The Muscular System: Head and Neck

A muscular system lab activity using Visible Body's Human Anatomy Atlas

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PRE-LAB EXERCISES

Before coming to lab, get familiar with a few muscle groups we'll be exploring during lab. Using Visible Body's Human Anatomy Atlas, go to the Views section. Under Systems, scroll down to the Muscular System views. Select the view Expression and find the following muscles. When you select a muscle, note the book icon in the content box. Selecting this icon allows you to read the muscle's definition.

1. Occipitofrontalis (epicranius)
2. Orbicularis oculi
3. Orbicularis oris
4. Nasalis
5. Zygomaticus major

Return to Muscular System views, select the view Head Rotation and find the following muscles.

1. Sternocleidomastoid
2. Scalene group (anterior, middle, posterior)

IN-LAB EXERCISES

Use the following modules to guide your exploration of the head and neck region of the muscular system. As you explore the modules, locate the muscles on any charts, models, or specimen available. Please note that these muscles act on the head and neck – those that are located in the neck but act on the back are in a separate section.

When reviewing the action of a muscle, it will be helpful to think about where the muscle is located and where the insertion is. Muscle physiology requires that a muscle will "pull" instead of "push" during contraction, and the insertion is the part that will move. Imagine that the muscle is "pulling" on the bone or tissue it is attached to at the insertion.

Access 3D views and animated muscle actions in Visible Body's Human Anatomy Atlas, which will be especially helpful to visualize muscle actions. When you select a structure in the Atlas app, you'll see options to read the definition and hear the pronunciation in the content box. When you select a muscle, be sure to select the blue pin icon in the content box. This will give you the option to view origins and insertions as visible pins on the muscle (select "attachments"), view the blood supply, and/or the nerve supply.

In each module below, identify the following:

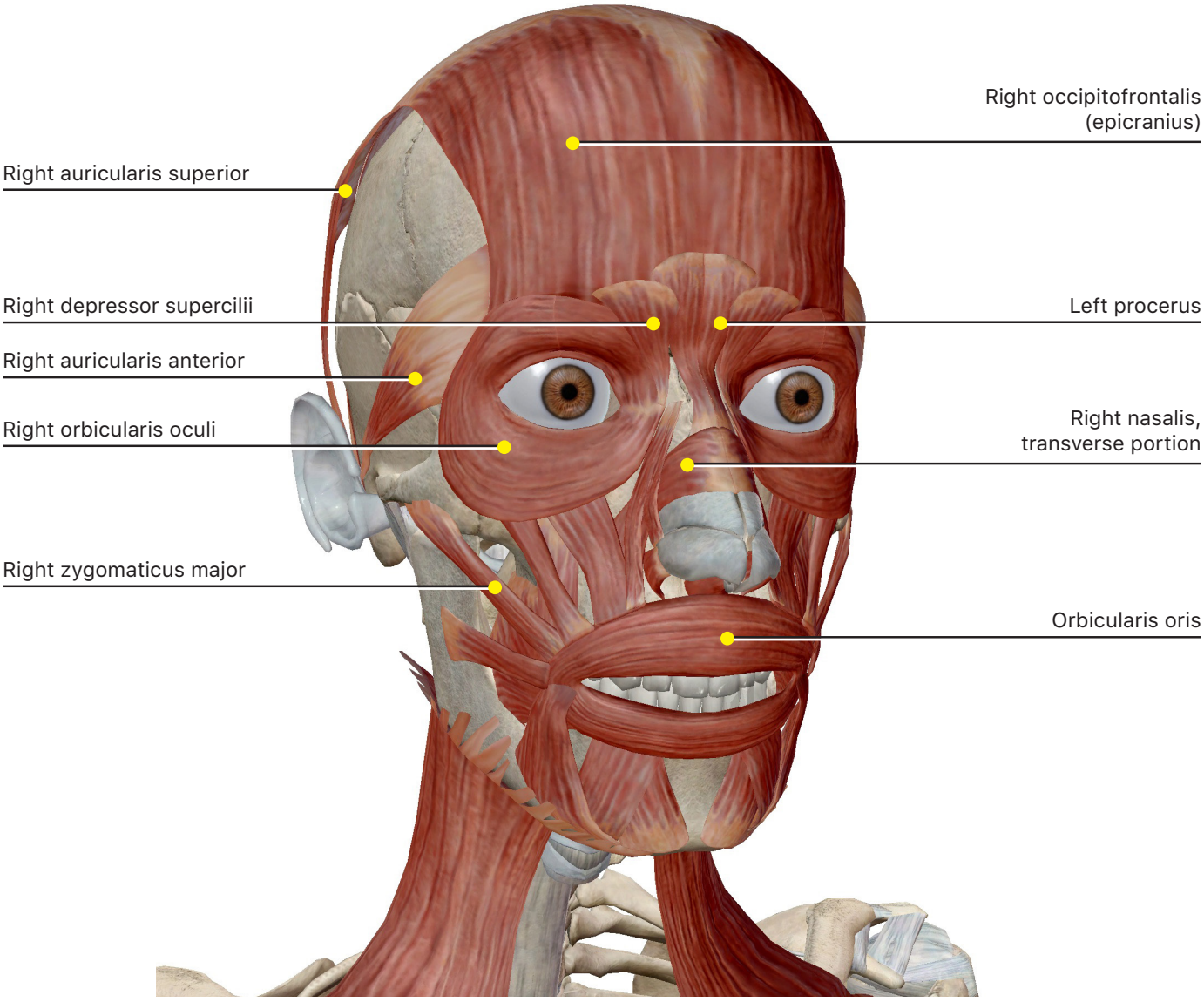
1. Muscle location
2. Origin(s) and insertion(s)
3. Muscle action
4. Nerve supply

A. Muscles of Facial Expression

Under the Views section, go to Systems: Muscular System Views and select 1. Muscular System Views: Expression.

These muscles insert into the skin of the face in order to create facial expressions. The specific insertion will determine what type of expression each muscle makes.

Muscles of Facial Expression



Facial Expression				
Muscle	**Origin**	**Insertion**	**Action**	**Innervation**
Occipitofrontalis (epicranius)				
Procerus				
Nasalis				
Depressor septi				
Corrugator supercilii				
Depressor supercilii				
Levator palpebrae superioris				
Orbicularis oculi				

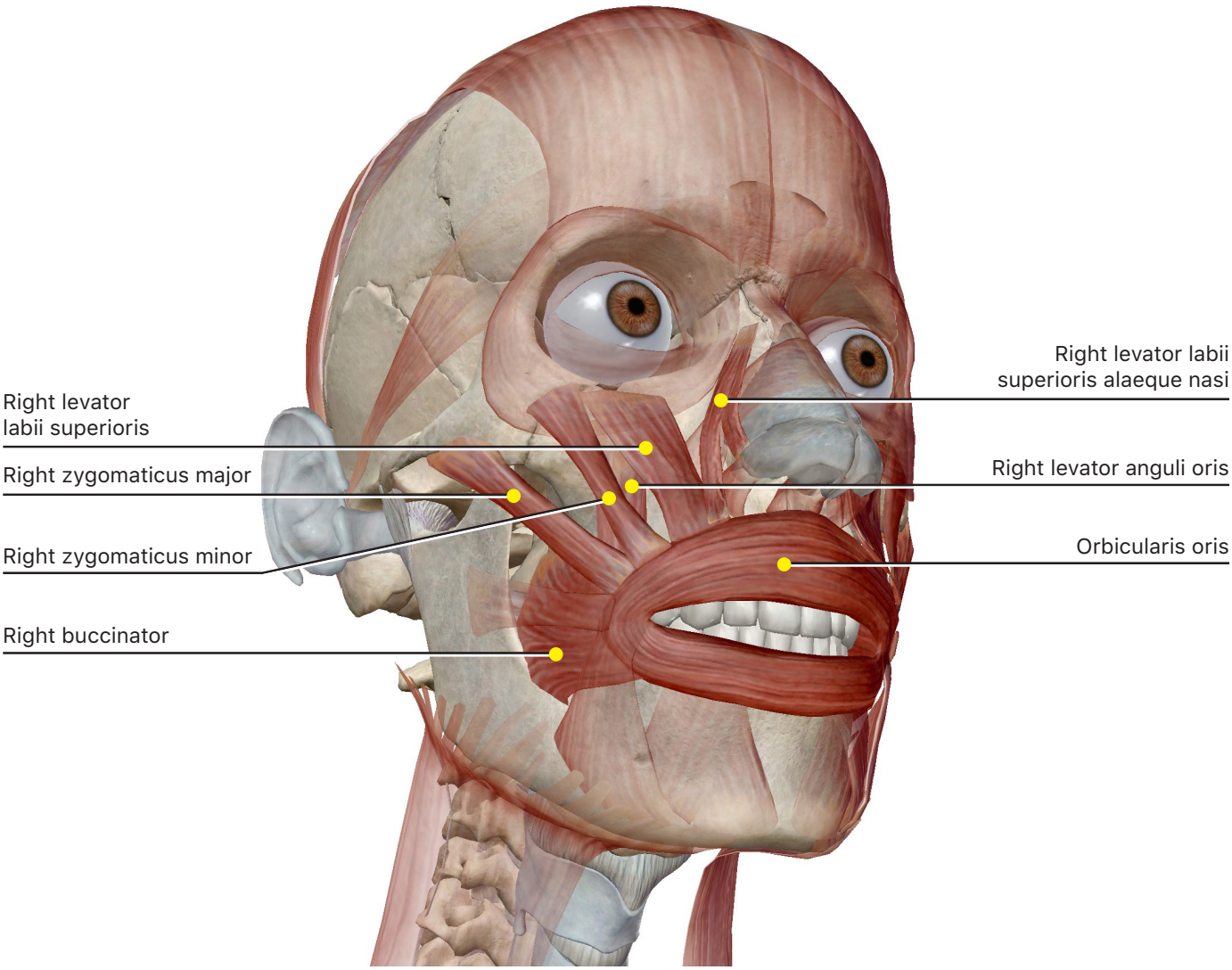
Facial Expression (continued)				
Muscle	**Origin**	**Insertion**	**Action**	**Innervation**
Auricularis anterior				
Auricularis superior				

B. Muscles of the Upper Mouth

Under the Views section, go to Systems: Muscular System Views and select 1. Muscular System Views: Expression.

Many different muscles are necessary to manipulate the mouth for speech, eating, whistling, and other actions. These muscles originate in different places, but insert on the tissue of the mouth. As you study these muscles, imagine the muscle pulling on the mouth – the angle where the muscle attaches to the mouth will determine how the mouth moves. Muscles located above the mouth will pull the mouth upward.

Muscles of the Upper Mouth



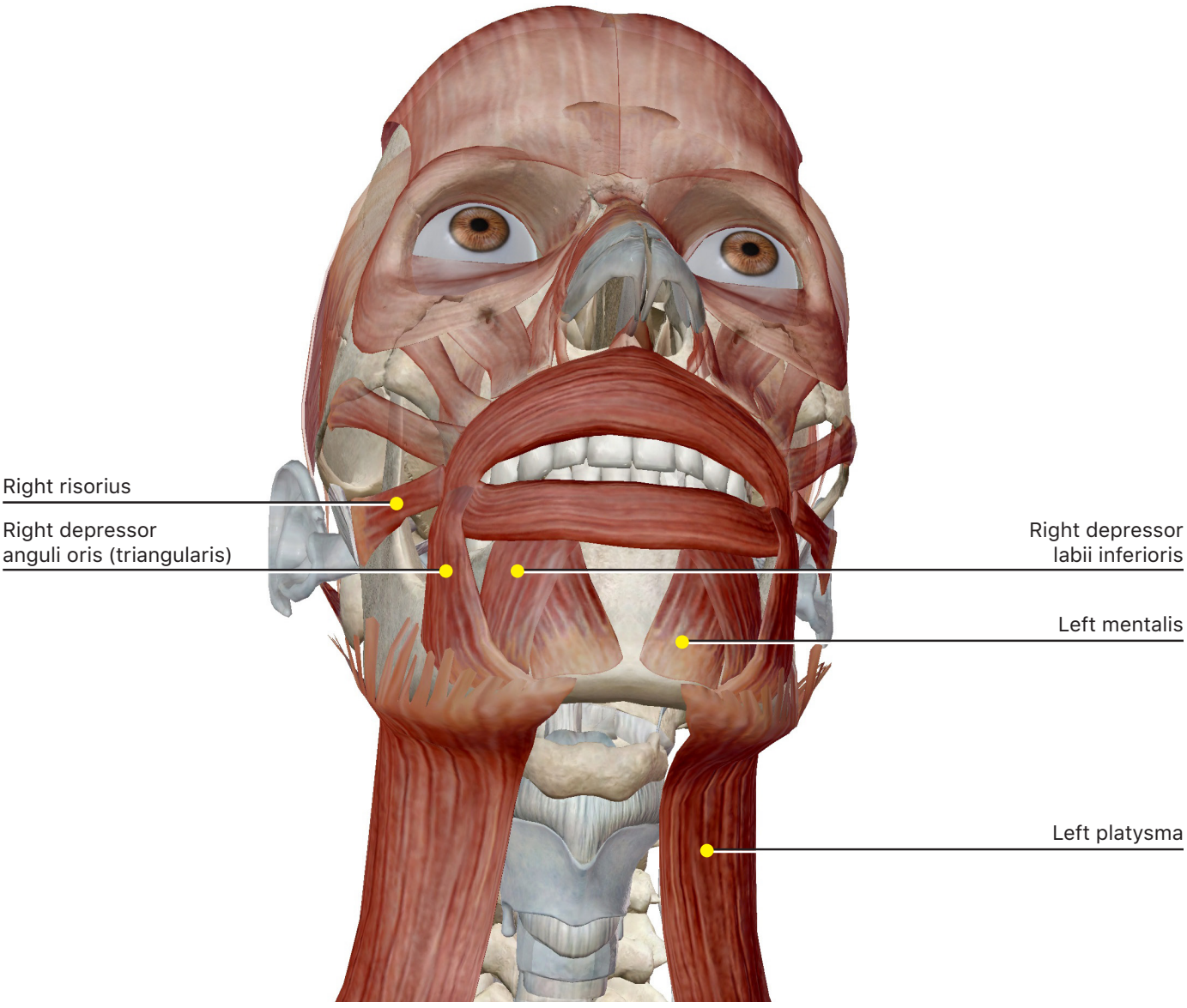
Upper Mouth				
Muscle	**Origin**	**Insertion**	**Action**	**Innervation**
Orbicularis oris				
Zygomaticus major				
Zygomaticus minor				
Levator labii superioris				
Levator labii superioris alaeque nasi				
Levator anguli oris				
Buccinator				

C. Muscles of the Lower Mouth

Under the Views section, go to Systems: Muscular System Views and select 1. Muscular System Views: Expression.

Use the same reasoning as with the muscles of the upper mouth to study these muscles. Since these muscles are located under the mouth, the mouth will be pulled downward or laterally when these muscles contract.

Muscles of the Lower Mouth



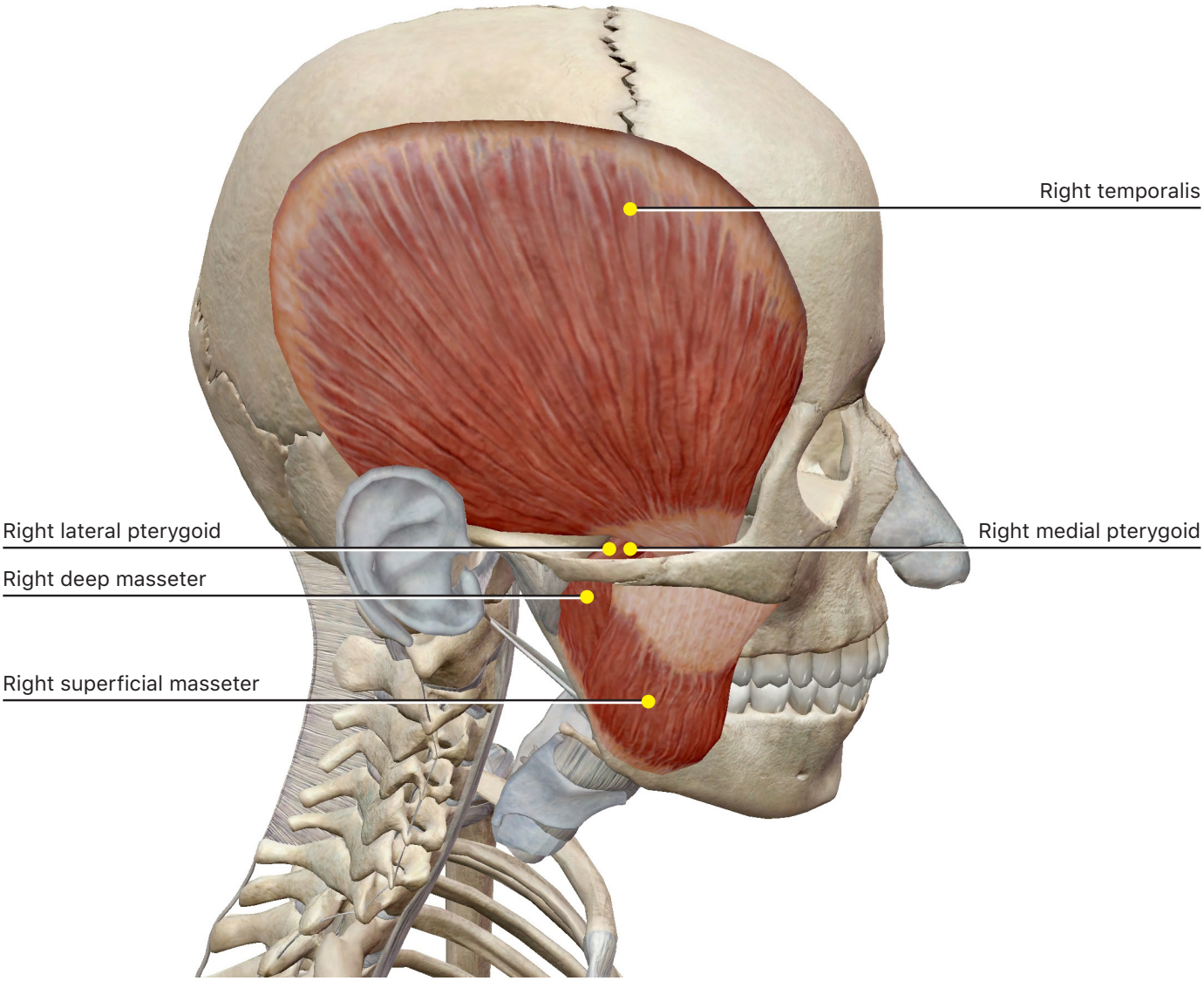
Lower Mouth				
Muscle	**Origin**	**Insertion**	**Action**	**Innervation**
Depressor anguli oris				
Depressor labii inferioris				
Risorius				
Mentalis				
Platysma				

D. Muscles of Mastication

Under the Views section, go to Systems: Muscular System Views and select 2. Mastication.

These are the muscles involved in chewing food. Consider the different ways food may be manipulated in the mouth as you study these muscles.

Muscles of Mastication



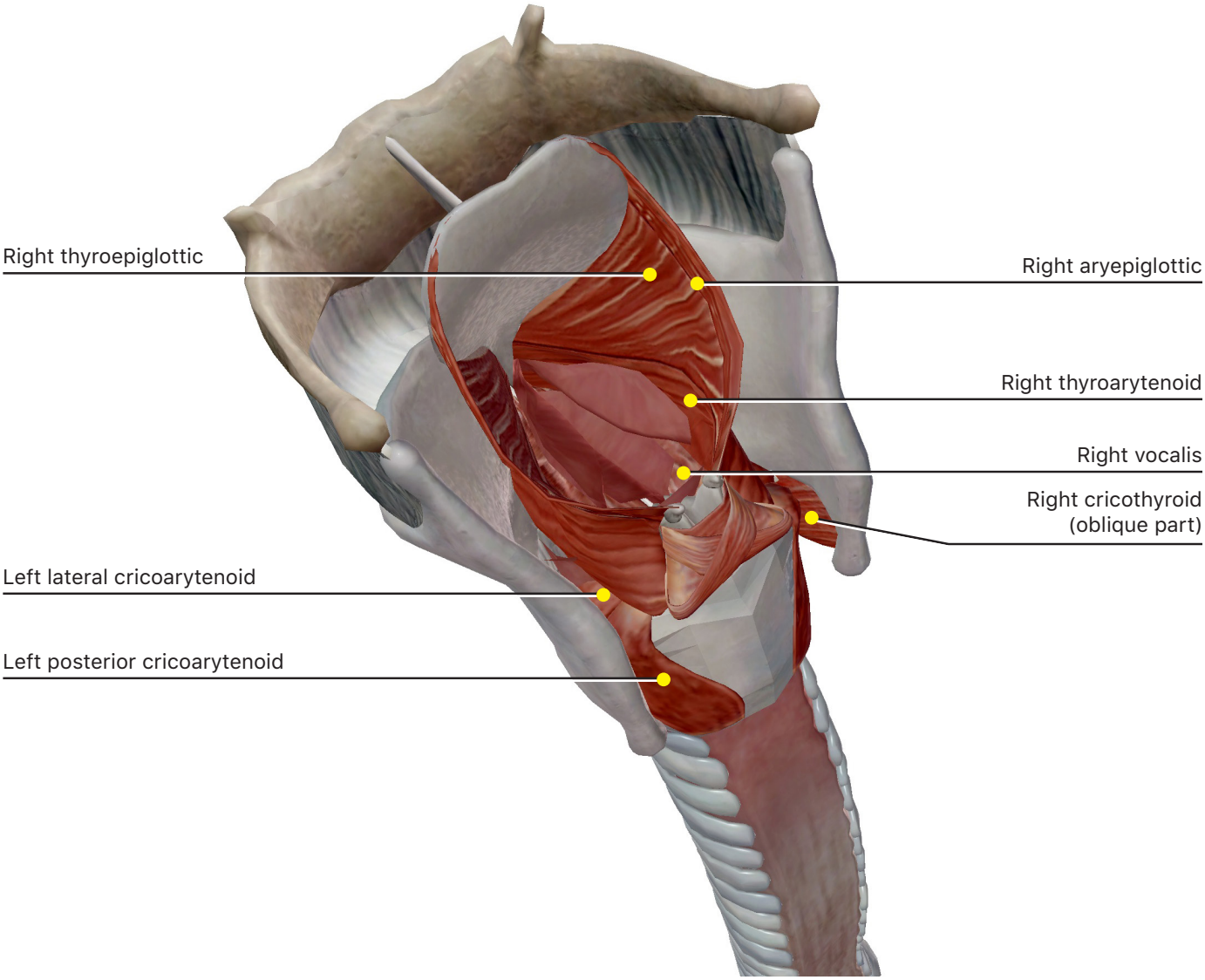
Muscles of Mastication				
Muscle	**Origin**	**Insertion**	**Action**	**Innervation**
Deep masseter				
Superficial masseter				
Temporalis				
Medial pterygoid				
Lateral pterygoid				

E. Laryngeal Muscles

Under the Views section, go to Systems: Muscular System Views and select 3. Laryngeal Muscles.

These muscles are responsible for manipulating the cartilages and vocal structures of the larynx for speech.

Laryngeal Muscles



Laryngeal Muscles				
Muscle	**Origin**	**Insertion**	**Action**	**Innervation**
Thyroepiglottic				
Aryepiglottic				
Thyroarytenoid				
Vocalis				
Lateral cricoarytenoid				
Posterior cricoarytenoid				
Oblique arytenoid				
Cricothyroid				

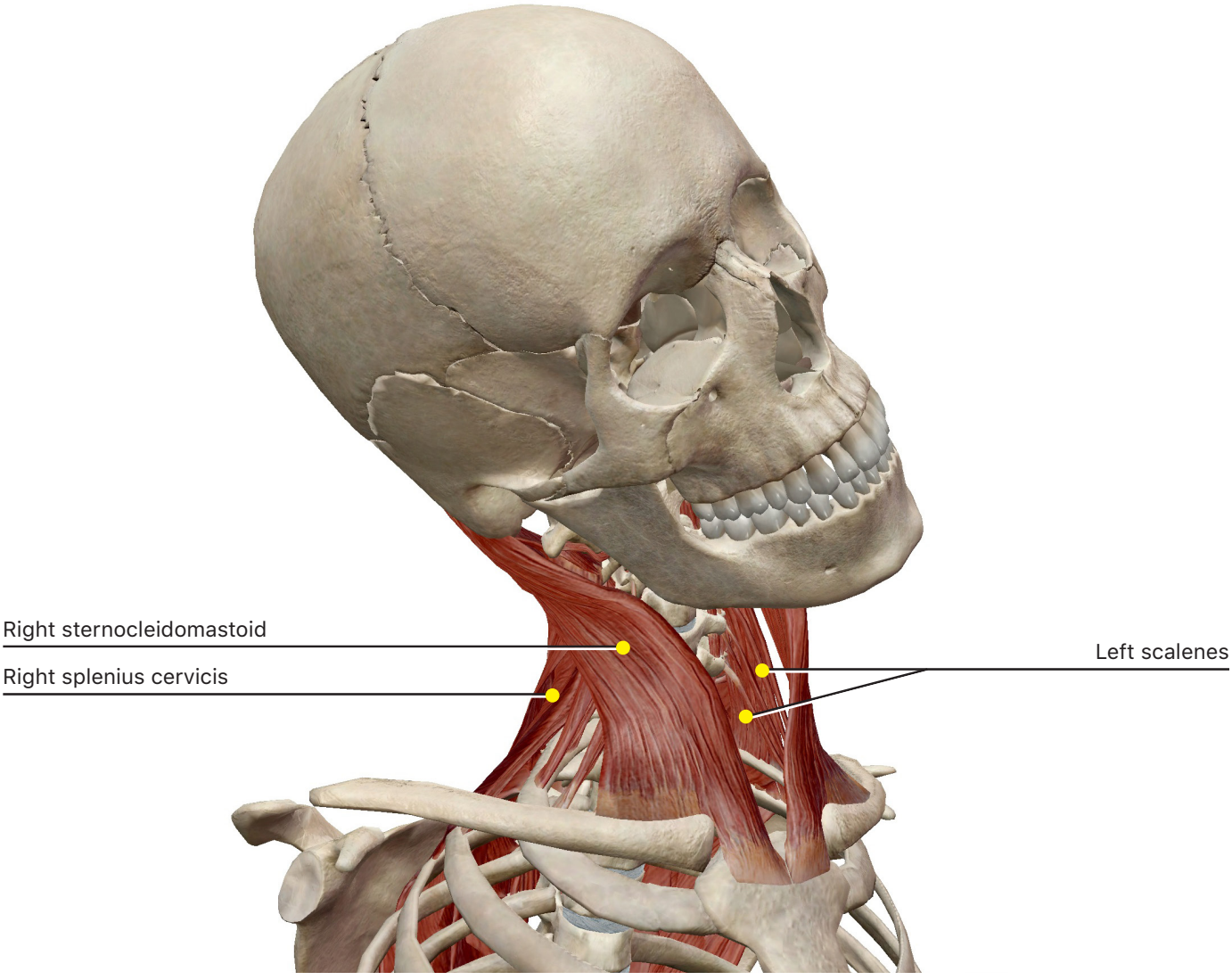
F. Neck Muscles (that act on the head)

Under Muscular System Views, explore the following views: 4. Lateral Flexion, 5. Head Rotation, 6. Head and Neck Extension, and 7. Head Flexion.

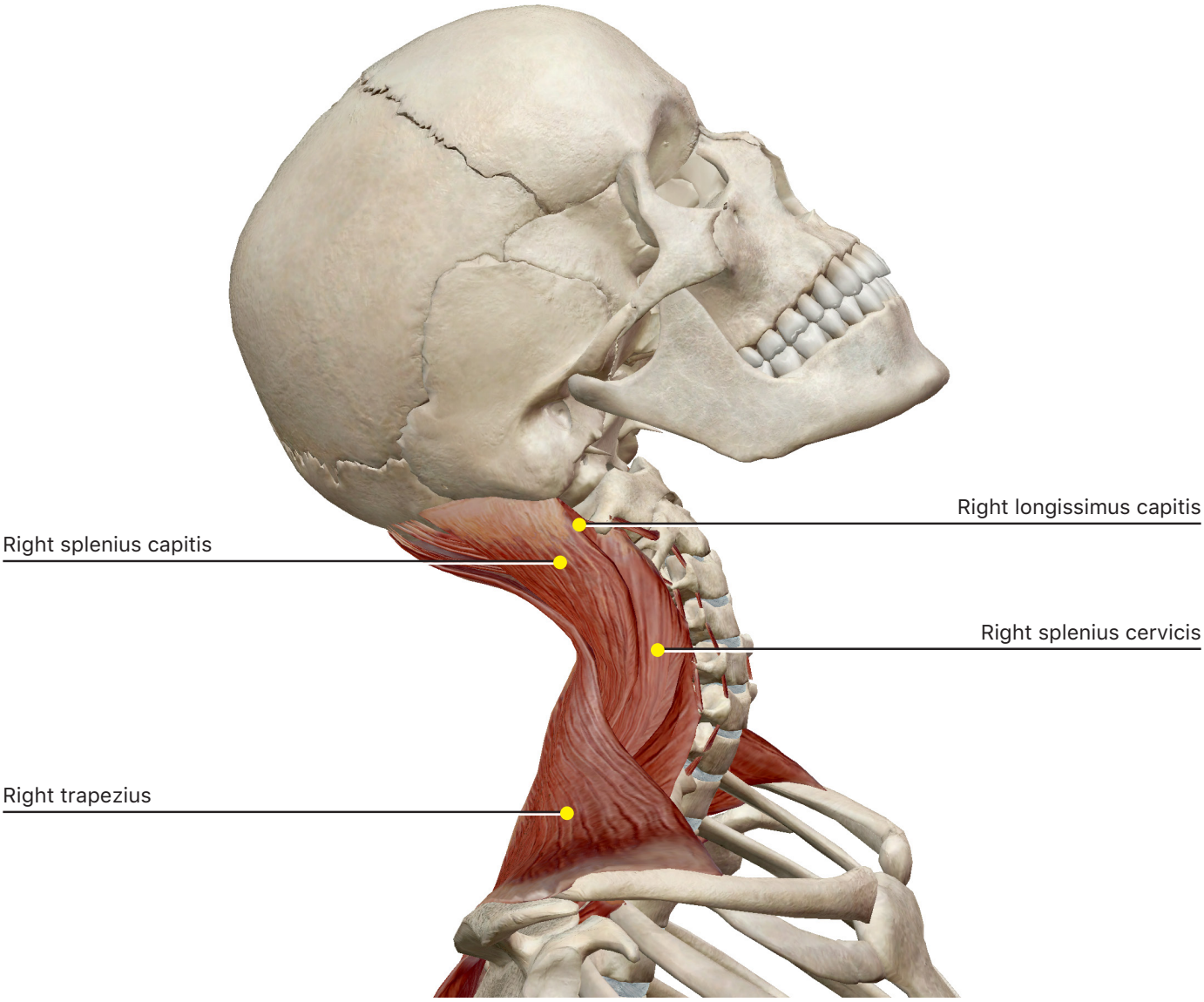
View the following Muscle Actions: Neck/head flexion, Neck/head extension, Neck/head lateral flexion, Head rotation (ipsilateral), and Head rotation (contralateral).

These muscles are located in the neck and move the head when they contract. It will again be helpful to pay careful attention to the location of the muscle and insertion to understand the action of each muscle. The muscle action videos will help you visualize how the muscles act during contraction.

Neck Muscles



Neck / Neck Extension



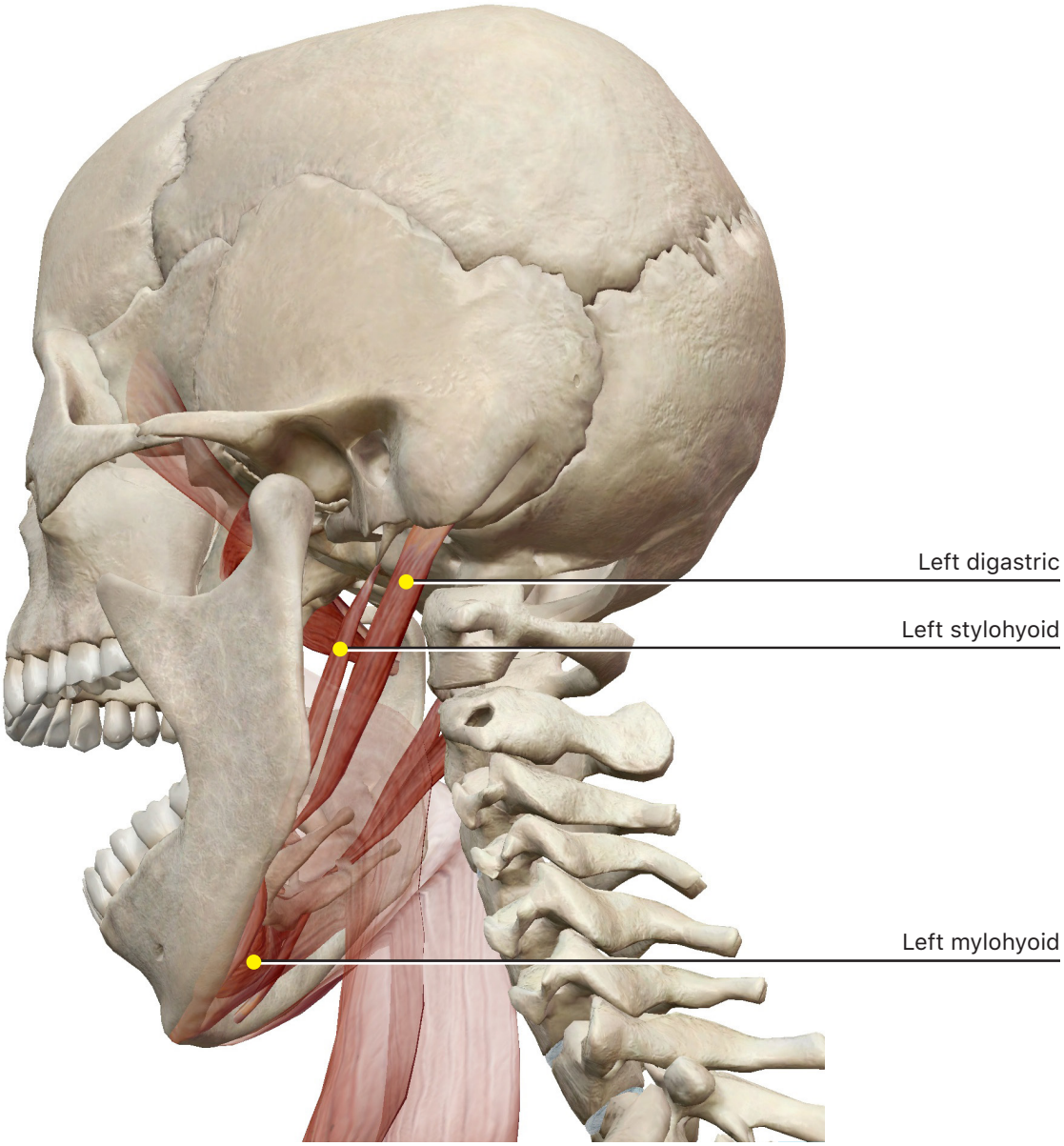
Neck Muscles				
Muscle	**Origin**	**Insertion**	**Action**	**Innervation**
Sternocleidomastoid				
Semispinalis capitis				
Splenius capitis				
Splenius cervicis				
Longissimus capitis				
Scalenes				
Trapezius				

G. Mandible Depression

Under the Views section, go to Systems: Muscular System Views and select 8. Mandible Depression.

These muscles attach to the hyoid bone– the only bone in the body that does not articulate with another bone. They participate in swallowing and moving the mandible.

Mandible Depression



Suprahyoid Muscles				
Muscle	**Origin**	**Insertion**	**Action**	**Innervation**
Digastric				
Stylohyoid				
Mylohyoid				
Geniohyoid				

PUTTING IT ALL TOGETHER

1. Based on what you've learned about the muscles in this exercise, what do you think the following terms mean?

a. Major

b. Minor

c. Levator

d. Depressor

e. Capitis

2. Which muscles are used when performing the following actions?

a. Smiling

b. Frowning

c. Raising the eyebrows

d. Expressing surprise

e. Whistling

f. Chewing

g. Swallowing

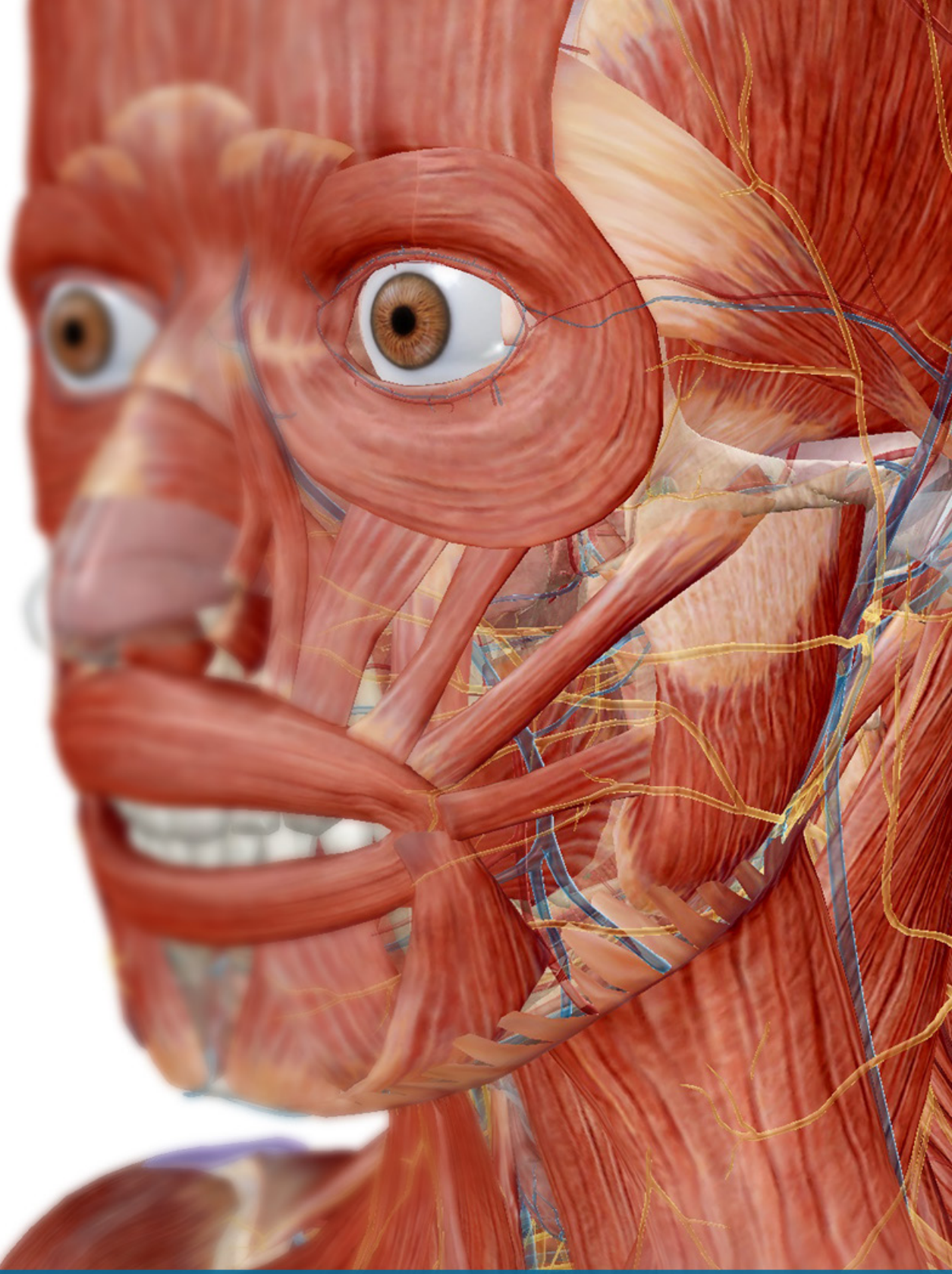
h. Nodding the head “yes

i. Shaking the head “no”

j. Tilting the head to look up toward the sky

k. Tilt the head to the side (bring the ear to the shoulder)

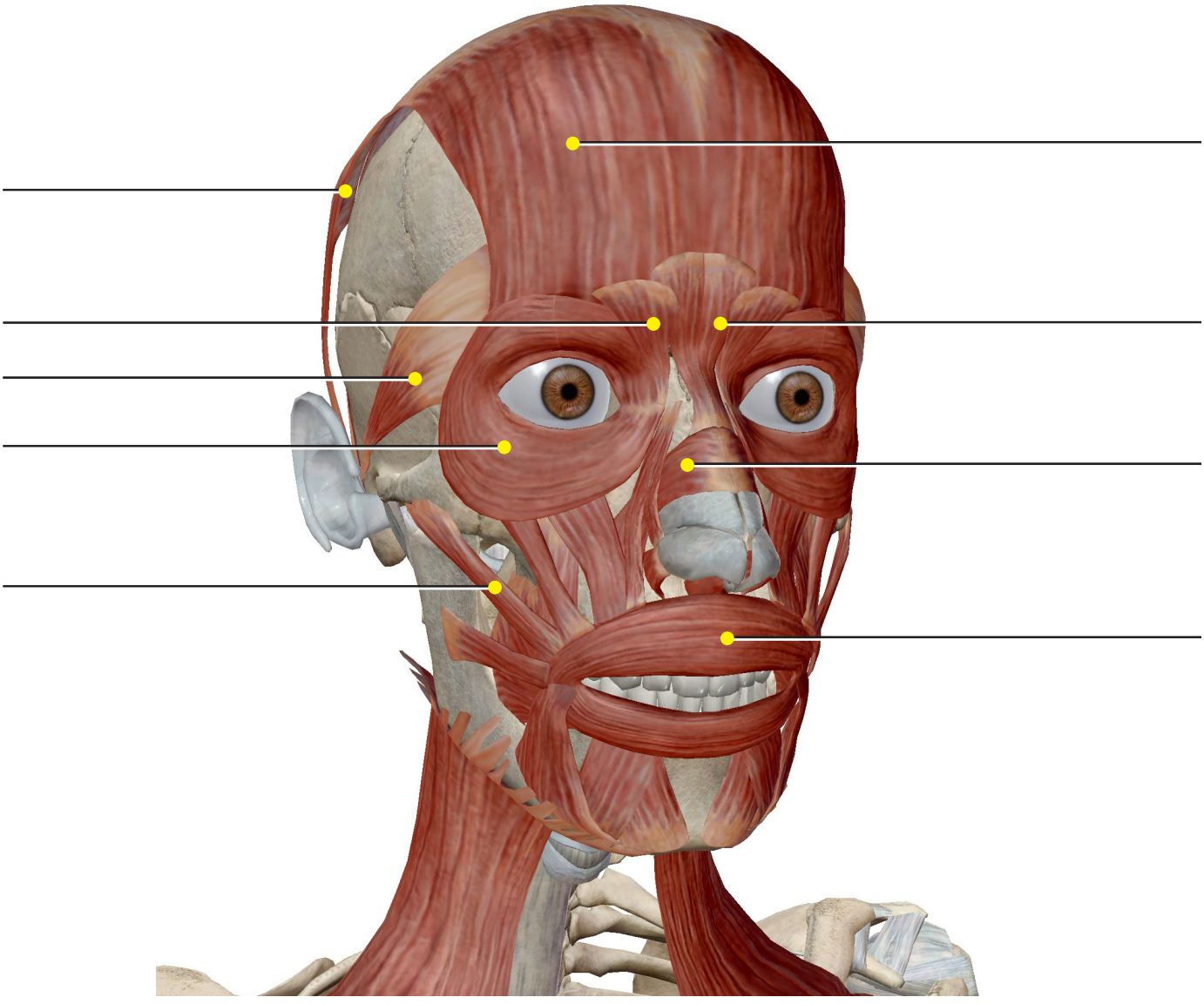
3. Bell’s Palsy results from damage to the facial nerves. If innervation to the facial nerves ceased, which muscles would be affected? Which actions of the face would be affected?



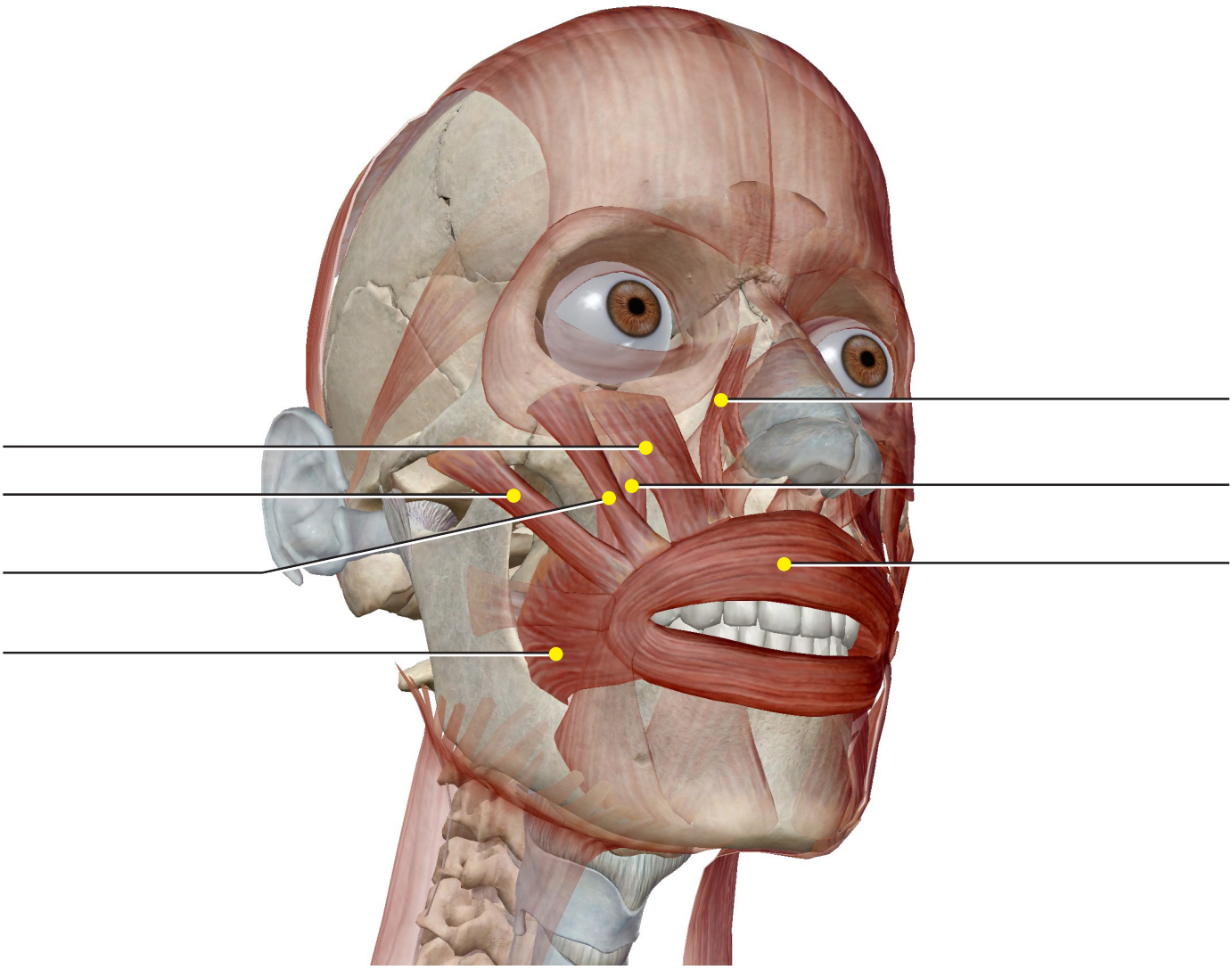
Student Practice

Label the muscles in the following figures

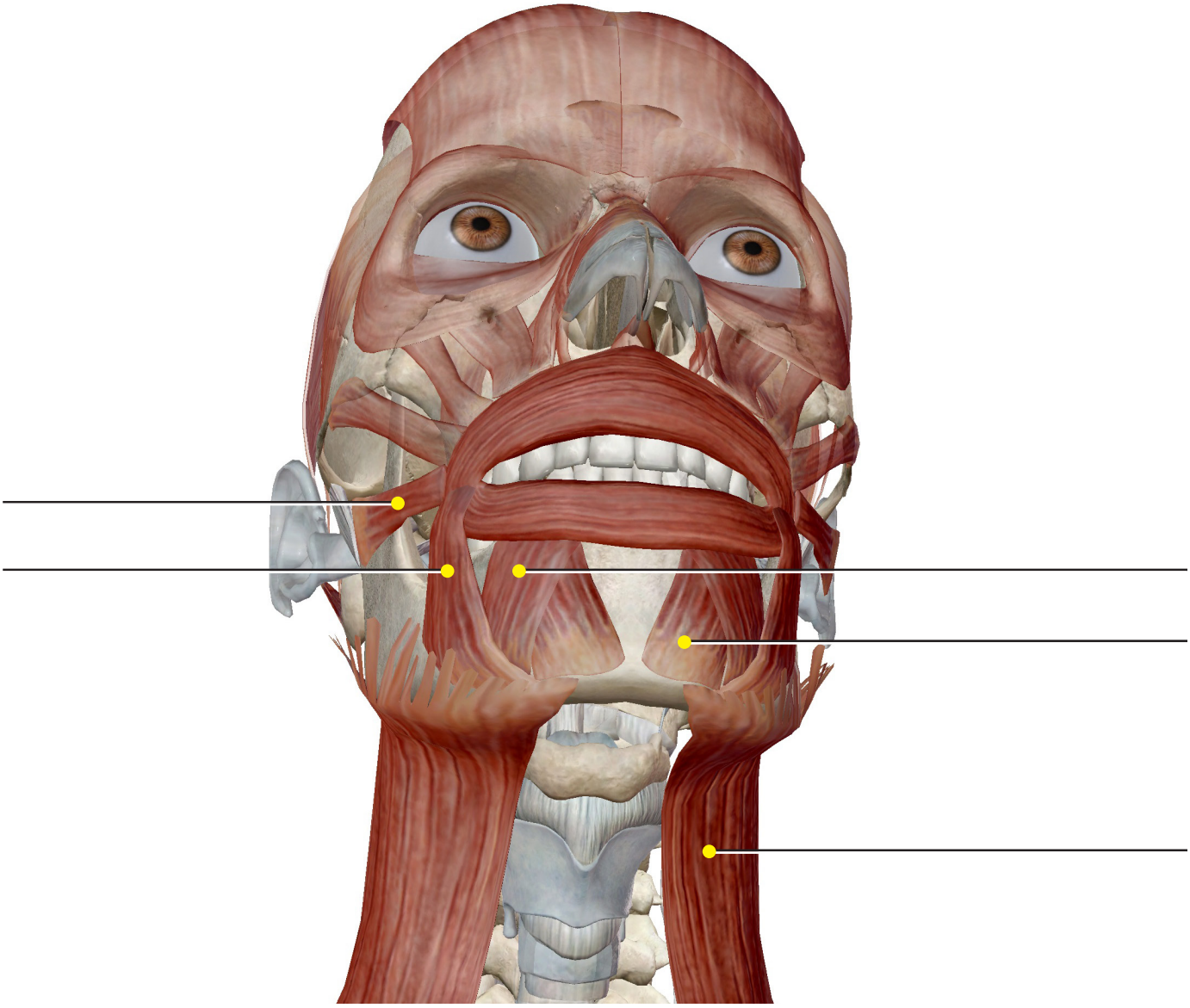
Muscles of Facial Expression



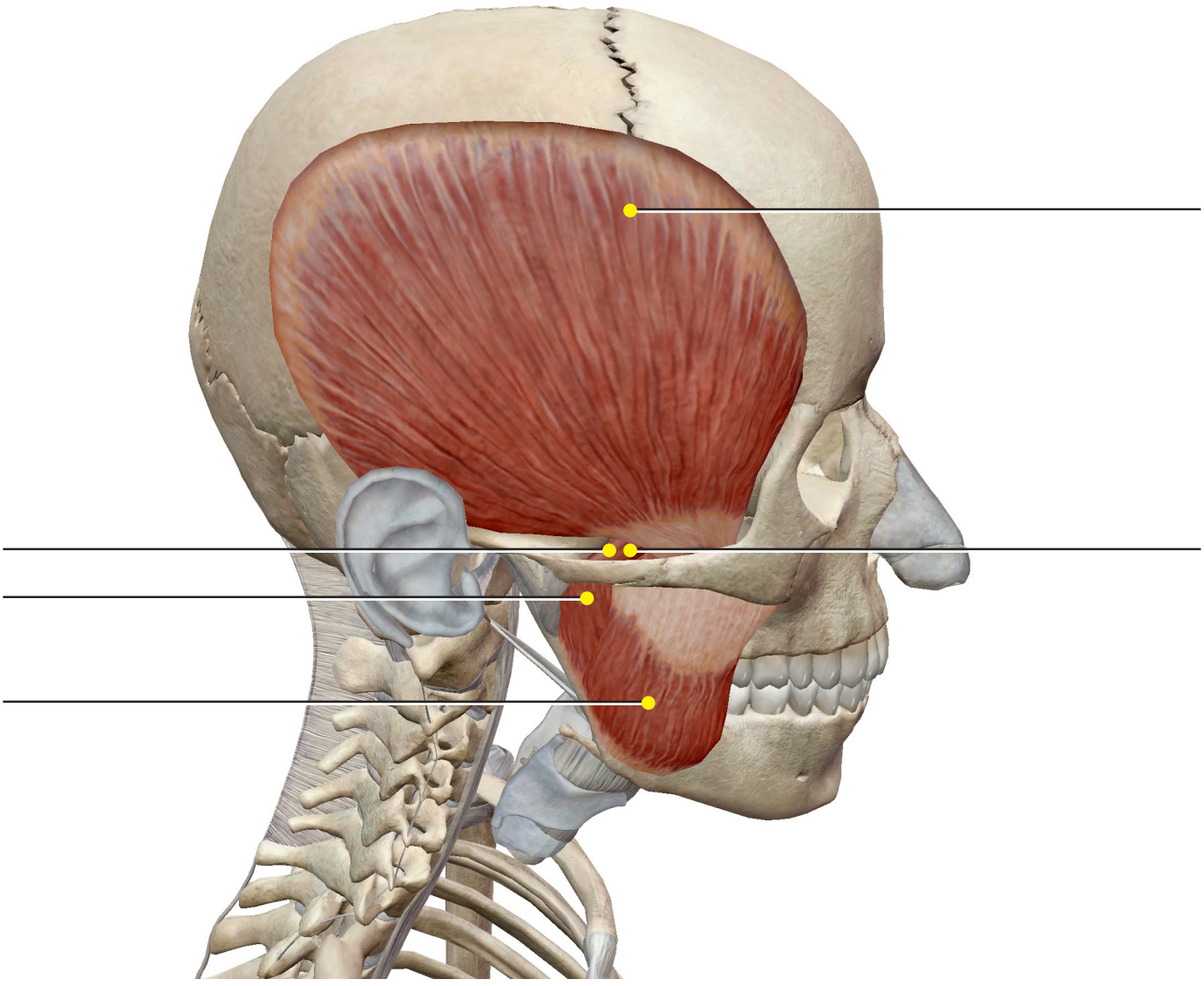
Muscles of the Upper Mouth



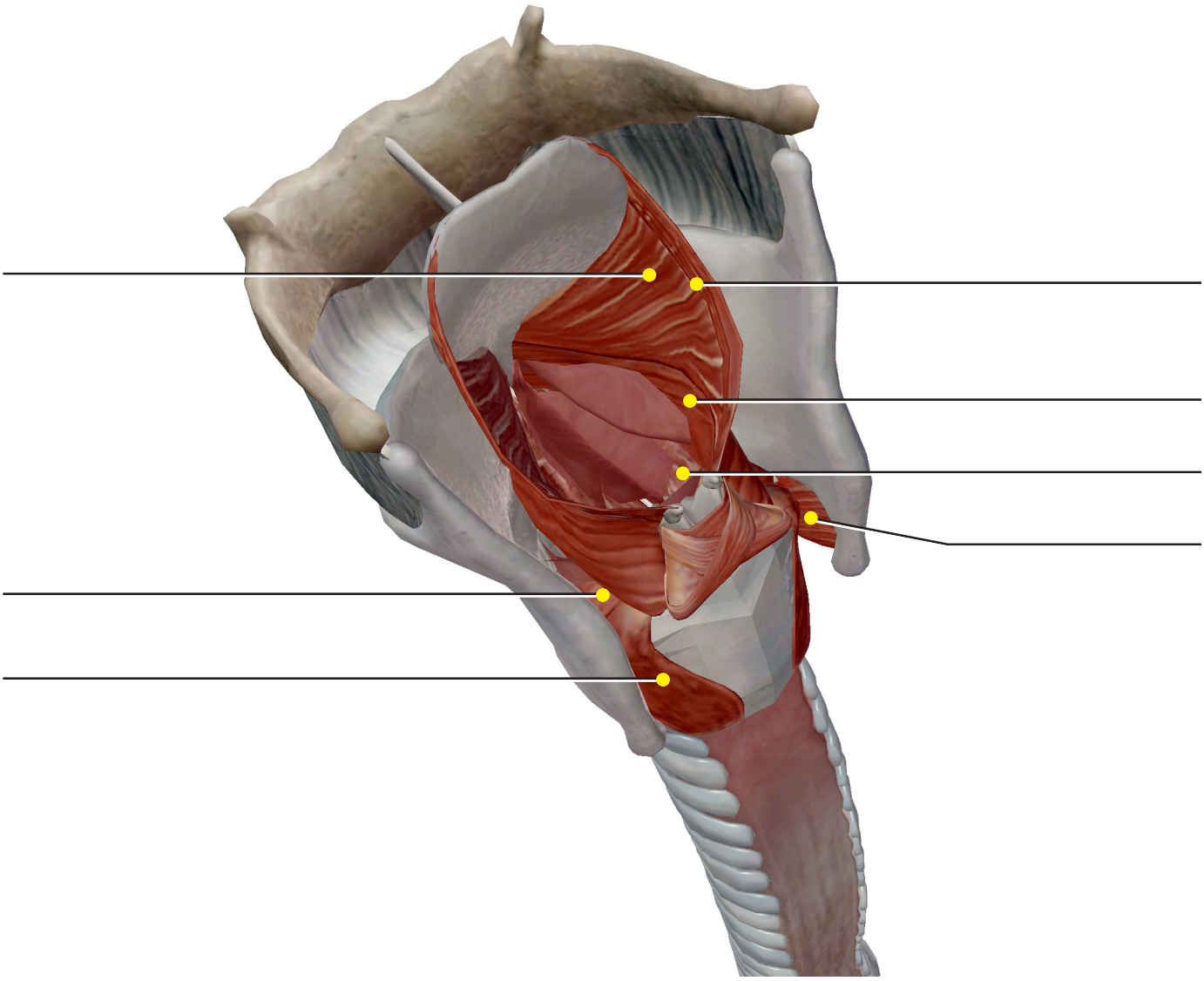
Muscles of the Lower Mouth



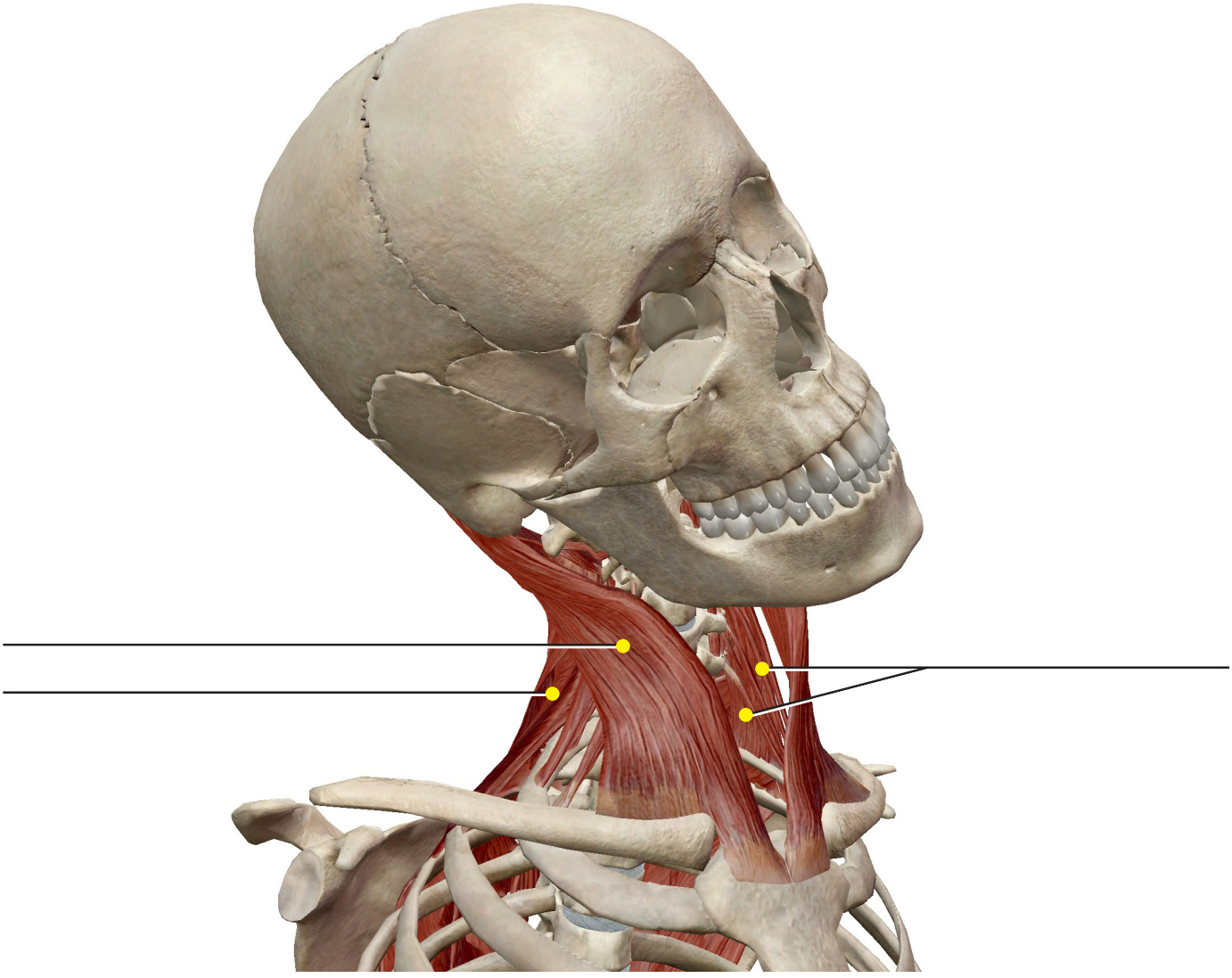
Muscles of Mastication



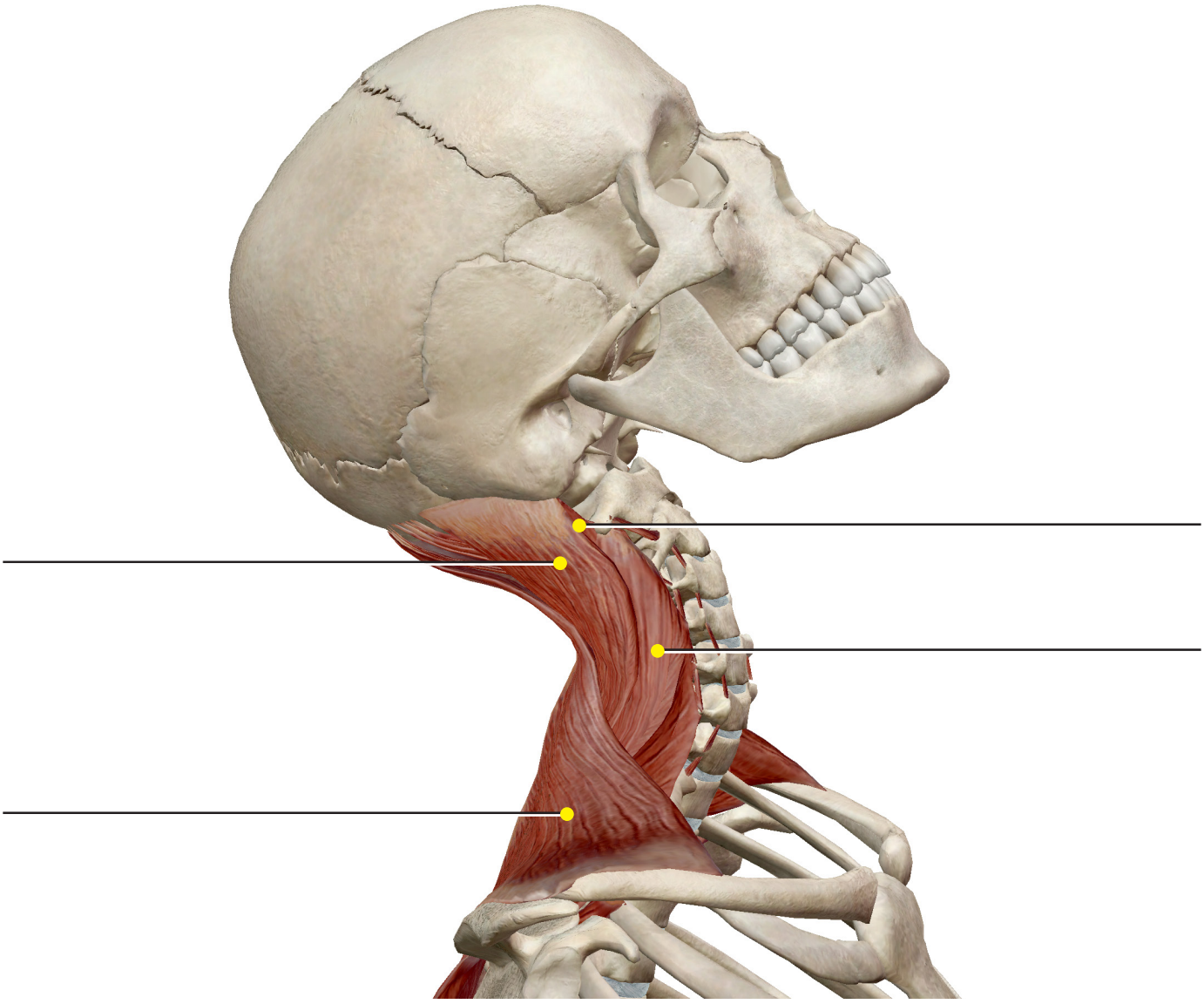
Laryngeal Muscles



Neck Muscles



Neck / Neck Extension



Mandible Depression