Nerves.....	34
Figure 17: Ophthalmic Branch of the Trigeminal Nerve.....	36
Figure 18: Maxillary Branch of the Trigeminal Nerve.....	38
Figure 19: Mandibular Branch of the Trigeminal Nerve.....	40
Figure 20: Lymph Drainage.....	42
Figure 21: Tongue.....	44
Figure 22: Extrinsic Muscles of the Tongue.....	46
Figure 23: Temporomandibular Joint	48
Figure 24: Salivary Glands	50
Figure 25: Thyroid Gland	52
Figure 26: Anterior Superior Alveolar Nerve Block.....	54
Figure 27: Middle Superior Alveolar Nerve Block	56
Figure 28: Posterior Superior Alveolar Nerve Block	58
Figure 29: Mental Nerve Block	60
Figure 30: Long Buccal Nerve Block.....	62
Figure 31: Inferior Alveolar Nerve Block	64
Figure 32: Nasopalatine Nerve Block	66
Figure 33: Greater Palatine Nerve Block	68

Figure 1: Surface Anatomy of the Face & Anatomical Nomenclature

Each anatomical figure below corresponds with a structure on the opposite page.

1. Superior

12. Lateral

2. Inferior

13. Medial Canthus of the Eye

3. Apex of the Nose

14. Sclera (Covered by Conjunctiva)

4. Ala of the Nose

15. Iris

5. Naris

16. Lacrimal Gland (Deep)

6. Philtrum

17. Lateral Canthus of the Eye

7. Labial Commissure

18. Auricle

8. Vermilion Border

19. Helix of the Ear

9. Vermilion Zone

20. External Acoustic Meatus

10. Anterior

21. Lobule

11. Medial

22. Posterior

Figure 1: Surface Anatomy of the Face & Anatomical Nomenclature

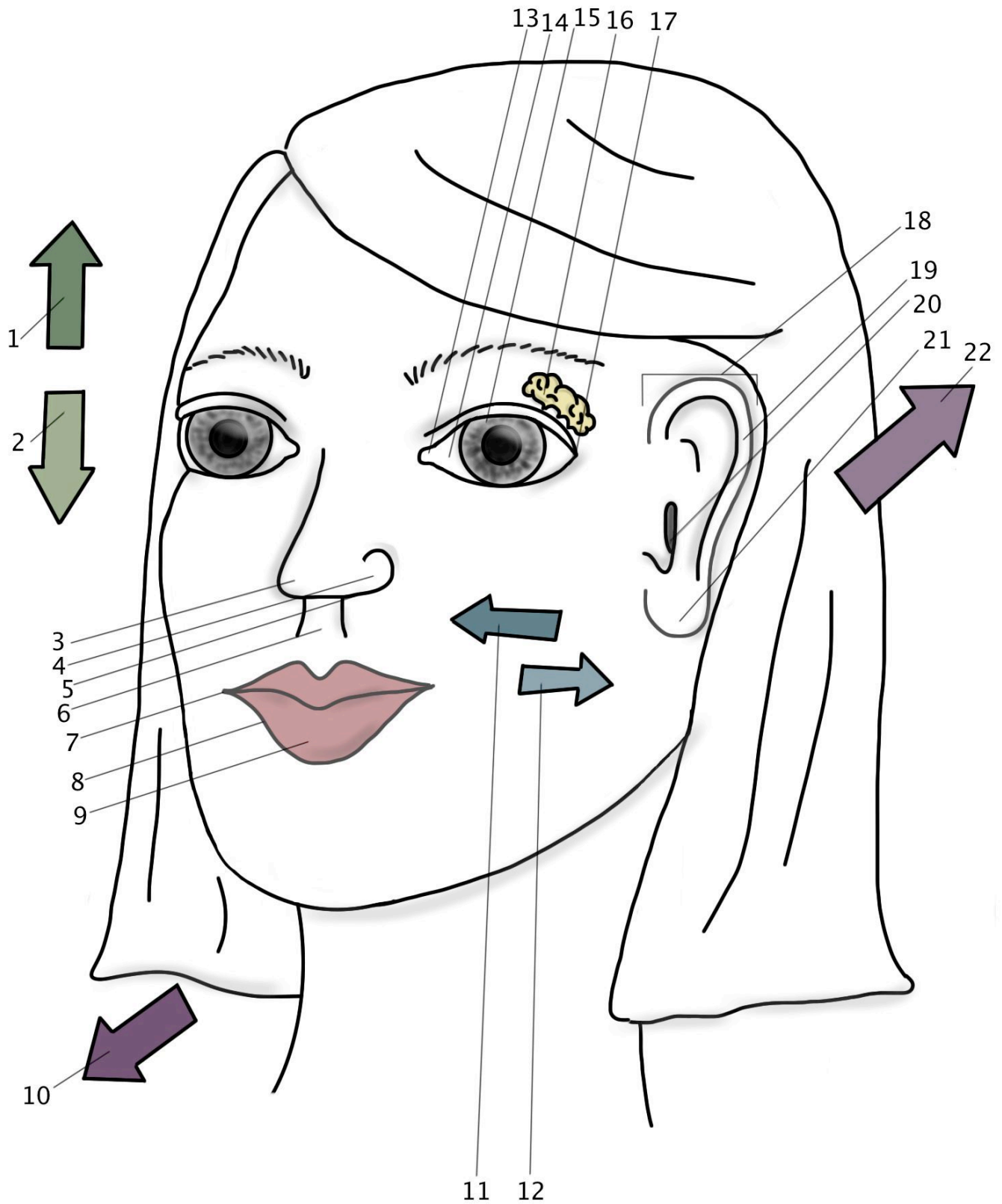


Figure 2: Anterior View of the Skull

Each blank represents the vessel/nerve that passes through the foramen.

*Indicates a bone that forms the orbit

- | | |
|--------------------------------|---|
| 1. Frontal Bone* (Single) | 17. Optic Canal |
| 2. Coronal Suture | a. <u>Cranial Nerve I</u> |
| 3. Parietal Bone (Paired) | b. <u>Ophthalmic Artery</u> |
| 4. Temporal Bone (Paired) | 18. Superior Orbital Fissure |
| 5. Sphenoid Bone* (Single) | a. <u>Ophthalmic Nerve</u> |
| 6. Lacrimal Bone* (Paired) | Cranial Nerves: b. <u>III</u> c. <u>IV</u> d. <u>V₁</u> e. <u>VI</u> |
| 7. Ethmoid Bone* (Single) | 19. Inferior Orbital Fissure |
| 8. Palatine Bone* (Paired) | a. <u>Zygomatic Nerve</u> |
| 9. Nasal Bone (Paired) | 20. Perpendicular Plate of Ethmoid Bone |
| 10. Zygomatic Bone* (Paired) | 21. Middle Nasal Concha of Ethmoid Bone |
| 11. Maxillary Bone* (Paired) | 22. Infraorbital Foramen |
| 12. Piriform Aperture | a. <u>Infraorbital Nerve & Artery</u> |
| 13. Intermaxillary Suture | 23. Inferior Nasal Concha (Separate Bone) |
| 14. Mandible (Single) | 24. Vomer |
| 15. Supraorbital Notch/Foramen | 25. Alveolar Processes |
| a. <u>Supraorbital Nerve</u> | 26. Mental Foramen |
| 16. Nasion | a. <u>Mental Nerve & Artery</u> |

Figure 2: Anterior View of the Skull

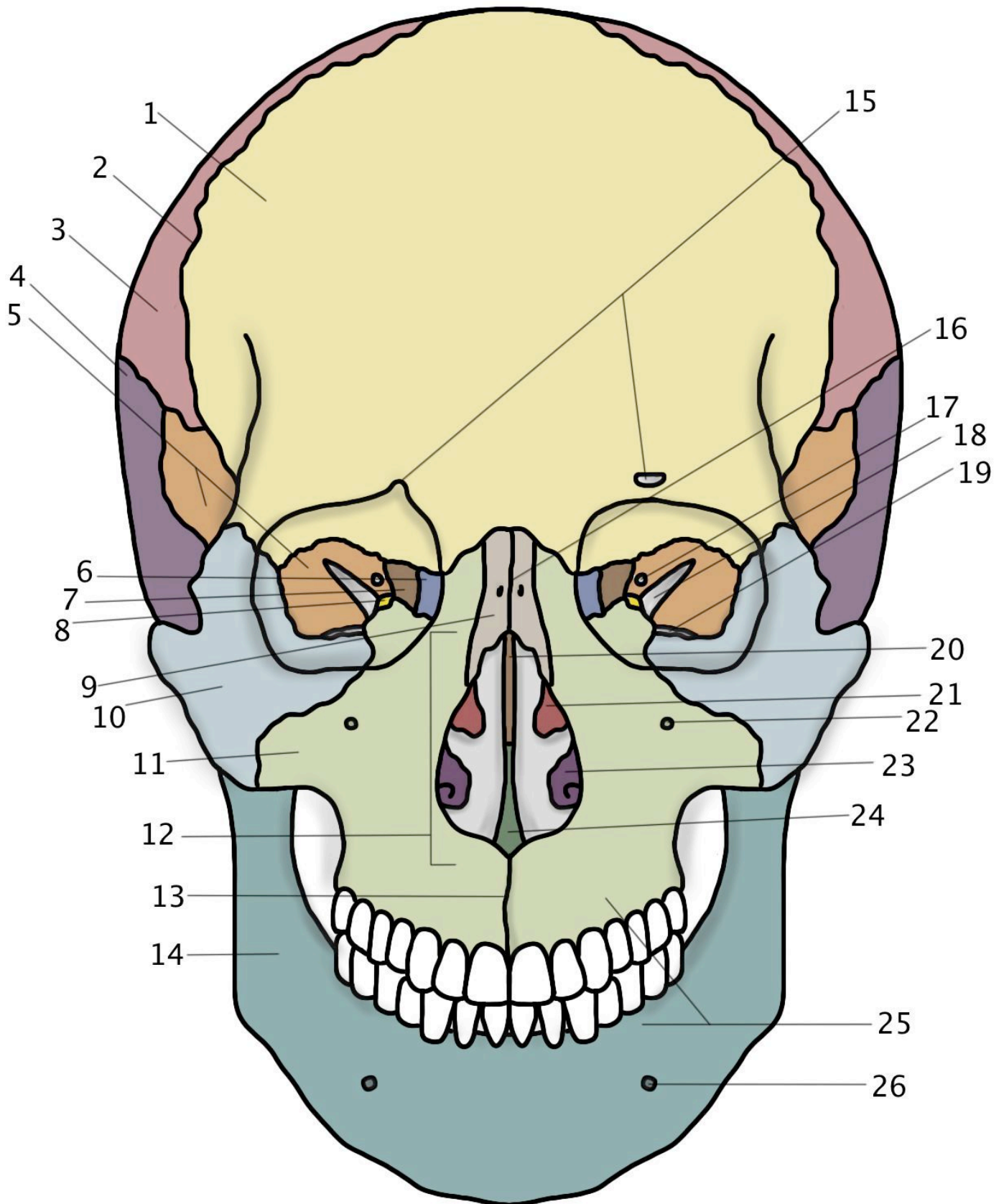


Figure 3: Lateral View of the Skull

Each blank represents the vessel/nerve that passes through the foramen.

*Indicates a bone that forms the orbit

- | | |
|---|--|
| 1. Parietal Bone (Paired) | 12. Mandible |
| 2. Coronal Suture | 13. Mental Foramen |
| 3. Frontal Bone* (Single) | a. <u>Mental Nerve & Artery</u> |
| 4. Supraorbital Ridge | 14. Zygomatic Bone* (Paired) |
| 5. Nasal Bone (Paired) | 15. Temporozygomatic Suture |
| 6. Lacrimal Bone* (Paired) | 16. Sphenoid Bone |
| 7. Nasolacrimal Duct | 17. Lateral Pterygoid Plate of Sphenoid Bone |
| 8. Ethmoid Bone* (Single) | 18. Pterion |
| 9. Infraorbital Foramen | 19. Temporal Bone (Paired) |
| a. <u>Infraorbital Nerve & Artery</u> | 20. Squamosal Suture |
| 10. Anterior Nasal Spine | 21. Asterion |
| 11. Maxillary Bone* (Paired) | 22. Lambdoidal Suture |
| | 23. Occipital Bone (Single) |

Figure 3: Lateral View of the Skull

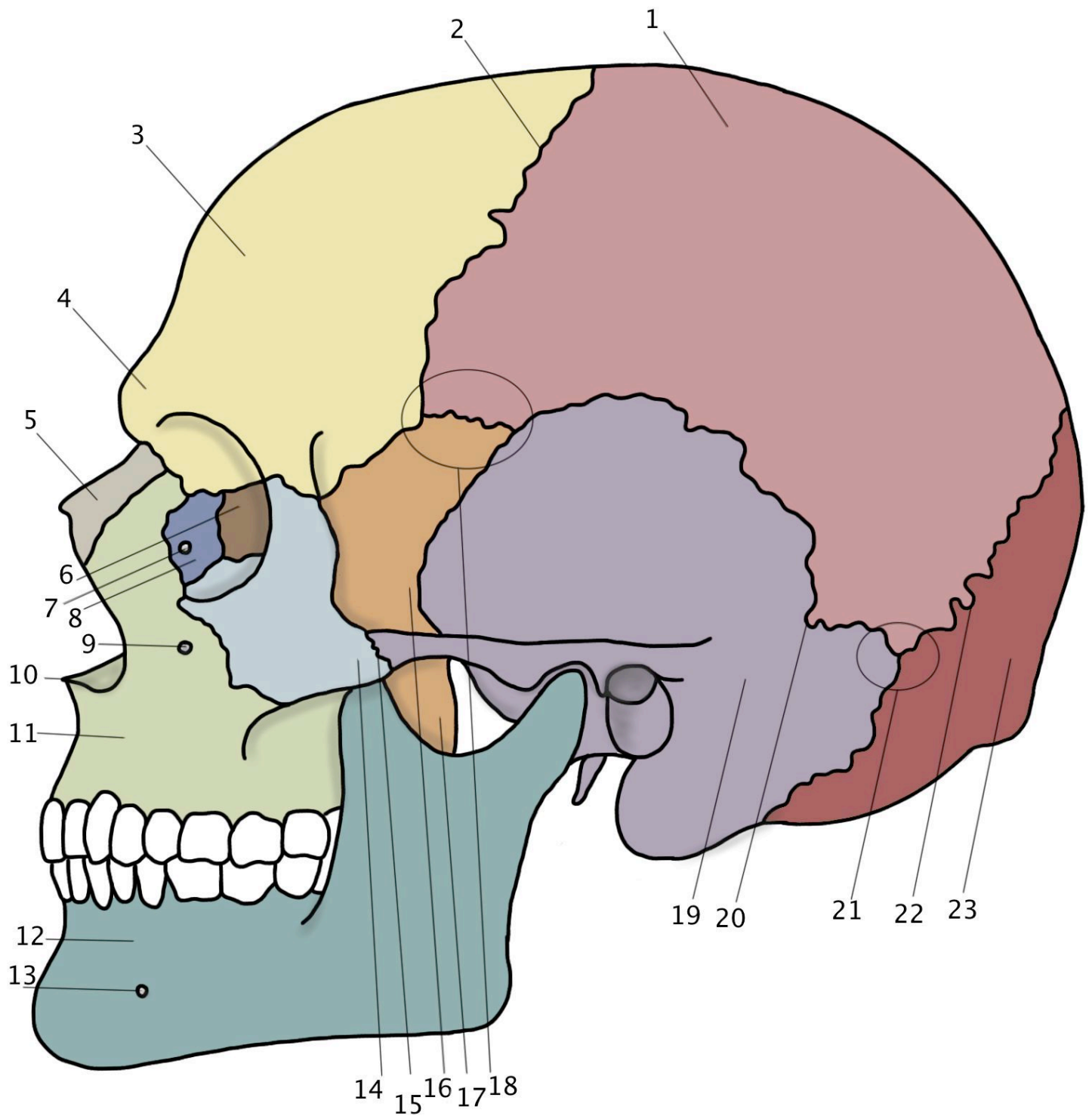


Figure 4: Detailed Views of Mandible & Temporal Bone

Each blank represents the vessel/nerve that passes through the foramen.

- | | |
|--|---|
| 1. Articulating Surface of Condyle | 14. Mandibular Notch |
| 2. Pterygoid Fovea | 15. Neck of Condyle |
| 3. Mandibular Foramen | 16. Condyle |
| a. <u>Inferior Alveolar Nerve & Artery</u> | 17. Squamous Portion of Temporal Bone |
| 4. Lingula | 18. Tympanic Portion of Temporal Bone |
| 5. Mandibular Canal | 19. Petromastoid Portion of Temporal Bone |
| 6. Coronoid Notch | 20. Zygomatic Process |
| 7. Mental Tubercle | 21. Articular Eminence |
| 8. Mental Foramen | 22. Articular Fossa |
| a. <u>Mental Nerve & Artery</u> | 23. Postglenoid Process |
| 9. Body of Mandible | 24. Petrotympanic fissure |
| 10. Oblique Line | a. <u>Chorda Tympani Nerve</u> |
| 11. Angle of Mandible | 25. Styloid Process |
| 12. Ramus of Mandible | 26. External Acoustic Meatus |
| 13. Coronoid Process | 27. Mastoid Process |

Figure 4: Detailed Views of Mandible & Temporal Bone

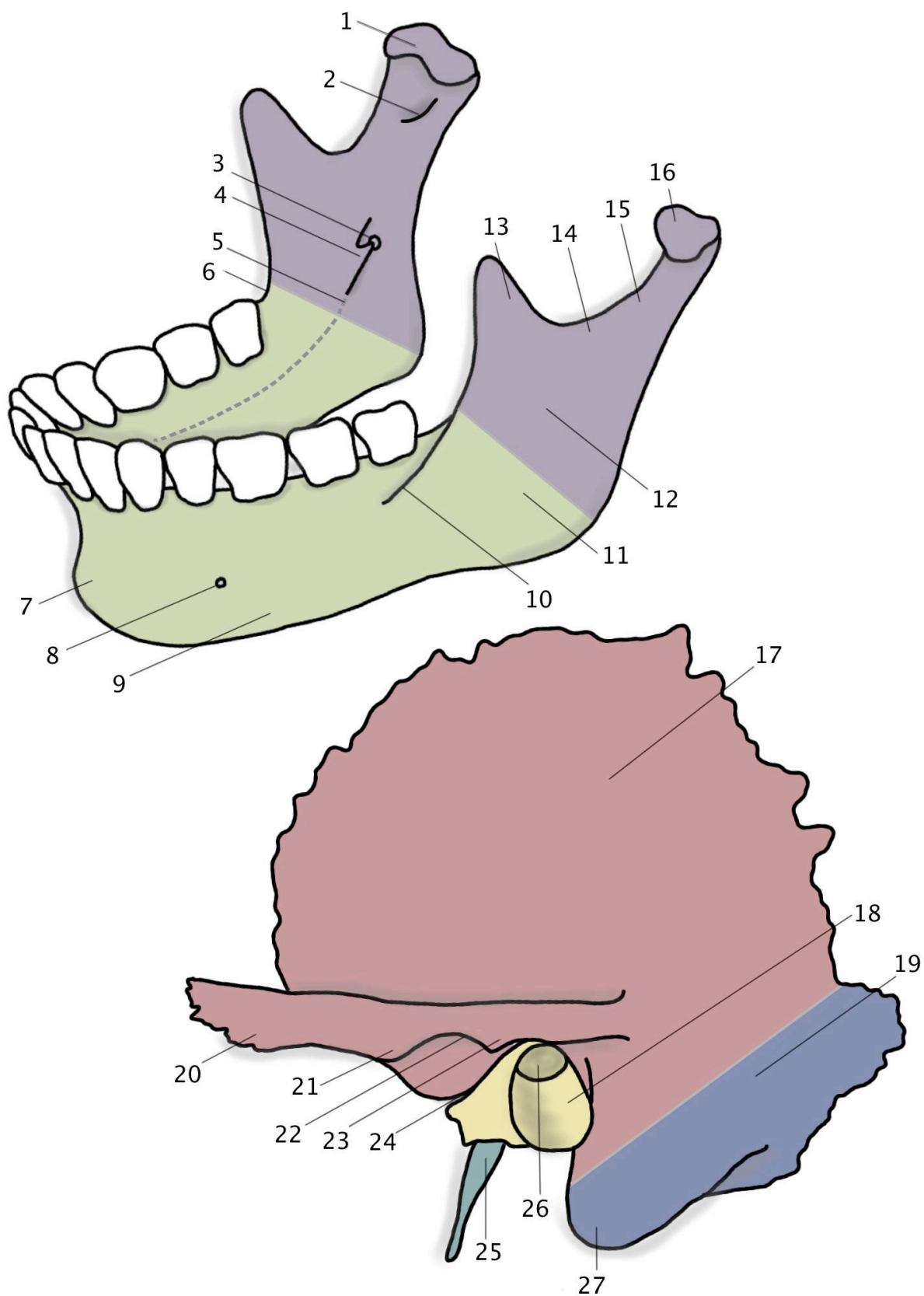


Figure 5: Inferior View of the Skull

Each blank represents the vessel/nerve that passes through the foramen.

- | | |
|---|--|
| 1. Maxillary Bone (Paired) | 21. Inferior Orbital Fissure |
| 2. Median Palatine Suture | a. <u>Zygomatic Nerve</u> |
| 3. Zygomatic Bone (Paired) | 22. Foramen Lacerum |
| 4. Transverse Palatine Suture | a. <u>Cartilage</u> |
| 5. Palatine Bone (Paired) | 23. Foramen Ovale |
| 6. Posterior Nasal Apertures | a. <u>3rd Branch of the Trigeminal Nerve</u> |
| 7. Frontal Bone (Single) | 24. Foramen Spinosum |
| 8. Sphenoid Bone (Single) | a. <u>Middle Meningeal Artery</u> |
| 9. Lateral Pterygoid Plate of Sphenoid Bone | 25. Carotid Canal |
| 10. Medial Pterygoid Plate of Sphenoid Bone | a. <u>Internal Carotid Artery</u> |
| 11. Vomer | 26. Jugular Foramen |
| 12. Temporal Bone (Paired) | a. <u>Internal Jugular Vein</u> |
| 13. Styloid Process | b. <u>Cranial Nerve IX</u> |
| 14. Mastoid Process | c. <u>Cranial Nerve X</u> |
| 15. Occipital Bone (Single) | d. <u>Cranial Nerve XI (Cranial Root)</u> |
| 16. Occipital Condyle | 27. External Acoustic Meatus |
| 17. Parietal Bone | 28. Stylomastoid Foramen |
| 18. Incisive Foramen | a. <u>Cranial Nerve VII</u> |
| a. <u>Nasopalatine Nerve & Artery</u> | 29. Hypoglossal Canal |
| 19. Greater Palatine Foramen | a. <u>Cranial Nerve XII</u> |
| a. <u>Greater Palatine Nerve & Artery</u> | 30. Foramen Magnum |
| 20. Lesser Palatine Foramen | a. <u>Spinal Cord</u> |
| a. <u>Lesser Palatine Nerve & Artery</u> | b. <u>Cranial Nerve XI (Spinal Root)</u> |

Figure 5: Inferior View of the Skull

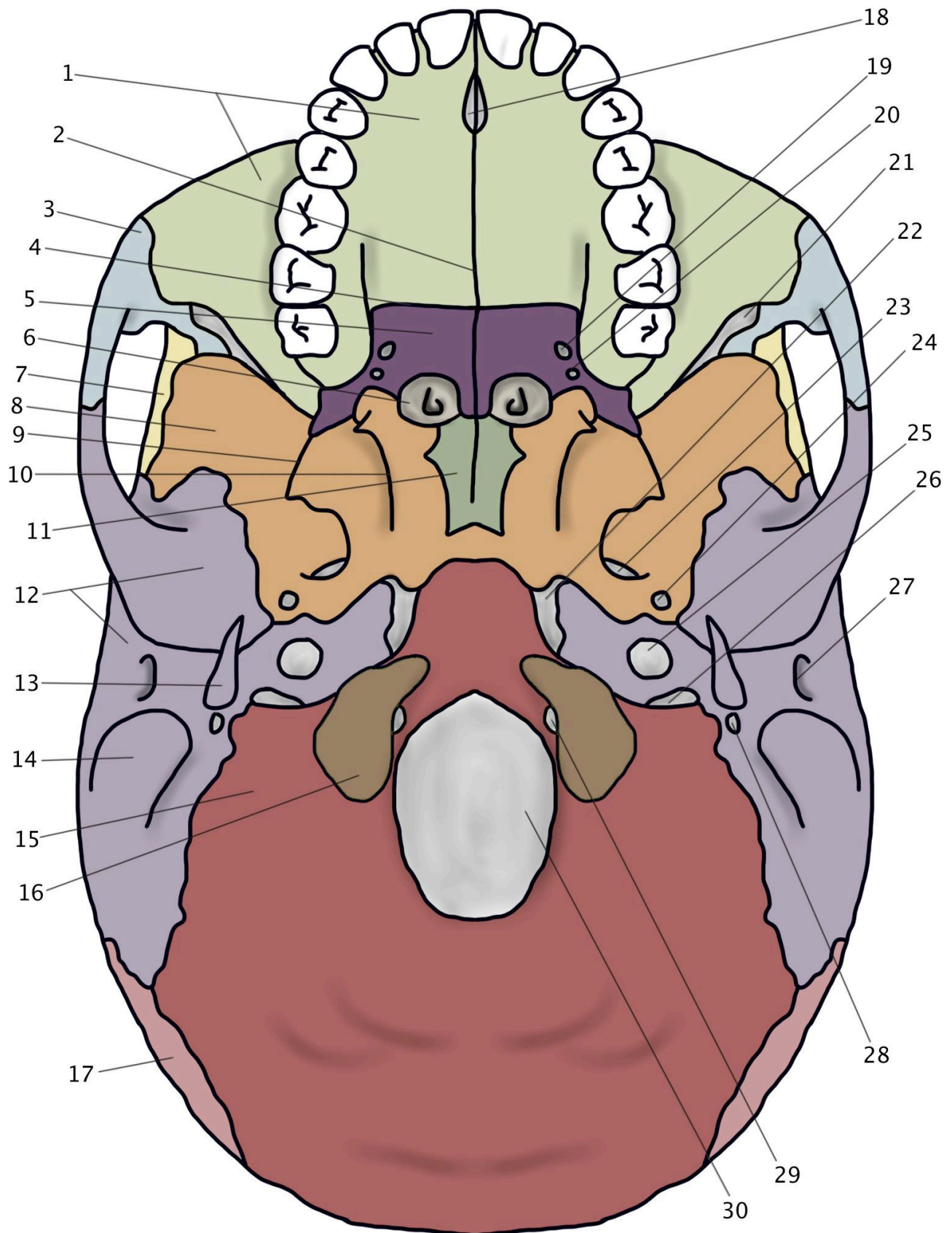


Figure 6: Floor of Cranium

Each blank represents the vessel/nerve that passes through the foramen.

- | | |
|---|---|
| 1. Frontal Bone (Paired) | 16. Foramen Rotundum |
| 2. Frontal Sinuses | a. <u>Second Branch of Trigeminal Nerve</u> |
| 3. Crista Galli of the Ethmoid Bone | 17. Foramen Ovale |
| 4. Sphenoid Bone (Single) | a. <u>Third Branch of Trigeminal Nerve</u> |
| 5. Lesser wing of Sphenoid Bone | 18. Foramen Spinosum |
| 6. Greater wing of Sphenoid Bone | a. <u>Middle Meningeal Artery</u> |
| 7. Anterior Clinoid Process | 19. Foramen Lacerum |
| 8. Sella Turcica | a. <u>Cartilage</u> |
| a. <u>Pituitary Gland</u> | 20. Internal Acoustic Meatus |
| 9. Posterior Clinoid Process | Cranial Nerves: a. <u>VII</u> b. <u>VII</u> |
| 10. Temporal Bone (Paired) | 21. Jugular Foramen |
| 11. Parietal Bone (Paired) | a. <u>Internal Jugular Vein</u> |
| 12. Occipital Bone (Single) | b. <u>Cranial Nerve IX</u> |
| 13. Cribriform Plate | c. <u>Cranial Nerve X</u> |
| a. <u>Cranial Nerve I</u> | d. <u>Cranial Nerve XI (Cranial Root)</u> |
| 14. Optic Canal | 22. Hypoglossal Canal |
| a. <u>Cranial Nerve I</u> | a. <u>Cranial Nerve XII</u> |
| b. <u>Ophthalmic Artery</u> | 23. Foramen Magnum |
| 15. Superior Orbital Fissure | a. <u>Spinal Cord</u> |
| a. <u>Ophthalmic Nerve</u> | b. <u>Cranial Nerve XI (Spinal Root)</u> |
| Cranial Nerves: b. <u>III</u> c. <u>IV</u> d. <u>V₁</u> e. <u>VI</u> | |

Figure 6: Floor of Cranium

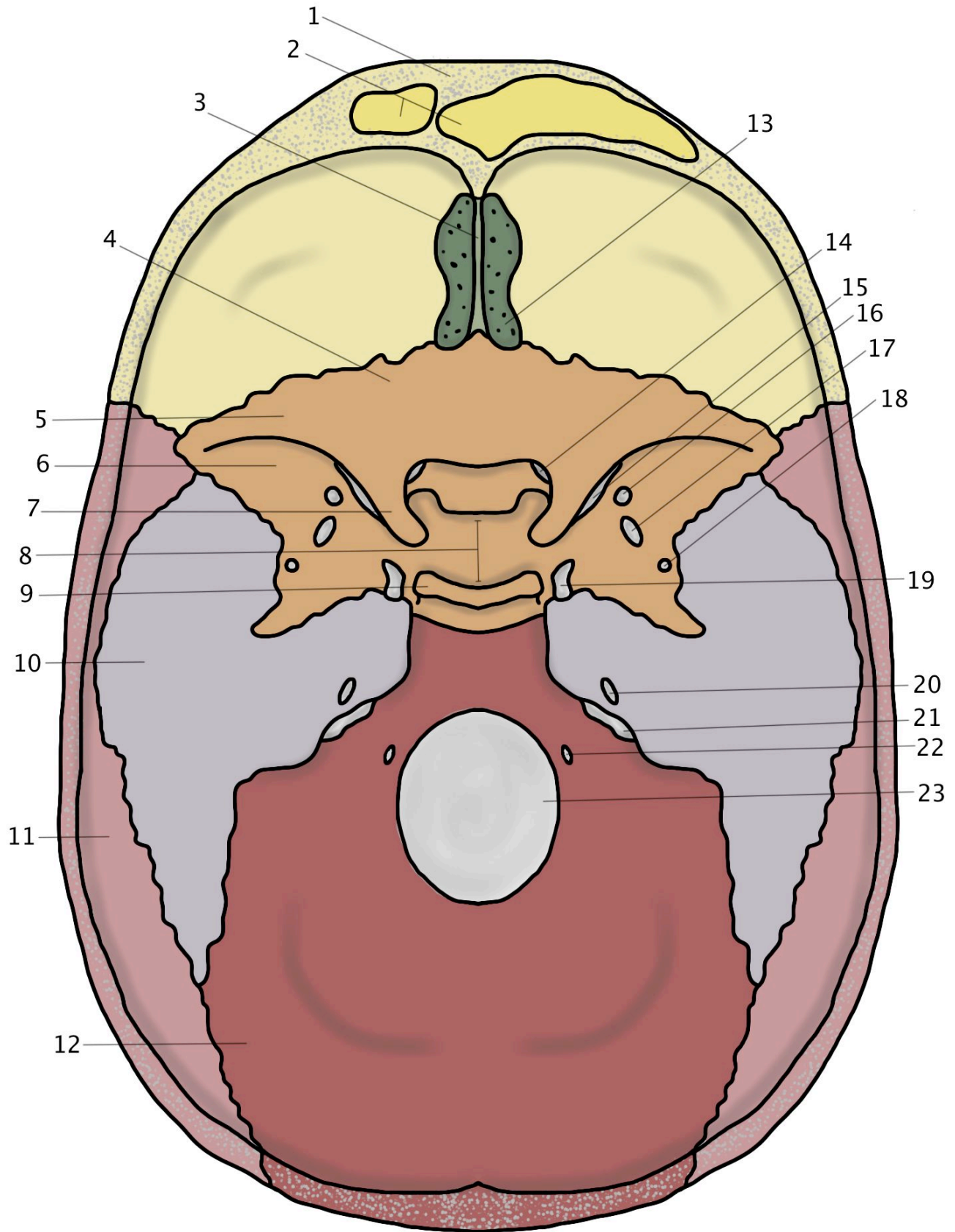


Figure 7: Muscles of Facial Expression

Each blank represents the action of the muscle.

- | | |
|---|--|
| 1. Corrugator Supercilii Muscle | 11. Depressor Anguli Oris Muscle |
| a. <u>Furrows Brow</u> | a. <u>Depresses Angle of Mouth</u> |
| 2. Orbicularis Oculi Muscle | 12. Depressor Labii Inferioris Muscle |
| a. <u>Closing Eyelid</u> | a. <u>Depresses Lower Lip</u> |
| 3. Nasalis Muscle | 13. Mentalis Muscle |
| a. <u>Flares Nostril</u> | a. <u>Protrudes Lower Lip</u> |
| 4. Levator Labii Superioris Alaeque Nasi Muscle | 14. Platysma Muscle |
| a. <u>Elevates Upper Lip</u> | a. <u>Tenses Skin of the Neck</u> |
| b. <u>Flares Nostril</u> | 15. Frontal Belly of Epicranial Muscle |
| 5. Levator Labii Superioris Muscle | a. <u>Elevates Eyebrows</u> |
| a. <u>Elevates Upper Lip</u> | b. <u>Wrinkles Forehead</u> |
| 6. Zygomaticus Minor Muscle | 16. Epicranial Aponeurosis |
| a. <u>Elevates Upper Lip</u> | 17. Anterior Auricular Muscle |
| 7. Levator Anguli Oris Muscle | a. <u>Wiggles Ears</u> |
| a. <u>Elevates Angle of Mouth</u> | 18. Superior Auricular Muscle |
| 8. Zygomaticus Major Muscle | a. <u>Wiggles Ears</u> |
| a. <u>Elevates Upper Lip</u> | 19. Posterior Auricular Muscle |
| 9. Risorius Muscle | a. <u>Wiggles Ears</u> |
| a. <u>Stretches Lips</u> | 20. Occipital Belly of Epicranial Muscle |
| 10. Orbicularis Oris Muscle | a. <u>Pulls Scalp Backwards</u> |
| a. <u>Closes, Purses & Puckers Lips</u> | 21. Sternocleidomastoid Muscle |
| b. <u>Rolls Lips Over Teeth</u> | 22. Trapezius Muscle |

Figure 7: Muscles of Facial Expression

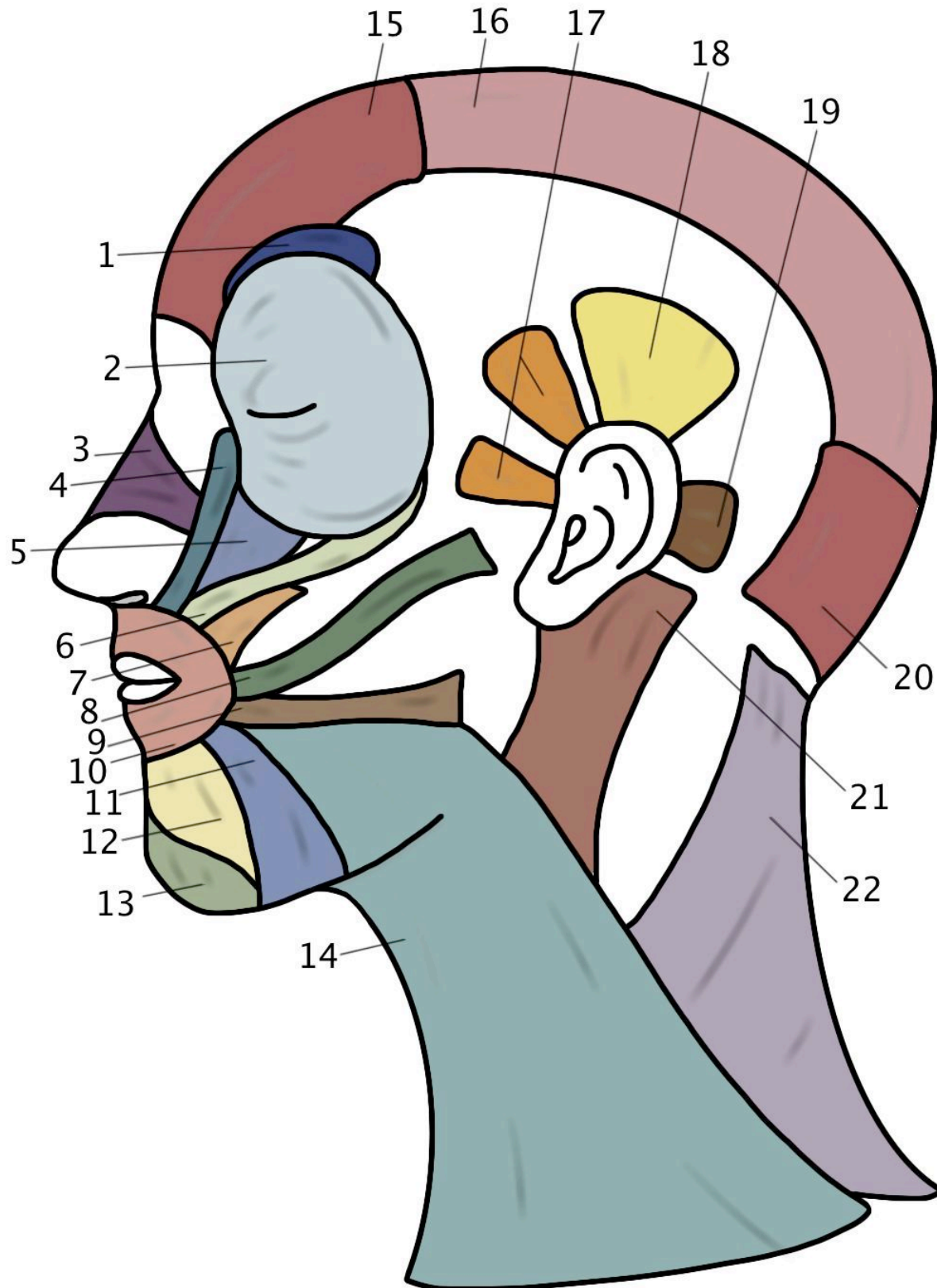


Figure 8: Facial Expression Identification

1. List at least three of the muscles being used to make this expression:

- Zygomaticus Major Muscle
- Zygomaticus Minor Muscle
- Levator Anguli Oris Muscle
- Levator Labii Superioris Muscle
- Levator Labii Superioris Alaeque Nasi Muscle
- Risorius Muscle

2. List at least three of the muscles being used to make this expression:

- Corrugator Supercilii Muscle
- Mentalis Muscle
- Depressor Anguli Oris Muscle
- Depressor Labii Inferioris Muscle

3. List at least three of the muscles being used to make this expression:

- Frontal Belly of Epicranial Muscle
- Occipital Bell of Epicranial Muscle
- Levator Labii Superioris Alaeque Nasi Muscle
- Platysma Muscle

4. List at least three of the muscles being used to make this expression:

- Levator Labii Superioris Muscle
- Levator Anguli Oris Muscle
- Frontal Belly of Epicranial Muscle
- Occipital Belly of Epicranial Muscle

Figure 8: Facial Expression Identification

Expression #1



Expression #2



Expression #3



Expression #4

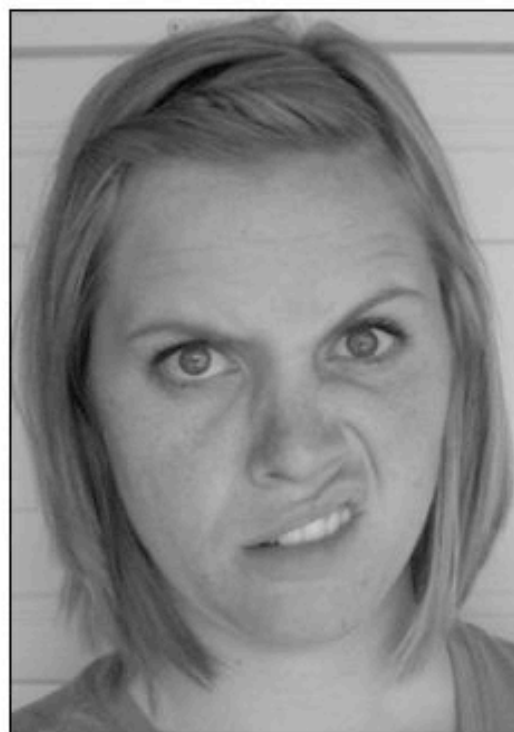


Figure 9: Muscles of Mastication

Each blank represents the action of the muscle.

- | | |
|--|--|
| 1. Mandible (cut) | 5. Superior Head of Lateral Pterygoid Muscle |
| 2. Masseter Muscle (cut) | a. <u>Depresses Mandible (Opens Jaw)</u> |
| a. <u>Elevates Mandible (Closes Jaw)</u> | b. <u>Deviates Mandible</u> |
| 3. Medial Pterygoid Muscle | c. <u>Protrudes Mandible</u> |
| a. <u>Elevates Mandible (Closes Jaw)</u> | 6. Styloid Process |
| 4. Inferior Head of Lateral Pterygoid Muscle | 7. Zygomatic Bone (cut) |
| a. <u>Depresses Mandible (Opens Jaw)</u> | 8. External Acoustic Meatus |
| b. <u>Deviates Mandible</u> | 9. Mastoid Process |
| c. <u>Protrudes Mandible</u> | 10. Temporalis Muscle (cut) |
| | a. <u>Elevates Mandible (Closes Jaw)</u> |

All Muscles of Mastication are innervated by the 3rd Branch of the Trigeminal Nerve.

Figure 9: Muscles of Mastication

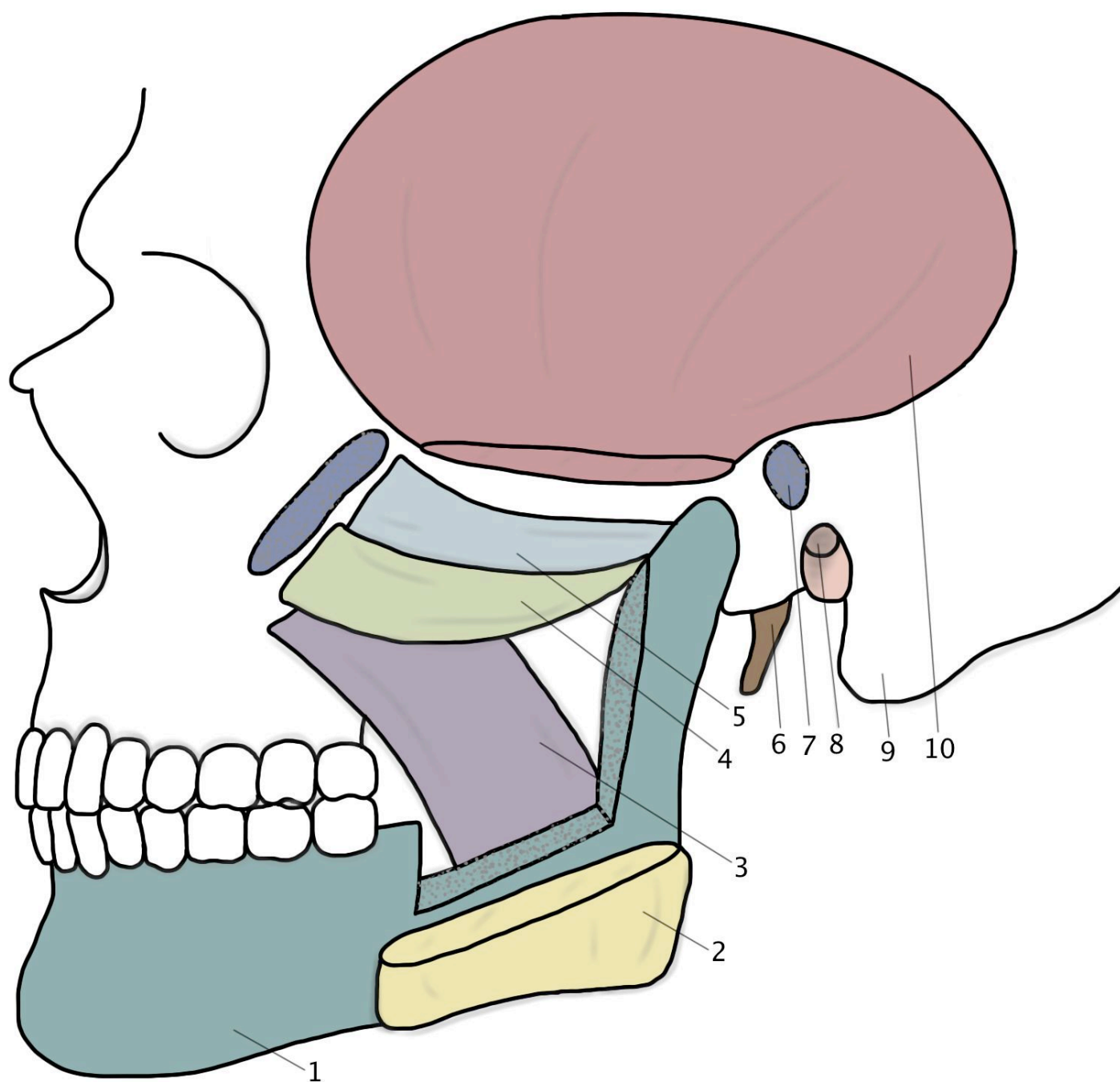


Figure 10: Anterior Neck Muscles

Each blank represents the action of the muscle.

- | | |
|---------------------------------------|---|
| 1. Mylohyoid Muscle | 9. Trapezius Muscle |
| a. <u>Forms Floor of Mouth</u> | 10. Inferior Belly of Omohyoid Muscle |
| b. <u>Elevates Tongue</u> | a. <u>Depresses Hyoid</u> |
| 2. Stylohyoid Muscle | 11. Sternocleidomastoid Muscle |
| a. <u>Elevates Hyoid</u> | 12. Sternum |
| 3. Hyoid Bone | 13. Anterior Belly of Digastric Muscle |
| 4. Sternohyoid Muscle | a. <u>Elevates Hyoid</u> |
| a. <u>Depresses Hyoid</u> | 14. Posterior Belly of Digastric Muscle |
| 5. Superior Belly of Omohyoid Muscle | a. <u>Elevates Hyoid</u> |
| a. <u>Depresses Hyoid</u> | 15. Thyrohyoid Membrane |
| 6. Thyrohyoid Muscle | 16. Thyroid Cartilage |
| a. <u>Depresses Hyoid</u> | 17. Cricothyroid Membrane |
| b. <u>Elevates Thyroid Cartilage</u> | 18. Cricothyroid Muscle |
| 7. Sternothyroid Muscle | a. <u>Tenses Vocal Folds</u> |
| a. <u>Depresses Thyroid Cartilage</u> | 19. Cricoid Cartilage |
| 8. Clavicle | 20. Thyroid Gland |
| | 21. Trachea |

13

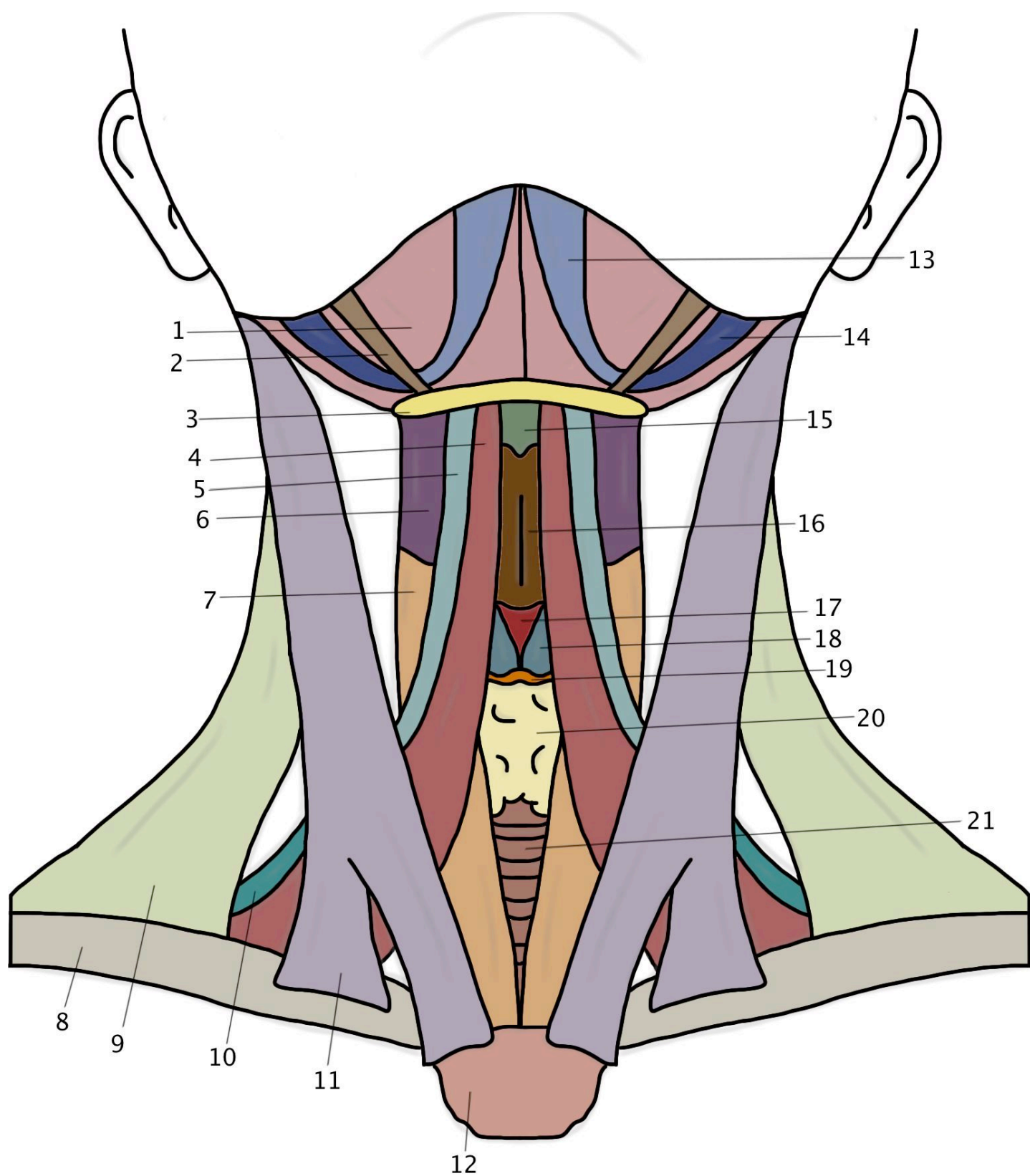


Figure 11: Lateral Neck Muscles

Each blank represents the action of the muscle.

- | | |
|--|---------------------------------------|
| 1. Stylohyoid Muscle | 7. Anterior Belly of Digastric Muscle |
| a. <u>Elevates Hyoid</u> | a. <u>Elevates Hyoid</u> |
| 2. Middle Pharyngeal Constrictor | 8. Hyoid Bone |
| a. <u>Elevates Pharynx</u> | 9. Sternohyoid Muscle |
| b. <u>Elevates Larynx</u> | a. <u>Depresses Hyoid</u> |
| c. <u>Assists in Swallowing</u> | 10. Superior Belly of Omohyoid Muscle |
| 3. Posterior Belly of Digastric Muscle | a. <u>Depresses Hyoid</u> |
| a. <u>Elevates Hyoid</u> | 11. Thyrohyoid Muscle |
| 4. Inferior Pharyngeal Constrictor | a. <u>Depresses Hyoid</u> |
| a. <u>Elevates Pharynx</u> | b. <u>Elevates Thyroid Cartilage</u> |
| b. <u>Elevates Larynx</u> | 12. Sternocleidomastoid Muscle |
| c. <u>Assists in Swallowing</u> | 13. Clavicle |
| 5. Hyoglossus Muscle | 14. Inferior Belly of Omohyoid Muscle |
| a. <u>Depresses the Tongue</u> | a. <u>Depresses Hyoid</u> |
| 6. Mylohyoid Muscle | 15. Trapezius Muscle |
| a. <u>Forms Floor of Mouth</u> | |
| b. <u>Elevates Tongue</u> | |

Figure 11: Lateral Neck Muscles

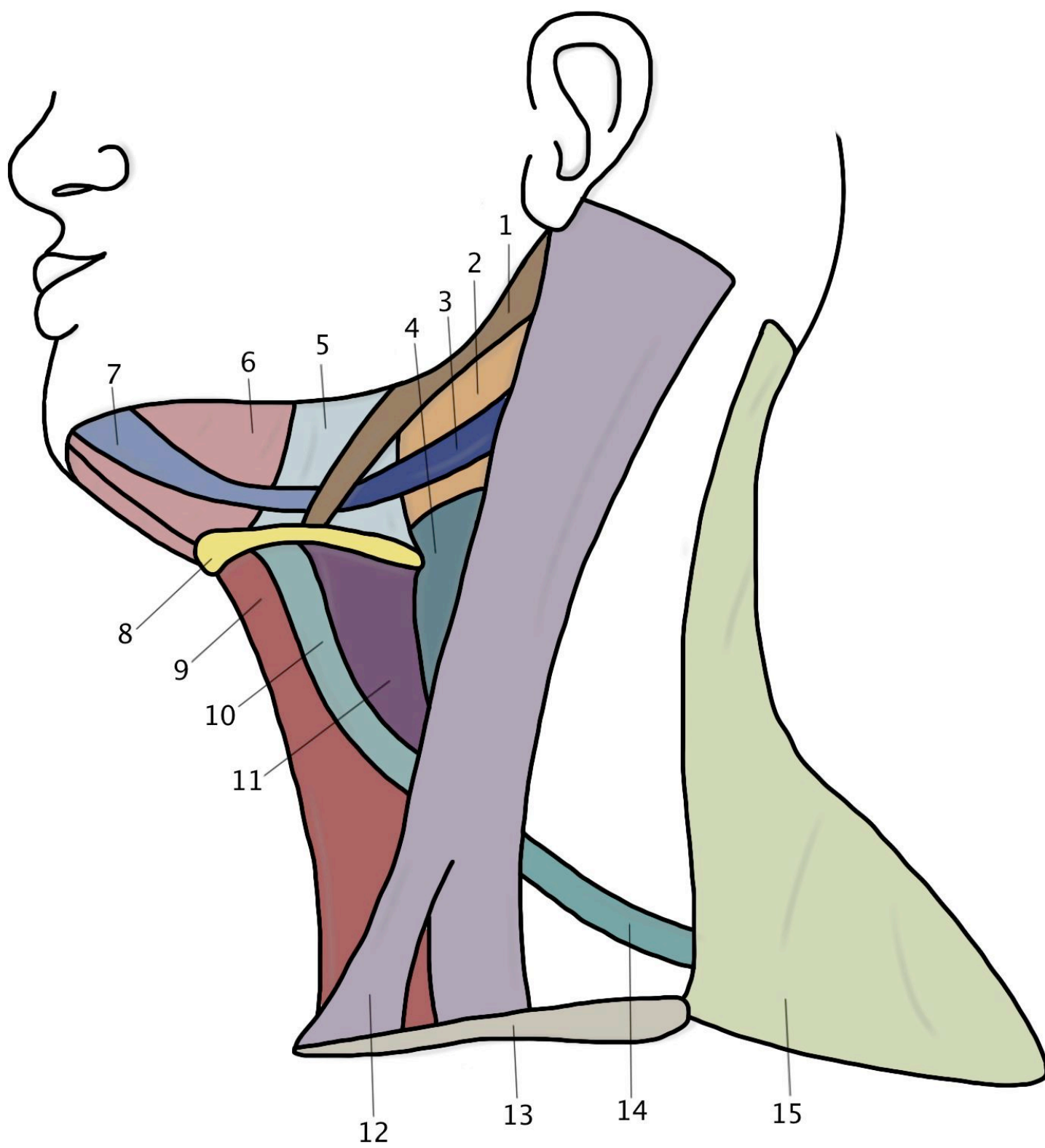


Figure 12: Pharyngeal Muscles

Each blank represents the action of the muscle.

- | | |
|---|---|
| 1. Mastoid Process | 8. Buccinator Muscle |
| 2. Styloid Process | a. <u>Keeps Food on Occlusal Table</u> |
| 3. Stylopharyngeus Muscle | 9. Orbicularis Oris Muscle |
| a. <u>Elevates & Widens Pharynx</u> | a. <u>Closes, Purses & Puckers Lips</u> |
| 4. Superior Pharyngeal Constrictor Muscle | b. <u>Rolls Lips Over Teeth</u> |
| a. <u>Elevates Pharynx</u> | 10. Mandible (cut) |
| b. <u>Elevates Larynx</u> | 11. Mylohyoid Muscle |
| c. <u>Assists in Swallowing</u> | a. <u>Forms Floor of Mouth</u> |
| 5. Pterygomandibular Raphe | b. <u>Elevates Tongue</u> |
| 6. Middle Pharyngeal Constrictor Muscle | 12. Hyoid Bone |
| a. <u>Elevates Pharynx</u> | 13. Thyrohyoid Membrane |
| b. <u>Elevates Larynx</u> | 14. Thyroid Cartilage |
| c. <u>Assists in Swallowing</u> | 15. Cricothyroid Membrane |
| 7. Inferior Pharyngeal Constrictor Muscle | 16. Cricoid Cartilage |
| a. <u>Elevates Pharynx</u> | |
| b. <u>Elevates Larynx</u> | |
| c. <u>Assists in Swallowing</u> | |

Figure 12: Pharyngeal Muscles

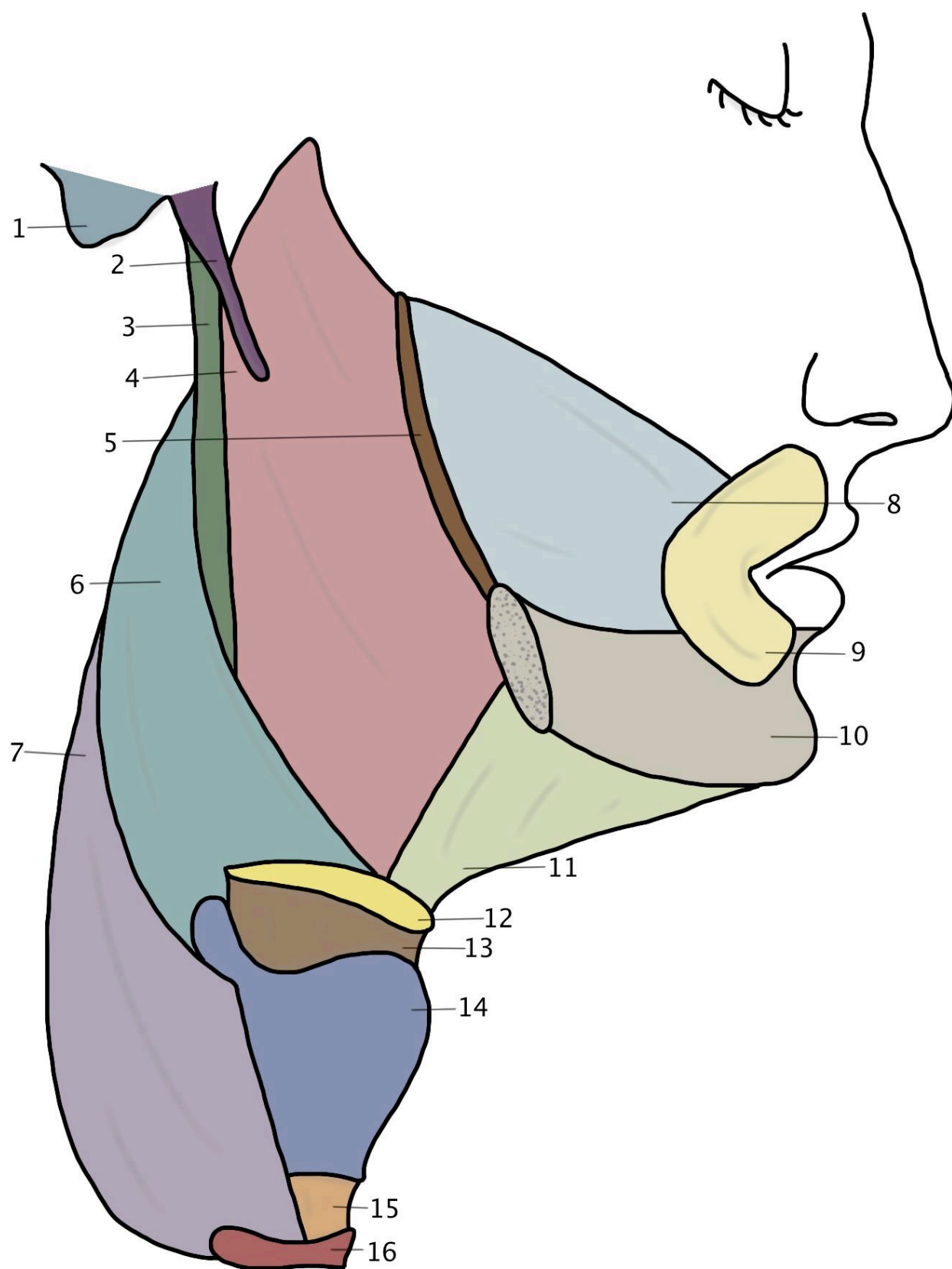


Figure 13: Arteries of the Head

- | | |
|------------------------------------|--------------------------------------|
| 1. Common Carotid Artery | 9. Posterior Auricular Artery |
| 2. Internal Carotid Artery (cut) | 10. Superficial Temporal |
| 3. External Carotid Artery | 11. Ophthalmic Artery |
| 4. Superior Thyroidal Artery (cut) | 12. Angular Artery* |
| 5. Lingual Artery (cut) | 13. Superior Labial Artery* |
| 6. Facial Artery | 14. Inferior Labial Artery* |
| 7. Maxillary Artery (cut) | 15. Submental Artery* |
| 8. Occipital Artery | 16. Ascending Palatine Artery* (cut) |

*Mnemonic for the Branches of the Facial Artery:
ASISA

Figure 13: Arteries of the Head

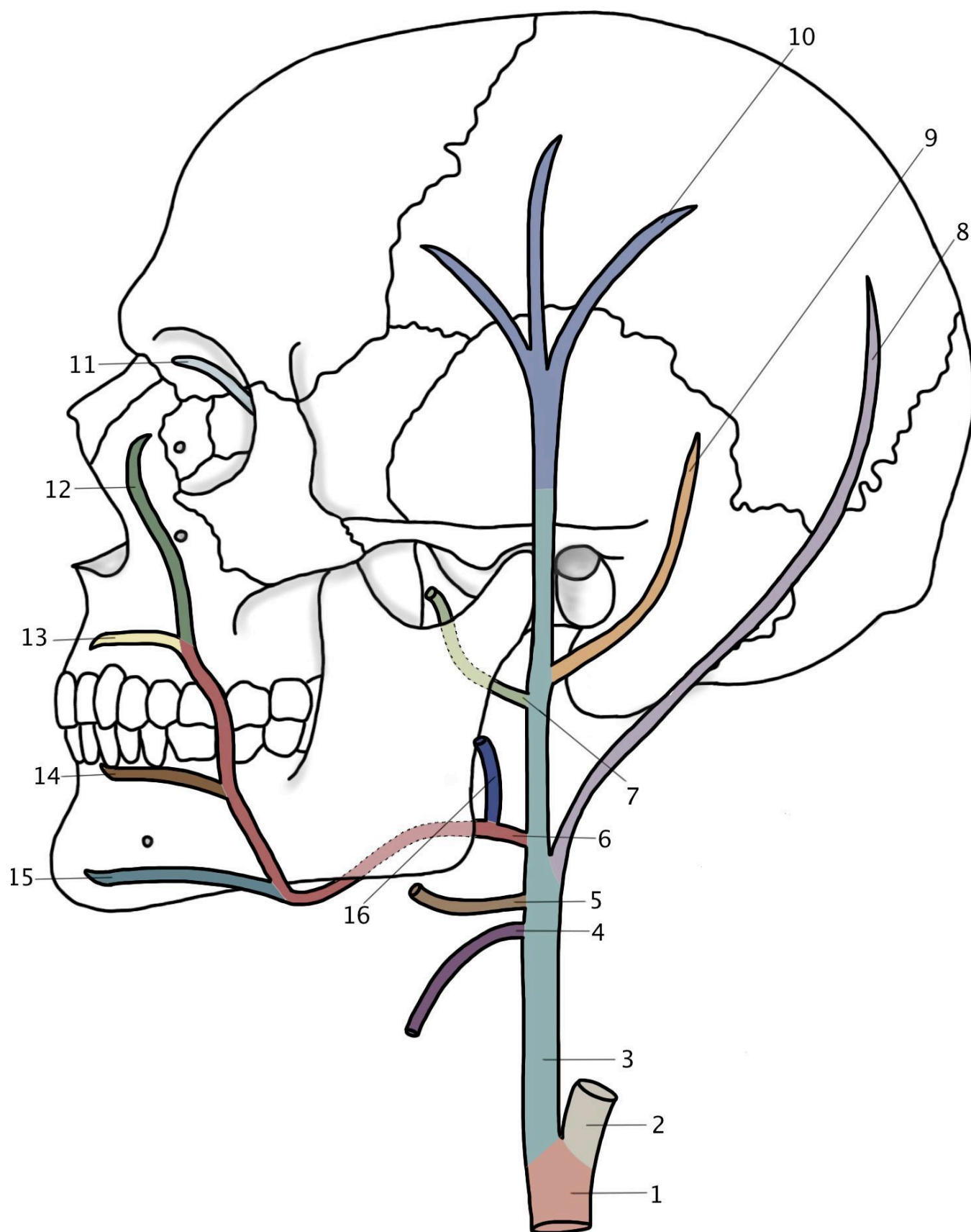


Figure 14: Branches of the Maxillary Artery

- | | |
|----------------------------------|--|
| 1. External Carotid Artery | 11. Buccal Artery |
| 2. Maxillary Artery | 12. Deep Temporal Artery |
| 3. Middle Meningeal Artery (cut) | 13. Posterior Superior Alveolar Artery |
| 4. Inferior Alveolar Artery | 14. Descending Palatine Artery (cut)* |
| 5. Mandibular Foramen | 15. Sphenopalatine Artery (cut) |
| 6. Mylohyoid Artery | 16. Infraorbital Artery |
| 7. Mental Foramen | 17. Infraorbital Foramen |
| 8. Mental Artery | 18. Anterior Superior Alveolar Artery |
| 9. Masseteric Artery | 19. Middle Superior Alveolar Artery |
| 10. Pterygoid Artery | |

*The Greater & Lesser Palatine Arteries are branches of Descending Palatine Artery

Figure 14: Branches of the Maxillary Artery

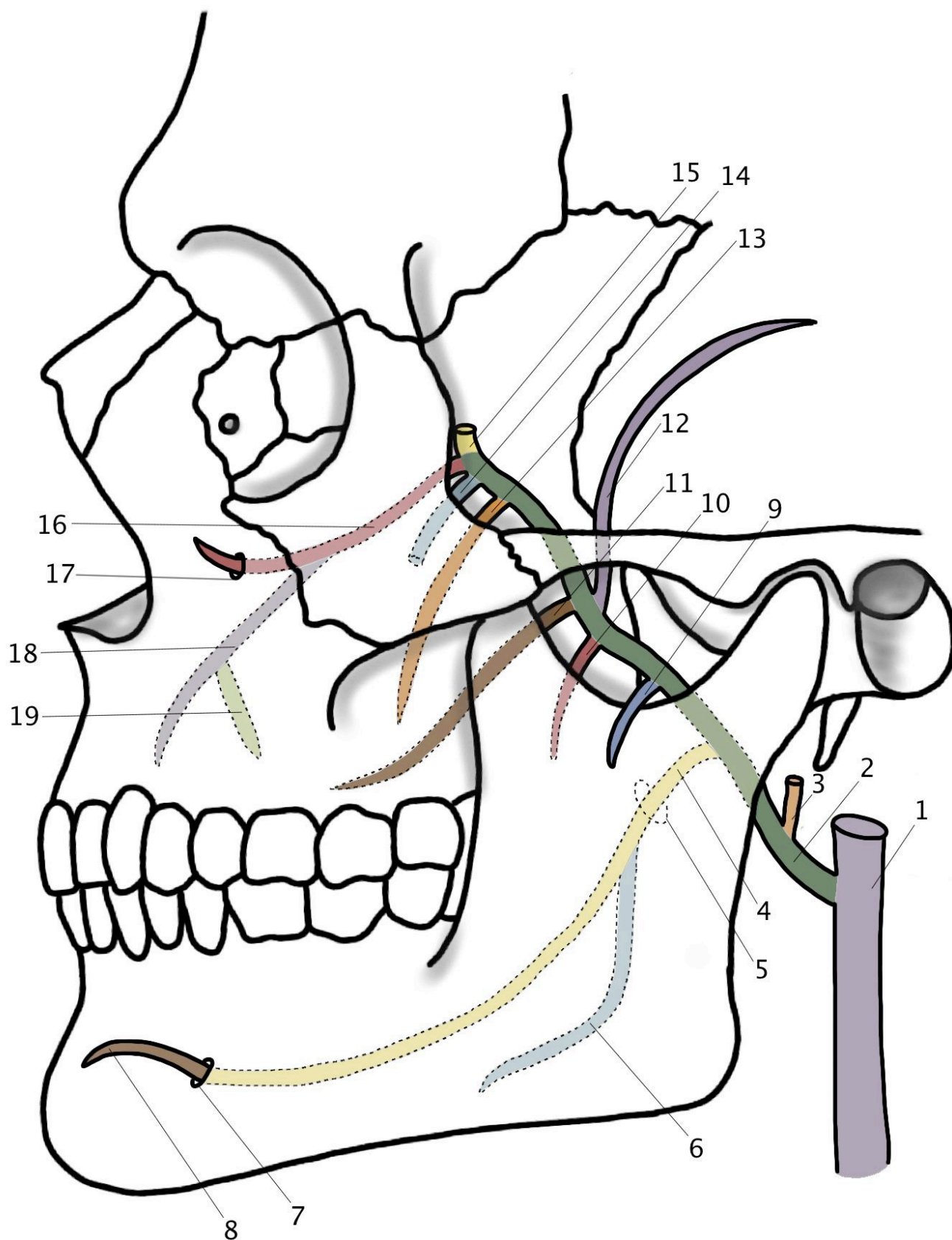


Figure 15: Venous Drainage of the Head

- | | |
|-------------------------------------|--|
| 1. Superior Vena Cava | 14. Superior Ophthalmic Vein |
| 2. Right Brachiocephalic Vein (cut) | 15. Supraorbital Vein |
| 3. Left Brachiocephalic Vein | 16. Cavernous Venous Sinus |
| 4. Internal Jugular Vein | 17. Deep Temporal Vein |
| 5. Facial Vein | 18. Superficial Temporal Vein |
| 6. Mandibular Foramen | 19. Maxillary Vein |
| 7. Inferior Alveolar Vein | 20. Retromandibular Vein |
| 8. Mental Foramen | 21. Posterior Division of Retromandibular Vein |
| 9. Mental Vein | 22. Anterior Division of Retromandibular Vein |
| 10. Deep Facial Vein | 23. Posterior Auricular Vein |
| 11. Pterygoid Plexus | 24. Occipital Vein |
| 12. Inferior Ophthalmic Vein | 25. External Jugular Vein |
| 13. Angular Vein | 26. Left Subclavian Vein |

Figure 15: Venous Drainage of the Head

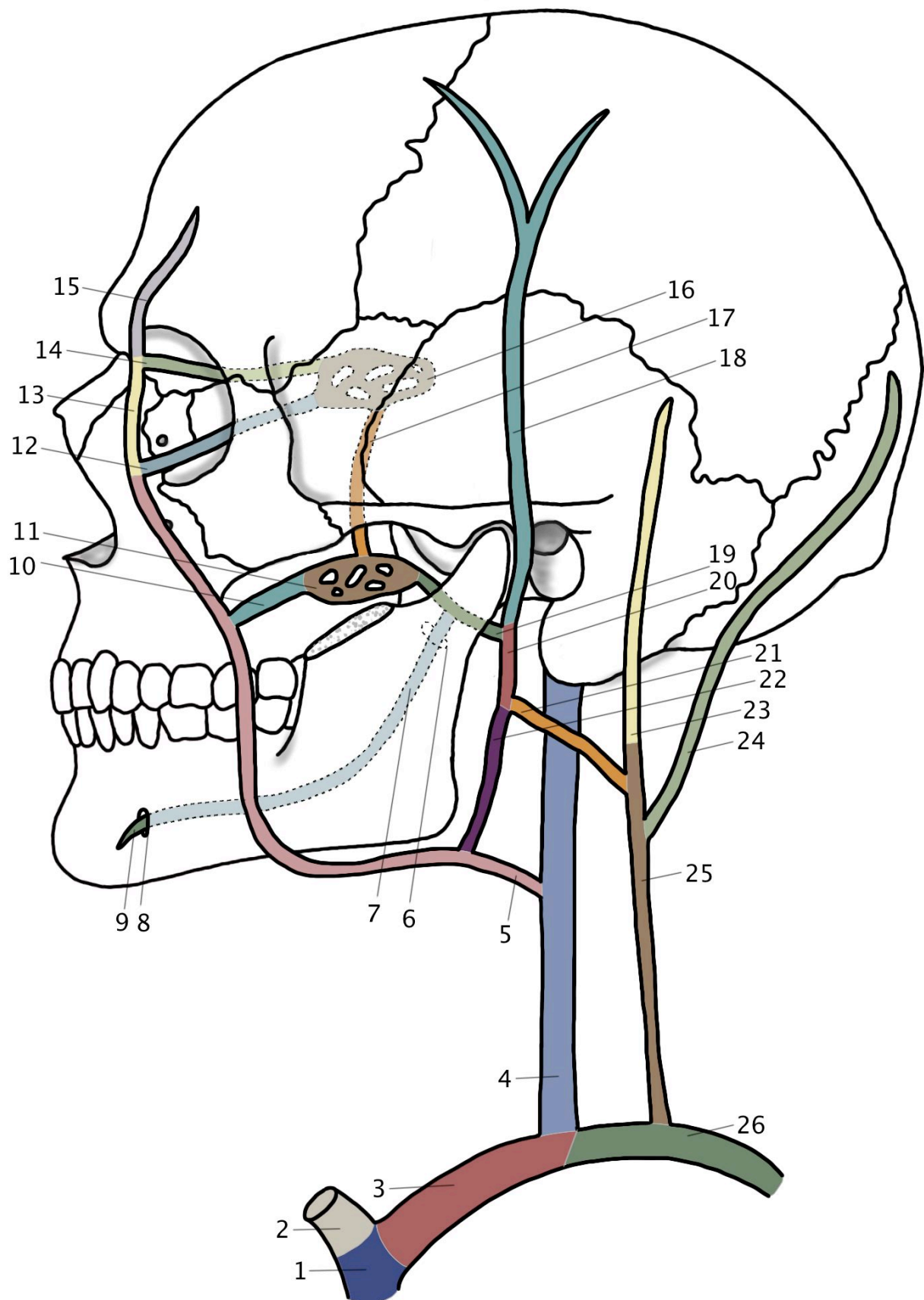


Figure 16: Cranial Nerves

Each blank represents: a. Foramen Where It Exits Skull b. Structure Innervated c. Sensory/Motor/Both

1. Olfactory

- a. Cribriform Plate
- b. Sense of Smell
- c. Sensory

2. Optic

- a. Optic Canal
- b. Vision
- c. Sensory

3. Oculomotor

- a. Superior Orbital Fissure
- b. Eye Movement
- c. Motor

4. Trochlear

- a. Superior Orbital Fissure
- b. Eye Movement
- c. Motor

5. Trigeminal

- a. Superior Orbital Fissure, Foramen Rotundum & Foramen Ovale
- b. See Figures 17, 18 & 19
- c. Both Motor & Sensory

6. Abducens

- a. Superior Orbital Fissure
- b. Eye Movement
- c. Motor

7. Facial

- a. Internal Auditory Meatus
- b. Facial Expression, Lacrimal Gland & Taste
- c. Both Motor & Sensory

8. Vestibulocochlear

- a. Internal Auditory Meatus
- b. Hearing and Balance
- c. Sensory

9. Glossopharyngeal

- a. Jugular Foramen
- b. Neck Muscles, Parotid Gland & Taste
- c. Both Motor & Sensory

10. Vagus

- a. Jugular Foramen
- b. Soft Palate, Pharynx, Larynx, Skin of Ear & Taste
- c. Both Motor & Sensory

11. Accessory

- a. Jugular Foramen (Cranial Root) Foramen Magnum (Spinal Root)
- b. Trapezius & Sternocleidomastoid
- c. Motor

12. Hypoglossal

- a. Hypoglossal Canal
- b. Tongue Movement
- c. Motor

Mnemonic for Cranial Nerves:

Oh, Oh, Oh, To Touch And Feel Very Good Vegetables, Ah Heaven!

Mnemonic for the Afferent/Efferent Action of Each Nerve:

S: Sensory M: Motor B: Both

Some Say Money Matters, But My Brother Says, "Big Brains Matter More"

Figure 16: Cranial Nerves

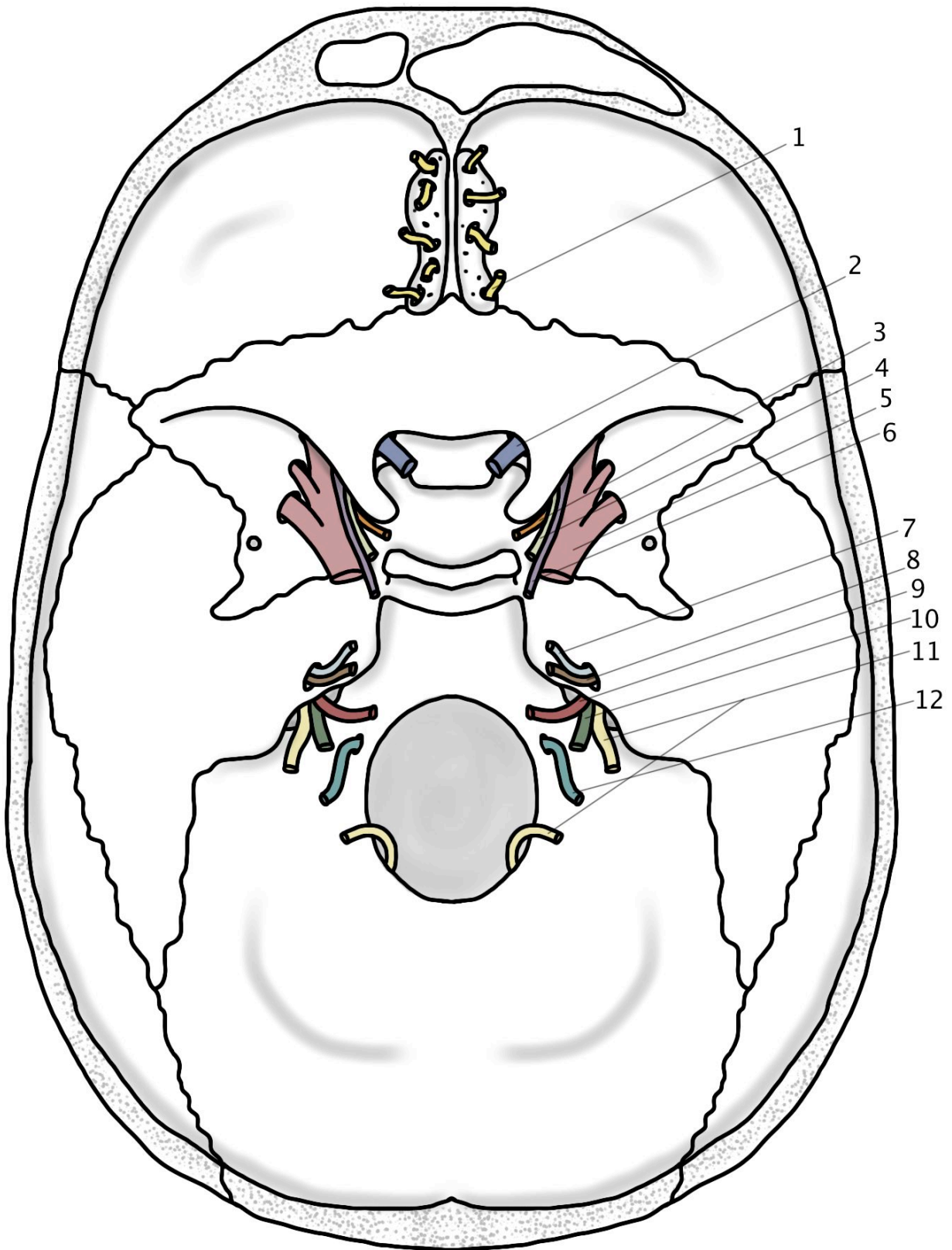


Figure 17: Ophthalmic Branch of Trigeminal Nerve

Each blank represents the structure the nerve innervates.

Lateral wall of orbit has been dissected.

- | | |
|--|------------------------------|
| 1. Trigeminal Ganglion | 11. Nasociliary Nerve |
| 2. Mandibular Branch of Trigeminal Nerve | 12. Ciliary Nerve |
| 3. Maxillary Branch of Trigeminal Nerve | a. <u>Eyeball</u> |
| 4. Ophthalmic Branch of Trigeminal Nerve | 13. Infratrochlear Nerve |
| 5. Superior Orbital Fissure | a. <u>Medial Eyelid</u> |
| 6. Frontal Nerve | 14. Anterior Ethmoidal Nerve |
| 7. Supraorbital Nerve | a. <u>Nasal Cavity</u> |
| a. <u>Forehead</u> | b. <u>Paranasal Sinuses</u> |
| 8. Supraorbital Notch/Foramen | 15. Zygomatic Bone (cut) |
| 9. Supratrochlear Nerve | 16. Lacrimal Gland |
| a. <u>Bridge of Nose</u> | 17. Internal Nasal Nerve |
| b. <u>Medial Upper Eyelid</u> | a. <u>Nasal Cavity</u> |
| c. <u>Medial Forehead</u> | b. <u>Nasal Septum</u> |
| 10. Lacrimal Nerve | 18. External Nasal Nerve |
| a. <u>Lateral Upper Eyelid</u> | a. <u>Skin of Nose</u> |
| b. <u>Lacrimal Gland</u> | |
| c. <u>Conjunctiva</u> | |

Figure 17: Ophthalmic Branch of Trigeminal Nerve

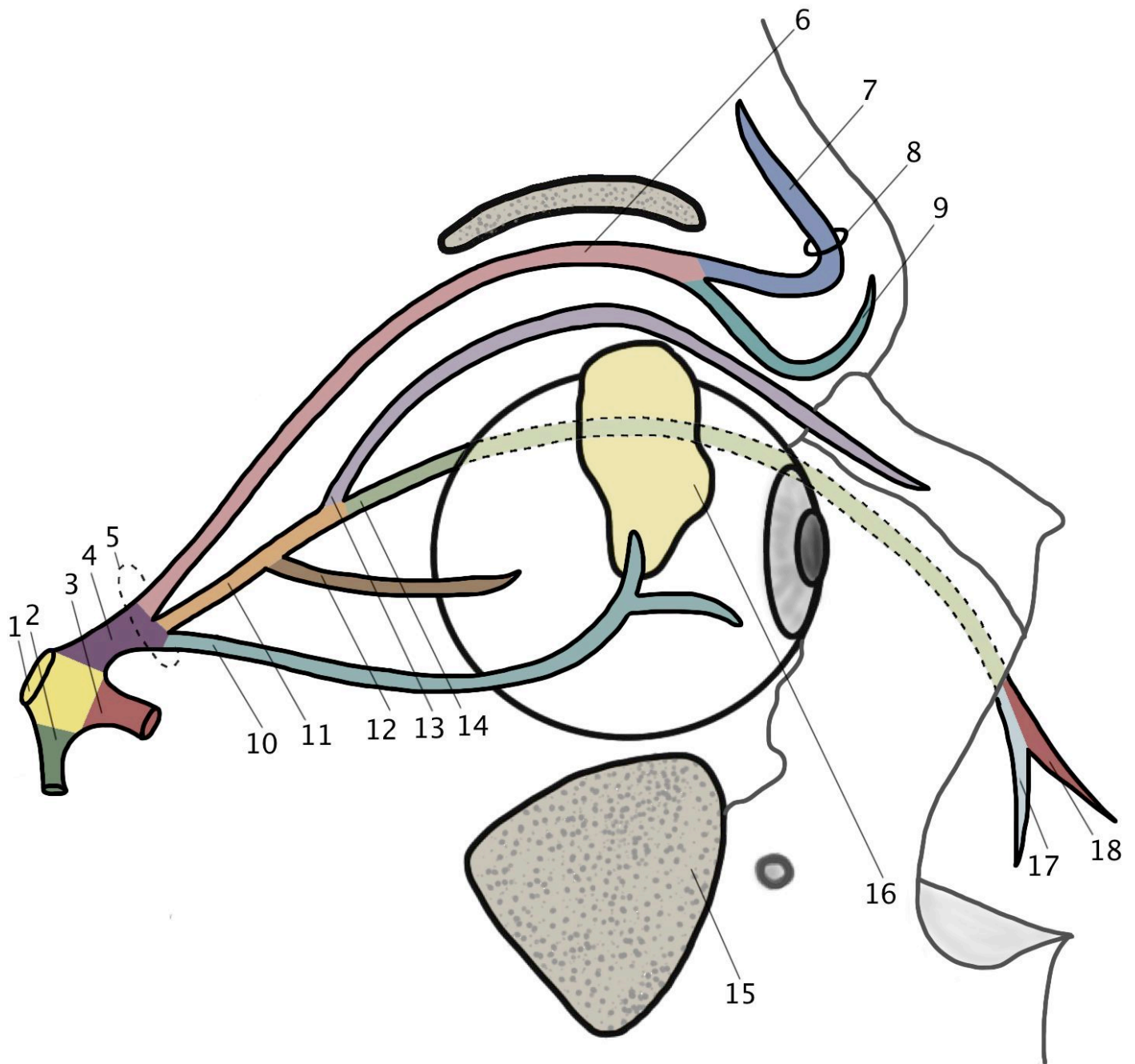


Figure 18: Maxillary Branch of Trigeminal Nerve

Each blank represents the structure the nerve innervates.

1. Trigeminal Ganglion
2. Mandibular Branch of Trigeminal Nerve
3. Ophthalmic Branch of Trigeminal Nerve
4. Maxillary Branch of Trigeminal Nerve
5. Foramen Spinosum
6. Meningeal Nerve
 - a. Dura of the Brain
7. Foramen Rotundum
8. Zygomatic Nerve
9. Inferior Orbital Fissure
10. Zygomaticotemporal Nerve
 - a. Skin of the Temple
11. Zygomaticotemporal Foramen
12. Zygomaticofacial Nerve
 - a. Skin of the Cheek
13. Zygomaticofacial Foramen
14. Infraorbital Nerve
 - a. Upper Lip
 - b. Cheek
 - c. Lower Eyelid
 - d. Side of Nose
15. Infraorbital Foramen
16. Anterior Superior Alveolar Nerve
 - a. Maxillary Anterior Teeth
 - b. Nasal Cavity
17. Middle Superior Alveolar Nerve
 - a. Maxillary Premolar Teeth
 - b. Mesiobuccal Root of 1st Molar
18. Incisive Foramen
19. Ganglionic Nerve
20. Pterygopalatine Ganglion
21. Sphenopalatine Foramen
22. Nasopalatine Nerve
 - a. Anterior Hard Palate
 - b. Lingual Gingiva of Max. Anterior Teeth
23. Descending Palatine Nerve
24. Lesser Palatine Foramen
25. Lesser Palatine Nerve
 - a. Soft Palate
 - b. Palatine Tonsils
 - c. Uvula
26. Greater Palatine Foramen
27. Greater Palatine Nerve
 - a. Posterior Hard Palate
 - b. Lingual Gingiva of Max. Posterior Teeth
28. Posterior Superior Alveolar Nerve (PSA)
29. External Branches of PSA
 - a. Buccal Gingiva of Maxillary Molars
30. Posterior Superior Alveolar Foramen
31. Internal Branches of PSA
 - a. Maxillary Molars (except Mesiobuccal Root of 1st Molars)

Figure 18: Maxillary Branch of Trigeminal Nerve

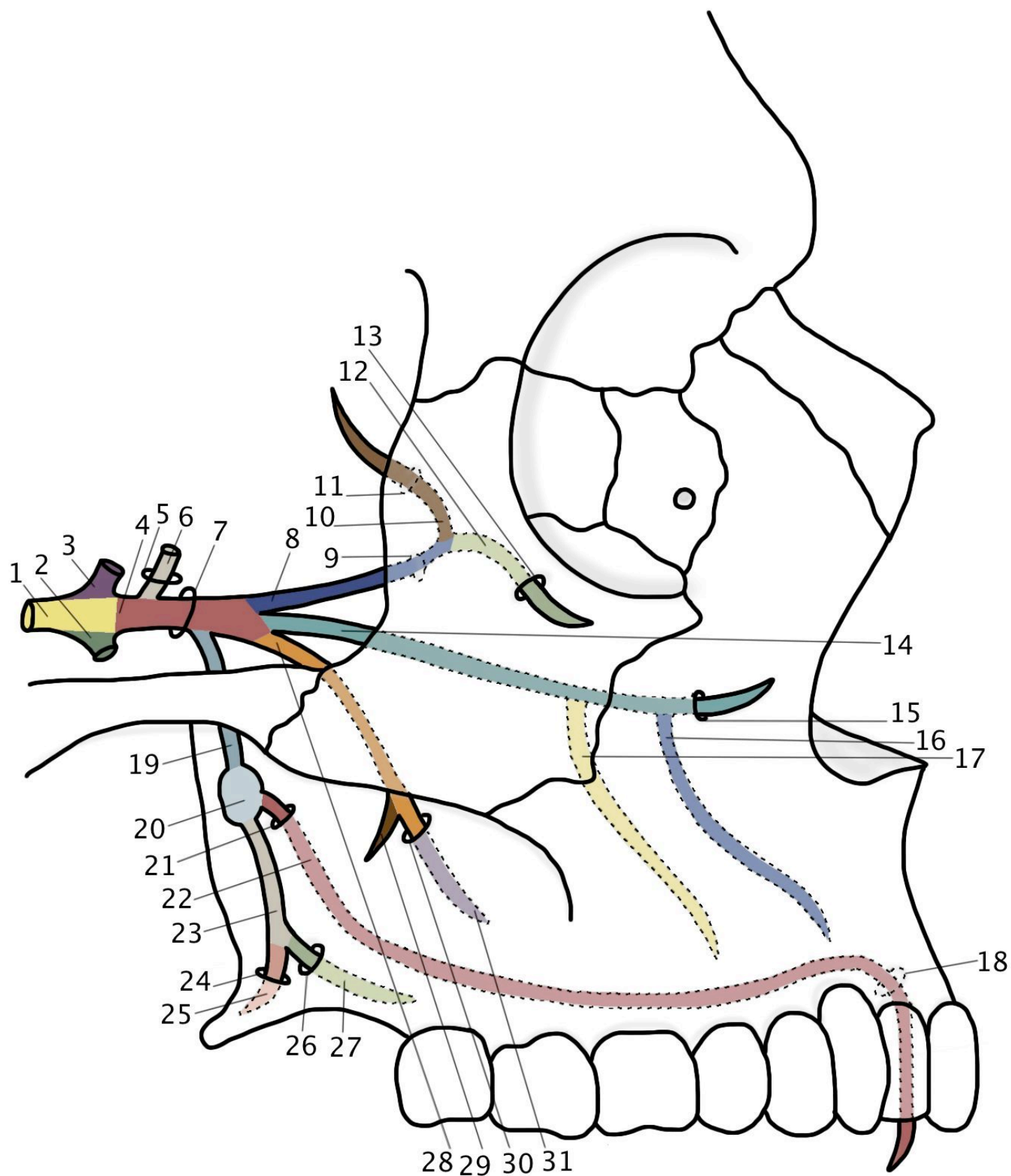


Figure 19: Mandibular Branch of Trigeminal Nerve

Each blank represents the structure the nerve innervates.

- | | |
|--|---|
| 1. Trigeminal Ganglion | 17. Posterior Division of Mandibular Branch |
| 2. Ophthalmic Branch of Trigeminal Nerve | 18. Auriculotemporal Nerve |
| 3. Maxillary Branch of Trigeminal Nerve | a. <u>Skin of the Ear</u> |
| 4. Foramen Ovale | b. <u>Skin of the Temple</u> |
| 5. Mandibular Branch of Trigeminal Nerve | 19. Inferior Alveolar Nerve |
| 6. Foramen Spinosum | a. <u>Mandibular Teeth</u> |
| 7. Meningeal Nerve | 20. Lingual Nerve |
| a. <u>Dura of the Brain</u> | a. <u>Body of the Tongue</u> |
| 8. Otic Ganglion | b. <u>Floor of the Mouth</u> |
| 9. Medial Pterygoid Nerve | c. <u>Lingual Gingival of Mand. Teeth</u> |
| a. <u>Medial Pterygoid Muscle (Mastication)</u> | 21. Chorda Tympani Nerve (From Cranial Nerve VII) |
| 10. Tensor Tympani Nerve | a. <u>Submandibular Salivary Gland</u> |
| a. <u>Tensor Tympani Muscle</u> | b. <u>Sublingual Salivary Gland</u> |
| 11. Tensor Veli Palatini Nerve | c. <u>Taste</u> |
| a. <u>Tensor Veli Palatini Muscle</u> | 22. Mylohyoid Nerve |
| 12. Anterior Division of the Mandibular Branch | a. <u>Mylohyoid Muscle</u> |
| 13. Deep Temporal Nerve | b. <u>Anterior Belly of Digastric Muscle</u> |
| a. <u>Deep Temporal Muscle (Mastication)</u> | 23. Mandibular Foramen |
| 14. Lateral Pterygoid Nerve | 24. Incisive Nerve |
| a. <u>Lateral Pterygoid Muscle (Mastication)</u> | a. <u>Mand. Anterior & Premolar Teeth</u> |
| 15. Masseteric Nerve | 25. Mental Foramen |
| a. <u>Masseter Muscle (Mastication)</u> | 26. Mental Nerve |
| 16. Long Buccal Nerve | a. <u>Labial Gingiva of Incisors</u> |
| a. <u>Buccal Mucosa</u> | b. <u>Skin of the Chin</u> |
| b. <u>Buccal Gingiva of Mand. Molars</u> | c. <u>Skin of the Lower Lip</u> |

Figure 19: Mandibular Branch of Trigeminal Nerve

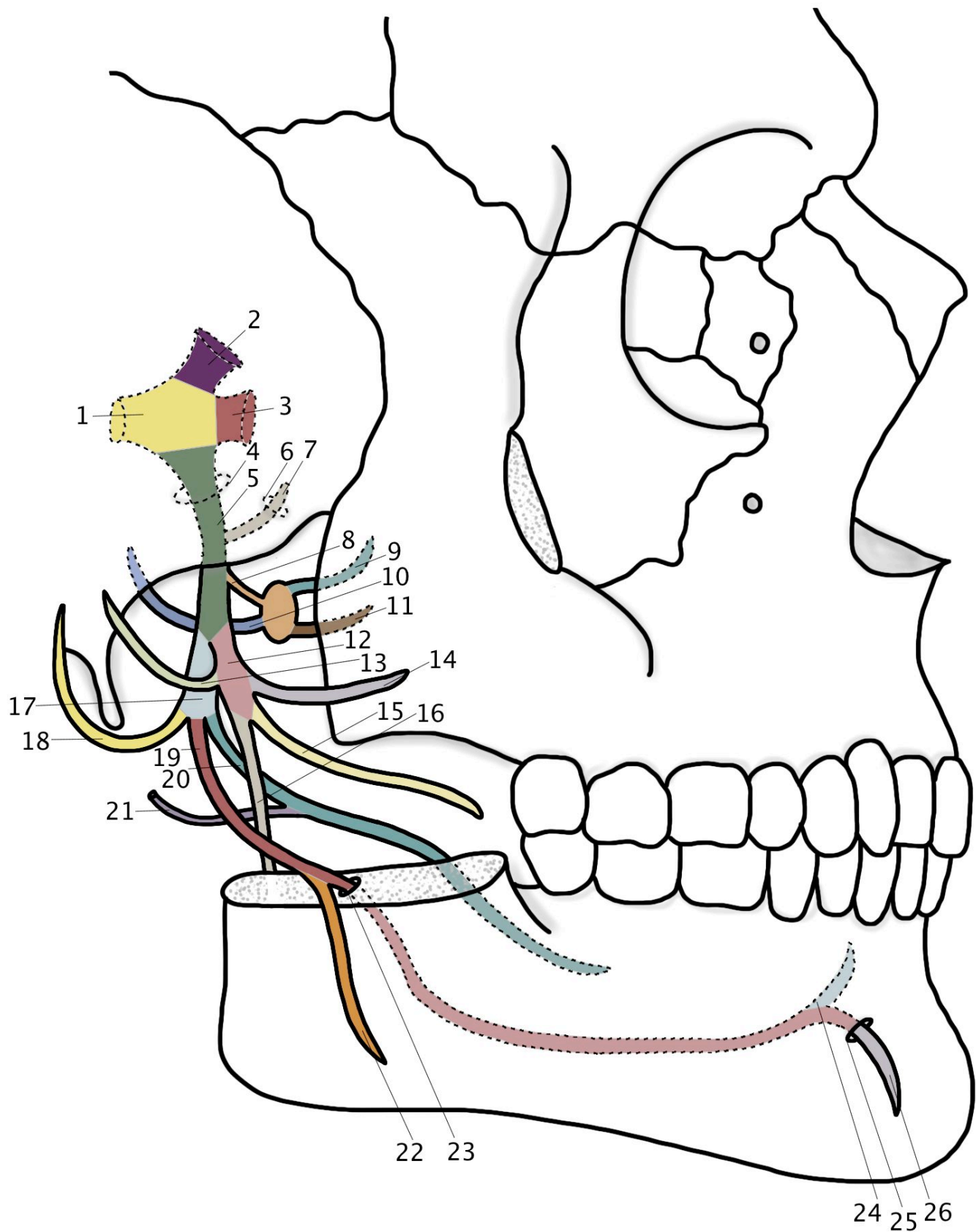


Figure 20: Lymph Drainage

Each blank represents the structures drained by the lymph nodes.

1. Superficial Parotid Nodes

- a. Scalp
- b. External Ear
- c. Lacrimal Gland

2. Anterior Auricular Nodes

- a. Scalp
- b. External Ear
- c. Lacrimal Gland

3. Retroauricular Nodes

- a. Scalp
- b. External Ear
- c. Lacrimal Gland

4. Occipital Nodes

- a. Scalp

5. Sternocleidomastoid

6. Deep Cervical Nodes

- a. Posterior Hard Palate
- b. Soft Palate
- c. Maxillary 3rd Molars
- d. Tonsils
- e. Base of Tongue
- f. Thyroid Gland

7. Submandibular Nodes

- a. Anterior Hard Palate
- b. Cheek
- c. Body of Tongue
- d. Upper Lip
- e. Mandibular Posterior Teeth
- f. Maxillary Teeth (Except 3rd Molars)
- g. Sublingual Salivary Gland
- h. Submandibular Salivary Gland

8. Submental Nodes

- a. Mandibular Anterior Teeth
- b. Floor of the Mouth
- c. Lower Lip
- d. Apex of Tongue
- e. Chin

Figure 20: Lymph Drainage

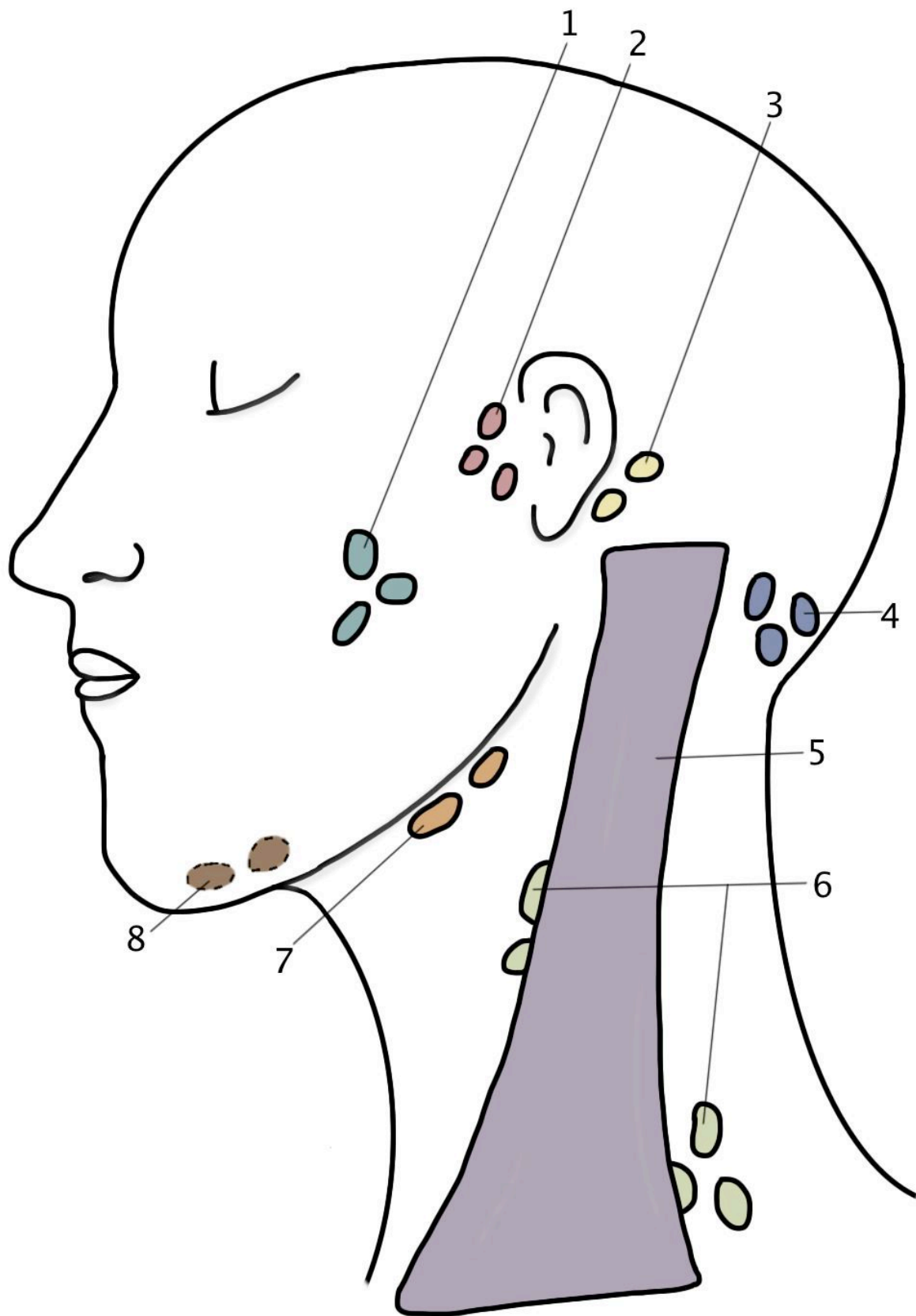


Figure 21: Tongue

- | | |
|-----------------------------|--|
| 1. Base of Tongue | 6. Median Lingual Sulcus |
| 2. Lingual Tonsils | 7. Circumvallate Papilla (Von Ebner's Salivary Glands are located within these papillae) |
| 3. Foramen Cecum | 8. Fungiform Papilla |
| 4. Lateral Border of Tongue | 9. Foliate Papilla |
| 5. Body of Tongue | 10. Filiform Papilla |

*The sense of taste is innervated by Cranial Nerves IX, X and the Chorda Tympani Nerve (Branch of Cranial Nerve VII).

Figure 21: Tongue

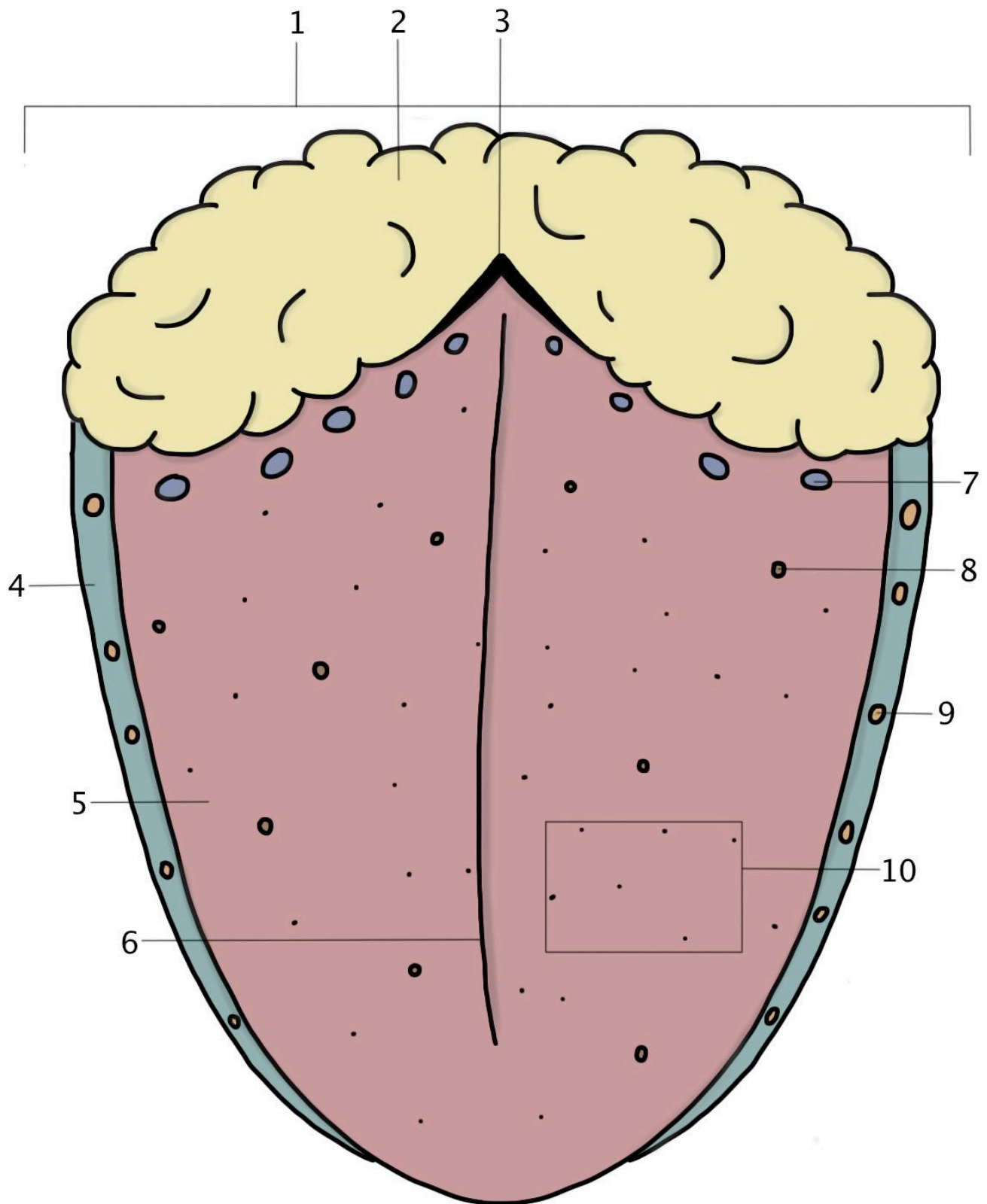


Figure 22: Extrinsic Muscles of the Tongue

Each blank represents the action of the muscle.

- | | |
|-----------------------------------|---------------------------------------|
| 1. Dorsum of the Tongue | 8. Styloglossus |
| 2. Palatoglossus Muscle | a. <u>Retracts Tongue</u> |
| a. <u>Elevates Base of Tongue</u> | 9. Stylohyoid Muscles |
| 3. Mandible (cut) | a. <u>Elevates Hyoid</u> |
| 4. Genial Tubercles | 10. Stylopharyngeus |
| 5. Genioglossus | a. <u>Elevates and Widens Pharynx</u> |
| a. <u>Protrudes Tongue</u> | 11. Hyoglossus |
| 6. Geniohyoid Muscle | a. <u>Depresses Tongue</u> |
| a. <u>Swallowing</u> | 12. Hyoid Bone |
| 7. Styloid Process | 13. Thyrohyoid Membrane |
| | 14. Thyroid Cartilage |

Figure 22: Extrinsic Muscles of the Tongue

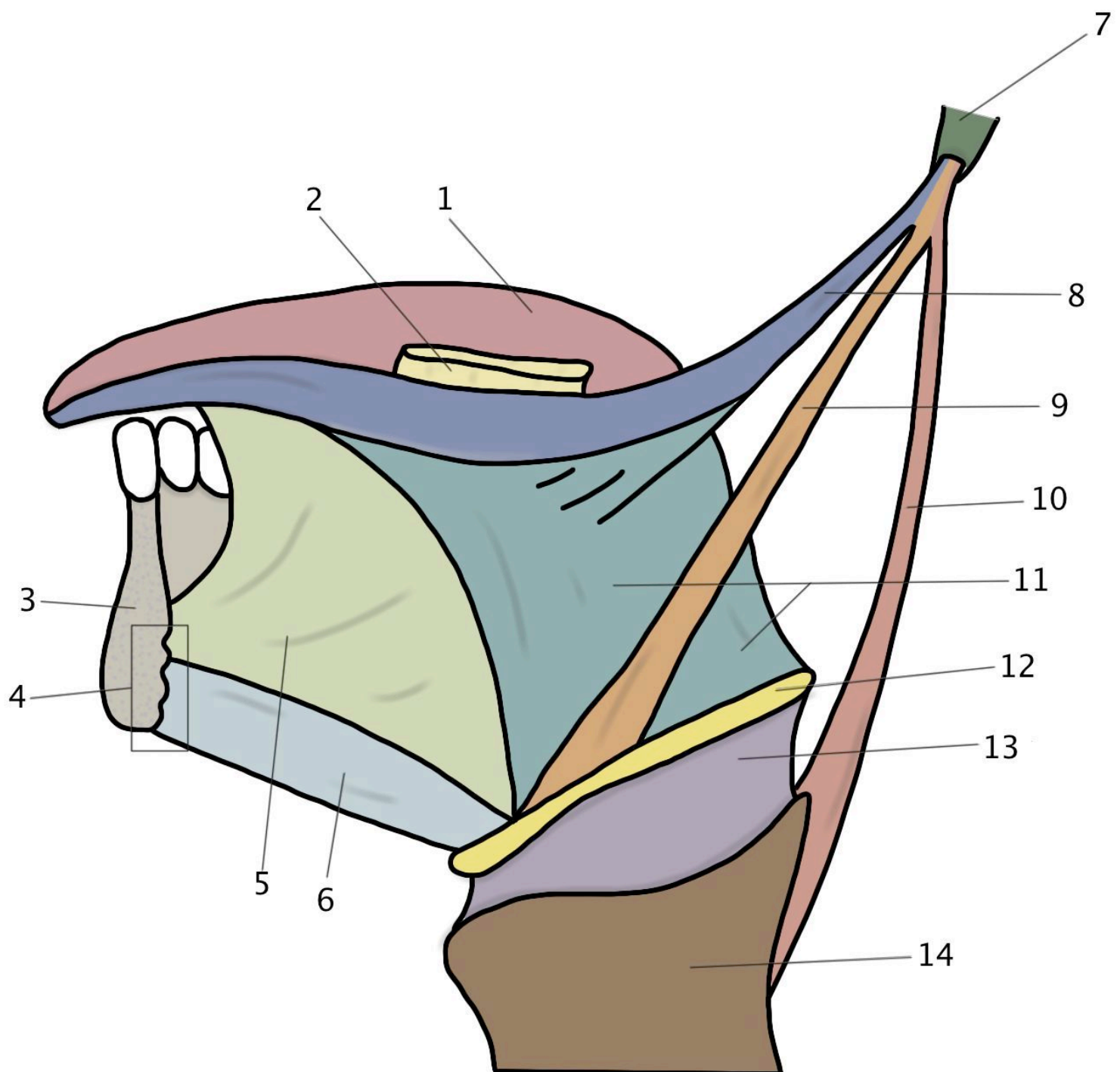


Figure 23: Temporomandibular Joint

- | | |
|--|--|
| 1. Temporomandibular Ligament | 6. Articular Eminence |
| 2. Joint Capsule (seen twice) | 7. Articular Fossa |
| 3. Stylomandibular Ligament (seen twice) | 8. Articular Disc |
| 4. Sphenomandibular Ligament | 9. Postglenoid Process |
| 5. Superior Head of Lateral Pterygoid | 10. Inferior Head of Lateral Pterygoid |
| | 11. Condyle |

Figure 23: Temporomandibular Joint

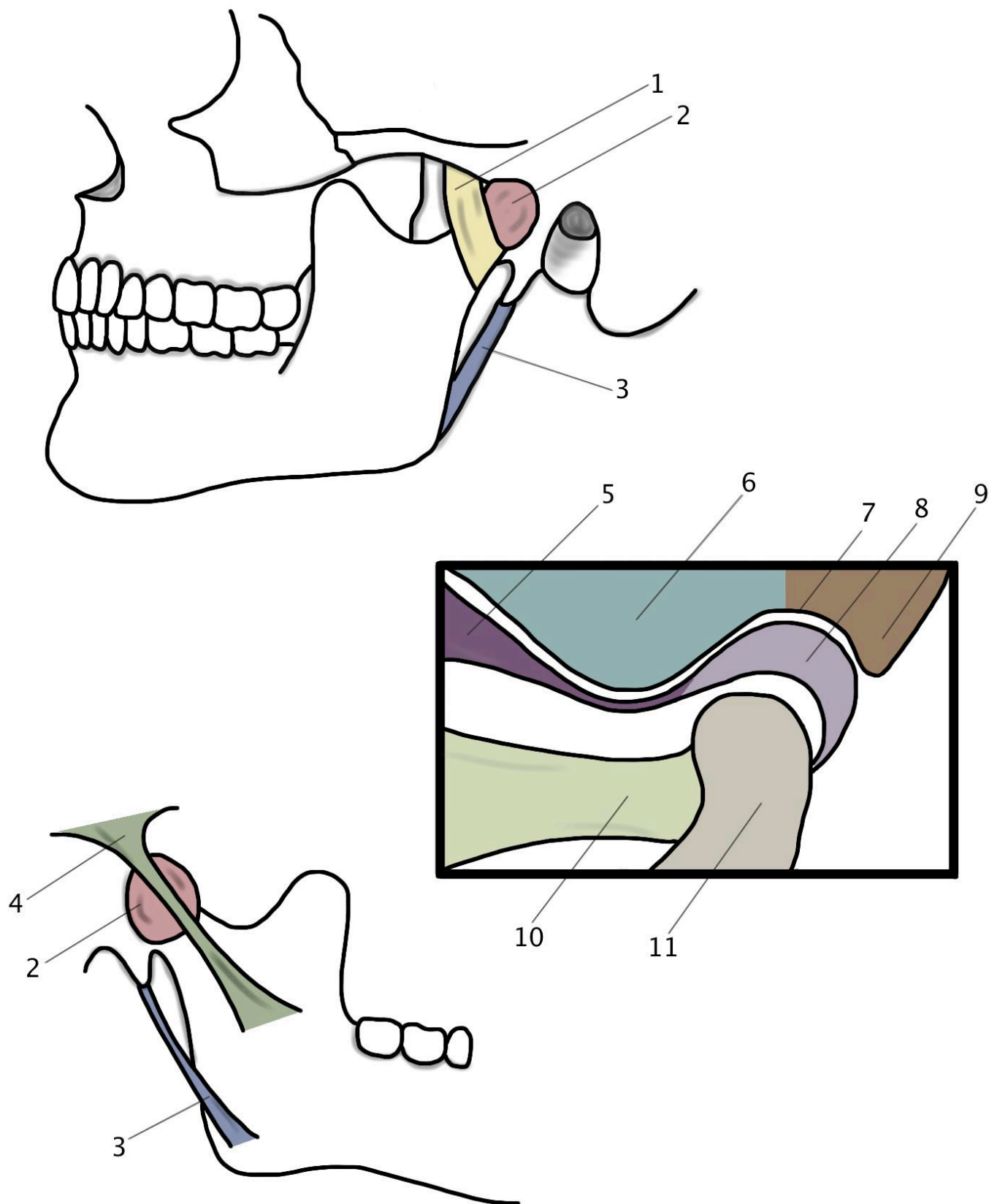


Figure 24: Salivary Glands

1. Parotid Gland
2. Parotid Duct (aka Stensen's Duct)
3. Parotid Papilla
4. Submandibular Gland
5. Submandibular Duct (aka Wharton's Duct)
6. Sublingual Caruncle
7. Sublingual Gland
8. Sublingual Duct (aka Bartholin's Duct)

*Von Ebner's Salivary Glands are located within the Circumvallate Papillae of the tongue which can be seen on Figure 21.

Gland	Saliva Produced	Innervation
Parotid	Serous: 25% Total	Cranial Nerve IX & Auriculotemporal Nerve
Submandibular	Mixed: 65% Total	Chorda Tympani (Branch of Cranial Nerve VII)
Sublingual	Mixed: 10% Total	Chorda Tympani (Branch of Cranial Nerve VII)
Von Ebner's	Serous: Minor	Chorda Tympani (Branch of Cranial Nerve VII)

Figure 24: Salivary Glands

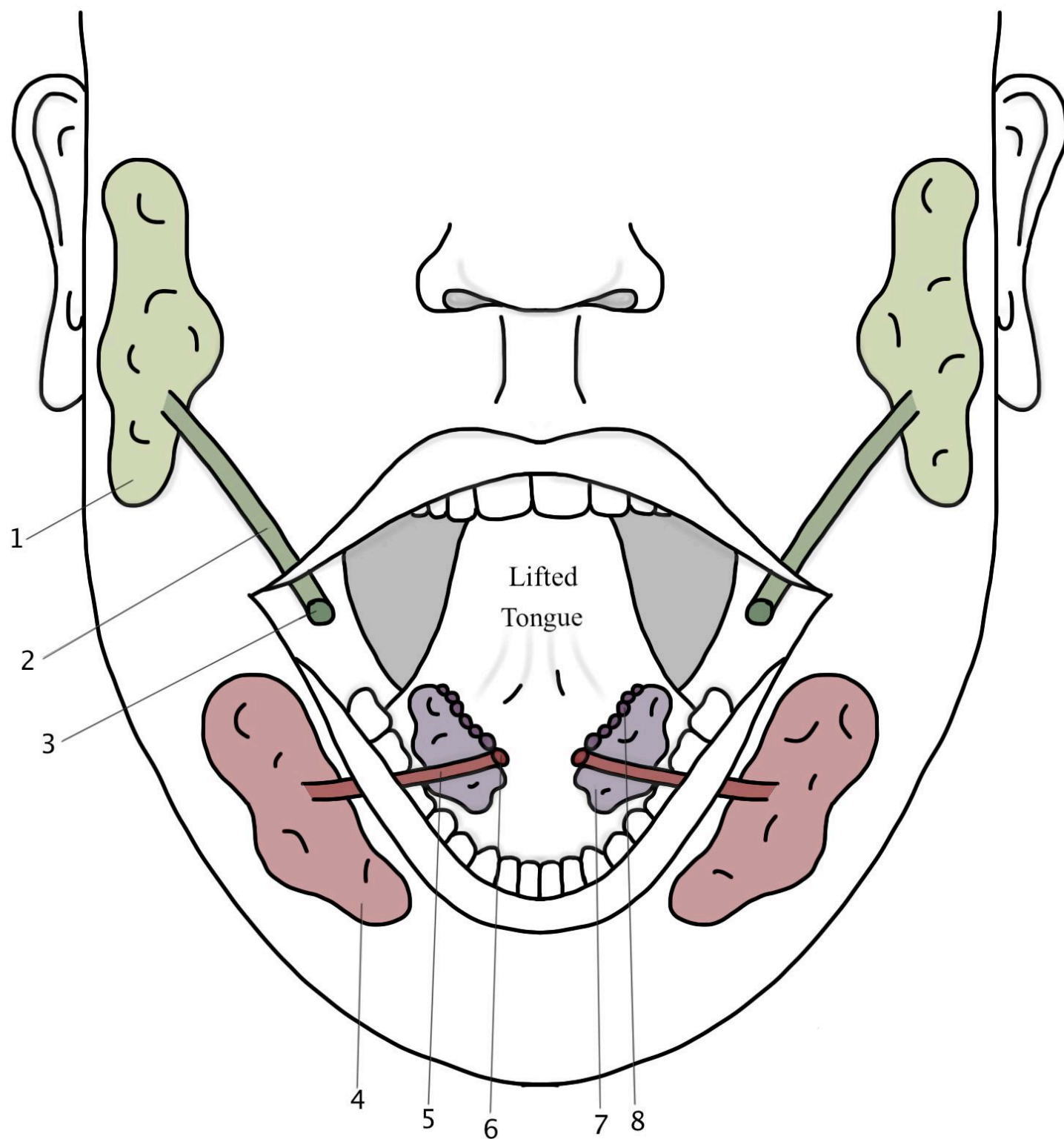


Figure 25: Thyroid Gland

- | | |
|--|--|
| 1. Middle Pharyngeal Constrictor Muscle (seen twice) | 7. Isthmus of Thyroid Gland |
| 2. Hyoid Bone (seen twice) | 8. Left Lobe of Thyroid Gland (seen twice) |
| 3. Thyrohyoid Membrane | 9. Trachea |
| 4. Thyroid Cartilage | 10. Inferior Pharyngeal Constrictor |
| 5. Cricothyroid Muscle | 11. Parathyroid Glands |
| 6. Right Lobe of Thyroid Gland (seen twice) | |

Figure 25: Thyroid Gland

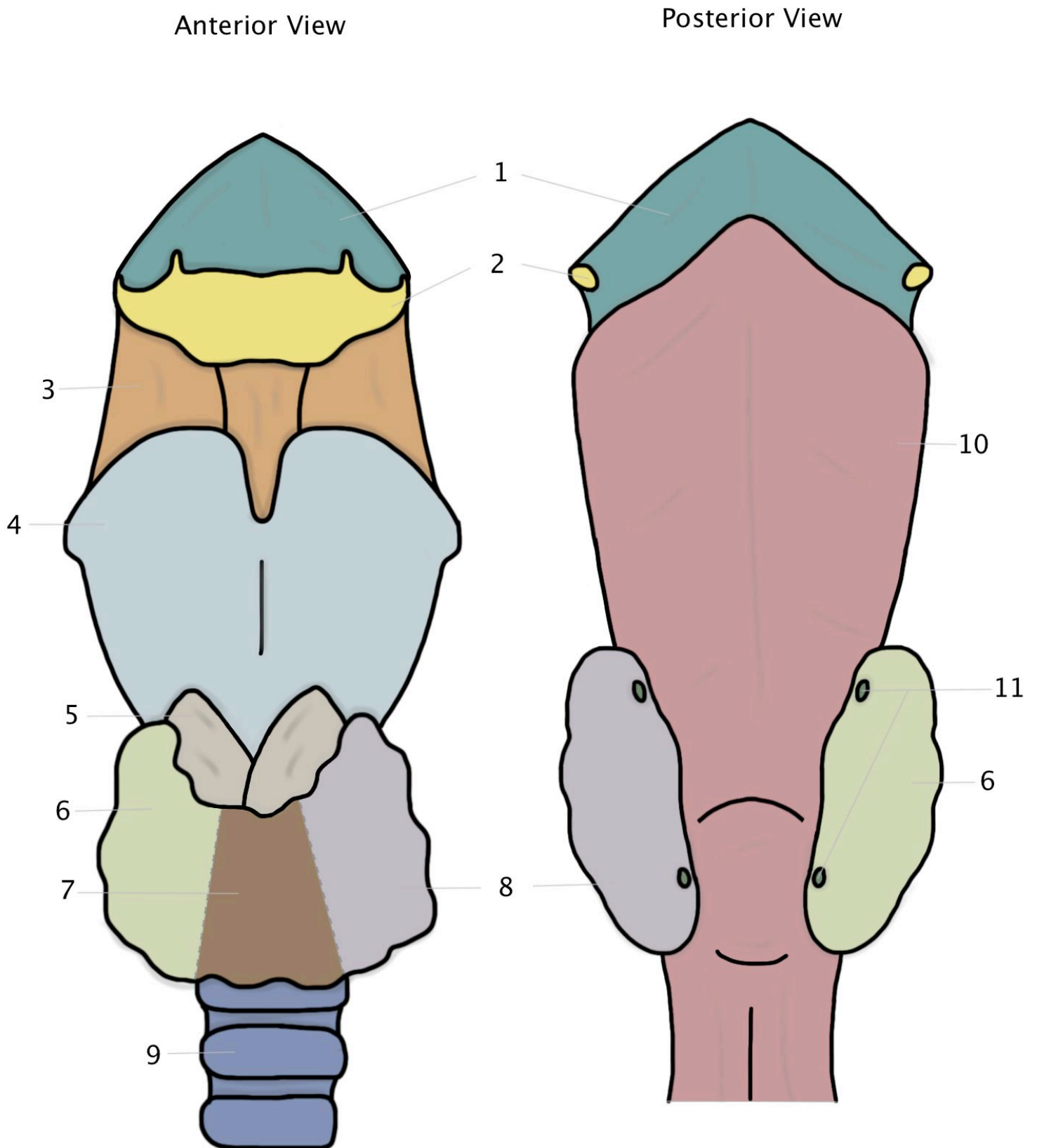


Figure 26: Anterior Superior Alveolar Nerve Block

- | | |
|--|--------------------------------------|
| 1. Gingiva | 3. Anterior Superior Alveolar Nerve |
| 2. Maxillary Bone (Buccal aspect has been removed) | 4. Anterior Superior Alveolar Artery |

Areas anesthetized by this block:

- a. Pulp of Maxillary Anterior Teeth
- b. Pulp of Maxillary Premolar Teeth (If MSA nerve isn't present)
- c. Pulp of Mesibuccal Root of 1st Molar (If MSA nerve isn't present)
- d. Buccal Gingiva of Maxillary Anterior Teeth
- e. Buccal Gingiva of Maxillary Premolar Teeth (If MSA nerve isn't present)
- f. Buccal Gingiva of Mesibuccal Root of 1st Molar (If MSA nerve isn't present)

Figure 26: Anterior Superior Alveolar Nerve Block

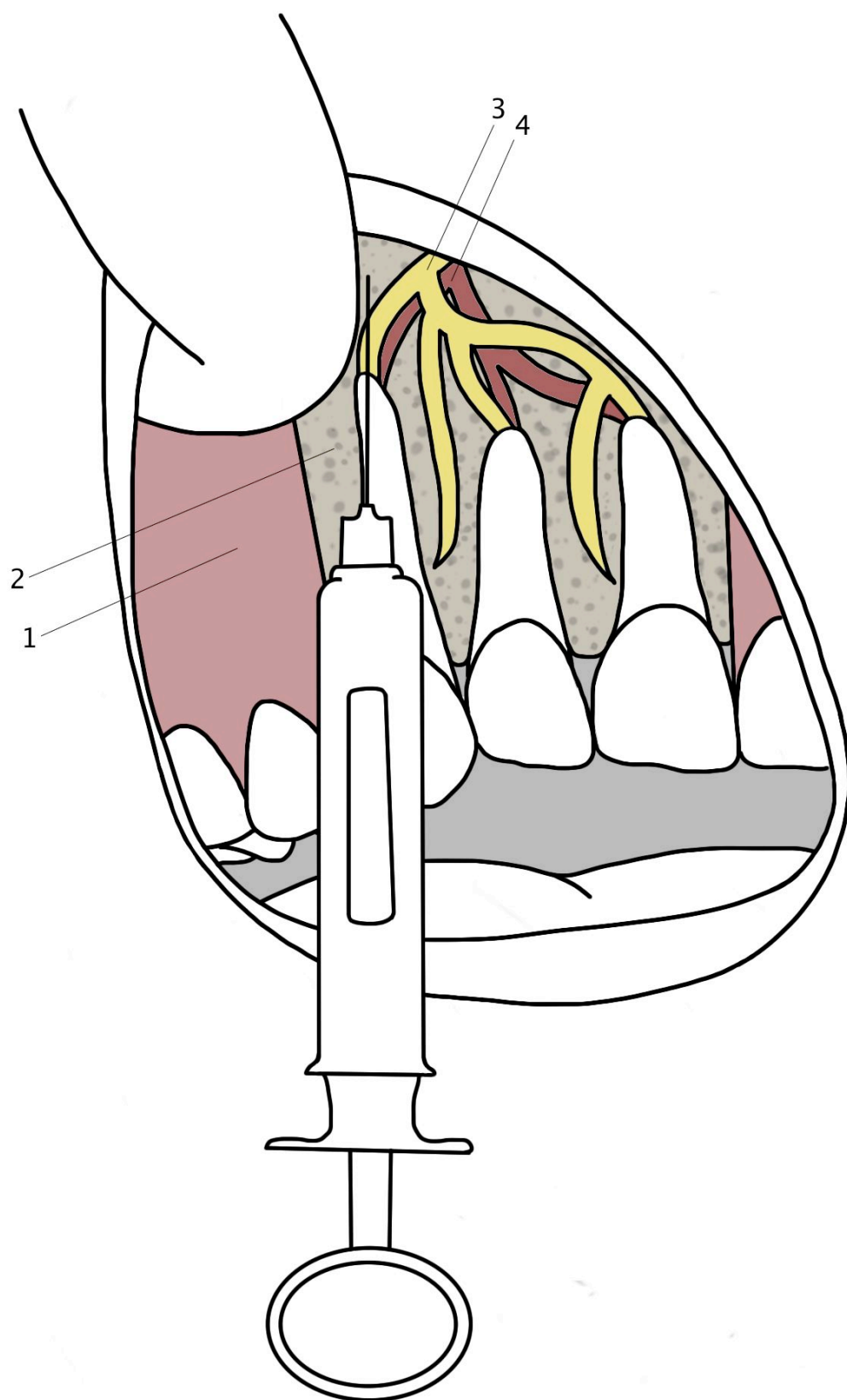


Figure 27: Middle Superior Alveolar Nerve Block

- | | |
|------------------------------------|--|
| 1. Middle Superior Alveolar Nerve | 3. Maxillary Bone (Buccal aspect has been removed) |
| 2. Middle Superior Alveolar Artery | 4. Gingiva |

Areas anesthetized by this block:

- a. Pulp of Maxillary Premolar Teeth
- b. Pulp of Mesiobuccal Root of 1st Molar
- c. Buccal Gingiva of Maxillary Premolar Teeth
- d. Buccal Gingiva of Mesiobuccal Root of 1st Molar

Figure 27: Middle Superior Alveolar Nerve Block

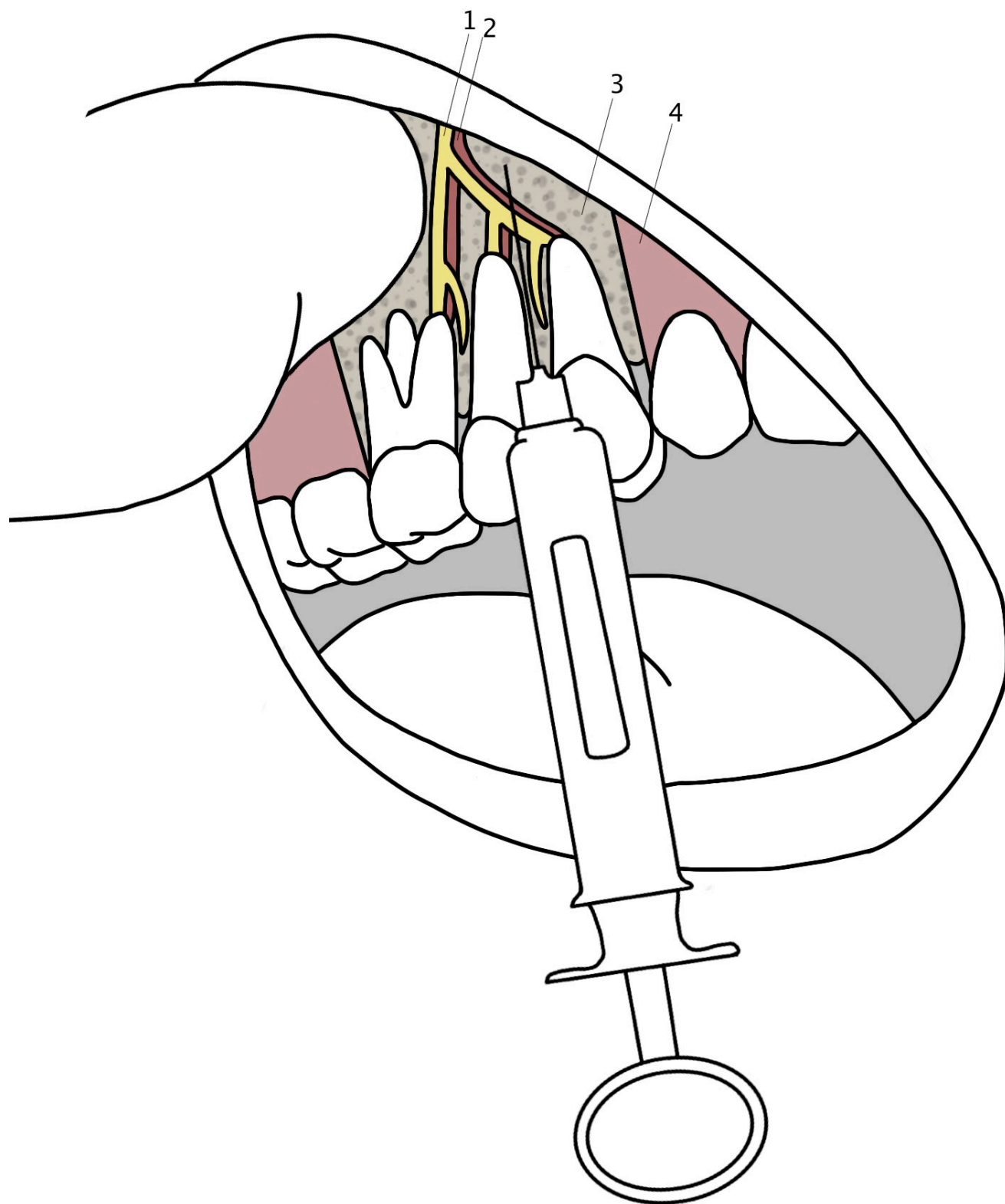


Figure 28: Posterior Superior Alveolar Nerve Block

- | | |
|--------------------------------------|---------------------------------------|
| 1. Pterygoid Plexus | 4. Posterior Superior Alveolar Artery |
| 2. Maxillary Artery | 5. Maxillary Bone (Gingiva dissected) |
| 3. Posterior Superior Alveolar Nerve | 6. Gingiva |

Areas anesthetized by this block:

- a. Pulp of Maxillary 2nd & 3rd Molars
- b. Pulp of 1st Molar except Mesiobuccal Root
- c. Buccal Gingiva of Maxillary 2nd & 3rd Molars
- d. Buccal Gingiva of 1st Molar except Mesiobuccal Root

Figure 28: Posterior Superior Alveolar Nerve Block

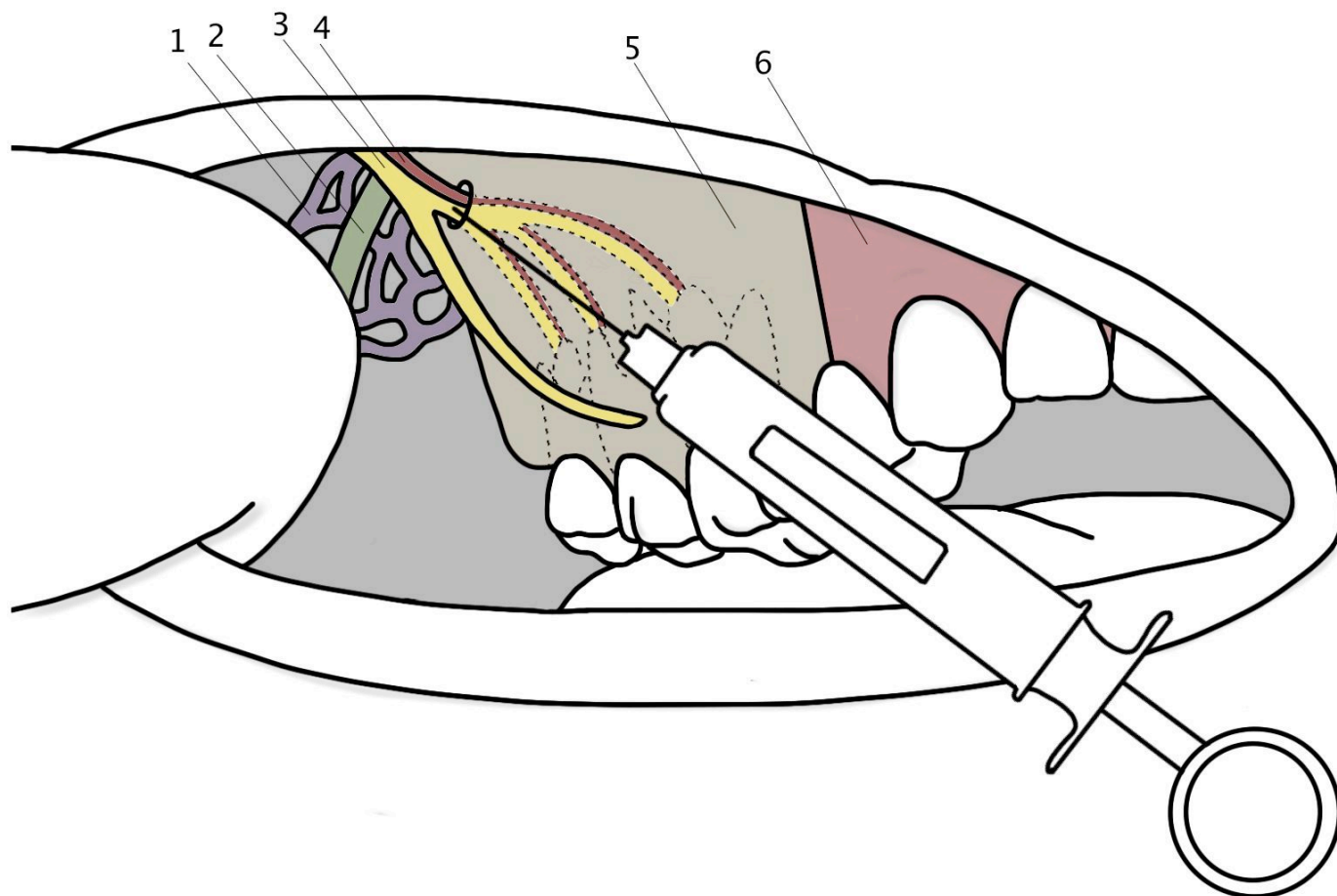


Figure 29: Mental Nerve Block

- | | |
|-------------------|--------------------------------------|
| 1. Mental Nerve | 4. Depressor Labii Inferioris Muscle |
| 2. Mental Artery | 5. Depressor Anguli Oris Muscle |
| 3. Mental Foramen | 6. Mandible |

Areas anesthetized by this block:

- a. Buccal Mucosa of Mandibular Anterior Teeth
- b. Buccal Mucosa of Mandibular Premolars
- c. Skin of Chin
- d. Skin of Lower Lip
- e. Pulps of Mandibular Premolars and Anteriors
(Only if anesthetic is pressed through Mental Foramen
and Incisive Nerve is anesthetized)

Figure 29: Mental Nerve Block

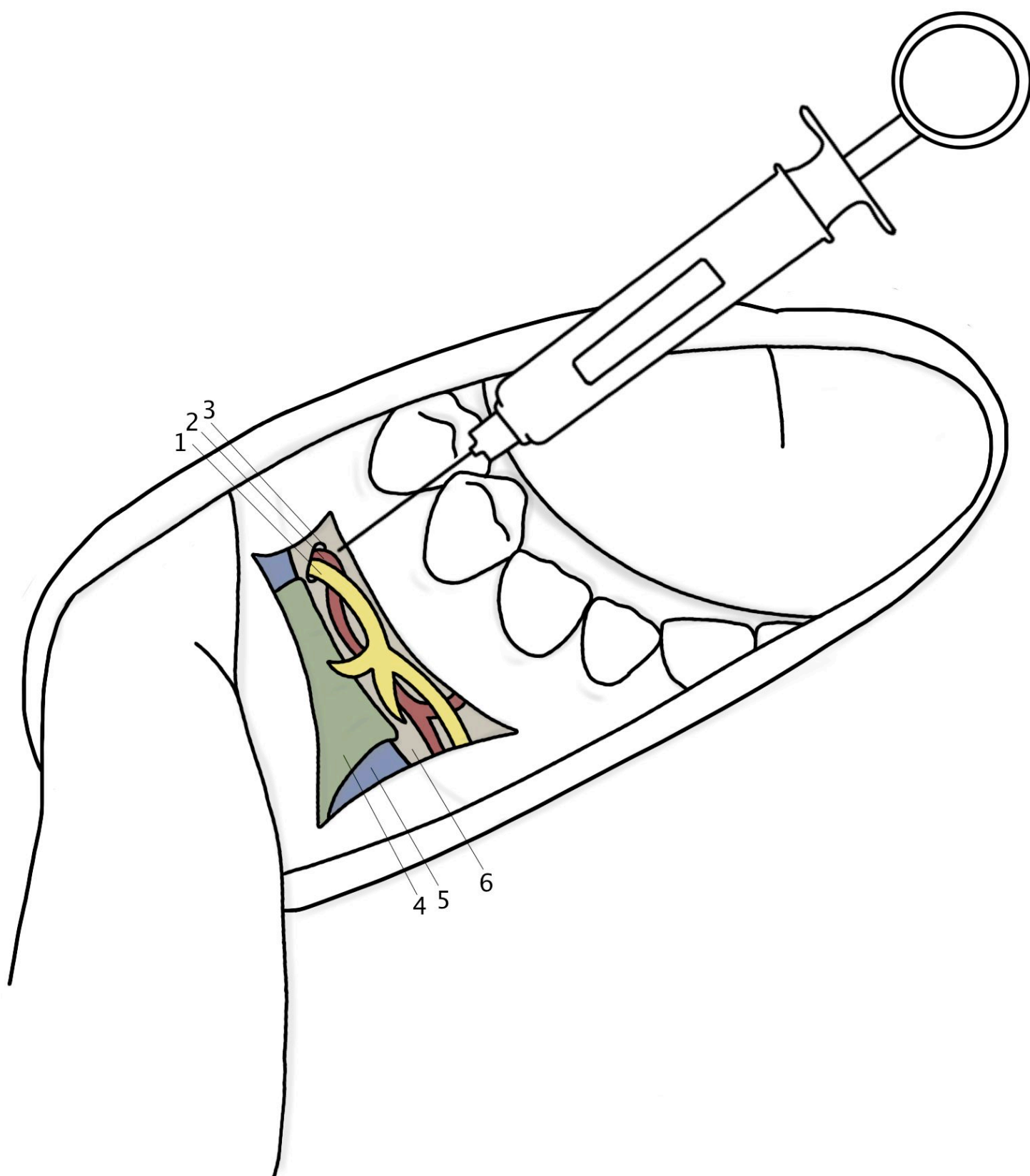


Figure 30: Long Buccal Nerve Block

1. Ramus of the Mandible (Gingiva Dissected)
2. Buccal Artery
3. Long Buccal Nerve

Areas anesthetized by this block:

- a. Buccal Mucosa of Mandibular Molars
- b. Buccal Mucosa of Cheek

Figure 30: Long Buccal Nerve Block

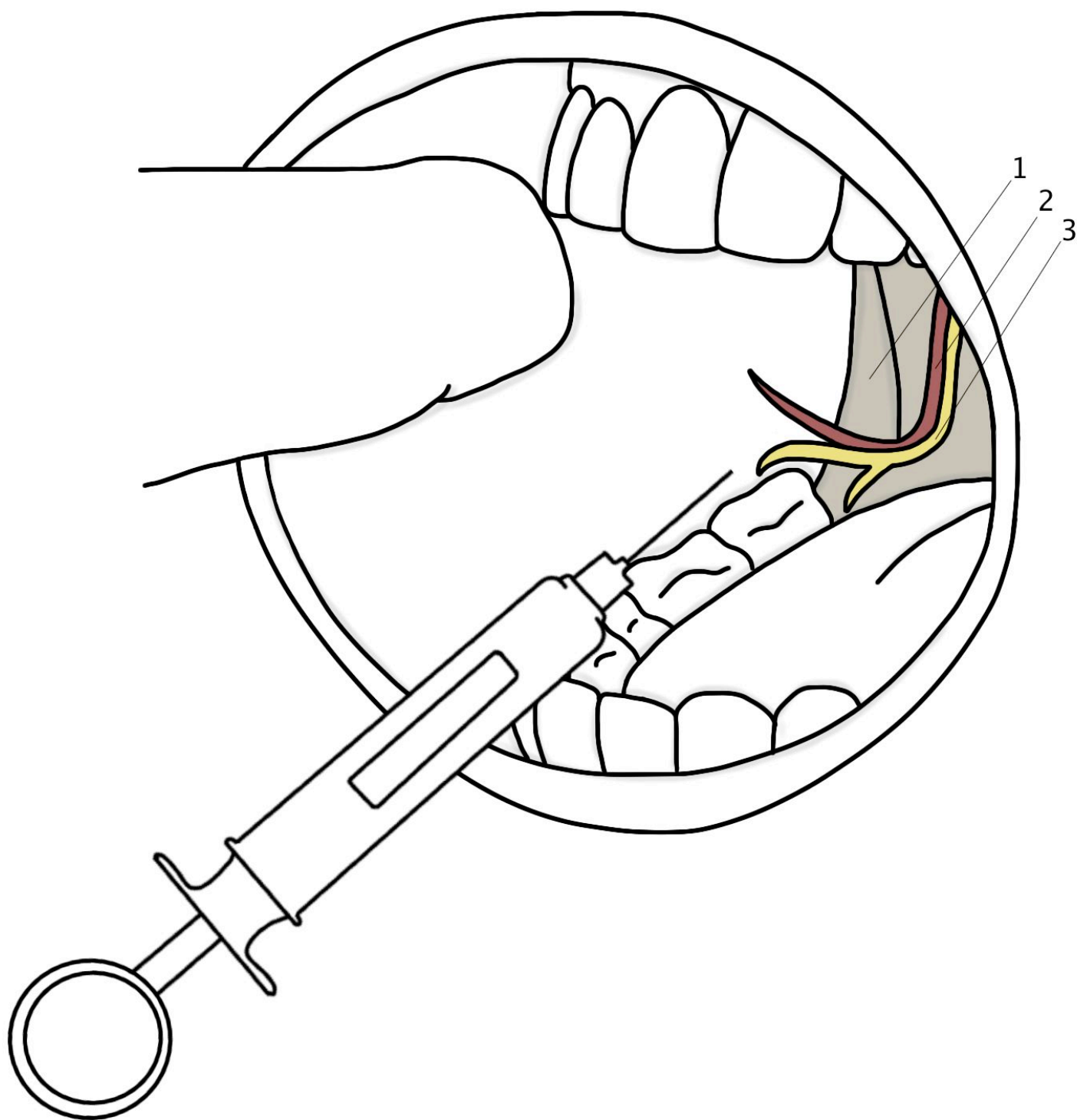


Figure 31: Inferior Alveolar Nerve Block

- | | |
|-------------------------------------|-----------------------------|
| 1. Mandible (Soft Tissue Dissected) | 6. Inferior Alveolar Nerve |
| 2. Coronoid Notch | 7. Inferior Alveolar Artery |
| 3. Lingual Nerve | 8. Parotid Gland |
| 4. Lingula | 9. Medial Pterygoid Muscle |
| 5. Mandibular Foramen | |

Areas anesthetized by this block:

- a. Pulp of all Mandibular Teeth
- b. Buccal Mucosa for Anteriors & Premolars
(Mental Nerve Branch of Inferior Alveolar)
- c. Lingual Mucosa for all Mandibular Teeth
(Lingual Nerve Branch of Inferior Alveolar)
- d. Anterior two thirds of tongue
(Lingual Nerve Branch of Inferior Alveolar)
- e. Floor of the Mouth
(Lingual Nerve Branch of Inferior Alveolar)

Figure 31: Inferior Alveolar Nerve Block

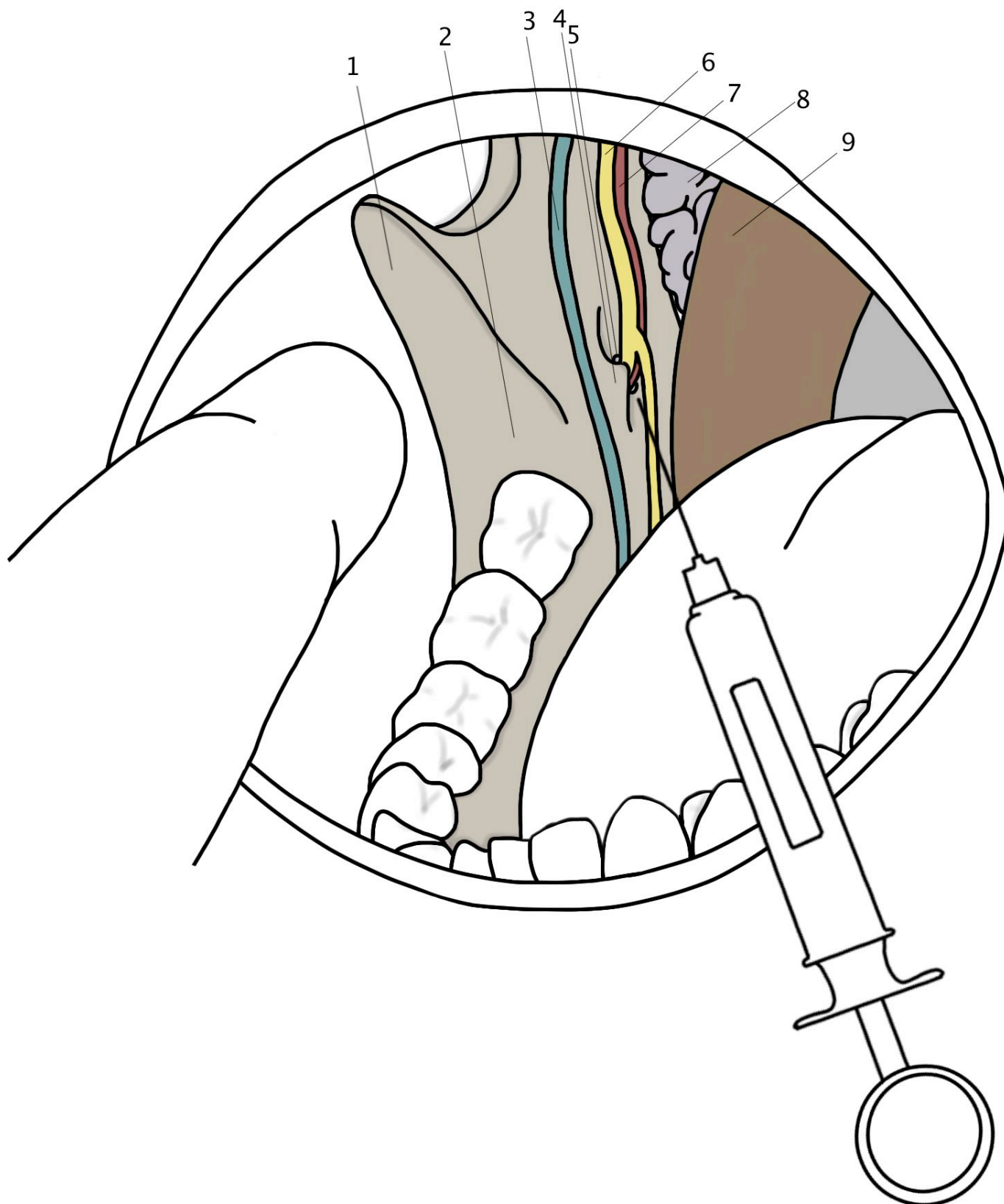


Figure 32: Nasopalatine Nerve Block

1. Incisive Papilla
2. Incisive Foramen
3. Nasopalatine Nerve
4. Nasopalatine Artery
5. Minor Palatine Salivary Glands

Areas anesthetized by this block:

- a. Soft Tissue of Anterior Portion of the Hard Palate
- b. Hard Tissue of Anterior Portion of the Hard Palate

Figure 32: Nasopalatine Nerve Block

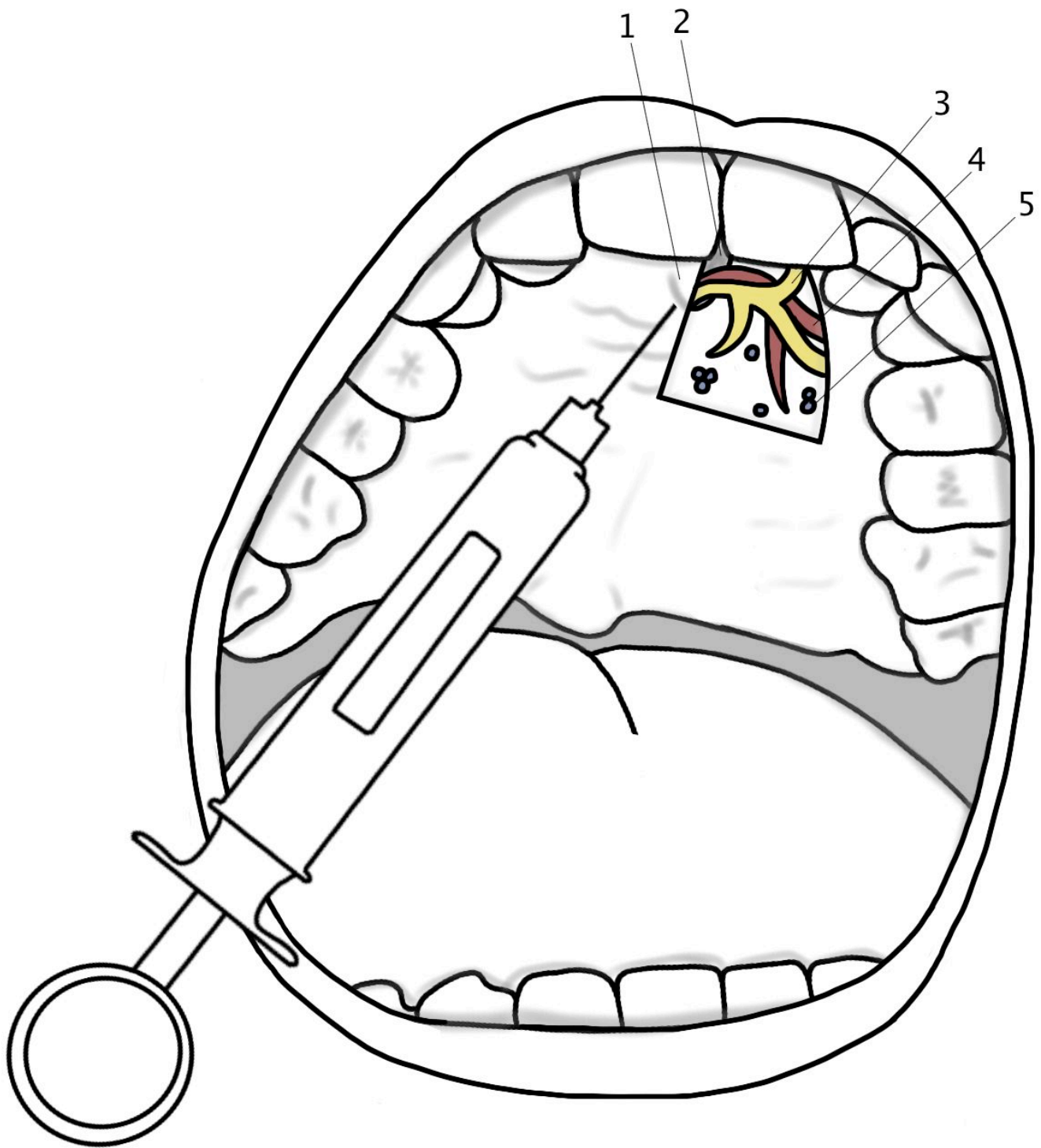


Figure 33: Greater Palatine Nerve Block

- | | |
|-----------------------------------|----------------------------|
| 1. Minor Palatine Salivary Glands | 5. Lesser Palatine Nerve |
| 2. Greater Palatine Nerve | 6. Lesser Palatine Artery |
| 3. Greater Palatine Artery | 7. Lesser Palatine Foramen |
| 4. Greater Palatine Foramen | |

Areas anesthetized by this block:

- a. Soft Tissue of Posterior Portion of the Hard Palate
- b. Hard Tissue of Posterior Portion of the Hard Palate

Figure 33: Greater Palatine Nerve Block

