Uldis Zarins

Form of the Head and Neck

anatomy for professional artists

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ANATOMY FOR SCULPTORS

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About, History, Background

Find your own sandbox

Looking back, I can say I had very little clue about what I was doing in my first semester of sculpting studies at the Riga College of Applied Arts. The main emphasis was always on those endless exercises – just copying stuff, without any real understanding of the human form and how it is composed.

Before each new project, I always tried my best to find some information in text-cluttered anatomy books, which was confusing and time-consuming. Then, I drew small sketches so that I could better analyze the complex shapes of the human body. Through my studies and with time, I became much better, but my real breakthrough came when I found my sandbox for affordable experimenting. In my final year in the Art Academy of Latvia, I got an offer to participate in a sand sculpture festival in Finland.

That was a game changer in many aspects. I discovered that working with sand is fast and cheap. That helped me let go and experiment, since my mistakes weren't carved in stone, and they suddenly became a lot less expensive. I could make ten different sculptures in two days, each of them teaching me a lesson about human depiction – I was suddenly on a steep learning curve.

Besides that, at these international events, you meet many colleagues from all over the world. Apart from gaining new friends and becoming more fluent in English, it was a great way to discover how the sculpting problems that I was struggling with were being solved in other parts of the world with different sculpting traditions.

Peer pressure

Back home, I started to get frequent requests to share my reference sketches for different parts of the human body that I had made over many years. To do that, I created a small Facebook group which quickly snowballed – in the era of no Facebook ads, and the Anatomy for Sculptors community grew to 50 000 people in just a year.

The group members often urged me to compile my materials in some comprehensive volume. One day, in response to that, I suggested that I could make an app for sculptors! The answer was: "We don't need an app, we need a book." You might suspect what happened next.

The power of visualization

I thought about all those dreadful anatomy books with their menacing and unending text passages, and writing one of my own did not seem like such a good idea. But I had also come across one book that was helpful for understanding the human figure: Gottfried Bammes', Der nackte Mensch. The easy-to-follow visualizations set the publication apart from others (even though there was still too much complex text). Then it came to me: "I could indeed make a book. One that is image-centered!"

Neurologically, reading comprehension is a relatively new thing. It's a complex multi-stage process that requires vast cognitive resources. We see words printed on a page and assemble them into sentences. We try to decipher the thought that's put into the text. Only then we visualize the written, and all of that together requires a lot of brain activity.

The visual centers of the brain, on the other hand, have developed over a much longer period. Understanding things through seeing comes more naturally to us. That was another good reason to fill my book with more images.

Visual artists are visual thinkers. Most of us, me included, soak up information best when it is presented visually. In addition to that, I also have dyslexia, which often made reading medical anatomy texts difficult. I had to develop a very systematic approach for translating text into visual information. Searching for the best way to understand my own notes, I became better with visual communication, which is what the Anatomy for Sculptors books are all about.

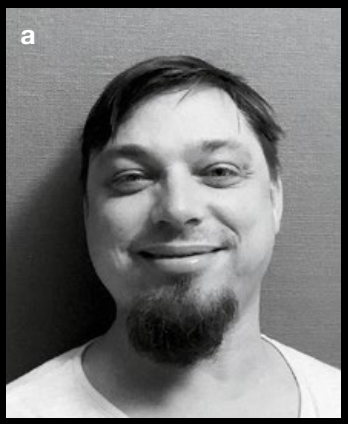
A concept alone doesn't make a book, though. Publishing is costly, and I didn't have that kind of resources to pay for a team of editors, printing house services, and logistics. In spring 2013, I launched a Kickstarter campaign, and the amazing Anatomy for Sculptors community came together and quickly crowdfunded the idea for the book. I had my work cut out for me.

The Form of the Head and Neck

Our first book, Understanding the Human Figure, was a general overview of the human physique (my friends from the international sand sculpting community helped immensely with making it). Afterward, came the Anatomy of Facial Expression, where we dived into mechanics of face muscles and the physiology behind different expressions.

The Form of the Head and Neck is all about morphology: the composition of all the complex surface shapes in a bust and how they vary depending on a person's age, ethnicity, gender, or body type. We reduce the forms of separate elements (mouth, eye, ear, etc.) to block-outs and reconstruct them gradually to give artists a true understanding of their forms. We believe that frees them creatively. As a student, I relied on my own sketches, where I had translated anatomy texts into images. Creating this book, however, I had the privilege of working with an awesome team of artists and medical experts. If I had had this kind of material when I started my studies in the art academy, my life would have been a lot easier. An artist doesn't have to remember every single anatomical detail, and you really shouldn't try to memorize all the contents of this book either. This is a handbook – use it to drive your own creative process forward!

WHAT MAKES THE FORM OF THE HEAD AND NECK SO SPECIAL



Homo sapiens have lived on this planet for at least 300 000 years. Humans have been able to cope with ever-changing environments and survive to this day mostly because of their ability to collect and analyze different kinds of information and adapt their behavior accordingly. A large part of this period we have spent in a social environment, communicating with other people.

The ability to speak (I don't mean the sounds used to express emotions, but meaningful articulated speech) doesn't go back more than 70 000 years[1] – almost nothing in comparison with the millions of years it took for our species to develop. It means that communication was non-verbal during most of human history. Usually, it was the body pose and hand movements that conveyed the message, and, since we're not covered with fur, the facial expressions were very important, as well. We learned to read people's faces, and the slightest shift in the form of the face wasn't left unrecognized.

The face is our most important tool for communication besides our verbal language. A large amount of information is encoded into those few inches of our skin, every tiny detail is important. Its capability of showing emotion is as precise as a finely made Swiss watch. But how fine-tuned are our expression-reading instruments, the eyes? What about our tool for analyzing visual information, the brain? – They're über-precise! Each little mistake could have cost the life of our ancient ancestors. That's why, when we see someone make a face, we recognize it without hesitation, as if without our conscious awareness. Our consciousness is indeed often left out. There is so much data to analyze that, if we'd consult our cognitive brain about every little impulse, we wouldn't have enough time to react. Information gets captured, analyzed, and our decisions are made without us even being aware.[2] A good example is the images above.

Can you guess which one of those two is a genuine smile and which one – a fake? Sure, you can! But can you explain it? If you're not trained for this, you might not have the right words for it. Consequently, if you as an artist do not have the language to explain it to yourself, you might also have difficulty recreating it in your artwork.

We're often even lacking the language to describe simple organic forms like a cloud, a rock, a puddle, or the shape of a pillow it takes in the morning. And you can be sure of one thing: the face is way more complex and way more charged with information than any of these simple things. Each tiny mistake gives a totally different impression to the human portrait. Hence, in order to draw or sculpt a human face, we need to adapt our language or invent a new one – a kind of language that will enable us to communicate with ourselves. In other words, TO THINK.

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[1] Lieberman, P. (1975) *On the Origins of Language*, New York, MacMillan

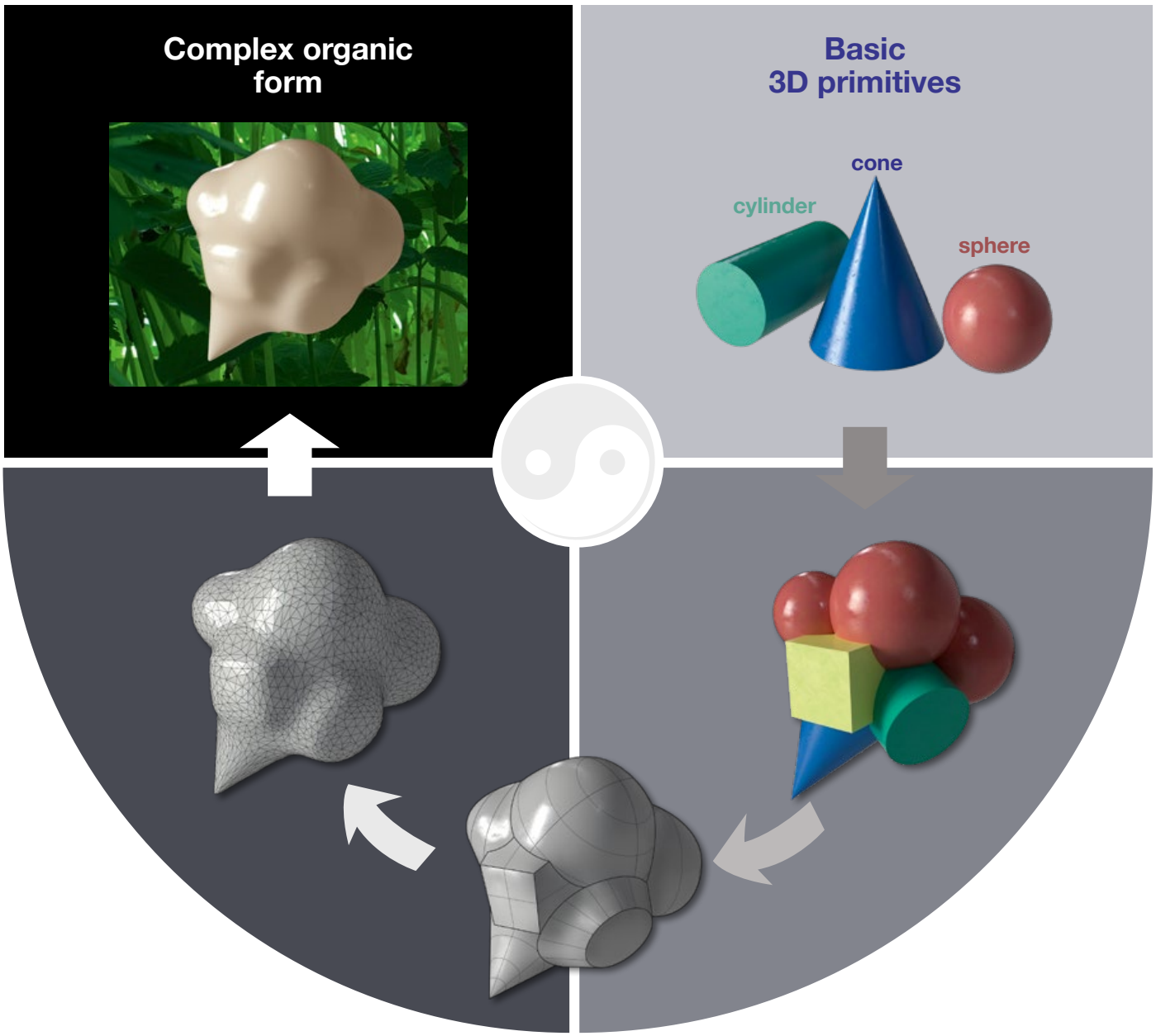
[2] Srinivasan, R., Golomb, J. D., Martinez. A. M. (2016). *A Neural Basis of Facial Action Recognition in Humans*. *Journal of Neuroscience*; 36 (16)

THE METHOD

What is the best we can build on? What do we have already? We have the language of geometry. Skip the thousands of similar no-name polygons. We will begin with something much simpler.
We will use the basic 3D geometry primitives, the shapes that each have their own distinct name and form that everyone understands. We'll be using a cone, a cube, a sphere, a cylinder, etc.
By combining these primitives as words in a language and gradually increasing complexity, we will explain myriad complex organic forms.

Chaos — **Order**

overwhelming — boring



Chaos is not the lack of order, it is merely the absence of order, that the observer is used to. /Mamur Mustapha/

Art is order, made out of the chaos of life. /Saul Bellow/

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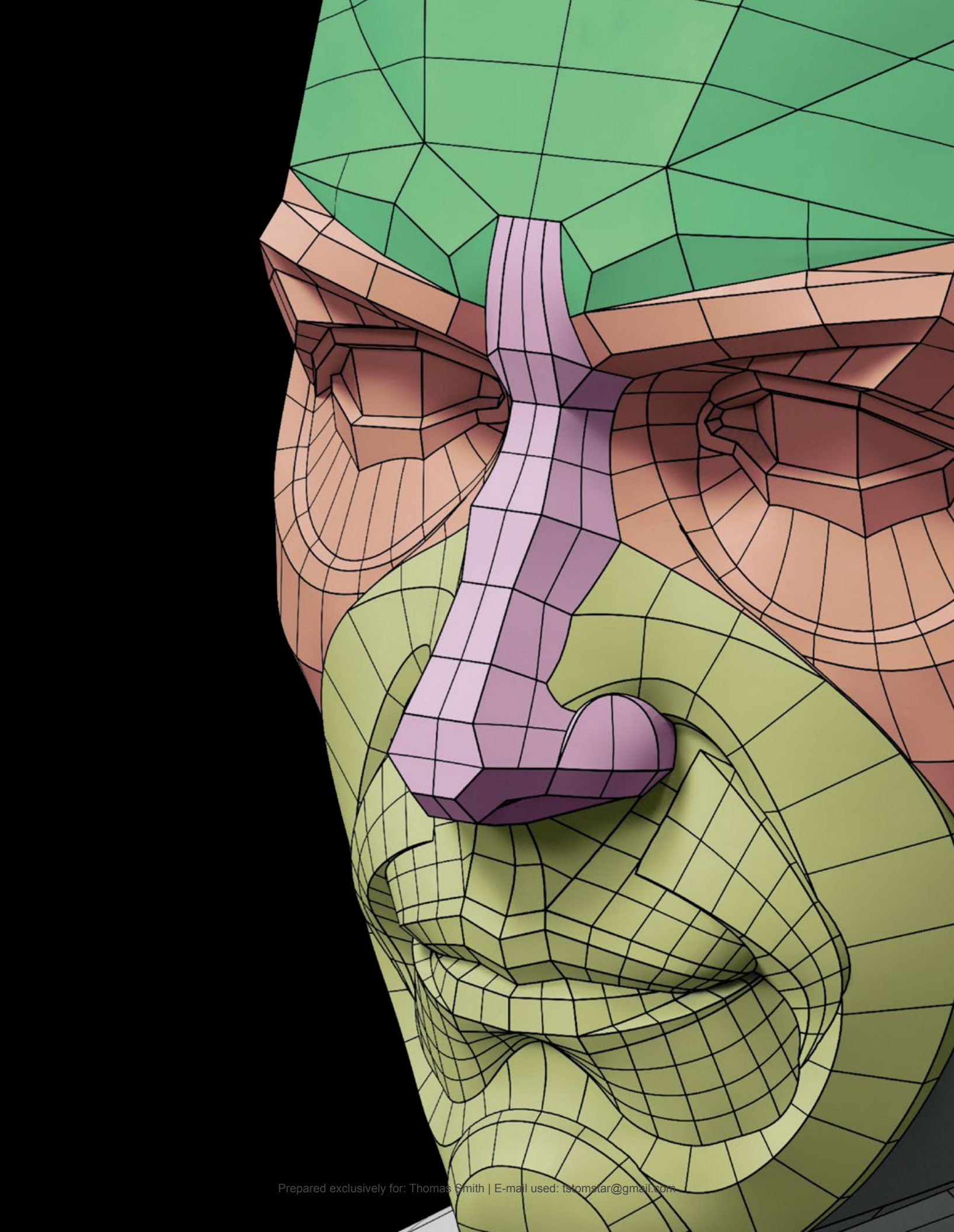
Head



WHY IT ALL STARTS WITH THE SKULL?

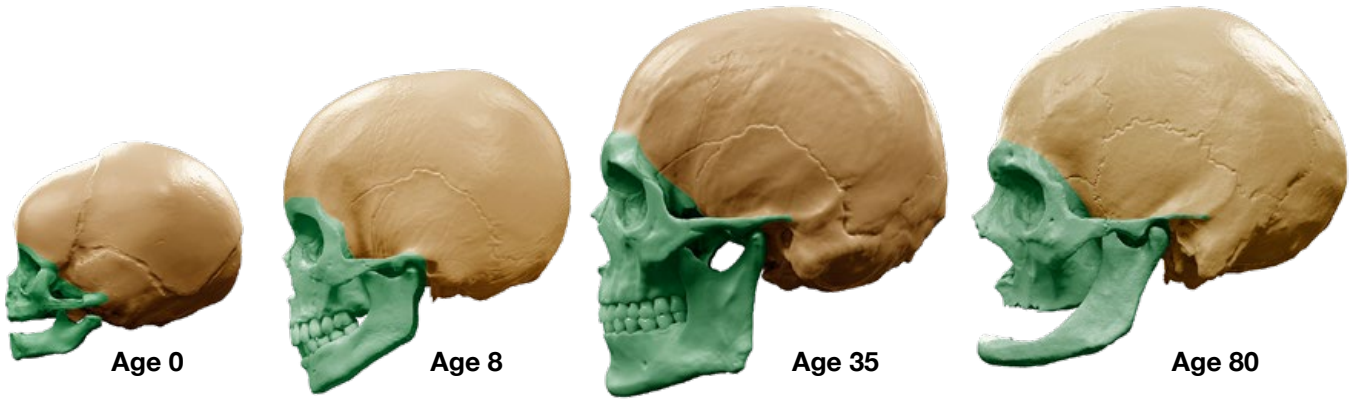
The skull defines the main shapes of the head. It can be roughly divided in two main parts: the **facial skeleton (viscerocranium)** and **braincase (neurocranium)**.

BRAINCASE (Neurocranium) forms the cranial cavity that surrounds and protects the brain and brainstem. **Braincase** is formed from the occipital bone, two temporal bones, two parietal bones, the sphenoid, ethmoid and frontal bones; they are all joined together with sutures.

FACIAL SKELETON
Supports the soft tissue of the face. The viscerocranium consists of 14 individual bones that fuse together. **The facial skeleton** contains the vomer, two inferior nasal conchae, two nasal bones, two maxilla, the mandible, two palatine bones, two zygomatic bones, and two lacrimal bones.

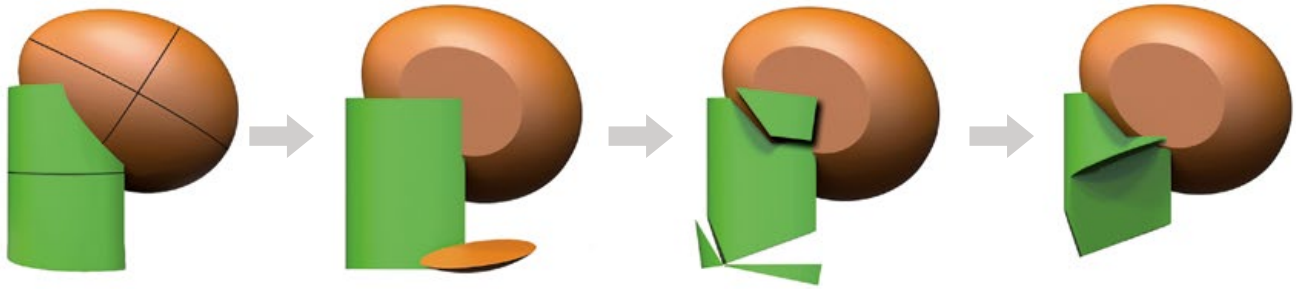
PROPORTIONAL CHANGES

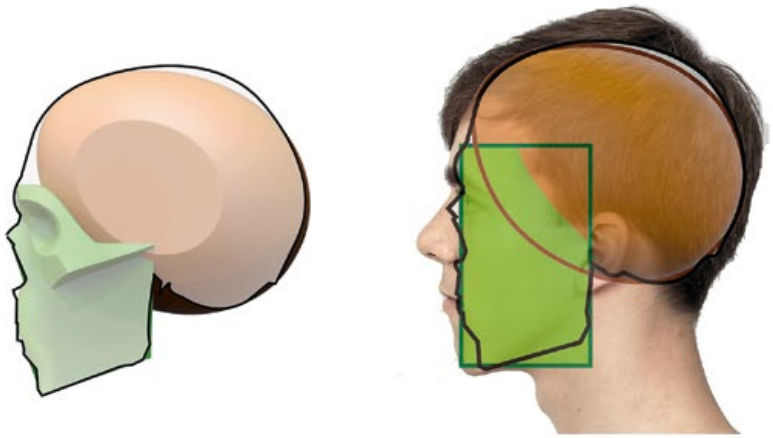
Facial skeleton and braincase proportion changes during development and aging. In adulthood, the facial skeleton is the largest size and, in old age, its size mostly decreases. This happens due to reduction of the mass of the mandible (lower jaw).



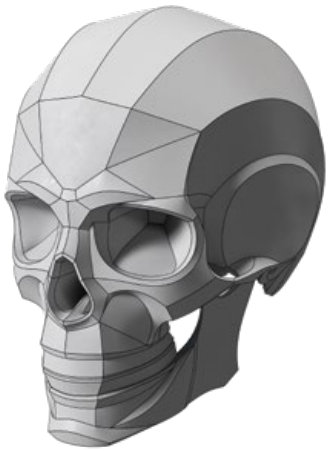
THE EGGHEAD

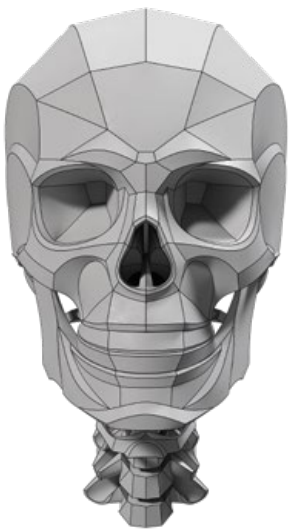
The **braincase** can be simplified to a tilted egg, and the **facial skeleton** – a shaved cylinder.

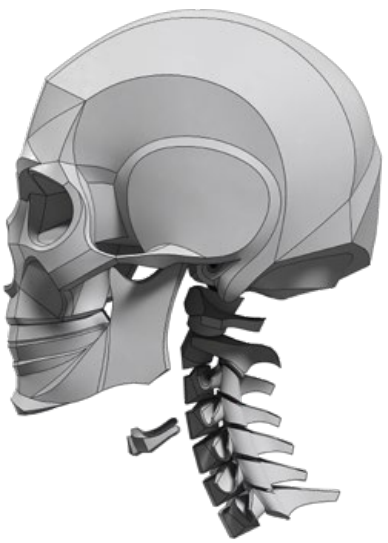




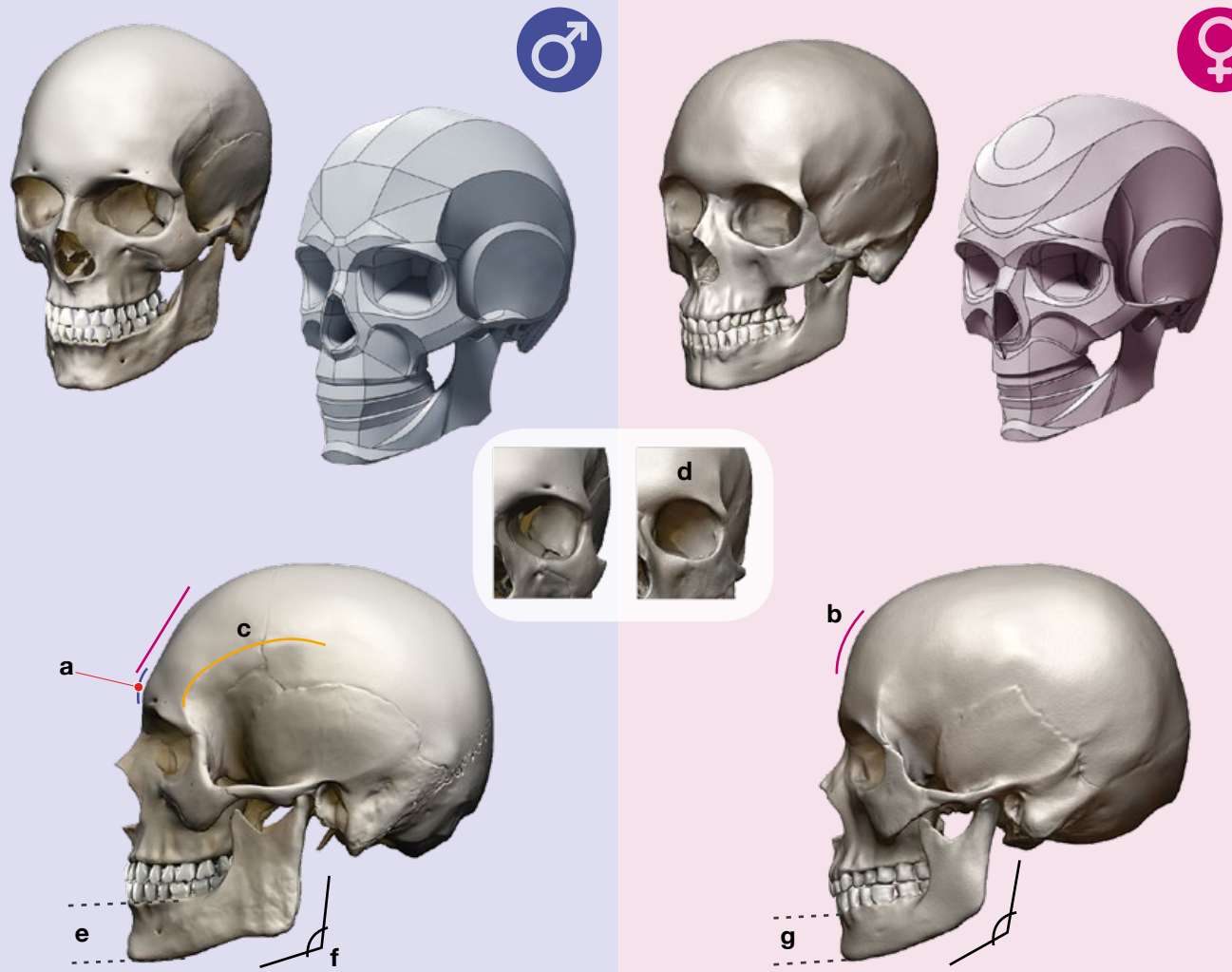
FORM OF THE SKULL







MALE AND FEMALE SKULL DIFFERENCES



Overall: The female skull is more gracile and relatively smaller than the male skull.

Forehead: Male skulls have a more prominent glabella and brow ridge (a), it makes the forehead look more flat and oblique. The female forehead instead is high, more vertical and rounded, because of the larger frontal eminences (b).

Temple: Male skulls have more prominent temporal lines (c).

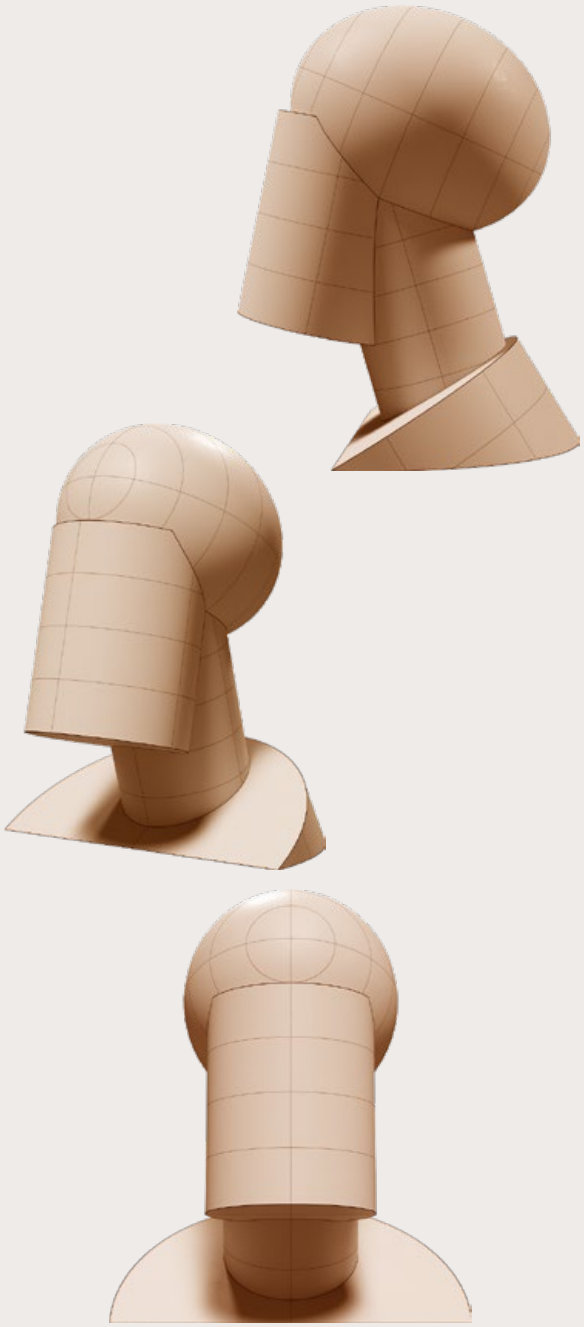
Eye orbits: Female skulls have rounder orbits with sharper supraorbital edges (d).

Jaws: The male chin is broad and more square, the mandible body is wider (e) and with a steeper angle (f). In males, the angle could be 90 degrees, but is usually 100–120 degrees. In females, this angle is wider and can go up to 120–140 degrees. The female chin is more rounded and pointed, jaws are narrower (g).

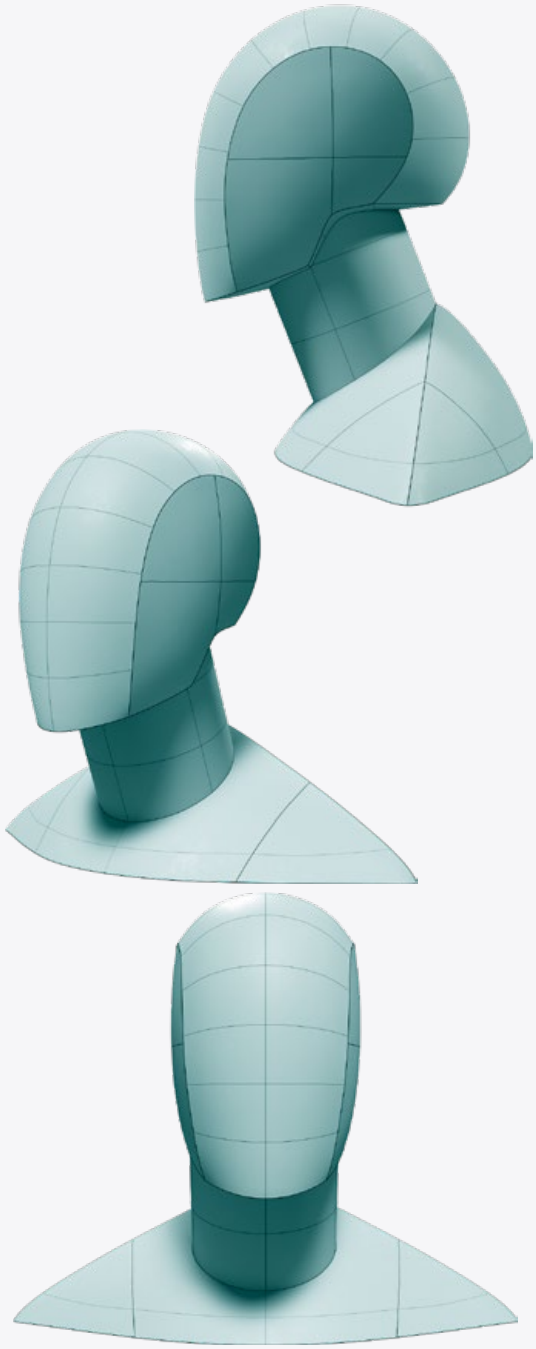
BASIC SHAPES OF THE HEAD

In the sketching phase, when you need some sort of base, you can use one of the simplified versions – head and neck. Here are two commonly used among artists. **The egghead** – it is constructed from two cylinders, and a twisted egg, or **the helmet head** – which is basically a smoothed-out head and neck without any details and and looks a little bit like a motorcycle helmet.

THE EGGHEAD



THE HELMET HEAD

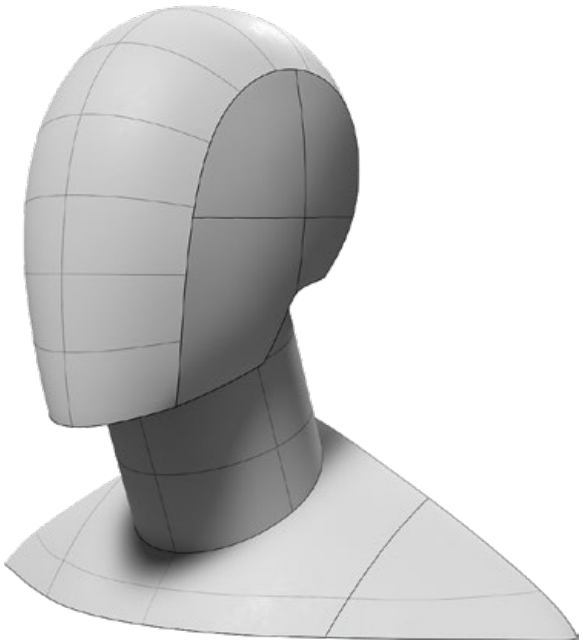


BASIC SHAPES OF THE HEAD

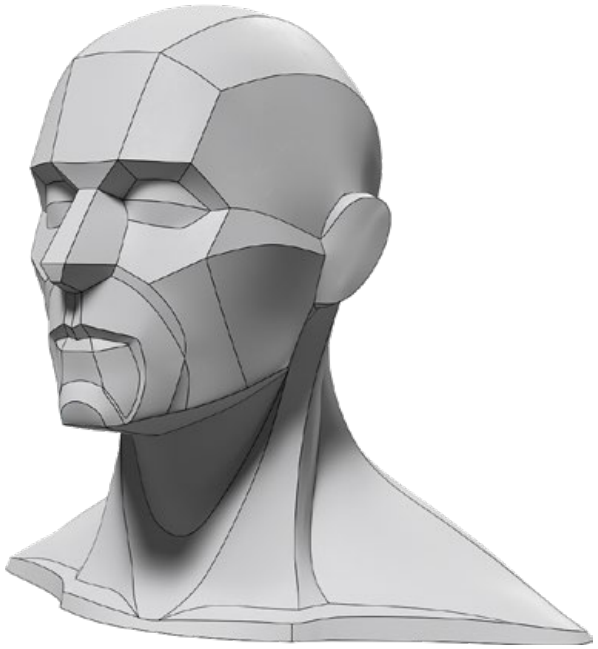
Simple to complex method in action

Using this method in the process of creation is rather a way of thinking about the form, not workflow or the steps you need to take.

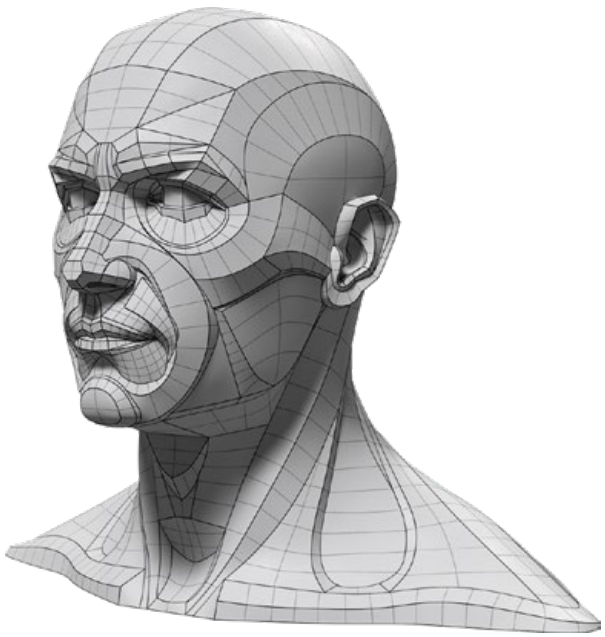
The helmet head



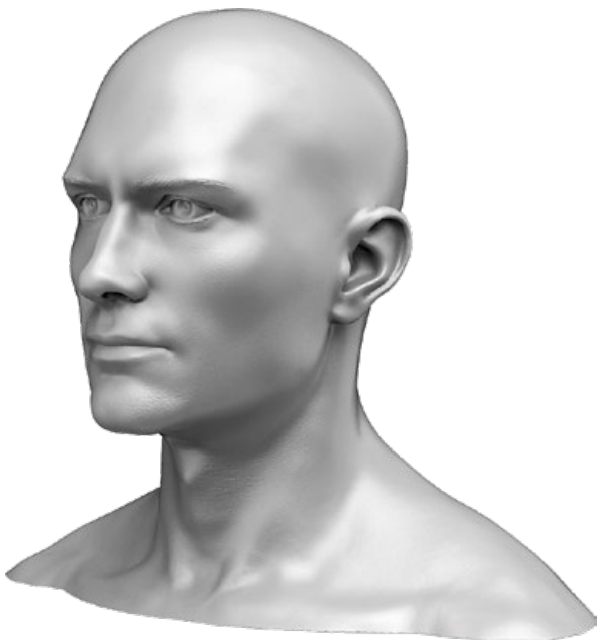
1st level block-out



2nd level block-out



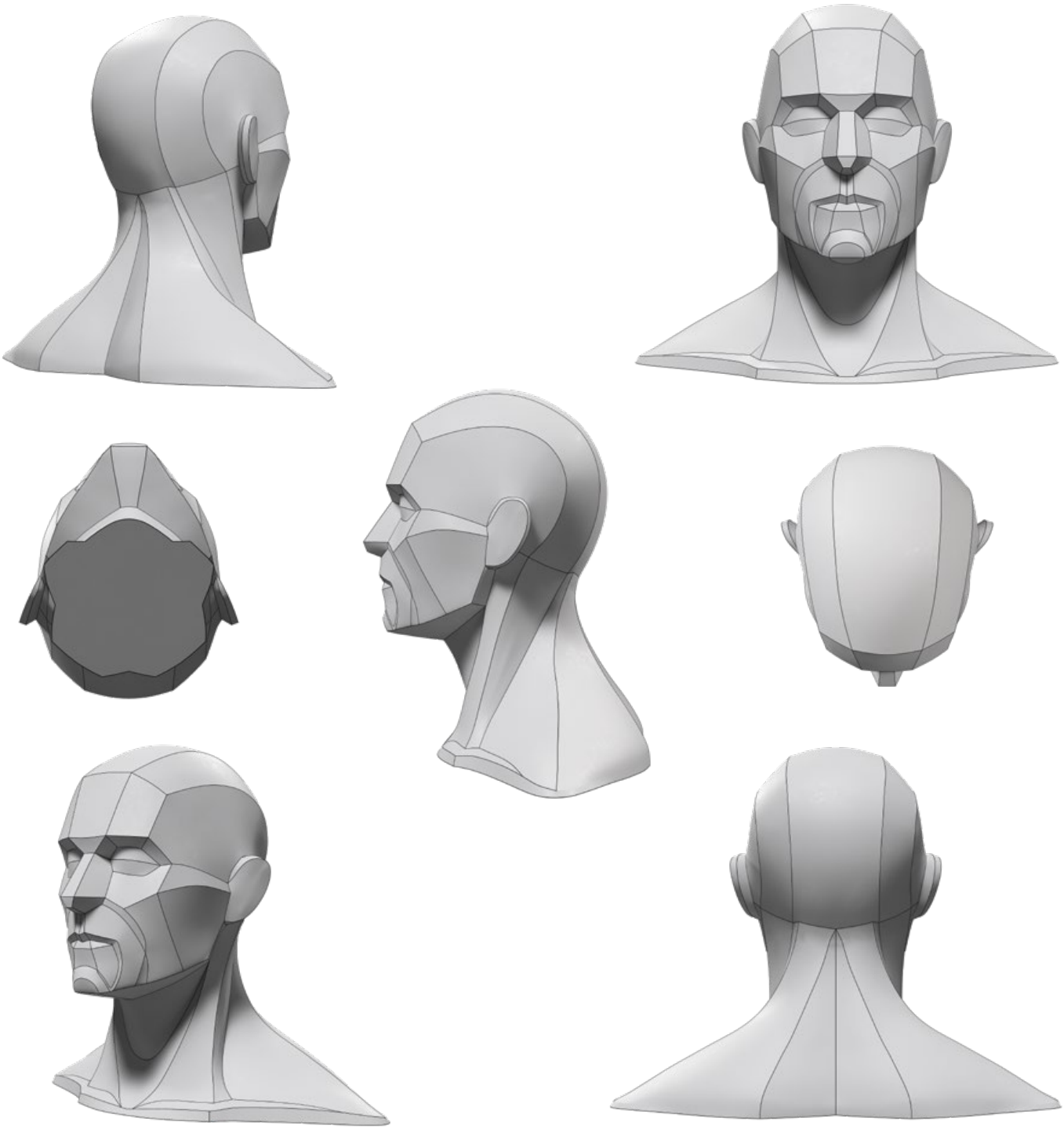
Realistic finish



MAIN SHAPES OF THE HEAD

1st level block-out

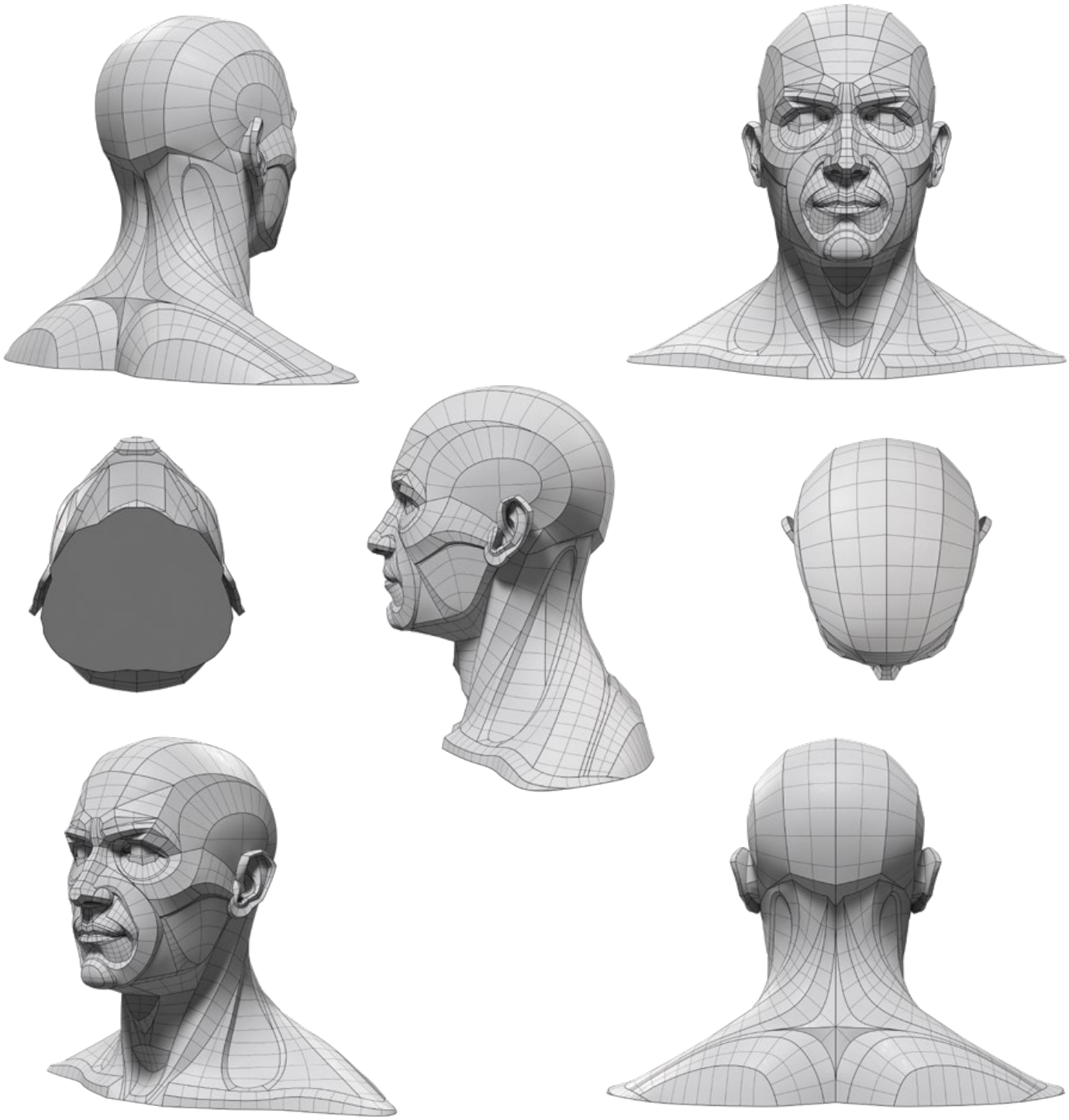
The next level after the helmet head is to block out the main features of the face and neck; all elements of the head start to be noticeable.



MAIN SHAPES OF THE HEAD

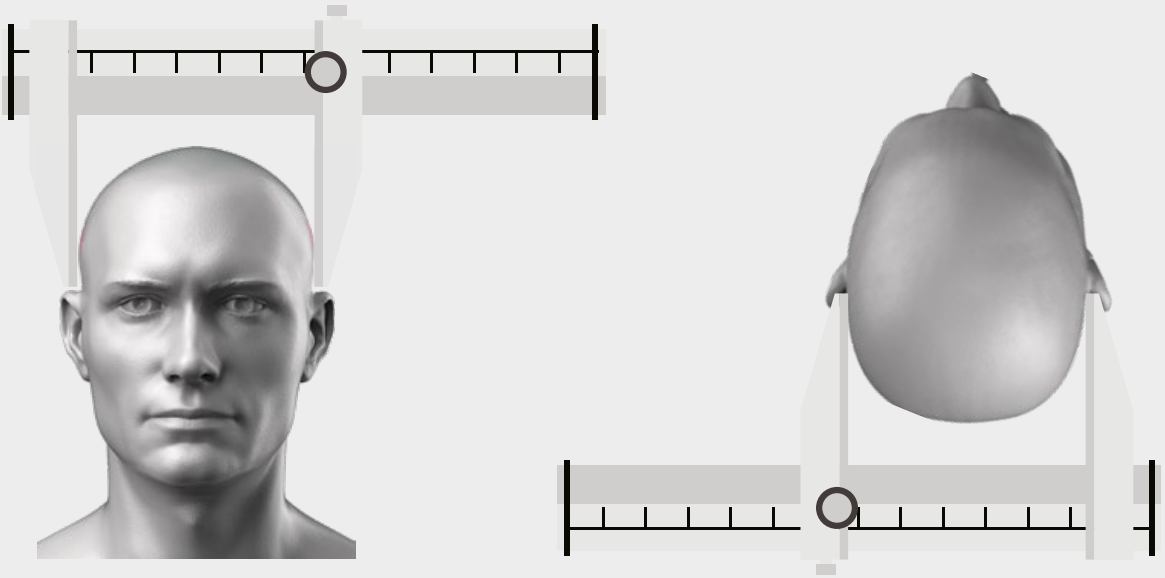
2nd level block-out

This is a more detailed block-out. The elements of the head, such as the ears, mouth, and eyes, are more detailed.

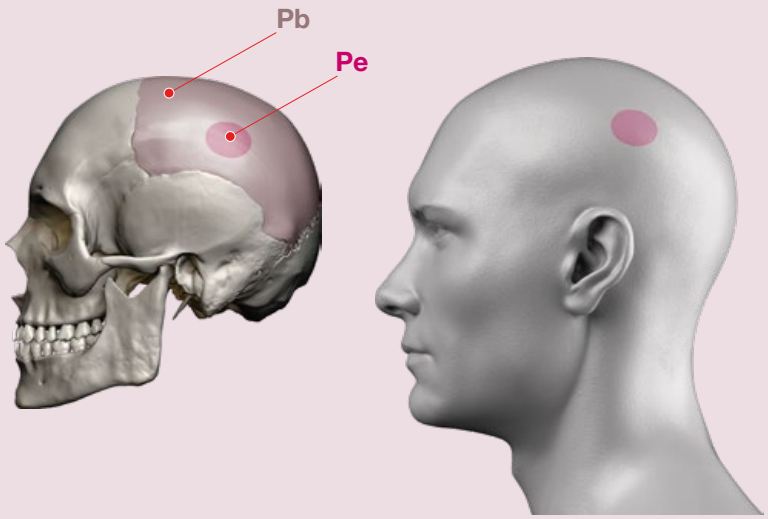


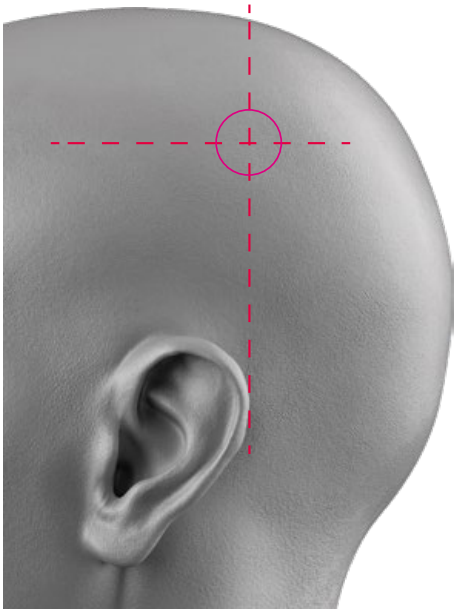
HEAD BREADTH

The widest part of the head is between the two **parietal eminences**.



Each **parietal bone** (**Pb**) presents a prominent bulge, called the **parietal eminence** (**Pe**), near the central portion of its external surface. The width of the head should be measured at this point because it is **the widest point of the head.**

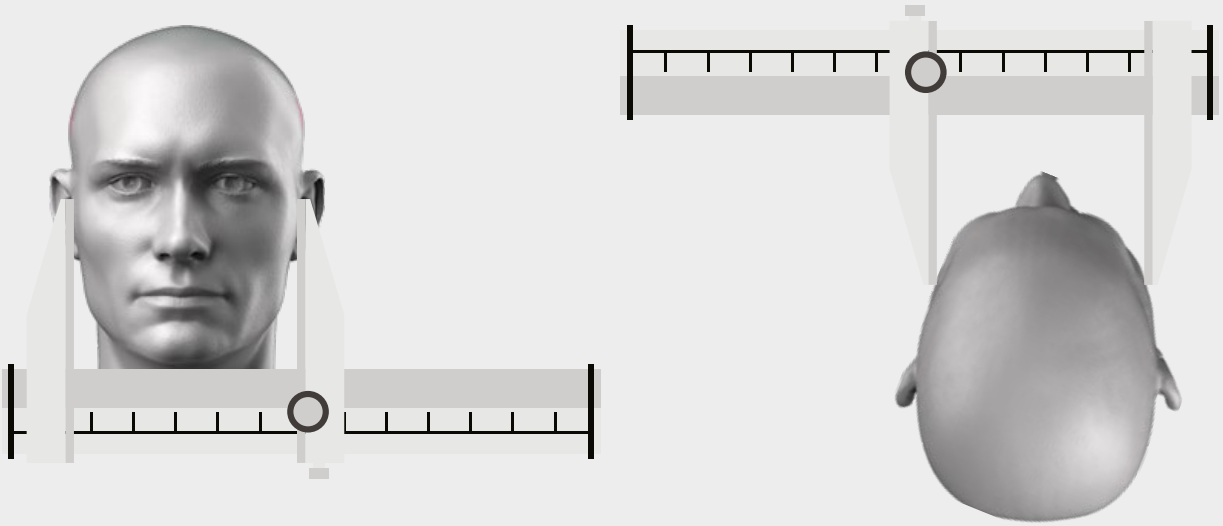


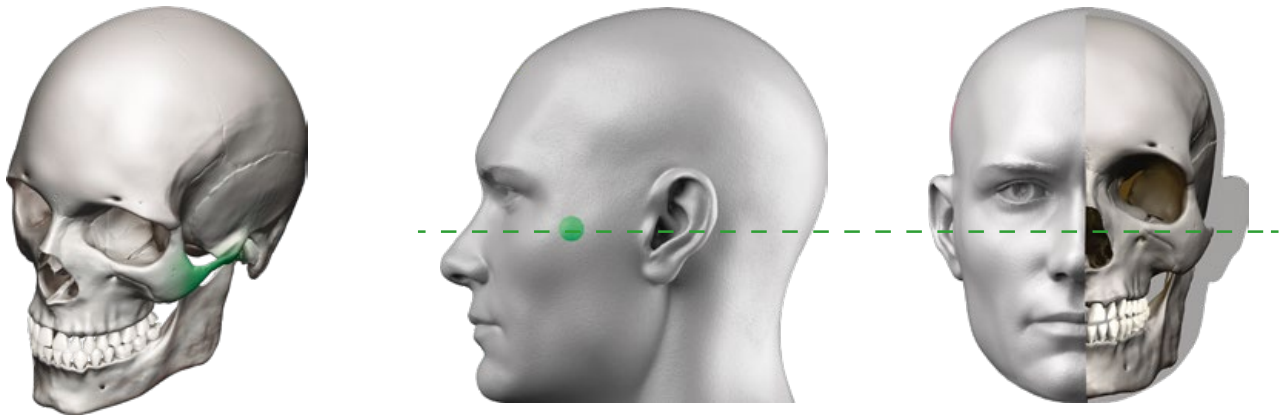


The maximum breadth of the head, usually above and behind the ears.

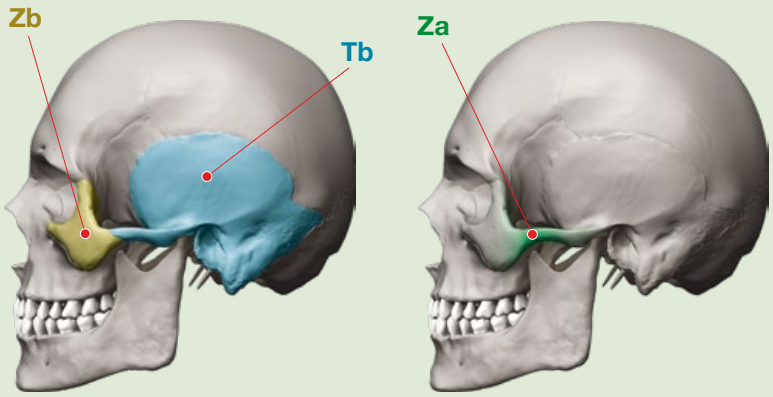
FACE BREADTH

The widest part of the face is between the two **cheekbones**.





The breadth of the face, measured across the most lateral projections of the **cheek bones** (**zygomatic arches**).
In anatomy, the **zygomatic arch** (**Za**), is a part of the skull formed by the zygomatic process of the **temporal bone** (**Tb**) (a bone extending forward from the side of the skull, over the opening of the ear) and the temporal process of the **zygomatic bone** (**Zb**).

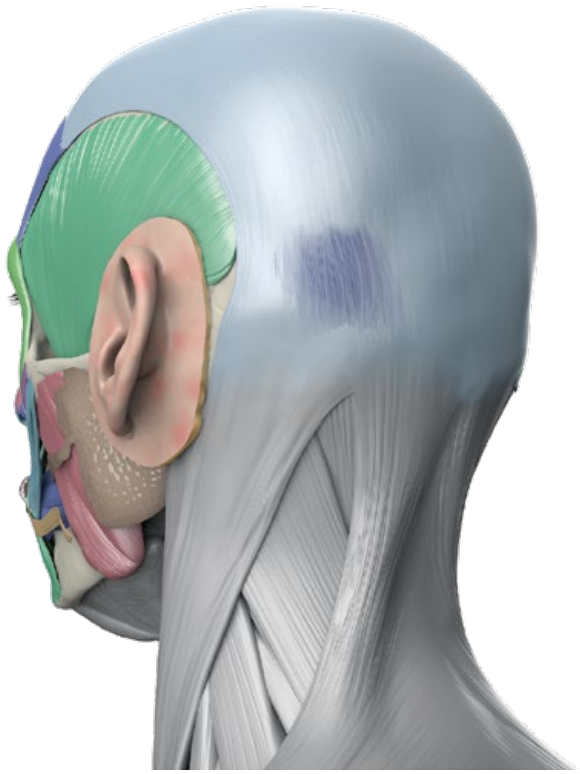


ANATOMY OF THE HEAD

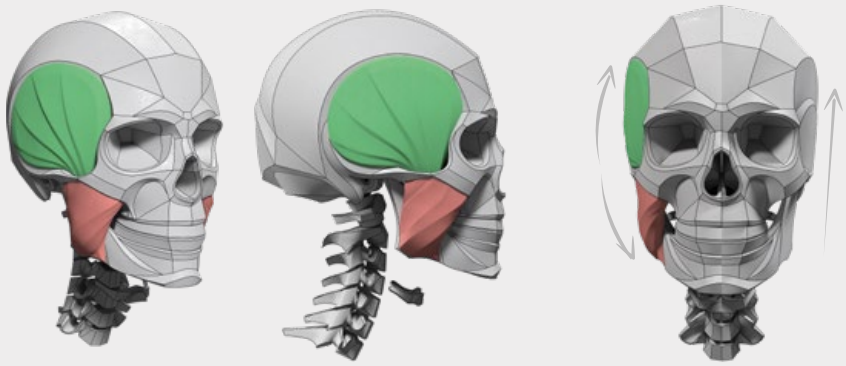
Skeleton of the head

ANATOMY OF THE HEAD

Muscles of the head



MUSCLES WITH VOLUME



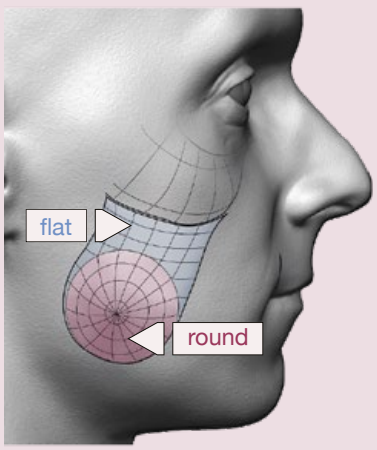
Unlike the muscles of facial expression, major chewing muscles (or mastication muscles) have significant volume. These four muscles form the roundness of the head. There are two pairs of **major chewing muscles** – **temporalis** and **masseter**.

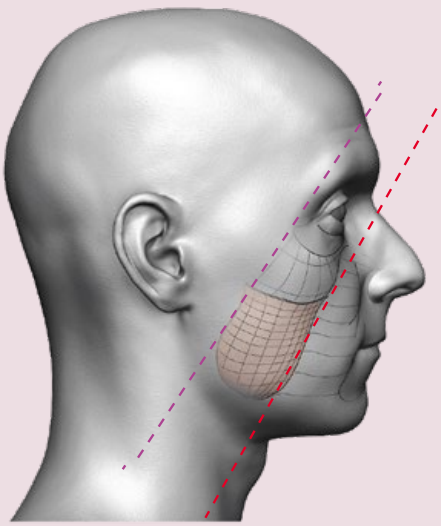
Masseter

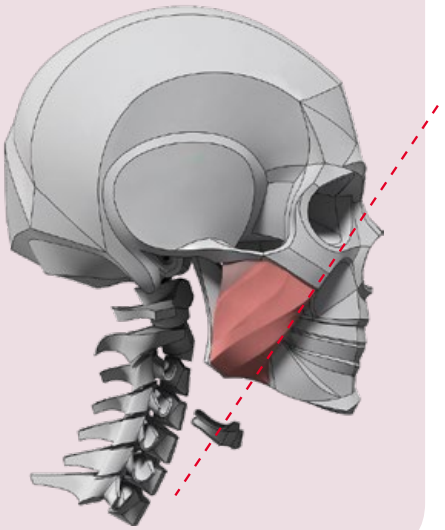
The **masseter** is the strongest and one of the most important cheek muscles. It helps you raise your lower jaw, which allows you to close your mouth and chew. It is a rectangularly-shaped muscle with two parts (superficial and deep). The origin of the masseter muscle is the inferior border and surface of the zygomatic arch. It inserts onto the masseteric tuberosity, located on the outer surface of the mandibular ramus.

Relaxed

Contracted

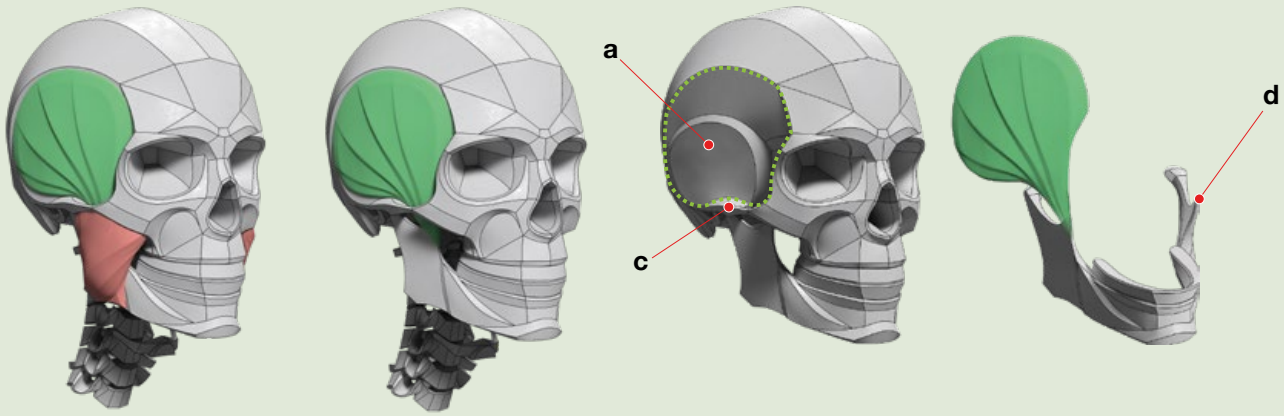




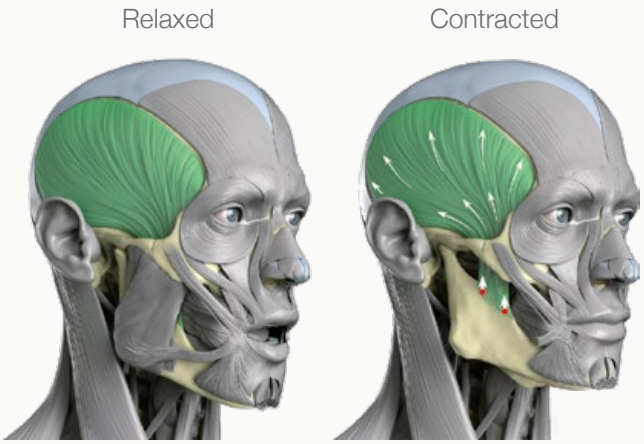


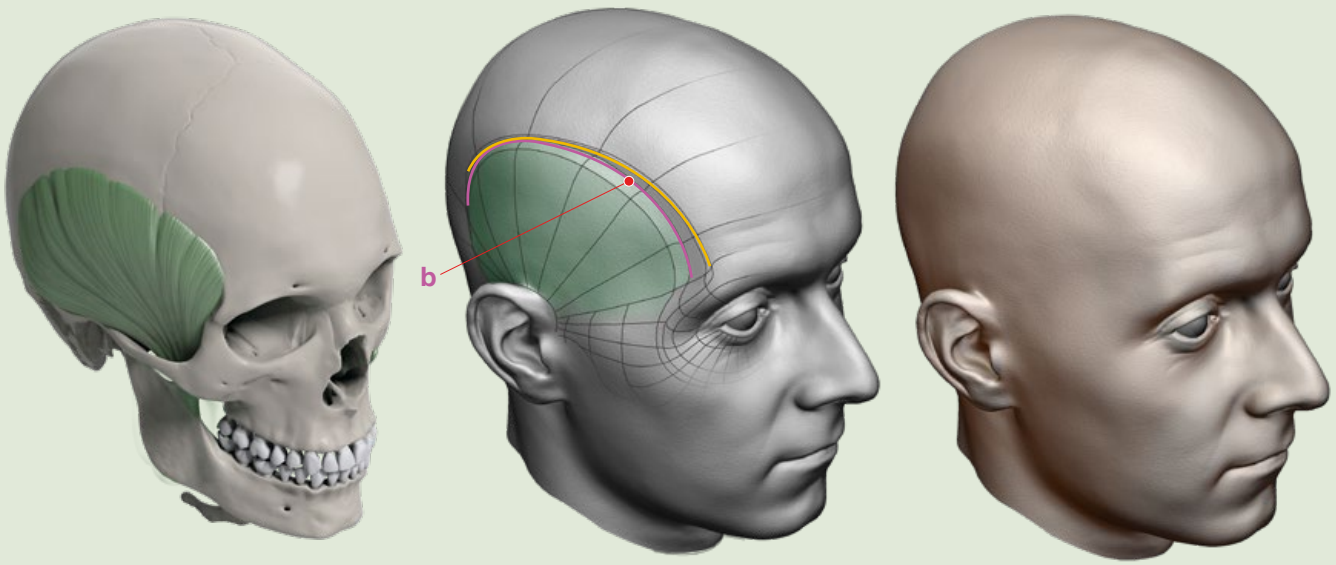
MUSCLES WITH VOLUME

Temporalis



Temporalis muscle is a fan-shaped muscle. The origin of the temporalis muscle spans from the **temporal fossa** (**a**) and temporal fascia to the **inferior temporal line** (**b**). The temporalis muscle fibers converge, forming a tendon that passes underneath the **zygomatic arch** (**c**) and inserts on the **coronoid process of the mandible** (**d**). The function of the anterior and mid-fibers of the temporalis muscle is to elevate the mandible. The posterior fibers of the temporalis muscle retract the mandible.



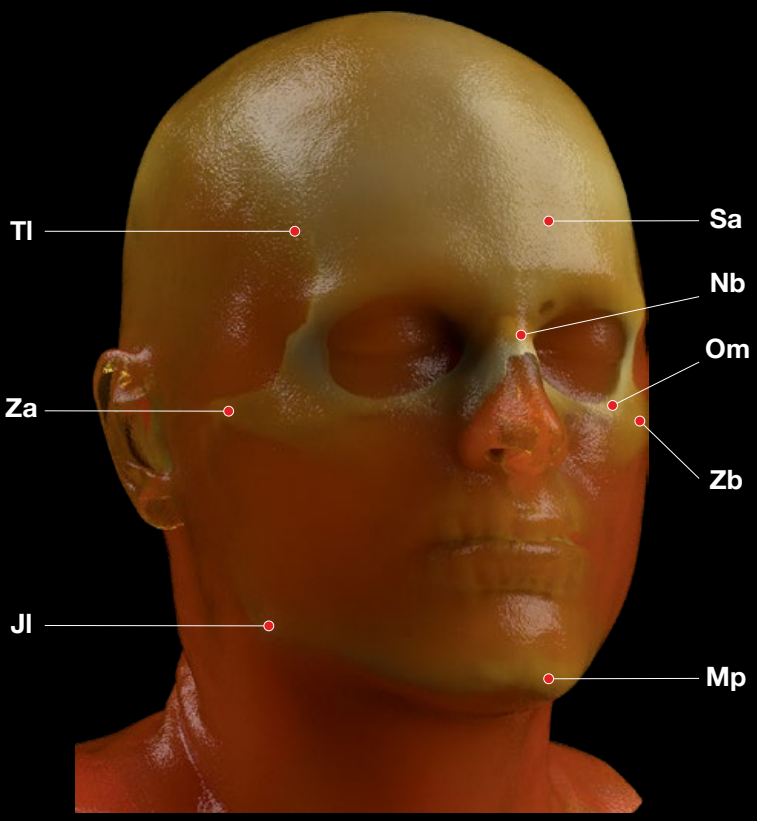


BONY LANDMARKS OF THE HEAD

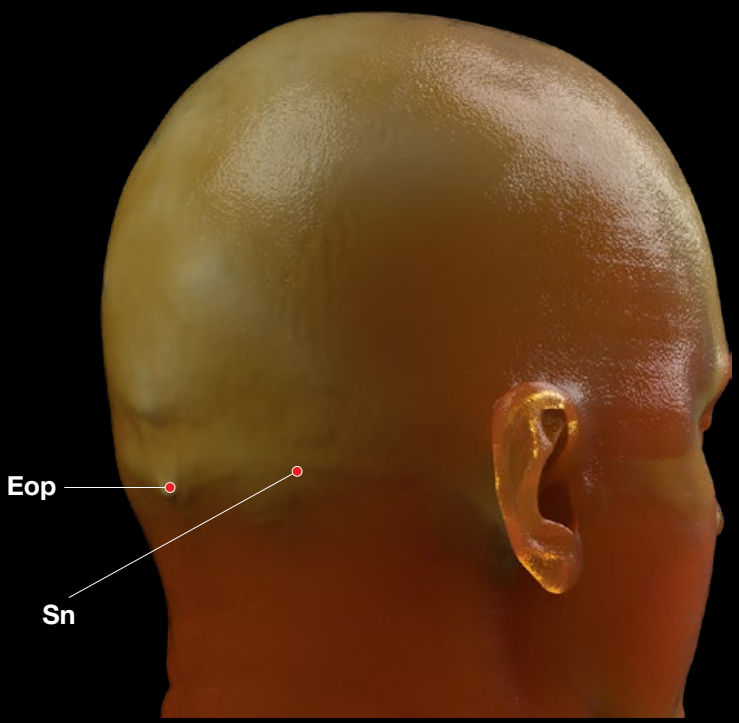
Soft tissue thickness and the positioning of facial structures based on de-personalized CT volume renders.

Understanding the relationship between the skull and the facial soft tissue has major relevance for building anatomically correct models. Facial soft tissue thickness, measured as the distance from the skin surface to the most superficial surface of the underlying skeletal tissue at specific landmarks, provides an important criterion for the evaluation of anatomical consistency.

BONY LANDMARKS OF THE HEAD



Tl	Temporal line
Sa	Superciliary arch (brow ridge)
Nb	Nasal bone
Za	Zygomatic arch
Om	Orbital margin
Eop	External occipital protuberance
Sn	Superior nuchal line
Zb	Zygomatic bone
Mp	Mental protuberance
Jl	Jawline (base of the mandible)



EYE AREA

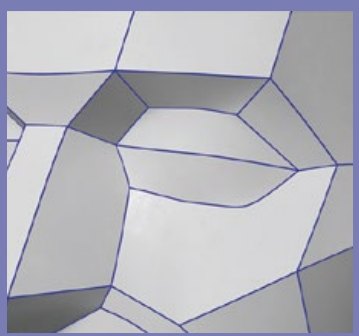
You can't look at the eye separately from the face. Eyes, similar to other elements of the face, are in context; everything in the face is somewhat connected and in constant interaction with each other and surrounding structures.

Complexity levels

Similarly, as we divide basic forms of the head, the eye area is also broken down into complexity levels. **1st level**: correct location of the eye, only the basic shapes of the eye, no details yet, **2nd level**: more complex block-out, all main details are present. **3rd level**: polished realistic finish.

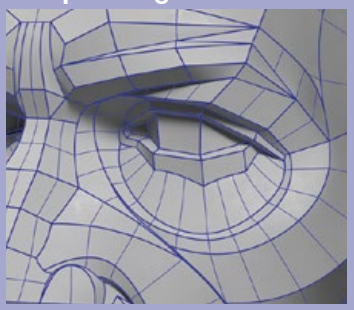
1st level

simplified block-out

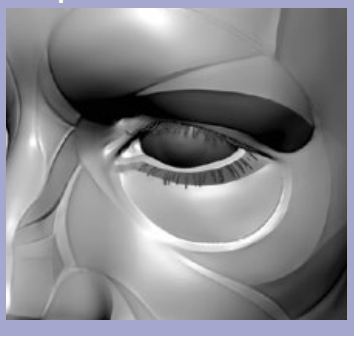


2nd level

complex angular block-out



complex rounded block-out

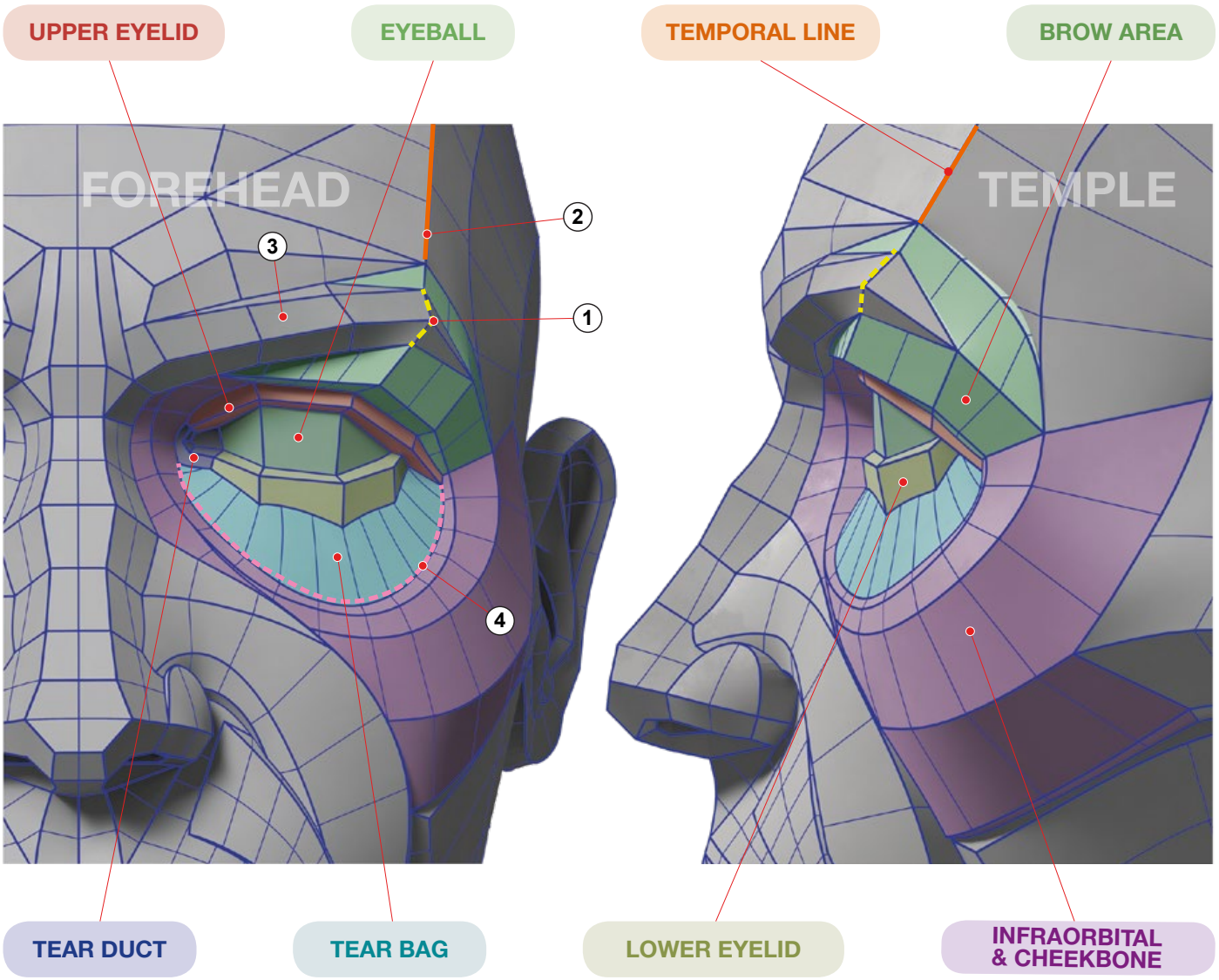


3rd level

realistic finish

EYE AREA

The eye area is divided into 6 separate parts. This division is not anatomical but rather based on form change, therefore, it may not entirely be relevant to those in medical and physical anthropology literature. The division was based on the 2nd level complex angular block-out.



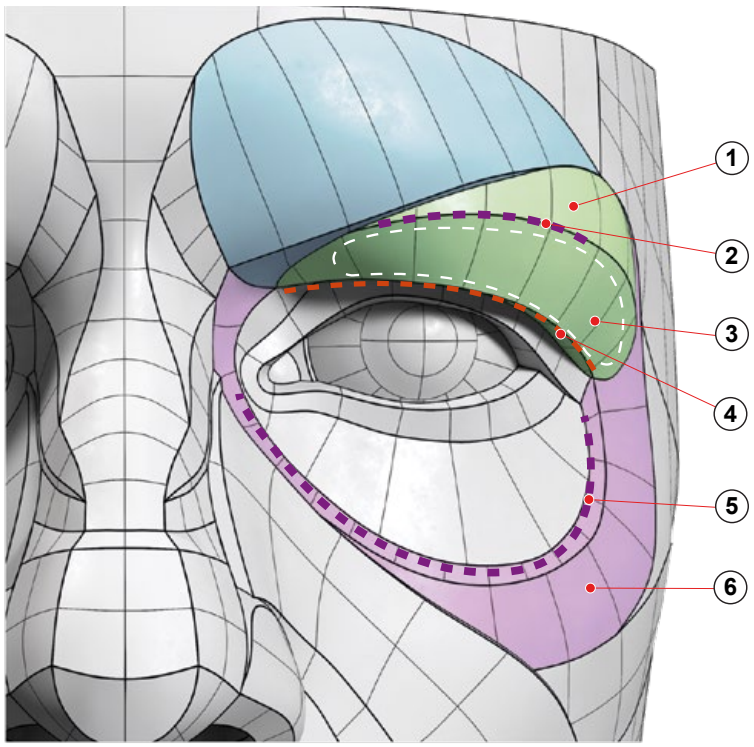
The temporal line separates **forehead** and **temple**, and usually ends with the **eyebrow angle** (**1**).

Brow area is located between the **zygomatic process** of the **frontal bone** (**2**) and upper eyelid. The location and morphology of the **eyebrow** (**3**) are very variable.

Tear bag is the area between the tarsal plate of the **lower eyelid** and Inferior **infraorbital margin** (**4**). In anatomy literature, the Tear bag is the lower part of the **orbital region**, considered a part of the **lower eyelid**.

EYE AREA

Forms that surround the eye



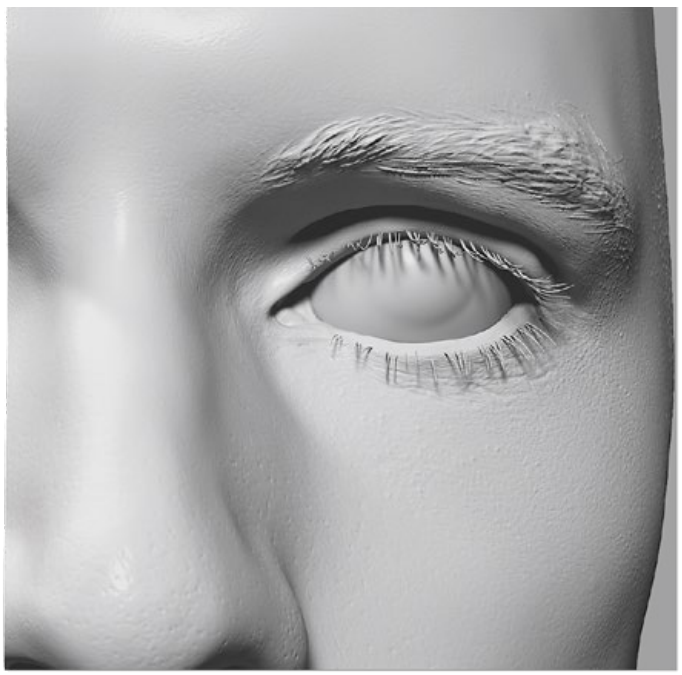
SUPRAORBITAL AREA

BROW AREA

1. ZP-TRIANGLE (Zygomatic process of frontal bone)
2. BROWBONE
3. HOOD
4. EYE COVER FOLD

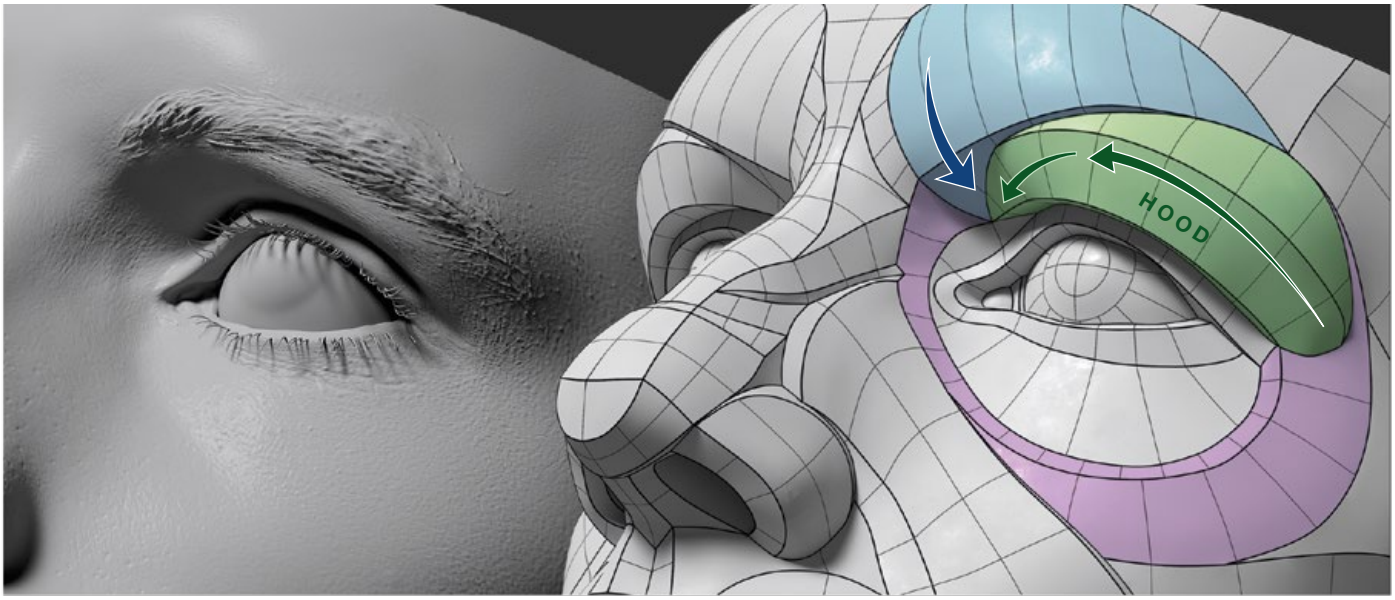
INFRAORBITAL AREA

5. INFRAORBITAL MARGIN
6. ZYGOMA (Cheekbone)

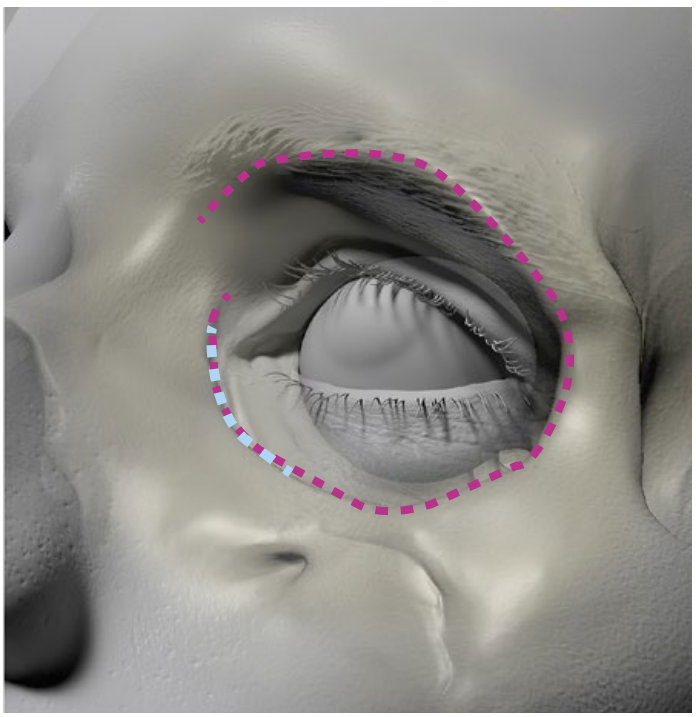


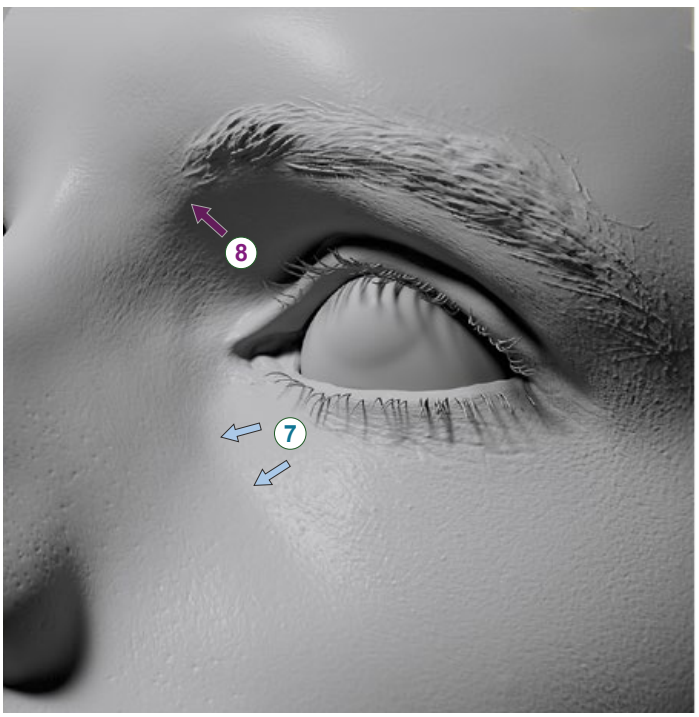
EYE AREA

Forms that surround the eye



Tear trough (**7**) is a groove in the medial infraorbital region referring to a narrow furrow around the **infraorbital margin** (**8**), and hollowness of the infraorbital region refers to a sunken space in the infraorbital area (see Sunken Eye pg. 32). Tear trough helps to identify medial portion of the **Orbital margin**.





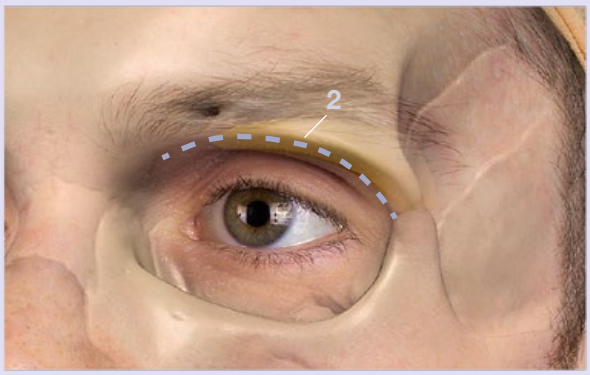
EYE AREA

What makes eyes look hooded or sunken?

HOODED

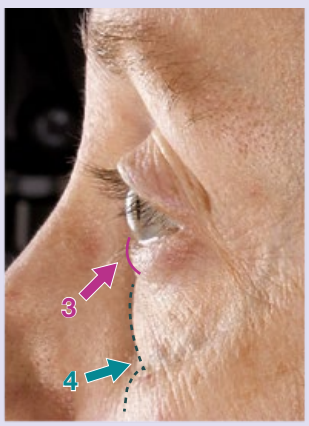
Lateral hooding and **eyebrow fullness**. Lateral hooding is related to medical disorders or muscle overwork and an **excess lateral upper eyelid skin and fat** (1) causing sagging eyebrows, droopy upper lids and usually goes together with bags under eyes.

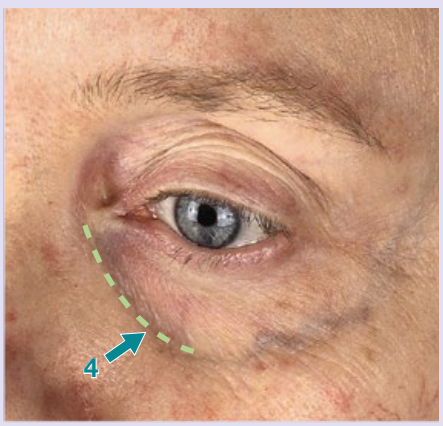
SUNKEN



Sunken eyes can cause decreased orbital adipose tissue, "soft tissue deflation" in the periorbital area, deflation of brow fat, revealing **upper orbital margin** (2).

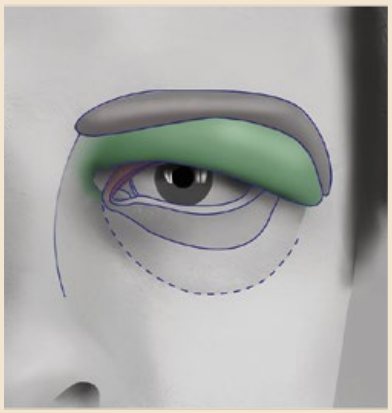
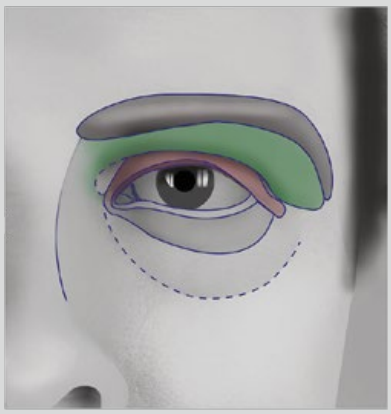
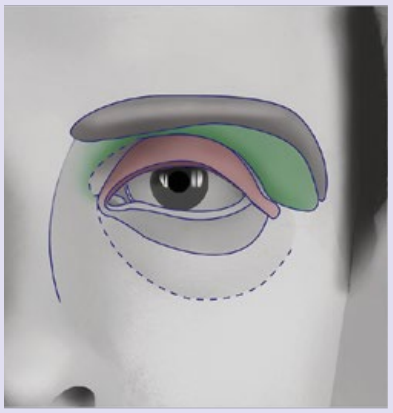
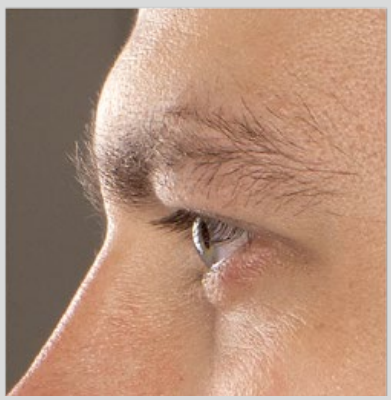
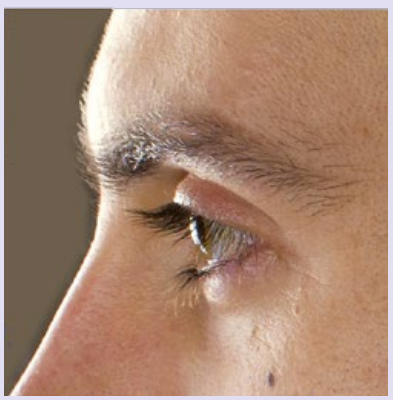
When the cause of **sunken eyes** is aging and lack of collagen in the skin or dehydration, features like **prominent lower eyelid** (3) and tear trough become prominent.
The **tear trough depression** (4) is an important feature of eyelid and midface aging.
Sunken eyes also go by other names, including "tear trough hollows" or "under-eye hollows."





EYE AREA

What makes eyes look hooded or sunken?

HOODED	REGULAR	SUNKEN
		
		
		

EYE AREA

Epicanthic fold (Monolid eye)

An **epicanthic fold** or **epicanthus** is the **eye cover fold** extended downward and partially or fully covering the **upper eyelid** and **inner corner** of the eye.
The highest frequency of occurrence of epicanthic folds is found in specific ethnicities: East Asians, Southeast Asians, Central Asians, North Asians. In European populations, epicanthic folds occur at a considerably lower frequency.

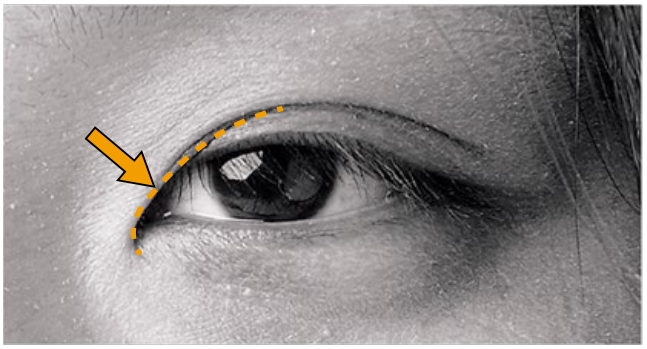


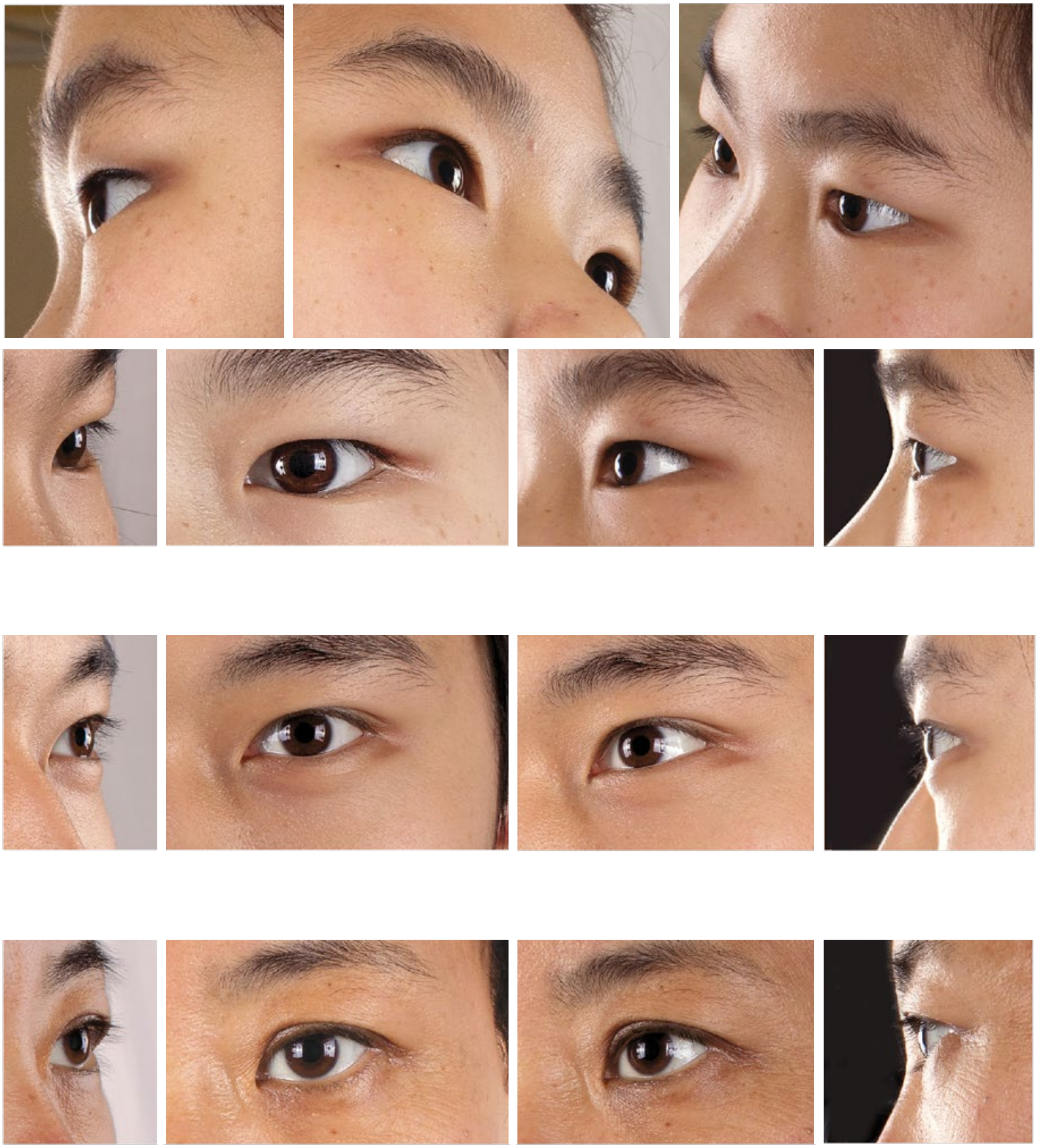
PHOTO: SHUTTERSTOCK (ID: 90142621)

PHOTO: SHUTTERSTOCK (ID: 90142621)

Epicanthic folds may be more visible in the development stages during childhood of any race, especially before the nose bridge fully develops.

EYE AREA

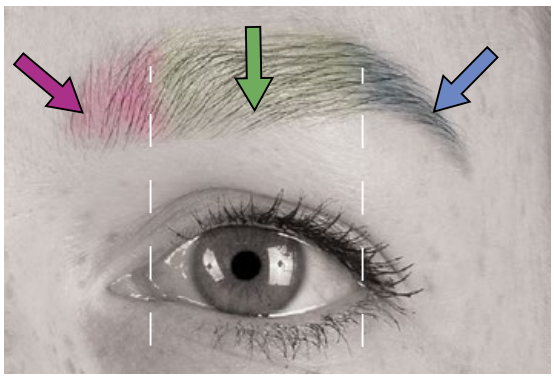
Examples of Monolid eyes

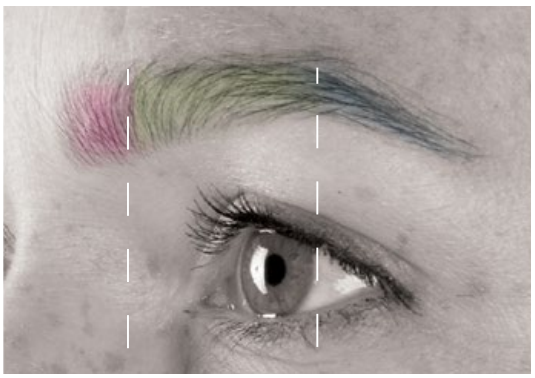


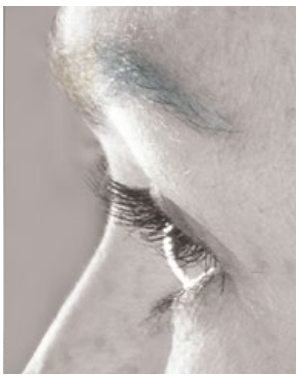
EYE AREA

Structure of the eyebrow

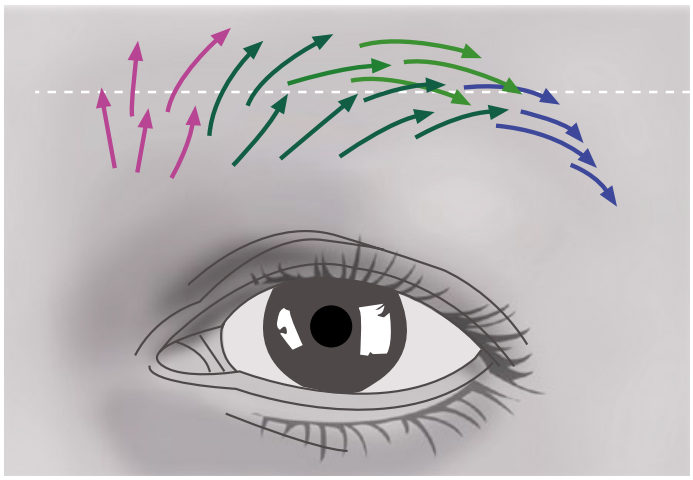
The eyebrow is divided into three anatomic parts: head, body, and tail.







Eyebrow cilia are directed at different angles in the upper and lower eyebrow. The **upper rows** grow down and laterally at an angle of <30 degrees from the vertical, whereas the **lower-most cilia** grow up and laterally, also at an angle of <30 degrees. An abrupt reversal occurs when these cilia meet in the midline of the eyebrow. However, this reversal does not occur at the **head** of the eyebrow, where the eyebrow cilia sweep superolaterally.



The three types of hair in the eyebrow are fine hair, also known as vellus hair, the slightly larger and lightly pigmented hair and the large terminal hair. All three types are the supercilia or the eyebrow hair. As vellus hair transforms into terminal hair, the pigmented hair can be considered the intermediate stage of transformation. The supercilia form an effective moisture barrier to keep sweat from running downward into the eye. The fluid flow is redirected medially and laterally, away from the eye.

EYE AREA

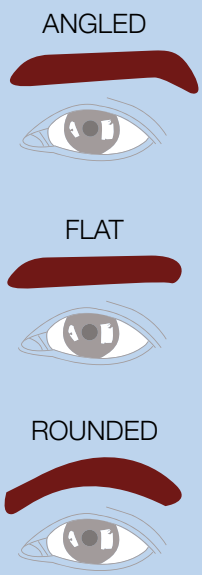
Gender difference of the eyebrow

The male and female eyebrows differ in both shape and position. The typical female eyebrow is positioned above the orbital rim; it is thinner and has a pointy tail. The male brow is flatter and fuller which runs over the orbital rim.

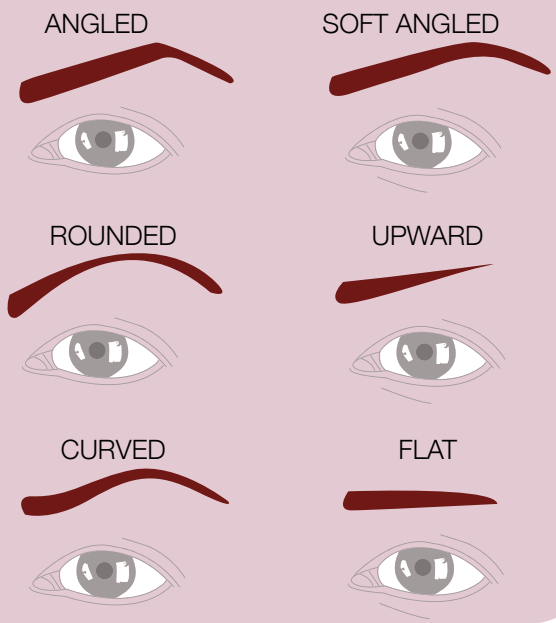
MALE

FEMALE

TYPICAL MALE EYEBROW

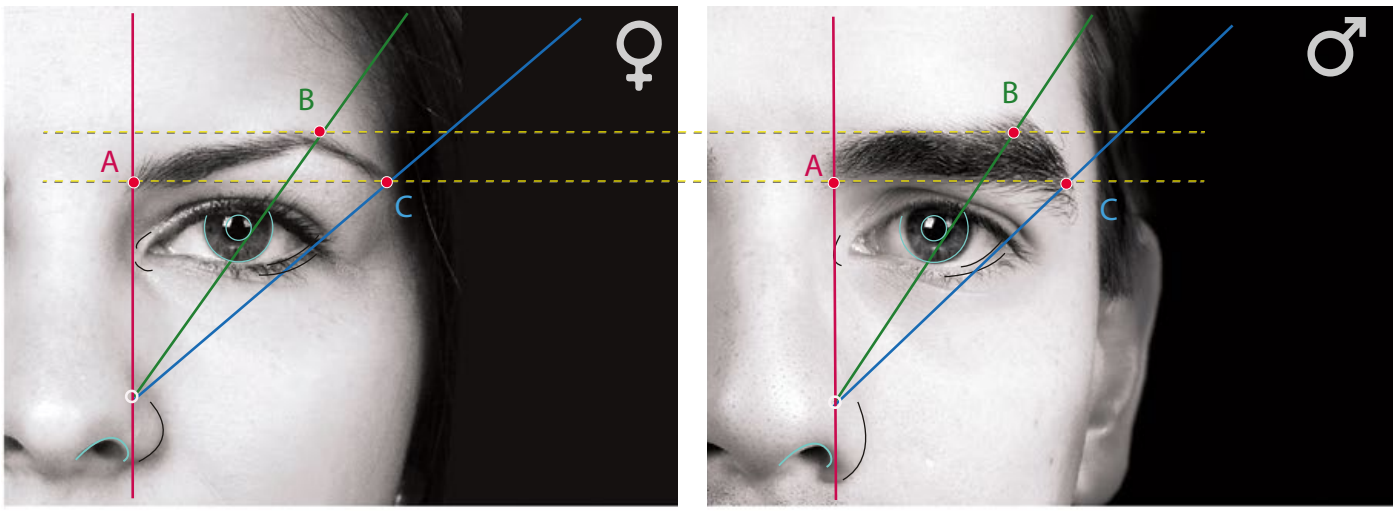


TYPICAL FEMALE EYEBROW

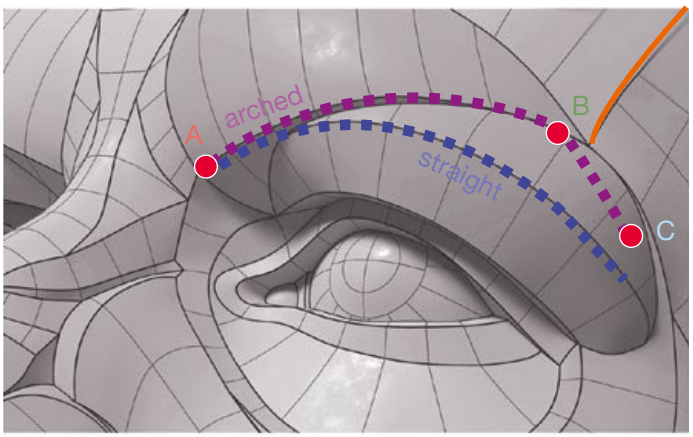


EYE AREA

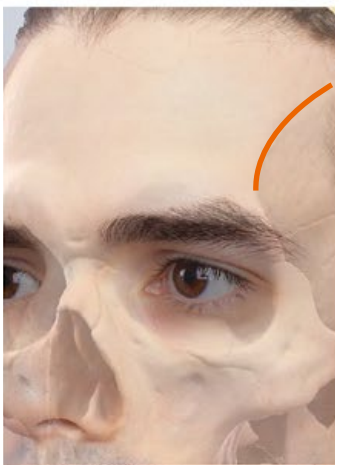
Topography of the eyebrow

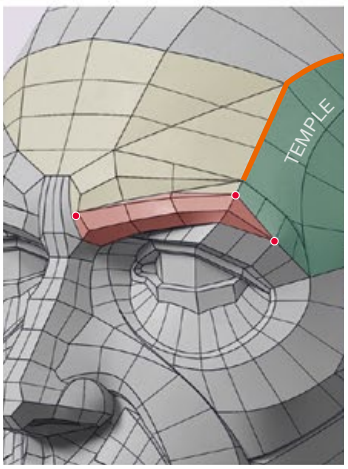


STRAIGHT VS ARCHED EYEBROW



RELATION OF THE SUPERIOR TEMPORAL LINE AND EYEBROW ARCH



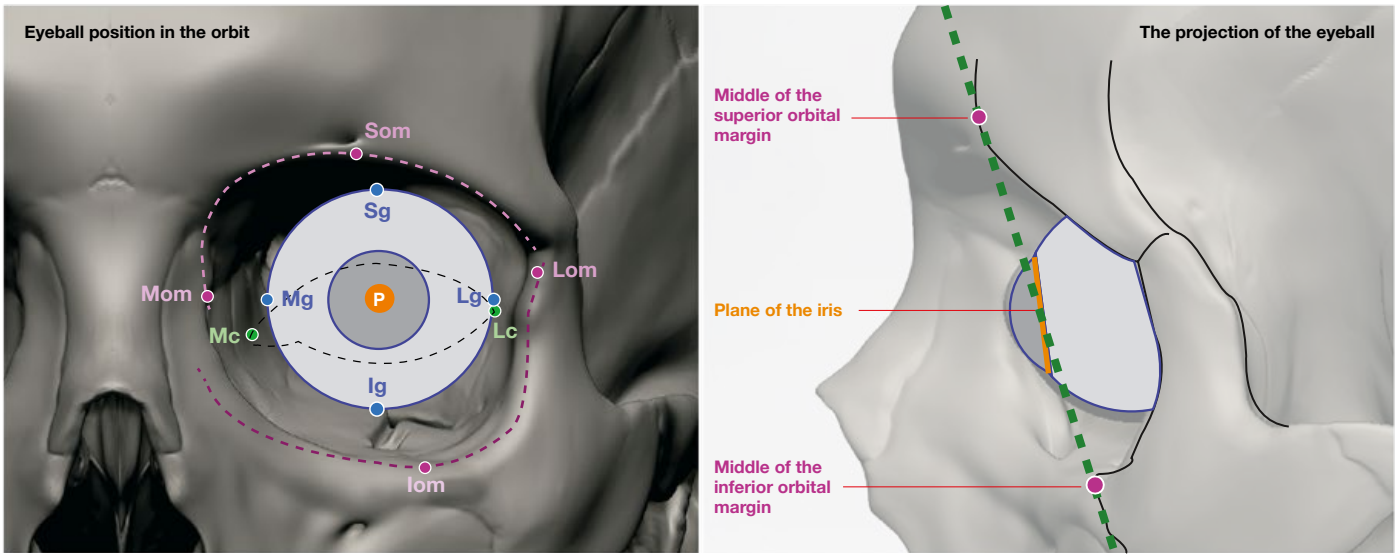


EYE AREA

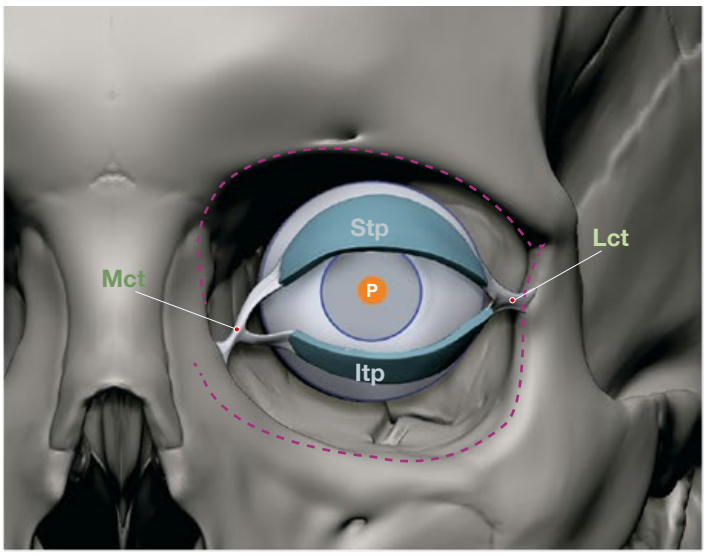
Various eyebrow examples

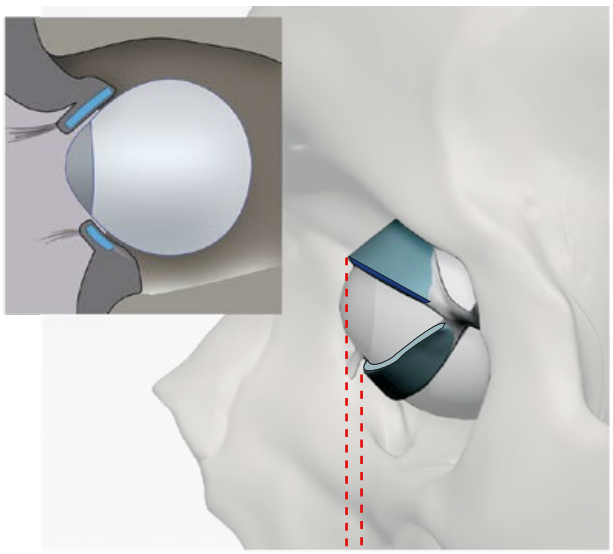
EYE AREA

Common placement of the eye globe in orbit



Iom = inferior-most point on the infraorbital margin, **Som** = superior-most point on the supraorbital margin, **Mom** = Flower's point (medial orbital margin), **Lom** = lateral-most point on the lateral orbital margin, **Lg** = lateral-most point of the meridian of the eyeball, **Sg** = superior-most point of the equator of the eyeball, **Ig** = inferior-most point of the equator of the eyeball, **Mg** = medial-most point of the meridian of the eyeball, **P** = pupil center, **Lc** = lateral canthus (outer corner or angle of the eye, the place where the upper and lower eyelid meet), **Mc** = medial canthus (the inner angle of the eye, the place where the upper and lower eyelid meet).



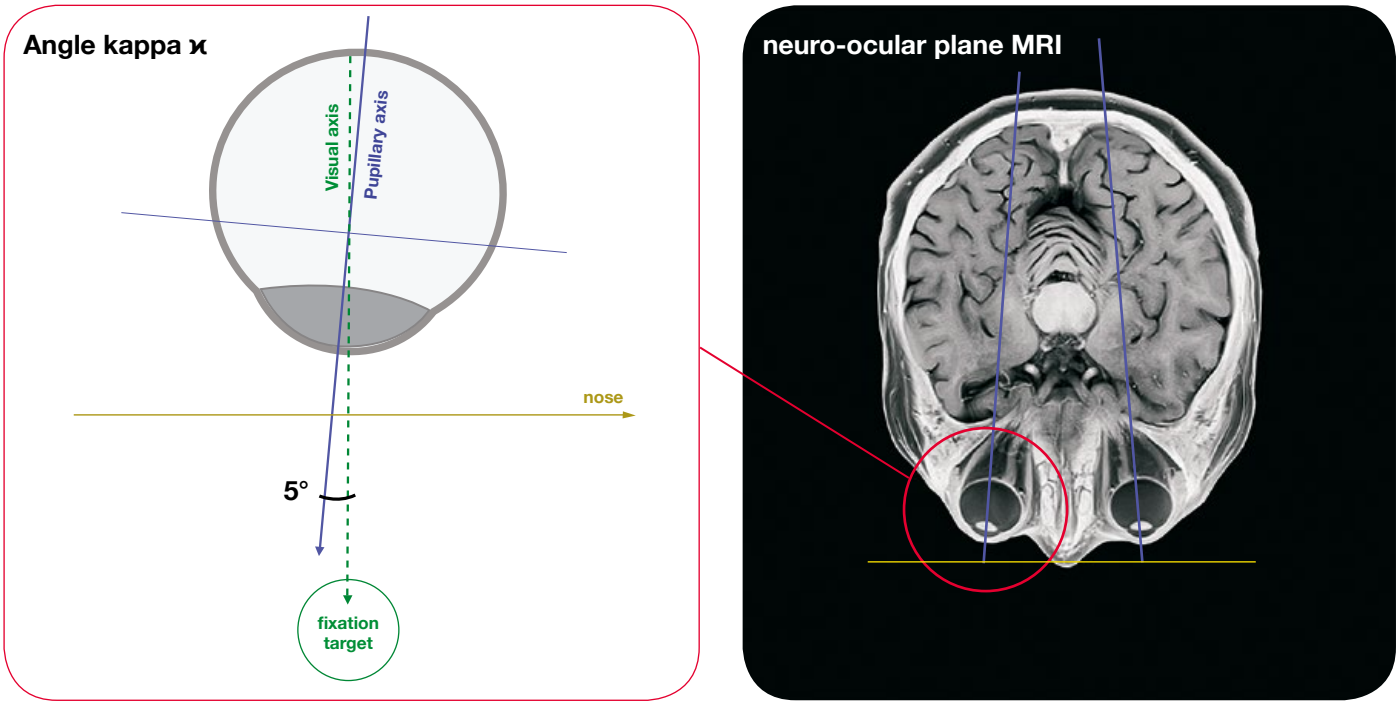


Stp and **Itp** are **superior** and **inferior tarsal plates**. They are two comparatively thick, elongated plates of dense connective tissue, about 10 mm (0.39 in) **Stp** and 5 mm for **Itp**; one is found in each eyelid, and contributes to its form and support.
Mct and **Lct** are canthal tendons that attach the **upper** and **lower tarsal plates** to the orbital margins.

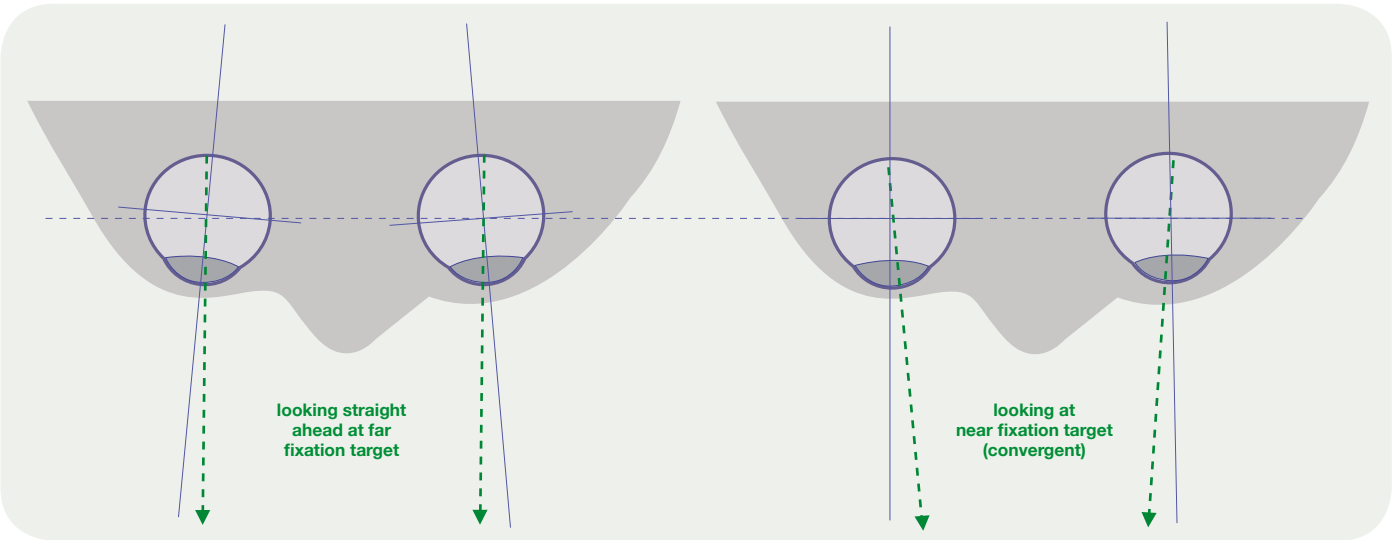
EYE AREA

Why do characters sometimes look cross-eyed?

It is because **pupillary axes** aren't parallel when looking at an infinite distance. Human eyes bow out at around 5 degrees.

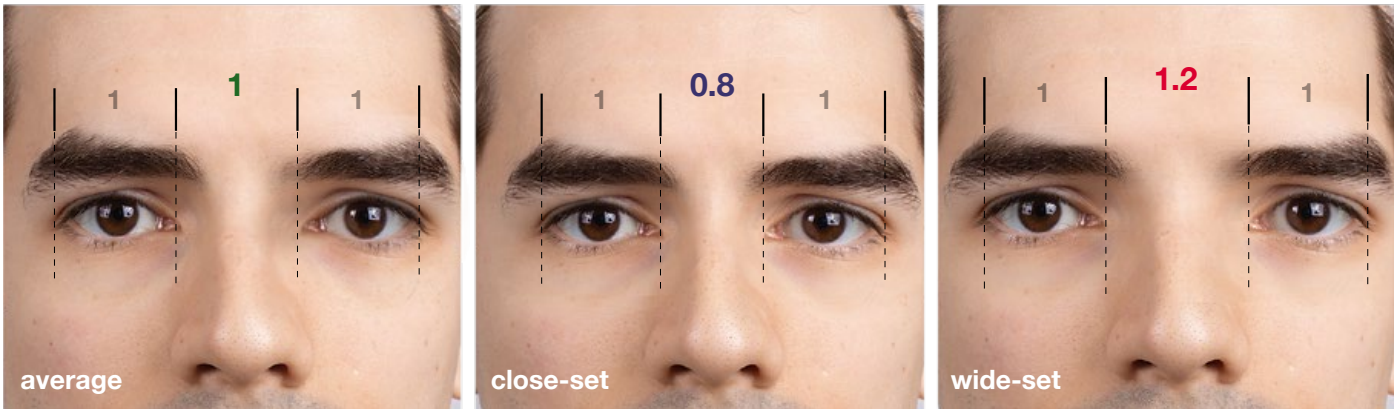


Angle kappa is the angle between the **visual axis** (an imaginary line connecting the central fovea and the foveola with the fixation target or the item being gazed upon) and the **pupillary axis** (a line to the surface of the cornea going through the center of the pupil entrance). It is the difference between both axes. Each eye might have a slightly different **Angle kappa**, but usually it is around 5°.



EYE AREA

The space between eyes (intercanthal distance)



The distance between the **inner corners** of the eyes is called the inner intercanthal distance. For most people, the inner intercanthal distance is roughly equal to the distance between the **inner corner** and the **outer corner** of each eye, that is, the width of the eye. The situation where inner intercanthal distance is intensely bigger than the width of the eye is called wide-set eyes. If intercanthal distance is less than one eye length in size, it is close-set eyes.

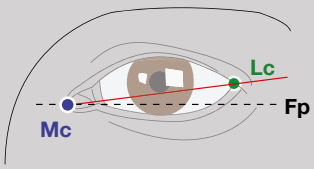
Examples

close-set

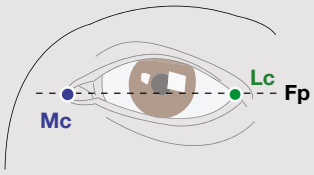
wide-set

EYE AREA

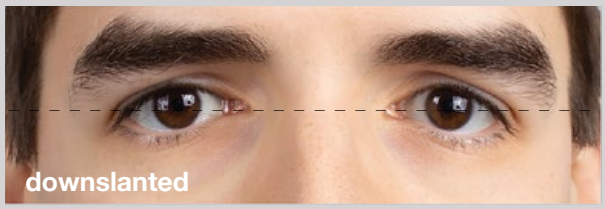
Canthal tilt (palpebral fissure inclination)

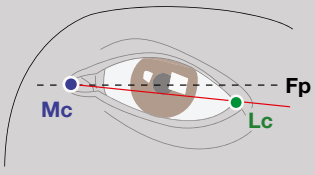


Lateral canthus (Lc) lie slightly higher than the medial canthus (Mc), it is called the positive canthal tilt.

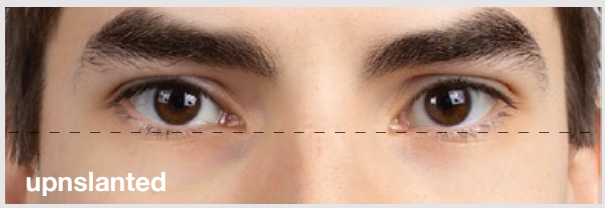


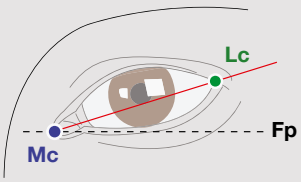
Both medial and lateral canthi are at the same level, it is called the neutral canthal tilt.





Lateral canthus lie lower than the medial canthus, it is called the negative canthal tilt.





Lateral canthus lie higher than the medial canthus. Common in East Asian populations. Tilt up to 10 degrees from **Fp**, it is also aversient of positive canthal tilt.

Examples

EYE AREA

Parts of the eye

The **pupil** is the black part of your eye, right in the middle. The iris is the colored part of your eye (eg. green, blue, brown) that surrounds the pupil. The Sclera are the white parts of your eye that surround the **iris**. **Plica semilunaris** is the crescent shaped fold located in the medial corner of the eye. **Lacrimal caruncle** is the small, pink, globular nodule that sits on top of the **plica semilunaris**. It is the mucosal protuberance covered with epithelium containing sebaceous and sweat glands.

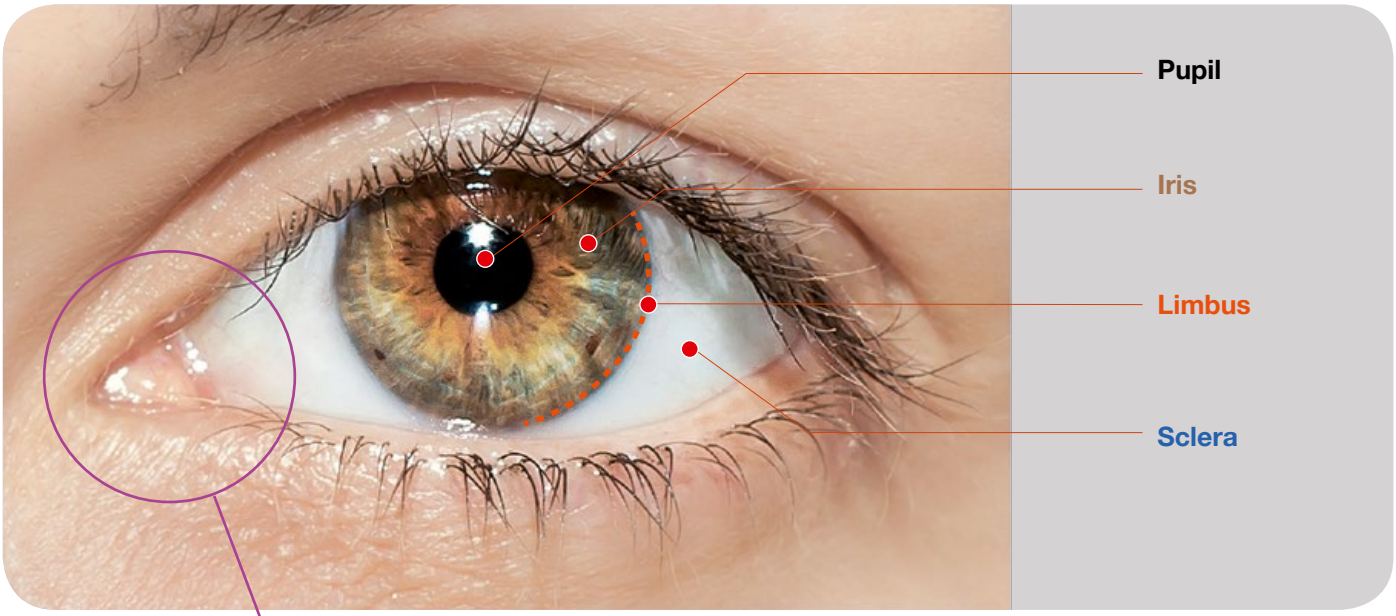
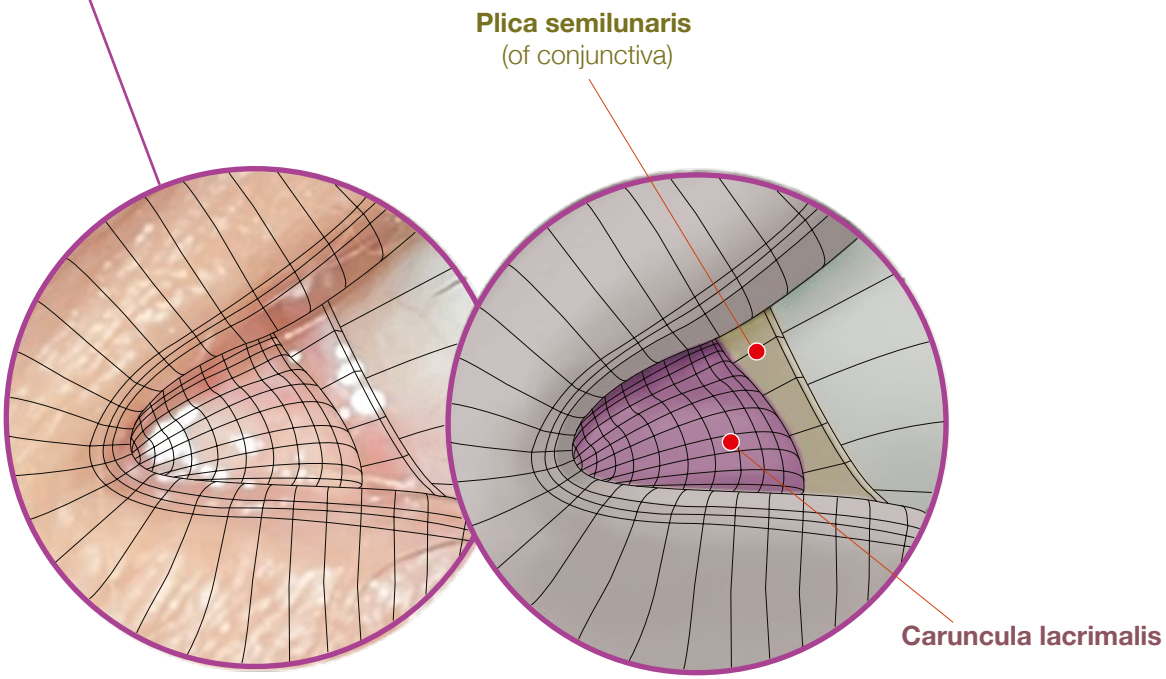


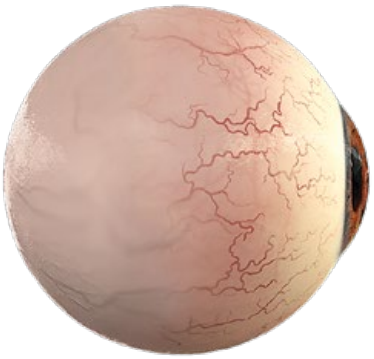
PHOTO: SHUTTERSTOCK (ID: 134275850)



EYE AREA

Parts of the eye

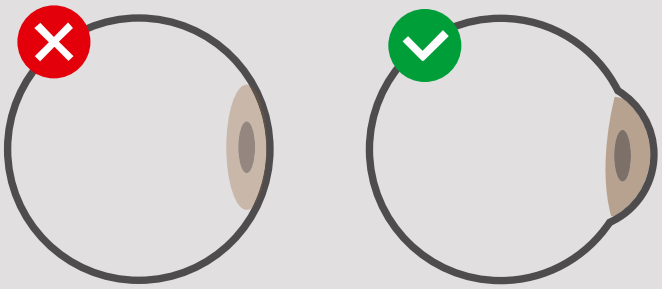
anterior view (orthographic)

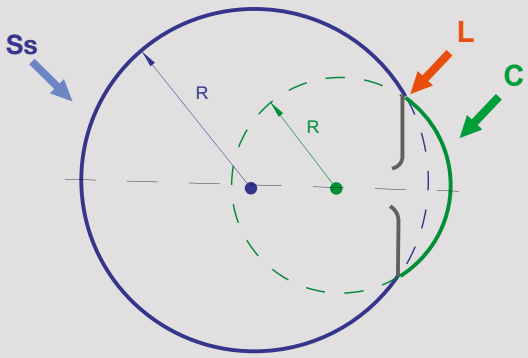


lateral view

NOT PERFECT SPHERE

The eyeball is not a simple sphere but can be viewed as the result of fusing two spheres – a small curved one with a large, not so strongly curved, sphere. The small piece, occupying about one-sixth of the whole, has a radius of 8 mm (0.3 inches). It is transparent and is called the **cornea** (**C**). The large one is the **scleral segment** (**Ss**), and it is opaque and has a radius of 12 mm (0.5 inches). The ring where the two areas join is called the **limbus** (**L**).





REFLECTIONS

Scleral reflection (**Sr**) is glossy but uneven, due to the bumpy surface of the **sclera** (i.e. white of the eye).
Corneal reflection (**Cr**) is a very glossy reflection. The **cornea** behaves like a convex spherical mirror.
Limbal reflection (**Lr**) appears on the boundary between the white sclera and the dark iris.
Tear fluid reflections (**Tfr**) a thin strip of tear fluid called the upper and lower tear menisci, and also along the **plica semilunaris**.

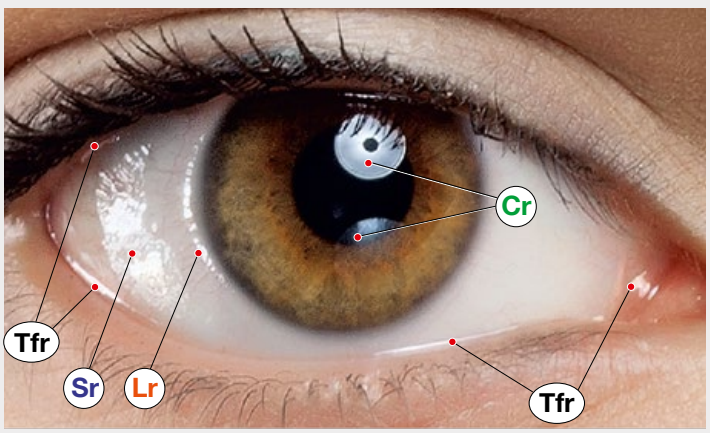
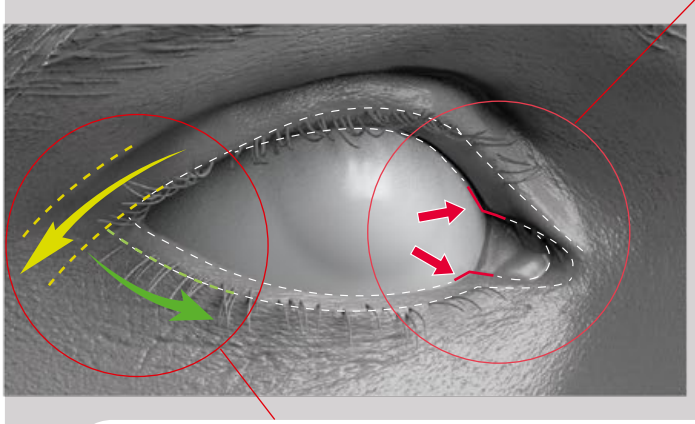


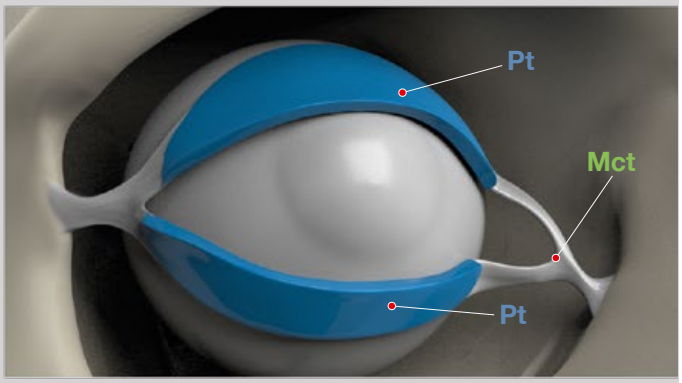
PHOTO: SHUTTERSTOCK (ID: 1309197 44)

EYE AREA

Eyelids

Both upper and lower eyelid create **sharp corners** in the place at the junction between the **medial canthal tendon** (**Mct**) and **palpebral plates** (**Pt**).

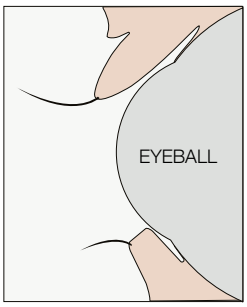




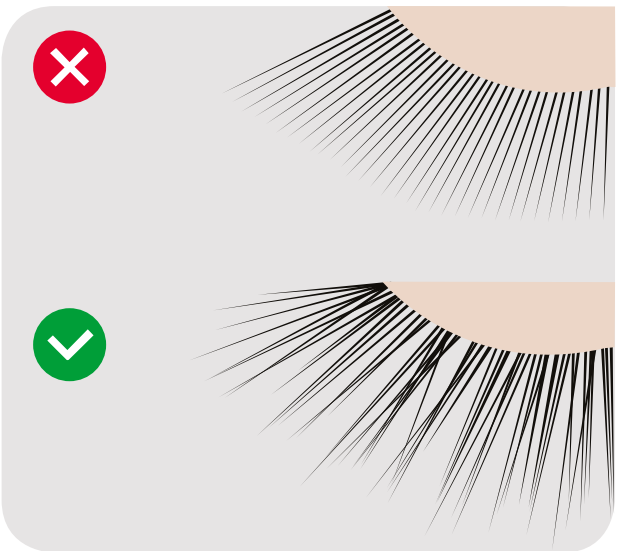
At the outer corner, the **upper eyelid** may overlap the **lower eyelid** slightly.

Eyelashes

CROSS-SECTION



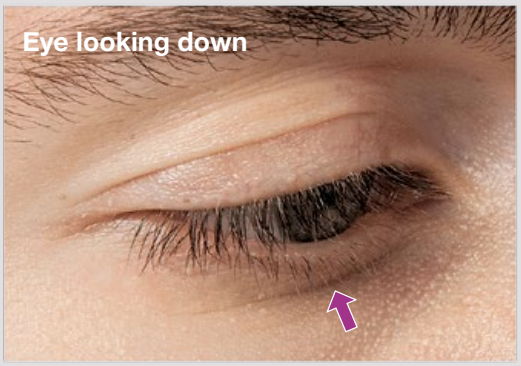
For the length and quantity of eyelashes, they vary from person to person.
On average, each human eye contains anywhere between 90–170 individual lashes on the top eyelid and between 70–90 on the bottom.
Eyelashes do not grow in even lines, rather in uneven rows: anywhere from 5–6 rows on the top eyelid and 3–4 rows on the bottom. The top eyelashes are always longer than the bottom ones. The lashes on the top eyelid are usually between 7–13 mm in length while the lashes on the bottom rarely grow longer than 7 mm.

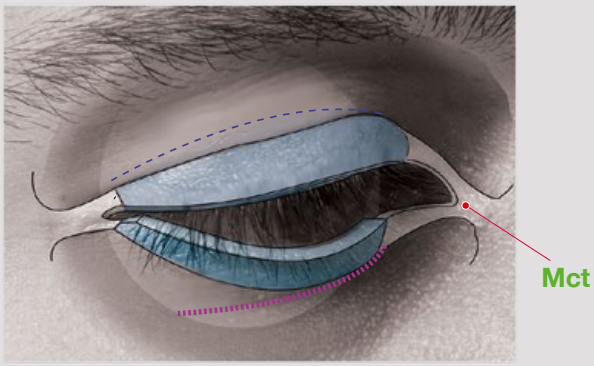


EYE AREA

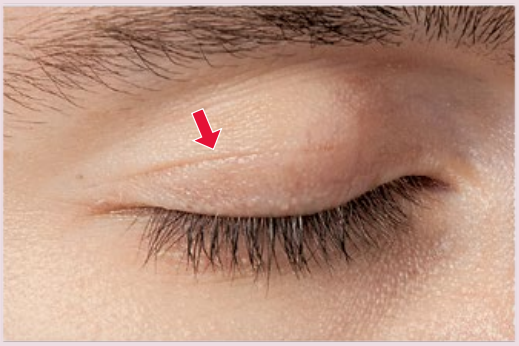
Eyelid creases

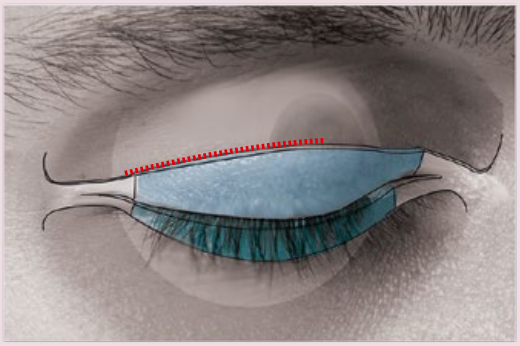
The **lower lid skin crease**, similar to the upper eyelid, also marks the edge of the palpebral plate. It is more prominent when looking down. The lower eyelid crease is commonly seen in children.





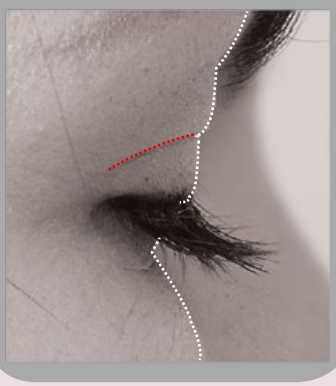
When the eye is closed, the **upper eyelid skin crease** usually matches with the edge of the **palpebral plate**. However, approximately 50% of the Asian population do not have **upper lid skin creases**, often referred to as the "single eyelid." (see Epicanthic fold)





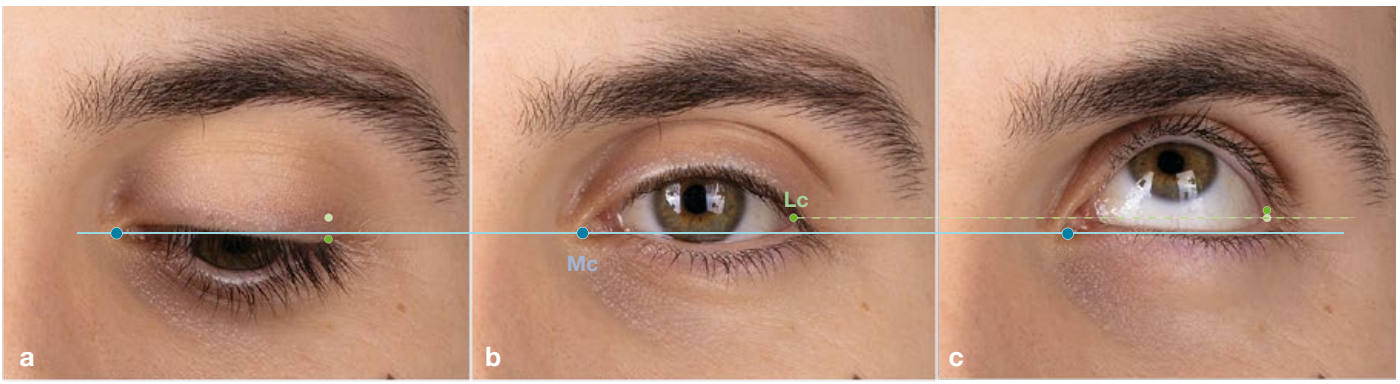
Asian (single eyelid)

European



EYE AREA

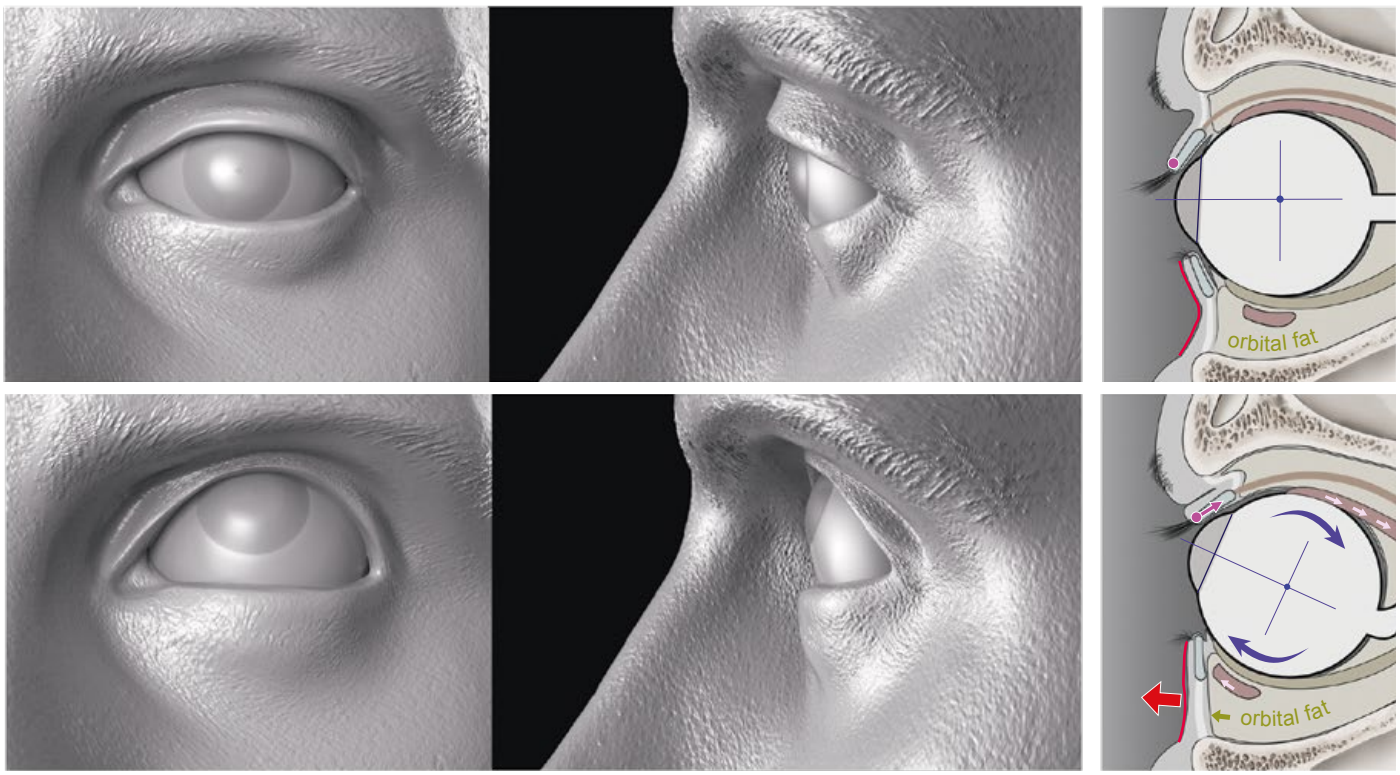
The vertical dynamic of the medial (Mc) and lateral canthi (Lc)



During vertical eye rotations, both eyelids move accompanying the direction of the gaze.
The height of the **outer corner of the eye (lateral santhus** (**Lc**)**)** is strongly influenced by upper and lower eyelid movements.
This effect is more pronounced in older subjects, probably reflecting the typical lateral canthal tendon laxity of the aging process.

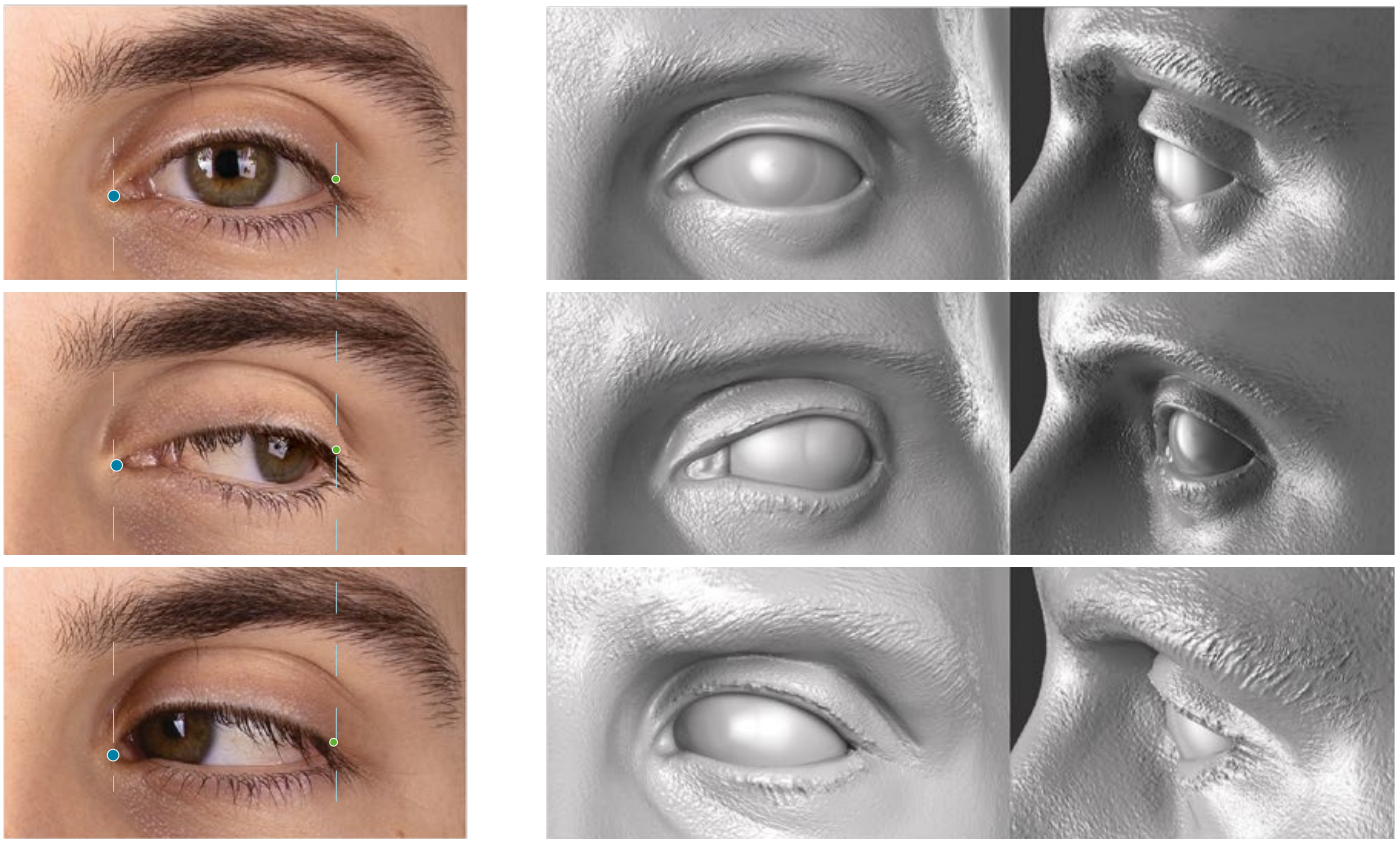
The elevated eye

When the eyeball elevates, **orbital muscles** push orbital fat forward, resulting in a **fullness under the eye**.
Also, it is important to remember that the elevation of the eye simultaneously causes the elevation of the **upper eyelid**.



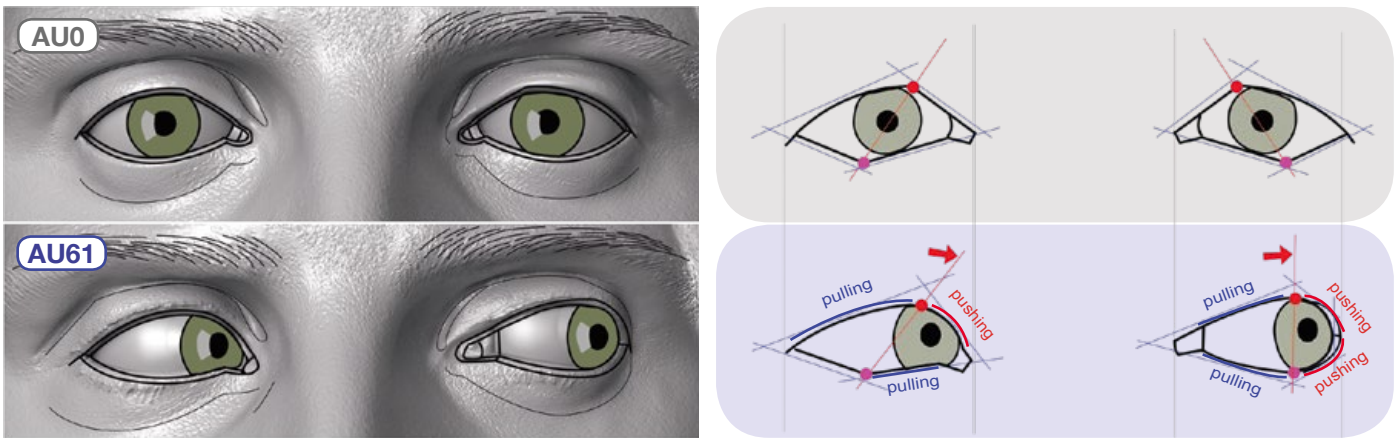
EYE AREA

The vertical dynamic of the medial (Mc) and lateral canthi (Lc)



The **medial canthus** (**Mc**) and the **lateral canthus** (**Lc**) have been shown to have insignificant horizontal dynamic function. **Mc** does not always move in the same direction as the eyeball. From the frontal view, the **Lc** appeared to adduct (movement towards the nose) with eyeball abduction (movement away from the nose).

Cornea influence on the form of the eyelids during horizontal gaze

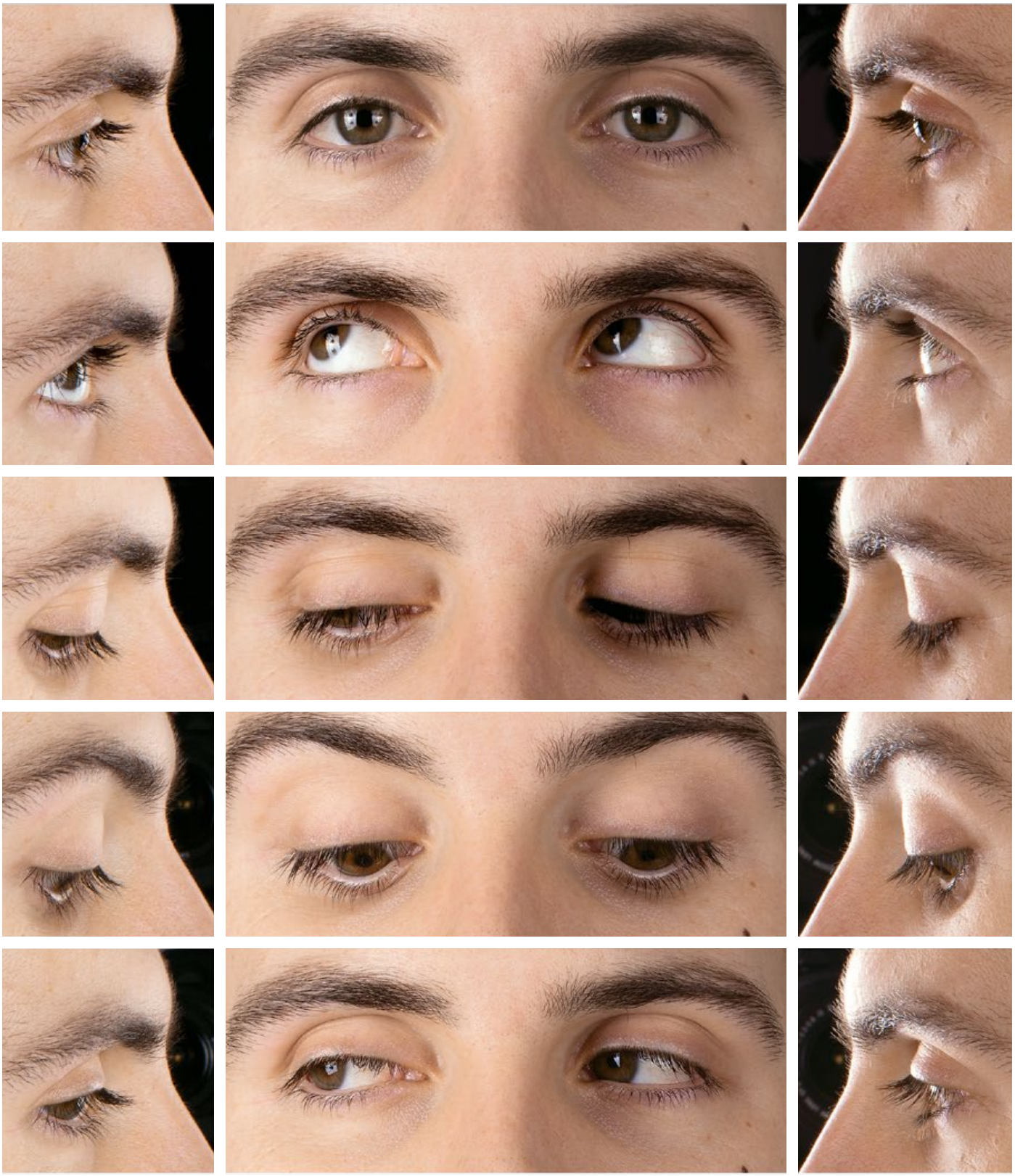


EYE AREA

Eye movement reference

EYE AREA

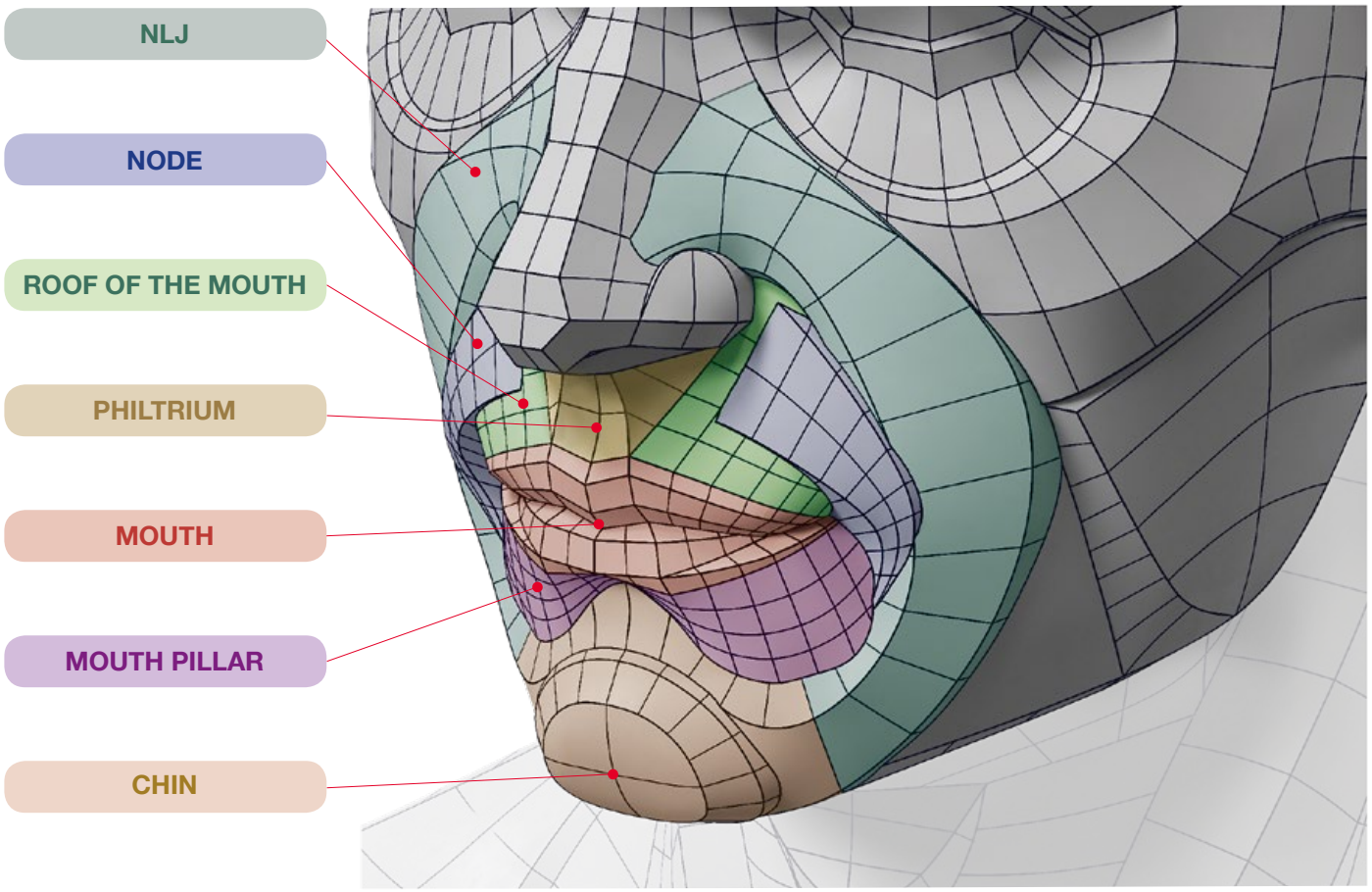
Eye movement reference



MOUTH AREA

Parts of the mouth area

The mouth area, similar to the eye area, can be divided into two large groups: structures surrounding the mouth and the mouth itself.



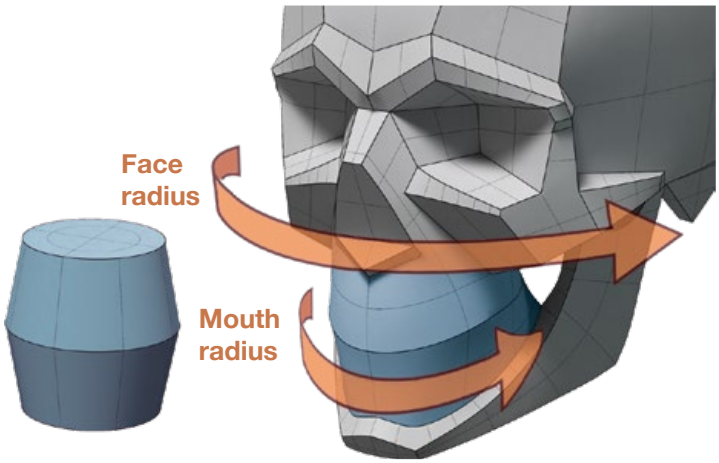
MOUTH AREA

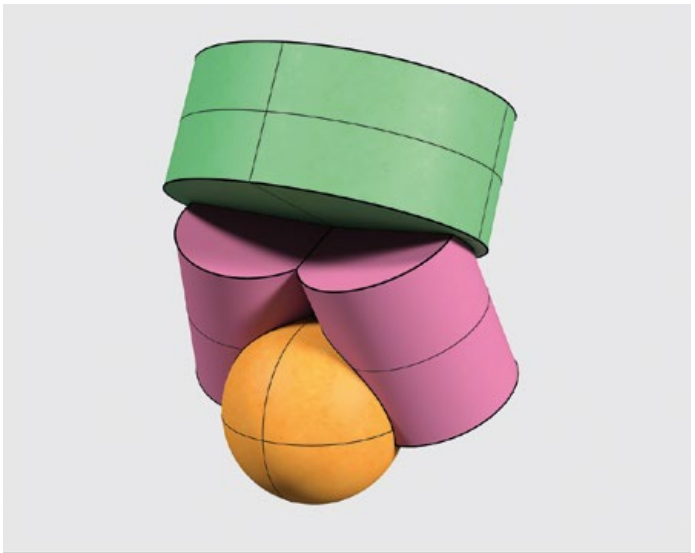
Basic structures of the mouth

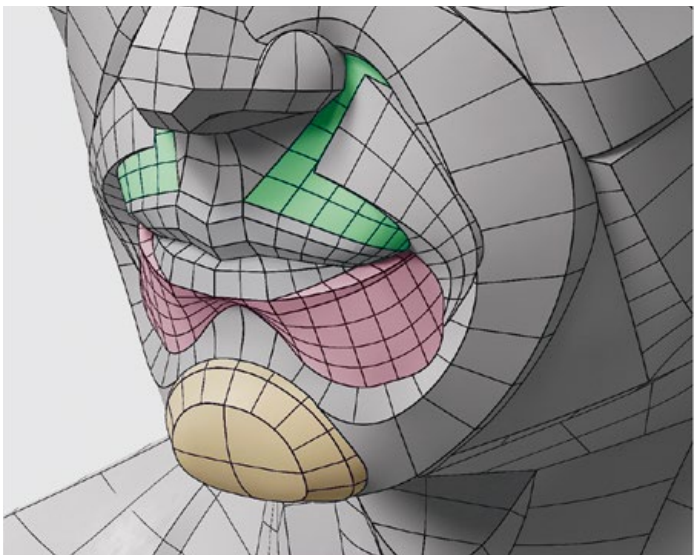
MOUTH BARREL

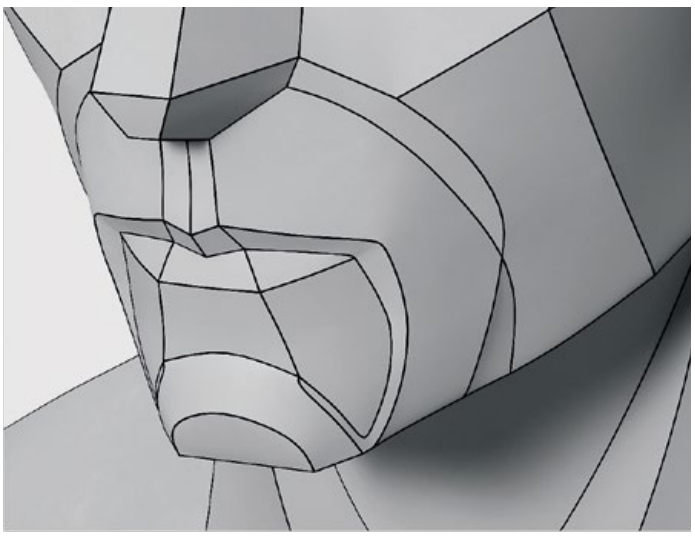
The Mouth area is organized around a smaller radius than the face radius. It is called the **mouth barrel**.

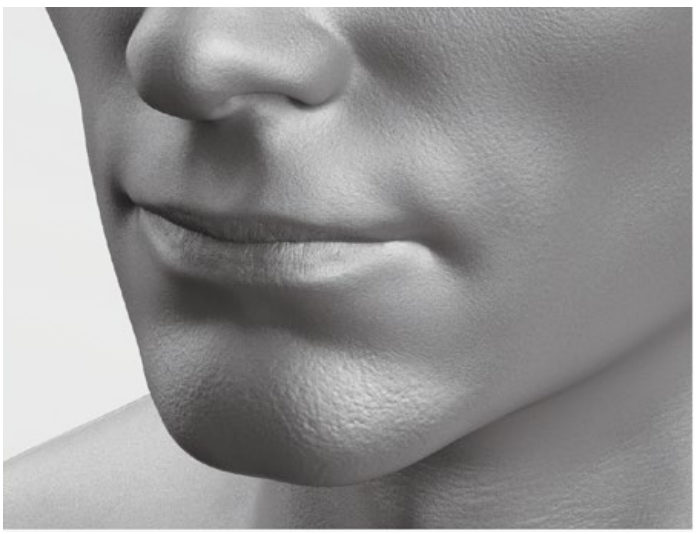
3 main parts that form the **mouth barrel**: **roof of the mouth** on top and, underneath, two supporting structures called **mouth pillars** with the **chin** sphere in the middle.







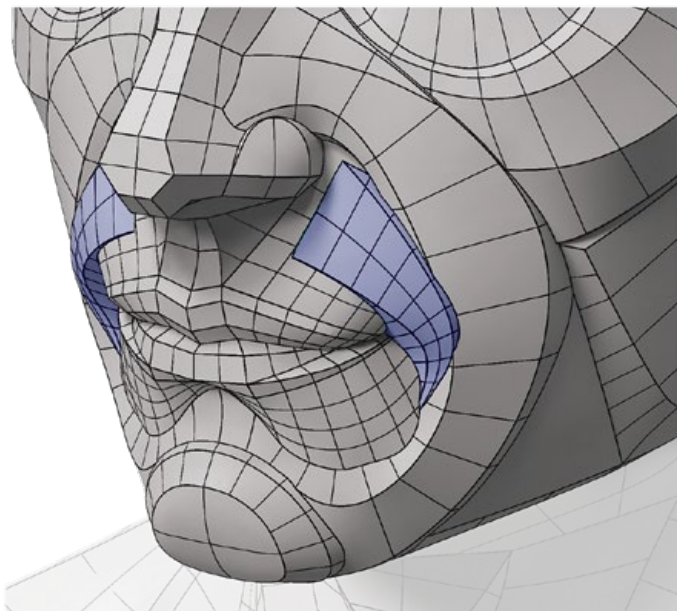


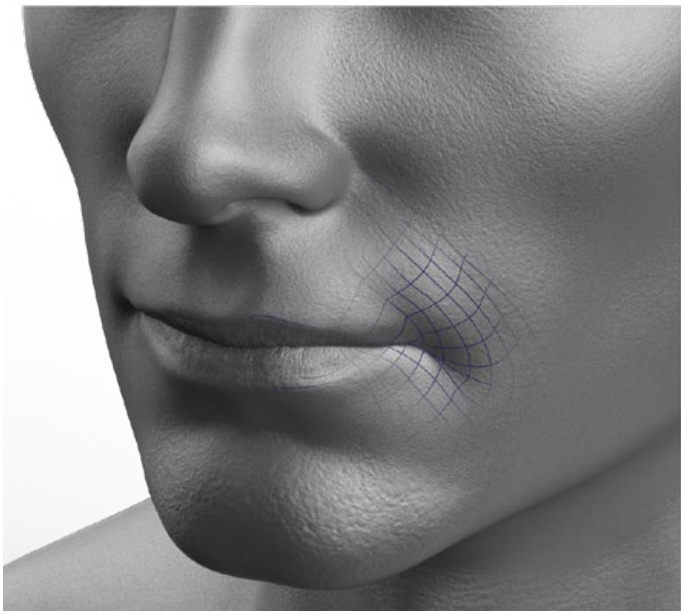


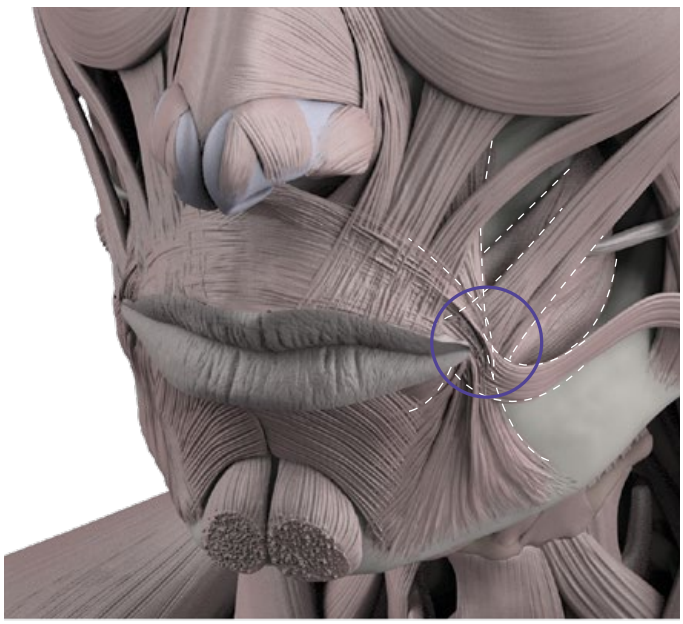
MOUTH AREA

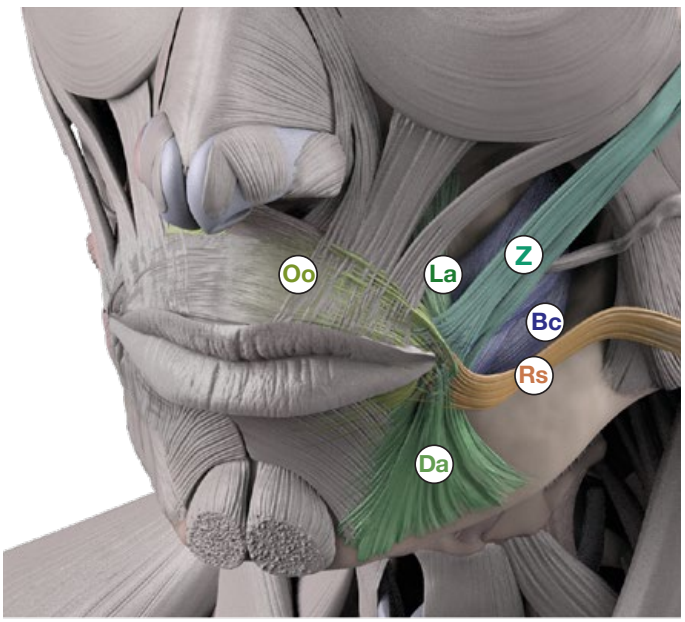
The node (modiolus)

The **node** is a protruding shape on the corner of the mouth. In medical literature, the **node** is known as the **modiolus**. It refers to the point lateral to the angle of the mouth where several facial muscles, also known as **modioli muscles**, converge.







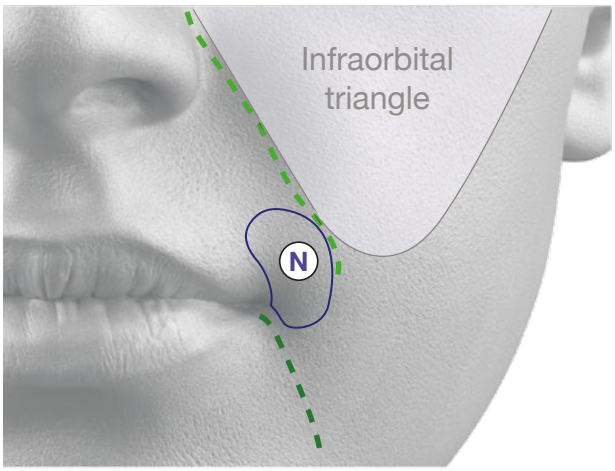


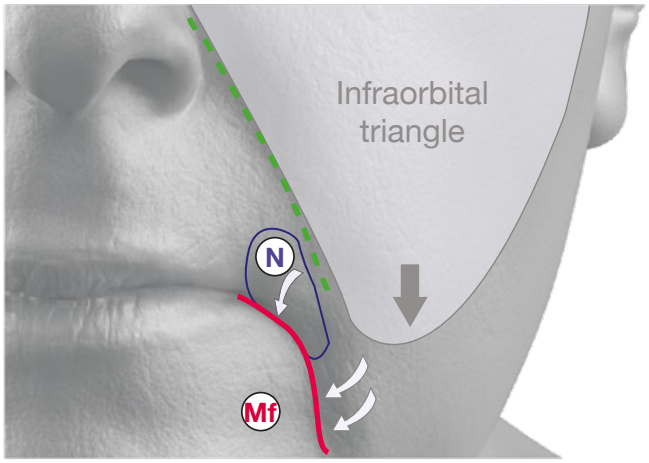
It has been described as coinciding with a muscular or tendinous node in the cheek. The **modioli muscles** are the following: **levator anguli oris** (**La**), **zygomaticus major** (**Z**), **risorius** (**Rs**), **buccinator** (**Bc**), and **depressor anguli oris** (**Da**). They are all connected to the circular muscle of the mouth called the **orbicularis oris** (**Oo**).

MOUTH AREA

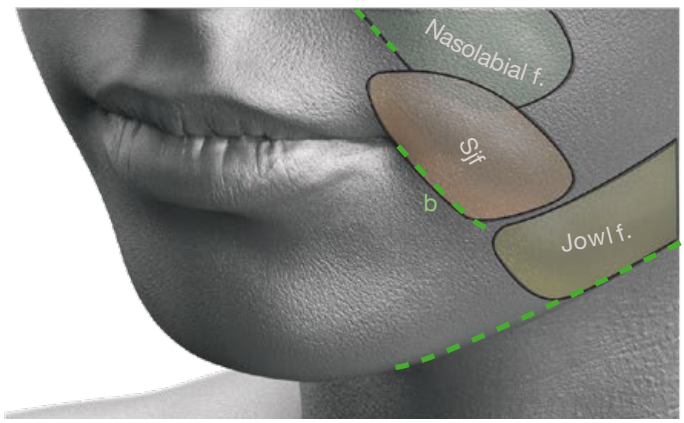
Basic structures of the mouth

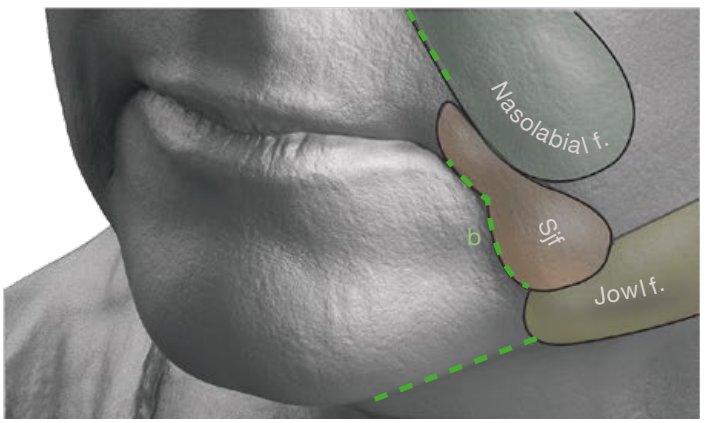
When the face ages, soft tissues lose their volume and elasticity. Structures like **node** (**N**) also tend to slide down due to gravity.





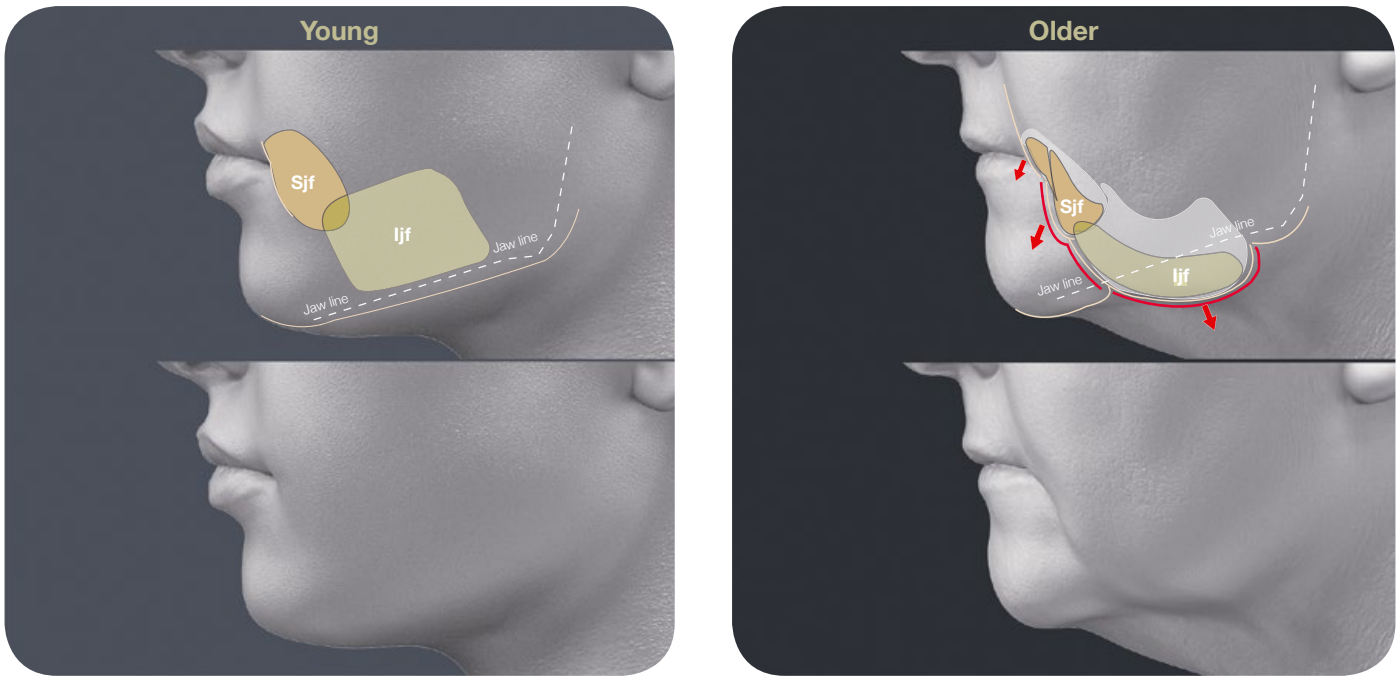
Gravity, aging with soft tissue volume loss causes stretching and looseness (laxity) in the **supporting ligaments** (flexible bands of tissues) of the face. Fat in the cheek droops, breaking into separate fat compartments. **Superior jowl fat** (**Sjf**), the one that covers the **node** rolling over the **ligament** (**b**) forming the so-called **marionette fold** (**Mf**).





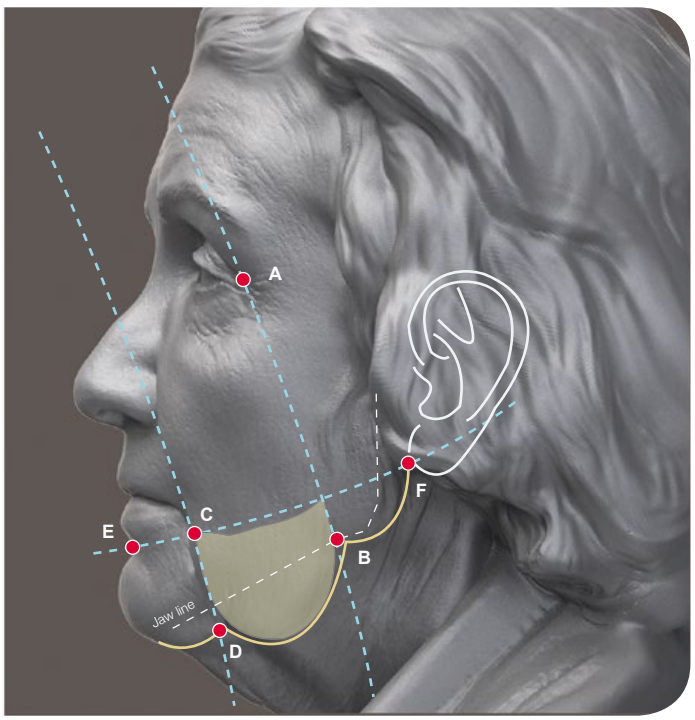
MOUTH AREA

Aging of the superior (Sjf) and inferior jowl fat (Ijf)



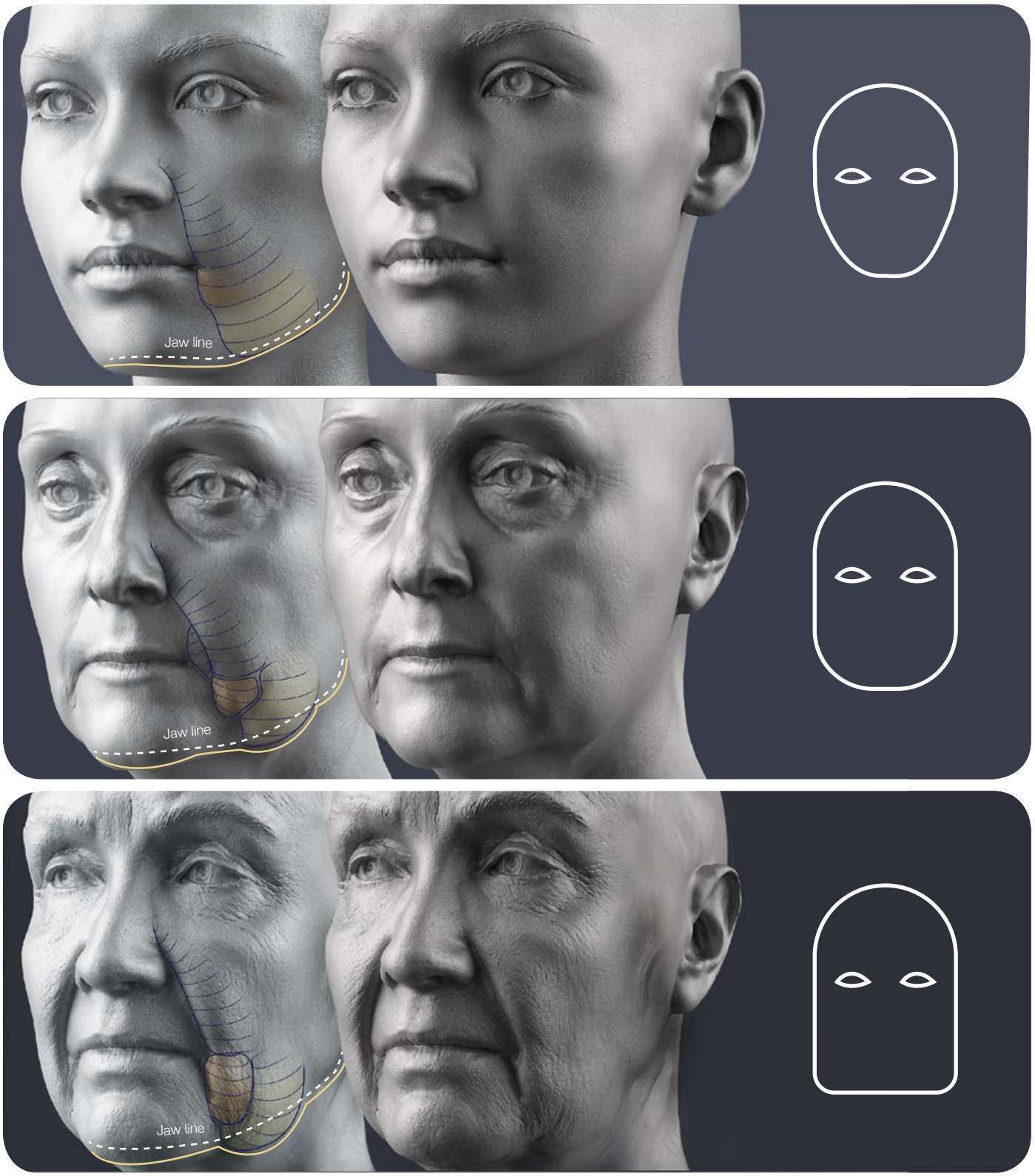
Localization of inferior jowl fat

Inferior fowl fat (**Ijf**) has specific boundaries, it occupies space between: A, lateral canthus; B, antegonial notch; C, oral commissure; D, prejowl sulcus; E, midline of mentolabial sulcus or groove; F, ear lobule.



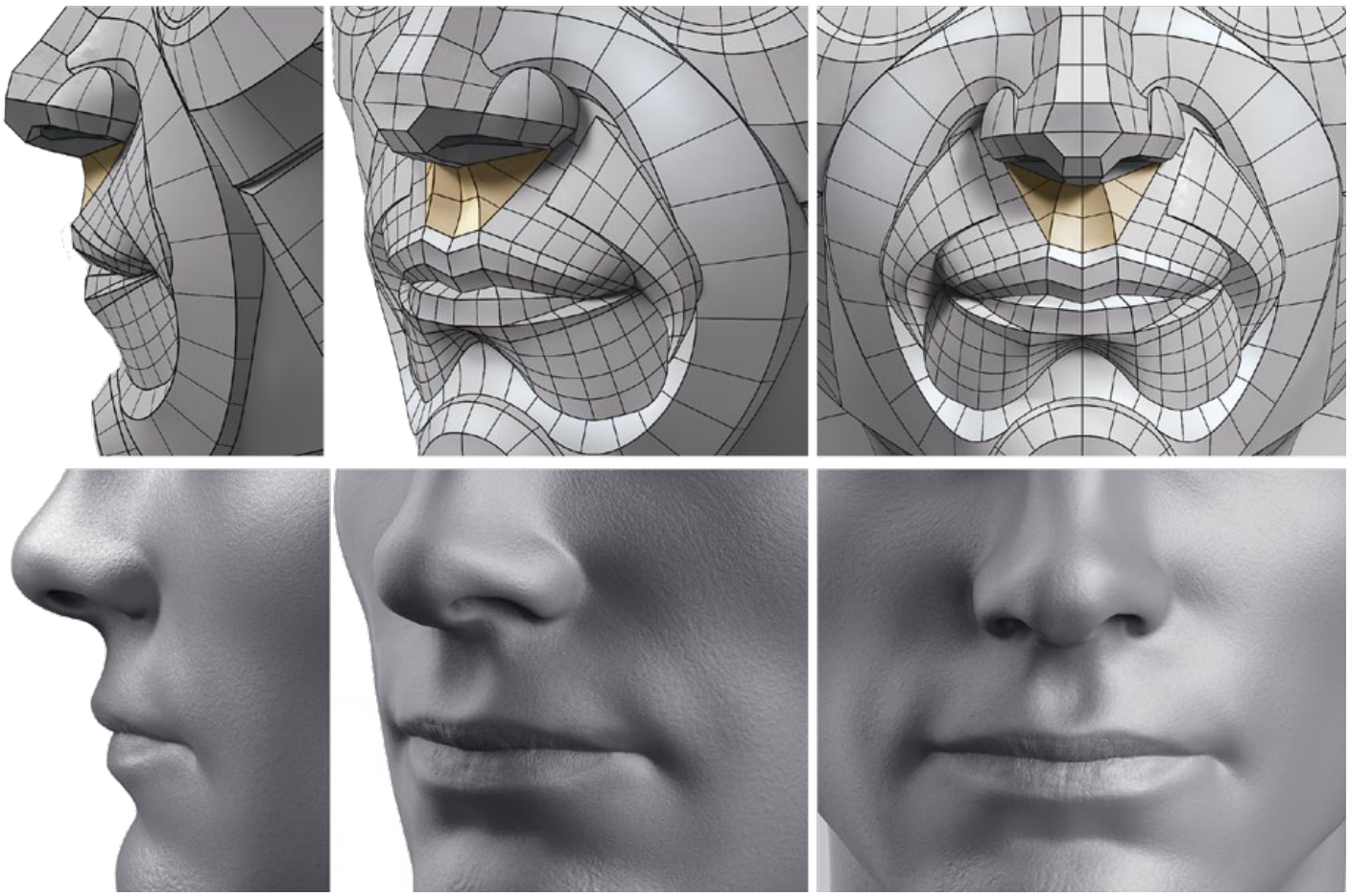
MOUTH AREA

Aging of the superior (Sjf) and inferior jowl fat (Ijf)

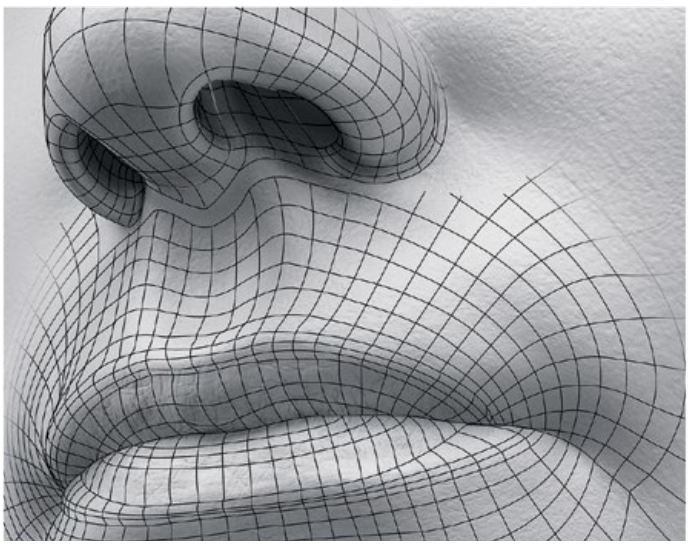


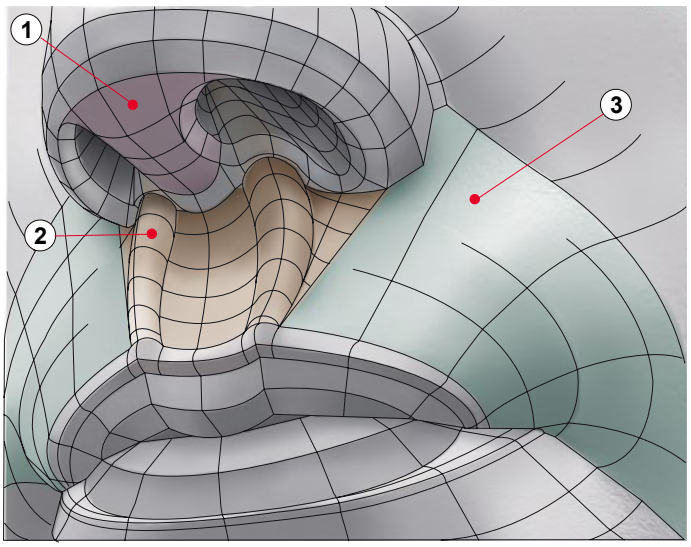
MOUTH AREA

Philtrum



Columella (1), philtrum (2), and roof of the mouth (3)

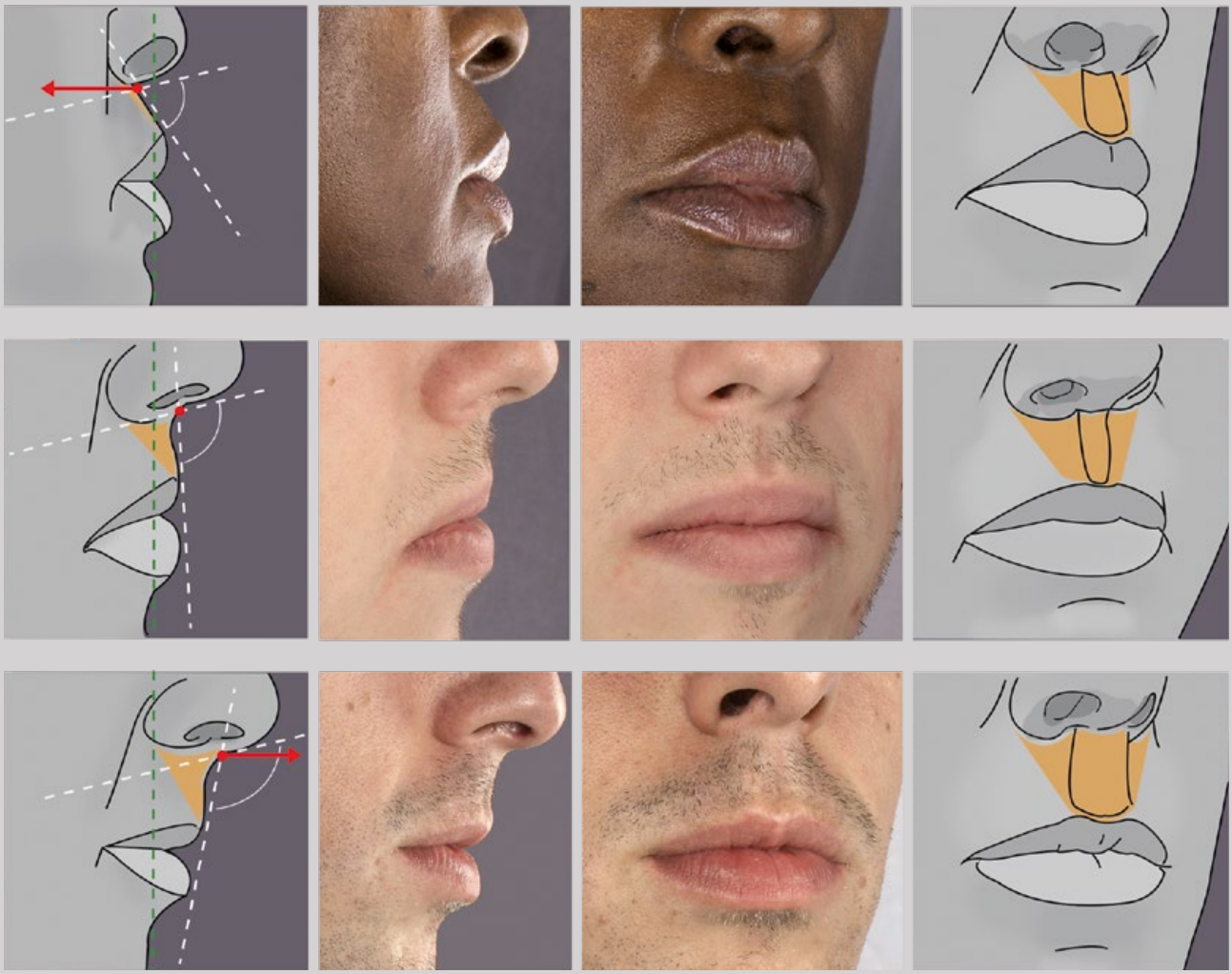




MOUTH AREA

Philtrum

Thickness of the philtrum



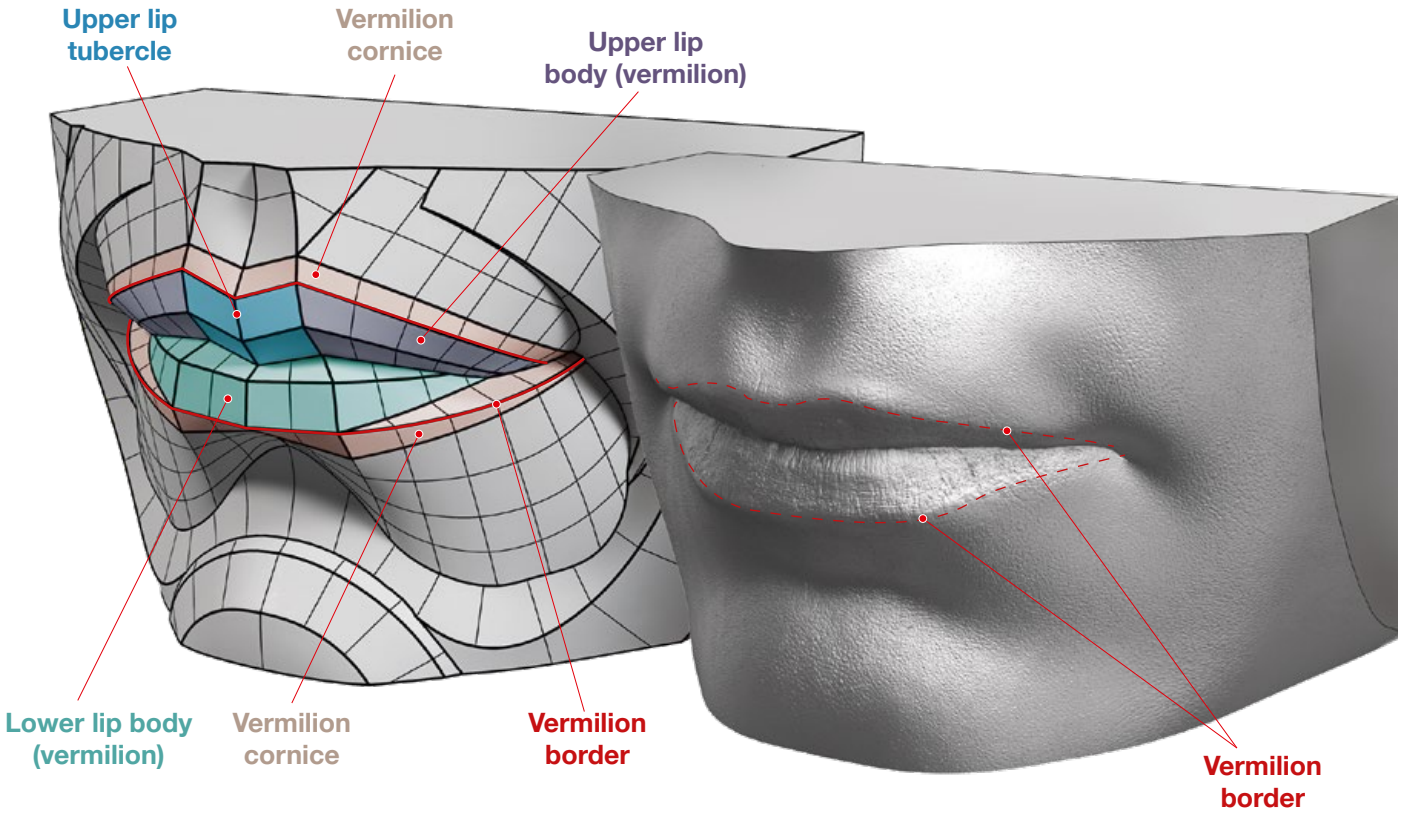
Profile of the philtrum

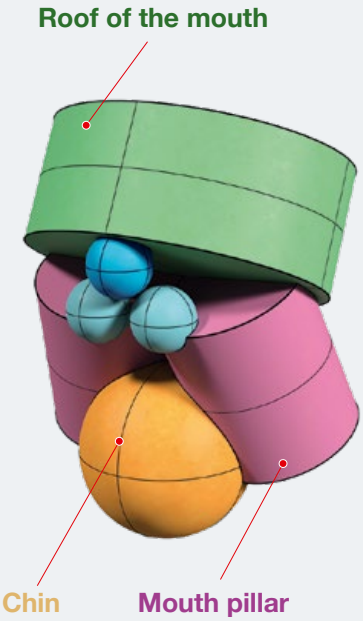
Concave, narrow and deep philtrum

Convex, shallow and wide philtrum

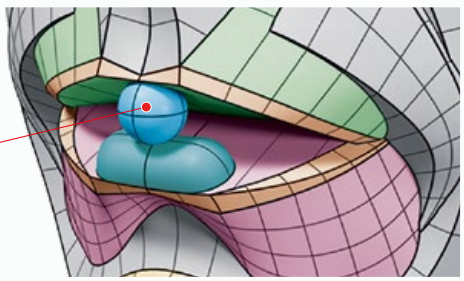
MOUTH AREA

Mouth

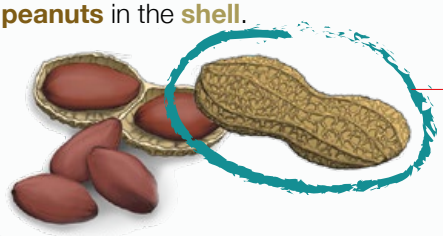


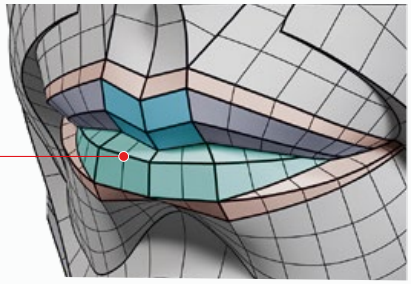


In the center of the upper lip is one easily distinguishable protuberance, also called the **tubercle**.



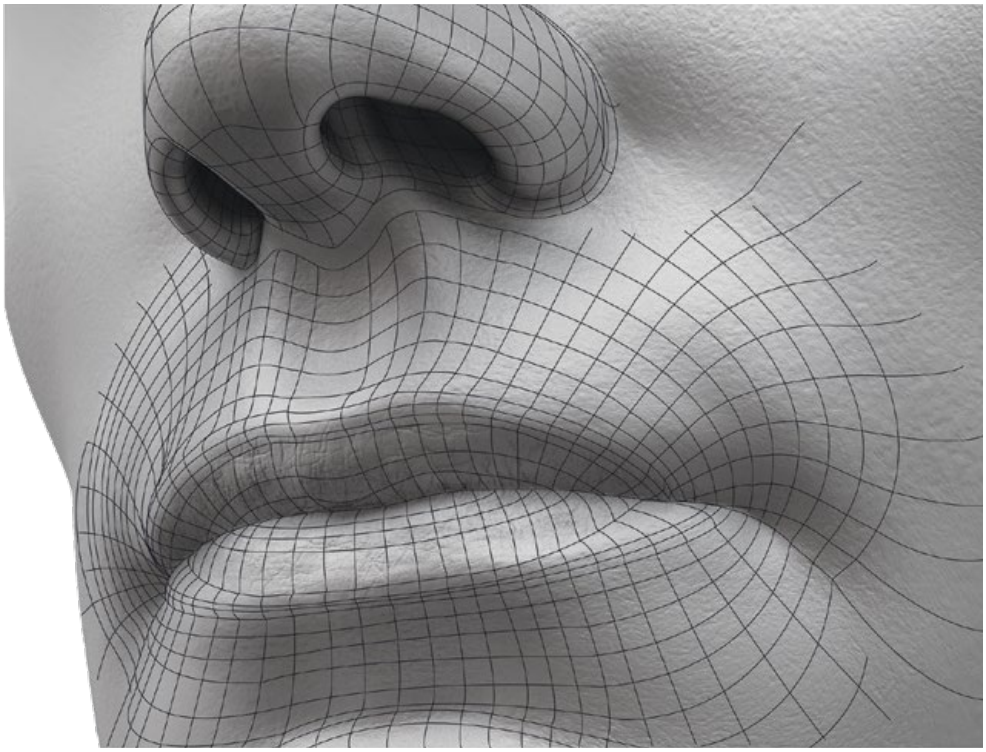
The **lower lip body** is made up of two fused tubercles, similar to **peanuts** in the **shell**.

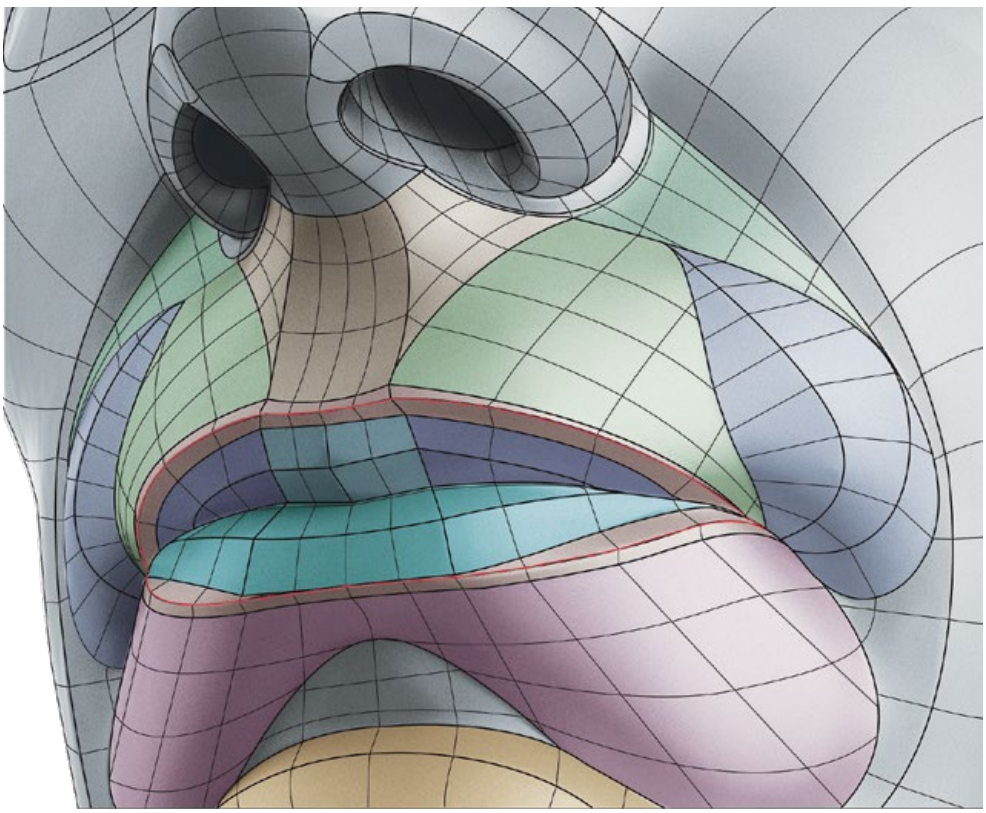




MOUTH AREA

Mouth

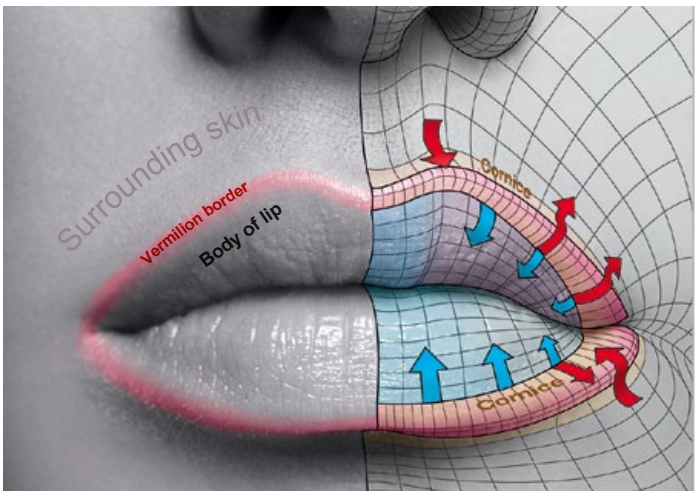


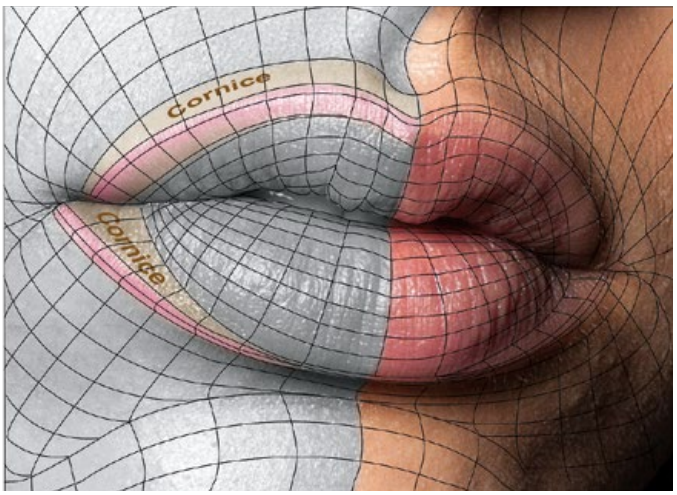


MOUTH AREA

Mouth / vermilion border

Vermilion border (**Vb**) is the boundary of which the upper part appears paler than the lower and it separates the body of the lip from the surrounding skin. The upper lip **cornice** is a flat strip above the upper lip; it usually appears lighter than the rest of the roof of the mouth. The more distinct the upper lip **cornice**, the more youthful appearance. The lower lip **cornice** is more prominent on the lateral side of the lip. It looks as if the body of the lower lip is sitting on top of the **cornice**.





Reflections of the lips:
a) Cupid's bow reflection,
b) Lower lip vermilion reflection (usually split in two),
c) Commissure reflection.

PHOTO: SHUTTERSTOCK (ID: 123856489)

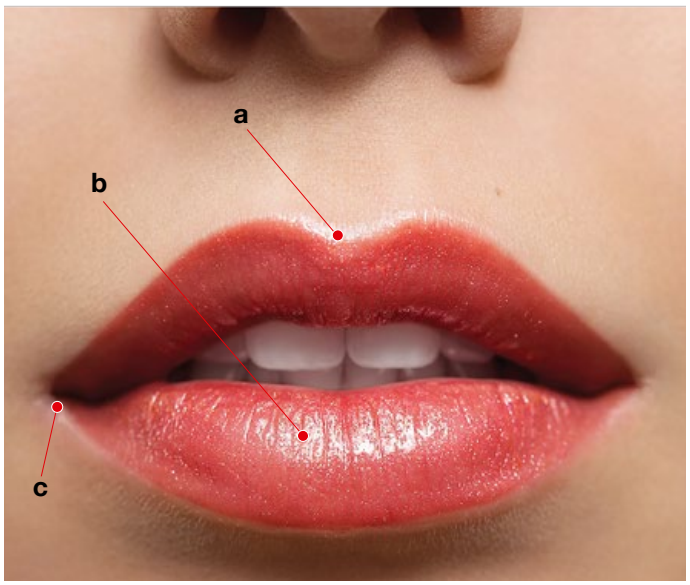


PHOTO: SHUTTERSTOCK (ID: 125847749)

MOUTH AREA

Mouth / vermilion border

Surface patterns of the lips

The surface of the body of the lip is not smooth. It has many elevations and depressions forming a characteristic pattern called lip patterns. Here is the so-called Suzuki's classification of these patterns.

Type I: Vertical, composed of complete [end-to-end] longitudinal fissure patterns.

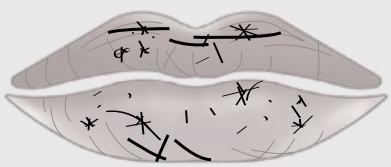
Type II: Partial length groove of type I.

Type II: Branched grooves, Y-shaped pattern.

Type III: Intersected grooves.

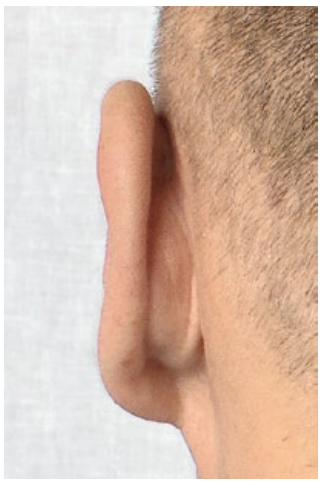
Type IV: Reticular, typical checkered pattern, fence-like.

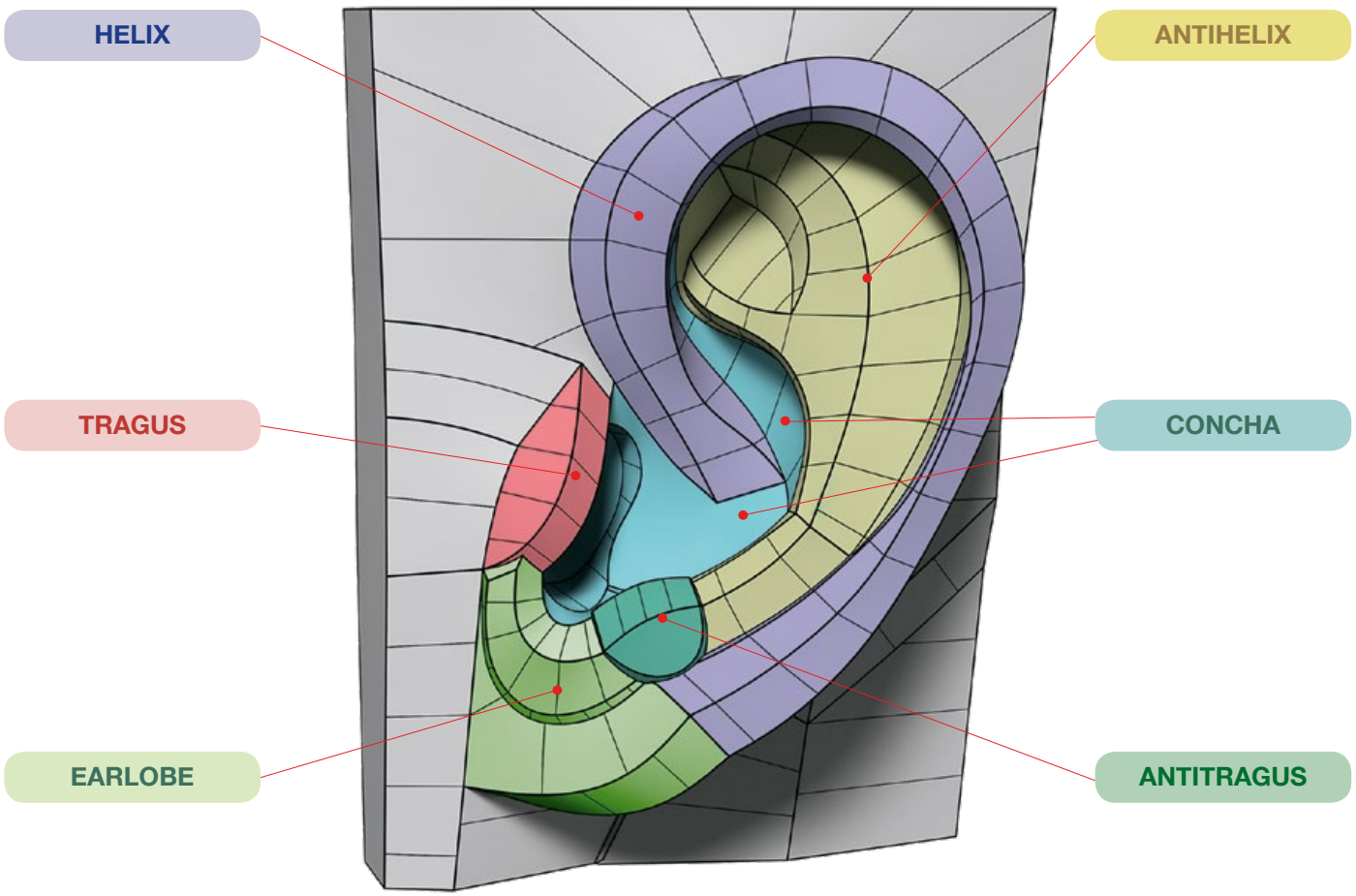
Type V: Undifferentiated grooves.



PARTS OF THE EAR

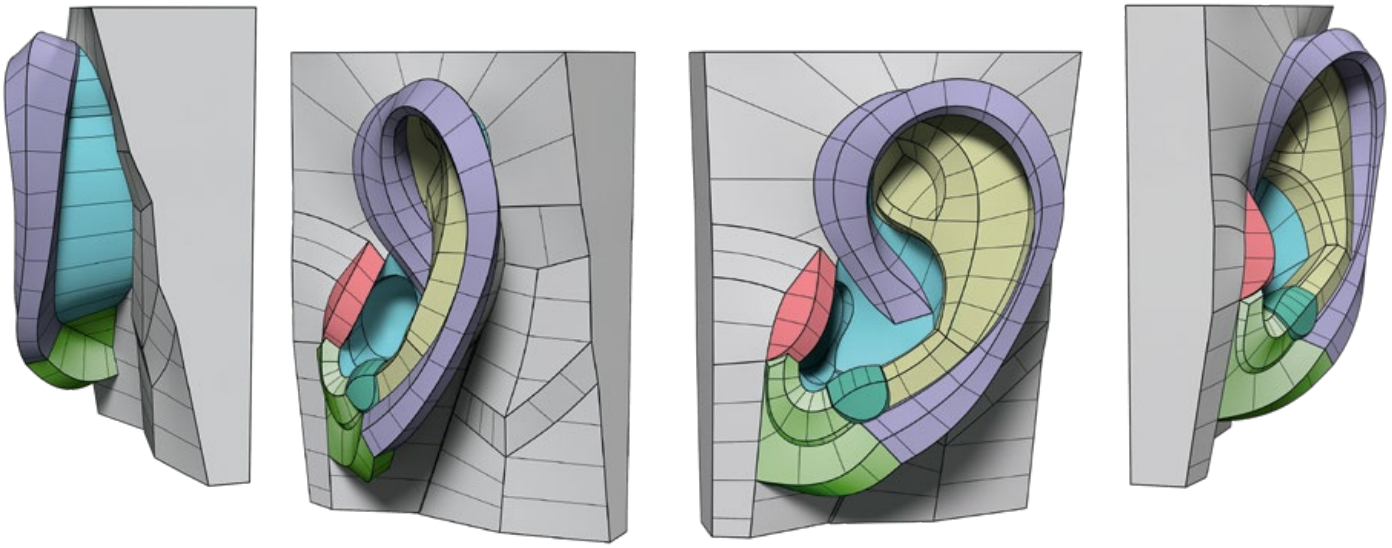
The auricle (part of the outer ear)



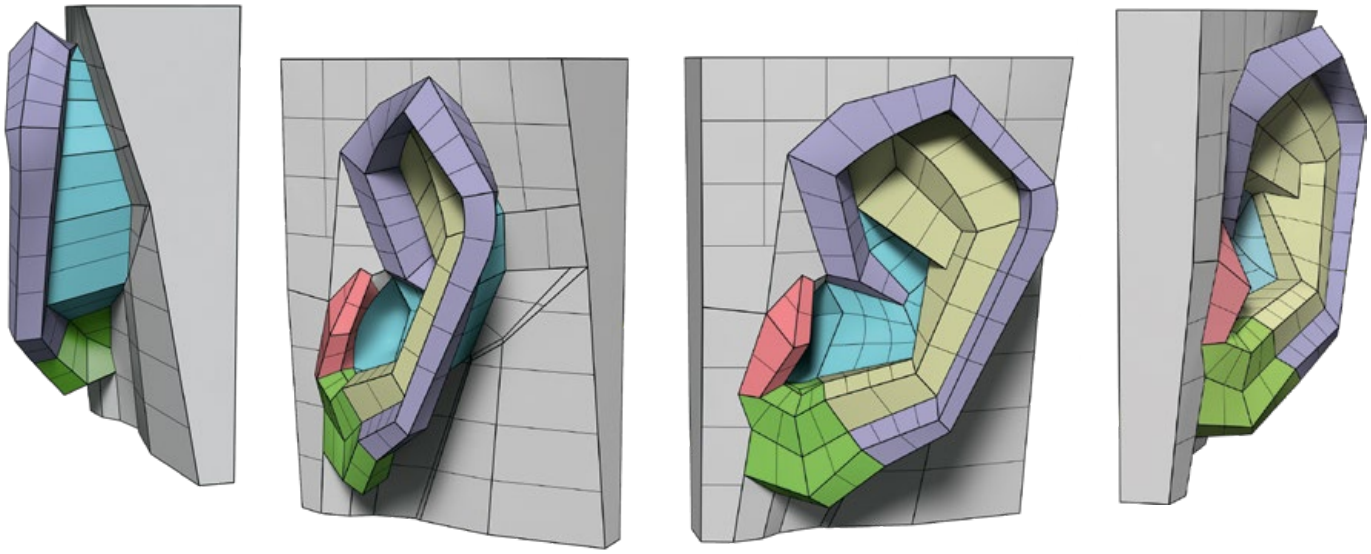



PARTS OF THE EAR

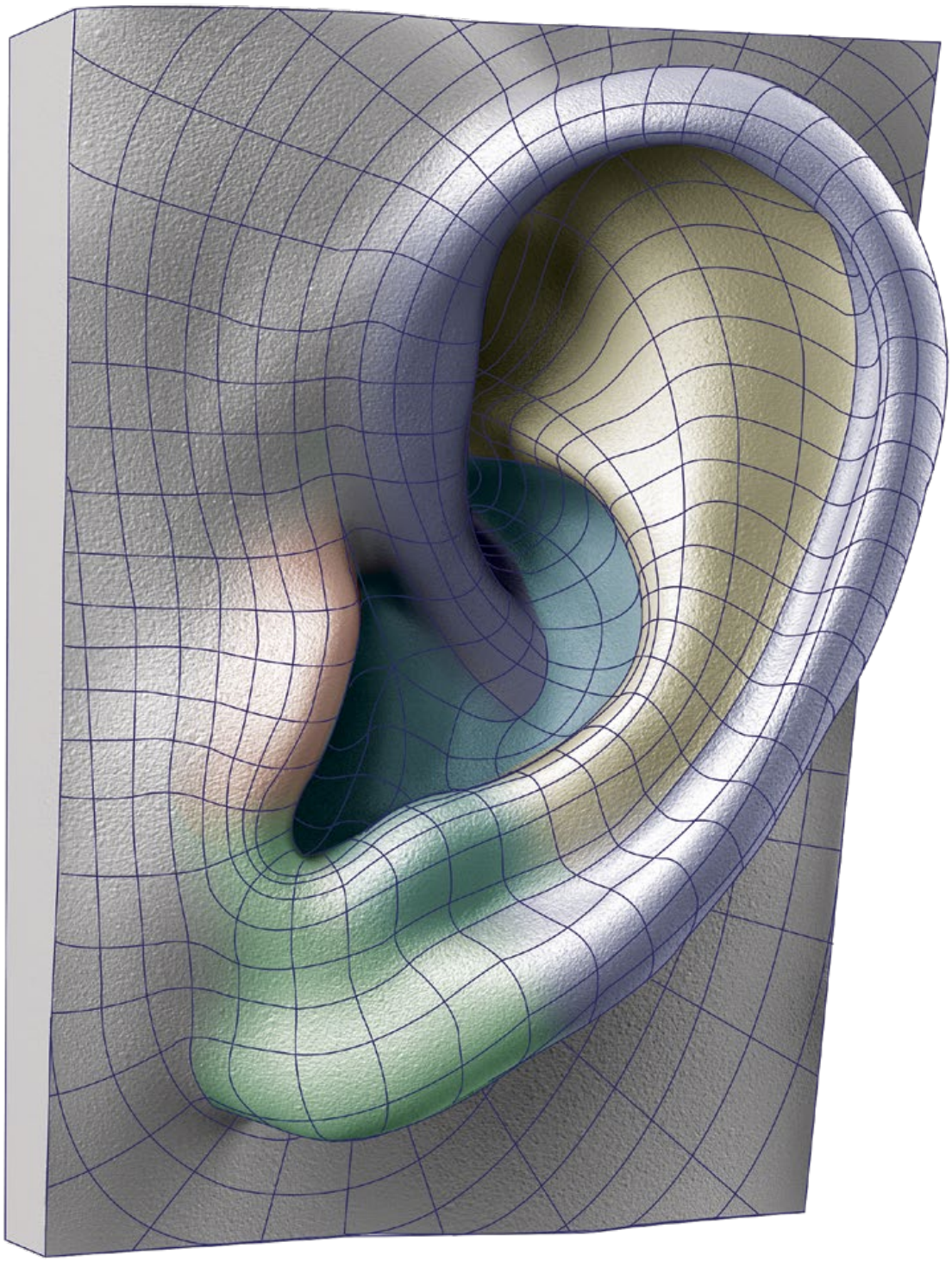
Complex block-out



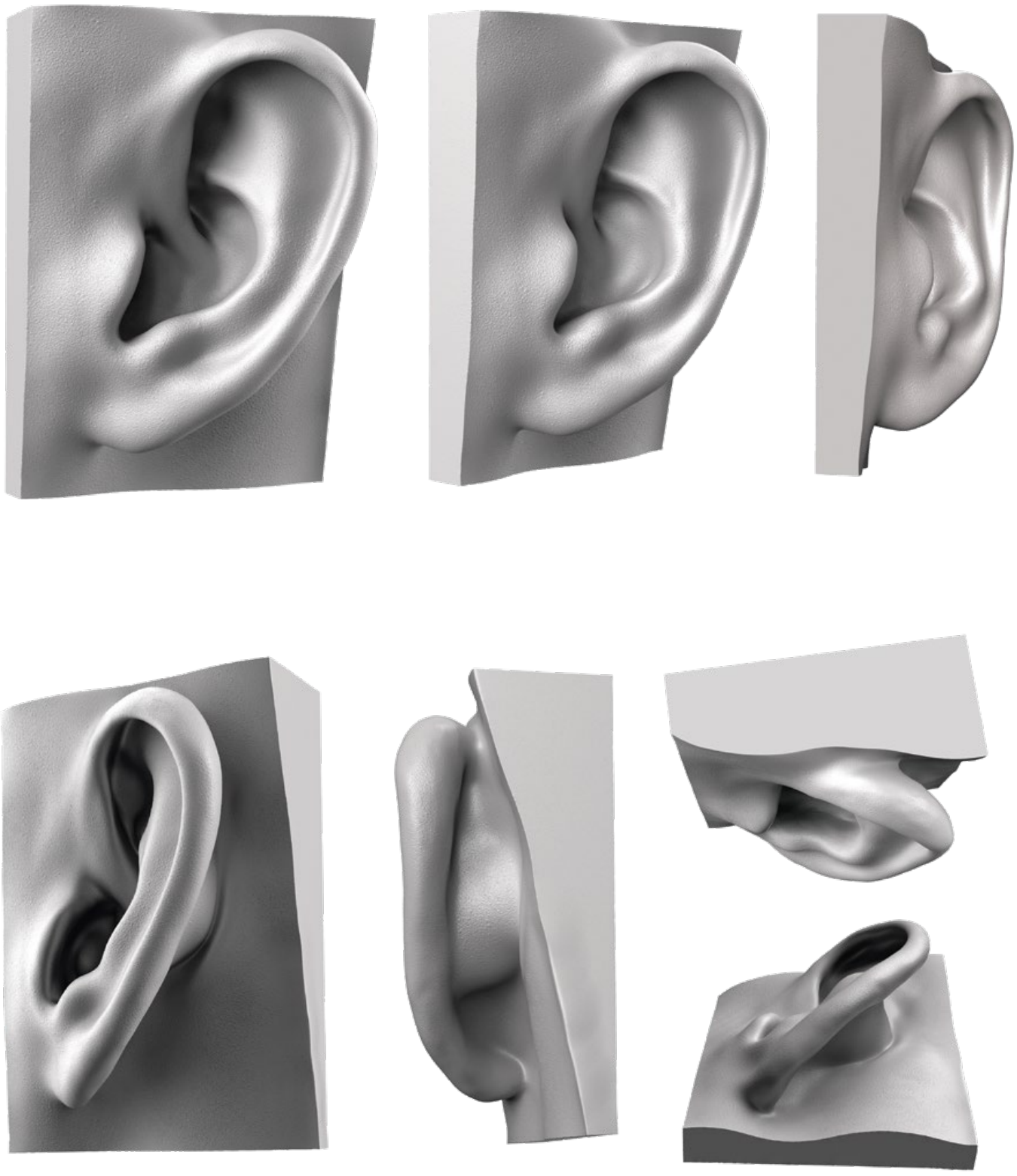
Simple block-out



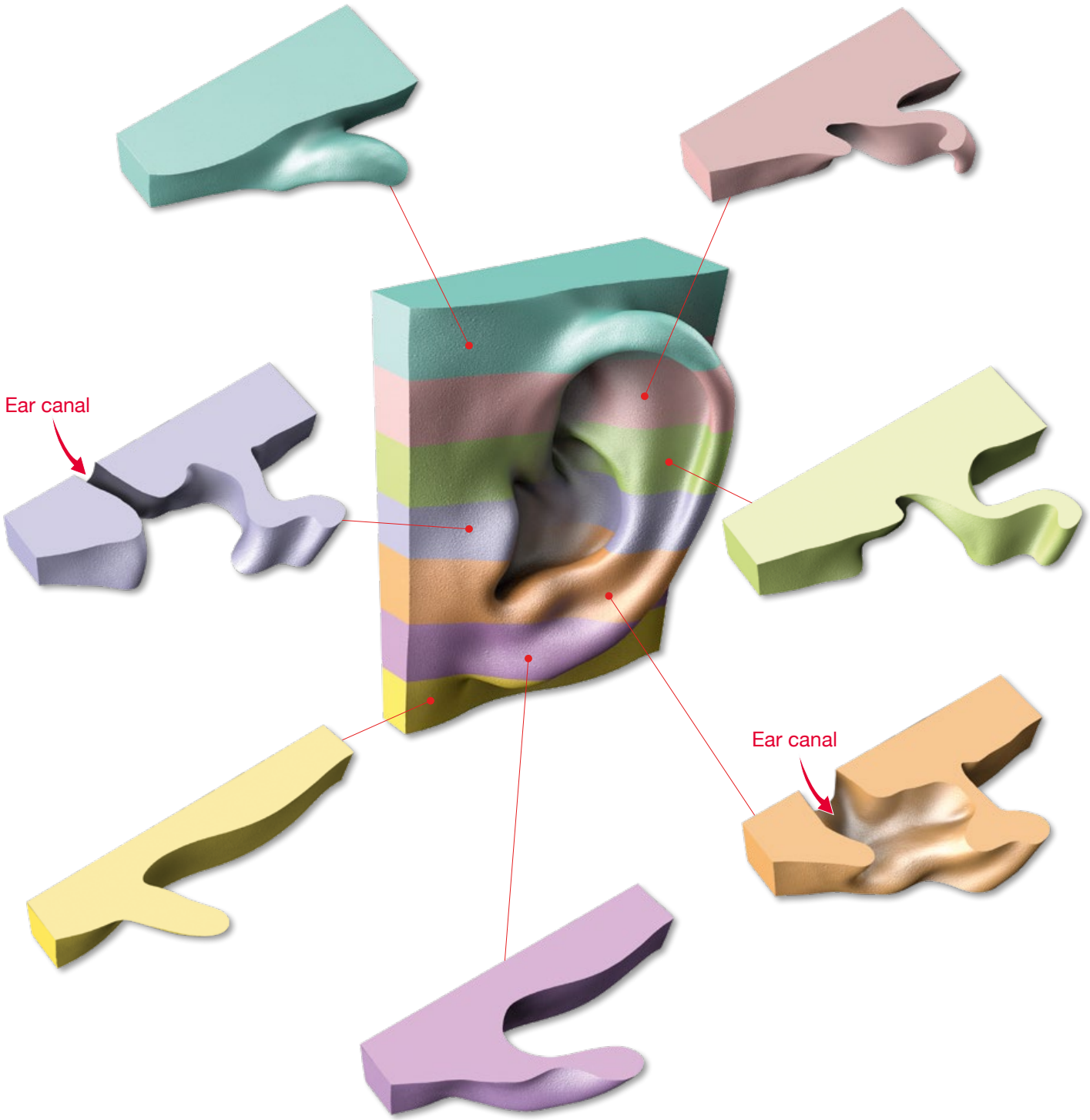
FORM OF THE EAR



FORM OF THE EAR

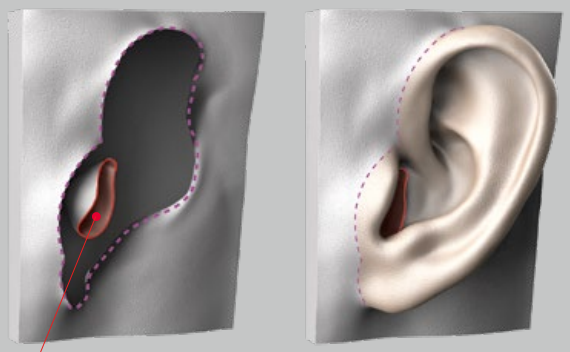


CROSS SECTIONS OF THE EAR

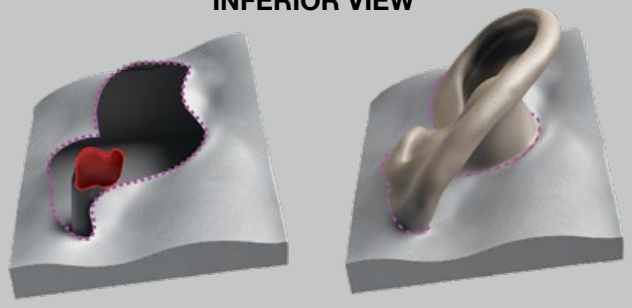


EAR CONNECTION AND POSITION ON THE HEAD

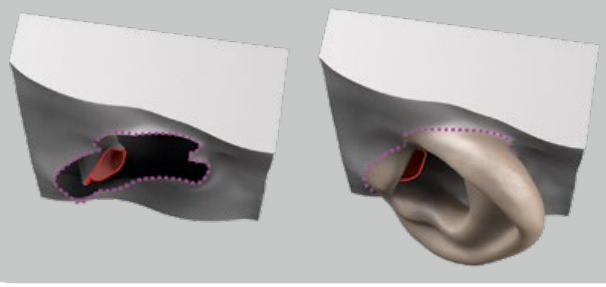
LATERAL VIEW



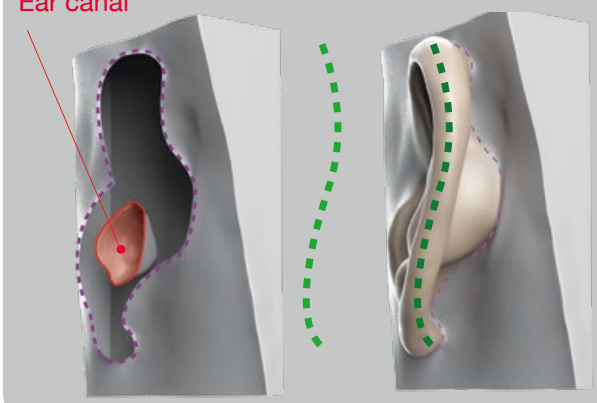
INFERIOR VIEW



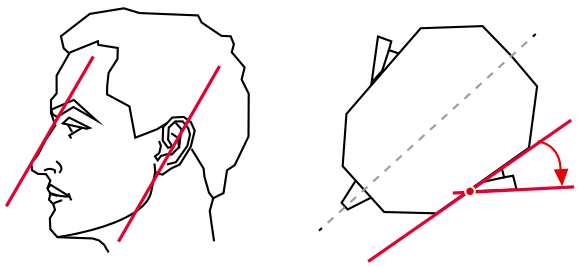
SUPERIOR VIEW



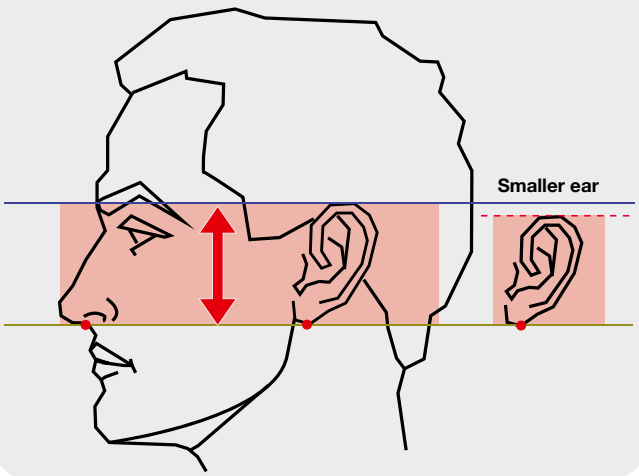
POSTERIOR VIEW



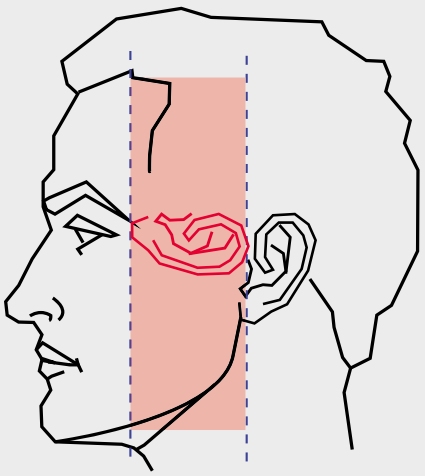
angle of nose = angle of ear



HEIGHT OF THE IDEALIZED EAR

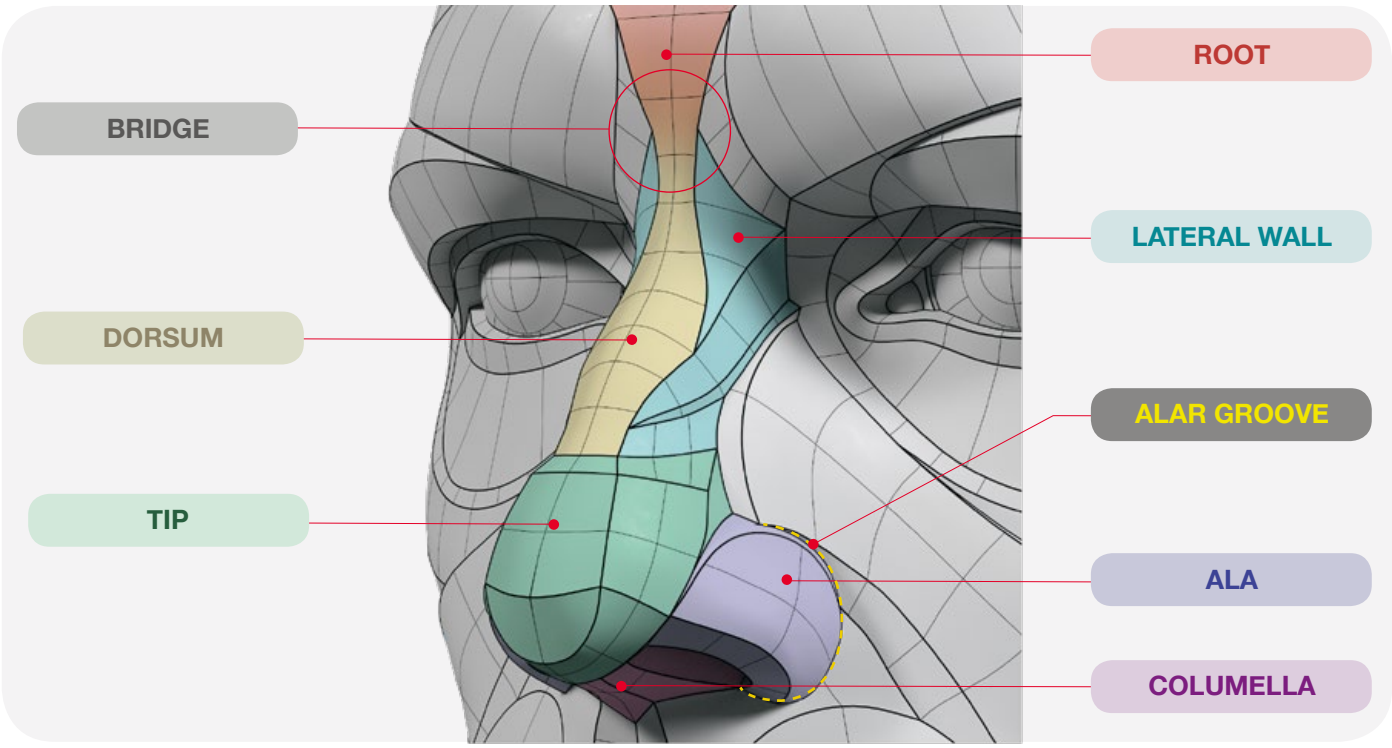


DISTANCE BETWEEN EYEBROW AND EAR



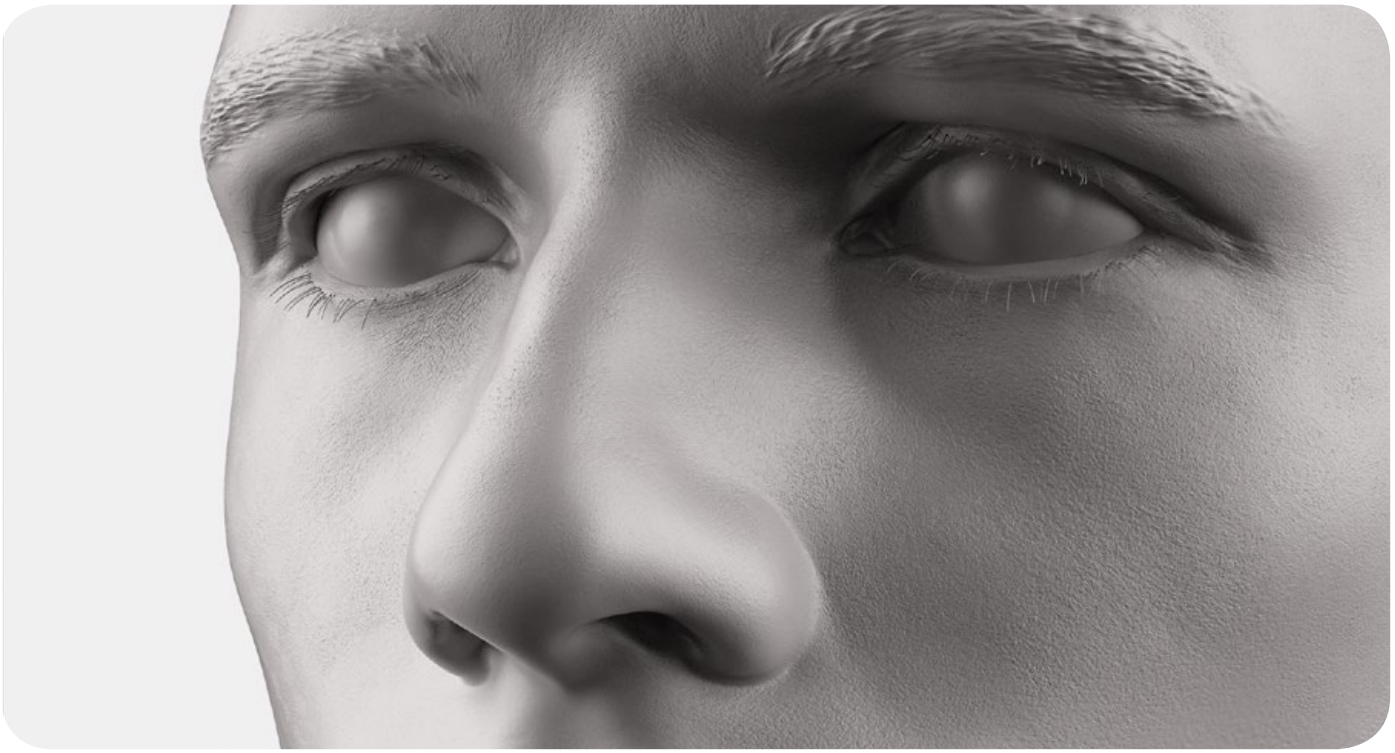
NOSE

Parts of the nose

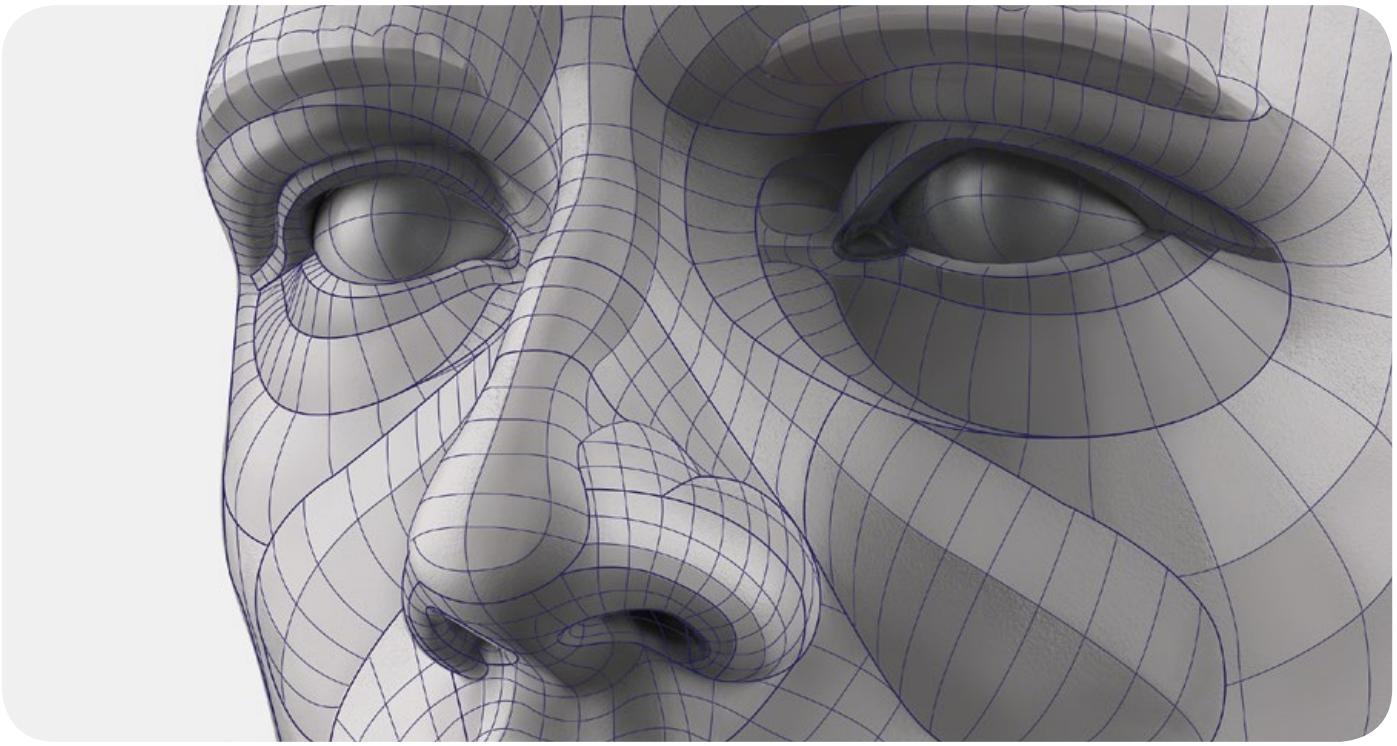


NOSE

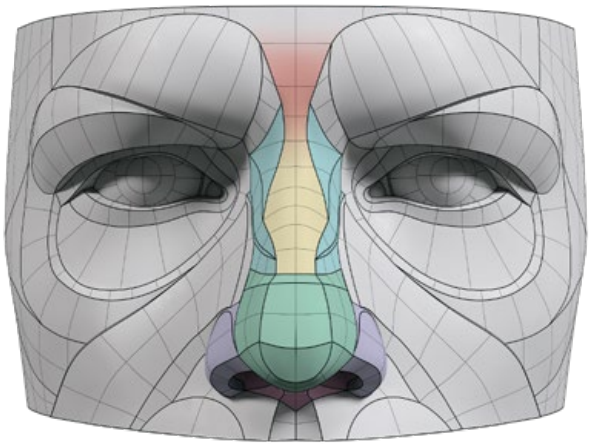
3D scan of the nose

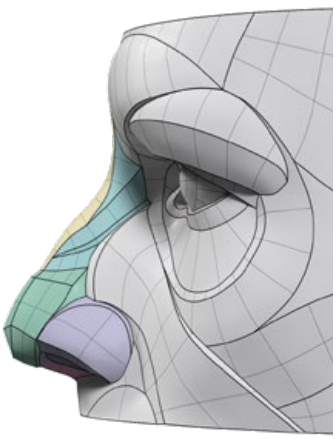


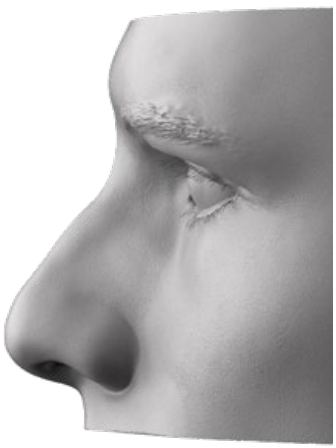
Forms of the nose

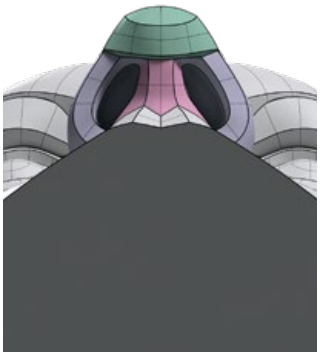


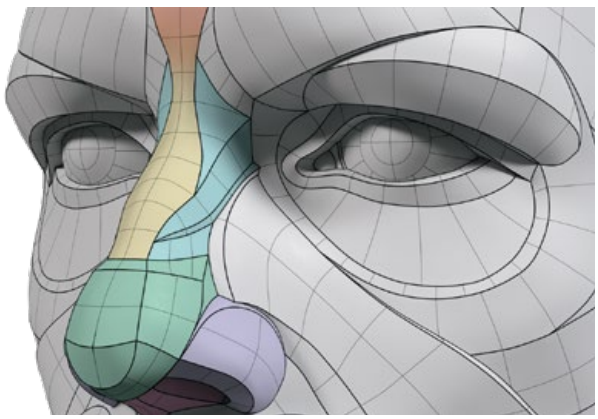
NOSE



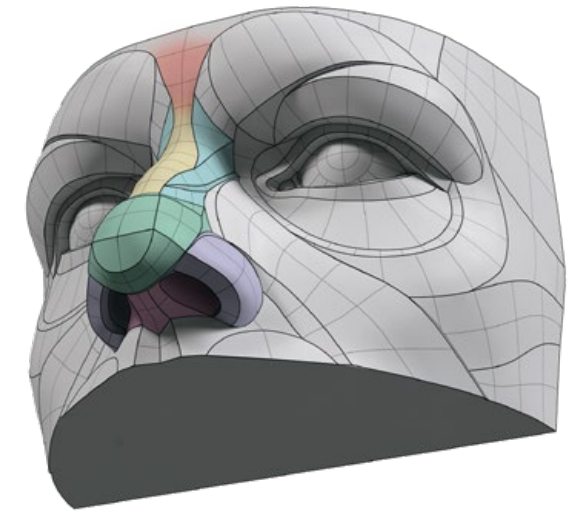


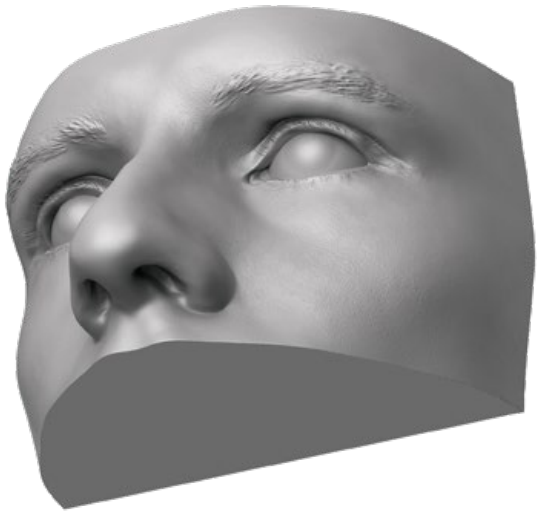


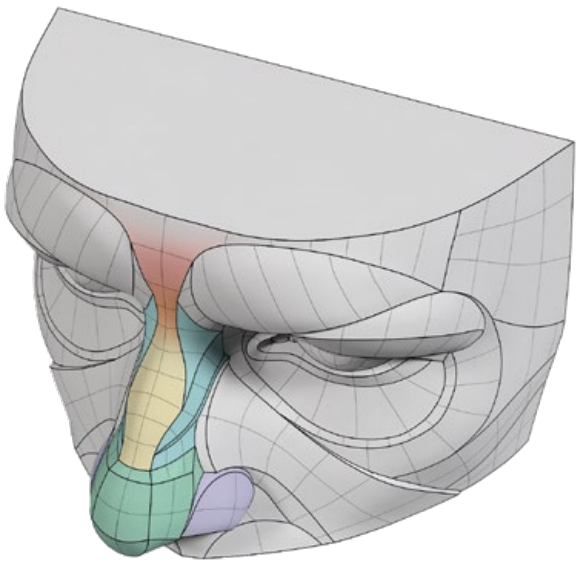


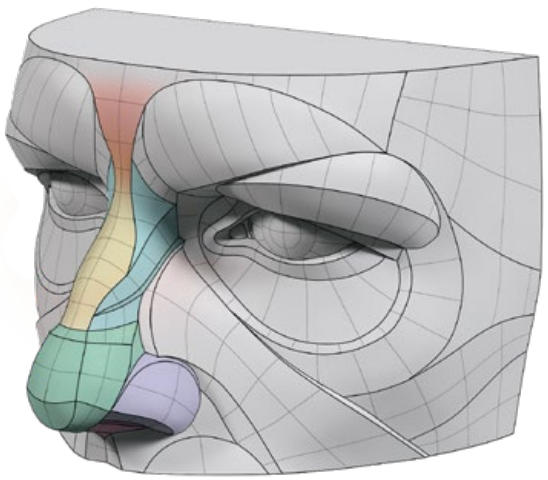


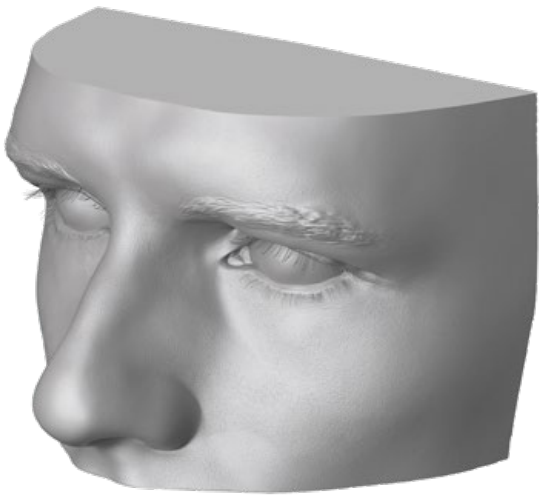
NOSE





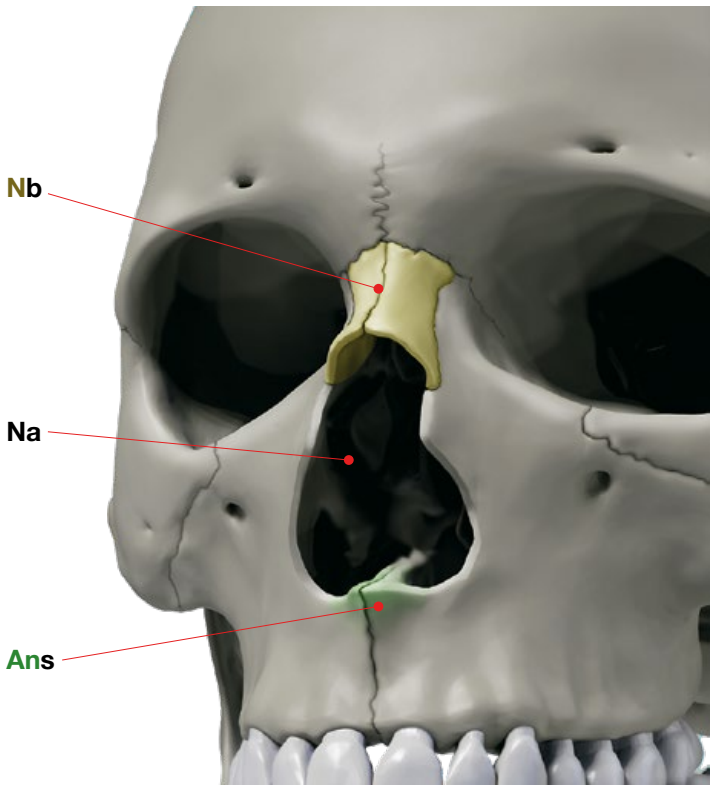




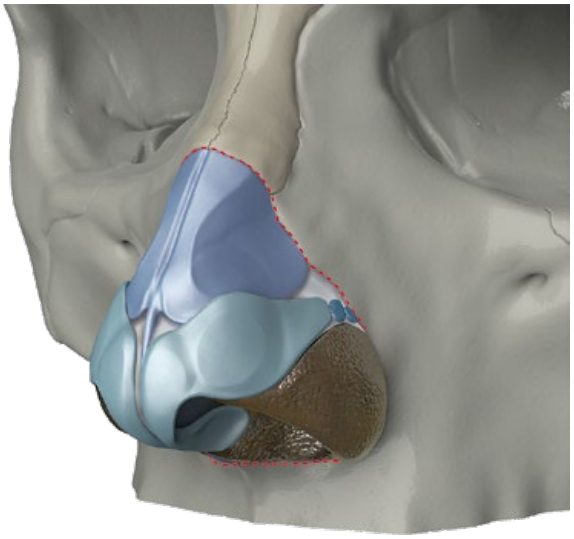


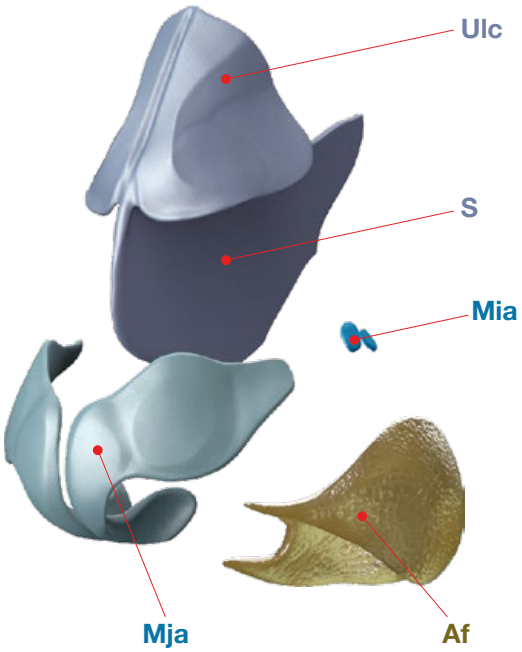
ANATOMY OF THE NOSE

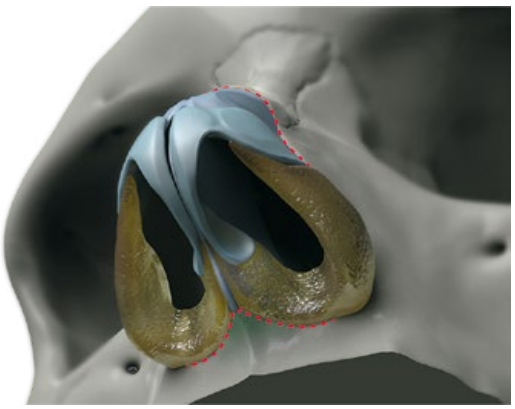
Nasal skeleton



Nb	Nasal bones
Na	Anterior nasal aperture (piriform aperture)
Ans	Anterior nasal spine



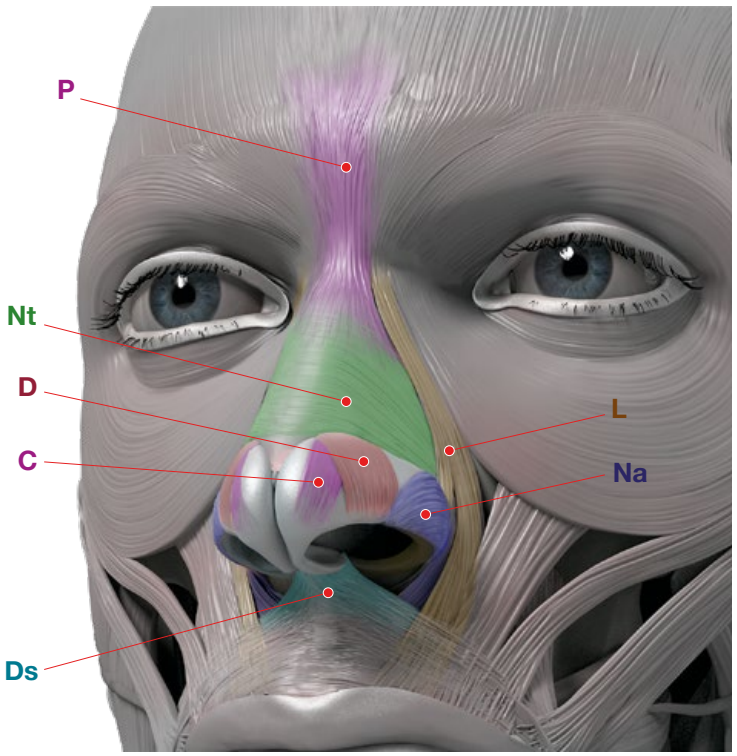


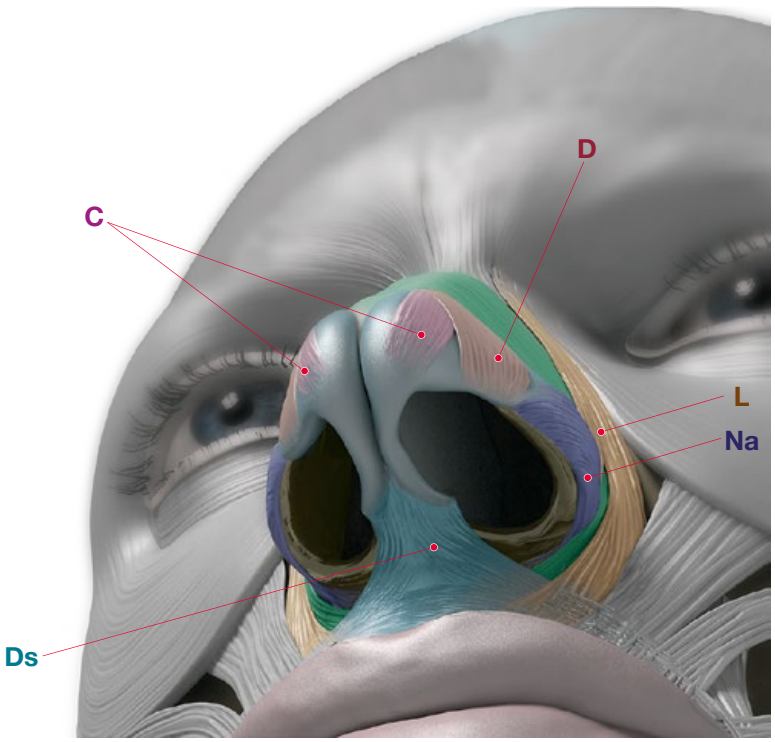


Ulc	Upper lateral cartilage
S	Septal cartilage
Mja	Major alar cartilage
Mia	Minor alar cartilage
Af	Alar fibro-fatty tissue

ANATOMY OF THE NOSE

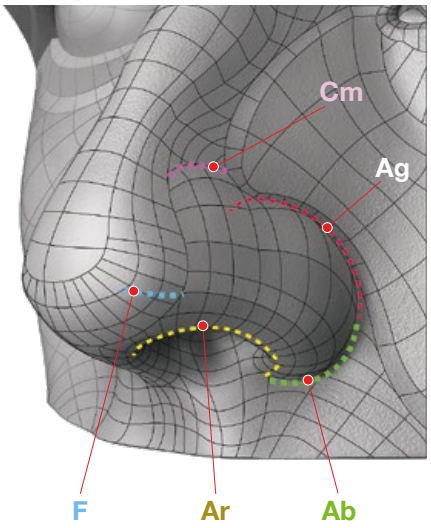
Muscles of the nasal area

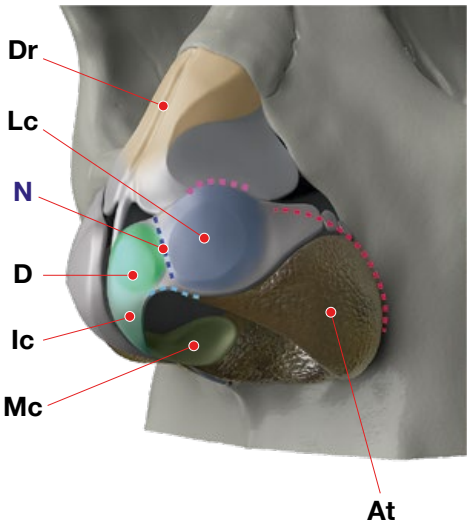




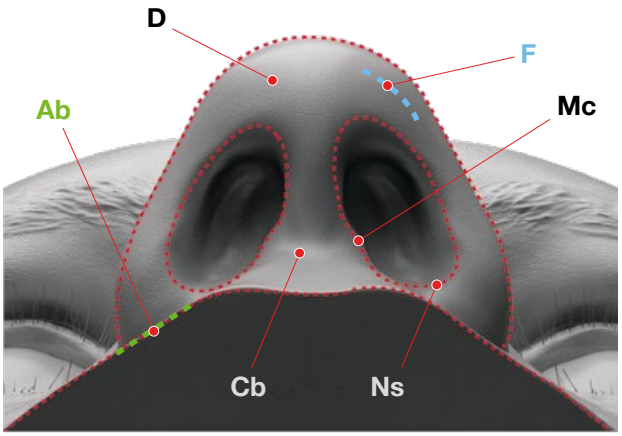
P	Procerus
Nt	Nasalis (transverse portion)
D	Dilator naris anterior
C	Compressor narium minor
Ds	Depressor septi nasi
Na	Nasalis (alar portion)
L	Levator labii superioris alaeque nasi

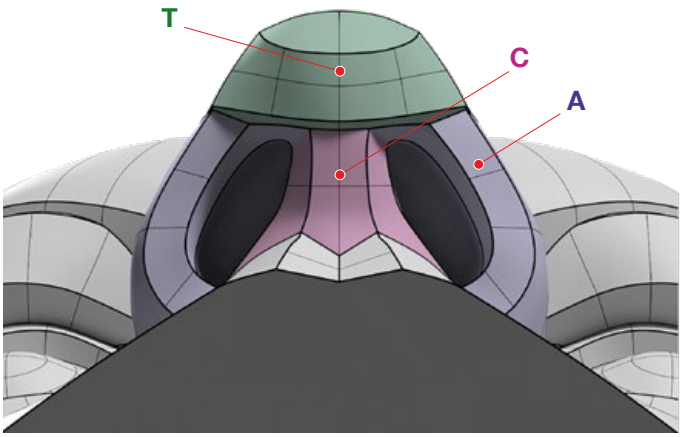
DETAILED ANALYSIS OF THE FORM OF THE NOSE

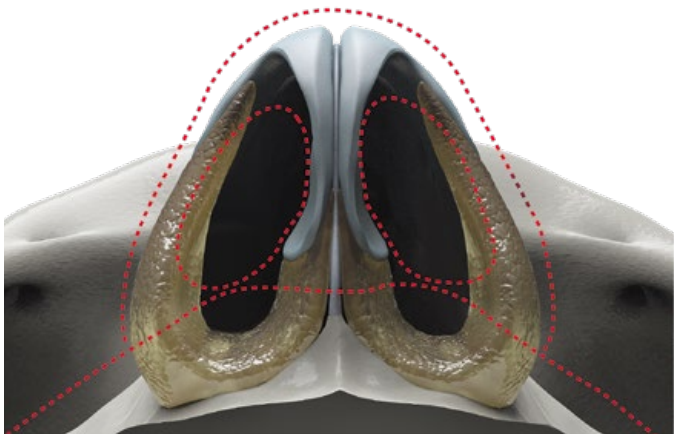




F	Facet	**Cm**	Cranial margin	**Dr**	Dorsum	**Ic**	Intermediate crus
Ar	Alar rim	**Ag**	Alar groove	**Lc**	Lateral crus	**Mc**	Medial crus
Ab	Alar base	**N**	Notch	**D**	Dome	**At**	Alar tissue





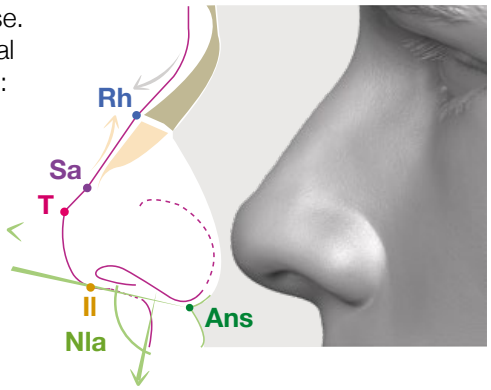


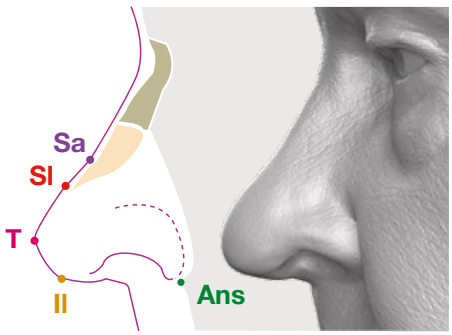
Cb	Collumellar base
Ns	Nostril sill
C	Collumella
T	Tip
A	Ala

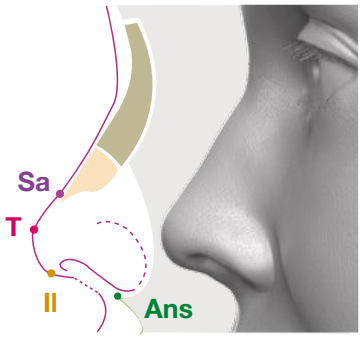
TYPOLOGY OF THE NOSE

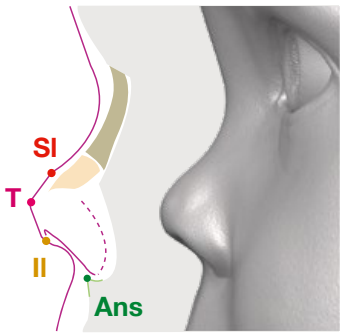
Nasal profile of the nose

The profile of the nose refers to the shape of the outline of the bridge of the nose. It is composed of the outline of the nasal bones, and the dorsum of upper lateral cartilages. The following points are important in analysis of the form of the nose:
Rhinion (**Rh**) – the bony-cartilaginous junction.
Supratip area (**Sa**) – the region above the tip.
Supratip lobule (**Sl**) – portion from the supratip break point to the tip defining point (**T**).
Tip (**T**) – the part of the nose furthest from the plane of the face.
Infratip Lobule (**Il**) – Lowest portion of the nasal tip.
The anterior nasal spine (**Ans**) – protrusion of the maxilla at the base.
Nla-nasolabial angle – angle between columella and line tangent to philtrum. Typically 92–98 degrees in men and 95–105 degrees in women.





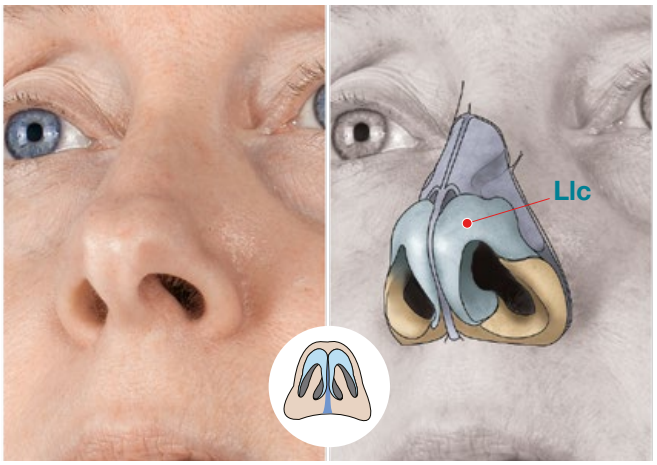




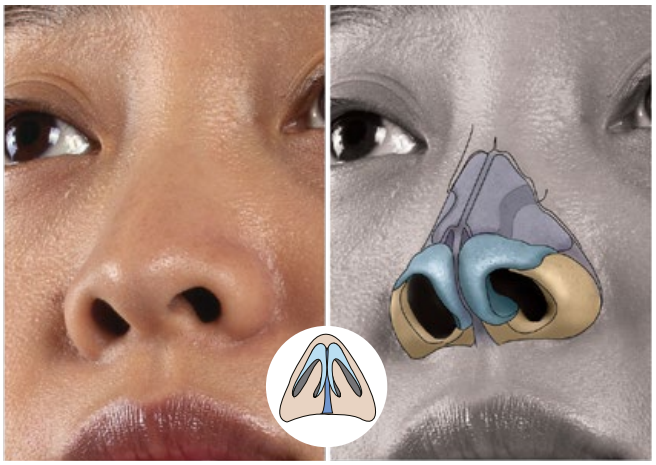
The nasal tip

The nasal tip is composed entirely of cartilage. The cartilage which creates the tip of the nose is called the **lower lateral cartilage** (**Llc**). There are two **lower lateral cartilages**. One forms the right side of the nasal tip. The other one forms the left side of the nasal tip. The shape of each of these **Llc**, and their relation to each other, is what determines the shape of the tip of the nose. There is an endless amount of variation of these cartilages which explains why there is such a variety of nasal tip shapes.

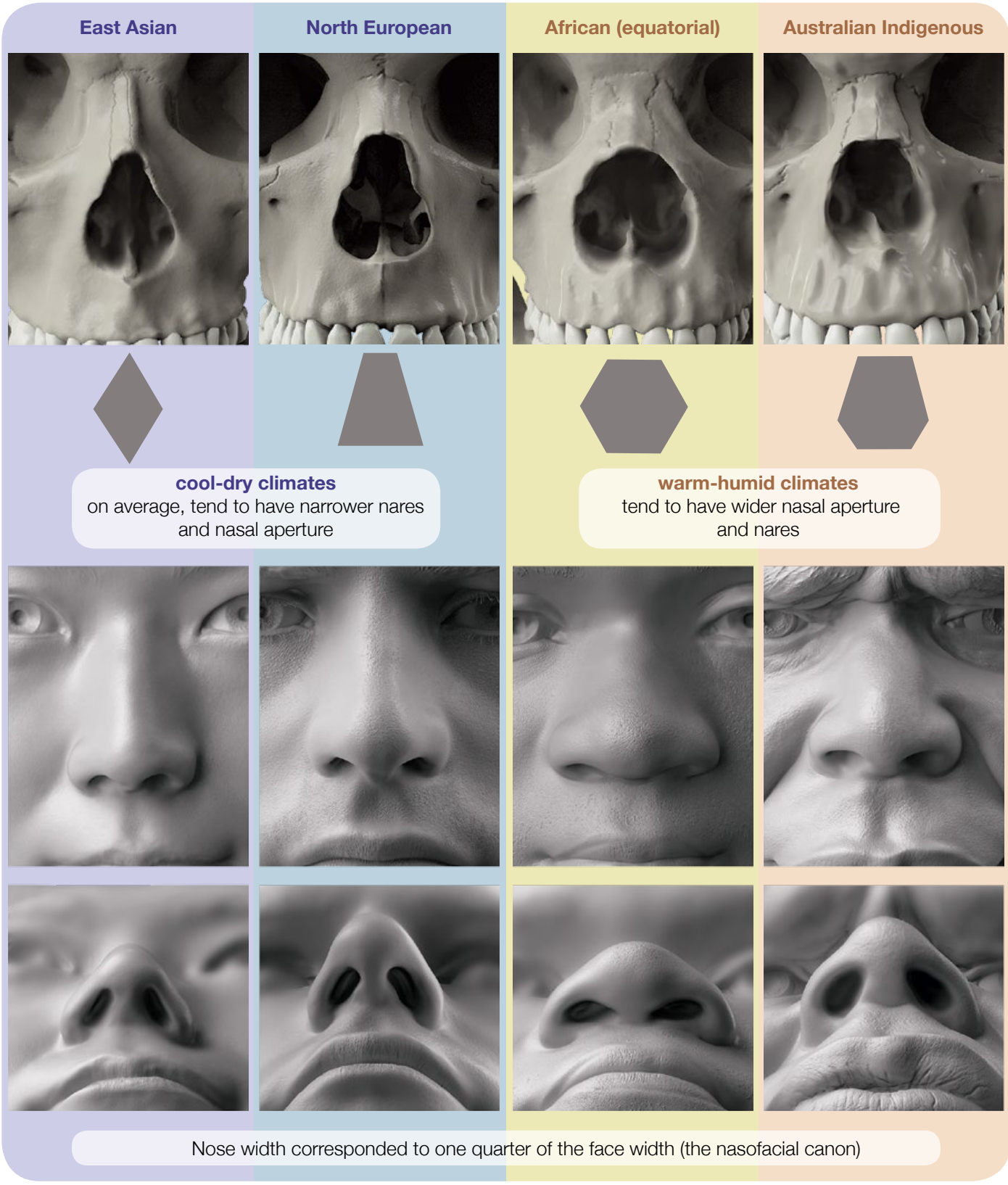
Broad or Boxy Tip



Sharp tip



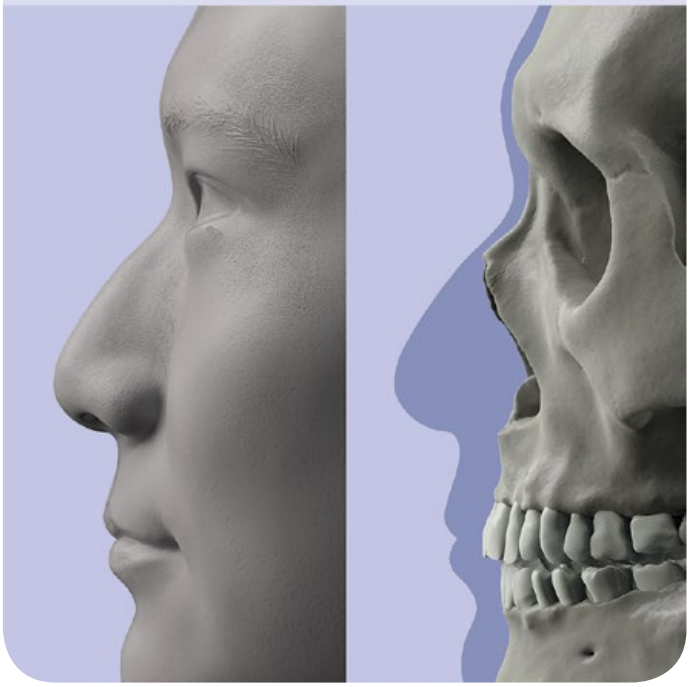
MAJOR ETHNIC NOSE PHENOTYPES



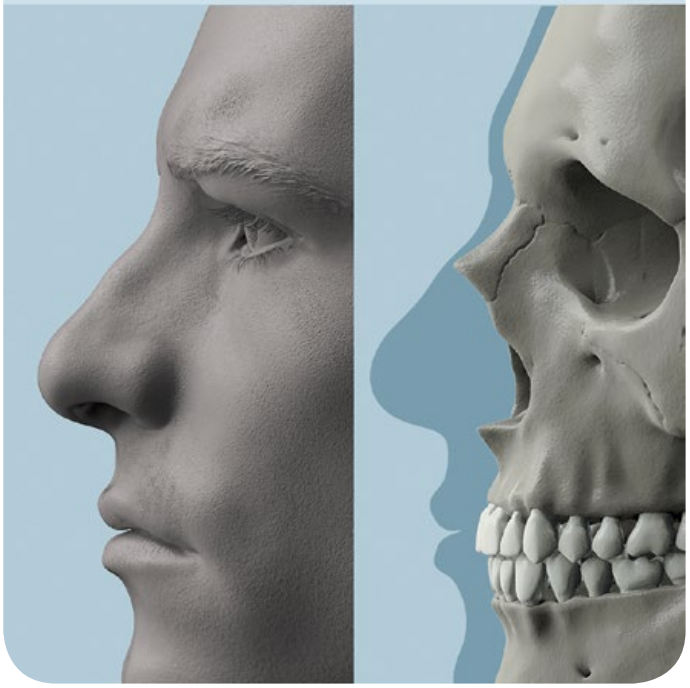
MAJOR ETHNIC NOSE PHENOTYPES

Anthropologists agree that the nasal variations are due to evolutionary adaptation to climate by natural selection.
Significant differences in the nasal proportions exist between ethnic groups.
However, there is not enough consistent data to demonstrate differences in nasal physiology between the ethnic groups.

East Asian



North European

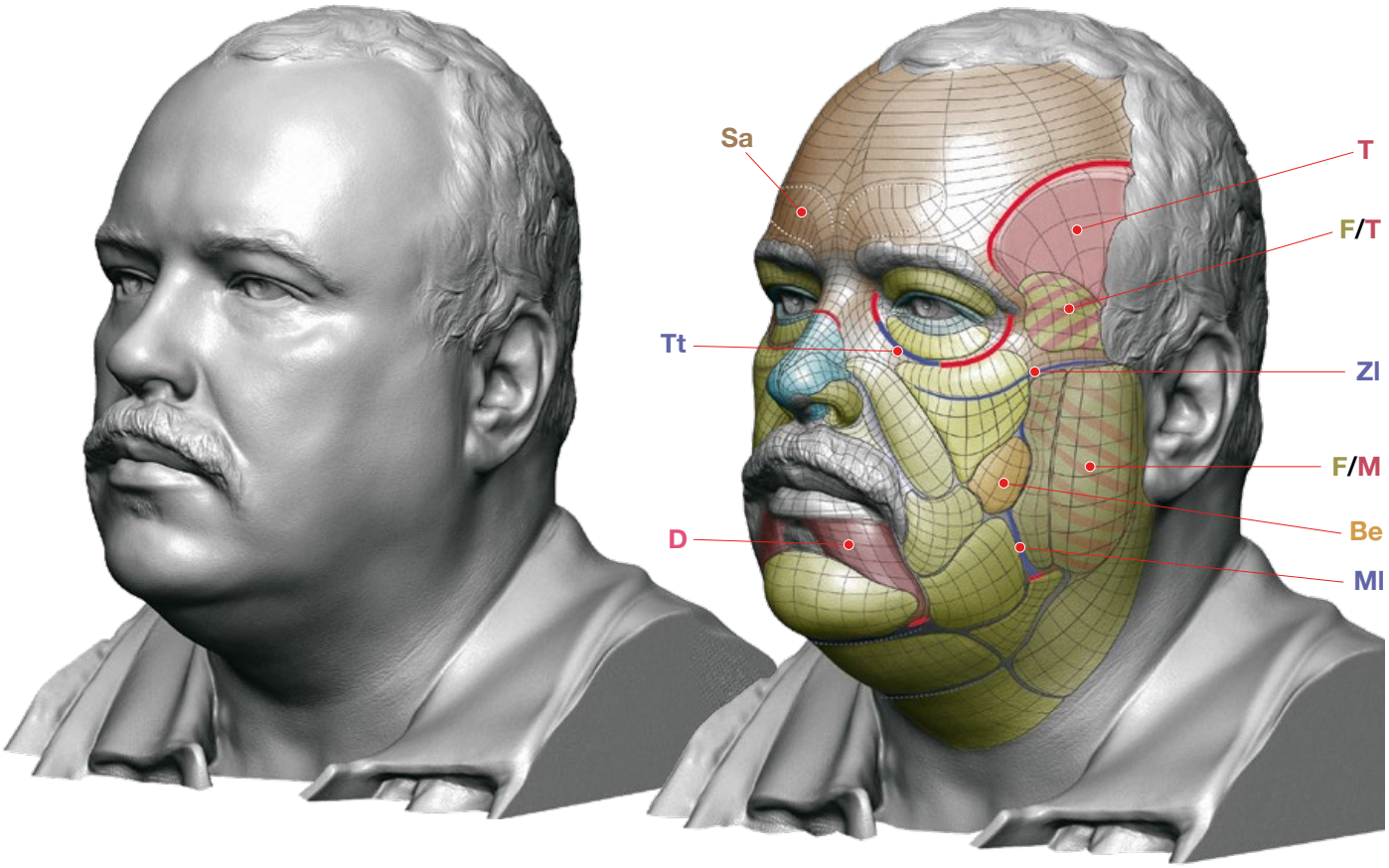


African (equatorial)

Australian Indigenous

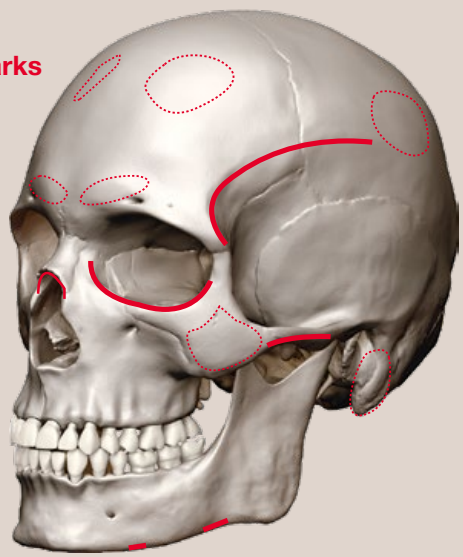
THE SHAPE OF THE FACE IS INFLUENCED BY THE:

bone | muscle | fat | cartilage



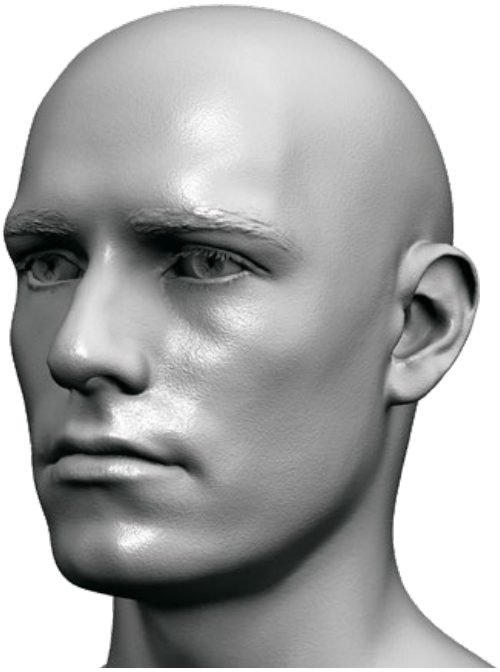
Sa	Superciliary arch
T	Temporalis muscle
F/T	Cheek fat and temporalis muscle
F/M	Temporal fat and masseter muscle
D	Depressor labii inferioris muscle
Be	Deflation of the buccal extension (deep fat pad) happens in older age
Tt	Tear trough ligament
Zl	Zygomatic cutaneous ligament
Ml	Masseteric cutaneous ligament

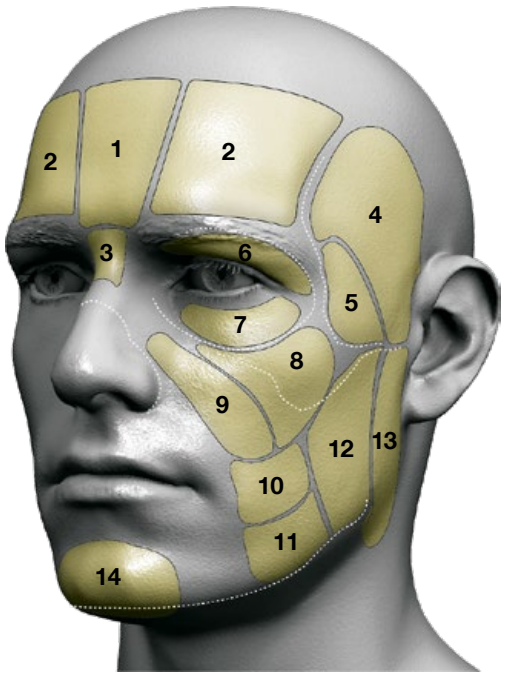
Bony landmarks



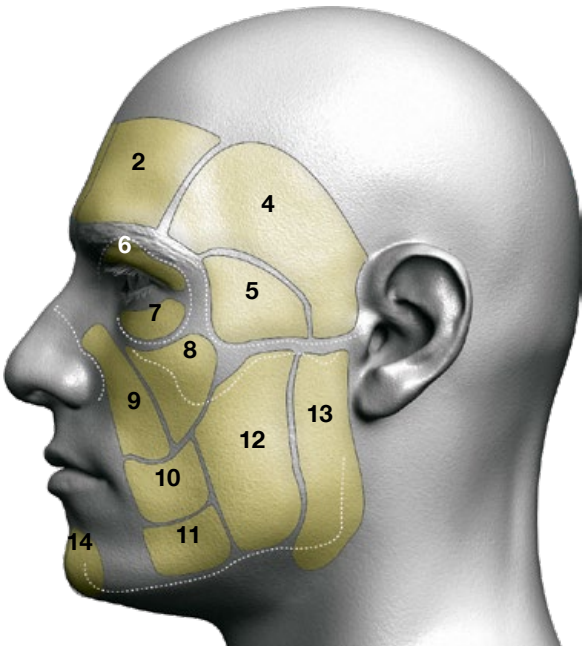
FACIAL FAT

The facial fat is organized in superficial and deep layers. Form of the face is mostly influenced by Subcutaneous (superficial) fat pads.



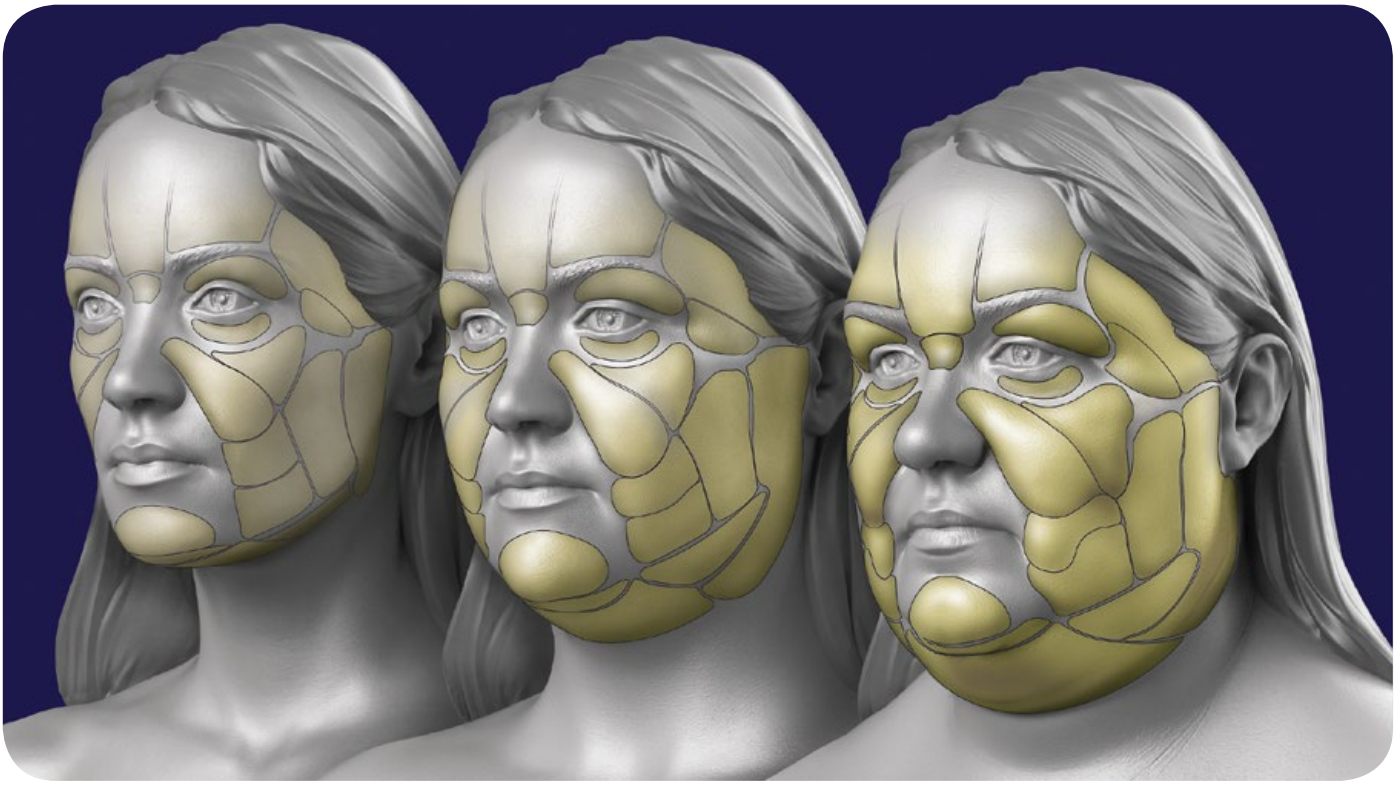


1	Central forehead fat
2	Middle (lateral) forehead fat
3	Radix fat
4	Lateral temporal-cheek fat (superior portion)
5	Inferior temporal (lateral orbital) fat
6	Superior orbital fat
7	Inferior orbital (Infraorbital) fat
8	Medial cheek fat
9	Nasolabial fat
10	Superior jowl fat
11	Inferior jowl fat
12	Middle cheek fat
13	Lateral temporal- cheek fat (inferior portion)
14	Mental fat

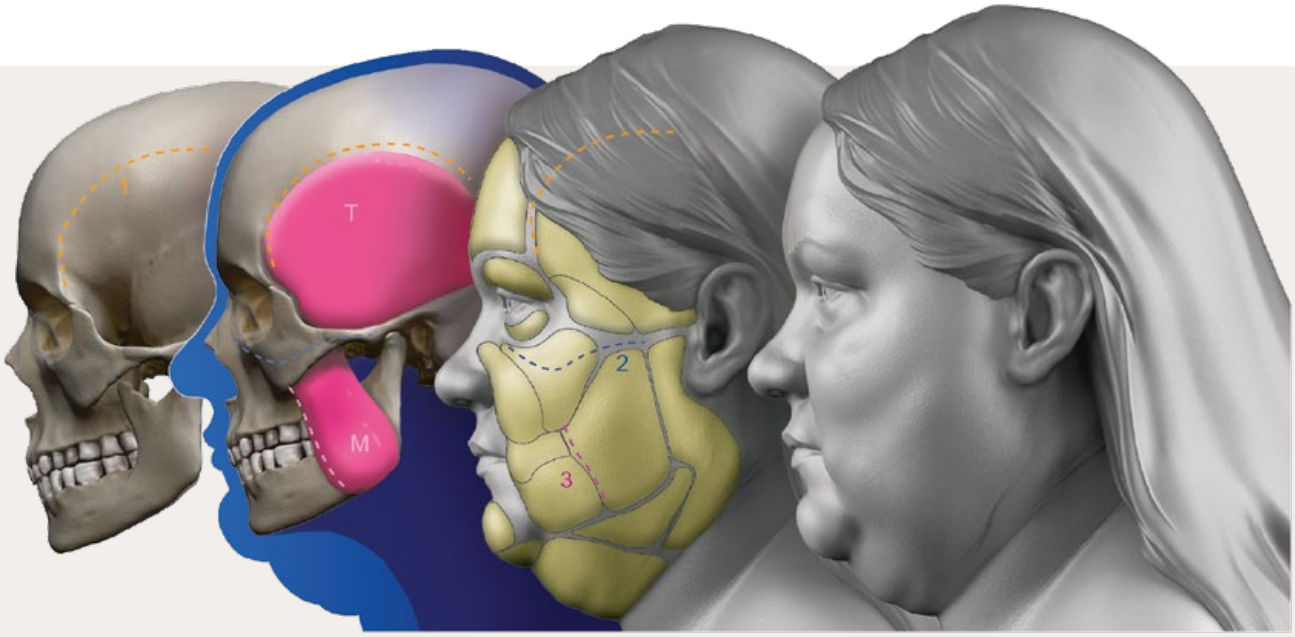


Fat pads are natural masses formed by connective tissue and packed with fat cells that help to give volume, shape and definition to your face. These can be found on the upper and mid face, as well as the lower face. Fat pads are usually also responsible for the shape of the cheeks, as well as the jawline.

FACIAL SUBCUTANEOUS FAT PAD DISTRIBUTION AND FACIAL SHAPE CHANGES

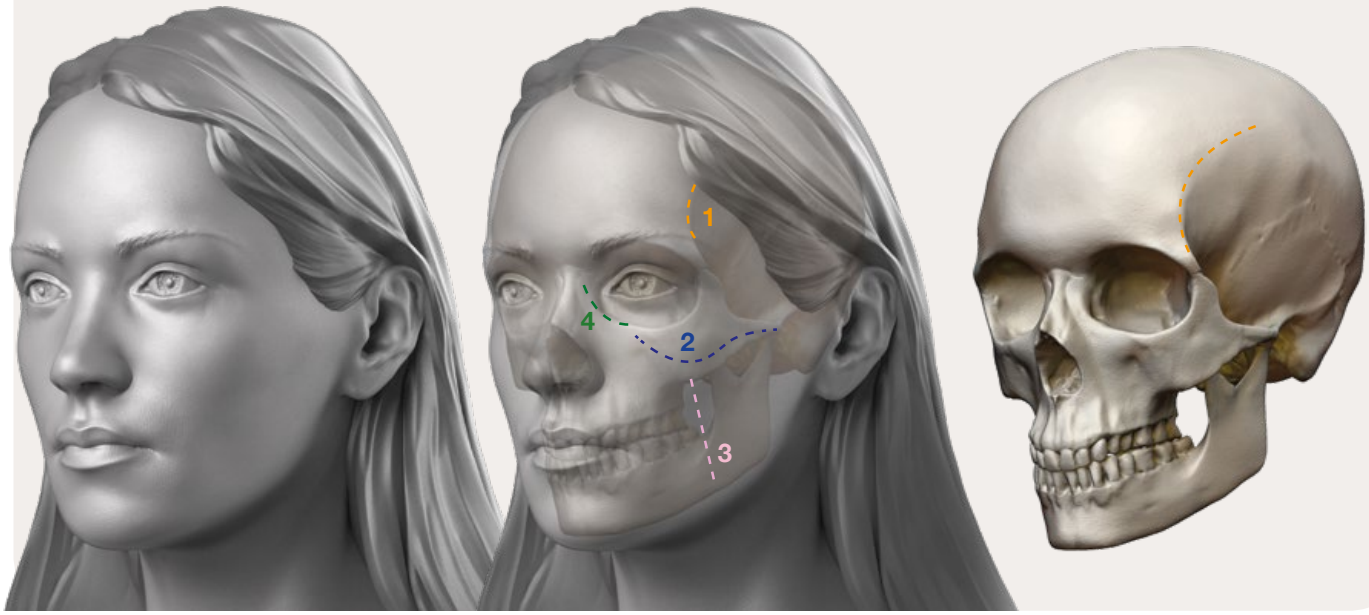


THE RETAINING LIGAMENTS



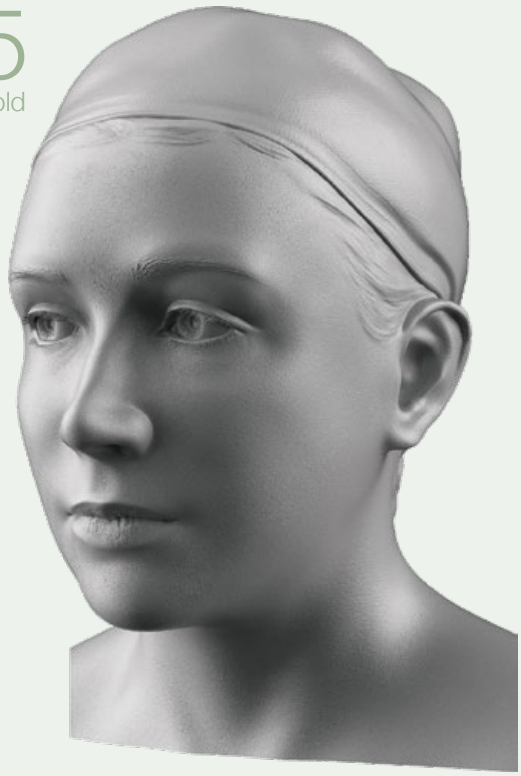
1	Temporal line	4	Tear trough ligament
2	Zygomatic cutaneous ligament	T	Temporal muscle
3	Masseteric cutaneous ligament	M	Masseter muscle

The retaining ligaments separate subcutaneous fat of the face into multiple, independent anatomical compartments or fat pads. The retaining ligaments of the face are important landmarks that occupy predictable anatomic locations. The retaining ligaments of the face are strong and deep fibrous attachments and act as anchor points, retaining and stabilizing the soft tissue.



AGING OF THE FACE

25
years old

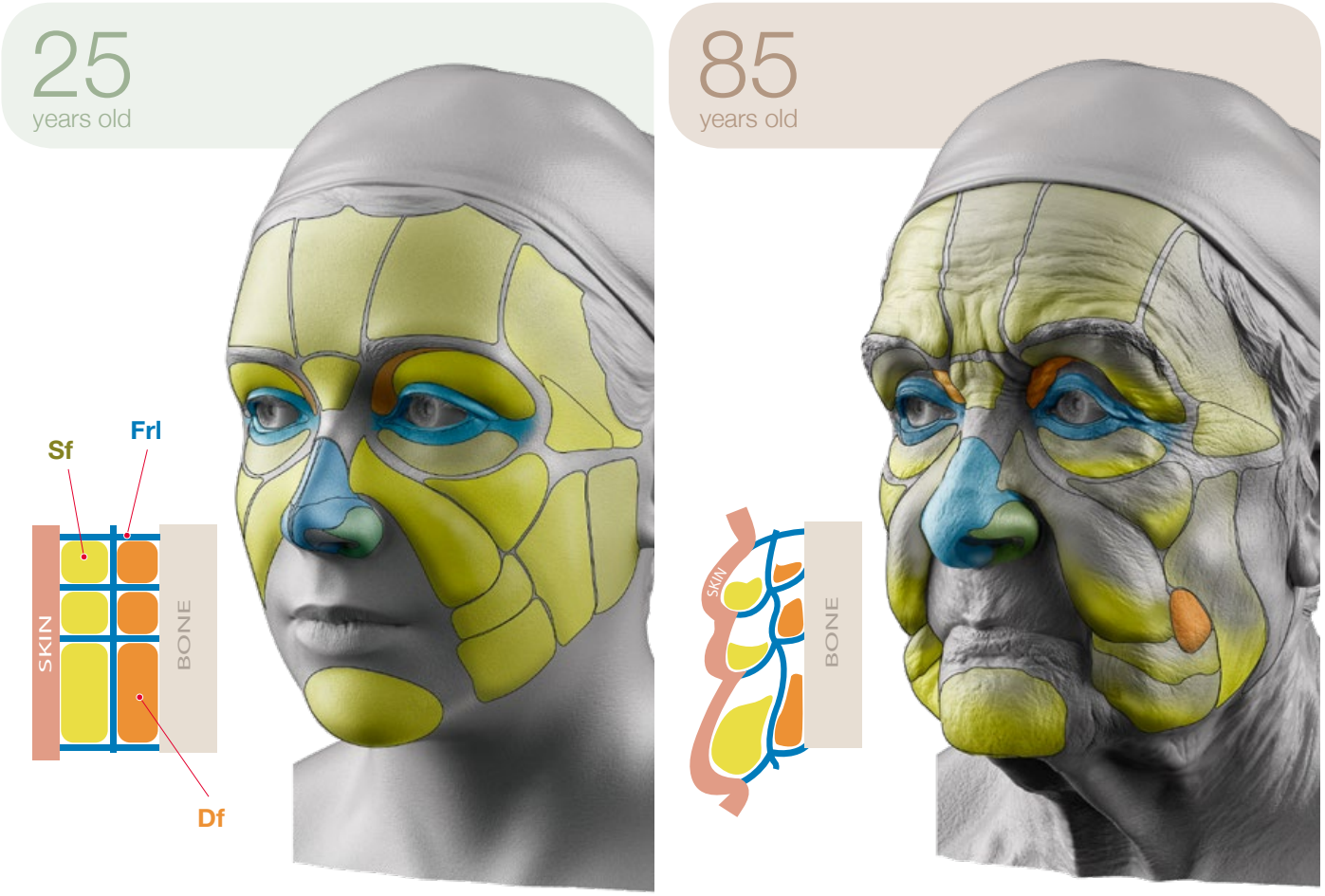


45
years old

65
years old

85
years old

AGING OF THE FACE



The youthful face is characterized by a diffuse, balanced distribution of **superficial** (**Sf**) and **deep fat** (**Df**).
But older faces store fat in distinct areas as more visible fat pads.
The fat storages become more discernible as separate entities, as do many of the underlying facial structures, such as the submandibular glands and bony protuberances.

Facial aging is a multifactorial process. Physiological and morphological changes occur in both skeletal and soft tissue composites – the bones, ligaments, muscles, fascia, fat, and skin.

As the fat pads diminish and sag, it causes the upper and middle parts of our face to lose structure and fullness, while the lower part gets a heavier appearance.

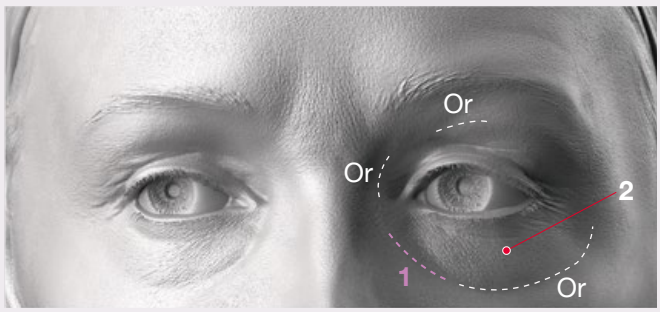
The skin of the face has consistent attachment points to the underlying structures through the **facial retaining ligaments** (**Frl**), and as the volume of the face deflates, these attachment points will define most of the shadows that develop with age. Where the fat pads are depleted, the skin can sag, look hollow, and wrinkle due to the lost fullness.

AGING OF THE EYES AND ORBITAL AREA

25 years old

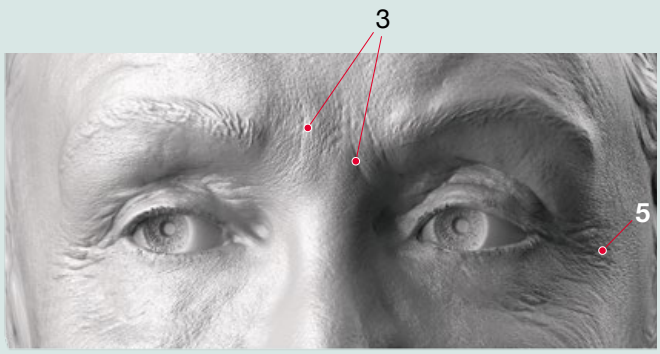
Tear troughs (1)
Tear troughs or under eye hollows are well-defined, dark and deep hollows that are located between the lower eyelid, nose and upper cheek.

Sunken eyes
One of the causes of sunken eyes and tear **troughs (1)** are decreased orbital fatty tissue. **Superior and inferior orbital rim (Or)** is visible. Most people will begin develop sunken and dark eyes by their late 30s and early 40s.



45 years old

Eyebags (2)
As volume is lost below the eyes, under eye located “palpebral bags” can appear. It happens due to atrophy of the orbicularis oculi muscle, adipose tissue loss and skin aging.

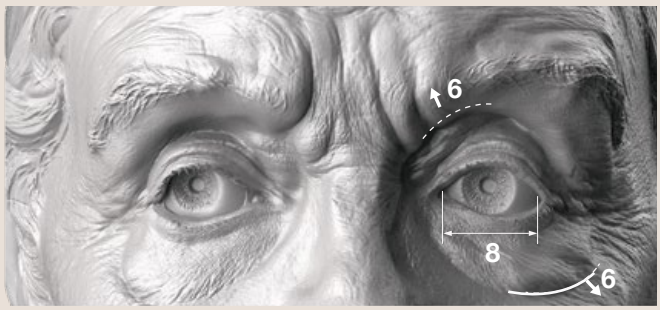


65 years old

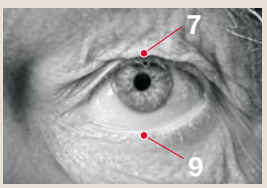
Frown lines (3)
Vertical lines that develop between your eyebrows and nose when you frown due to contraction and movement of paired facial muscles called corrugator supercilii muscles.

Crow’s feet (5)
The skin around the eyes gets wrinkles, creating crow’s feet at the side of the eyes.

Receding orbital rim (6)
Bone tissues along the orbital rim, especially superomedially and inferolaterally, have been shown to recede with increasing age, while the central orbital parts remain relatively stable.



80+ years old



Excess of upper eyelid skin (7)

Visible areas of the eyes become smaller (8)

Sometimes **lower lids weaken and droop (9)** revealing more of the white part of the eye called the sclera; it will make a person look tired and years older.

AGING OF THE MOUTH AND ORAL AREA

Thinner lips (1)
Human lips also change throughout adulthood. Dryness increases with age and is more on the lower lip than on the upper one.

Deeper nasolabial folds (2)
With age, the malar fat pad gradually slides forward and down to bulge against the nasolabial crease, giving rise to the prominence of the nasal fold in the aged face.

Marionette lines (3)
The lines run vertically between the mouth and chin, which can also create sagging in the lower half of your face.

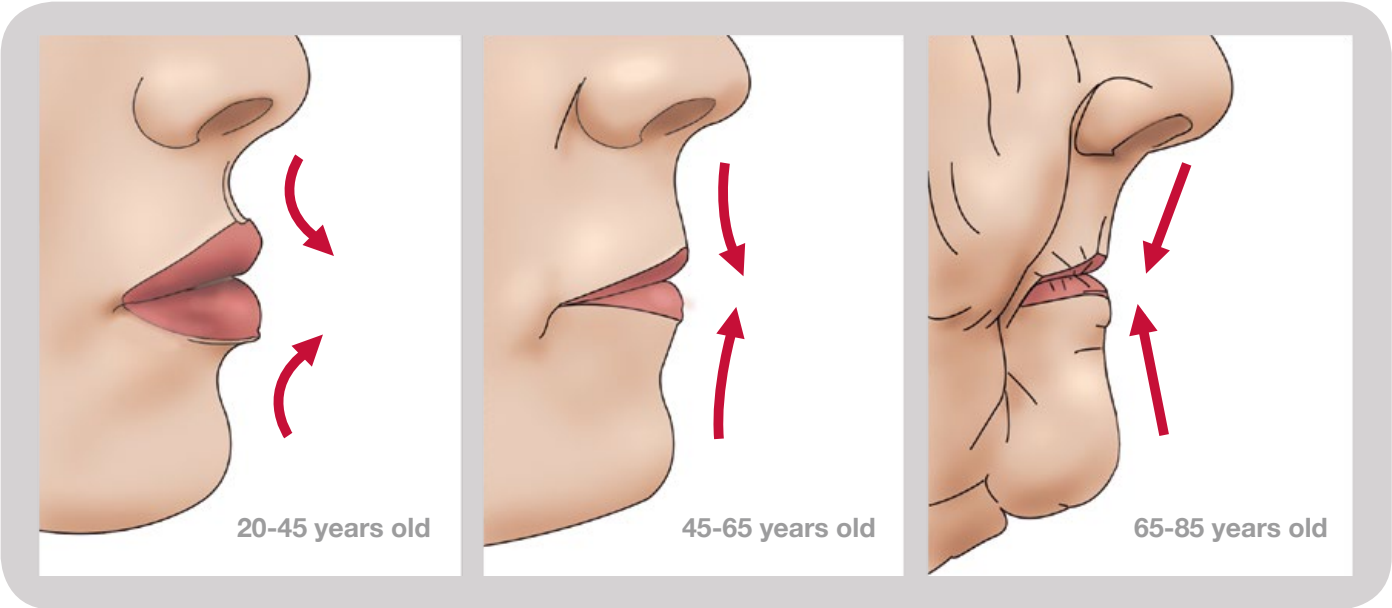
Droopy mouth corners (4)
Also known as inverted smile. Basically, you take a smile and turn it upside down. The reasons of such change is due to reduction of cheek volume and skin elasticity and high-contraction of one or both “depressor anguli orris” muscles. These changes are more evident between ages 35–40s, even when a person is calm, it looks like she is sad and depressed.

Chin widening (5)
In the chin, loss of lateral and inferior volume results in relative protrusion of the central chin, which can create the impression of chin widening when viewed from the front.

AGING OF THE MOUTH AREA

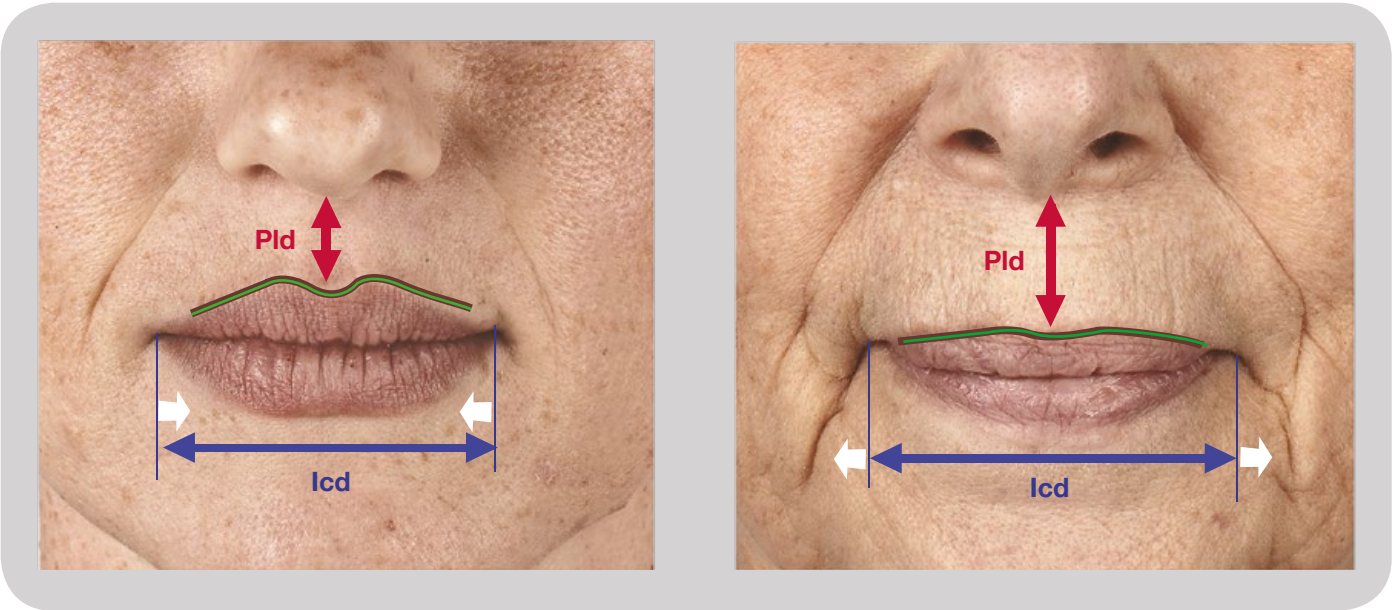
Lips inversion with age

Changes in lip morphology during aging include the position of the lip lines, a decrease in lip volume and thickness. Full lips are a property of a youthful healthy appearance. Around age 45, the lips start slowly losing their volume, become thinner and roll inward.



Dimensional changes of the lips

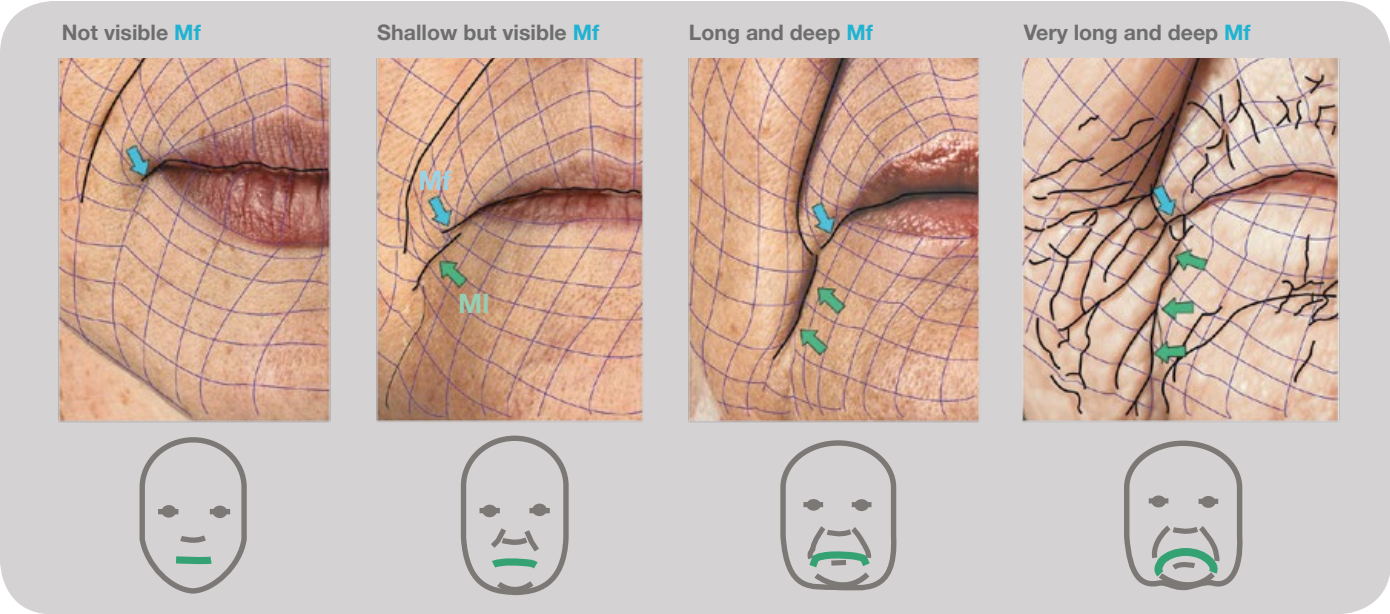
When aging, the **philtro-labial distance** (**Pld**) increases. The philtrum becomes ill-defined, **cupid's bow** starts flattening out. The lower lip becomes dominant over the upper lip and is more noticeable in women. The commissures descend and **Inter-commissural distance** (**Icd**) increases with age.



AGING OF THE MOUTH AREA

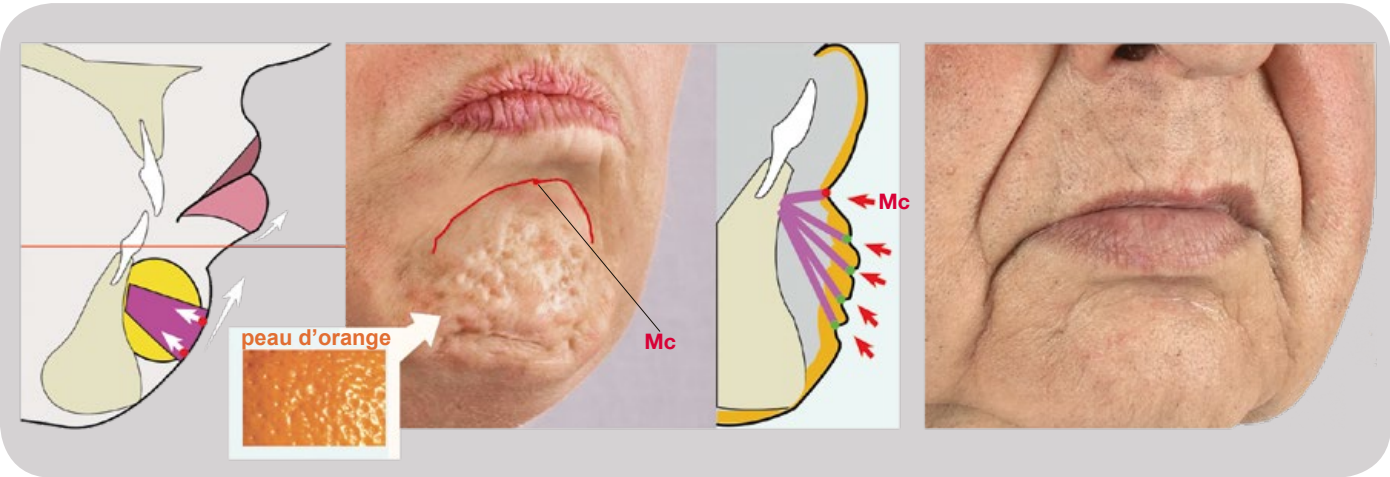
Marionette lines

Marionette lines (**Ml**) are the lengthening of the so-called **mouth angle furrow** (**Mf**), the vertical lines appearing from the corners of the mouth and either side of the chin. A downward movement of the fat and skin in the face are the main influencers in the appearance of these lines. Coupled with facial expressions and repetitive facial movements, these creases become more defined with time.



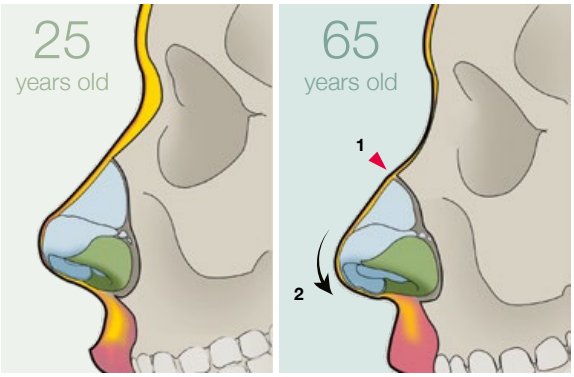
Mentalis crease and peau d'orange

Two additional signs of aging are seen in the area of the chin, including the **mentalis crease** and **peau d'orange**. The **mentalis muscle** finds its origin on the mandible at the second incisors juga alveolaria. Its action is to elevate, evert and protrude the lower lip. It also makes wrinkles in the skin of the chin. The repetitive action of this muscle over time can lead to **mentalis crease** (**Mc**), which gives an expression of doubt. **Peau d'orange**, the French term meaning orange skin, describes a condition of the lower lip of dimpling on the chin resulting from visible attachments with the mentalis muscle, seen through aging thin skin.



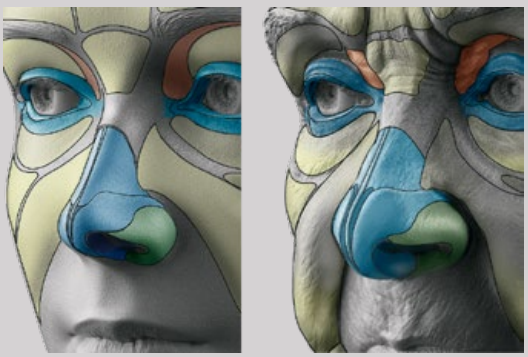
AGING OF THE NOSE AND MIDFACIAL AREA

Nose hump (1)
Thinning and loss of elasticity of the nasal skin often results in the formation of a hump on the bridge of the nose.

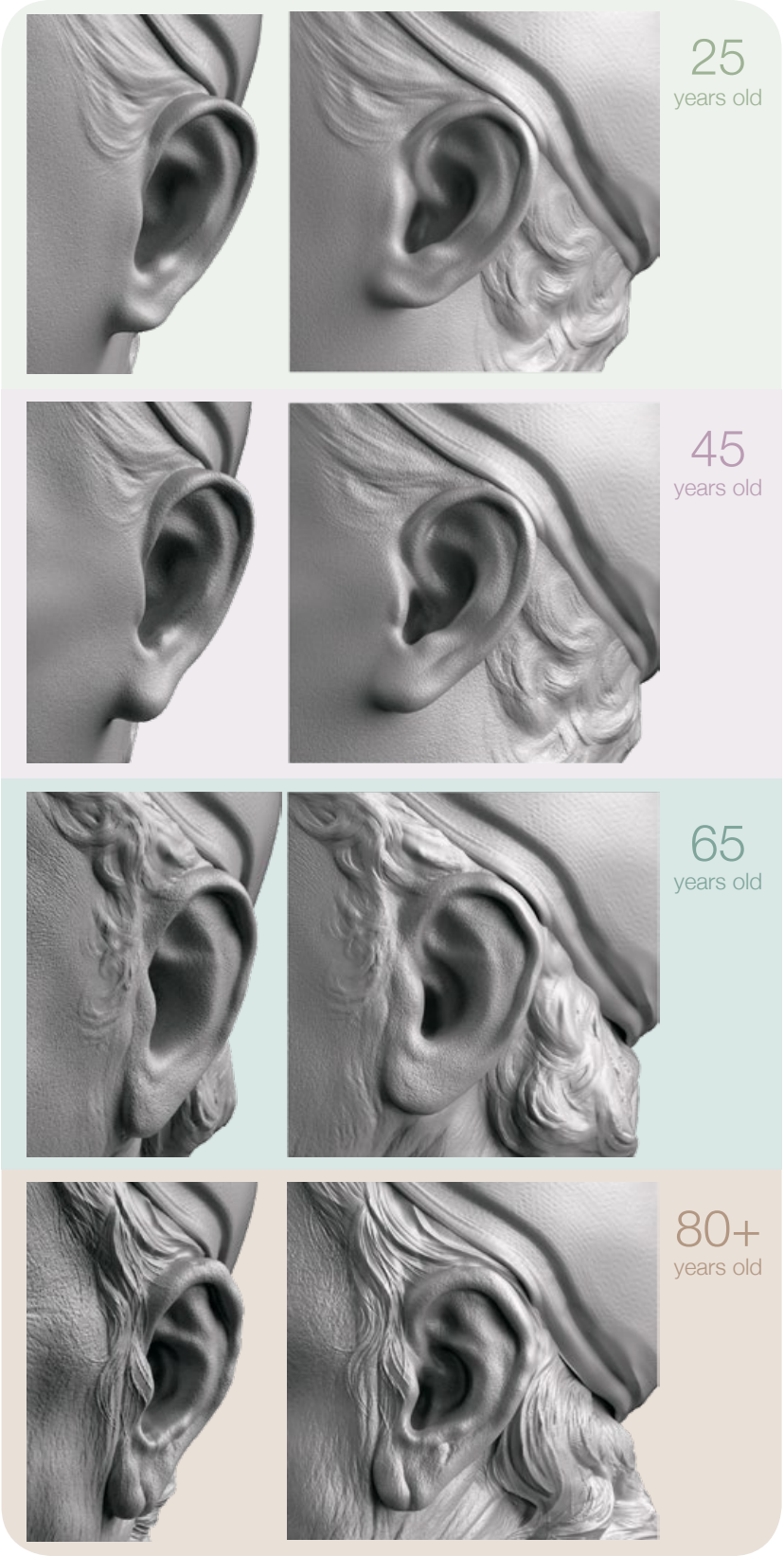


Droopy nose tip (2)
One of the first signs of aging is facial sag and a droopy nose tip. It happens because of changes in the nasal skin as well as a general weakening of the cartilage framework and nasal bones which once provided excellent support to the nose. The process that causes Droopy Nose Tip is called nasal tip ptosis.

Larger nose
Progressive descent of the nasal tip pulls on and separates the connective tissues between the **cartilages** at the end of the nose resulting in lengthening and enlargement of the nose.



AGING OF THE EAR



Why old people have big ears

The ears may lengthen in some people (probably caused by gravity that affects cartilage growth). Ears increase by an average of 0.22 mm per year – a centimeter (or just under half an inch) over 50 years. Ear circumference increases on average 0.51 mm per year. This enlargement is likely associated with aging changes of collagen.

Collagen is a protein, one of the major building blocks of bones, skin, muscles, tendons, and ligaments.

Earlobes sag

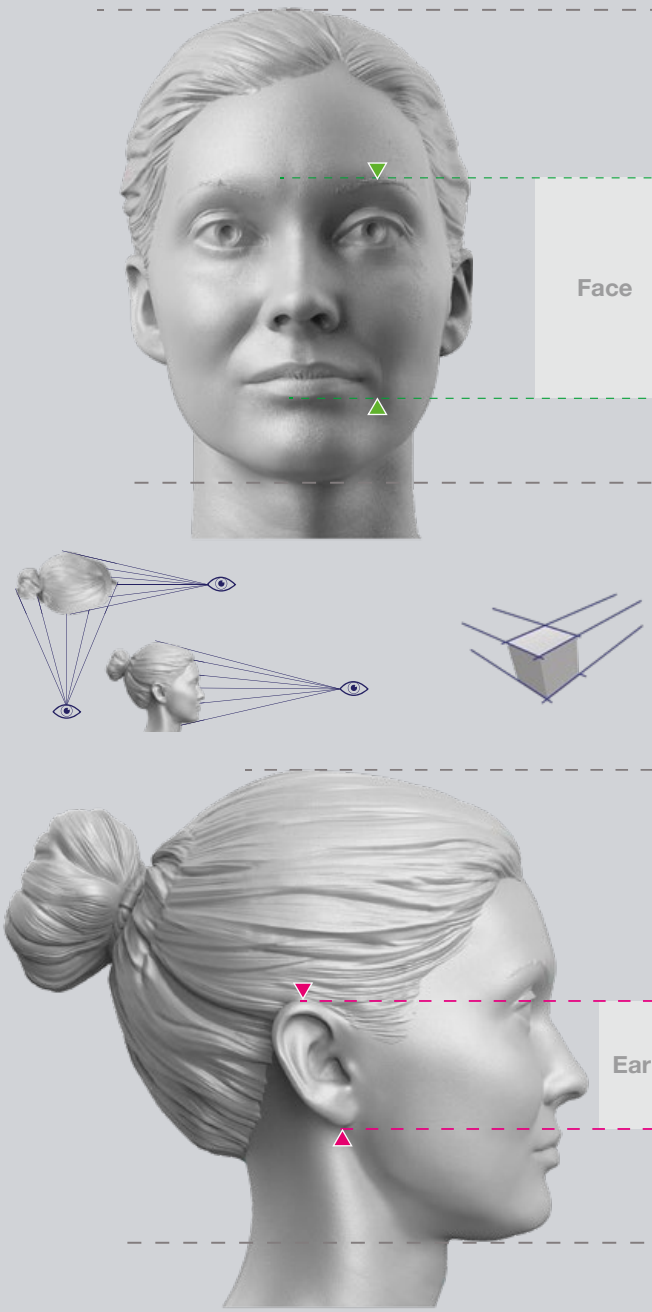
Earlobes change with age — like anything else, they can become droopy, earlobes sag and become larger, they can "deflate", and they can even develop folds and seem "collapsed".

PERSPECTIVE DISTORTION

Before using proportion charts of any kind, be aware of perspective distortion. First, you need to decide what type of artwork you are going to create, **3D** or 2D. If **3D**, then turn off the perspective, so you can avoid all distortions created by perspective.

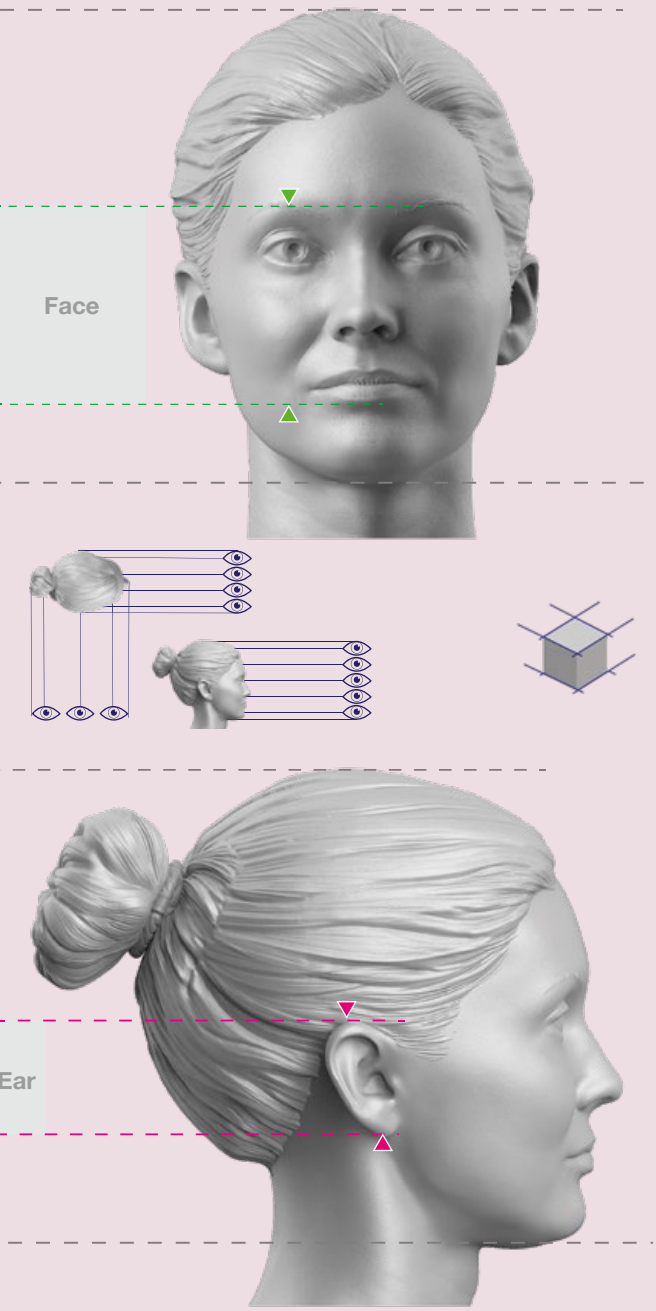
PERSPECTIVE ON

In the perspective view, (that's how we normally see the world), parts of the face which are far away are smaller than those nearby.



PERSPECTIVE OFF

In the orthographic view, all parts appear at the same scale. The face looks somewhat flat and occupies a smaller part of the head.



LENS DISTORTION

Lens distortion is something you need to consider every time you use a photo of a face as a reference image for sculpting. The wide-angle lenses when you're in really close (first image on the left, taken at 30 mm) are nowhere near as flattering as the longer focal lengths when you're standing farther away (last photo in the third row – taken at 200 mm).

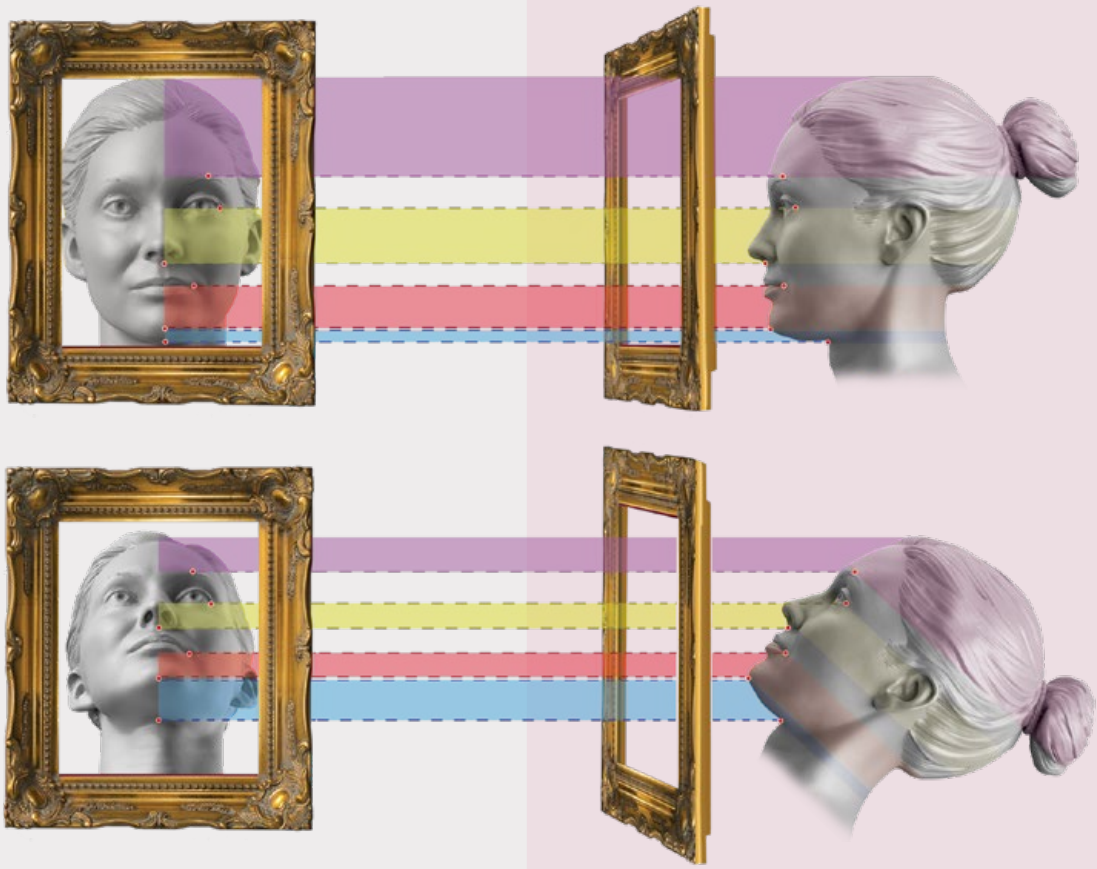
POINT OF VIEW

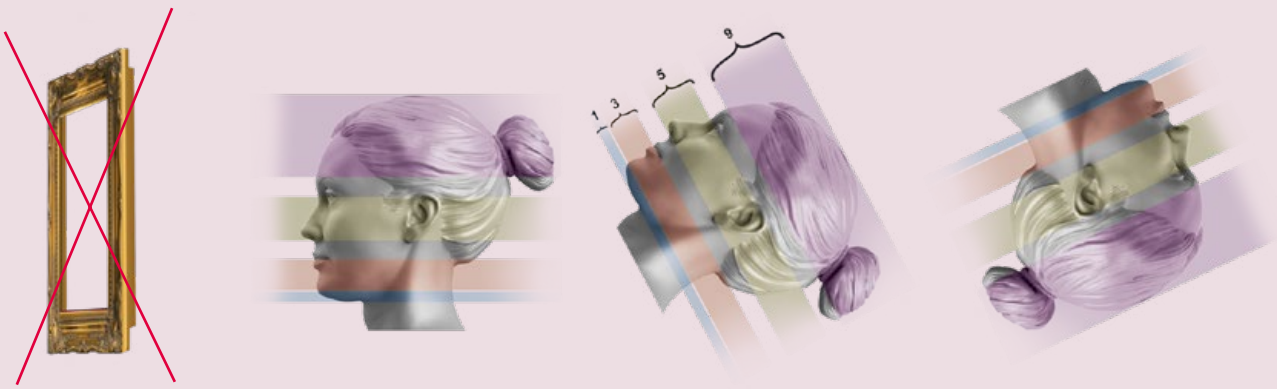
2D world

In a 2D world, proportions are subjective and very dependent on not only the lens and perspective distortions, but also on point of view. Therefore, ratios and proportion charts may not be useful.

3D world

In a 3D world, similar to the quantum world, all objects are in a superposition and proportions are objective and are independent from the observer's point of view.

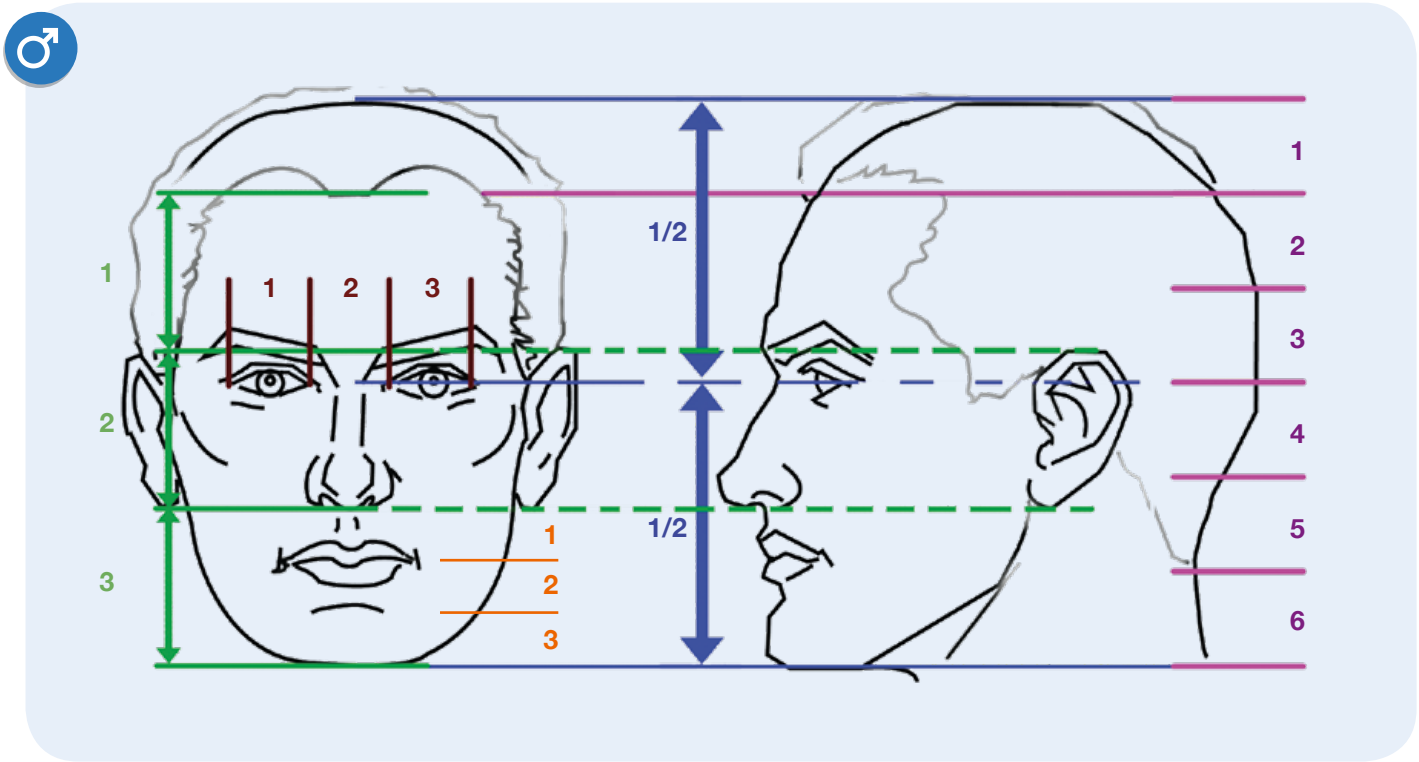


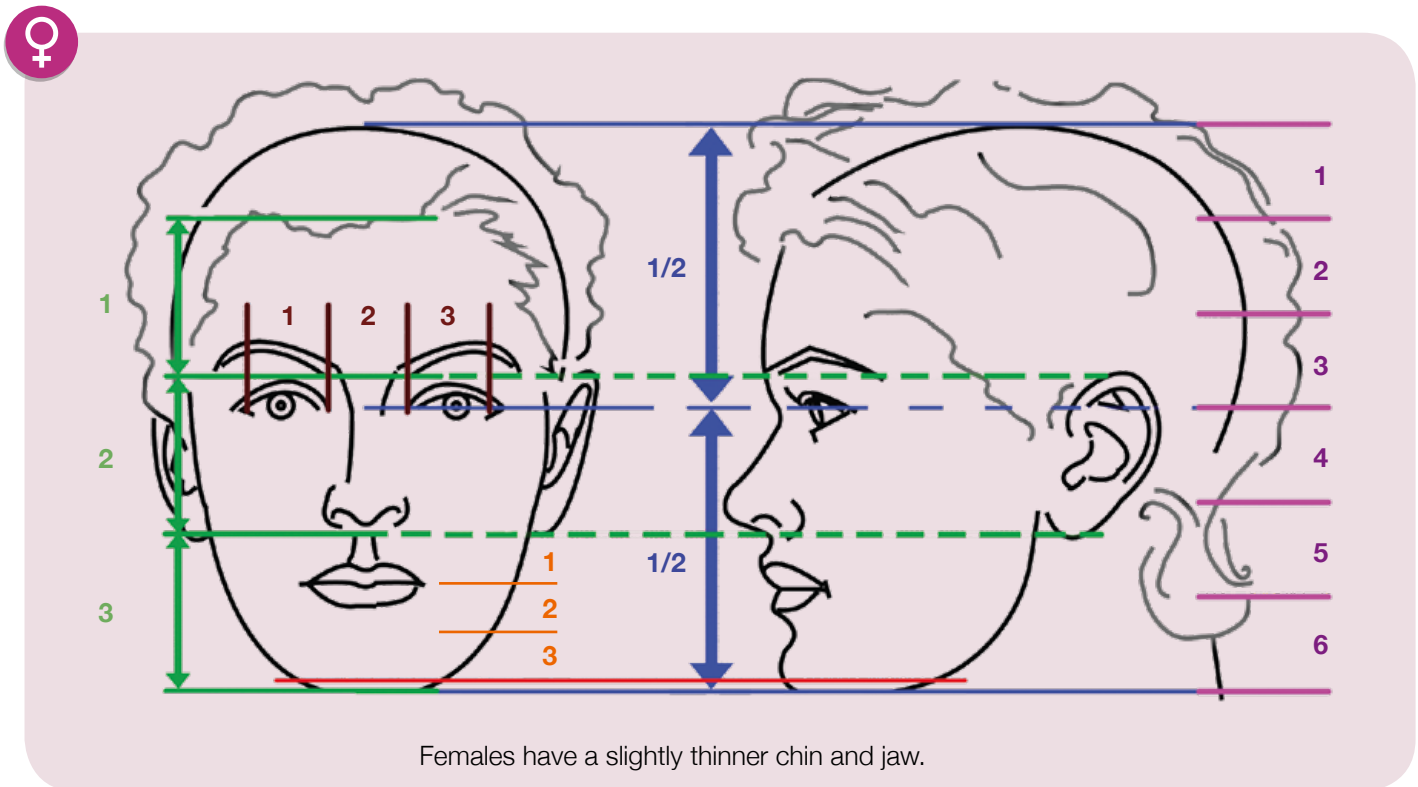


In a 3D world, you can use ratios because proportions always stay the same no matter how you look at the object

THE PROPORTIONS OF THE HEAD

Adult

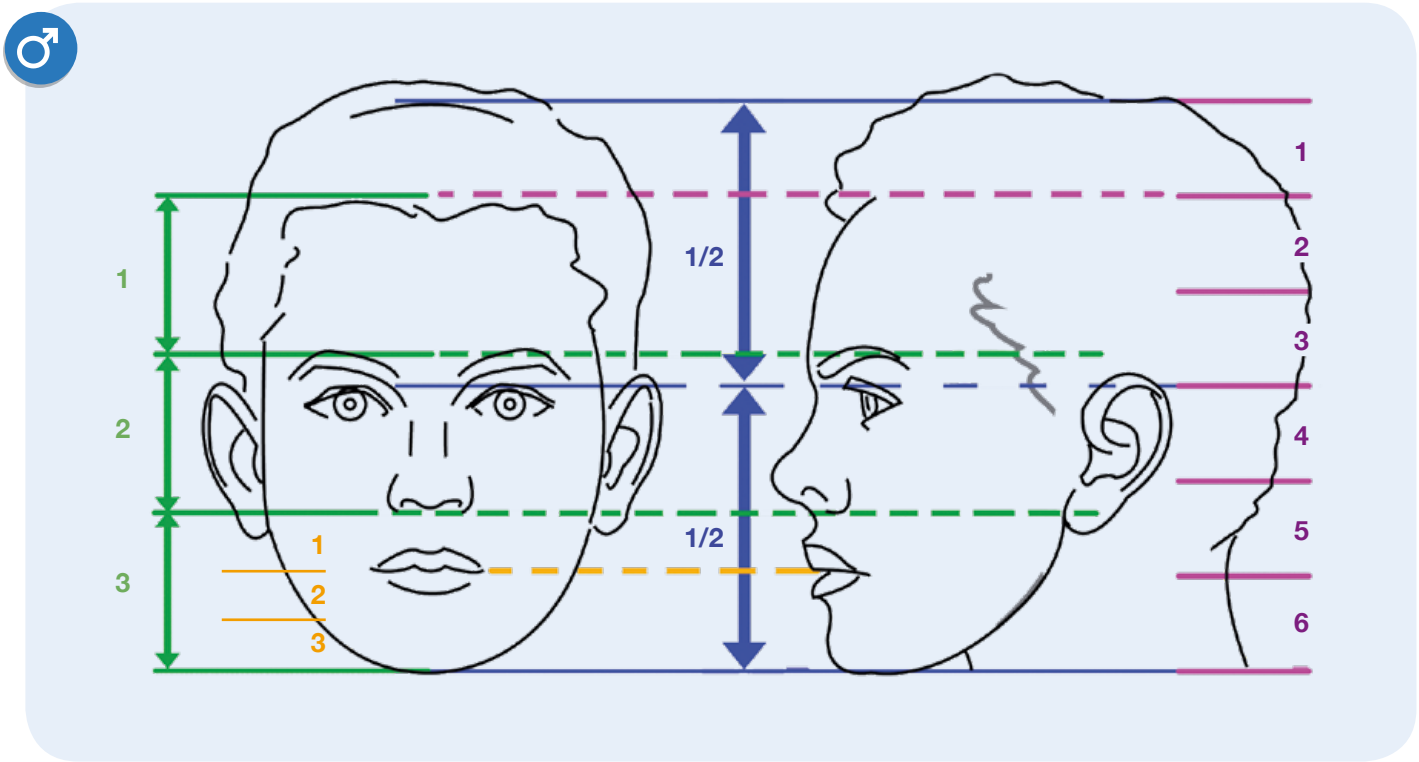


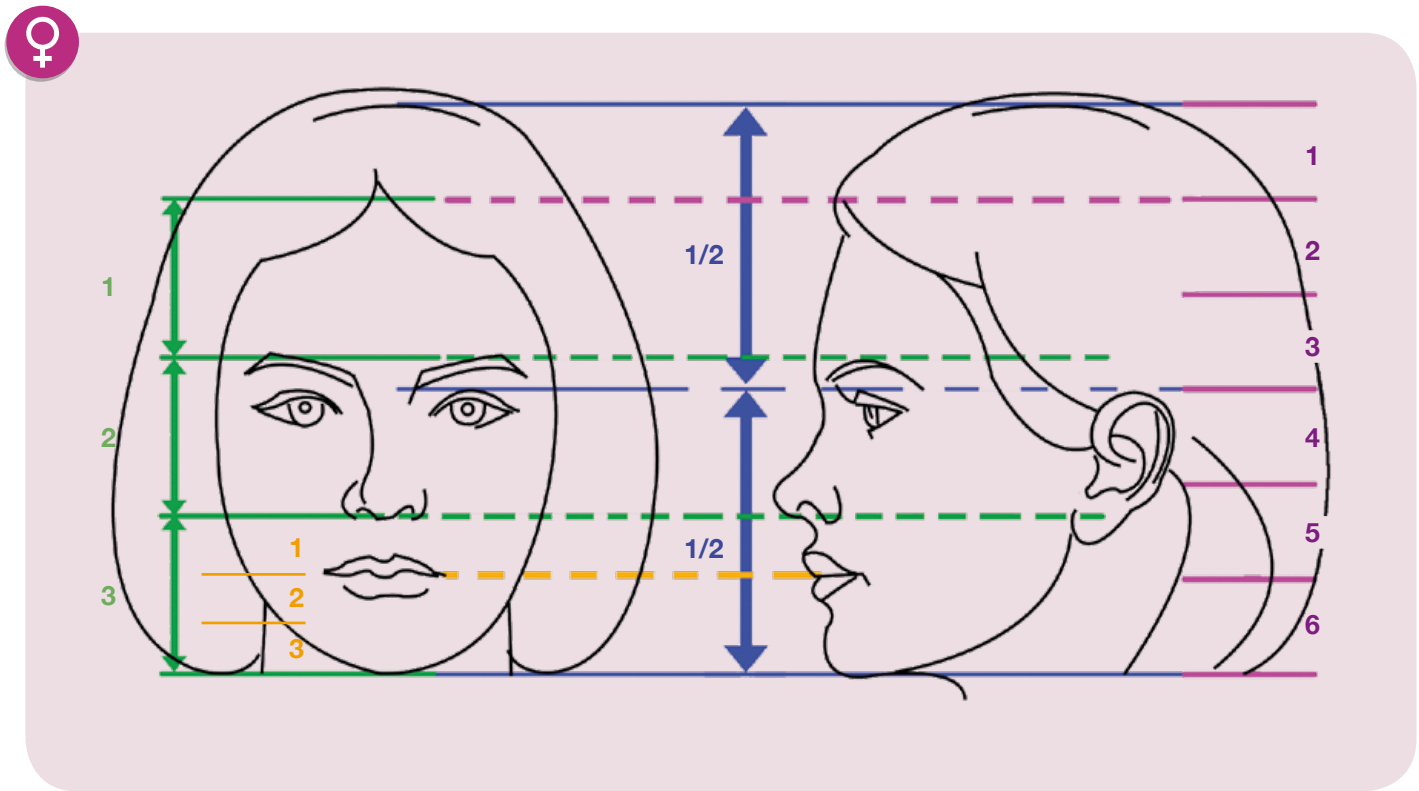


Females have a slightly thinner chin and jaw.

THE PROPORTIONS OF THE HEAD

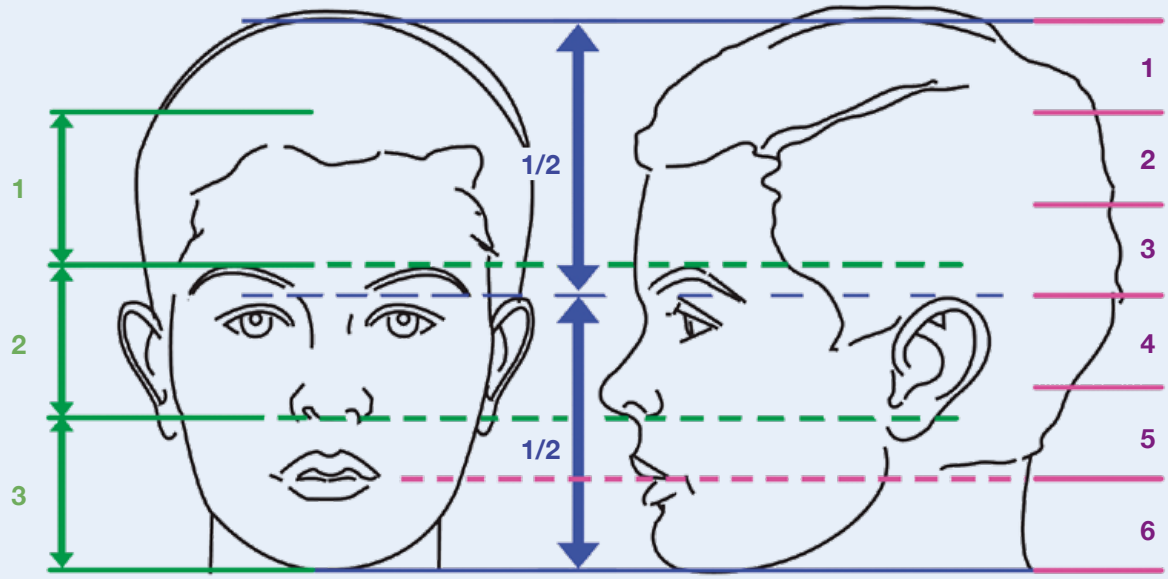
Teen

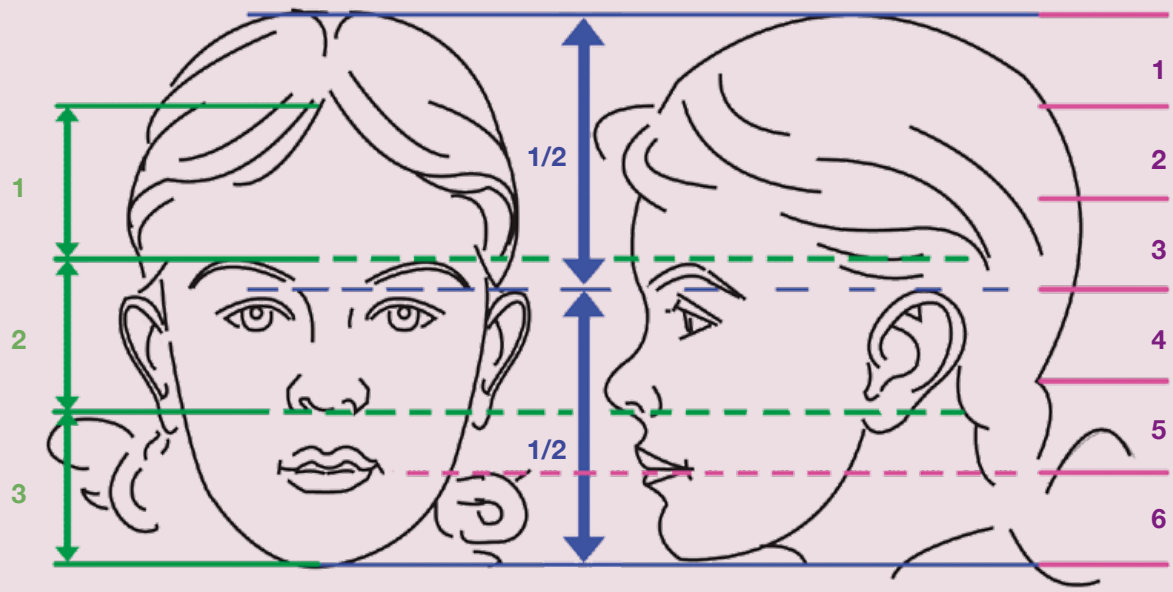




THE PROPORTIONS OF THE HEAD

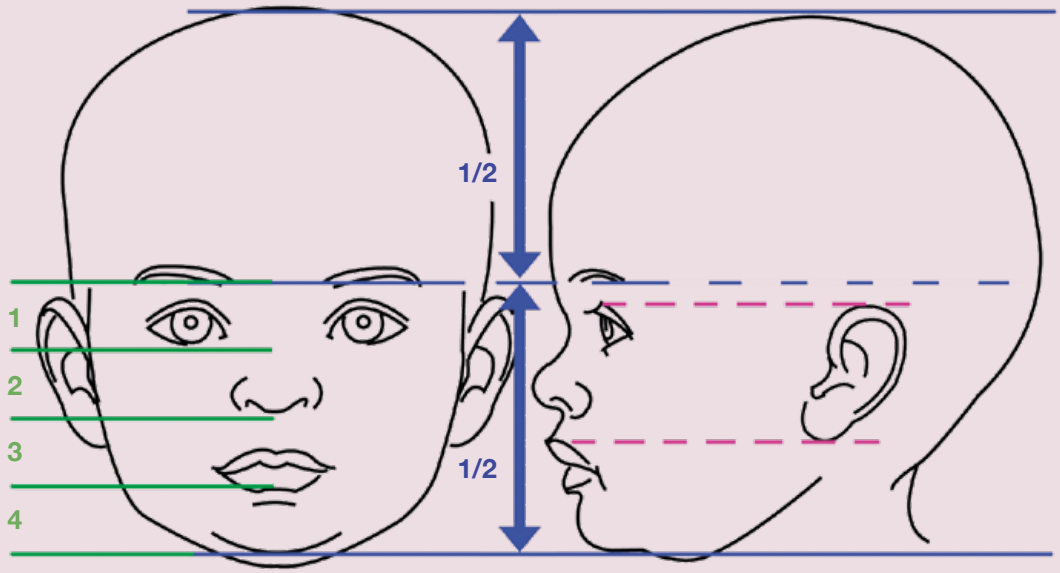
Child



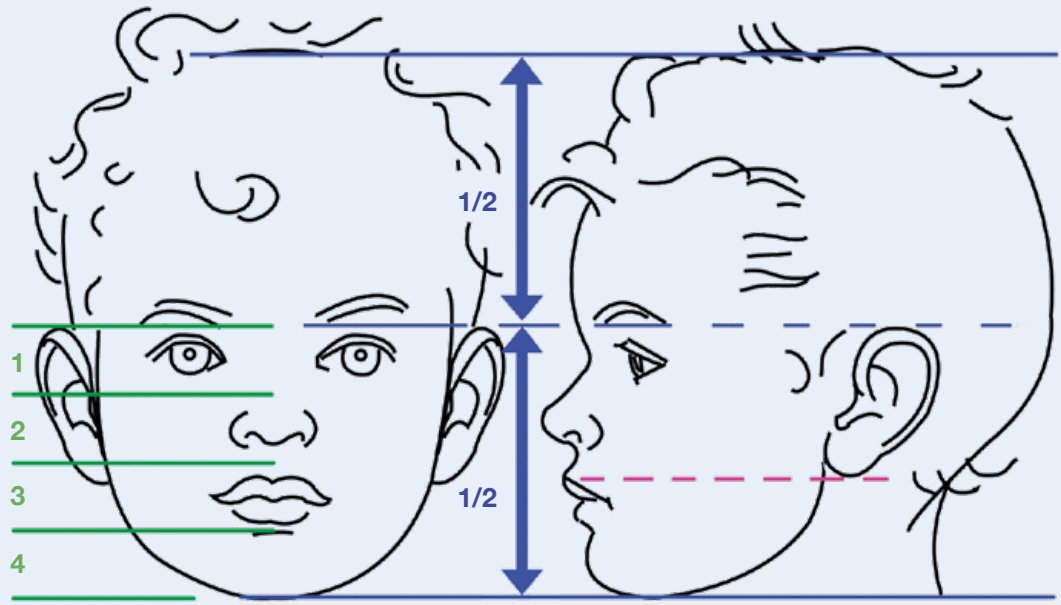


THE PROPORTIONS OF THE HEAD

Baby

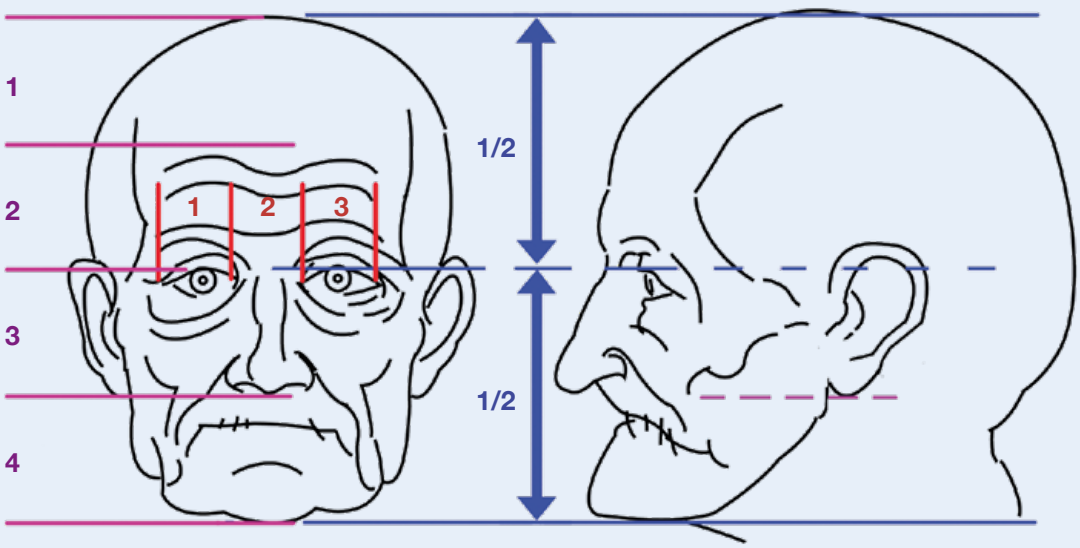


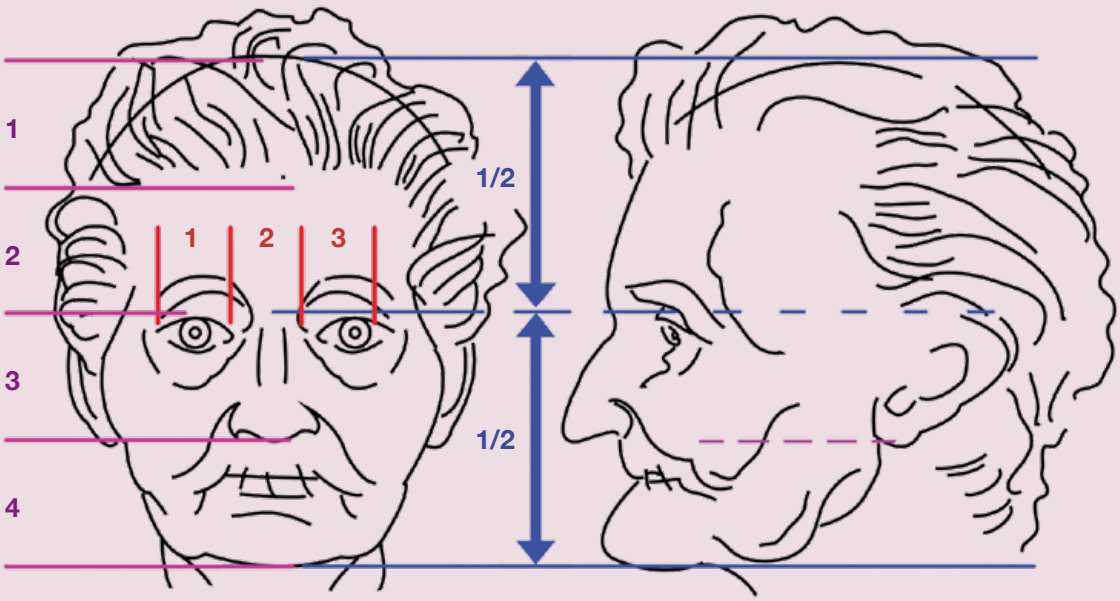
Toddler



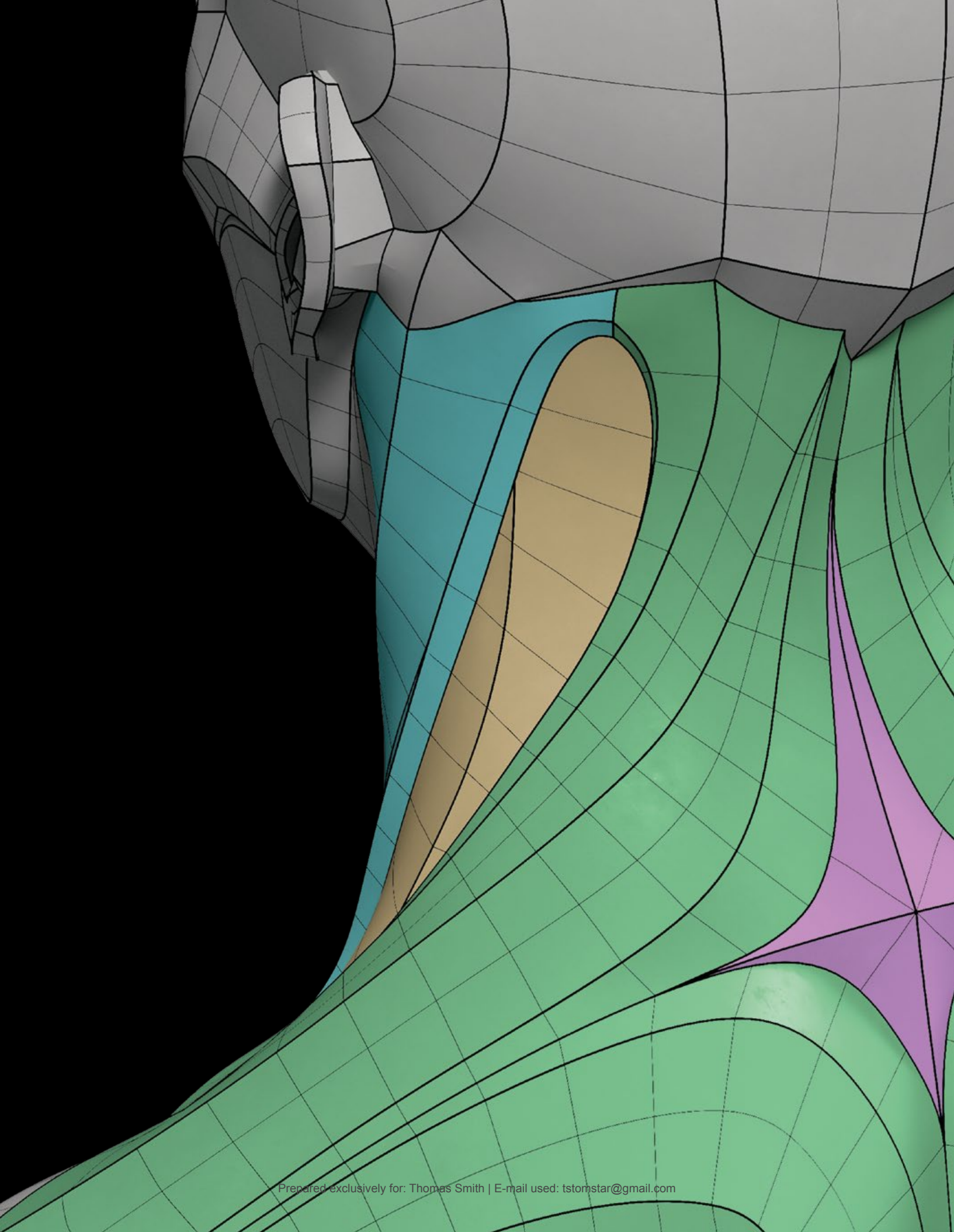
THE PROPORTIONS OF THE HEAD

Senior



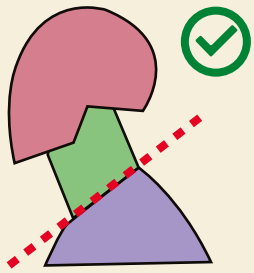


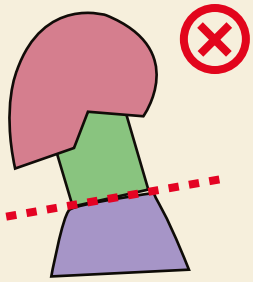
Neck



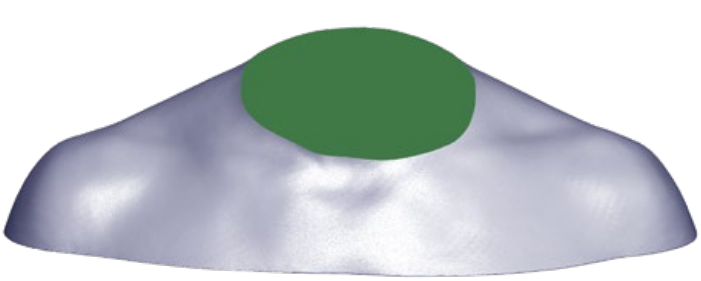
GENERAL MORPHOLOGY OF THE NECK

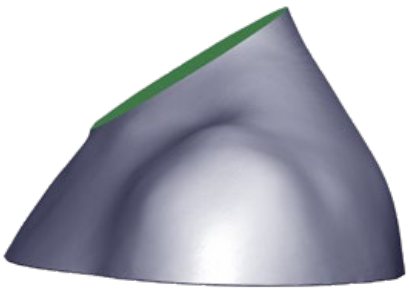
How the neck is connected to the trunk

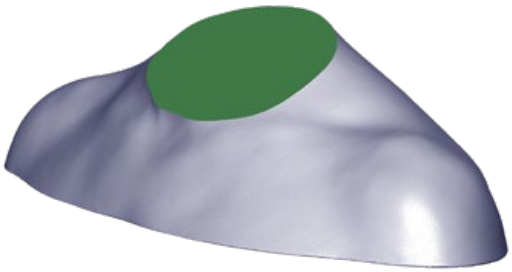


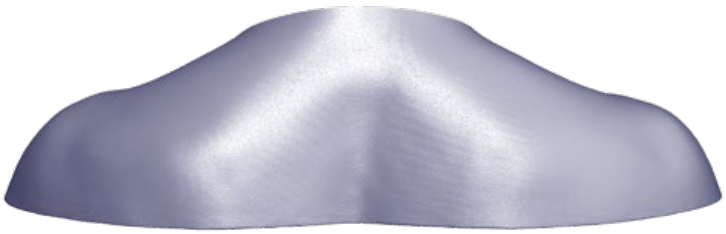


The **neck** is connected to the front-top side of the **trunk** not to the top. It is a common mistake among junior artists.

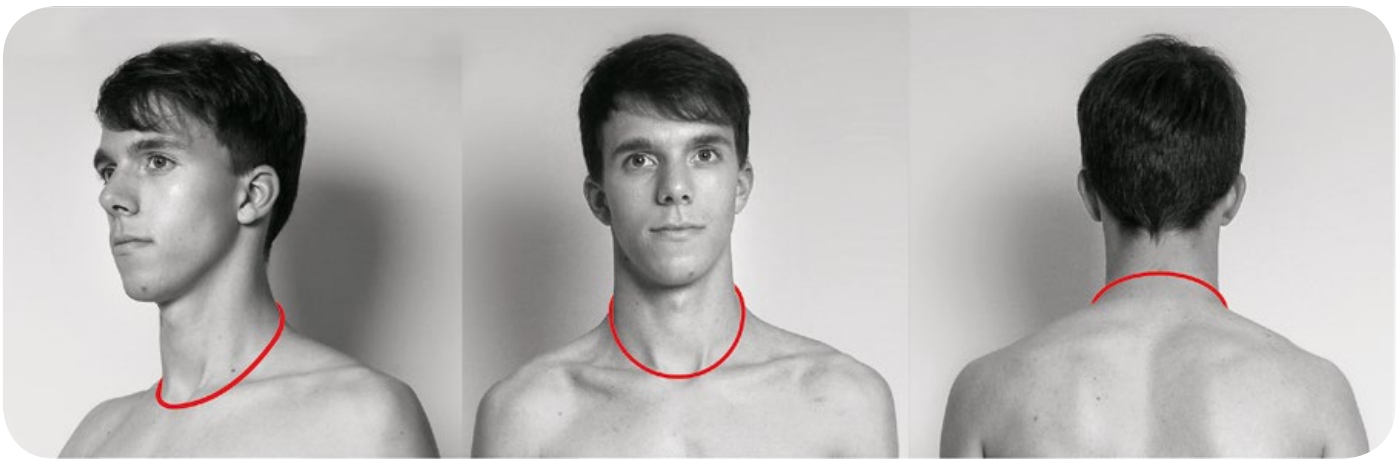








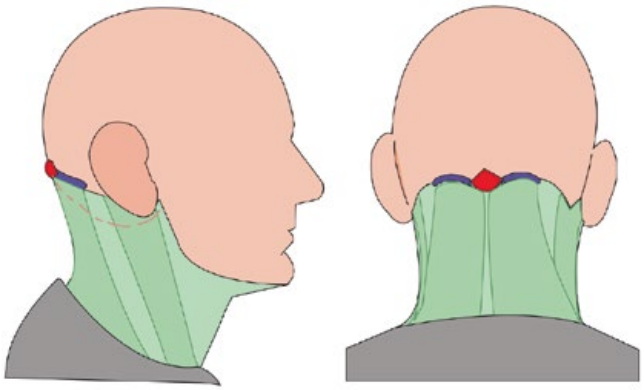
The way to set the neck properly is as if you draw an imaginary **necklace** on the neck, it is the line where the **neck** and **trunk** meet.

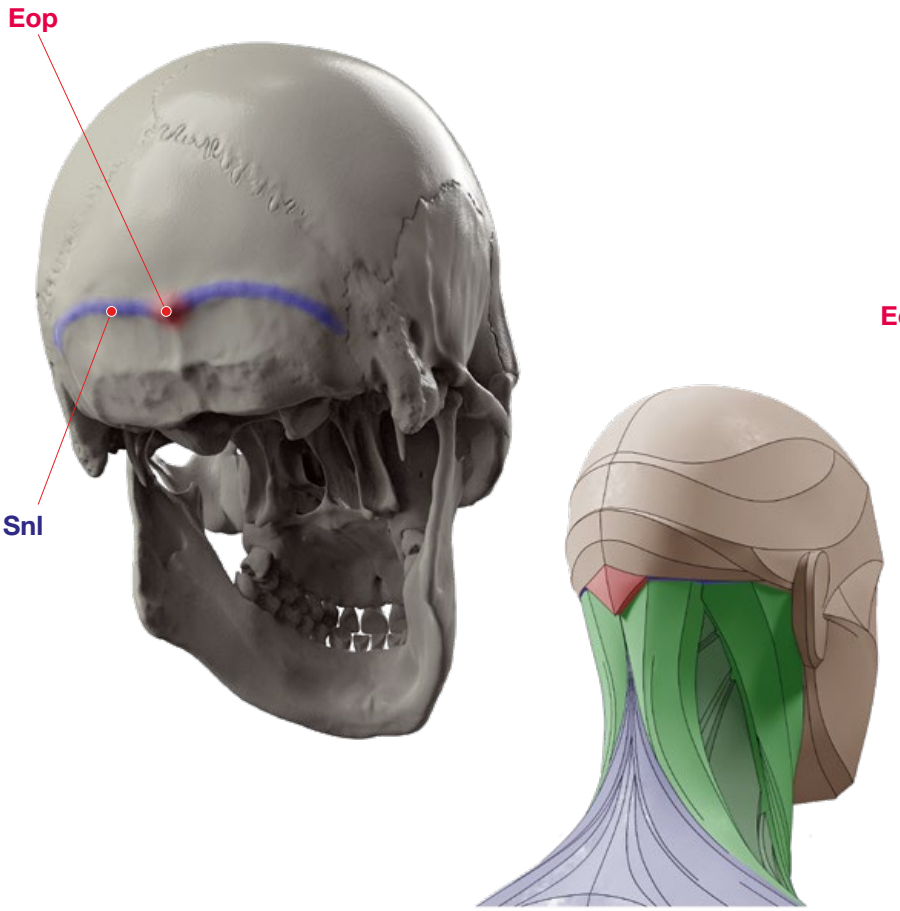


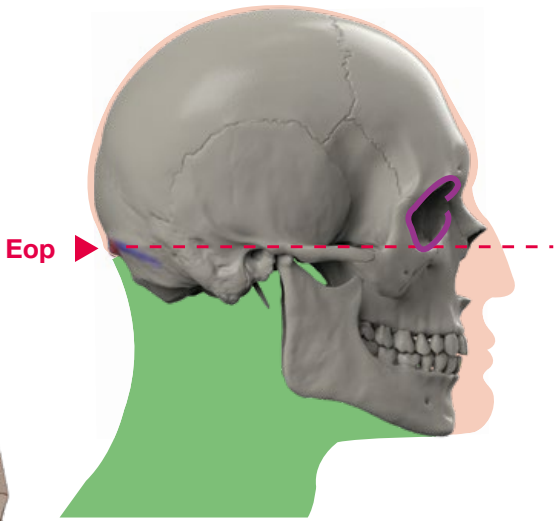
GENERAL MORPHOLOGY OF THE NECK

How the head is connected to the neck

Neck connection to the **head** is mostly on the **superior nuchal line** (**Snl**).
The **Snl** extends from midline to the occipitomastoid sutures. At its midline is a prominence called the **external occipital protuberance** (**Eop**).
The **Snl** provides an origin for the **neck** muscles, such as the trapezius muscle and insertion for muscles, such as the semispinalis capitis muscle.

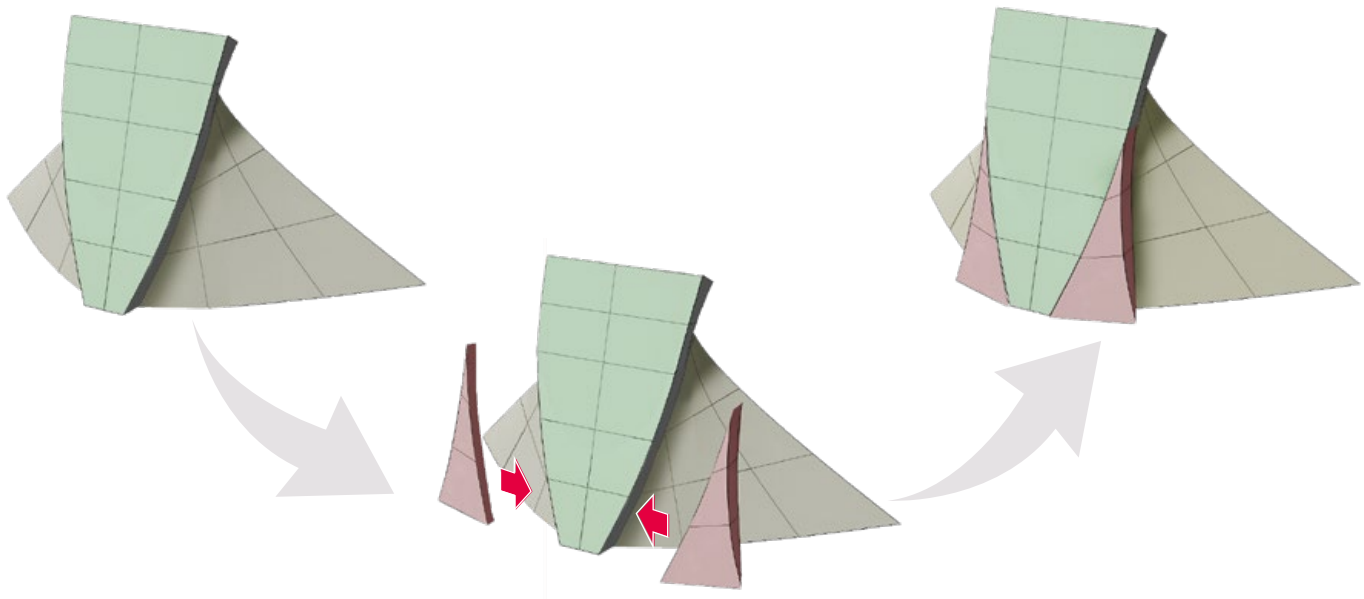


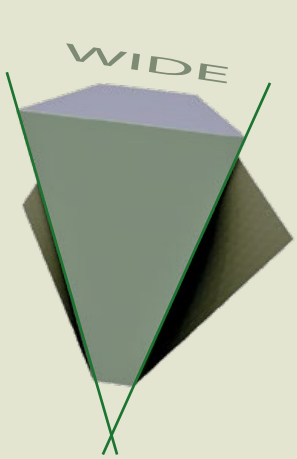


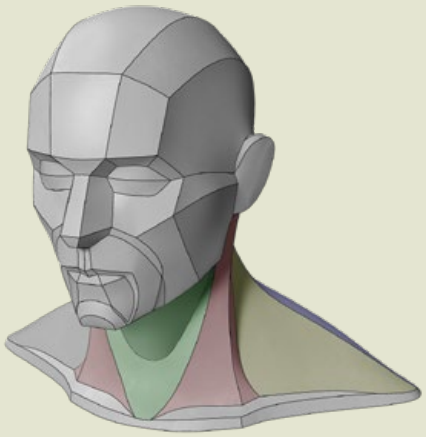


Eop is aligned with the floor of the **orbital cavity**.

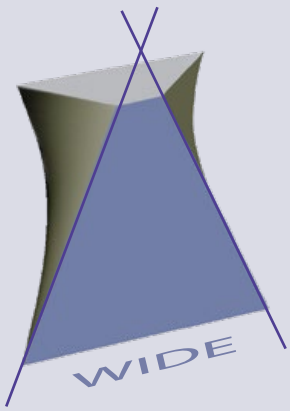
GENERAL SHAPES OF THE NECK

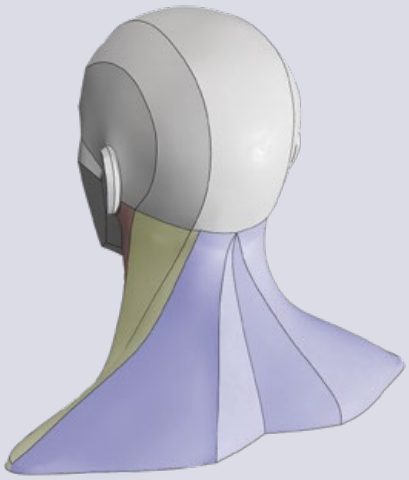






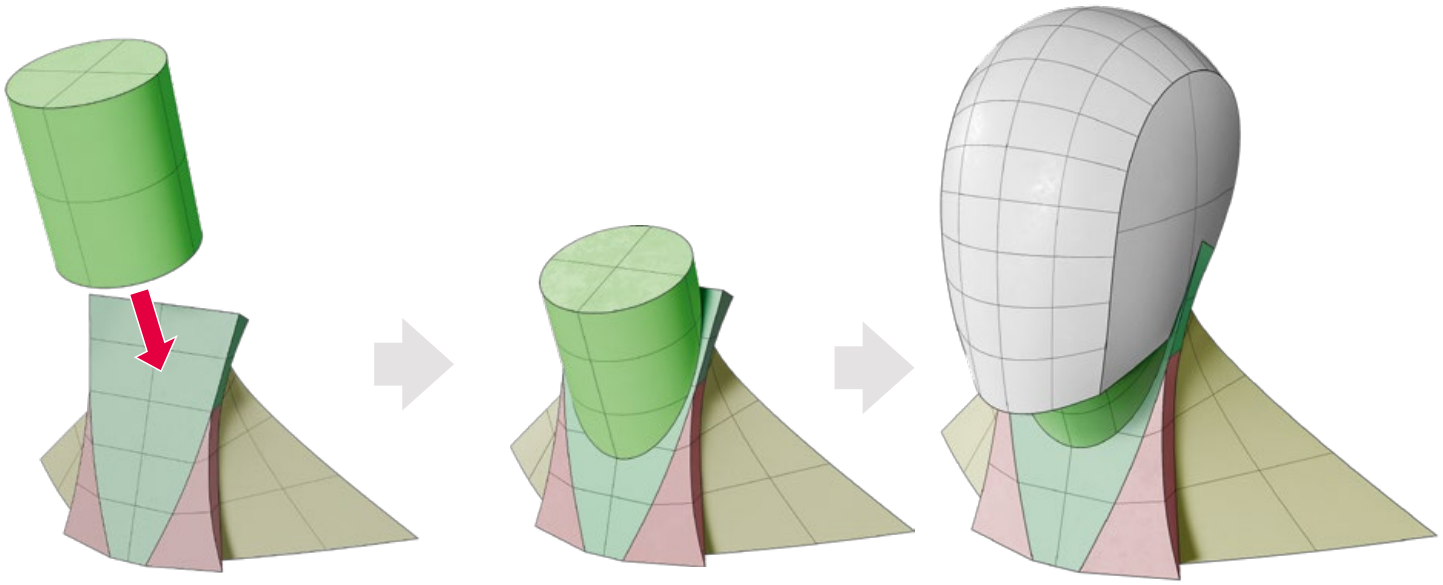
Front view

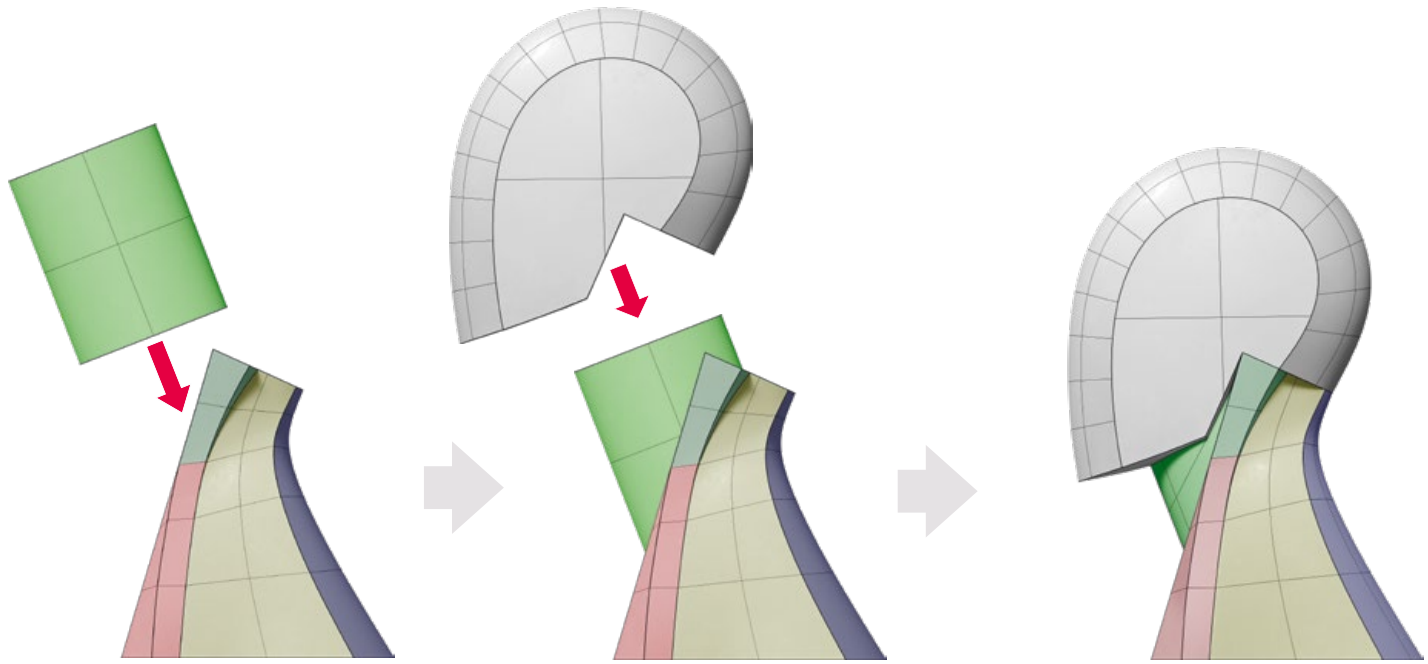




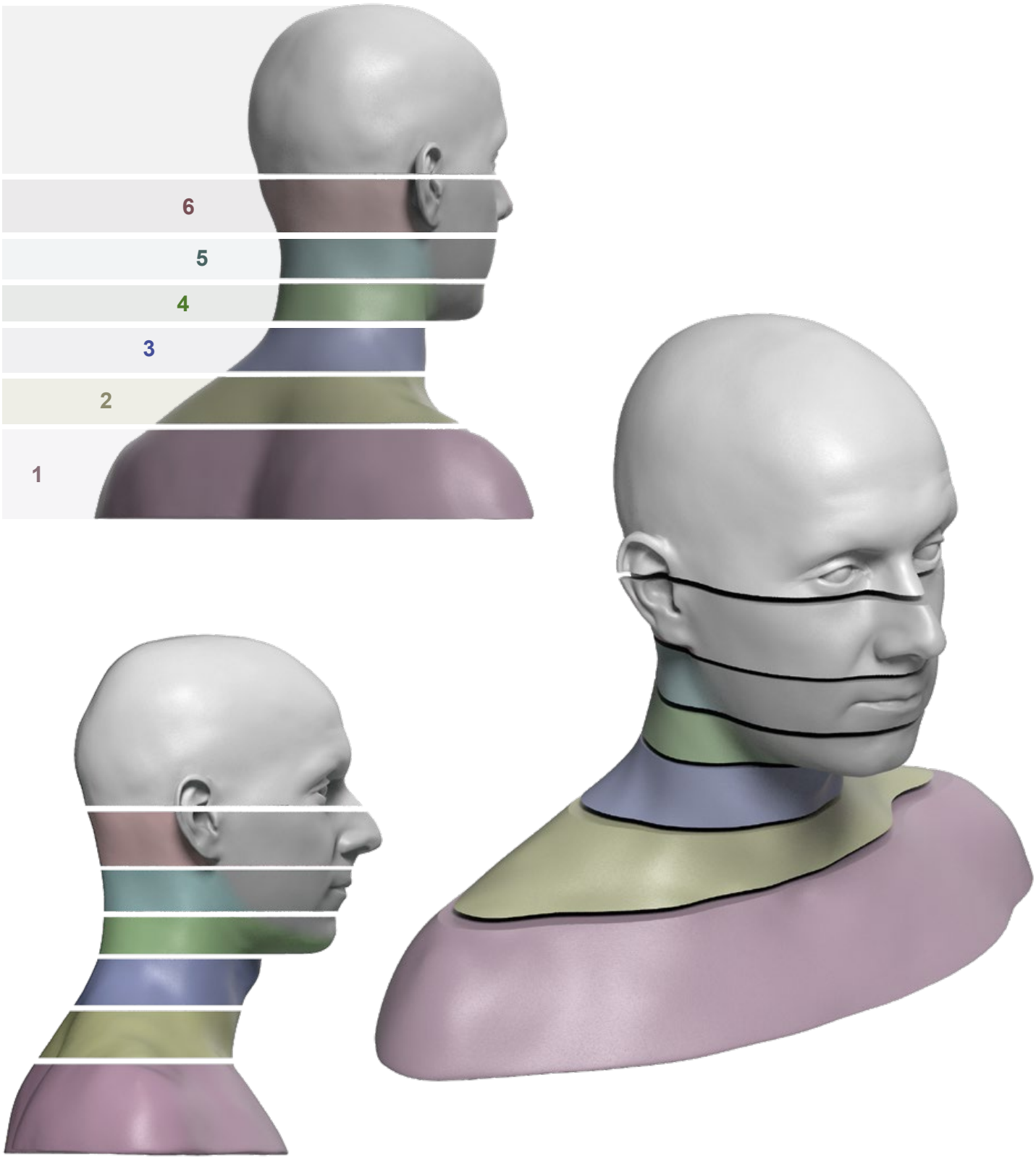
Back view

GENERAL SHAPES OF THE NECK

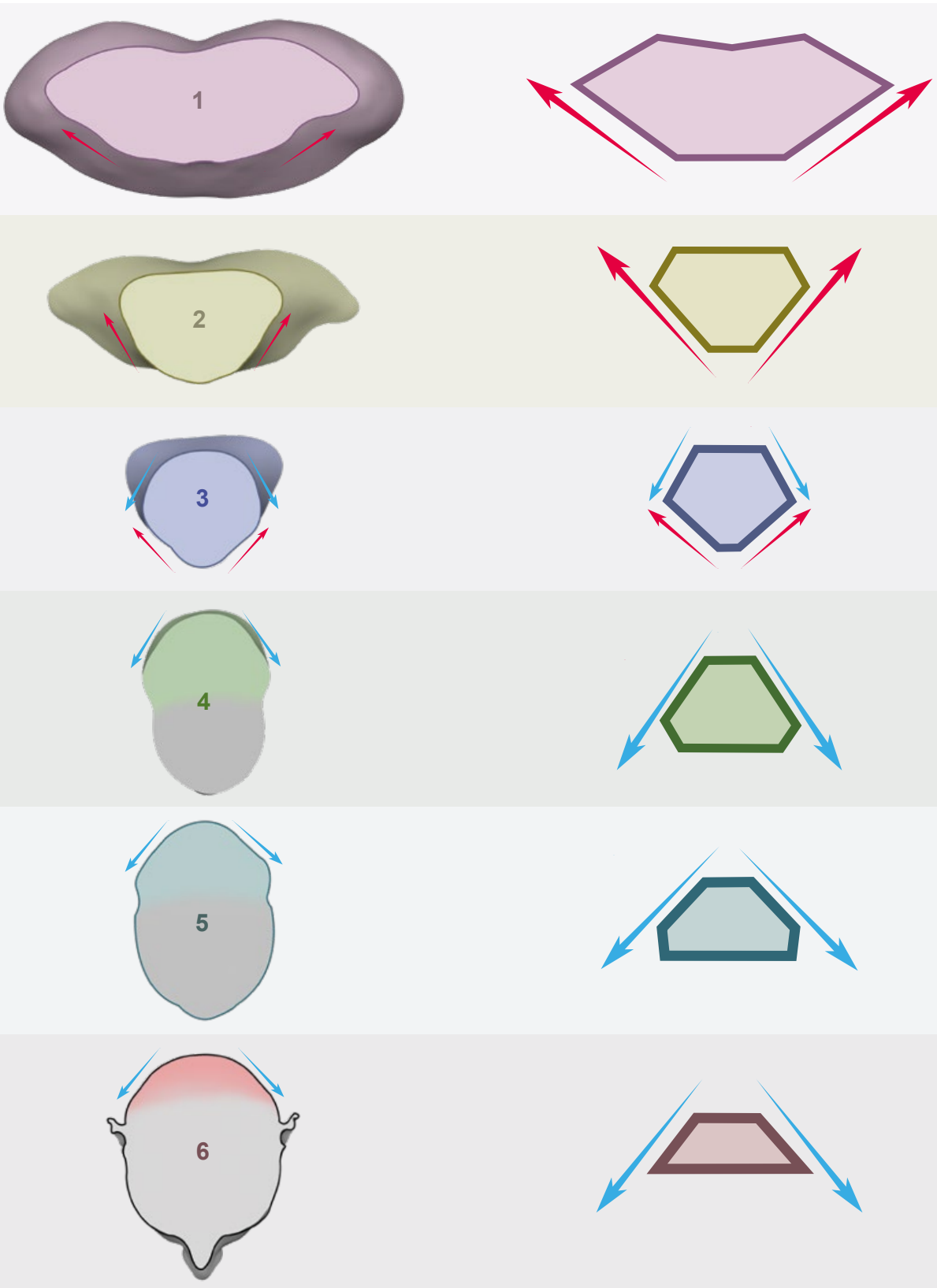




CROSS SECTIONS OF THE NECK



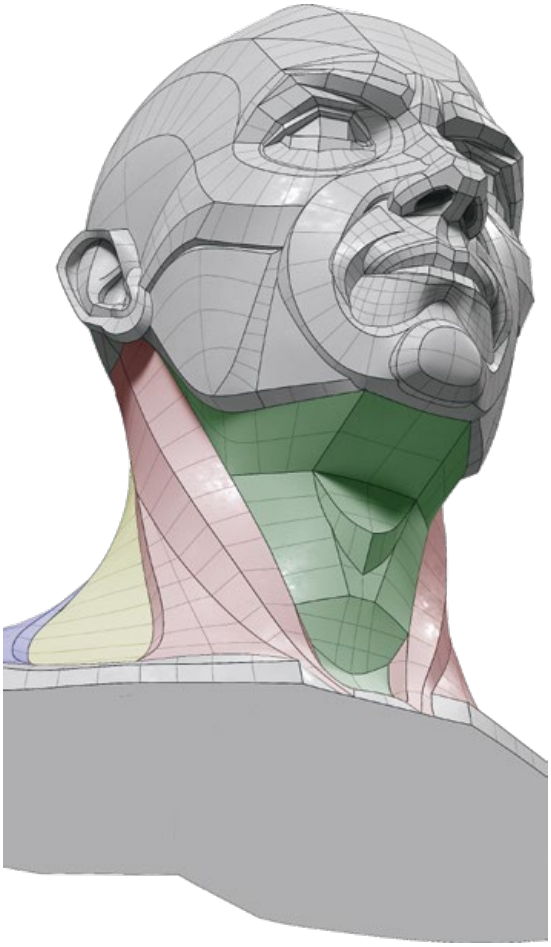
CROSS SECTIONS OF THE NECK

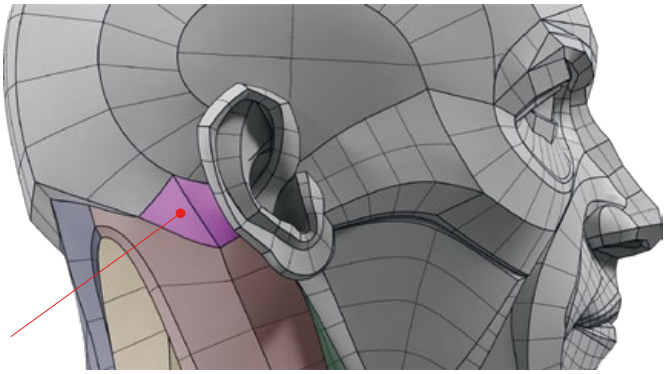


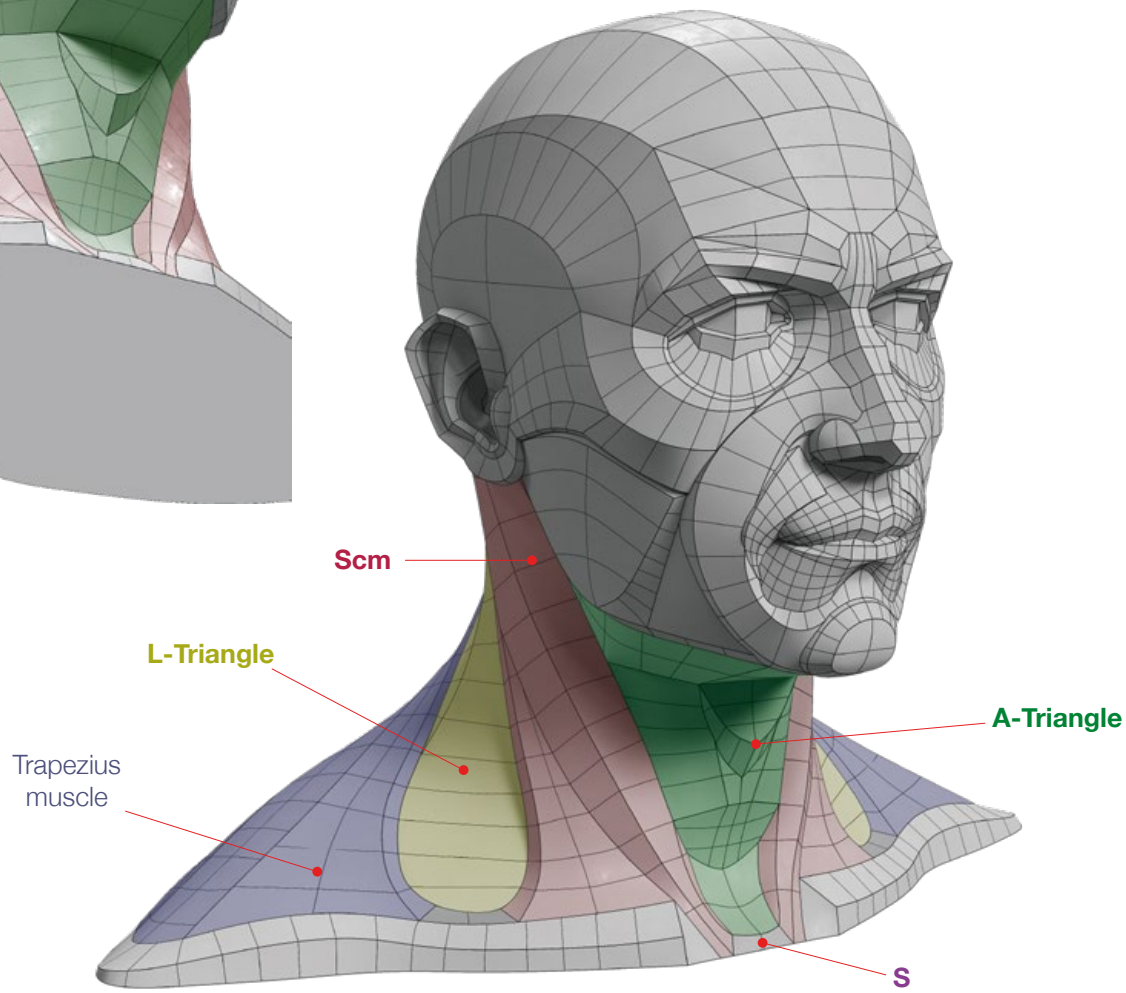
DETAILED SHAPES OF THE MALE NECK

Triangles of the Neck

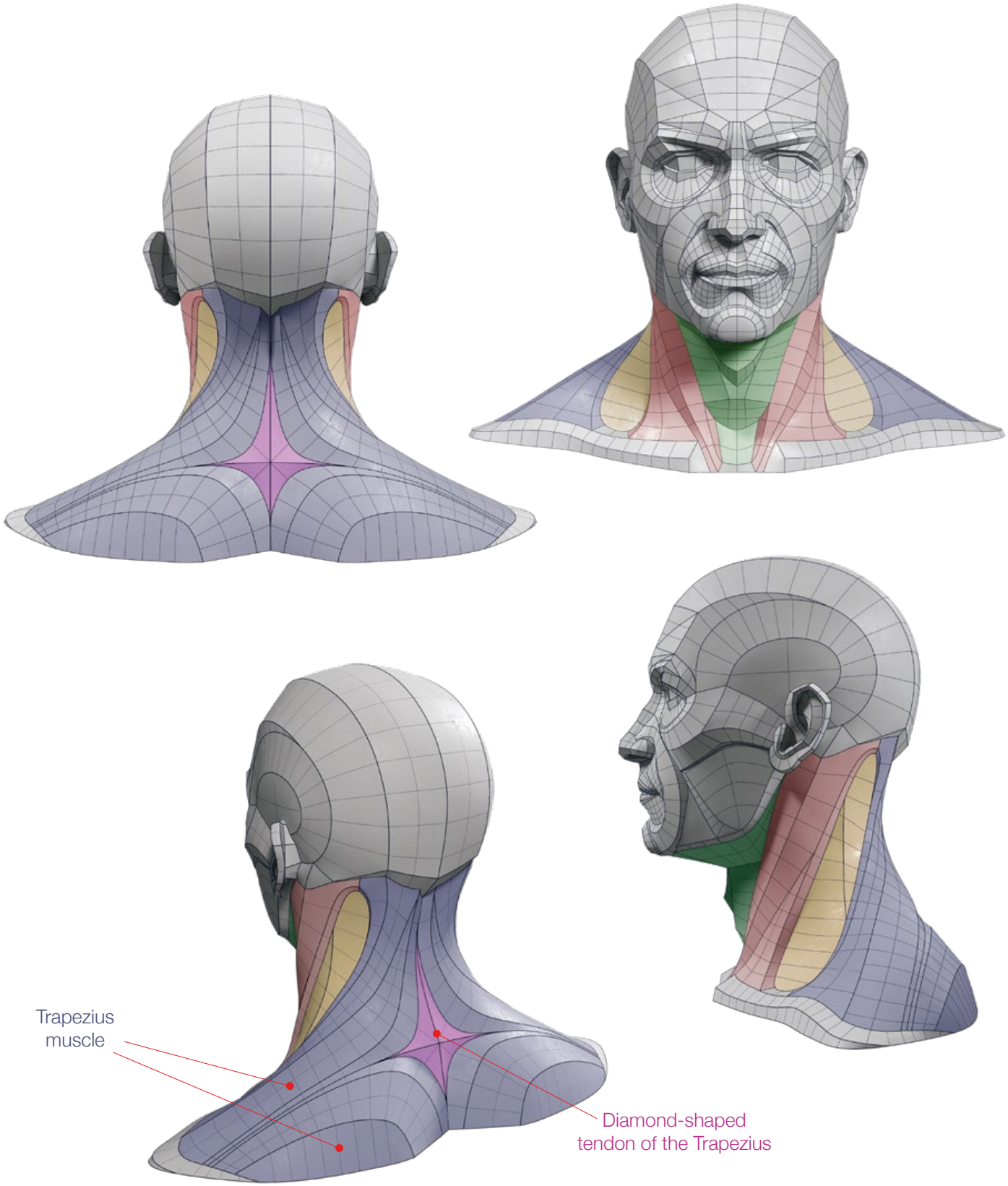
The **sternocleidomastoid muscle** (**Scm**) passes obliquely across the neck, from the **sternum** (**S**) and **clavicle** below, to the **mastoid process** (**Mp**) and superior nuchal line above and divides the neck into two large triangles.
The triangular space in front of the **Scm** is called the **anterior triangle** (**A-Triangle**) of the neck; and laterally behind it, the **lateral triangle of the neck** (**L-Triangle**).







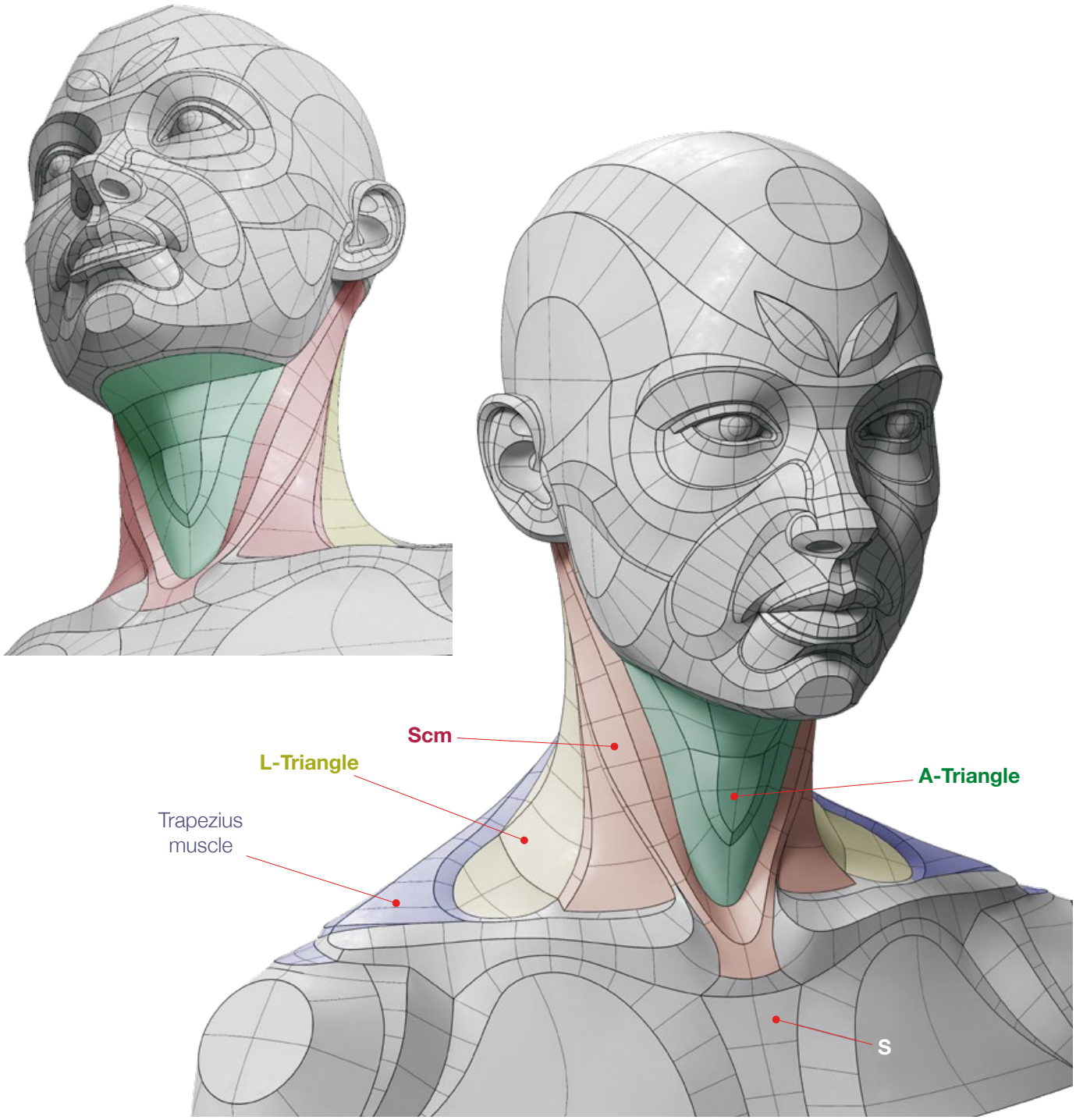
DETAILED SHAPES OF THE MALE NECK



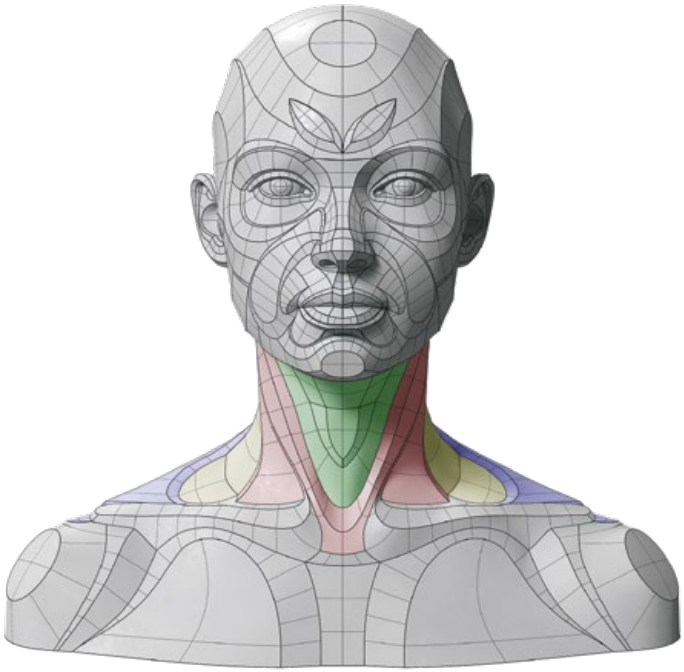
DETAILED SHAPES OF THE FEMALE NECK

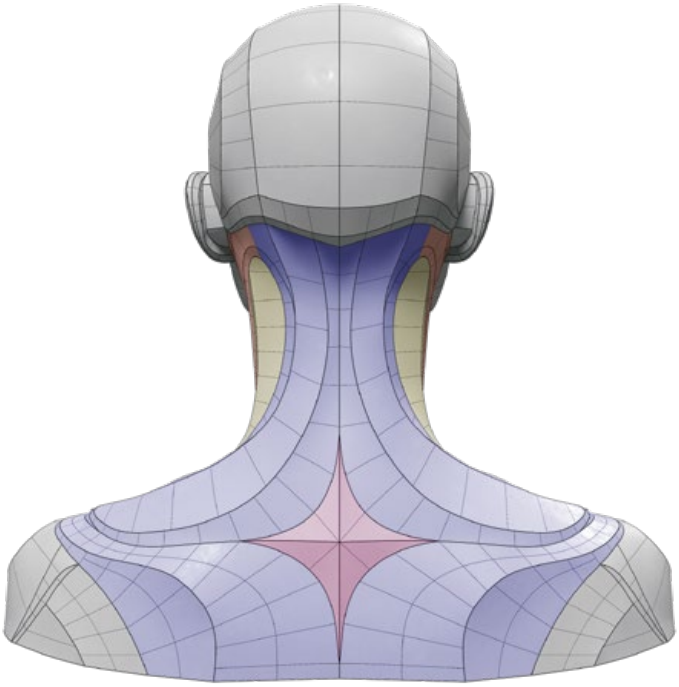
Triangles of neck

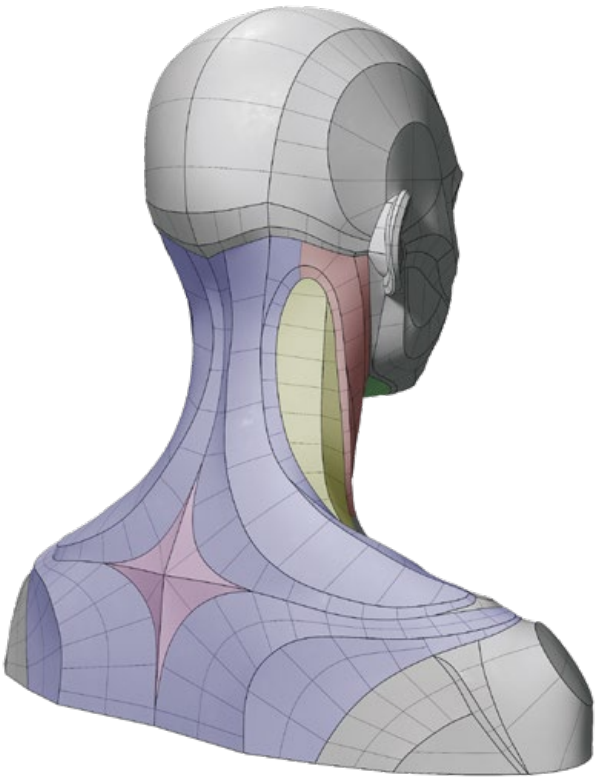
The **sternocleidomastoid muscle** (**Scm**) divides the neck into two large triangles.
The triangular space in front of the **Scm** is called the **anterior triangle** (**A-Triangle**) of the neck; and laterally behind it, the **lateral triangle of the neck** (**L-Triangle**).

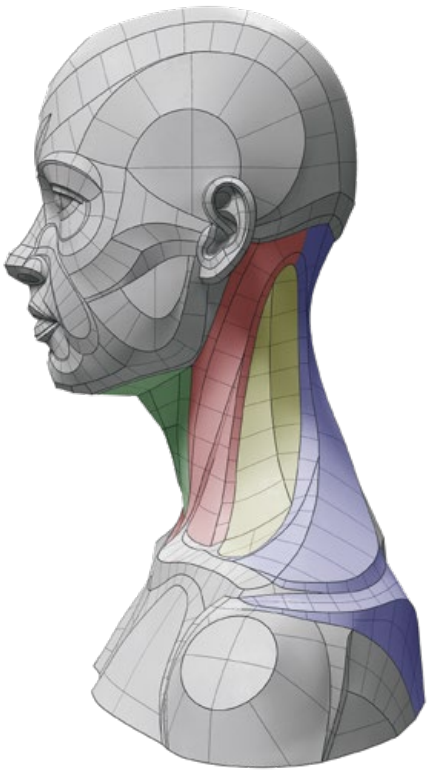


DETAILED SHAPES OF THE FEMALE NECK

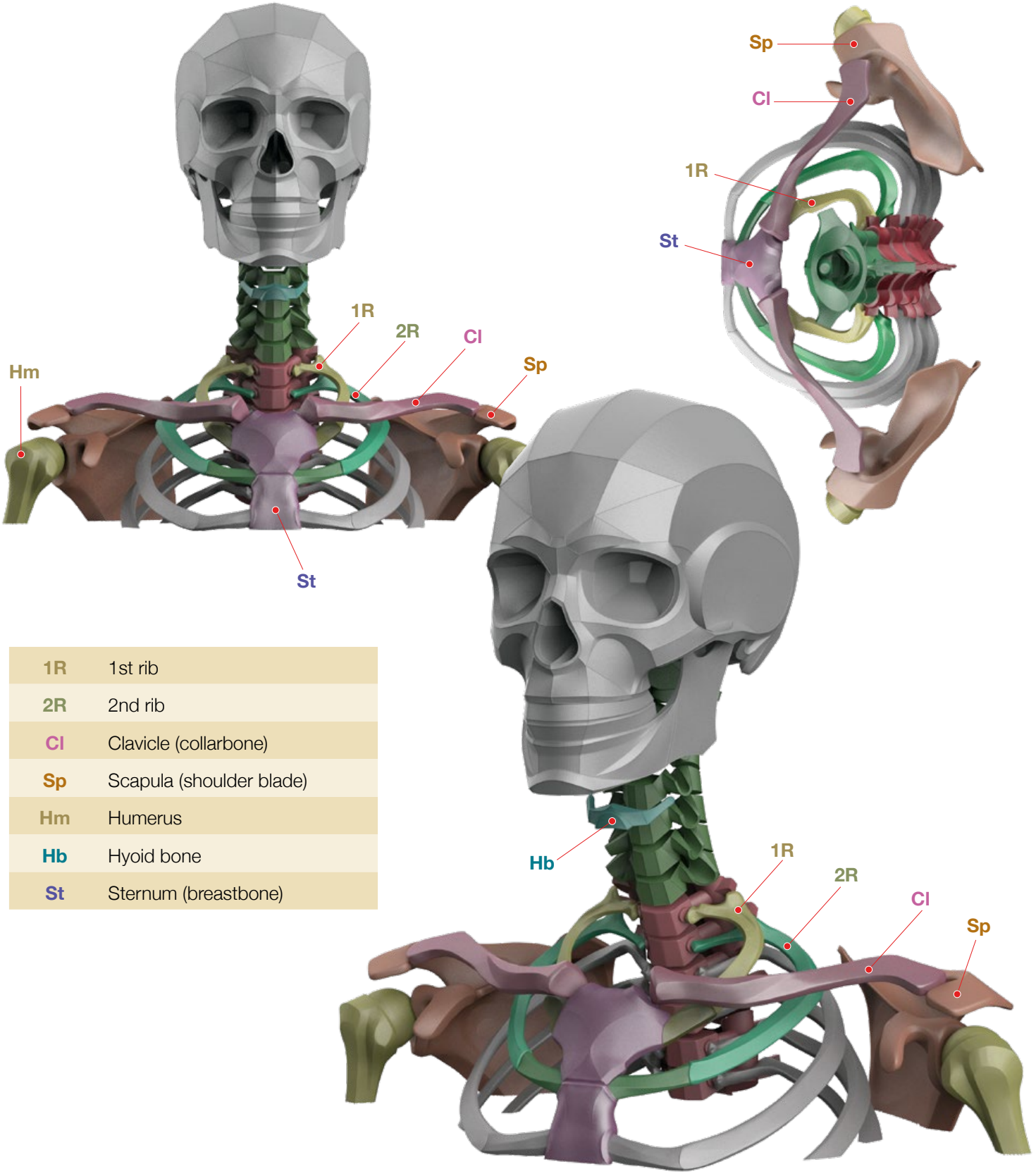






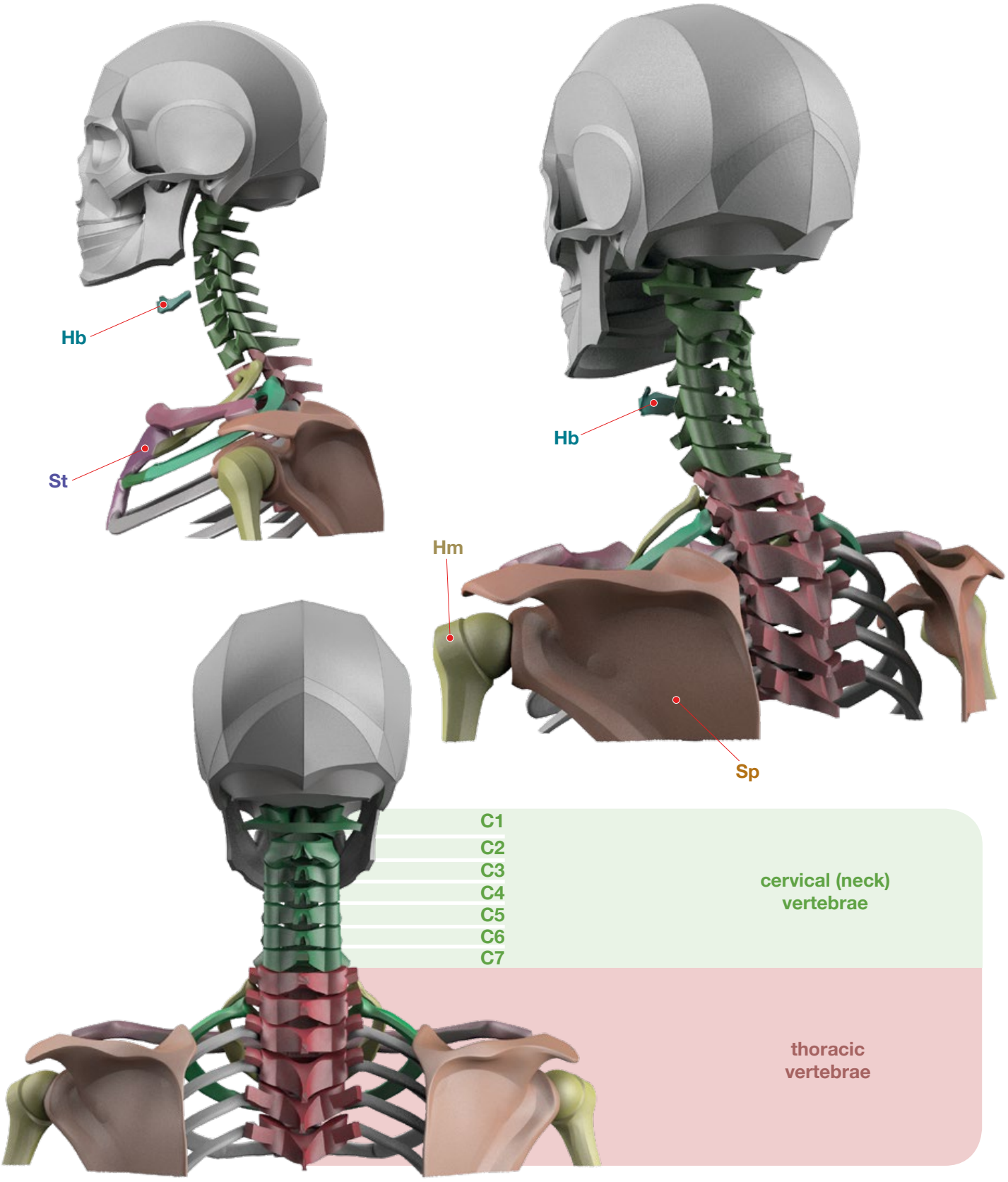


ANATOMY OF THE NECK

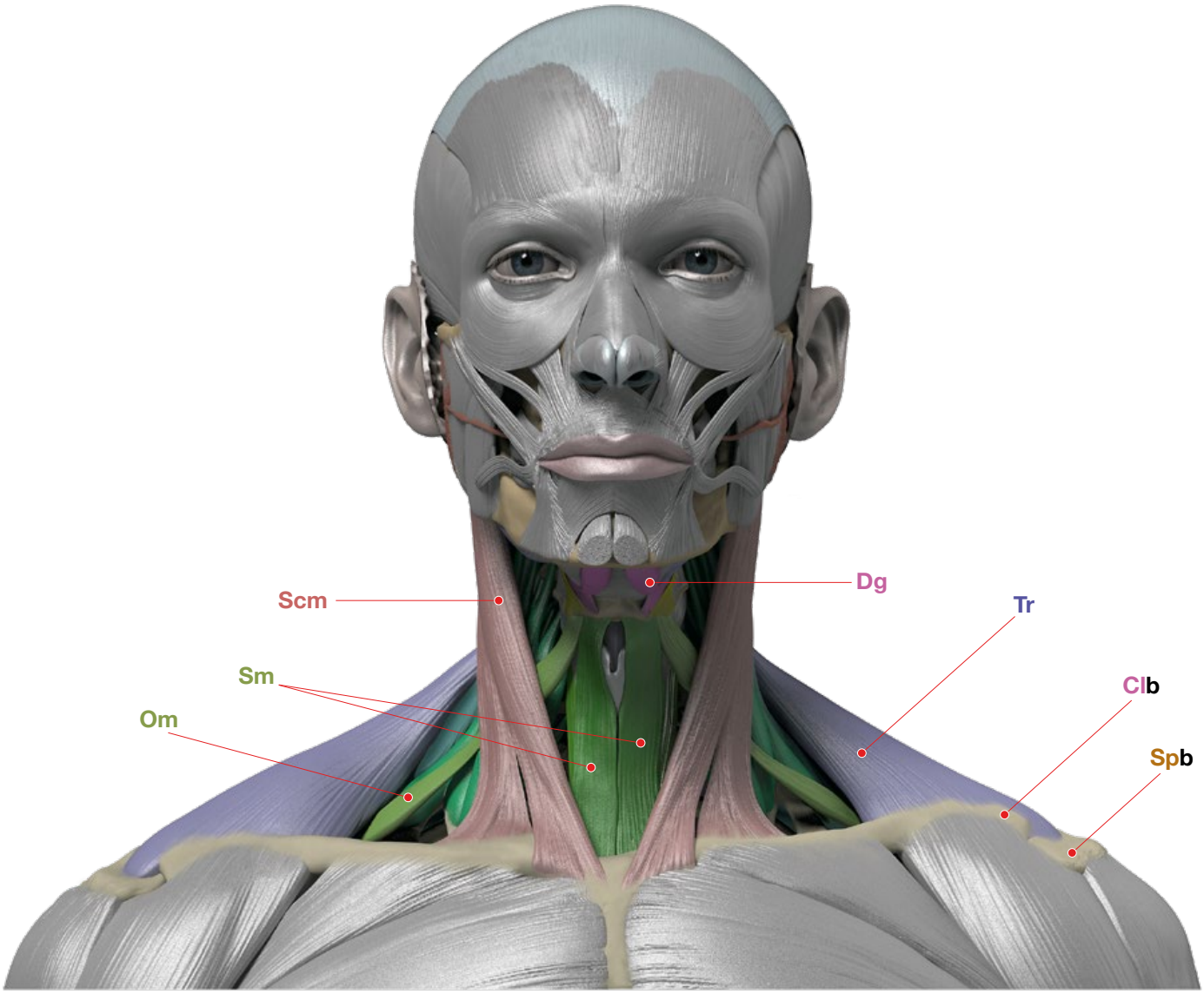


1R	1st rib
2R	2nd rib
Cl	Clavicle (collarbone)
Sp	Scapula (shoulder blade)
Hm	Humerus
Hb	Hyoid bone
St	Sternum (breastbone)

ANATOMY OF THE NECK

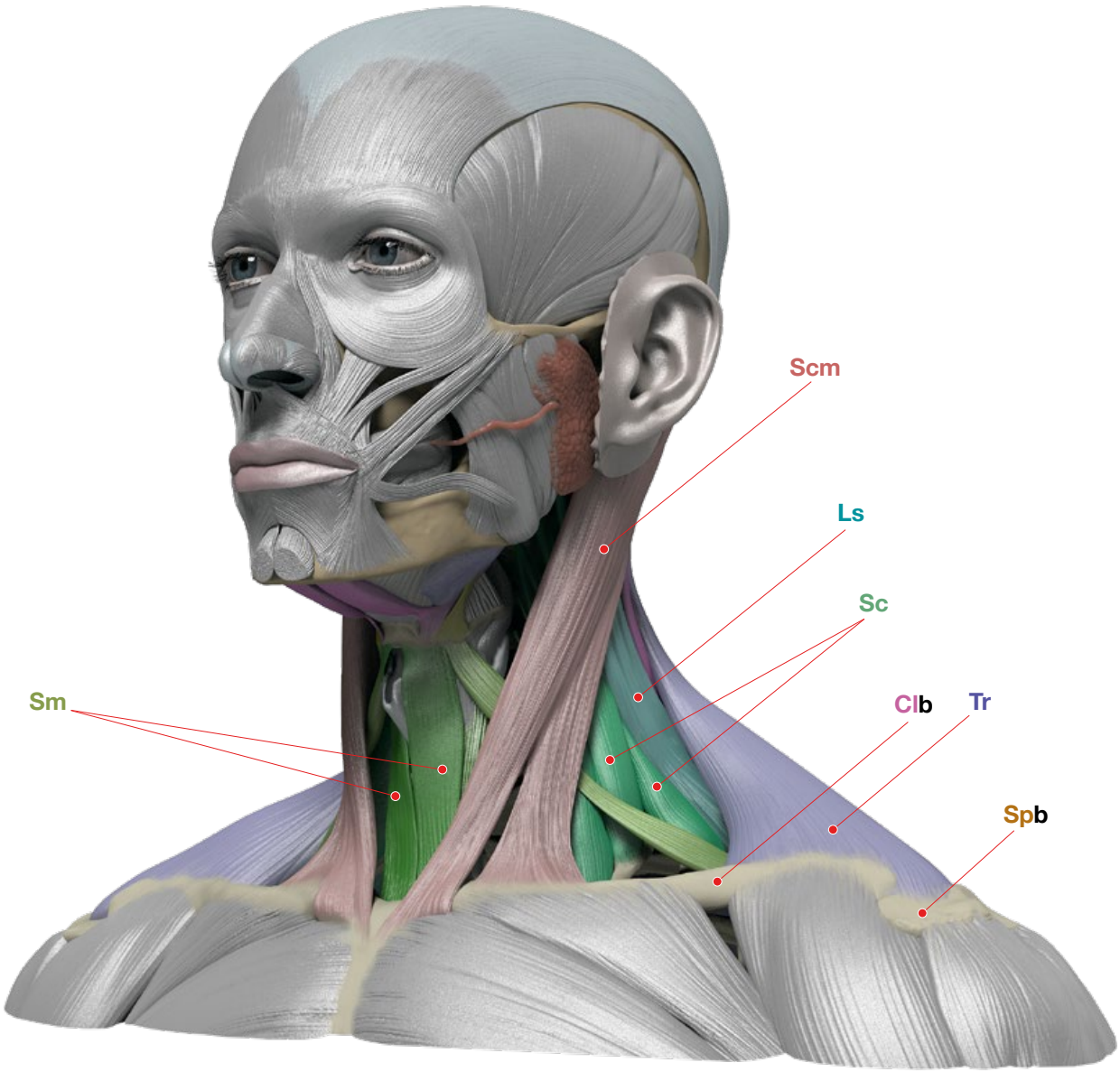


ANATOMY OF THE NECK



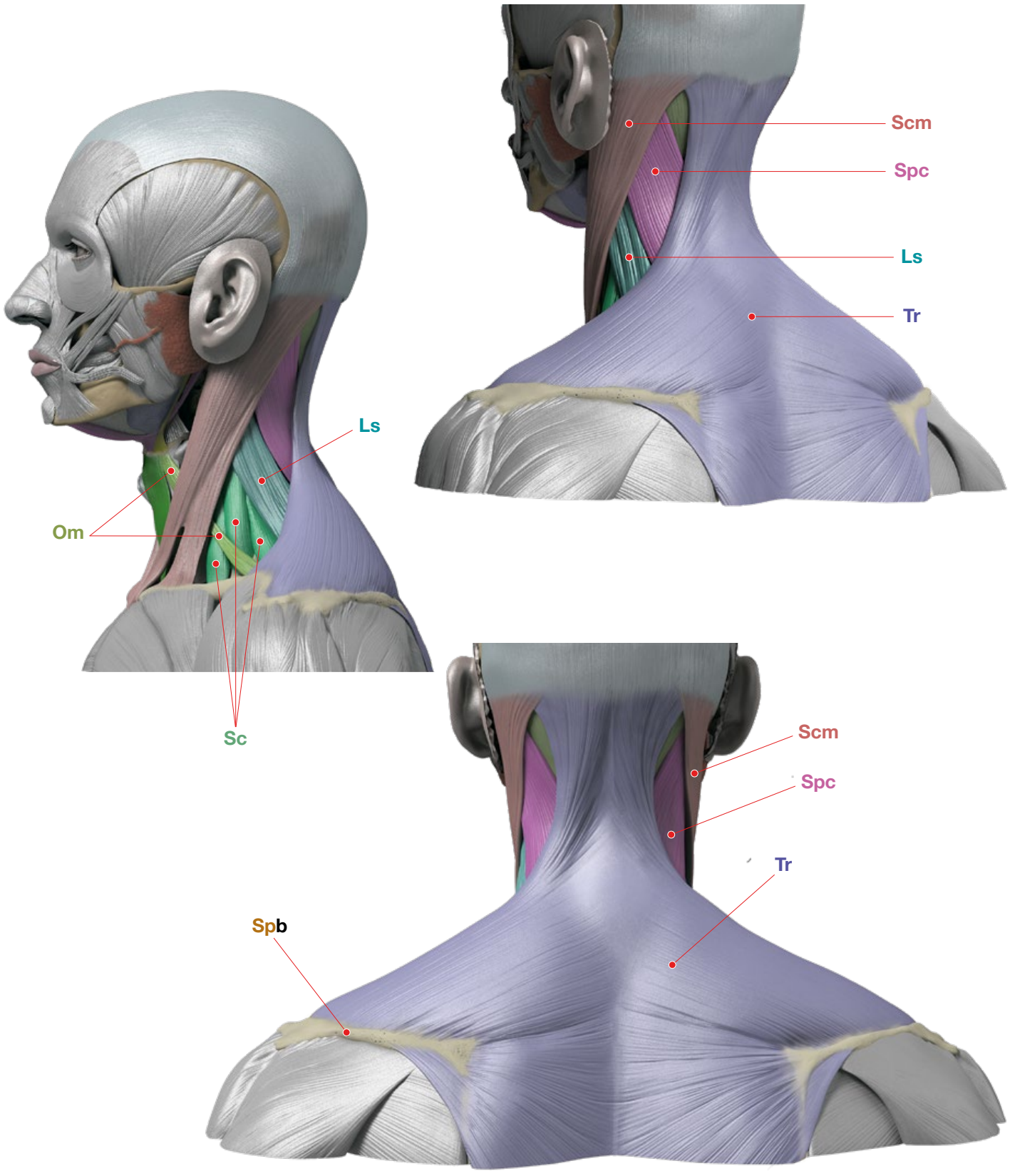
Scm	Sternocleidomastoid
Sm	Strap muscles (infrahyoid muscles)
Om	Omohyoid
Dg	Digastric muscle
Tr	Trapezius
Spb	Scapula bone (shoulder blade)
Clb	Clavicle (collarbone)

ANATOMY OF THE NECK

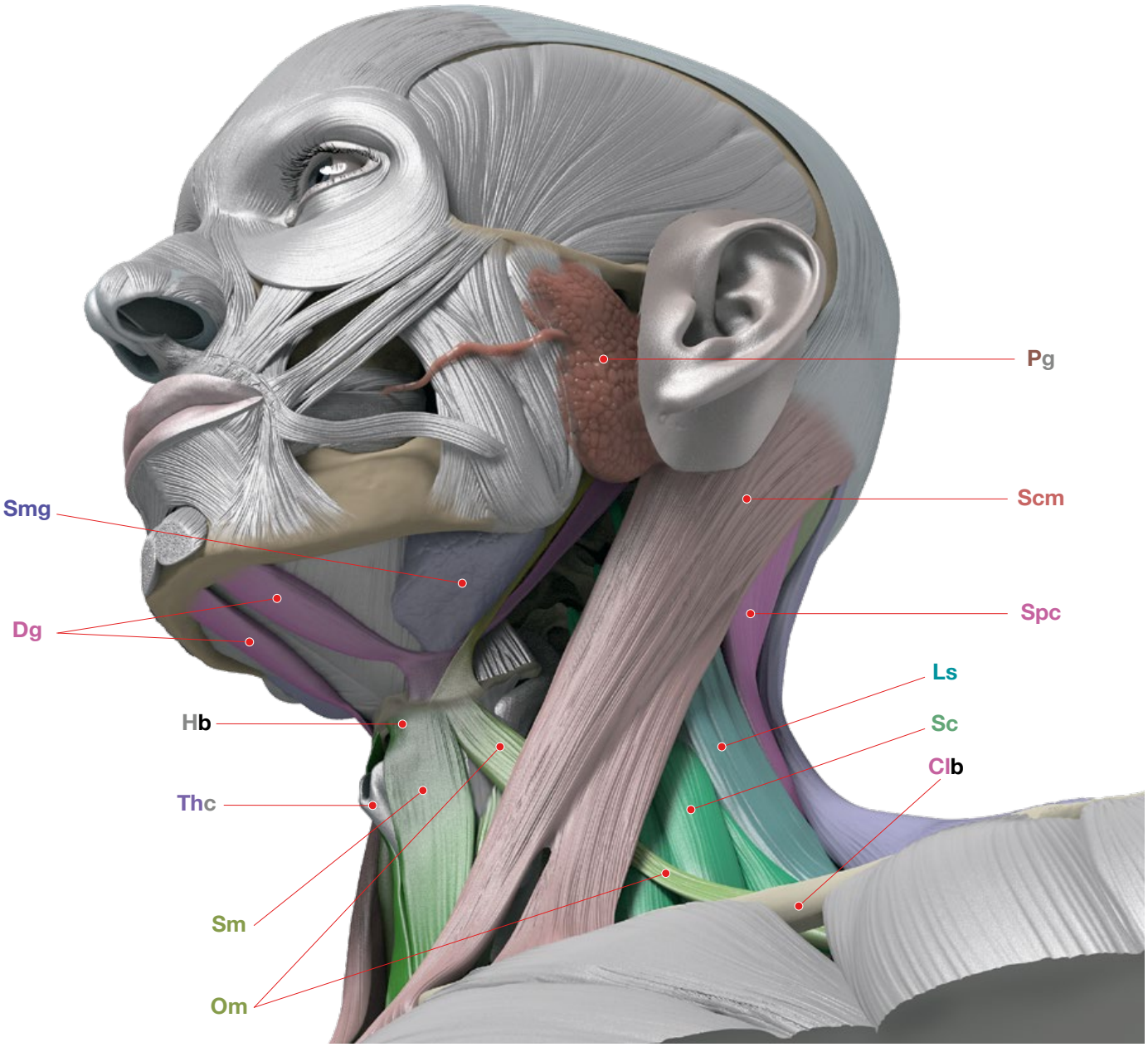


Scm	Sternocleidomastoid
Ls	Levator scapulae
Sc	Scalene muscles group
Tr	Trapezius
Spb	Scapula bone (shoulder blade)
Clb	Clavicle (collarbone)
Sm	Strap muscles (infrahyoid muscles)

ANATOMY OF THE NECK



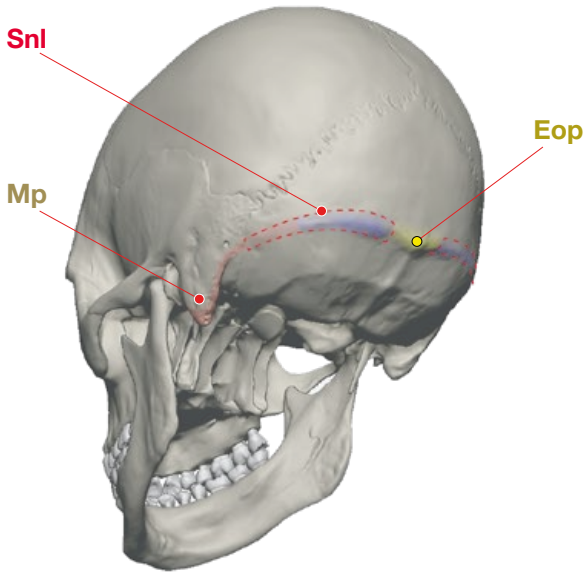
ANATOMY OF THE NECK

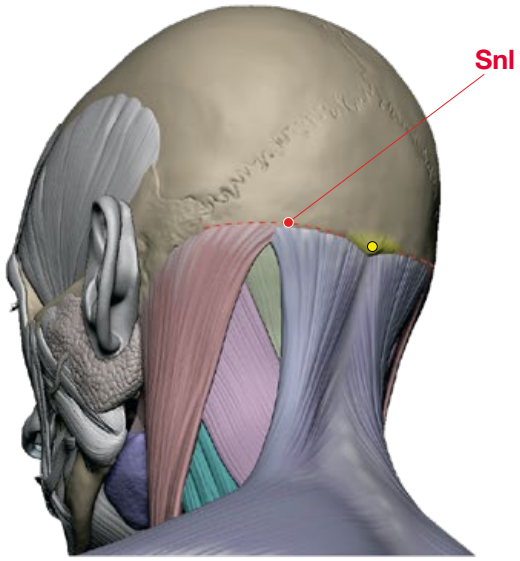


Scm	Sternocleidomastoid	**Sc**	Scalene muscles
Spc	Splenius capitis	**Smg**	Submandibular gland (salivary gland)
Ls	Levator scapulae	**Dg**	Digastric muscle
Tr	Trapezius	**Hb**	Hyoid bone
Om	Omohyoid	**Thc**	Thyroid cartilage
Clb	Clavicle (collarbone)	**Sm**	Strap muscles (infrahyoid muscles)
Spb	Scapula (shoulder blade)	**Pg**	Parotid gland (salivary gland)

ANATOMY OF THE NECK

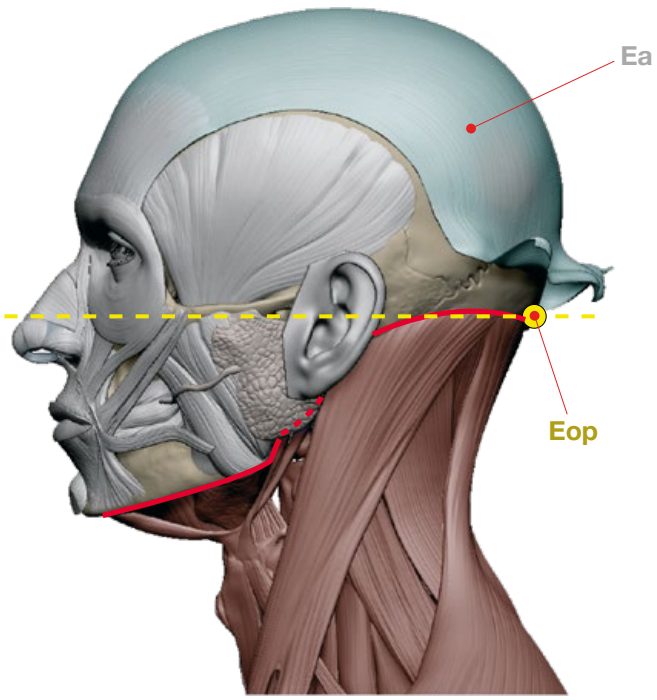
Connecting the head and neck

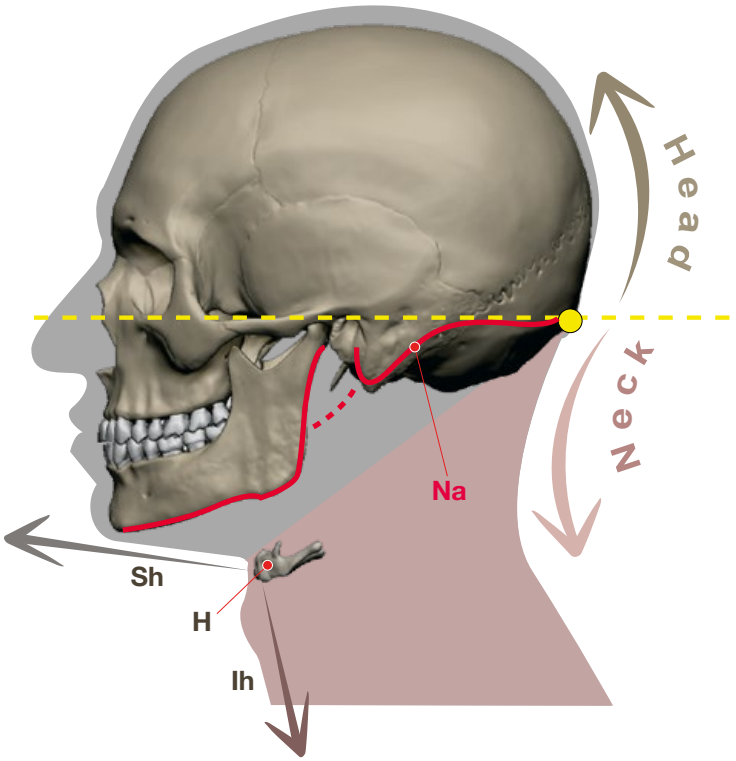




Snl	Superior nuchal line
Mp	Mastoid process (temporal bone)
Ea	Epicranial aponeurosis (scalp)
Eop	External occipital protuberance

Sh	Suprahyoid neck
H	Hyoid bone
Ih	Infrarahyoid neck
Na	Neck attachment line

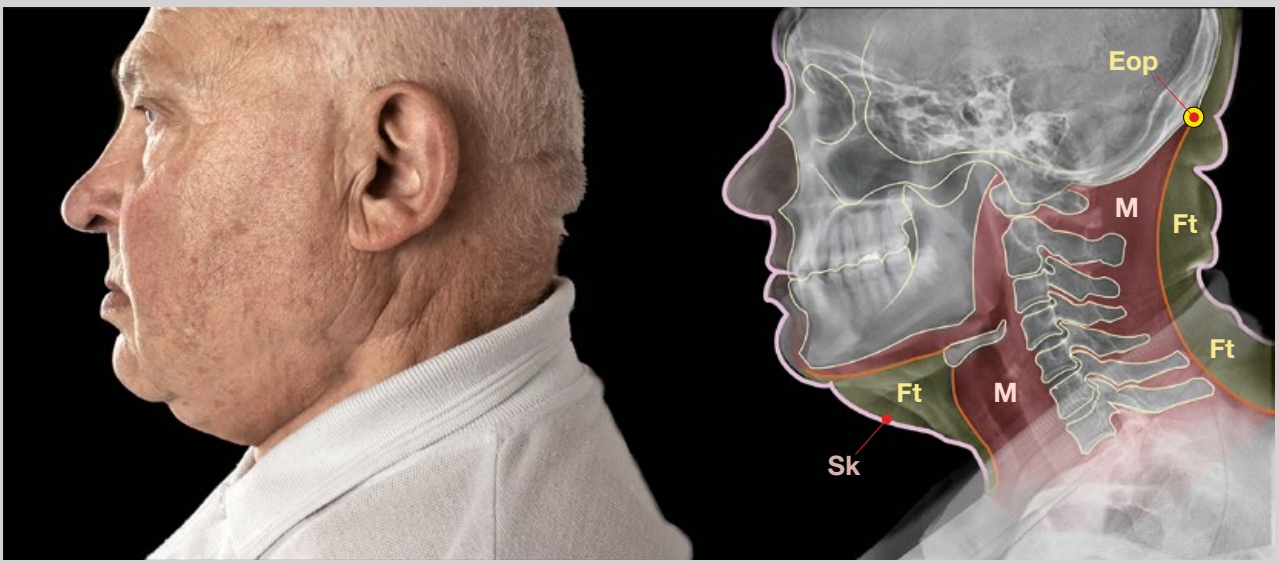




ANATOMY OF THE NECK

Connecting the head and neck

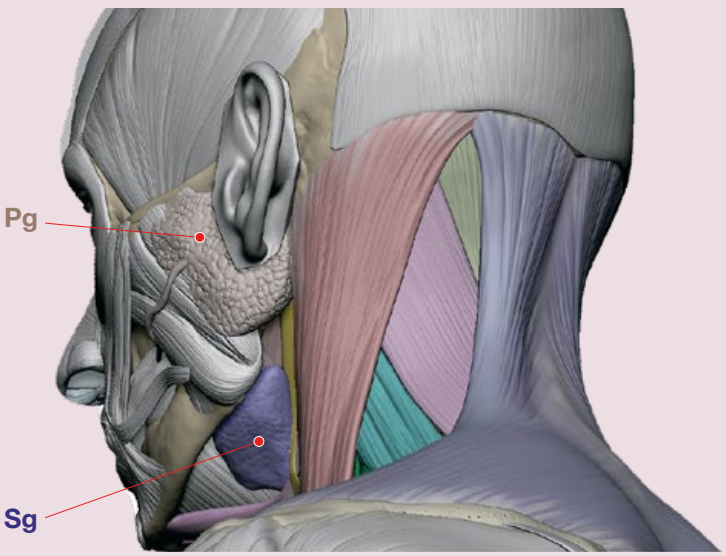
FAT PLAYS AN IMPORTANT ROLE IN HEAD AND NECK CONNECTION

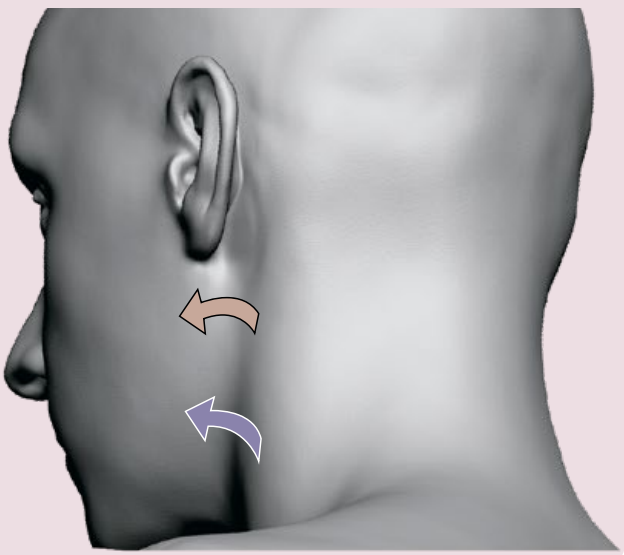


Ft	Fat	**Eop**	External occipital protuberance
M	Muscles of the neck	**Sk**	Skin

SALIVARY GLANDS

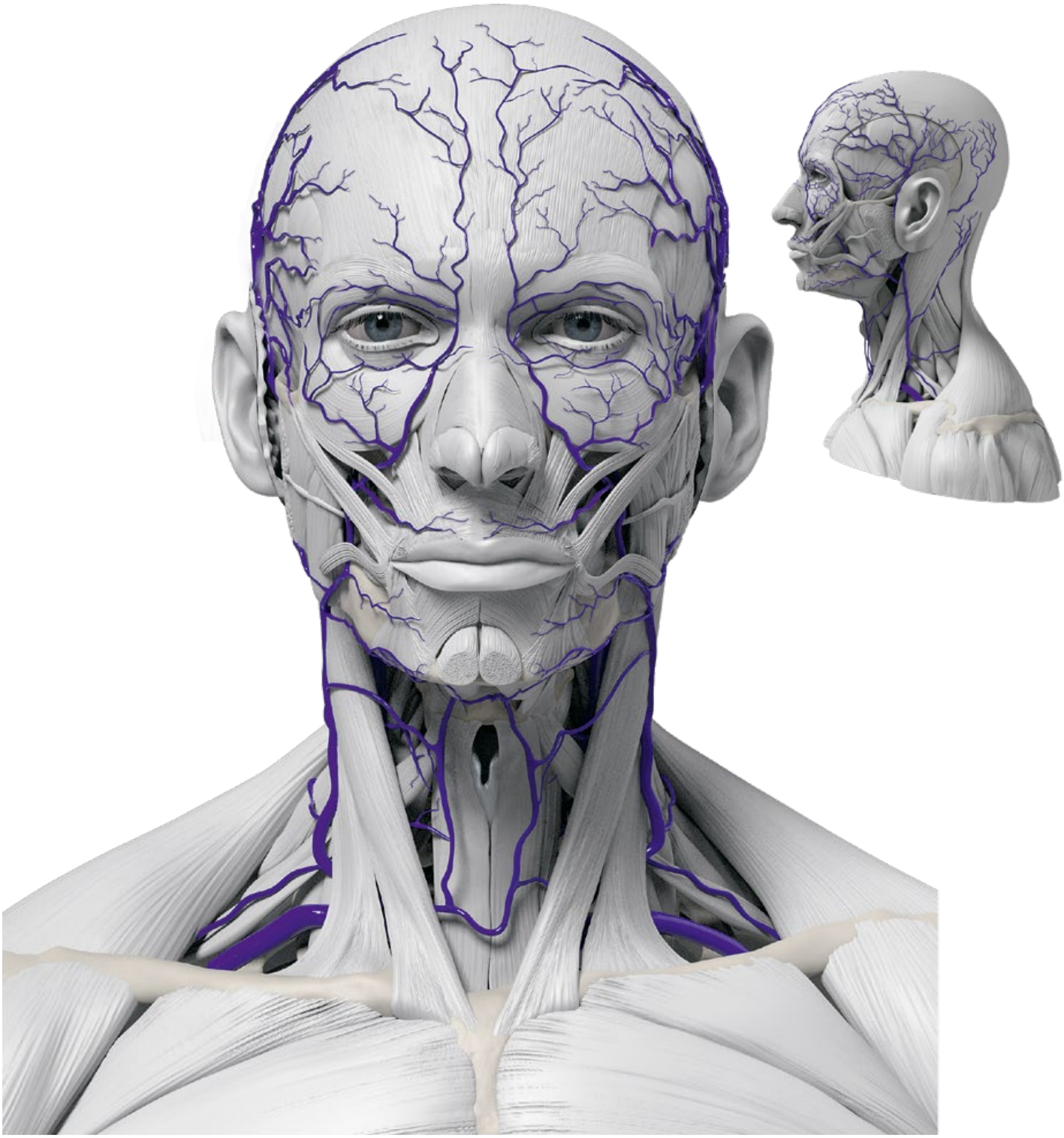
Parotid (**Pg**) and **Submandibular** (**Sg**) glands also take part in forming connection of the head and neck by softening the transition between the neck muscles and the mandible





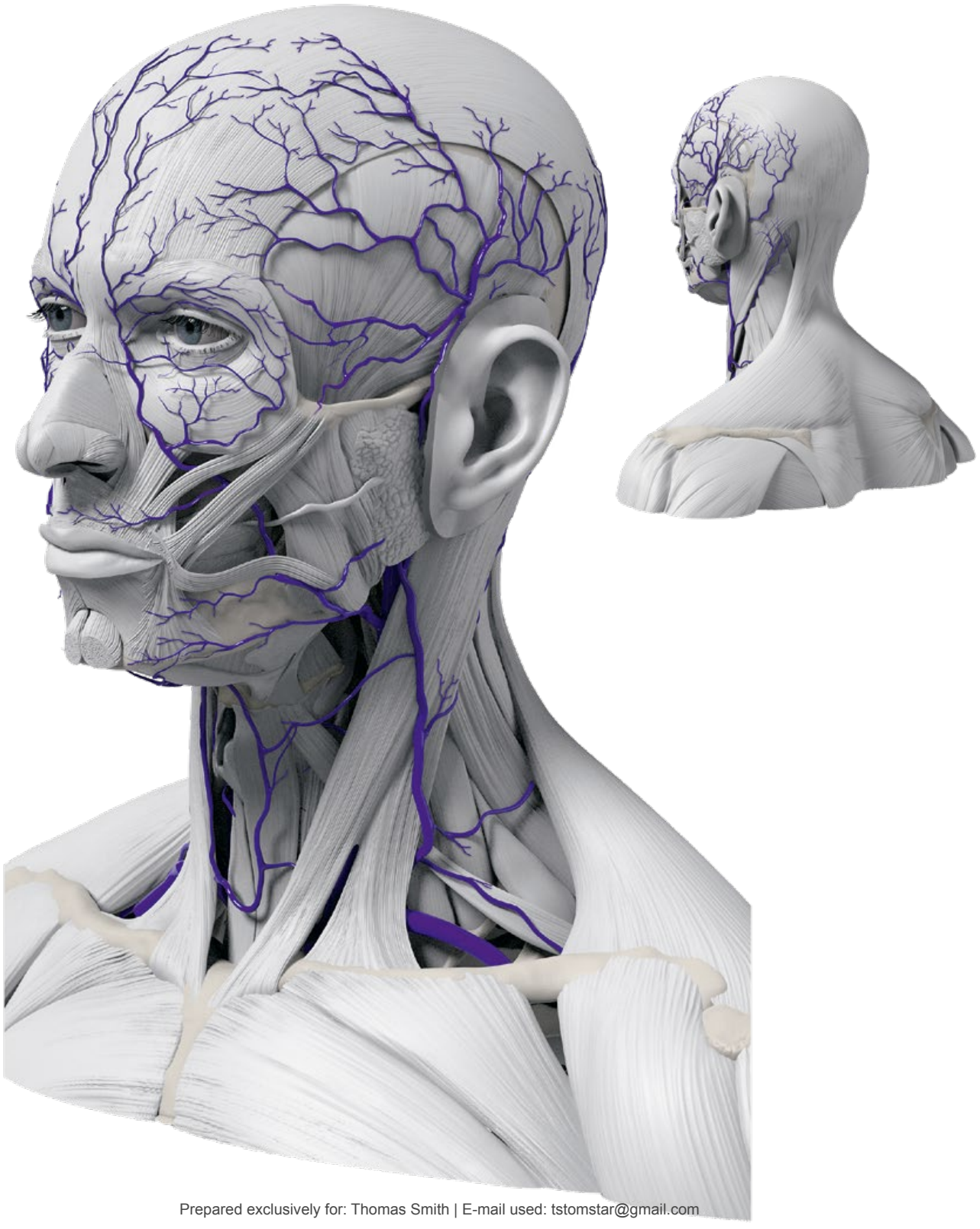
ANATOMY OF THE NECK

Major veins of the head and neck

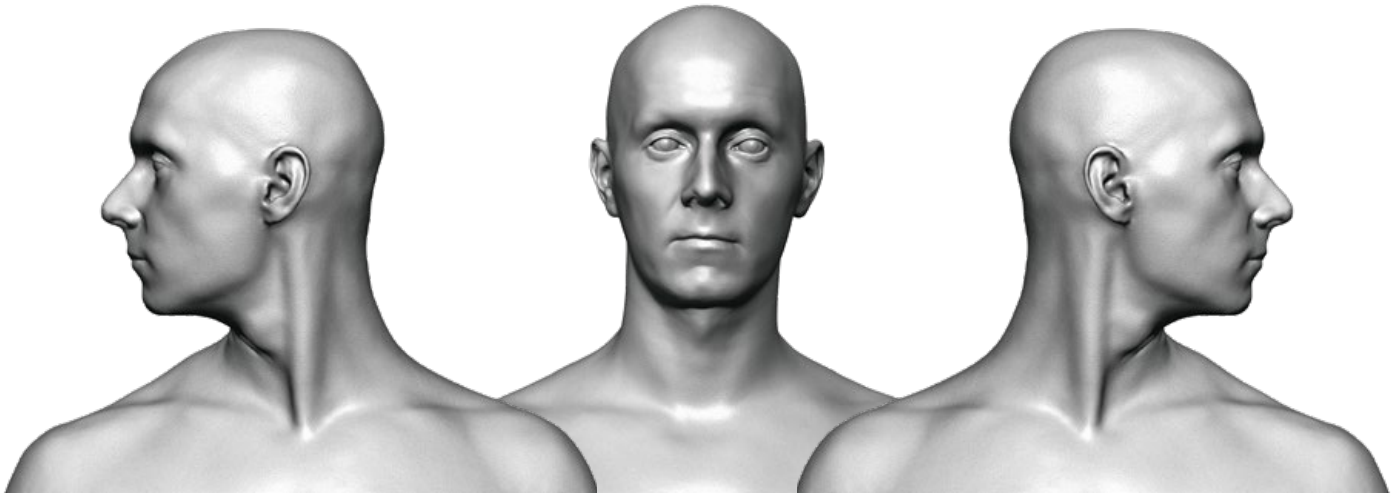


ANATOMY OF THE NECK

Major veins of the head and neck

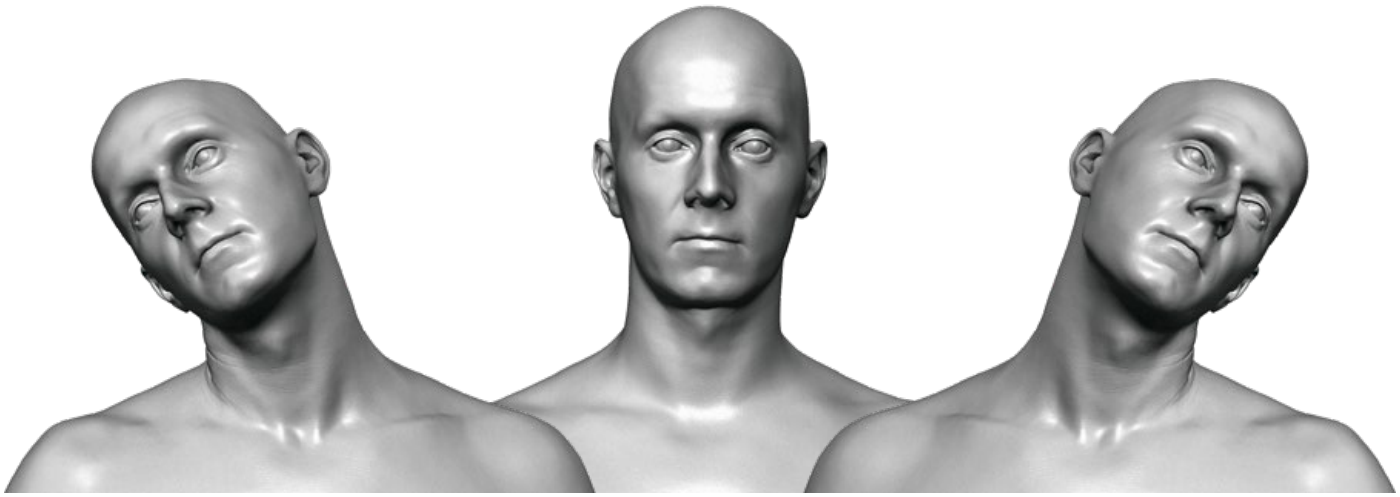


MOVEMENTS OF THE NECK



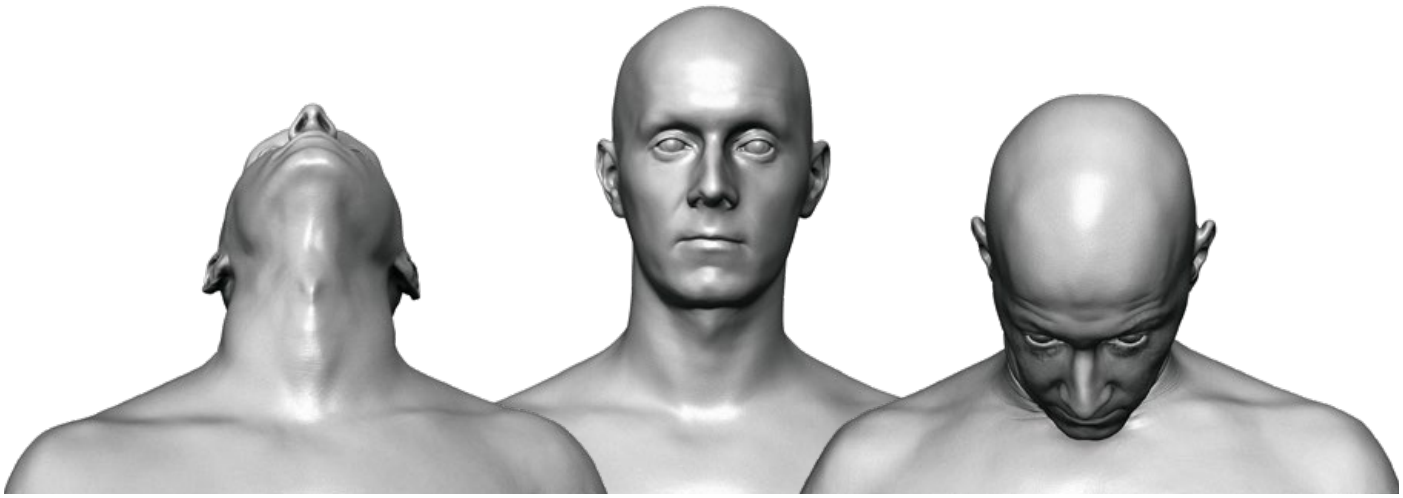
Right rotation

Left rotation



Right side flexion

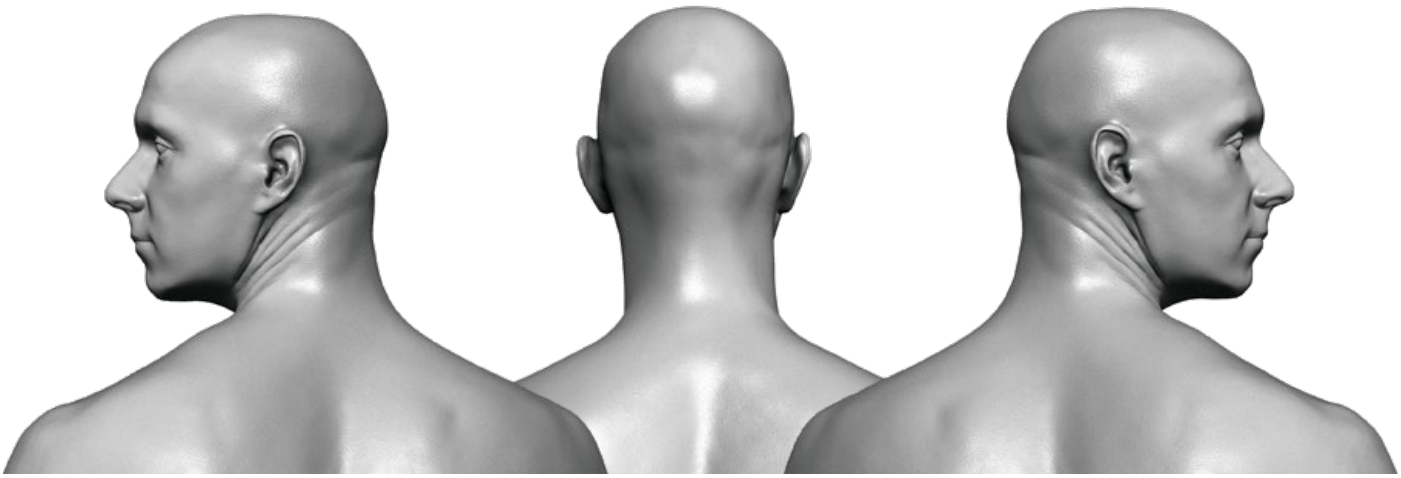
Left side flexion



Extension

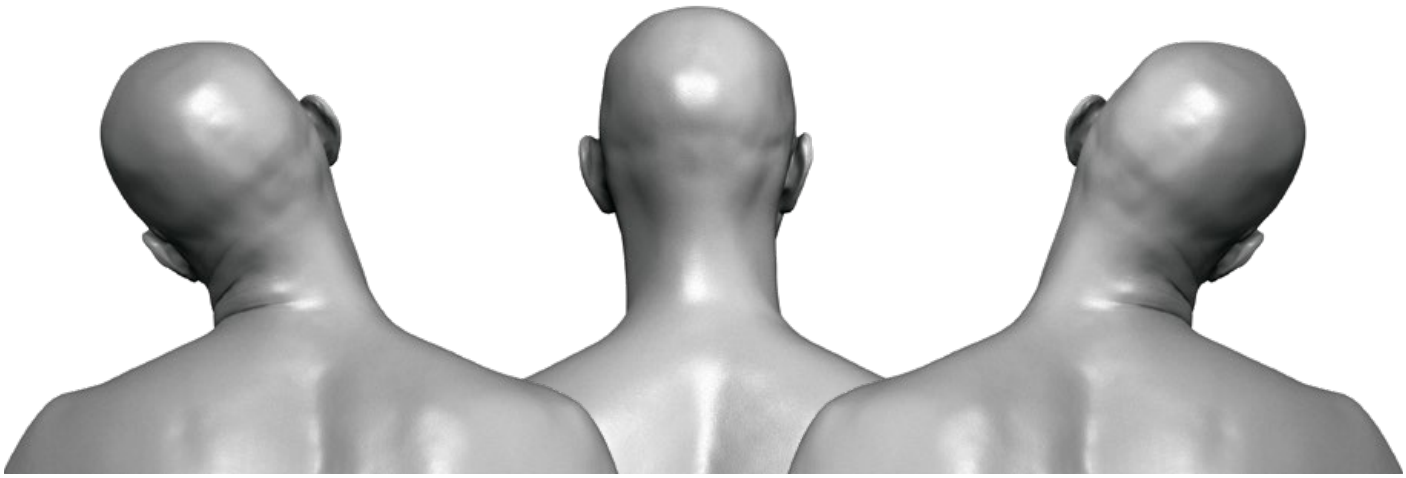
Flexion

MOVEMENTS OF THE NECK



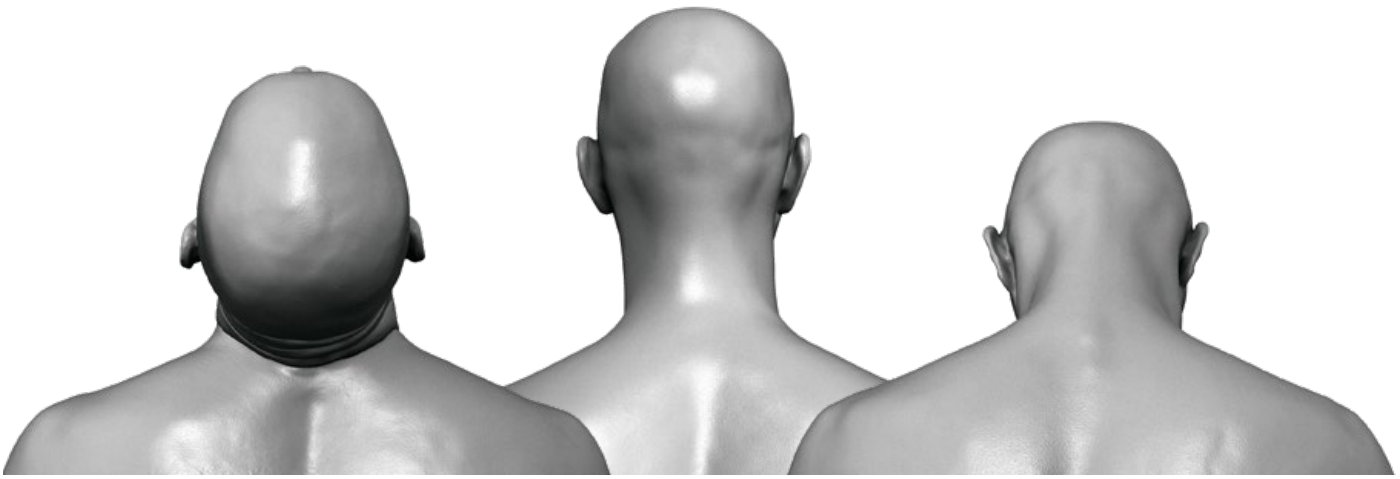
Left rotation

Right rotation



Left side flexion

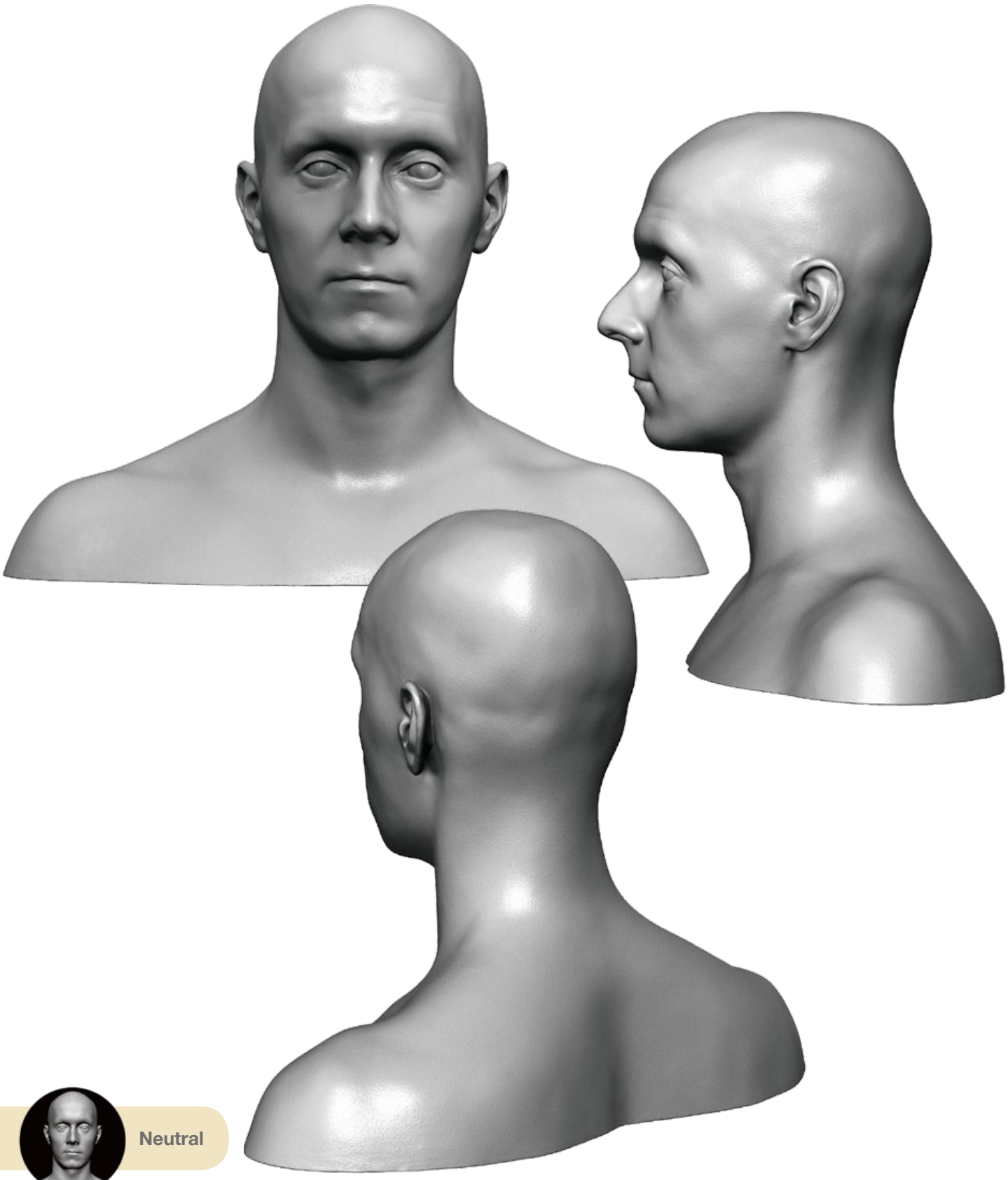
Right side flexion



Extension

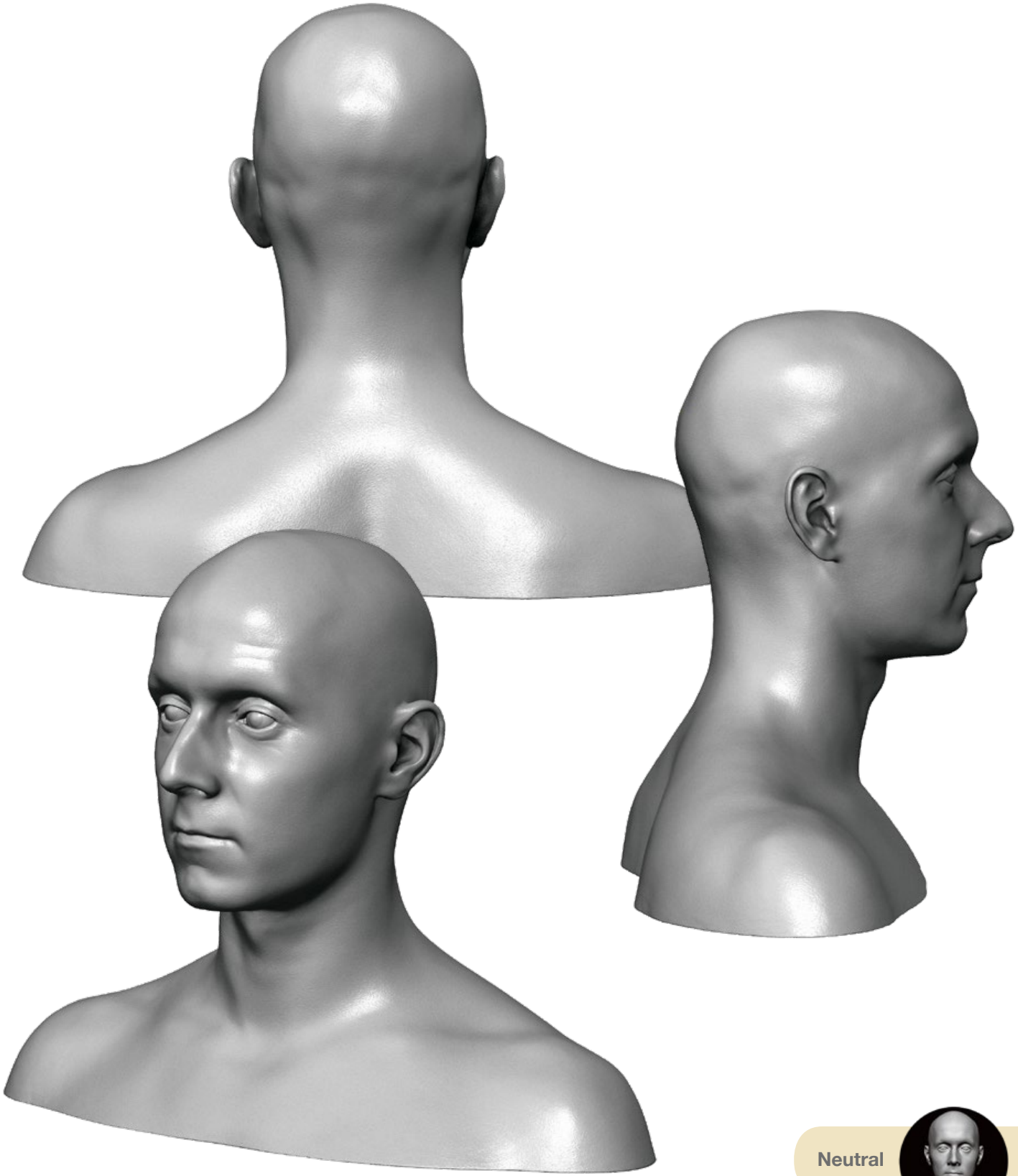
Flexion

MOVEMENTS OF THE NECK

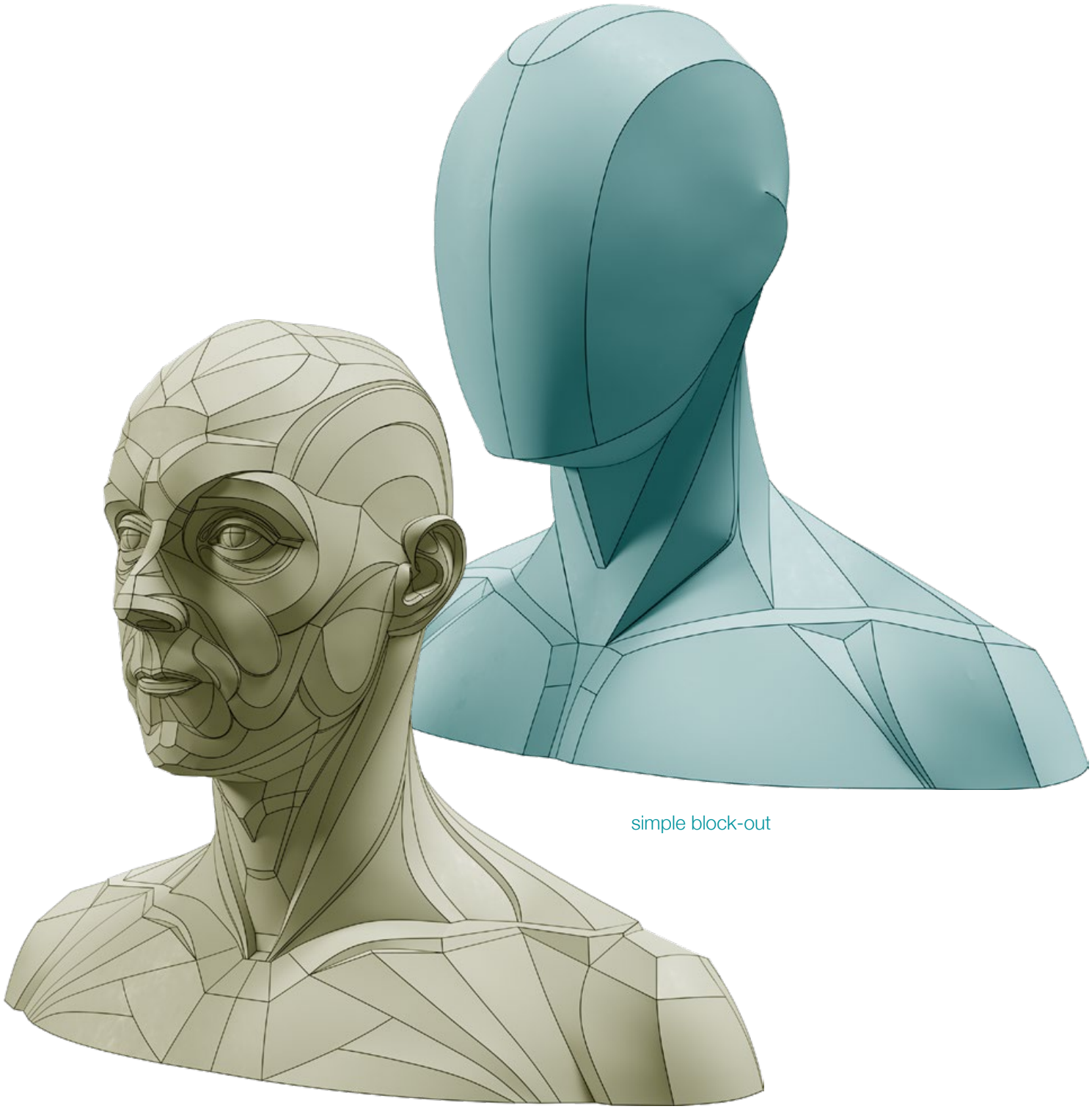


Neutral

MOVEMENTS OF THE NECK



MOVEMENTS OF THE NECK

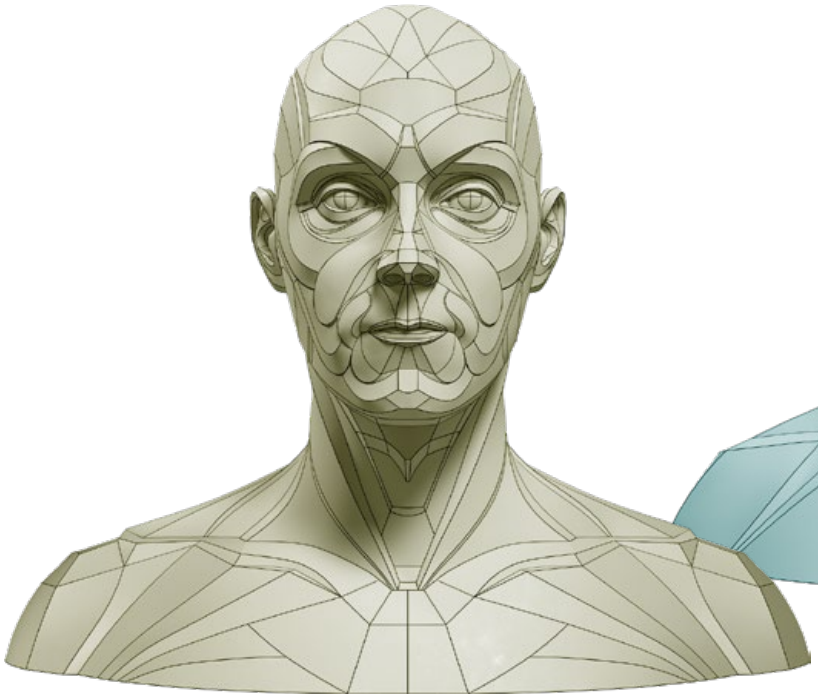


simple block-out

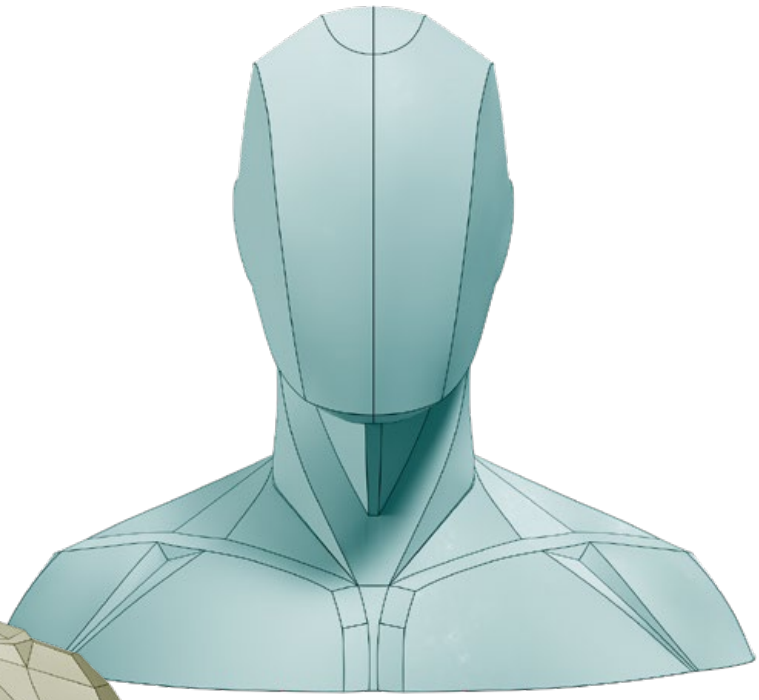
complex block-out

Neutral

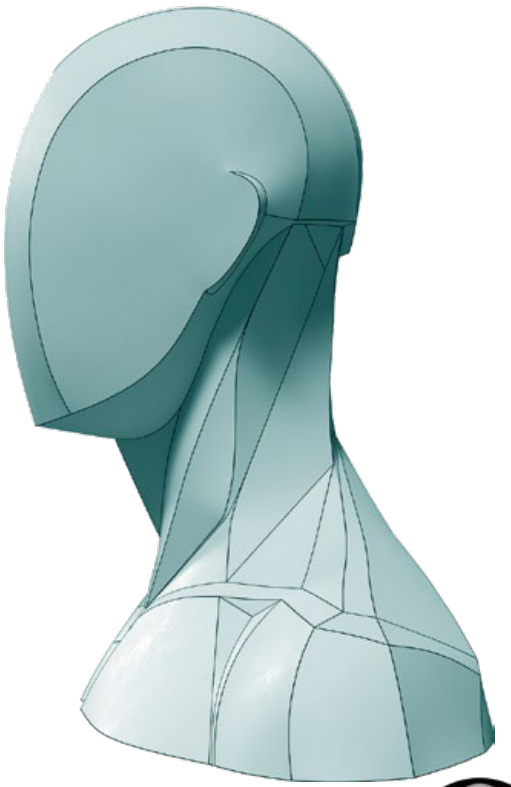
MOVEMENTS OF THE NECK



complex block-out



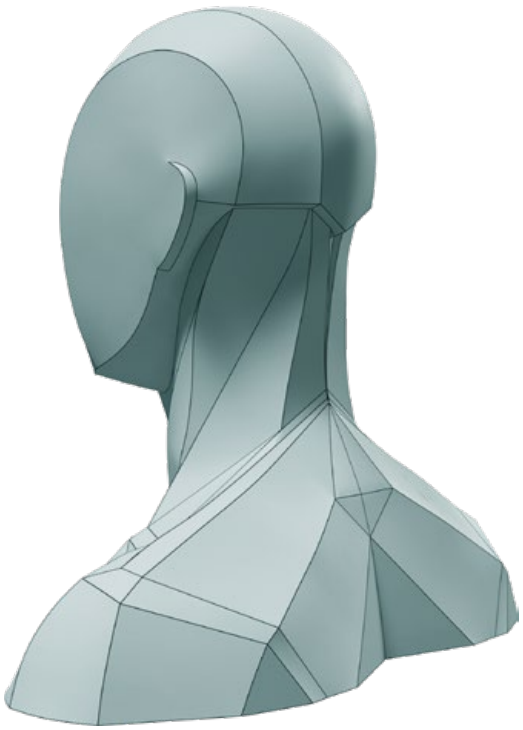
simple block-out



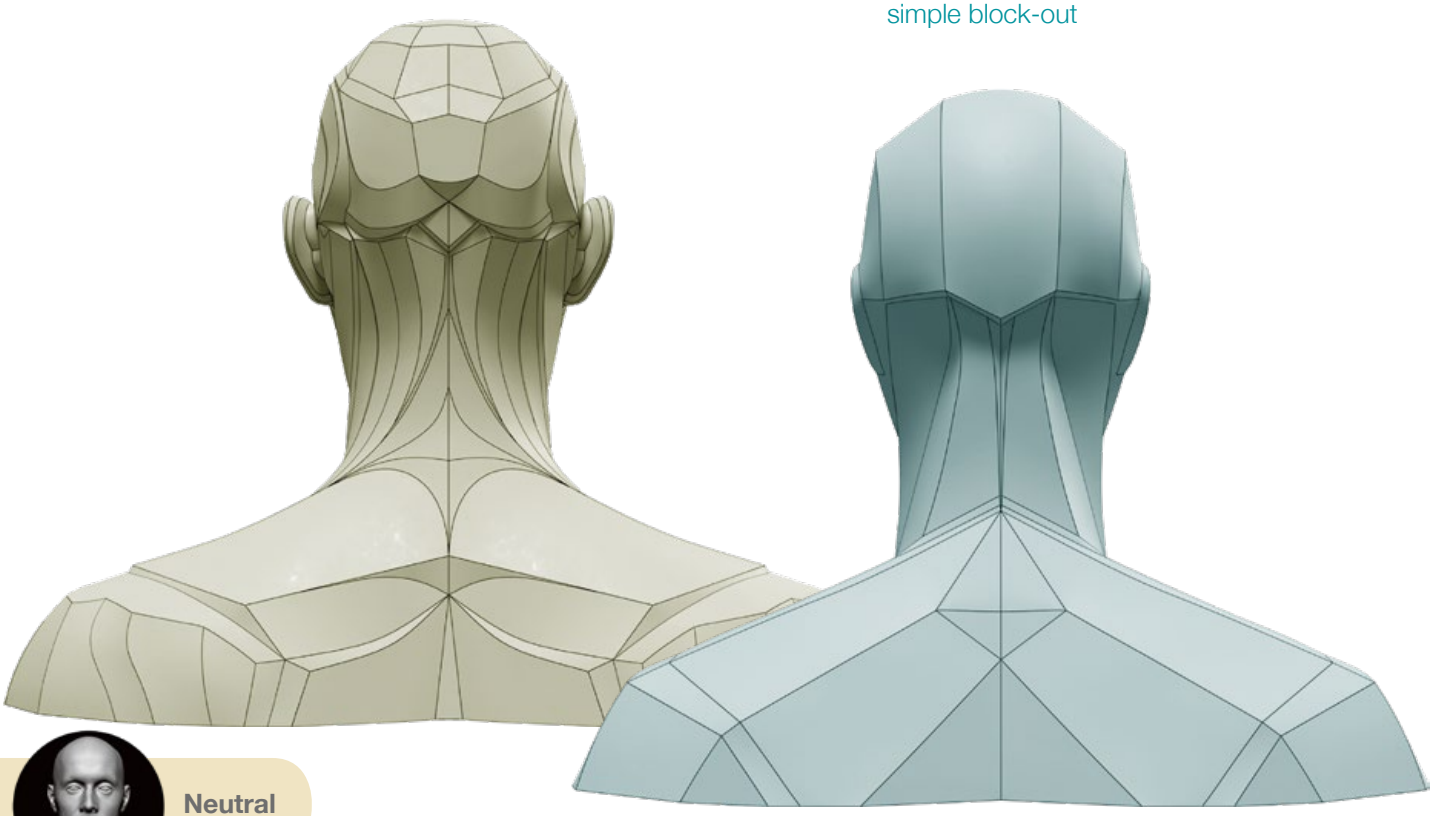
Neutral

MOVEMENTS OF THE NECK

complex block-out



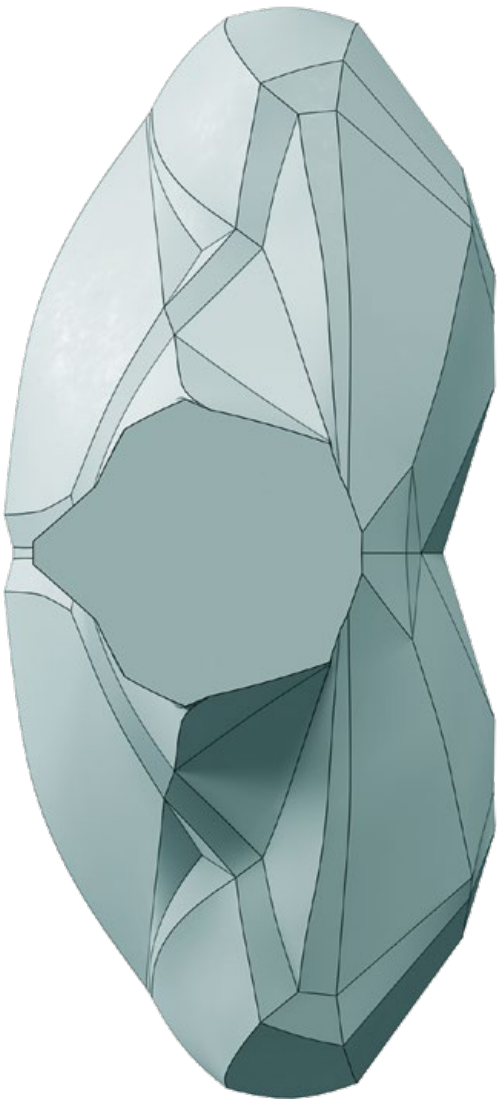
simple block-out



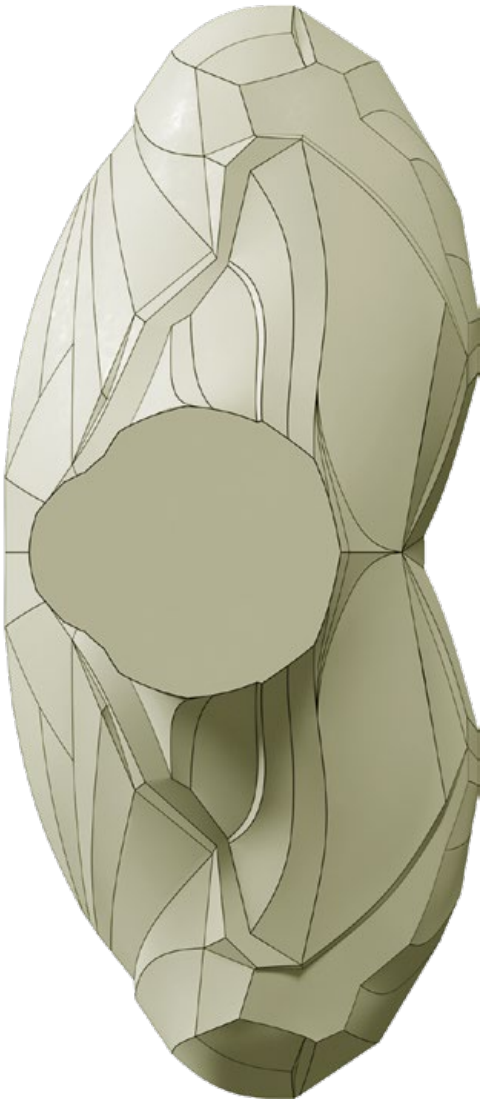
Neutral

MOVEMENTS OF THE NECK

simple block-out

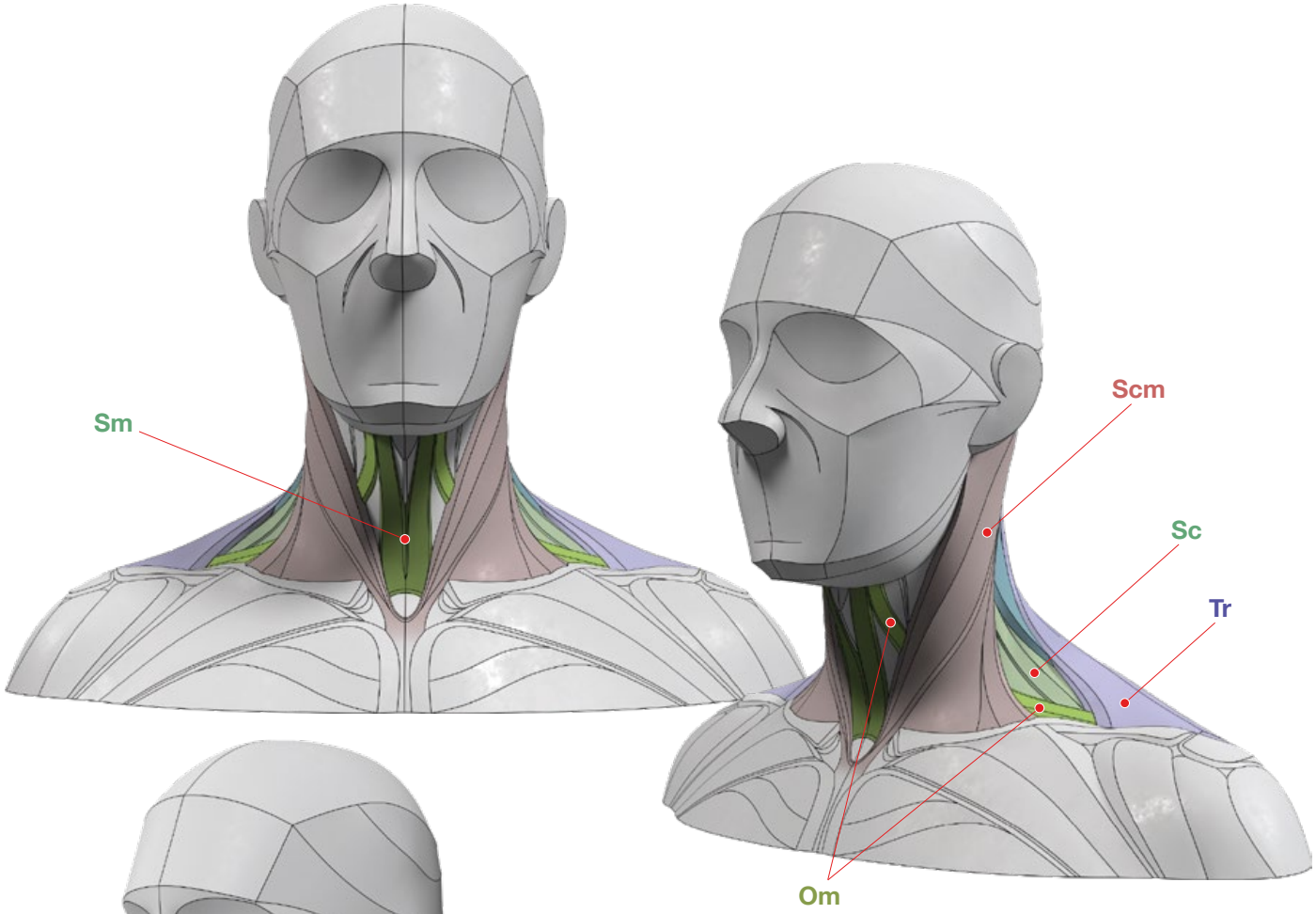


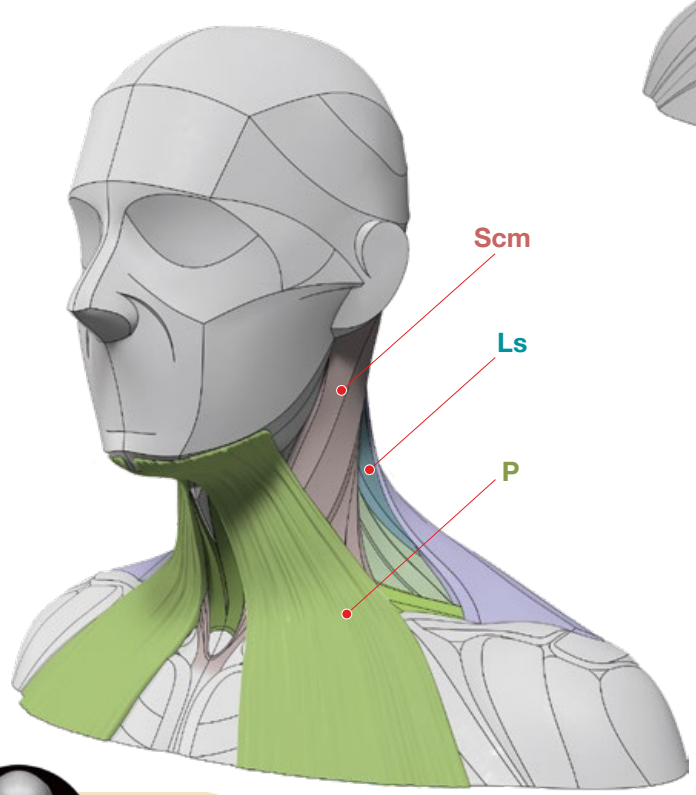
complex block-out



Neutral

ANATOMY OF THE NECK



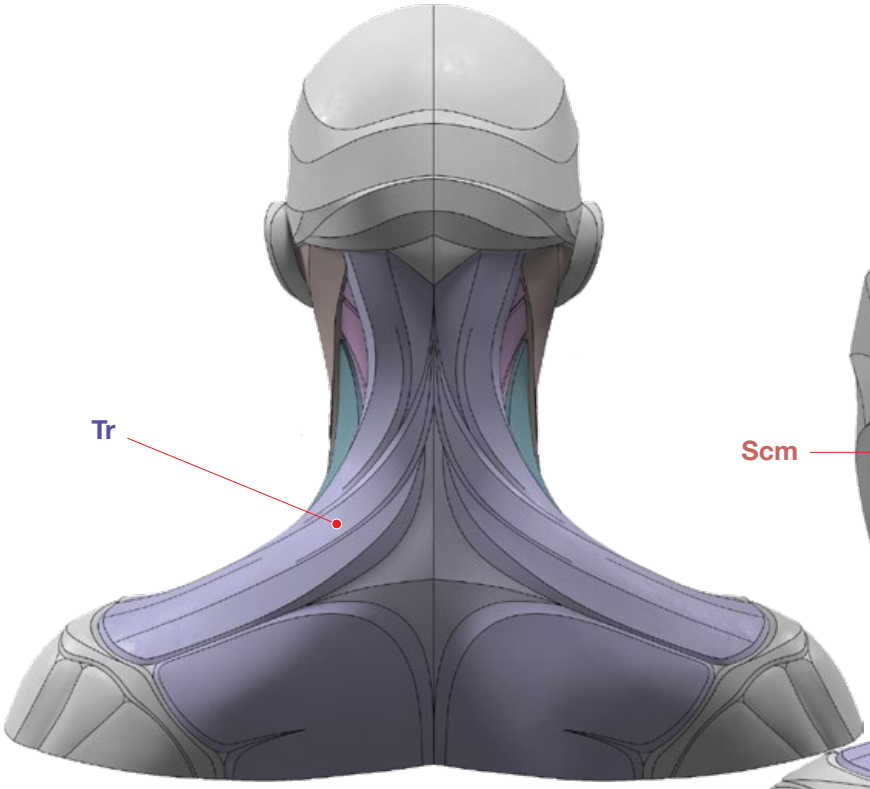


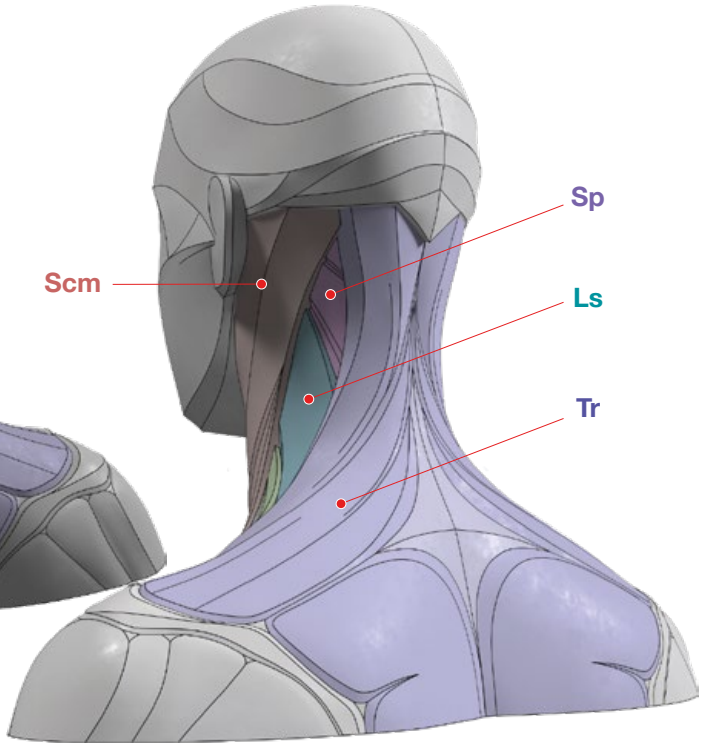
Neutral

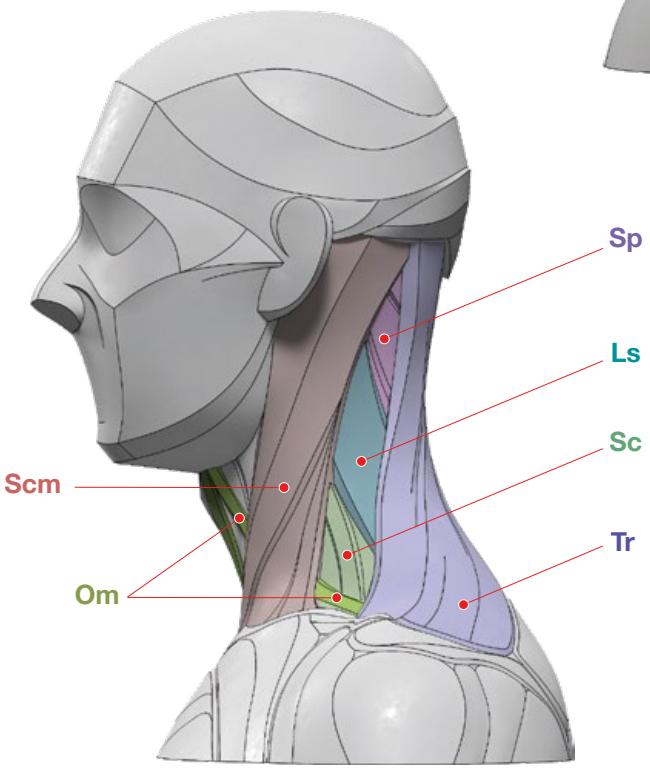
Sm	Strap muscles (infrahyoid muscles)
Scm	Sternocleidomastoid
Tr	Trapezius
Ls	Levator scapulae
Om	Omohyoid
Sc	Scalene muscles
Sp	Splenius capitis
P	Platysma

The Platysma is a broad, thin, superficial sheet-like muscle that runs from the upper thoracic and shoulder regions, up through the neck, and attaches to the lower border of the body of the mandible and skin around the lip angles.

ANATOMY OF THE NECK

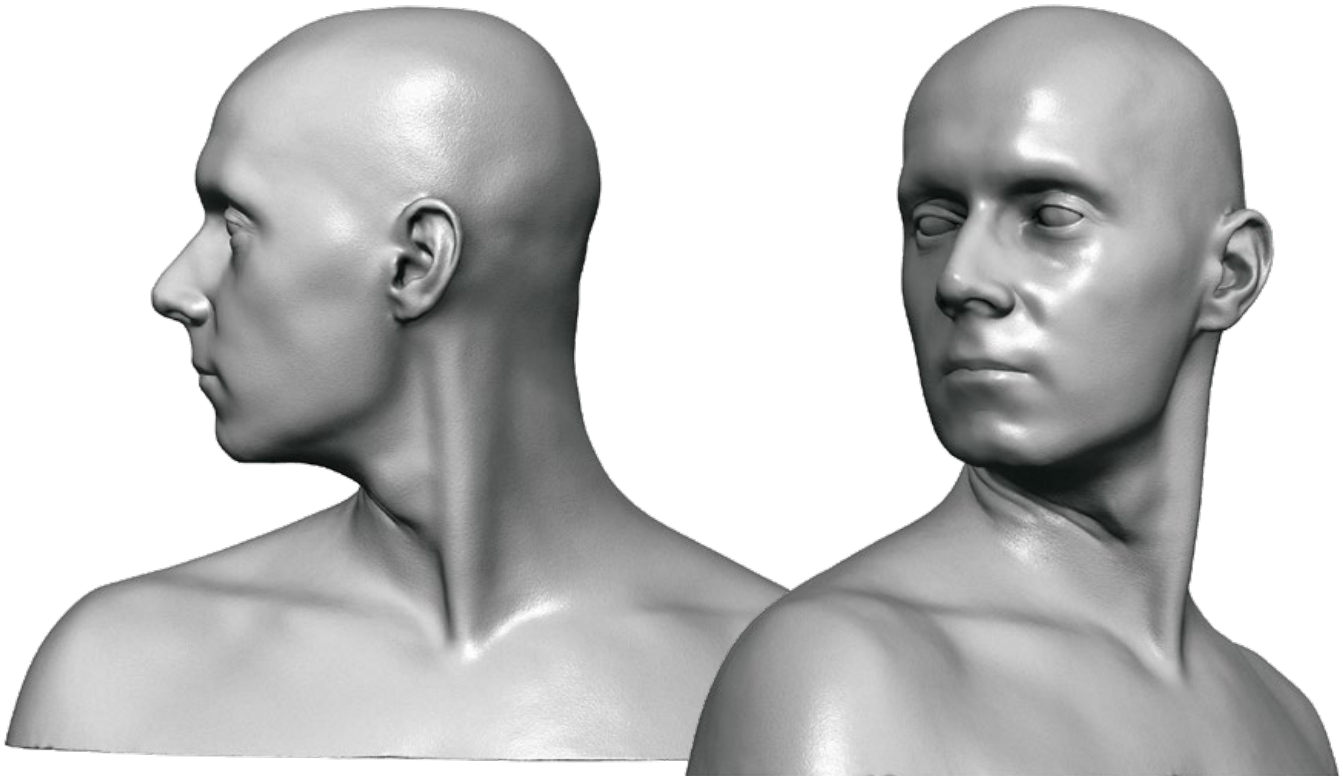


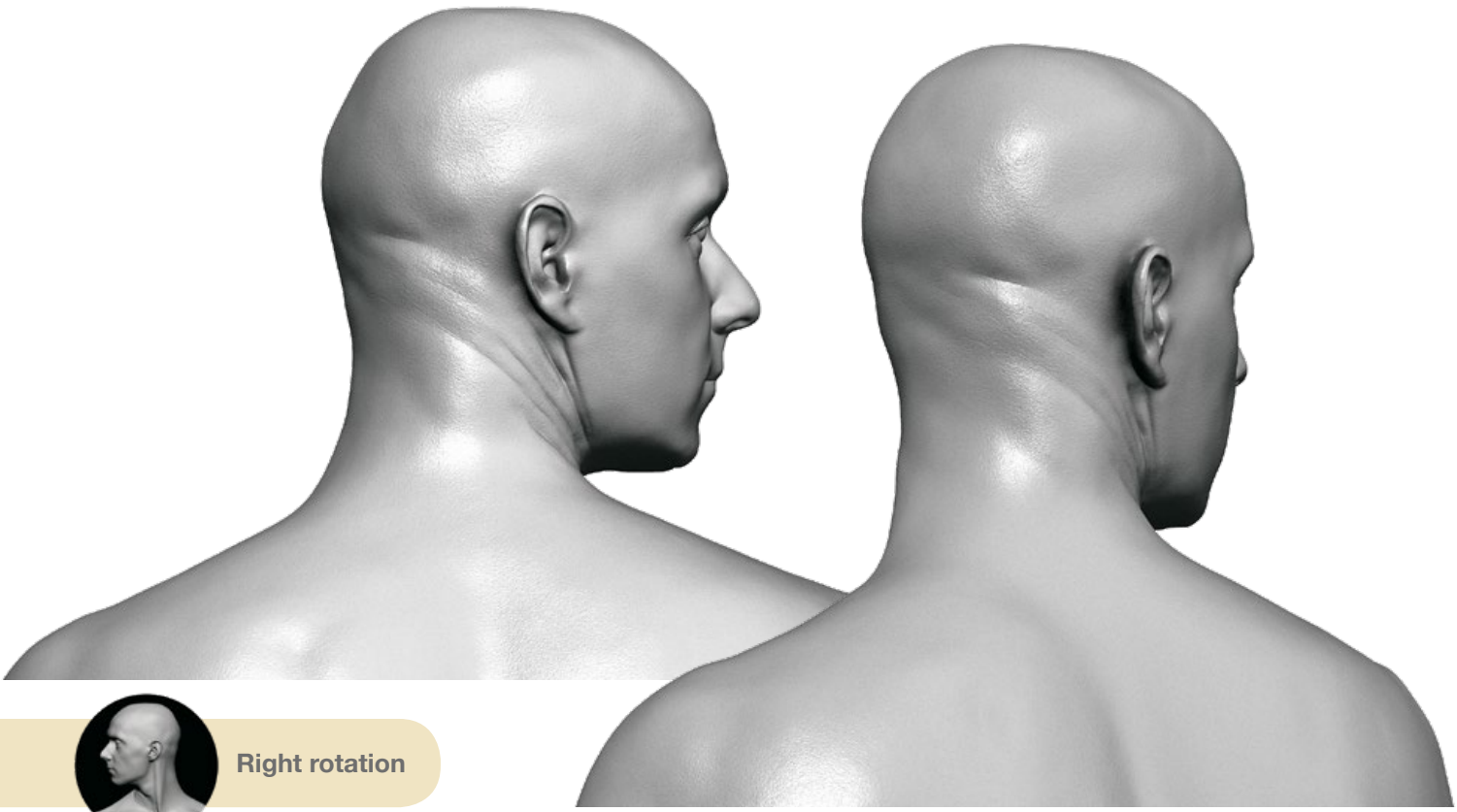




Scm	Sternocleidomastoid
Tr	Trapezius
Ls	Levator scapulae
Om	Omohyoid
Sc	Scalene muscles
Sp	Splenius capitis
P	Platysma

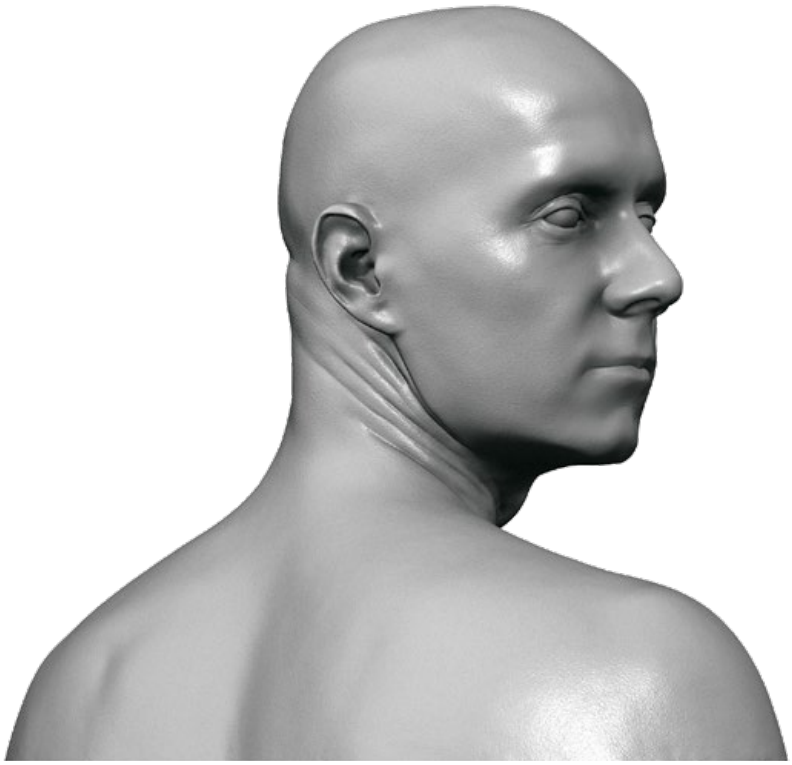
MOVEMENTS OF THE NECK

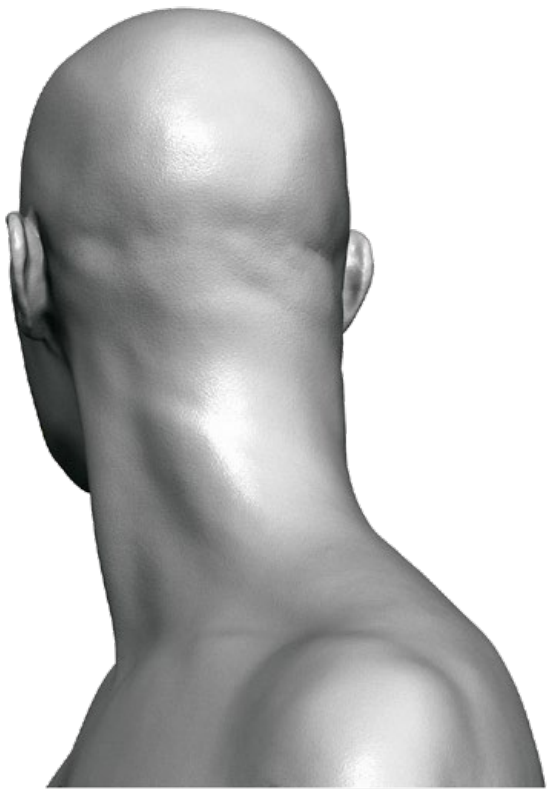


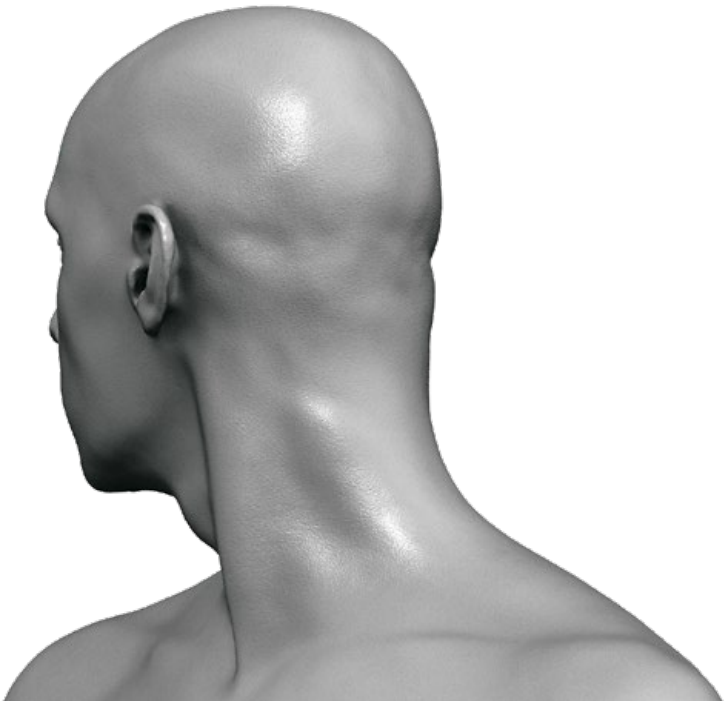


Right rotation

MOVEMENTS OF THE NECK

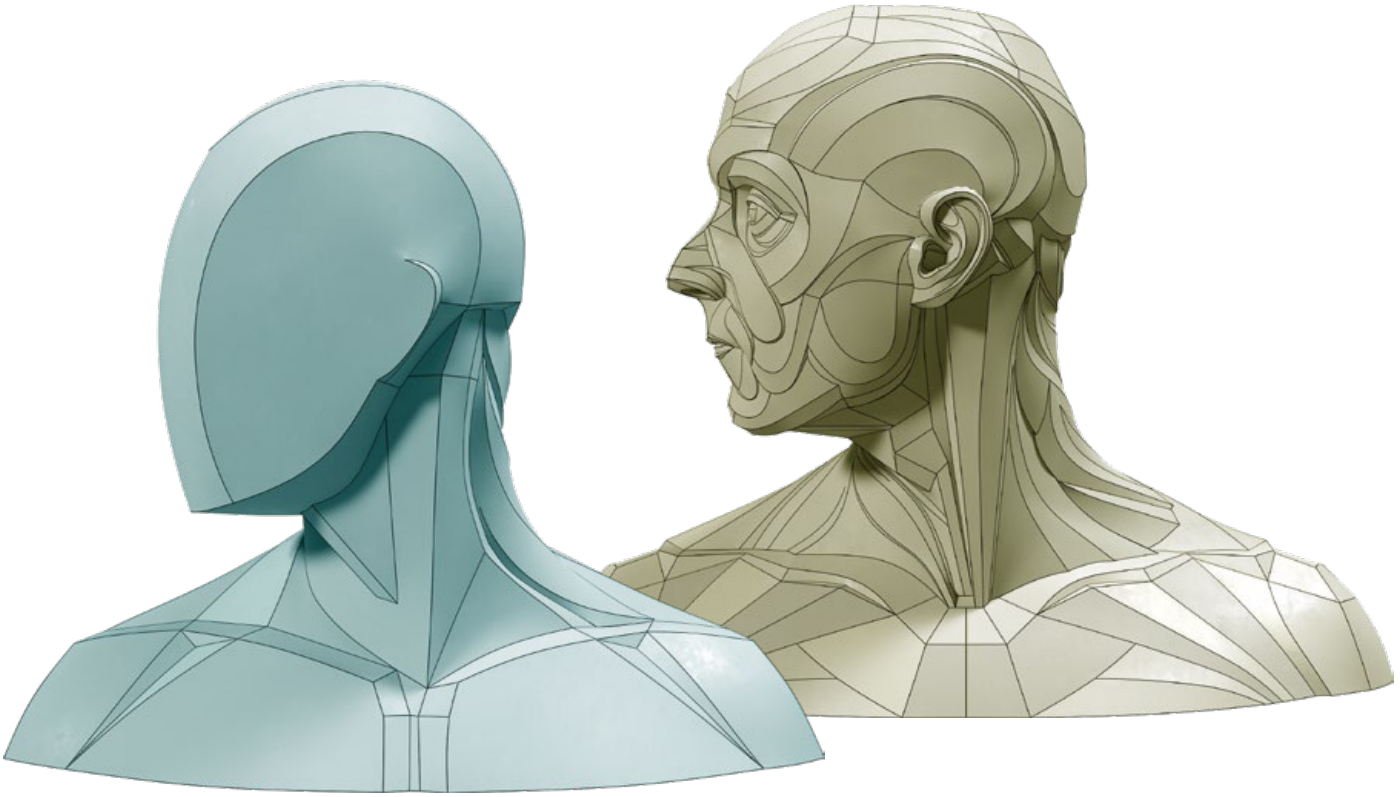






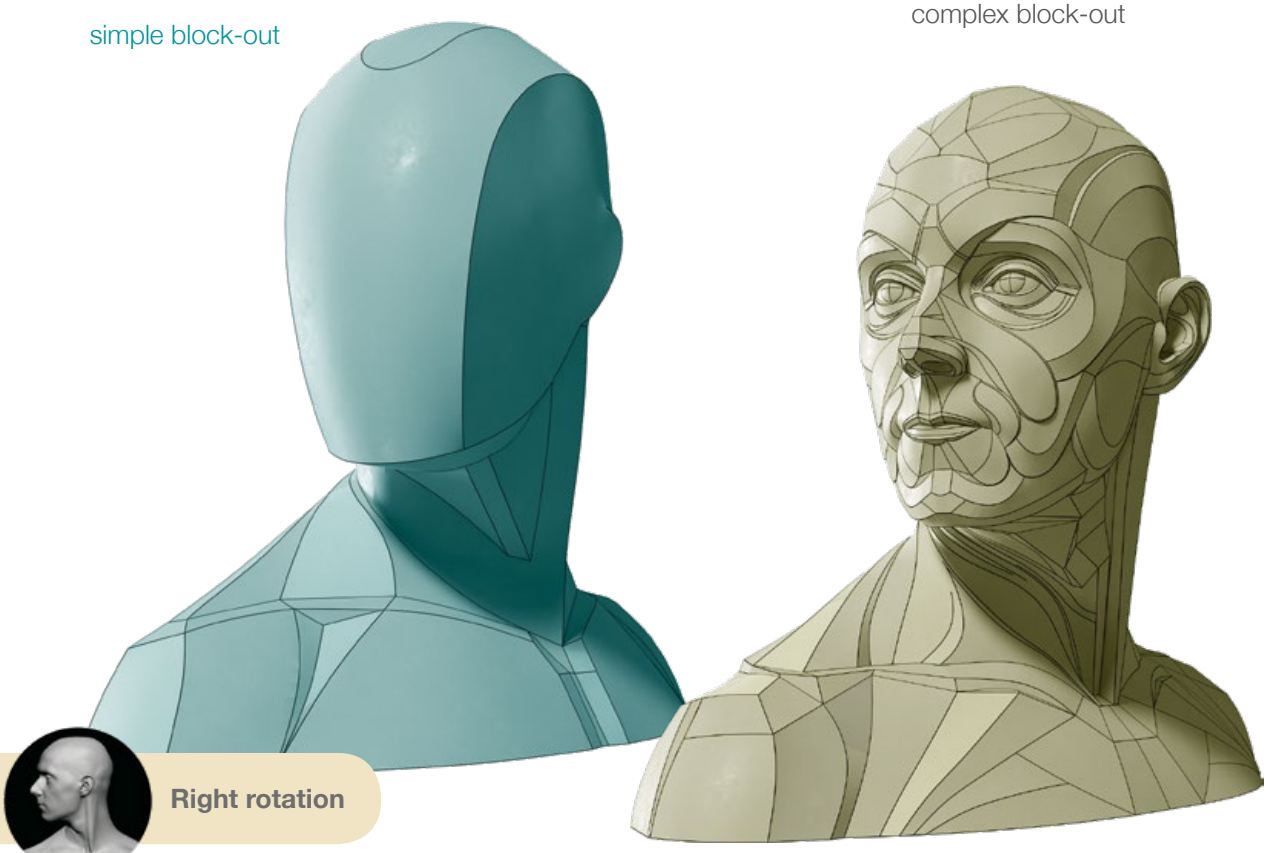
Right rotation 

MOVEMENTS OF THE NECK



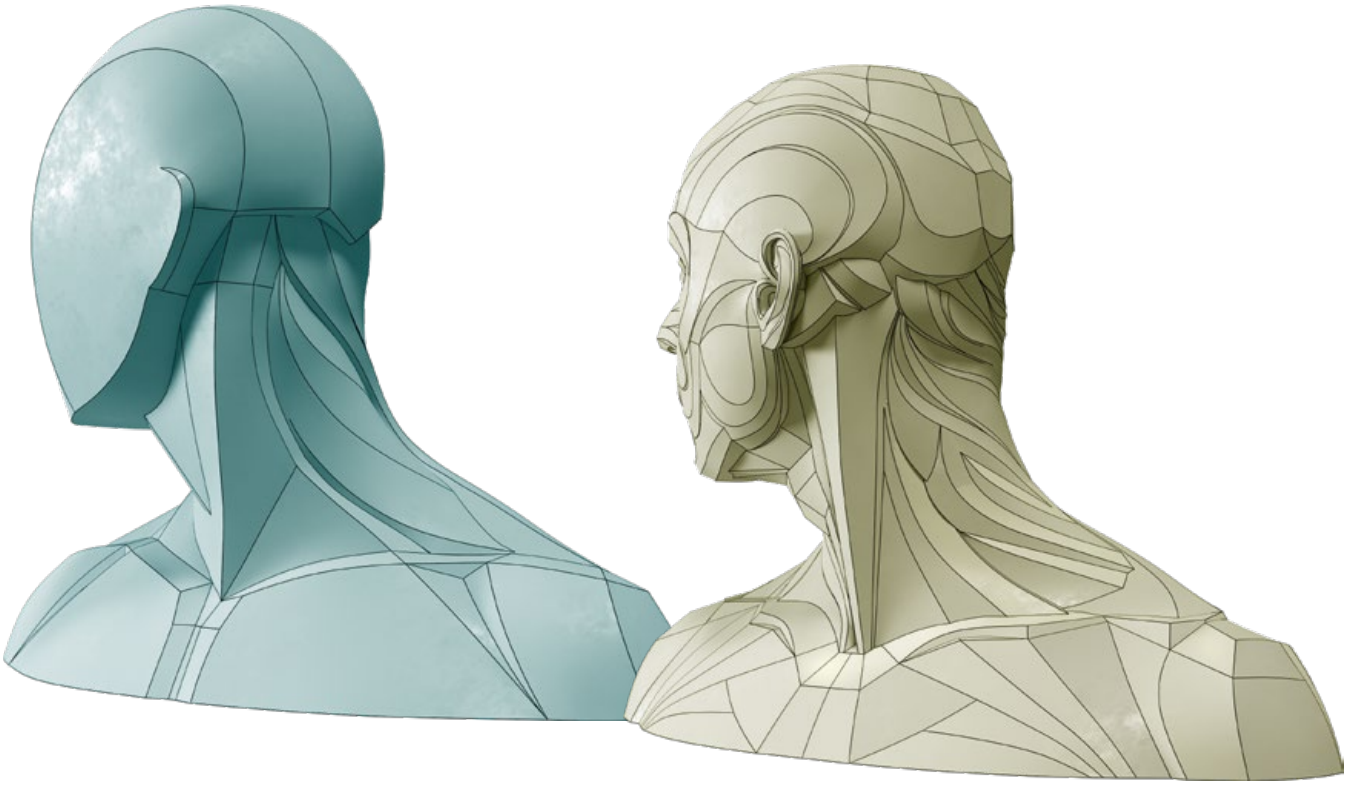
simple block-out

complex block-out



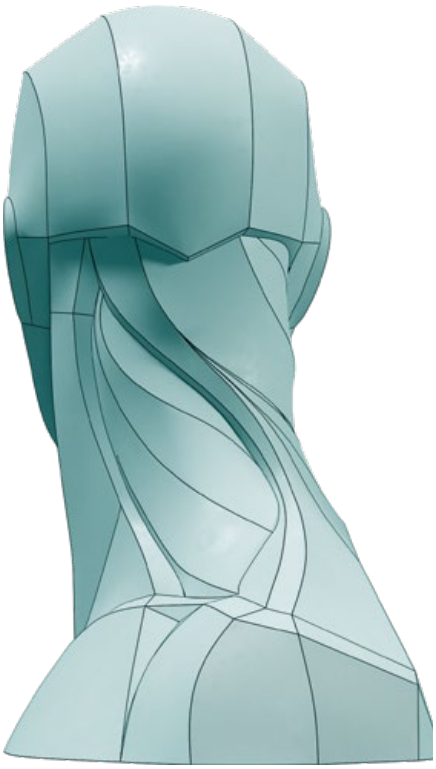
Right rotation

MOVEMENTS OF THE NECK



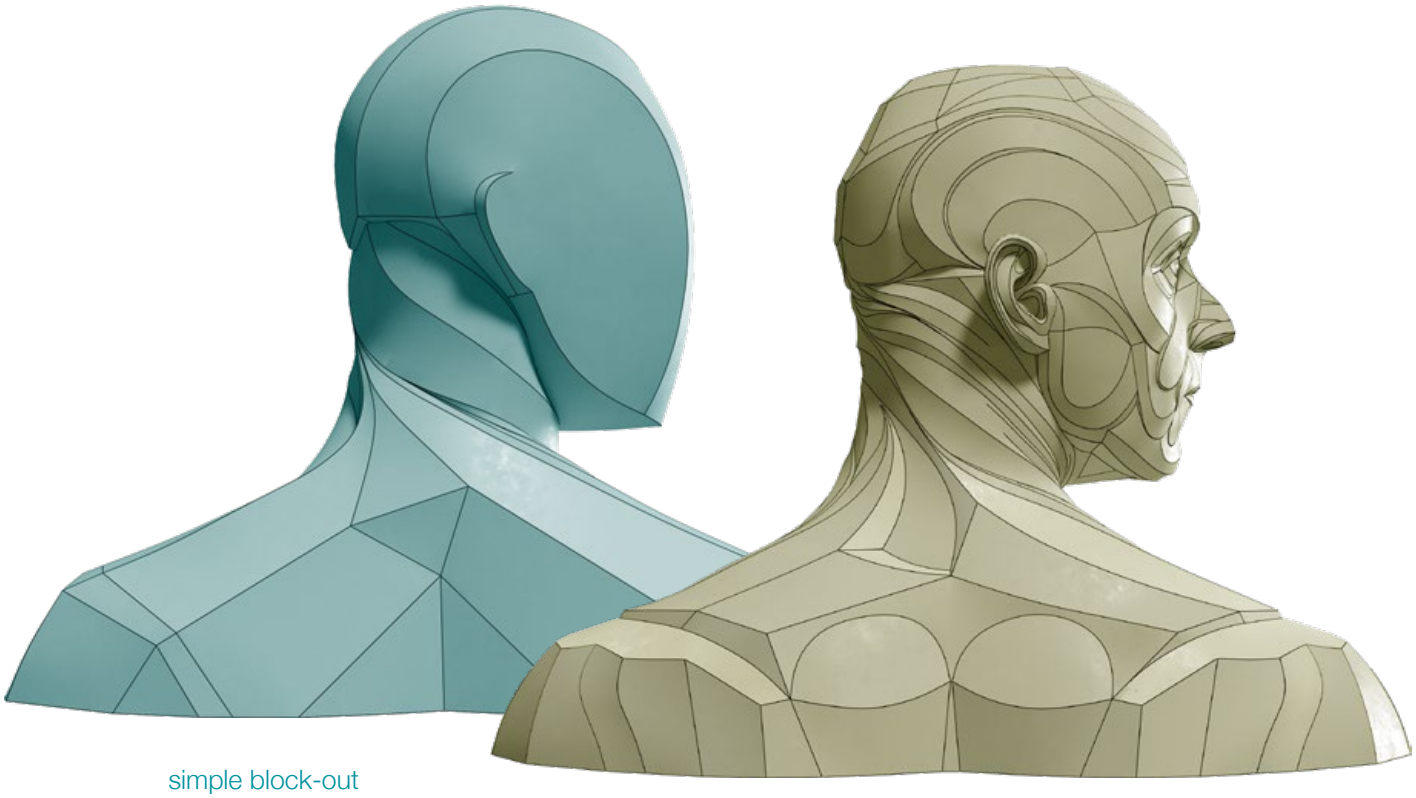
simple block-out

complex block-out



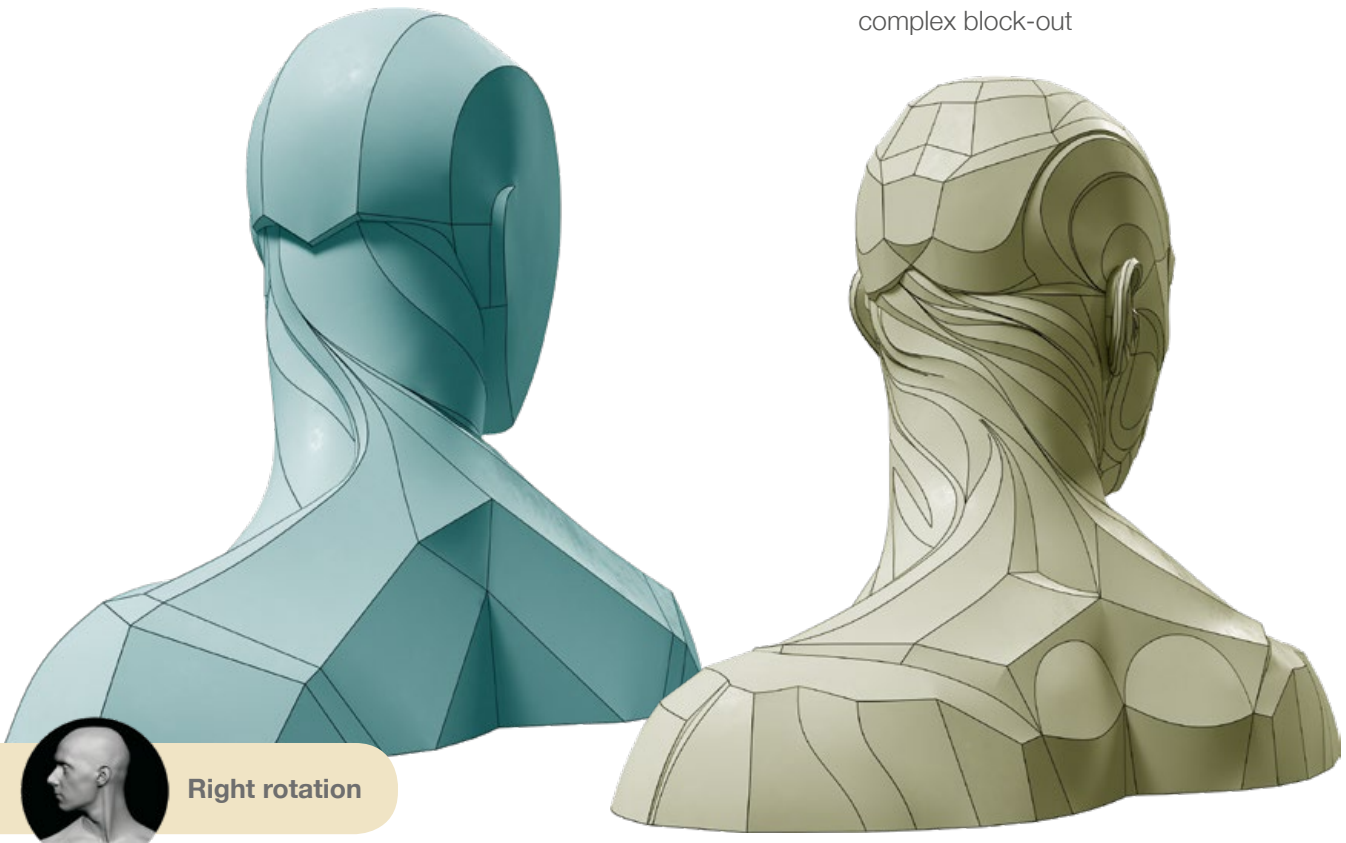
Right rotation

MOVEMENTS OF THE NECK



simple block-out

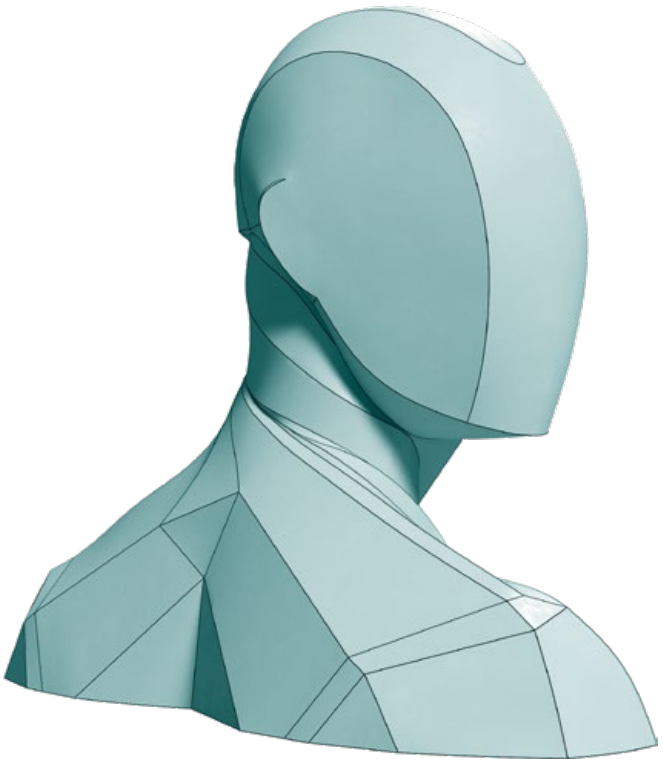
complex block-out



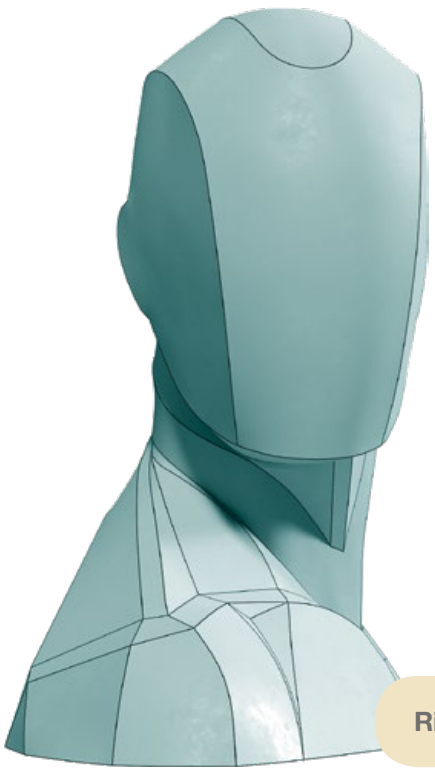
Right rotation

MOVEMENTS OF THE NECK

complex block-out



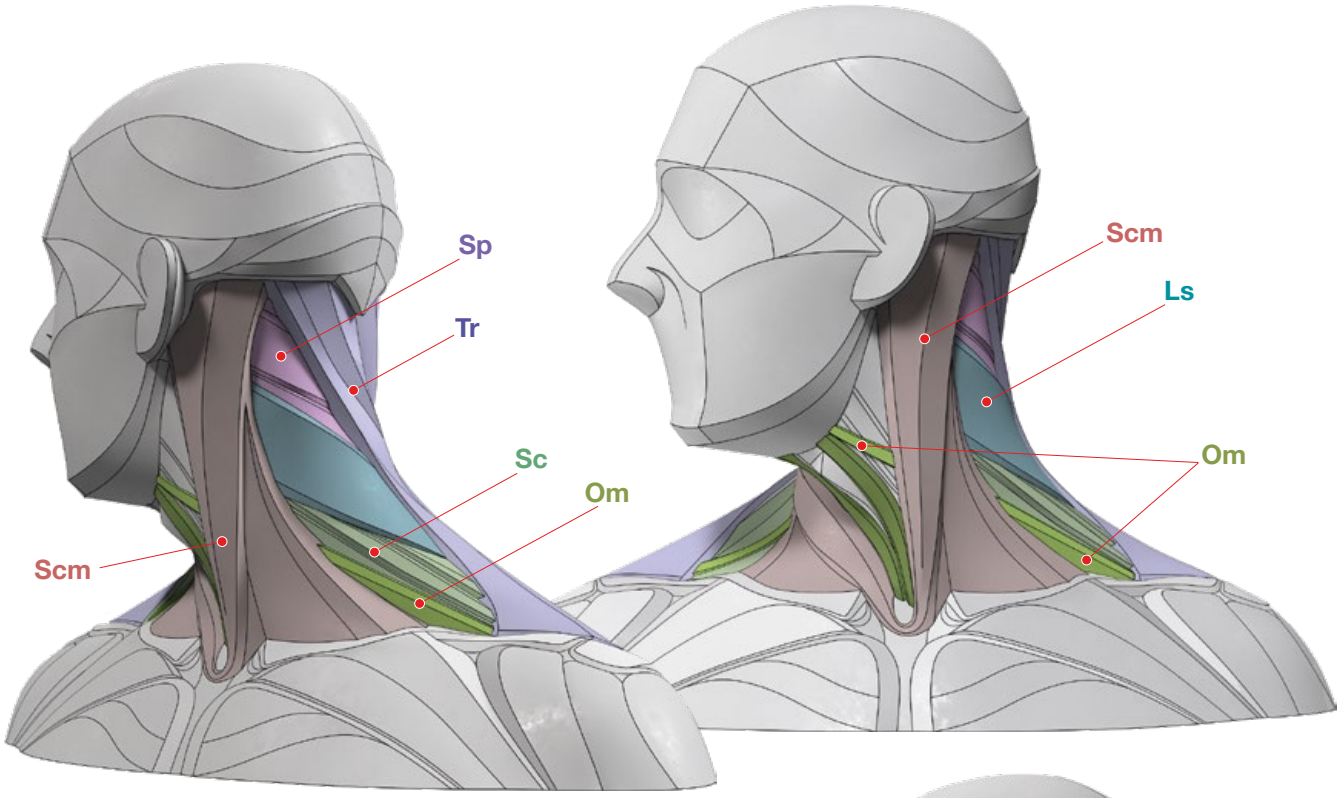
simple block-out

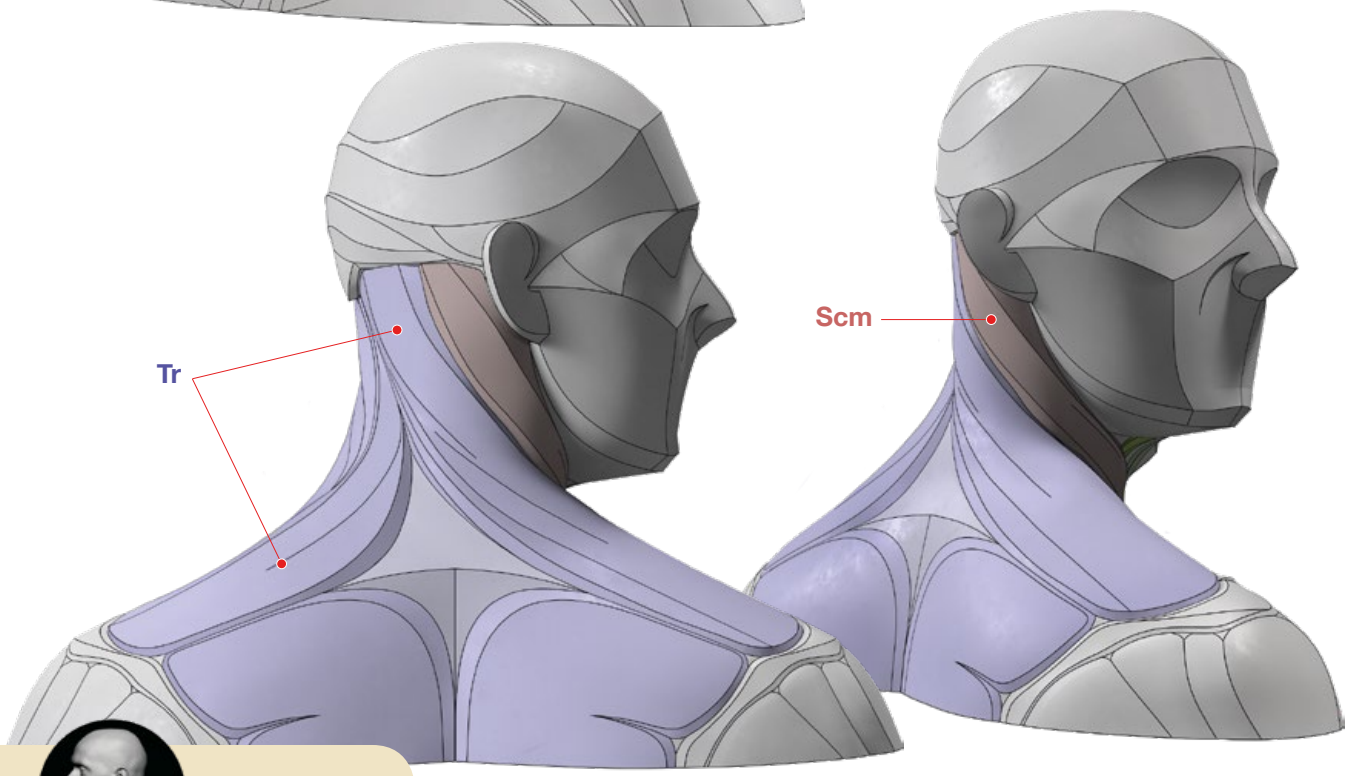


Right rotation

MOVEMENTS OF THE NECK

Anatomy

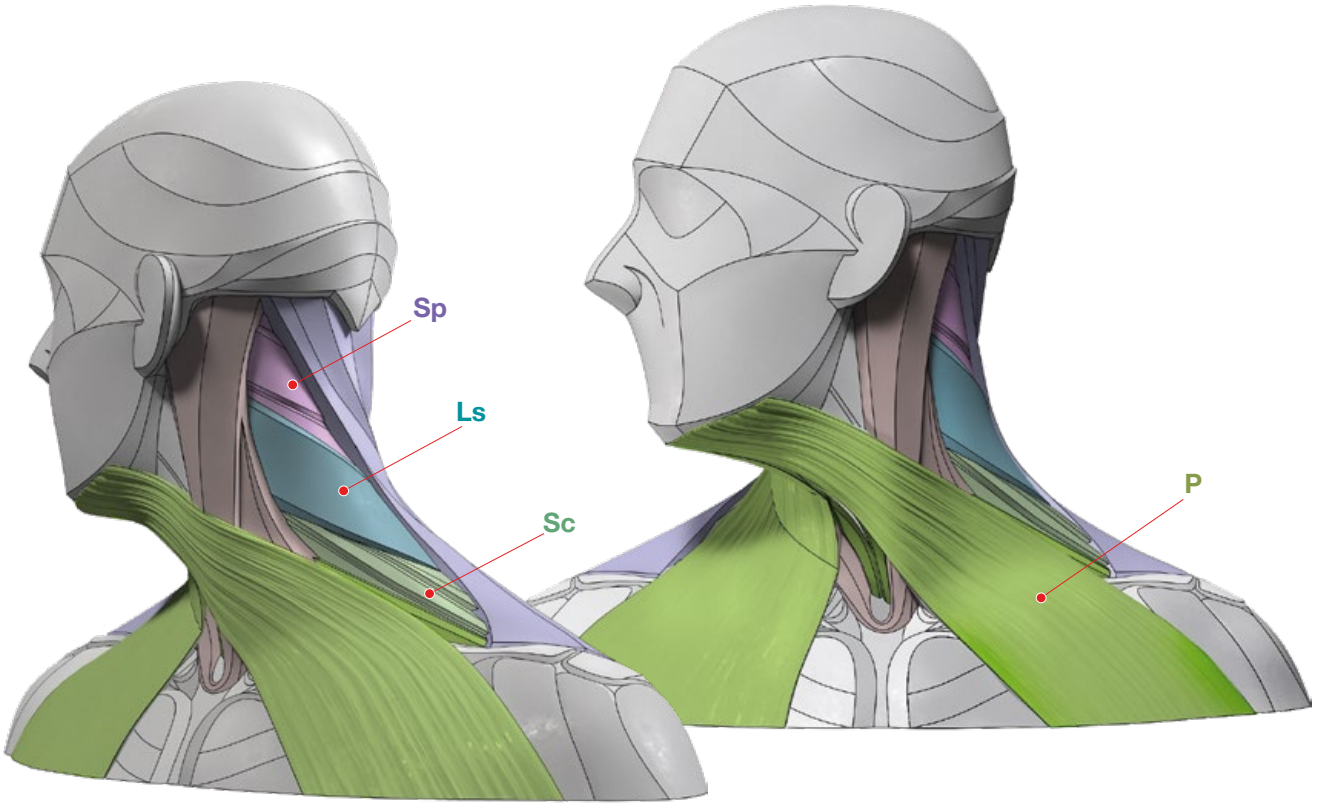




Right rotation

MOVEMENTS OF THE NECK

Anatomy



Scm	Sternocleidomastoid
Tr	Trapezius
Ls	Levator scapulae
Om	Omohyoid
Sc	Scalene muscles
Sp	Splenius capitis
P	Platysma

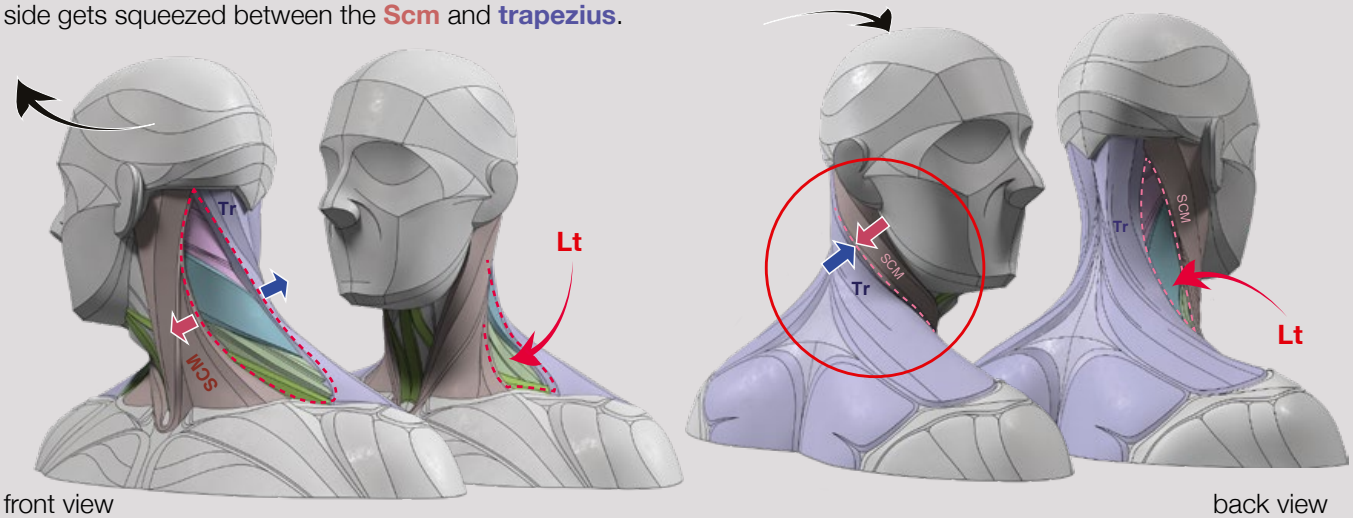
The Platysma is a broad, thin, superficial sheet-like muscle that runs from the upper thoracic and shoulder regions, up through the neck, and attaches to the lower border of the body of the mandible and skin around the lip angles.

Right rotation

MOVEMENTS OF THE NECK

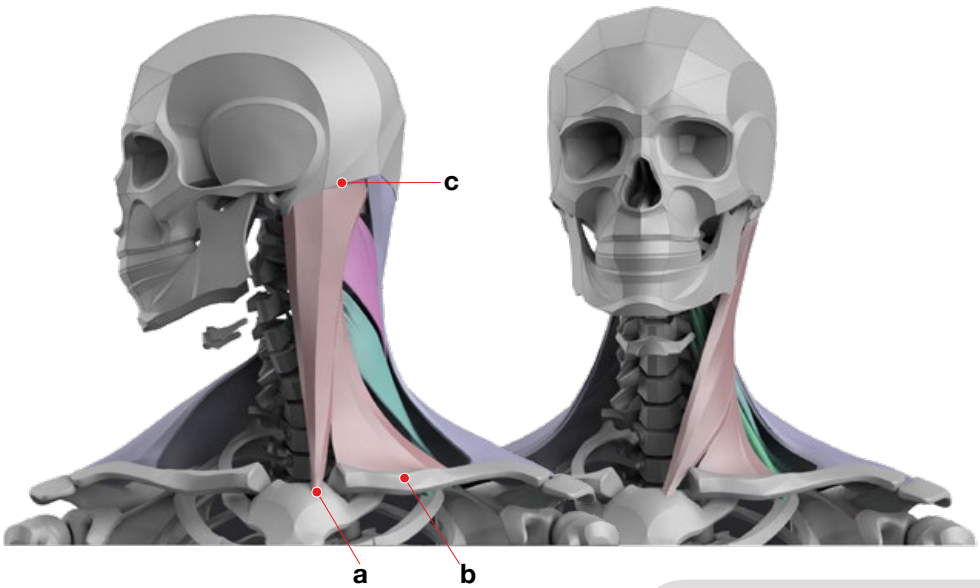
Anatomy

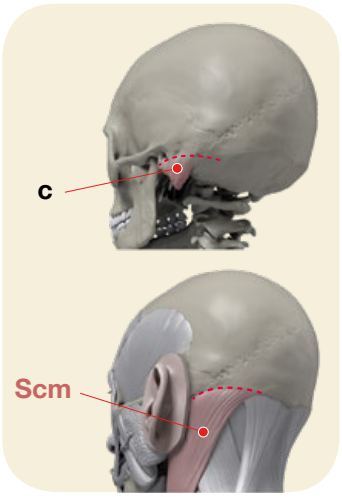
If the head is rotated, the **lateral triangle** (**Lt**) of the neck on the turning side gets squeezed between the **Scm** and **trapezius**.



front view

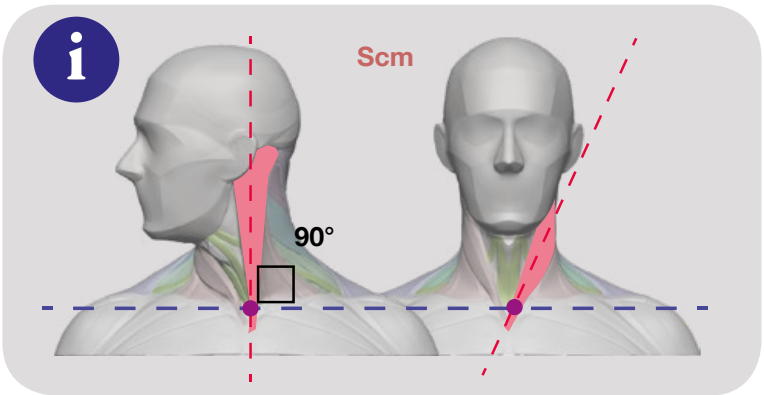
back view





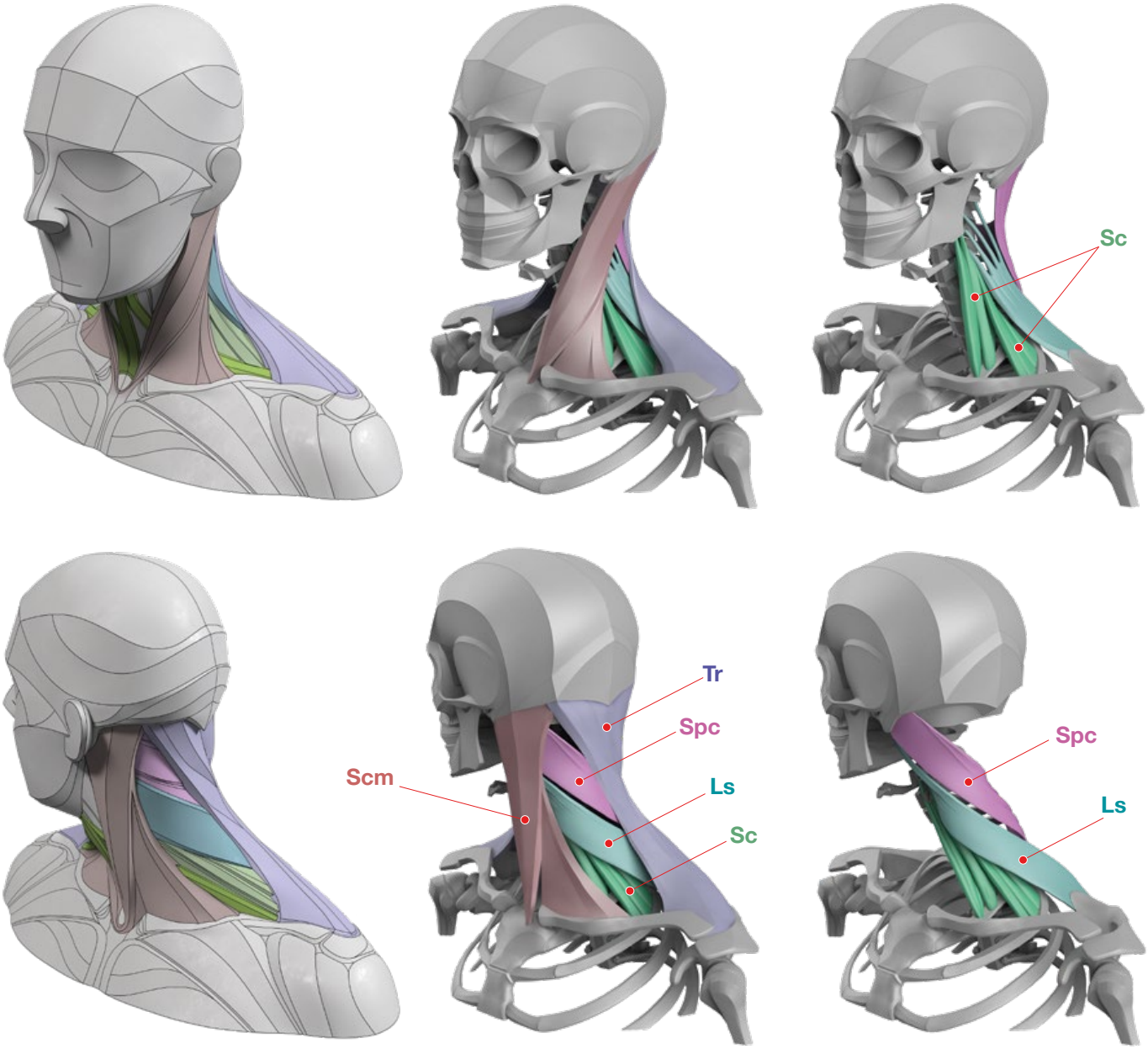
The **Scm** muscle originates from two locations: the **manubrium of the sternum** (**a**) and the sternal end of the **clavicle** (**b**). It travels obliquely across the side of the neck and inserts at the **mastoid process of the temporal bone of the skull** (**c**).

Right rotation



MOVEMENTS OF THE NECK

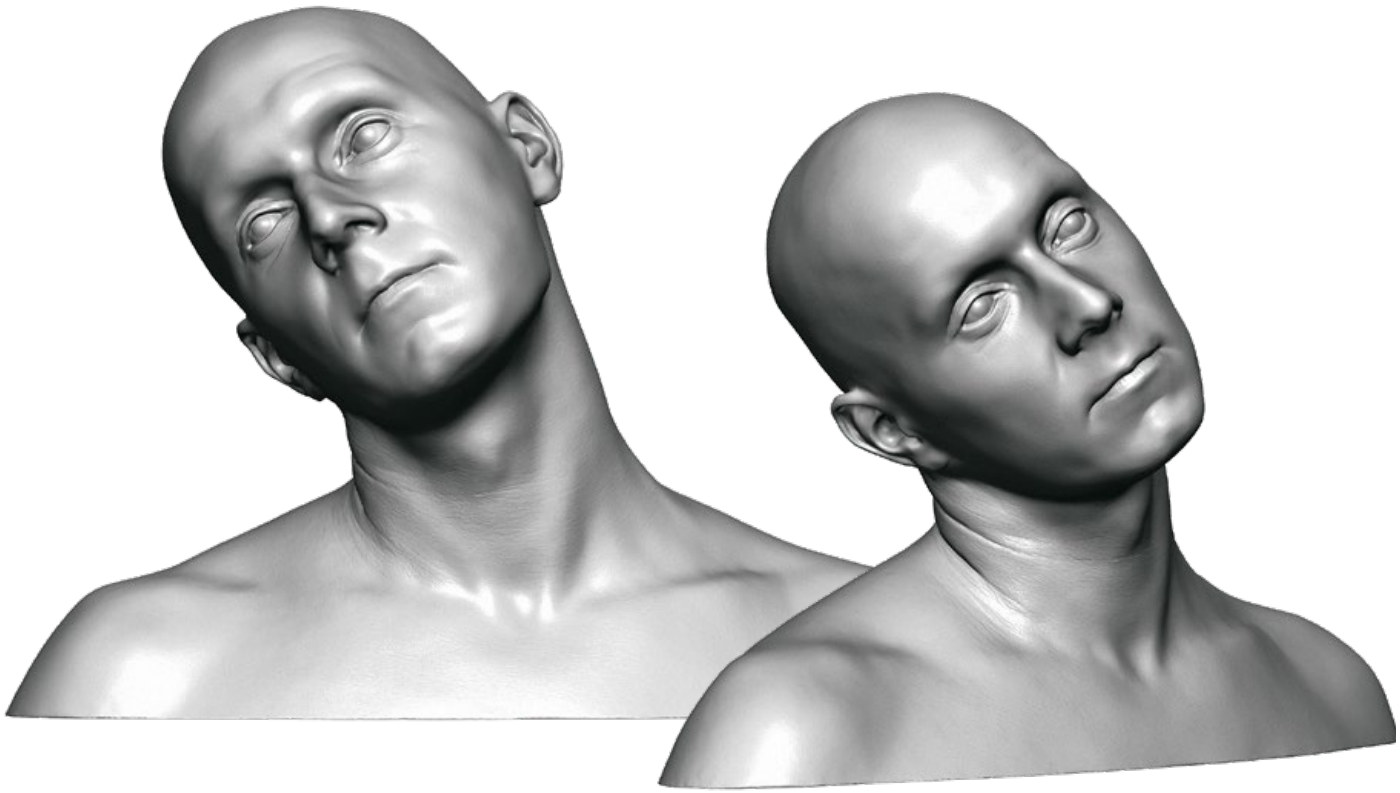
Anatomy

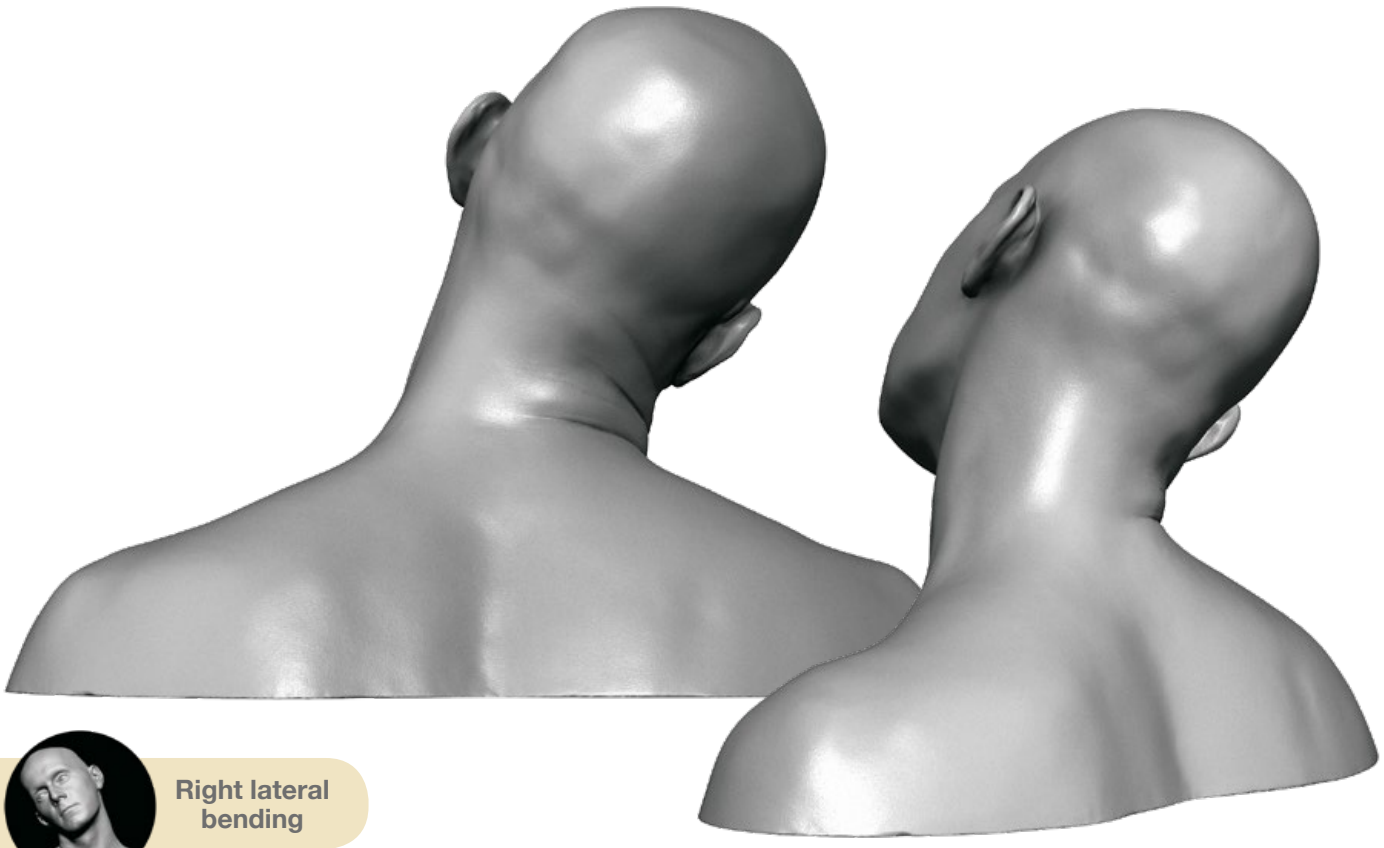


Scm	Sternocleidomastoid
Spc	Splenius capitis
Ls	Levator scapulae
Tr	Trapezius
Sc	Scalene muscles

Right rotation

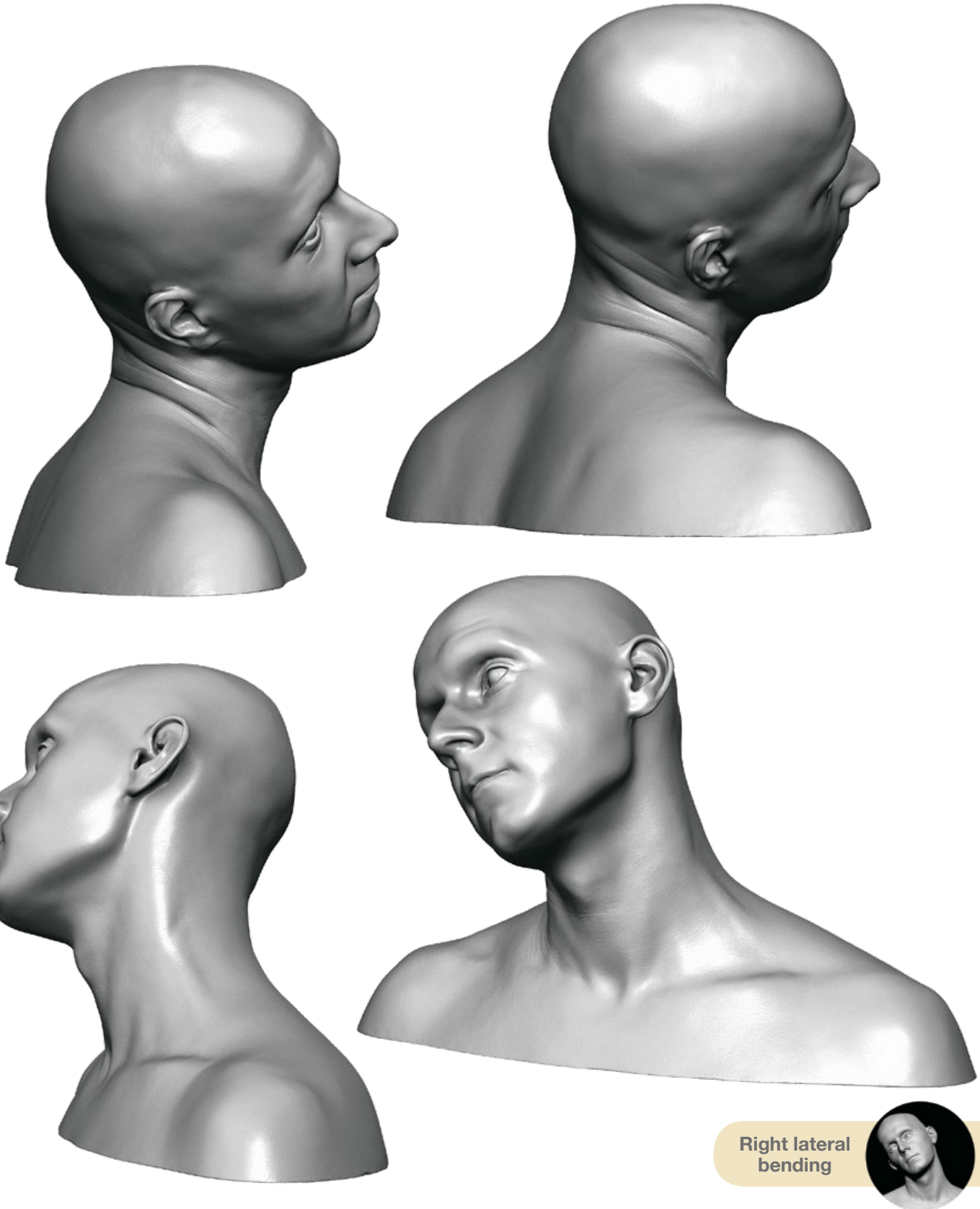
MOVEMENTS OF THE NECK





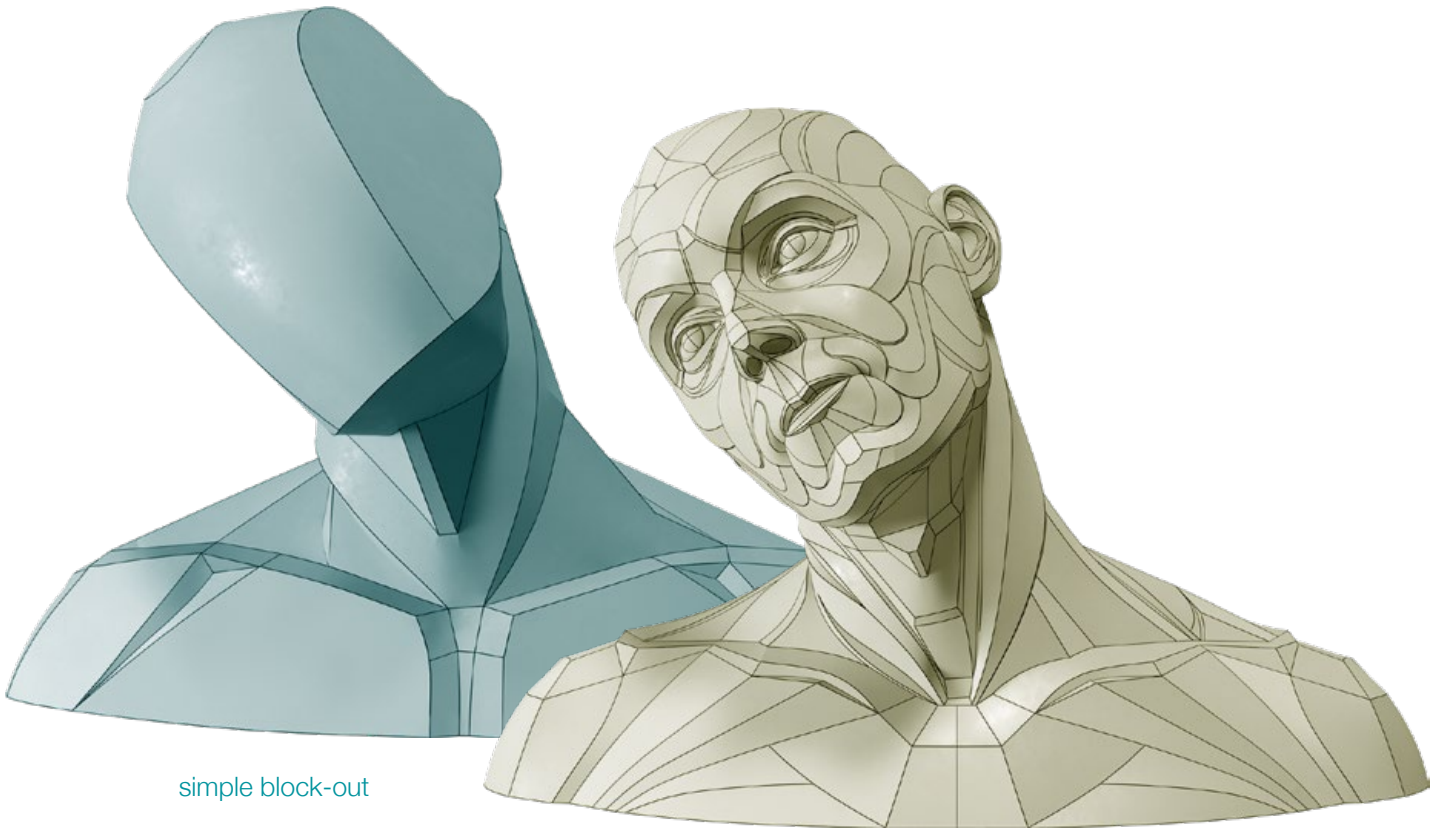
Right lateral bending

MOVEMENTS OF THE NECK



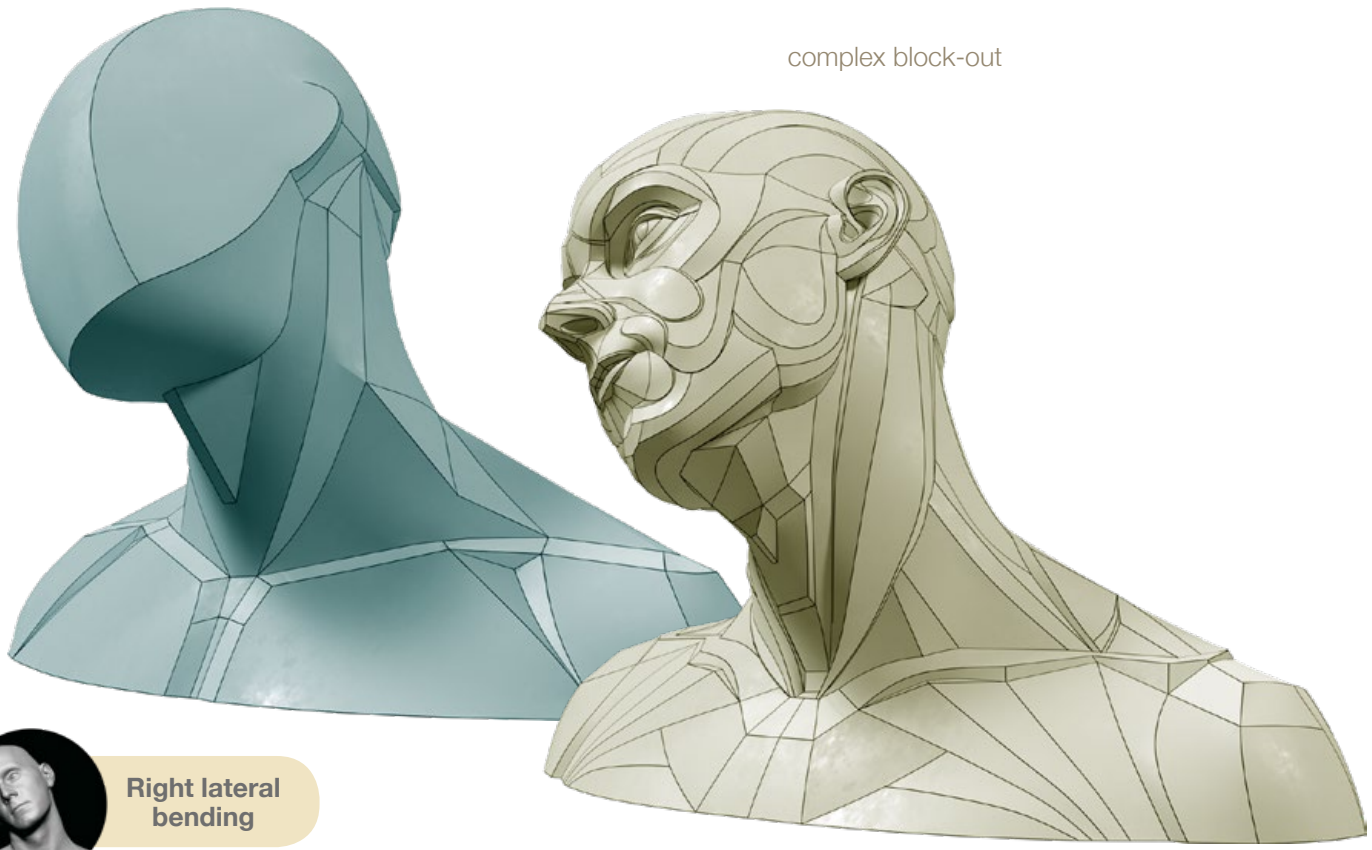
Right lateral bending

MOVEMENTS OF THE NECK



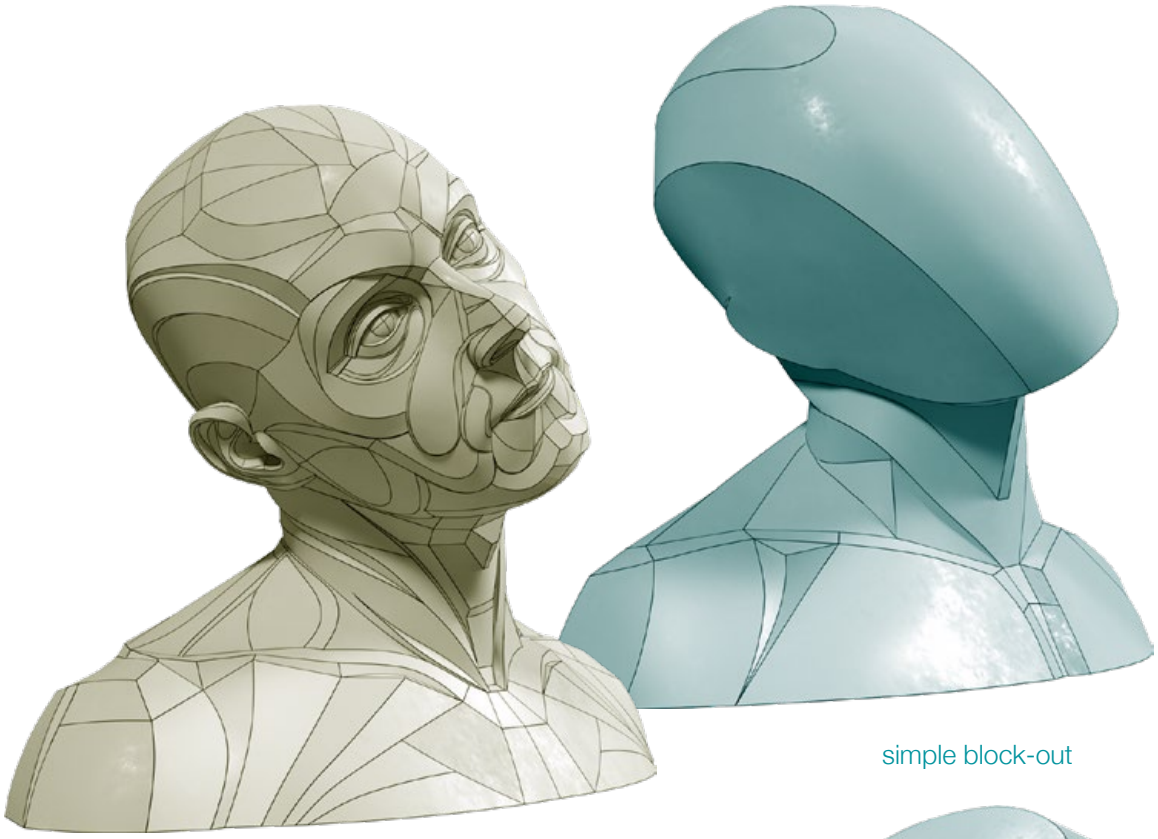
simple block-out

complex block-out



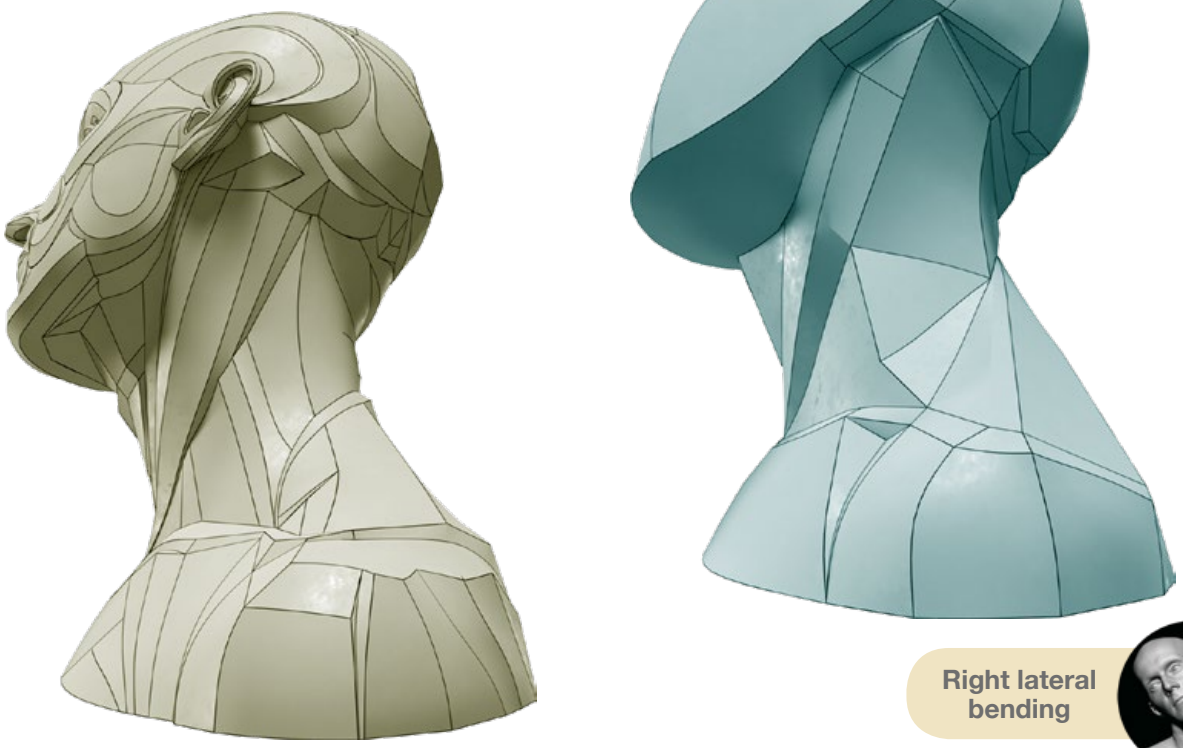
Right lateral bending

MOVEMENTS OF THE NECK



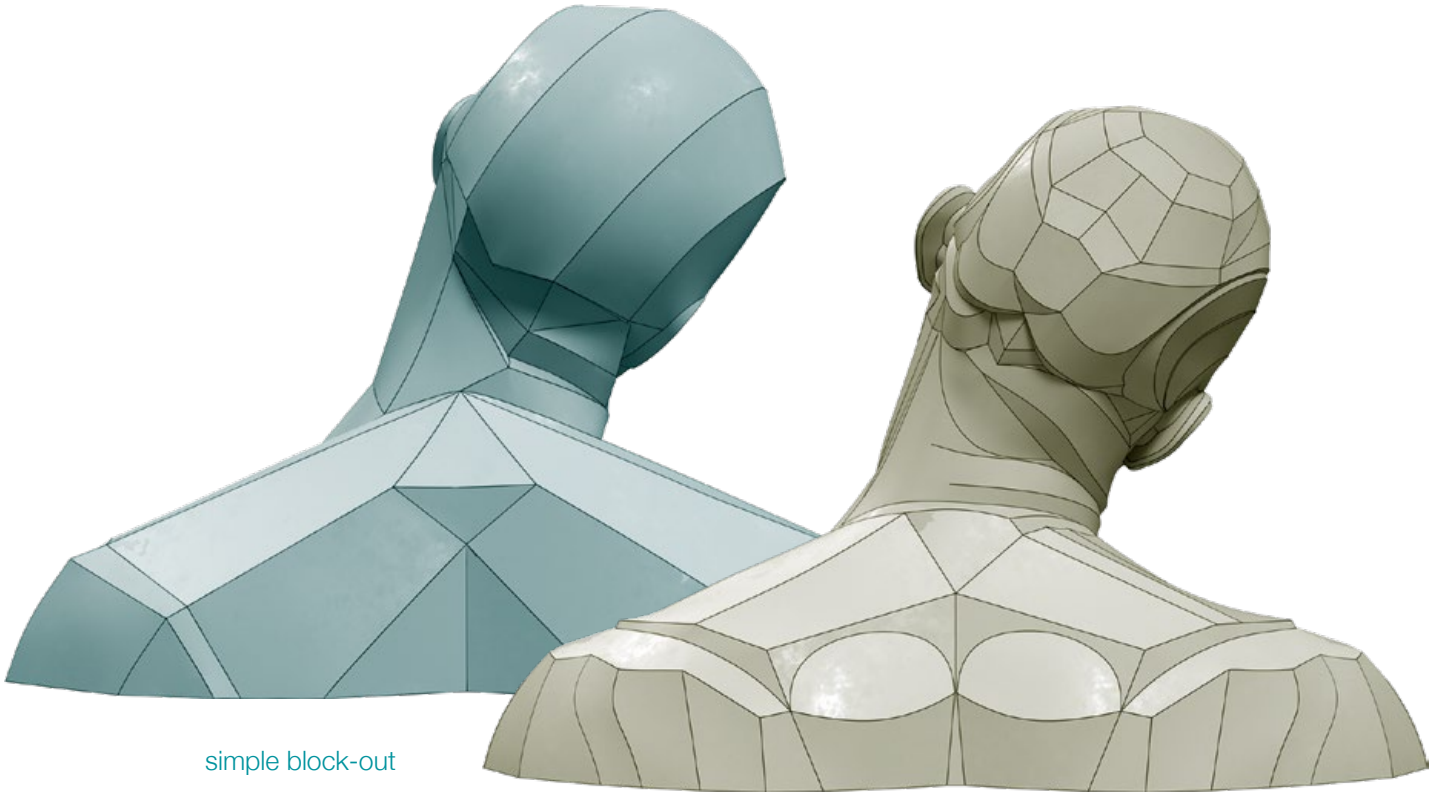
complex block-out

simple block-out



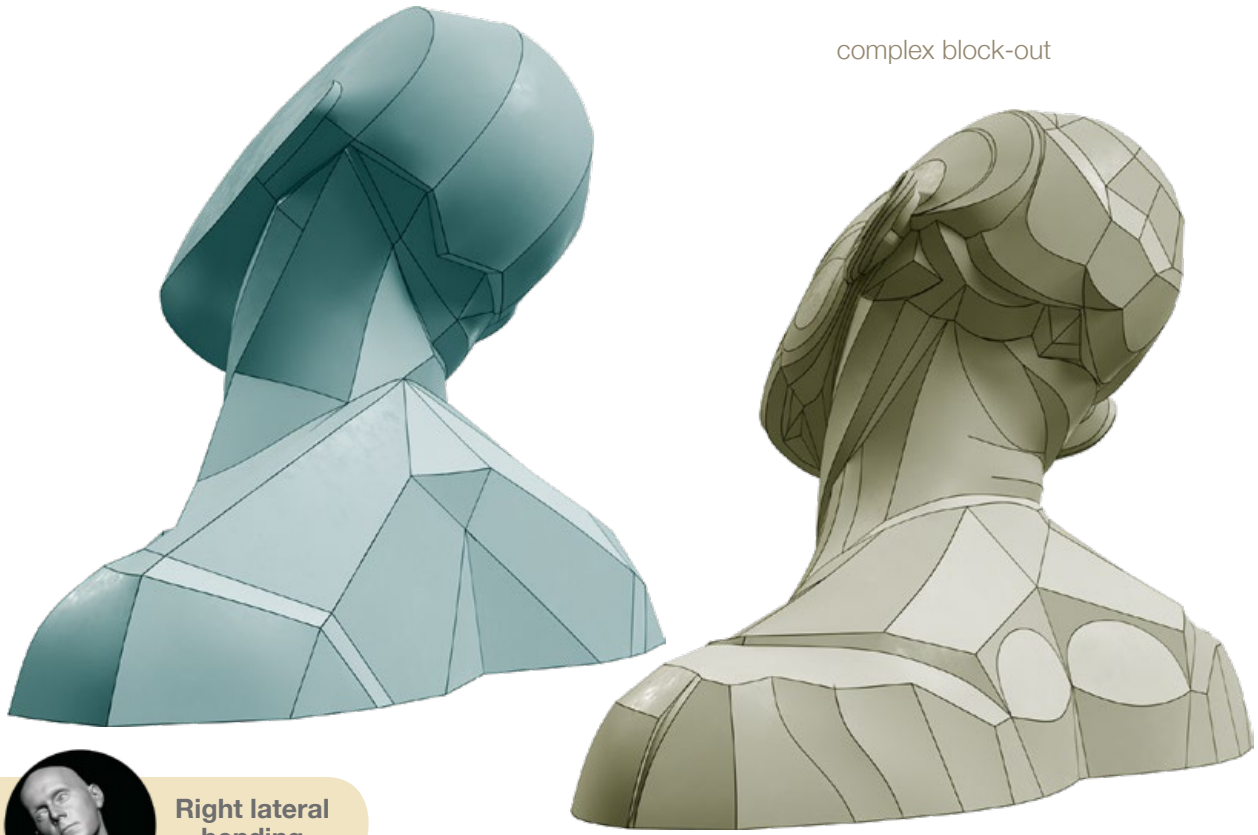
Right lateral bending

MOVEMENTS OF THE NECK



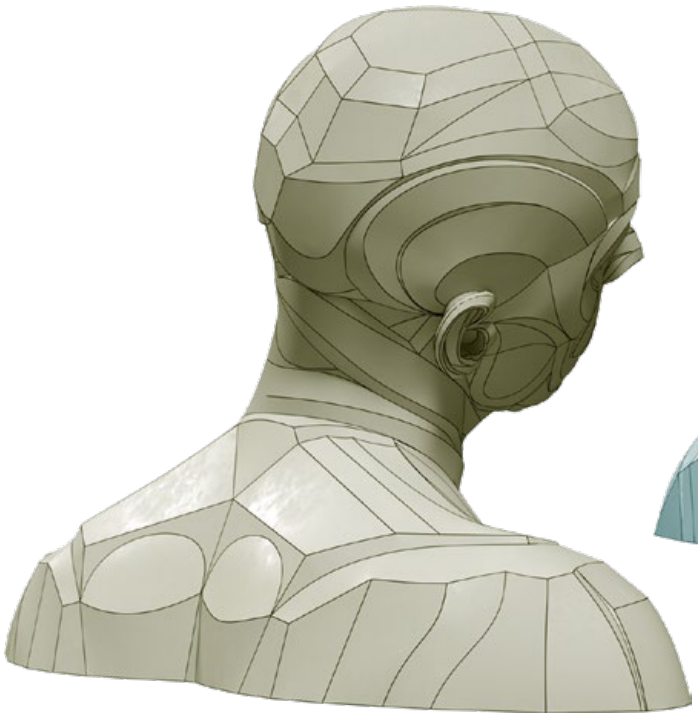
simple block-out

complex block-out

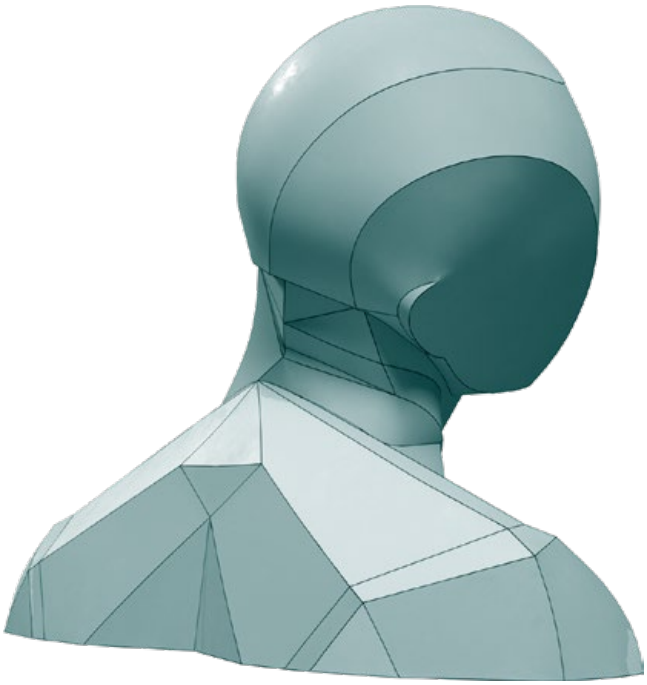


Right lateral bending

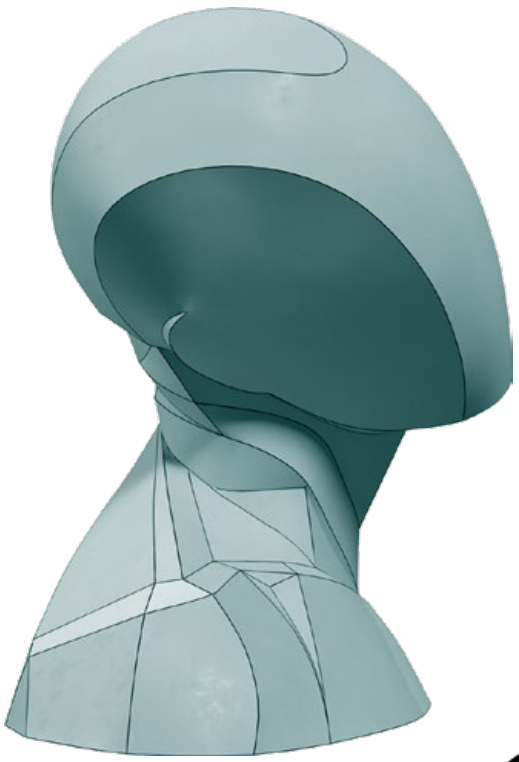
MOVEMENTS OF THE NECK



complex block-out



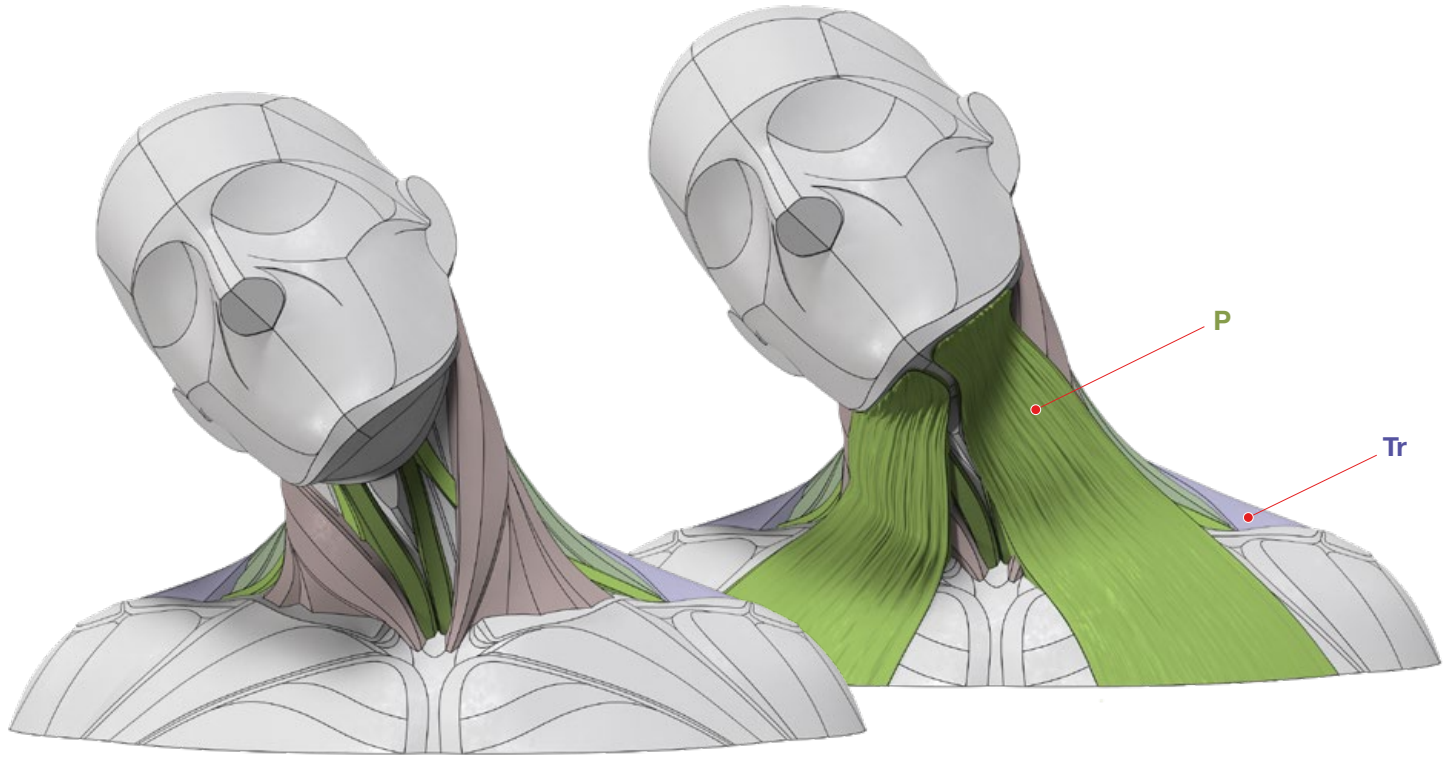
simple block-out

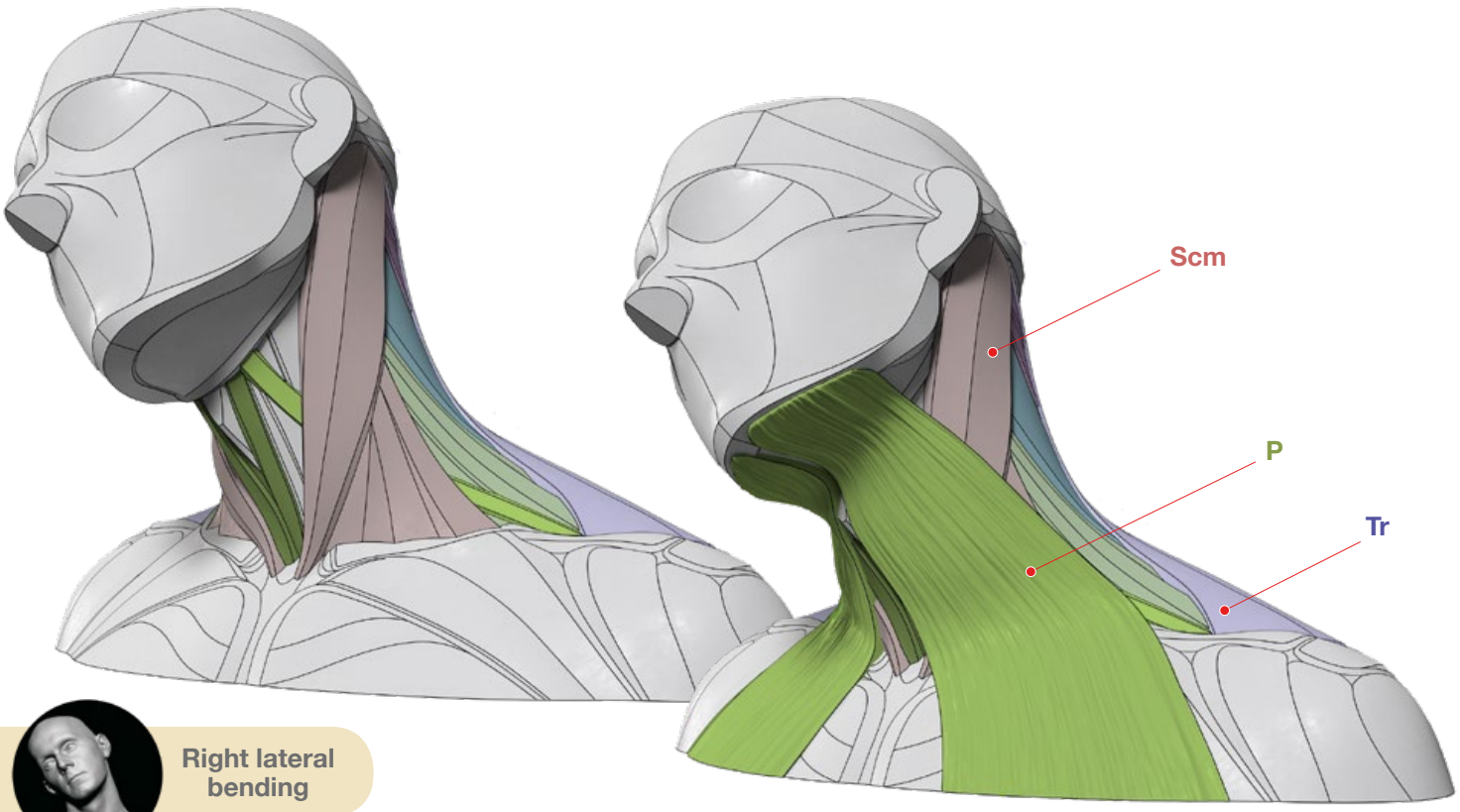


Right lateral bending

MOVEMENTS OF THE NECK

Anatomy

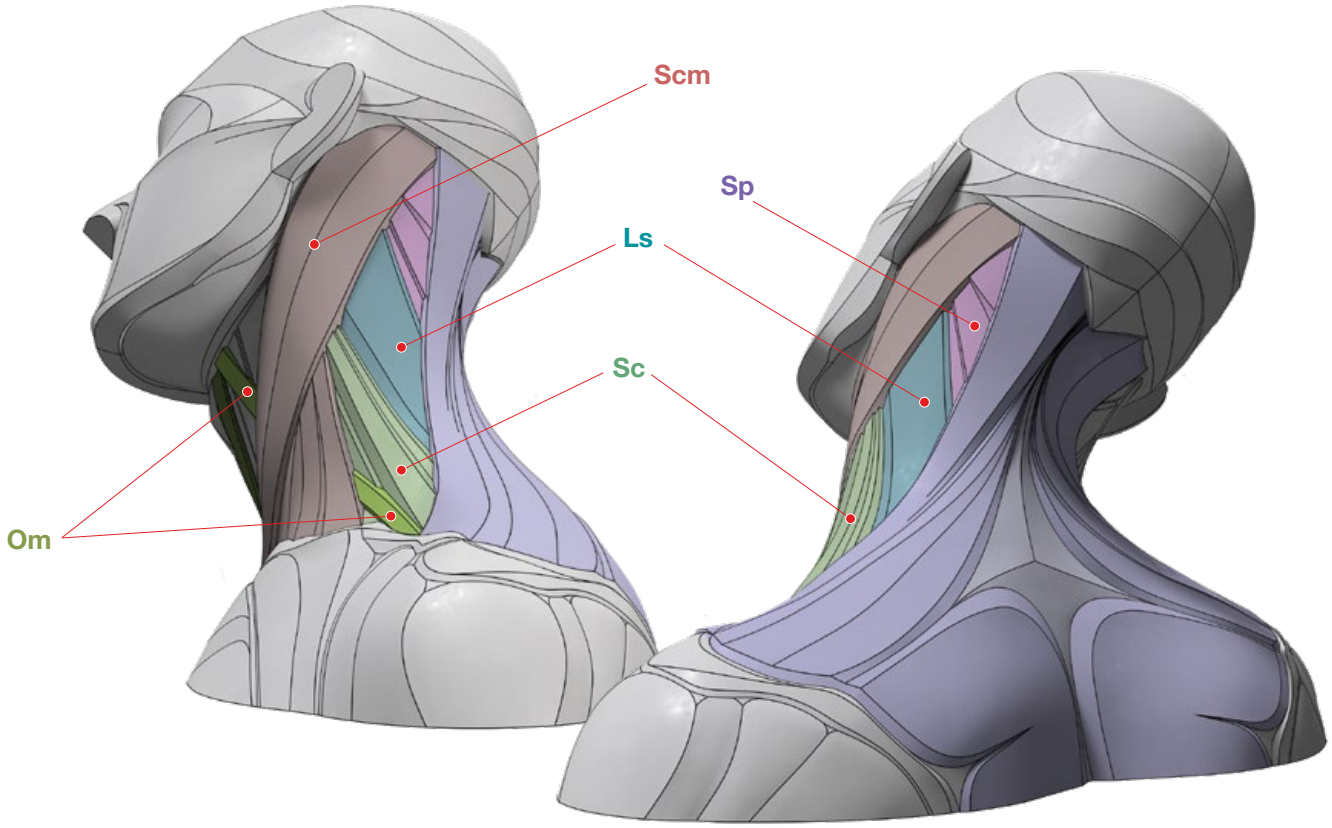




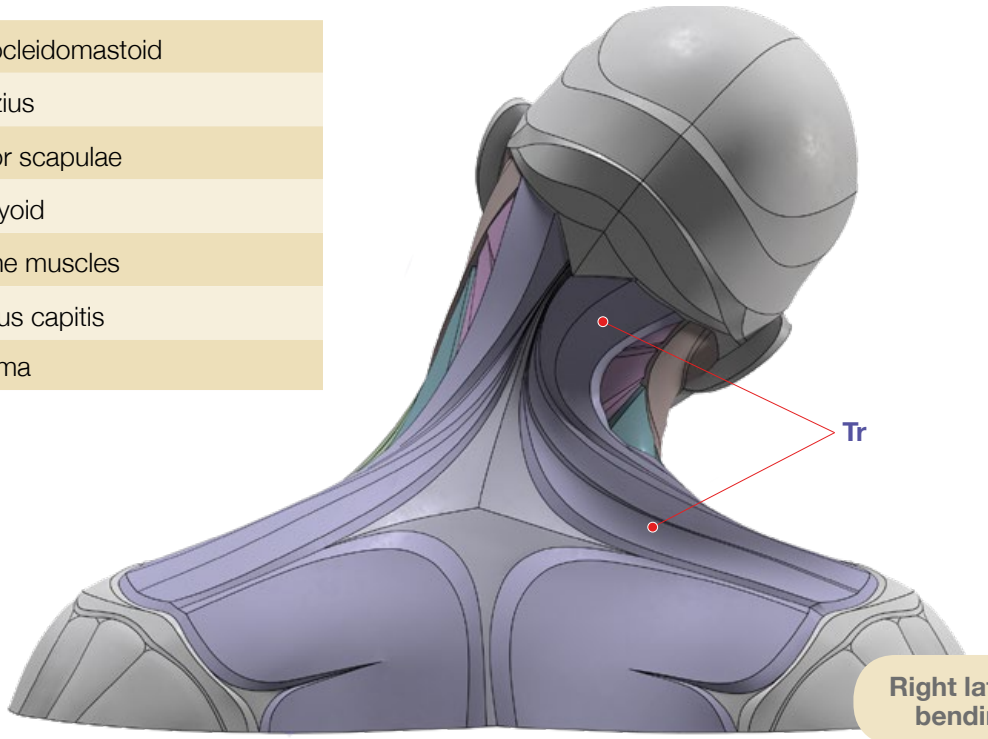
Right lateral bending

MOVEMENTS OF THE NECK

Anatomy



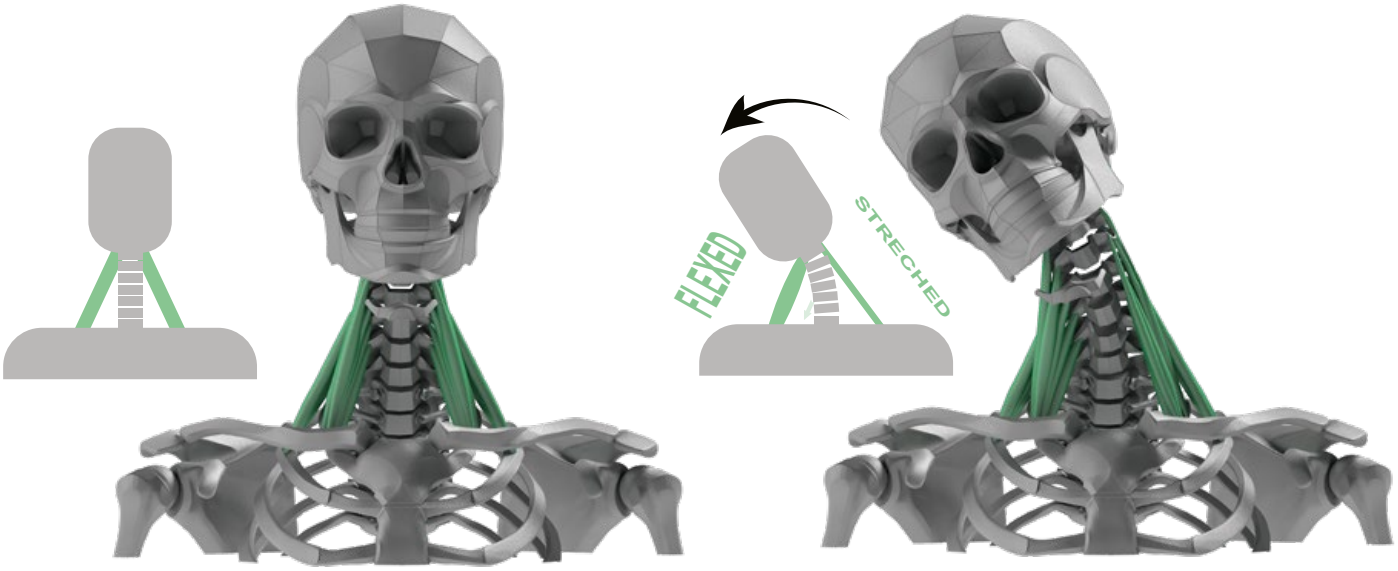
Scm	Sternocleidomastoid
Tr	Trapezius
Ls	Levator scapulae
Om	Omohyoid
Sc	Scalene muscles
Sp	Splenius capitis
P	Platysma



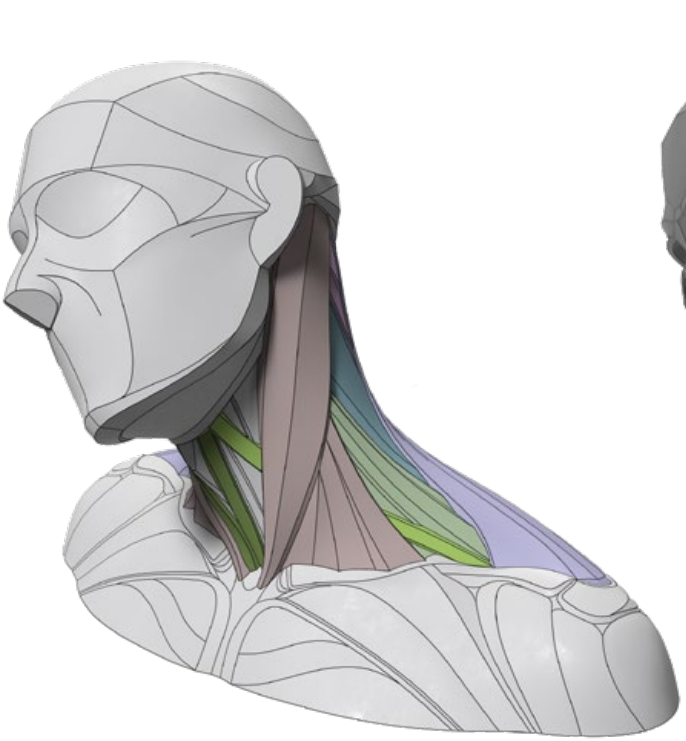
Right lateral bending

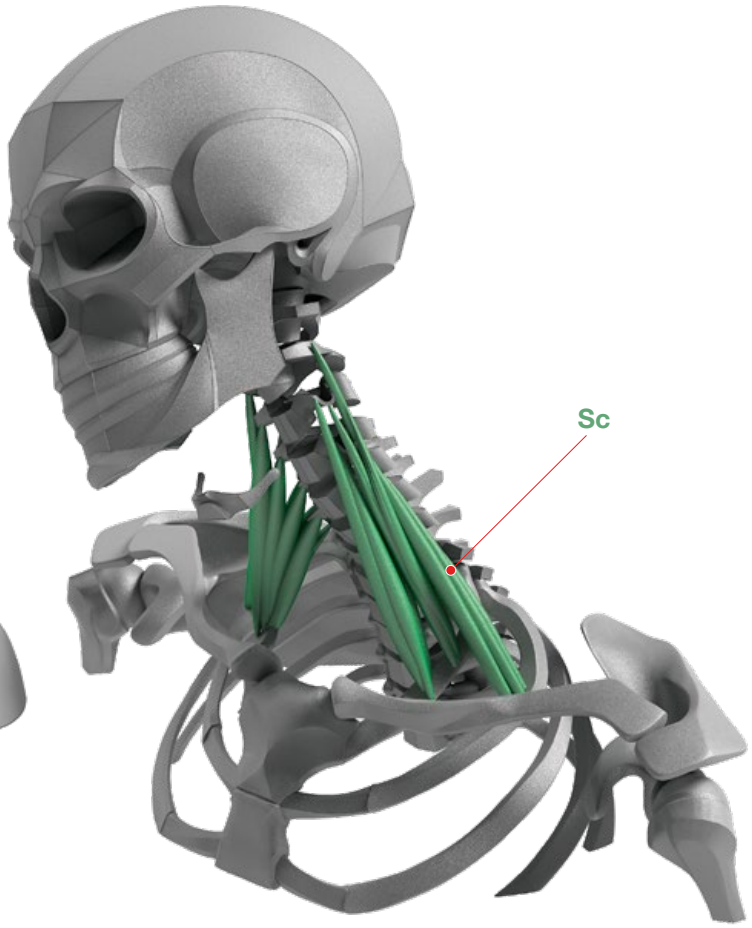
MOVEMENTS OF THE NECK

Anatomy



The **scalene muscles** are a group of three pairs of muscles in the lateral neck, with one set located on either side of your body. To imagine what they look like, you might think of the angled rigging of a ship's mast; the **scalenes** resemble on the neck and collarbone similarly. The main functions of these muscles are flexion, lateral flexion, and rotation of the neck. Also, they take part in respiration as accessory muscles.



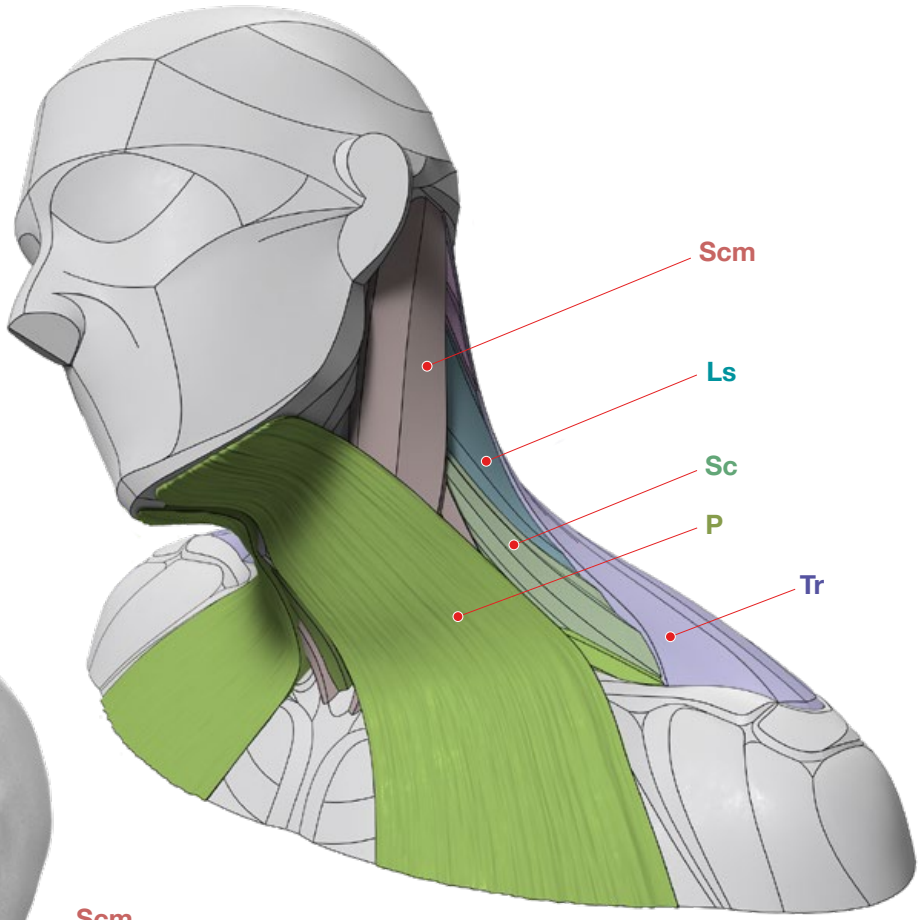


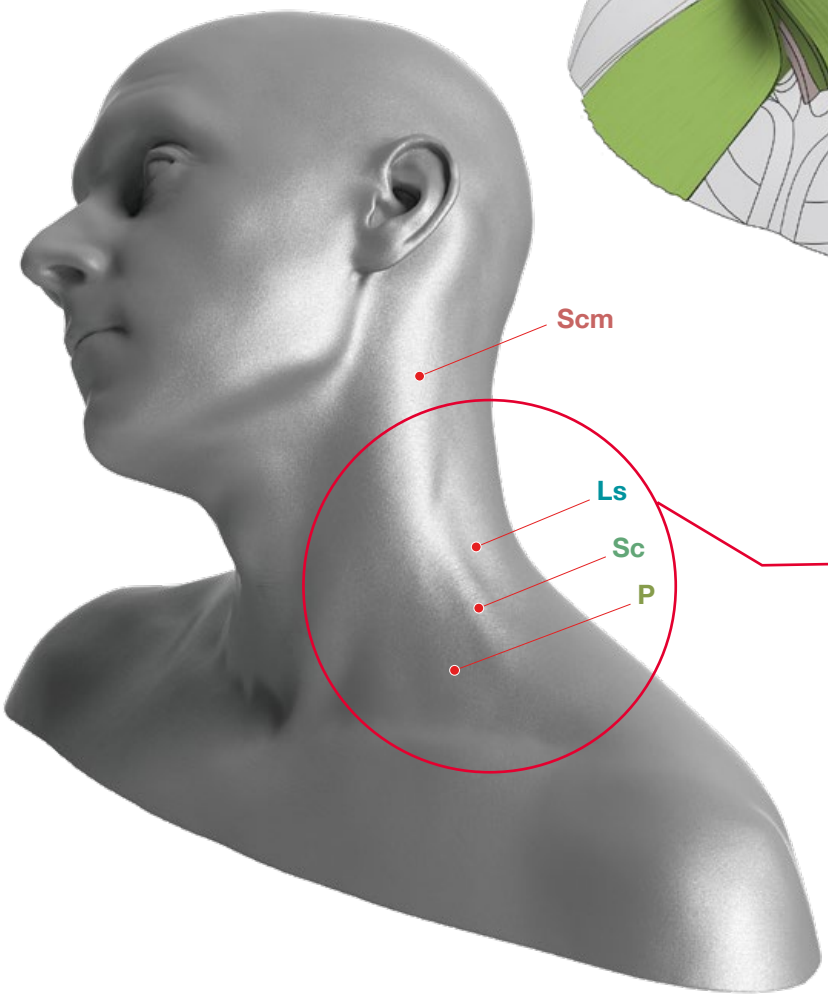
Right lateral bending

MOVEMENTS OF THE NECK

Anatomy

Scm	Sternocleidomastoid
Ls	Levator scapulae
Sc	Scalene muscles
P	Platysma
Tr	Trapezius muscle

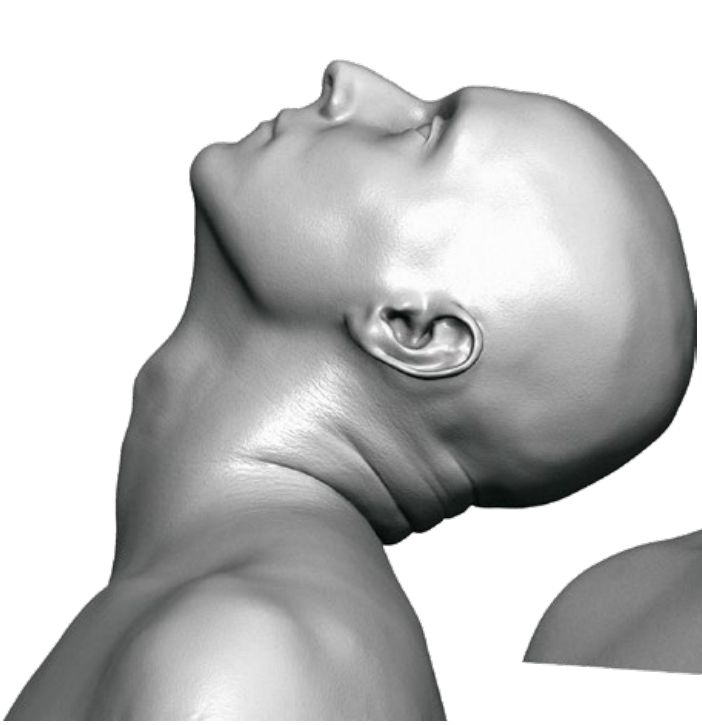


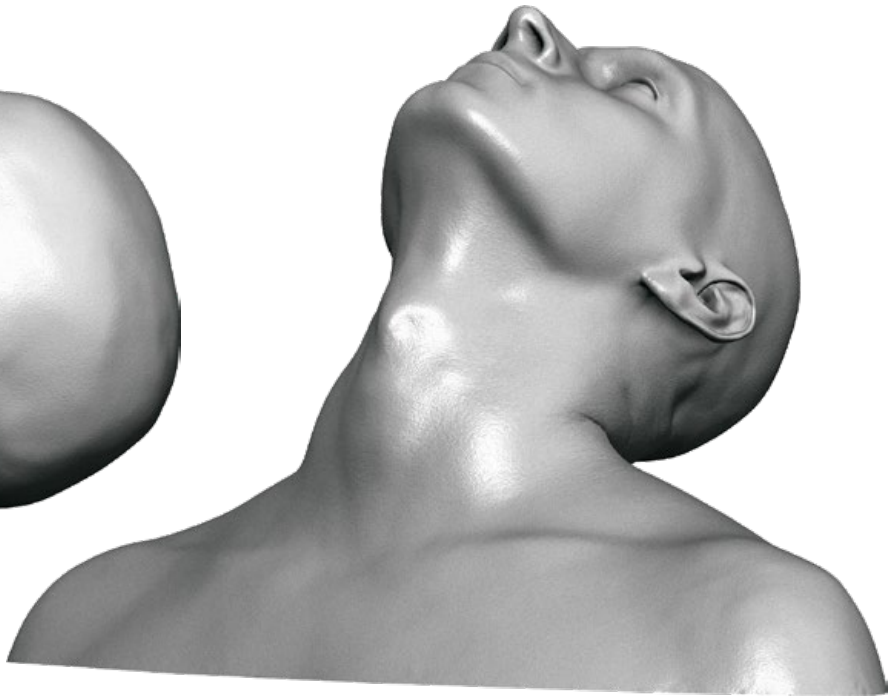


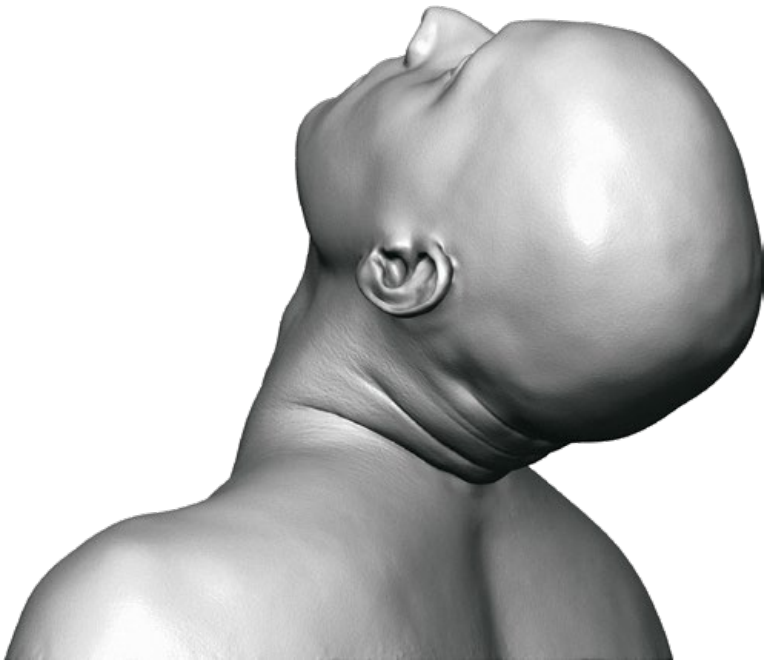
Most lateral bending is done by monolateral, in this case, right side, contracting of the **Scm** and **Sc**. On the opposite side, however, on the lateral neck, several parallel lines appear. They are not random. They are mostly created by stretched superficial muscles, such as the **P**, **Ls**, **Sc**.

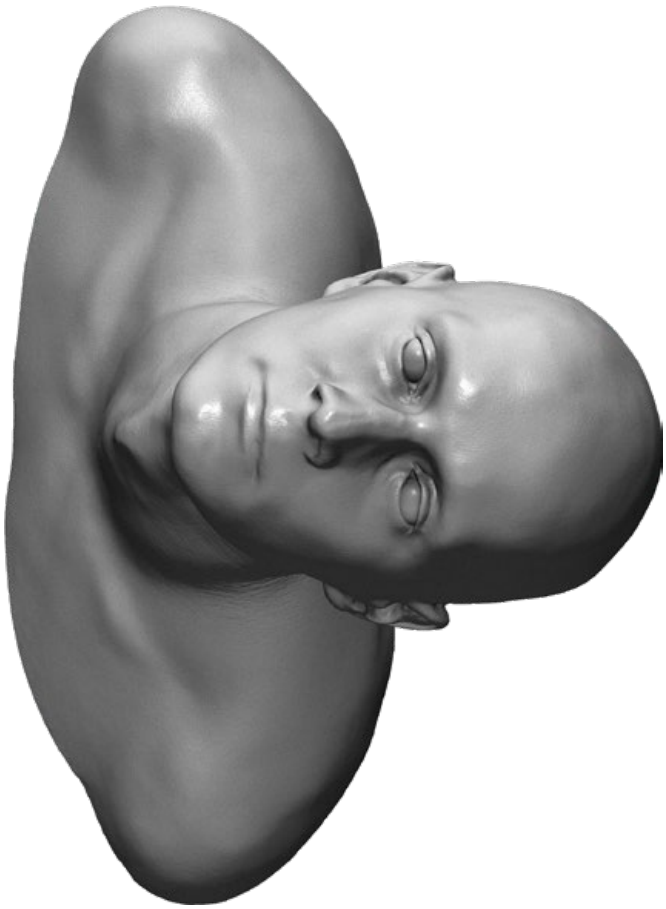
Right lateral bending

MOVEMENTS OF THE NECK



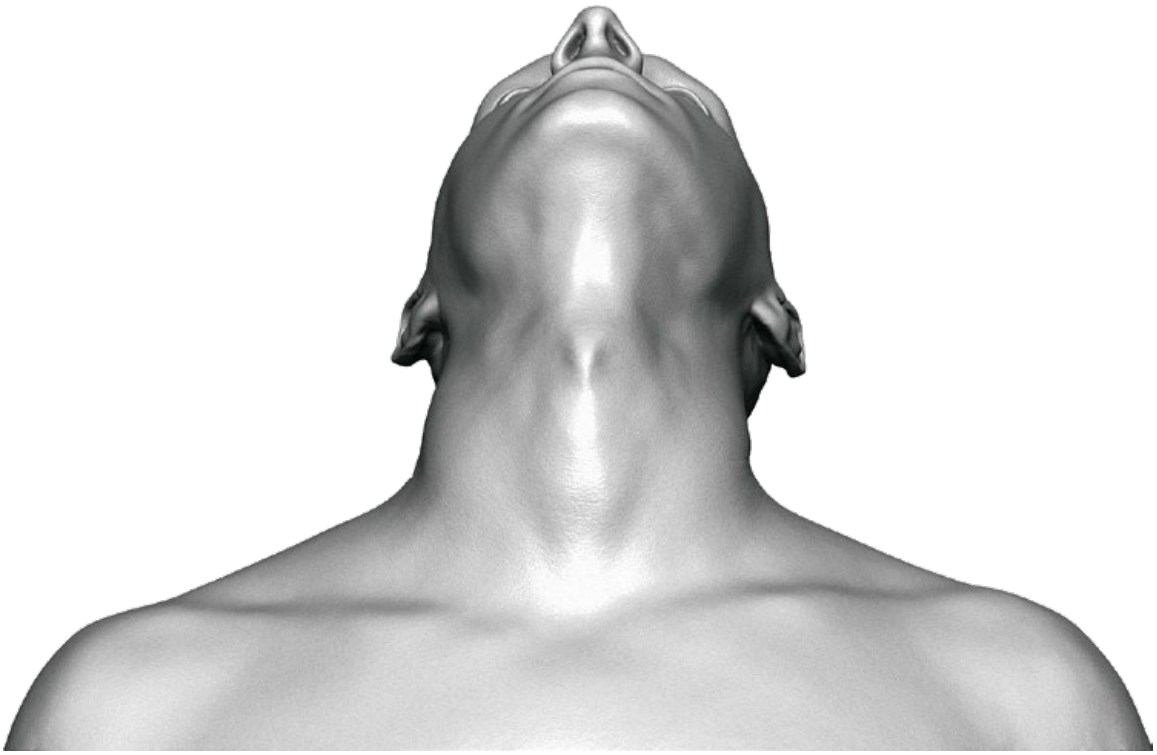


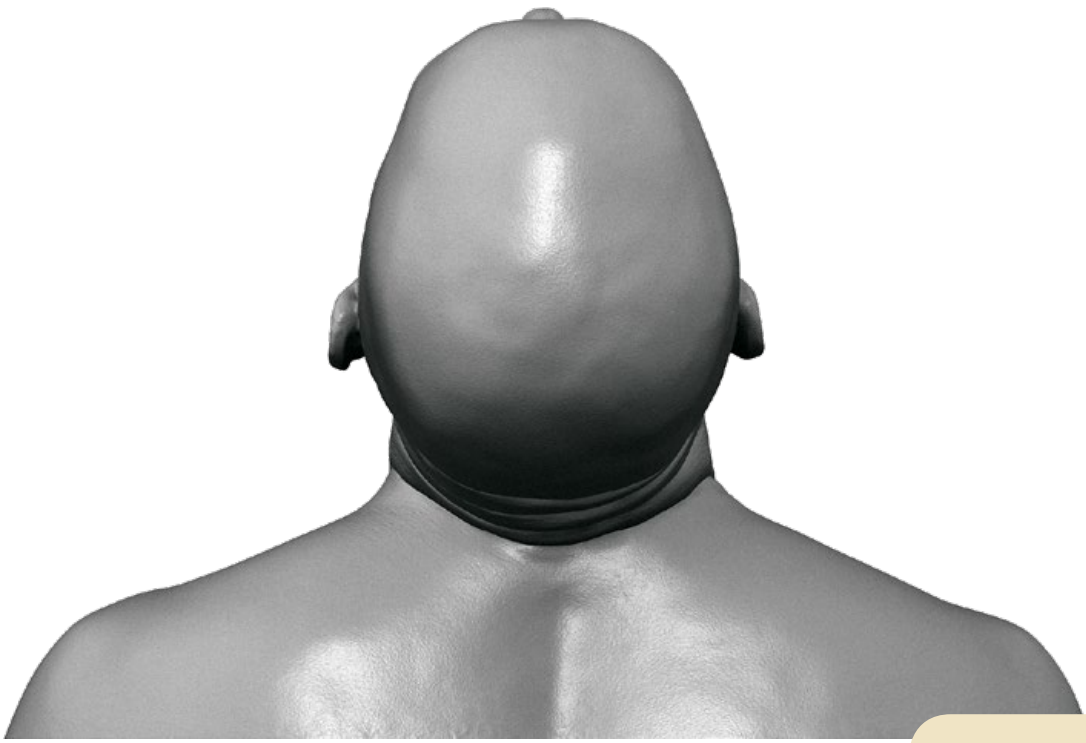




Extension

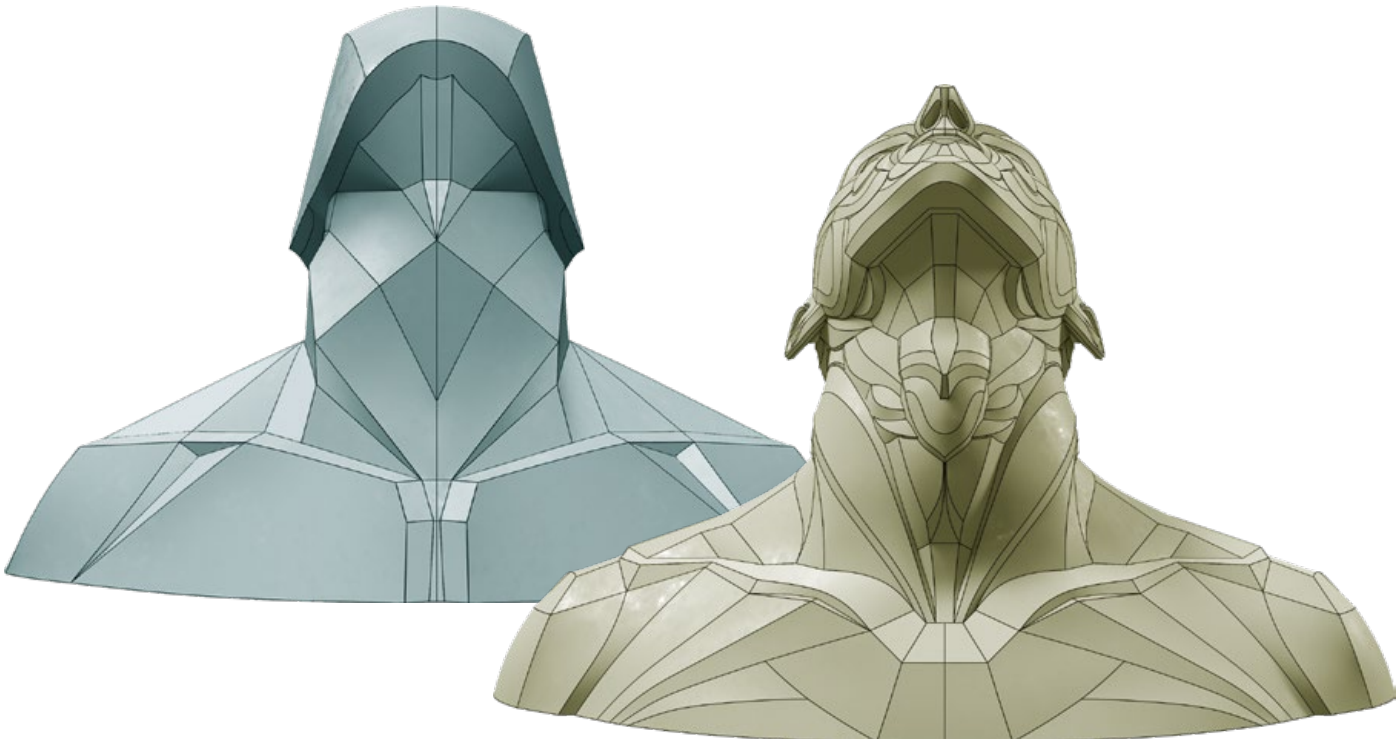
MOVEMENTS OF THE NECK





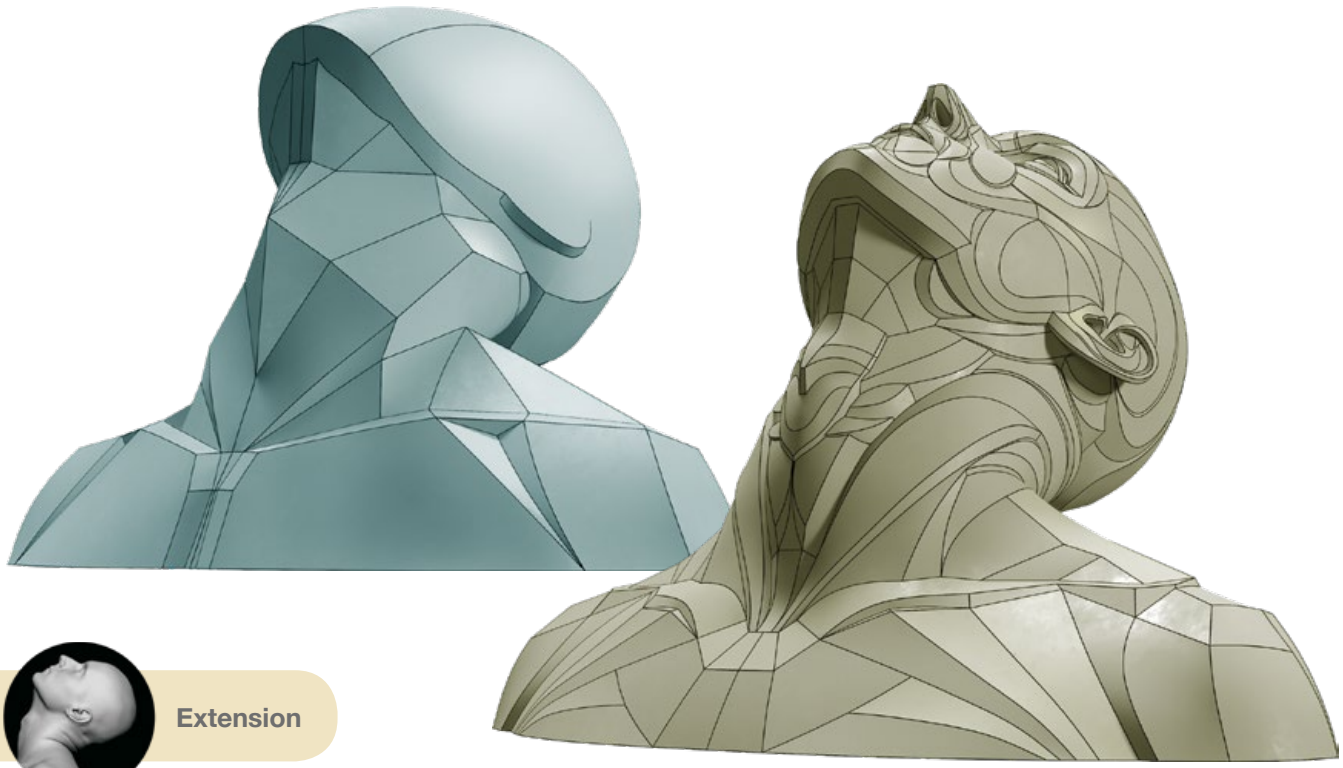
Extension

MOVEMENTS OF THE NECK



simple block-out

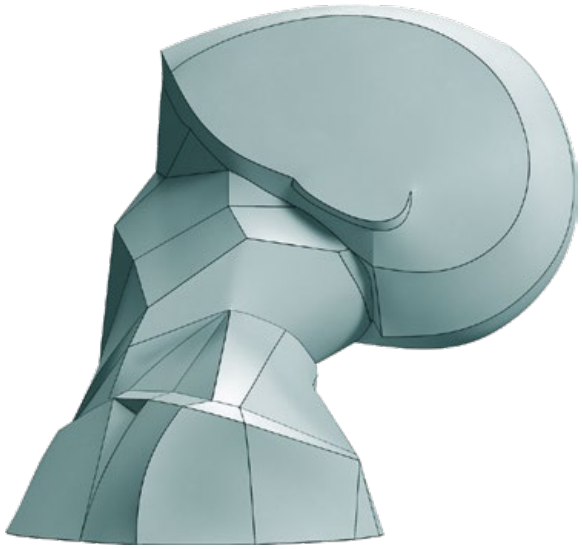
complex block-out



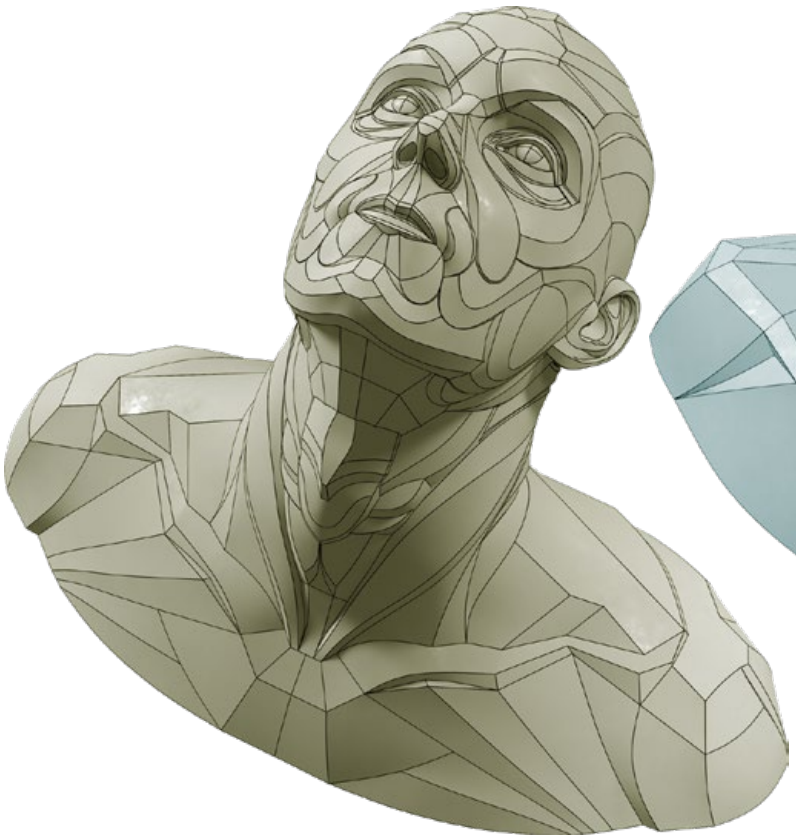
Extension

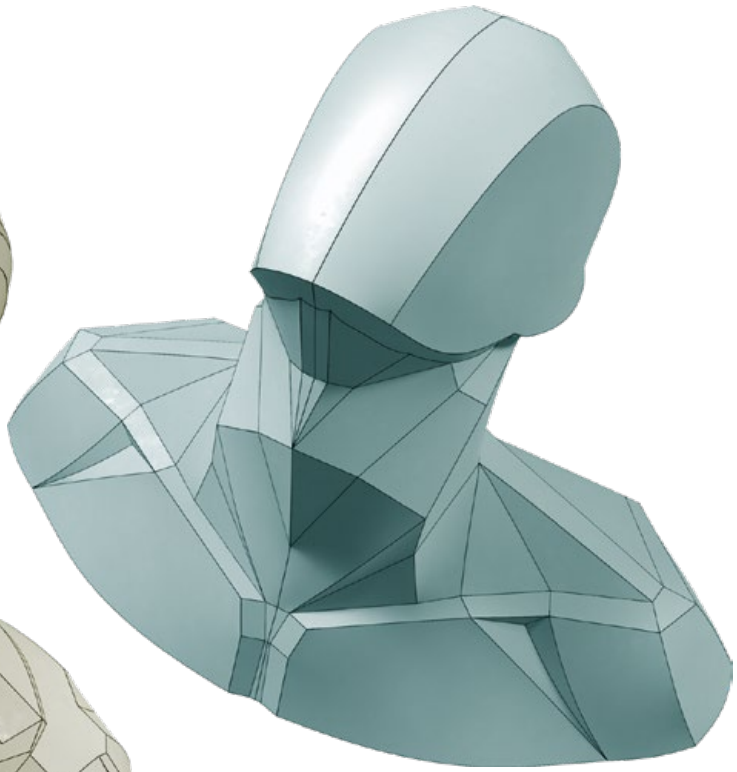
MOVEMENTS OF THE NECK

complex block-out



simple block-out





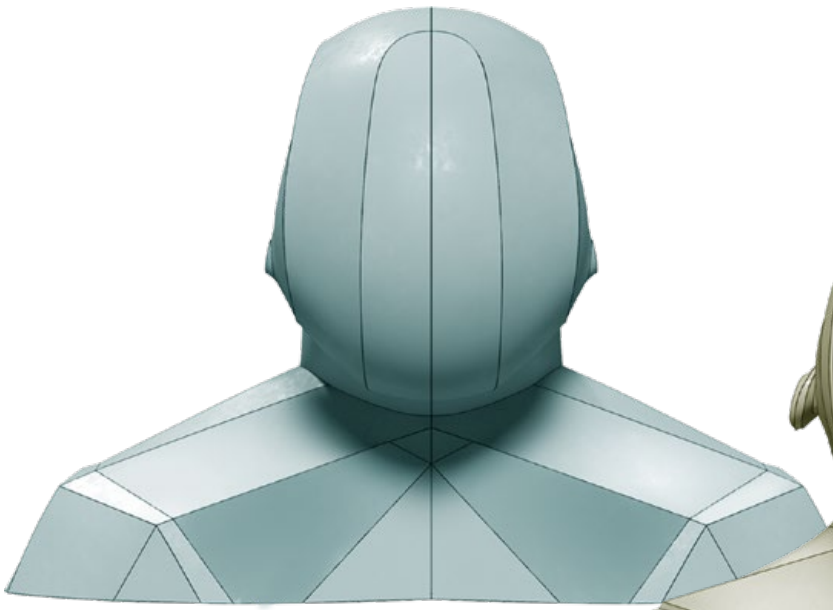
Extension

MOVEMENTS OF THE NECK

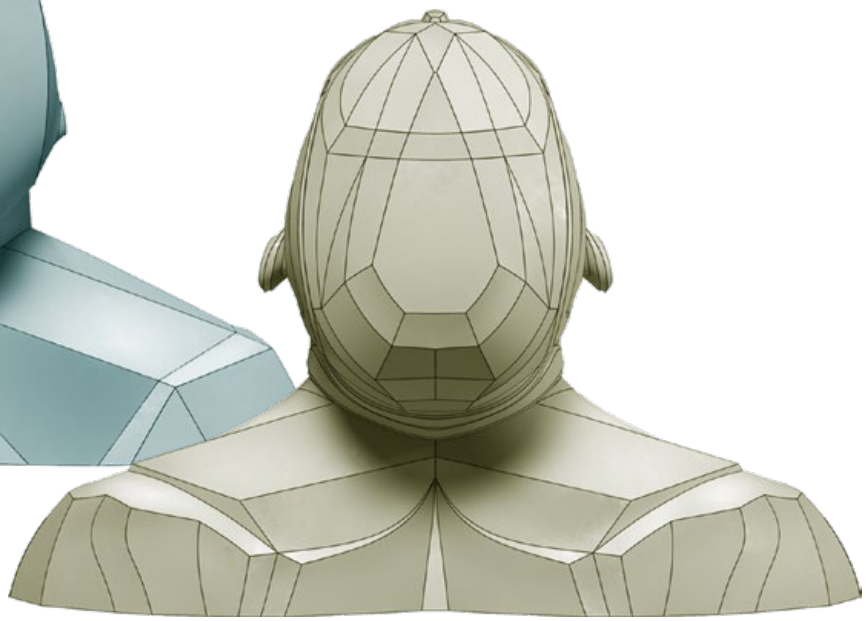
photo scan

complex block-out

simple block-out



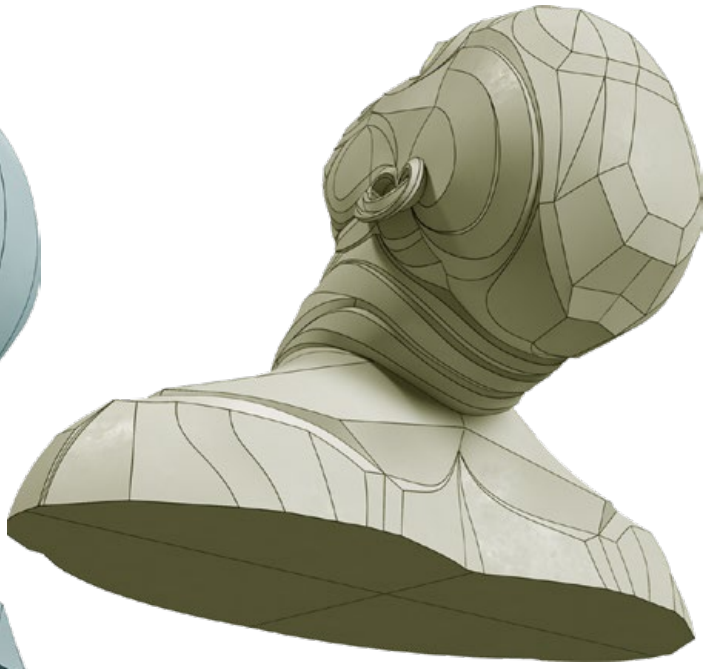
complex block-out



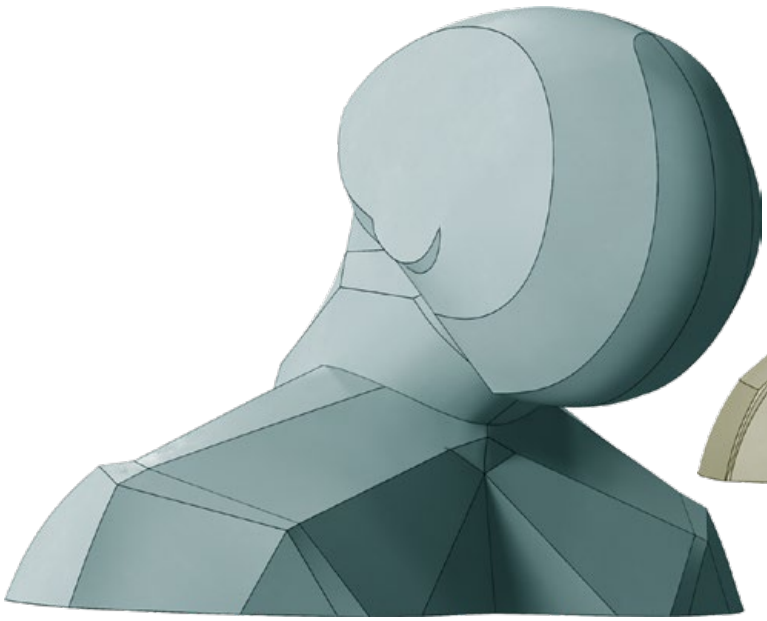
Extension

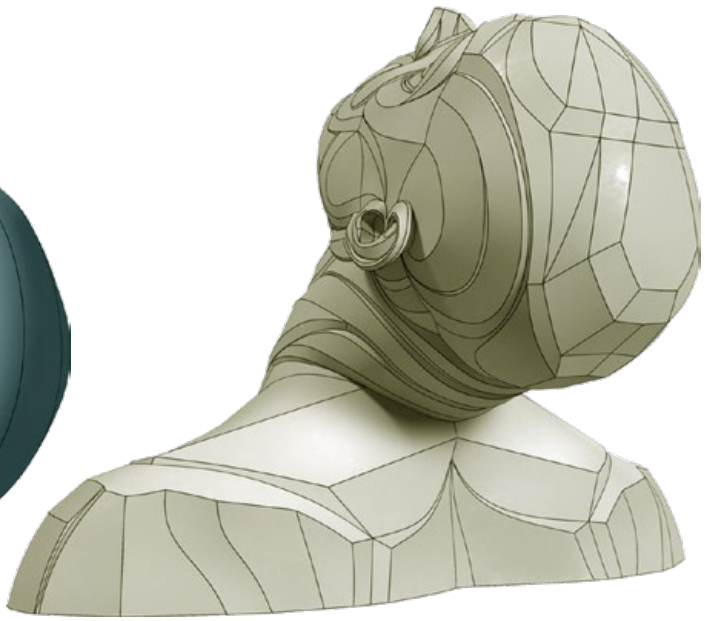
MOVEMENTS OF THE NECK

simple block-out



complex block-out

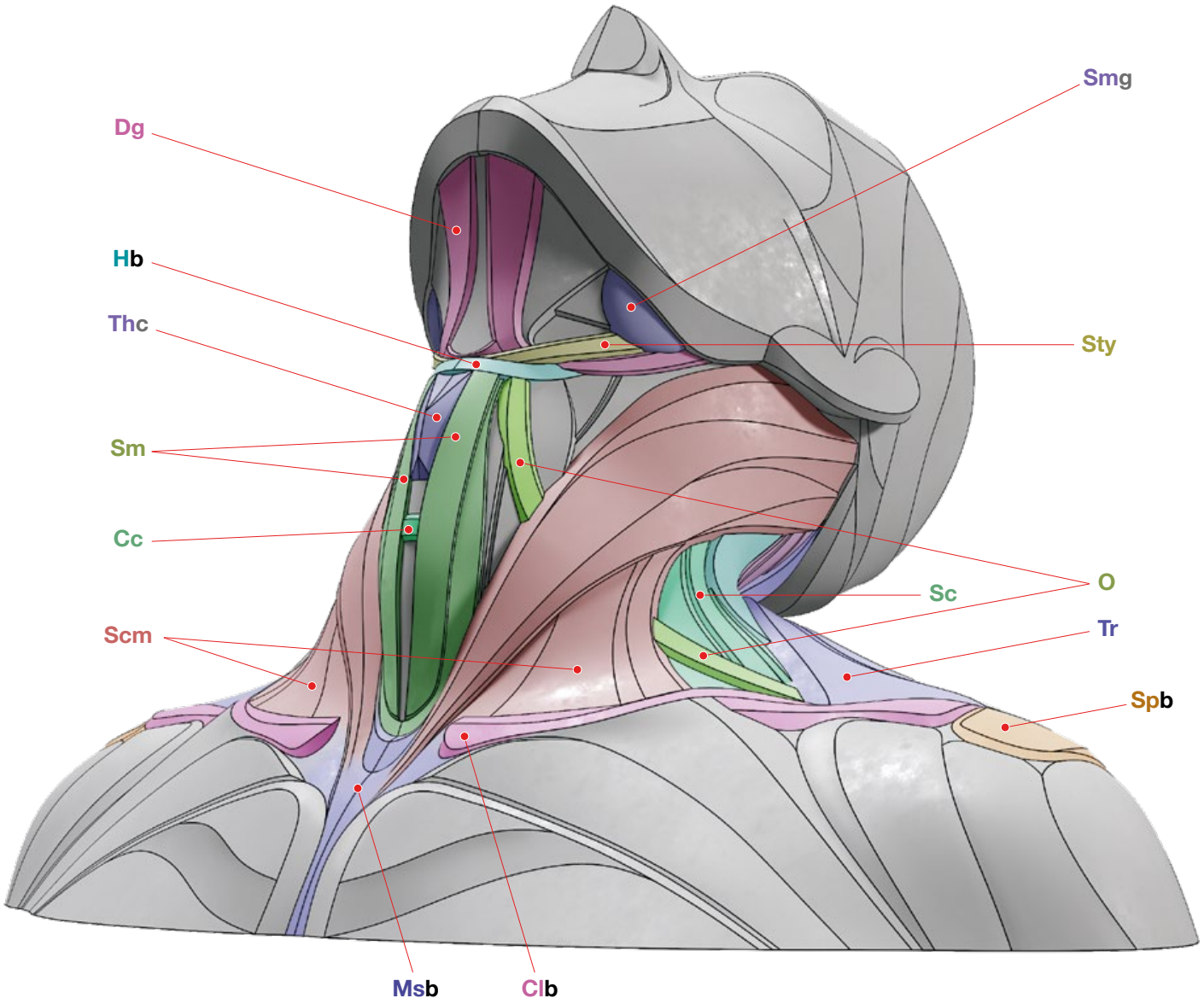




Extension

MOVEMENTS OF THE NECK

Anatomy

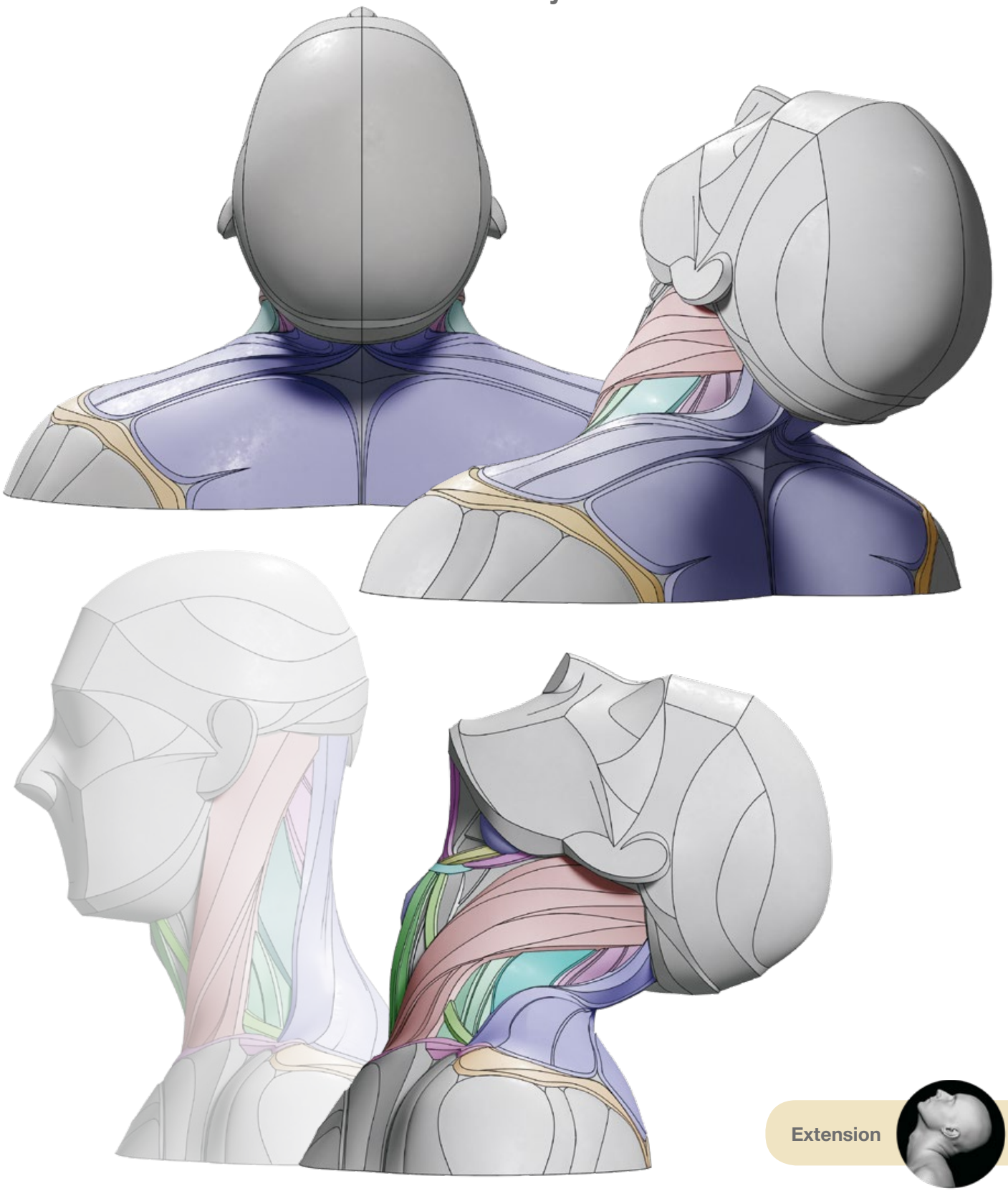


Dg	Digastric muscle	**Sty**	Stylohyoid muscle
Hb	Hyoid bone	**O**	Omohyoid
Sm	Strap muscles (infrahyoid muscles)	**Sc**	Scalene muscles
Cc	Cricoid cartilage	**Tr**	Trapezius
Scm	Sternocleidomastoid	**Spb**	Scapula bone (shoulder blade)
Thc	Thyroid cartilage	**Clb**	Clavicle (collarbone)
Smg	Submandibular gland	**Msb**	Manubrium of the Sternum (breastbone)

Extension

MOVEMENTS OF THE NECK

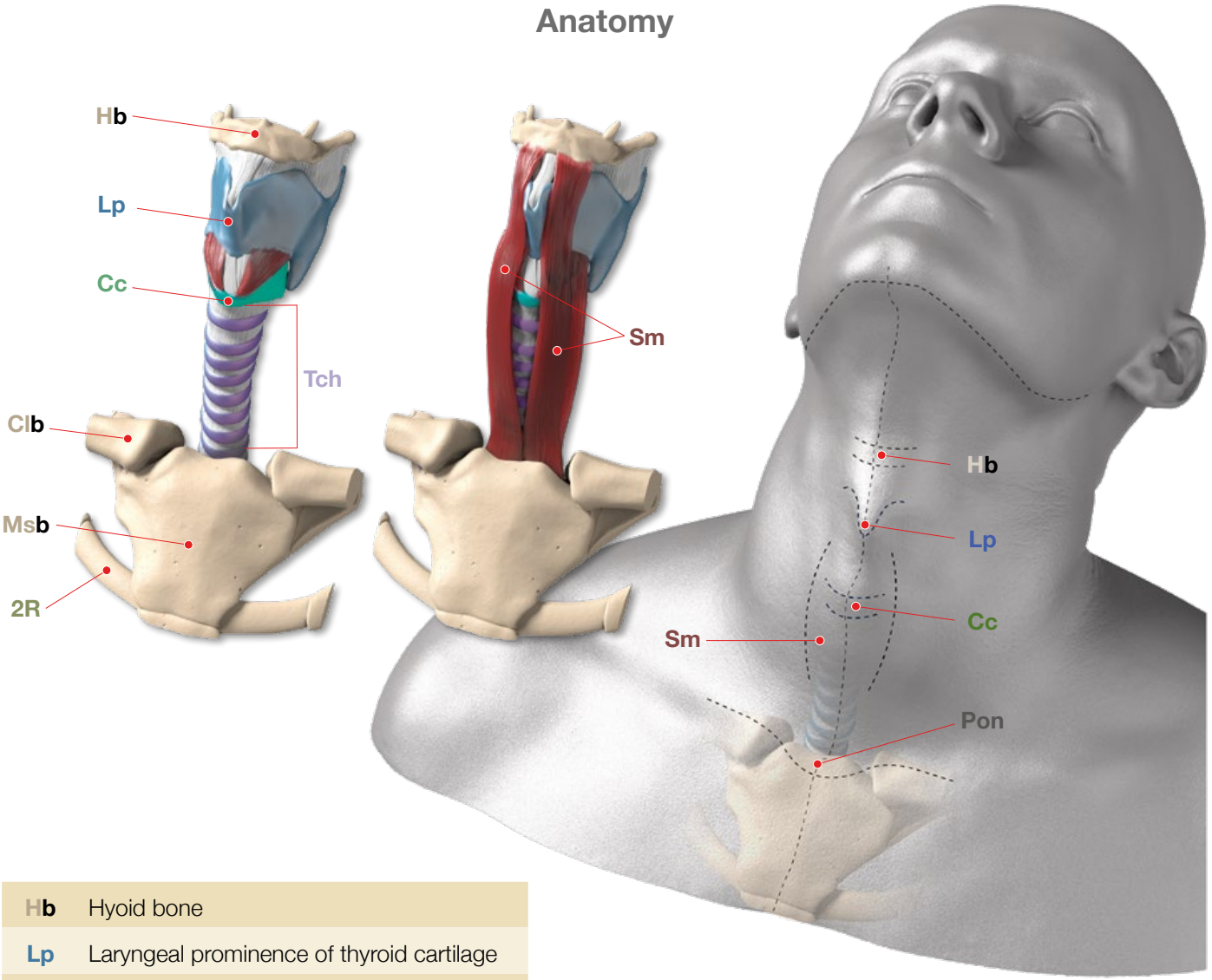
Anatomy



Extension

MOVEMENTS OF THE NECK

Anatomy

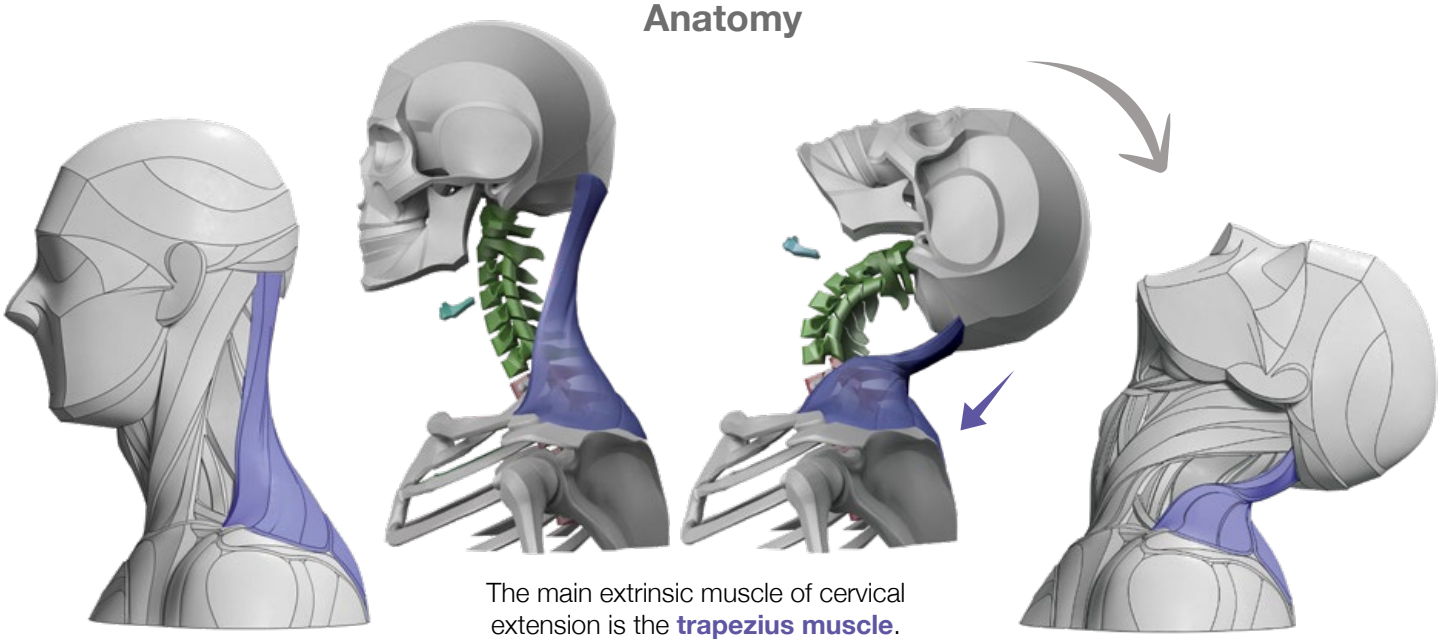


Hb	Hyoid bone
Lp	Laryngeal prominence of thyroid cartilage
Cc	Cricoid cartilage
Clb	Clavicle (collarbone)
Msb	Manubrium of the sternum (breastbone)
2R	2nd rib
Sm	Strap muscles (infrahyoid muscles)
Pon	Pit of the neck (jugular notch)
Tch	Trachea

Extension

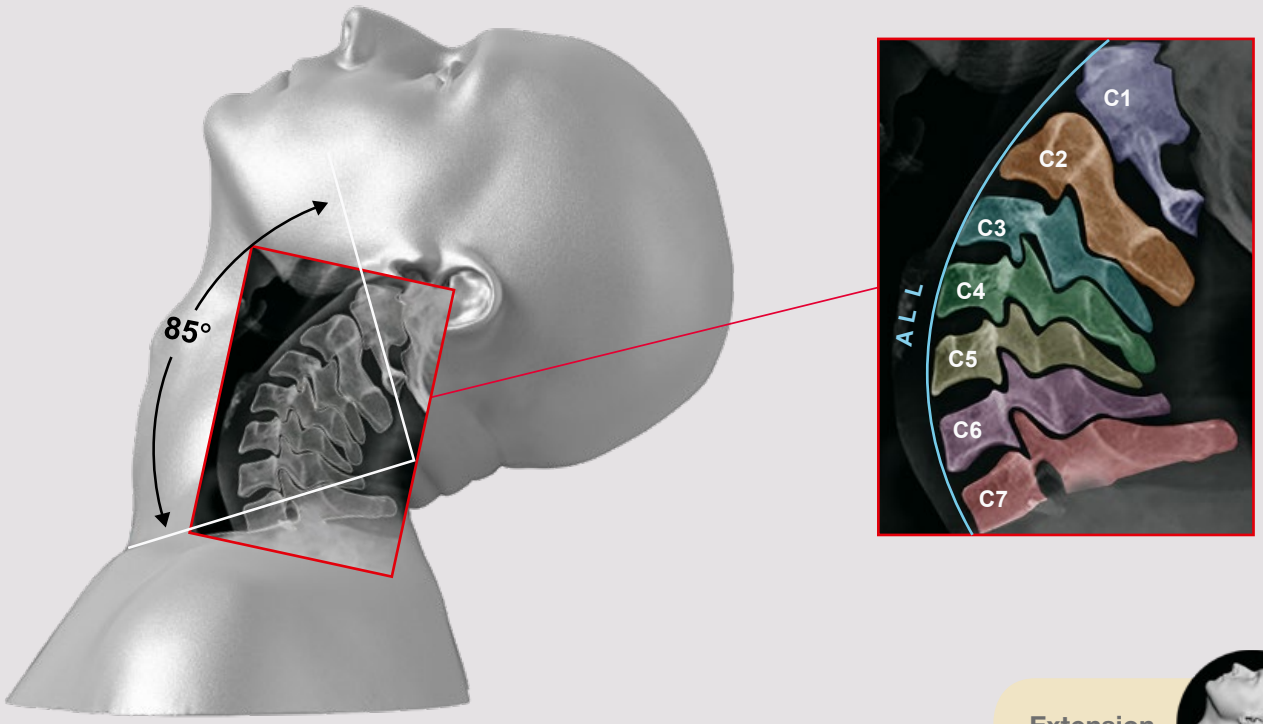
MOVEMENTS OF THE NECK

Anatomy



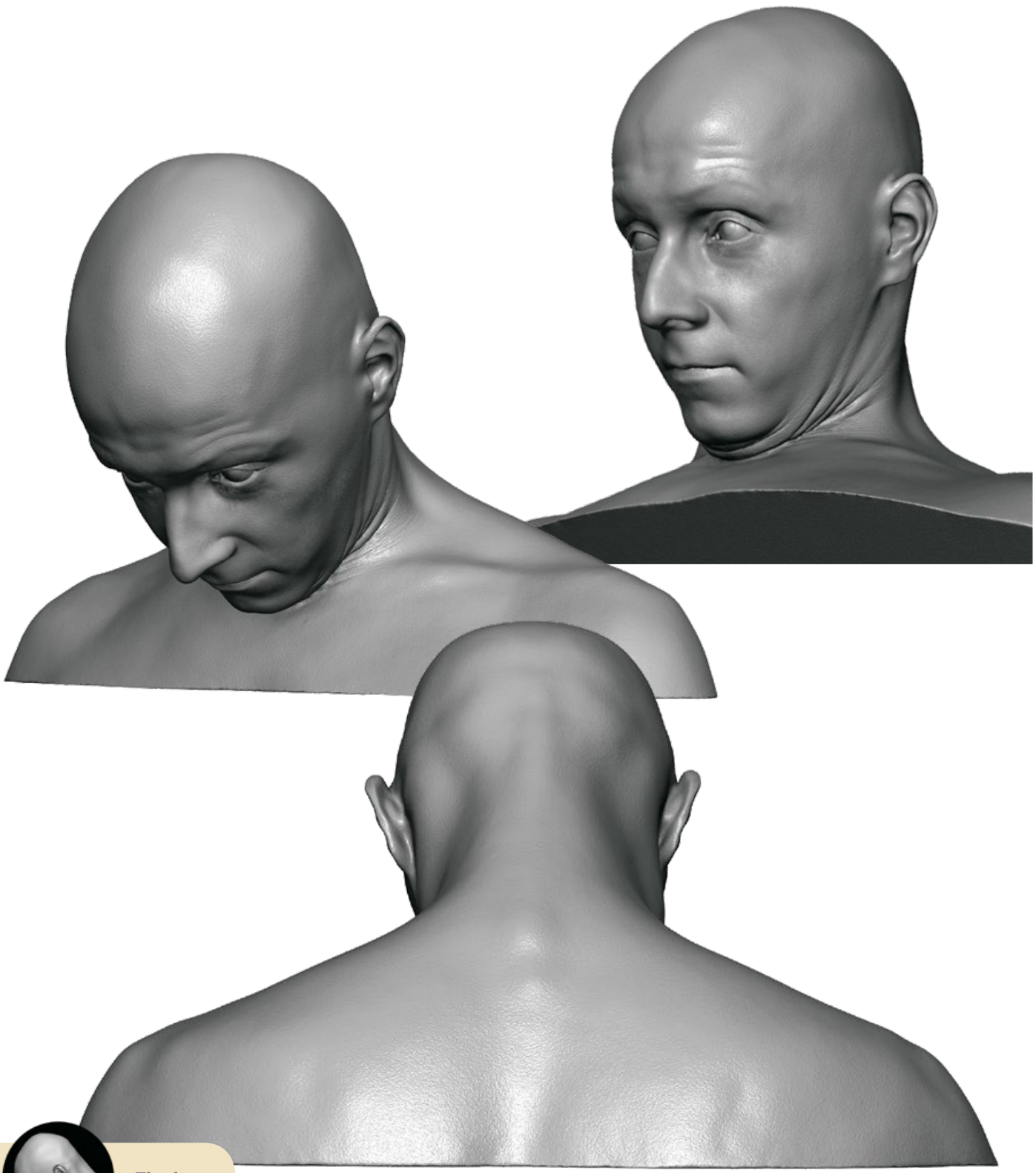
The main extrinsic muscle of cervical extension is the **trapezius muscle**.

Cervical vertebrae (**C3 through C7**) bodies remain a bit like rounded boxes, with relatively small spinous processes (finger-like projections) compared to other vertebrae. From the posterior part of the vertebral body extends the vertebral arch. From the midline of the arch extends the spinous processes. When there is maximum extension, the tips of the spinous processes are simultaneously compressed, they are designed to match one another. Both the anterior longitudinal ligament (ALL) at the front, and Spinous processes on the back, limit the range of extension of the neck.



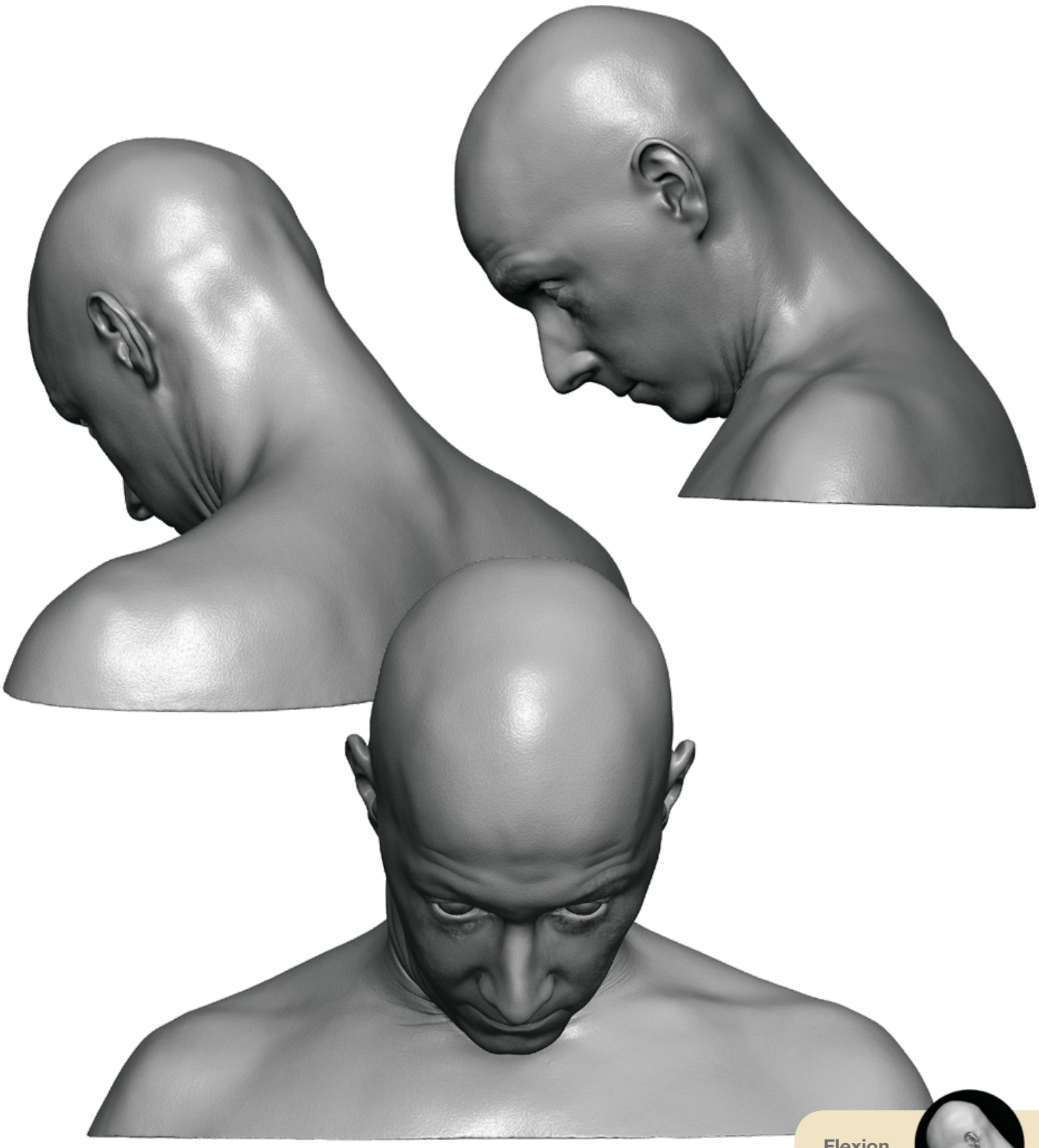
Extension

MOVEMENTS OF THE NECK



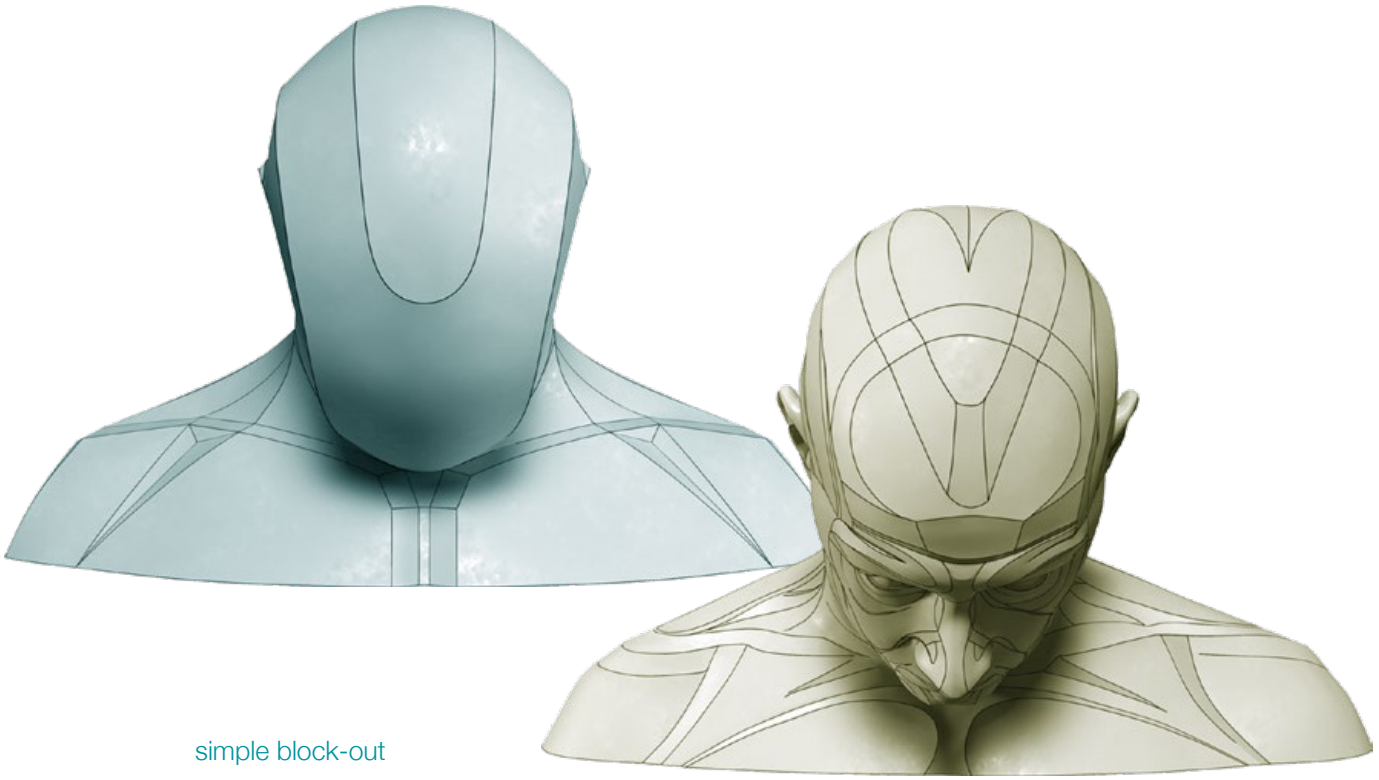
Flexion

MOVEMENTS OF THE NECK



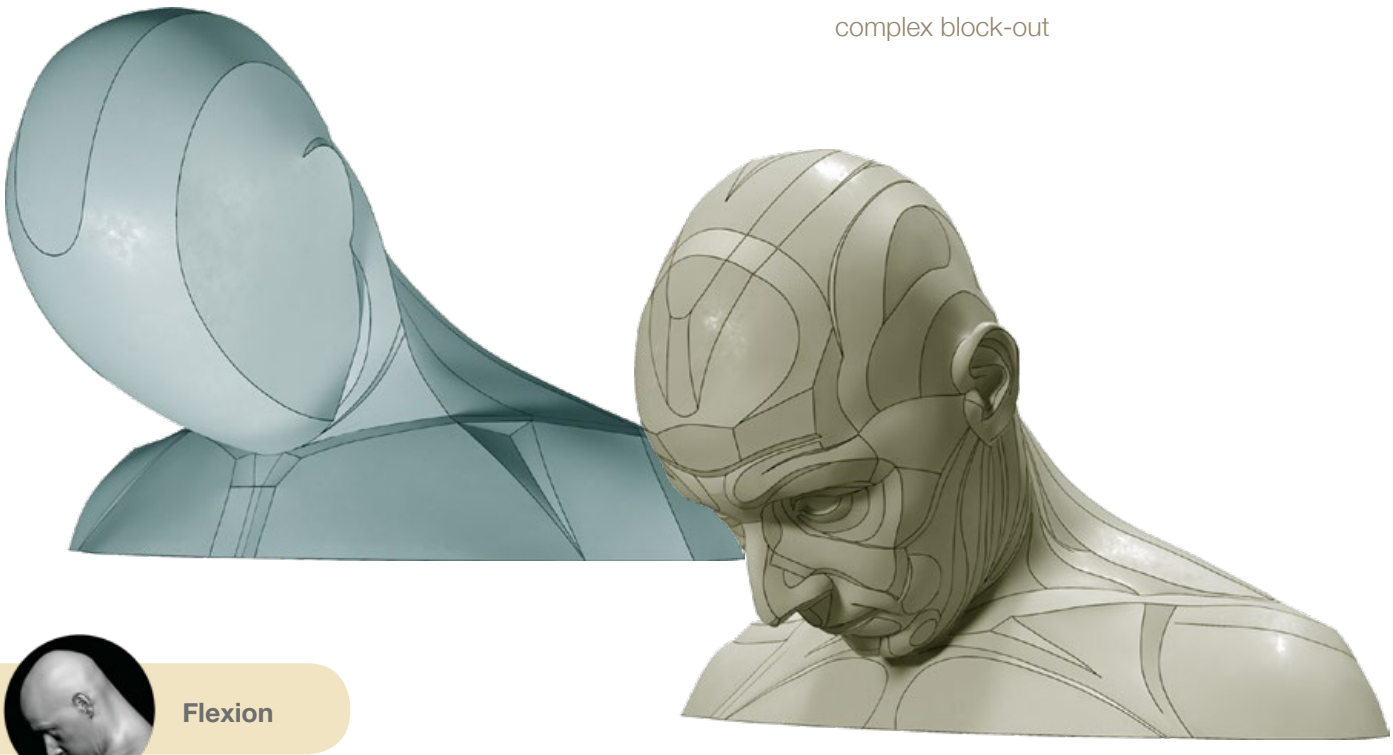
Flexion

MOVEMENTS OF THE NECK



simple block-out

complex block-out



Flexion

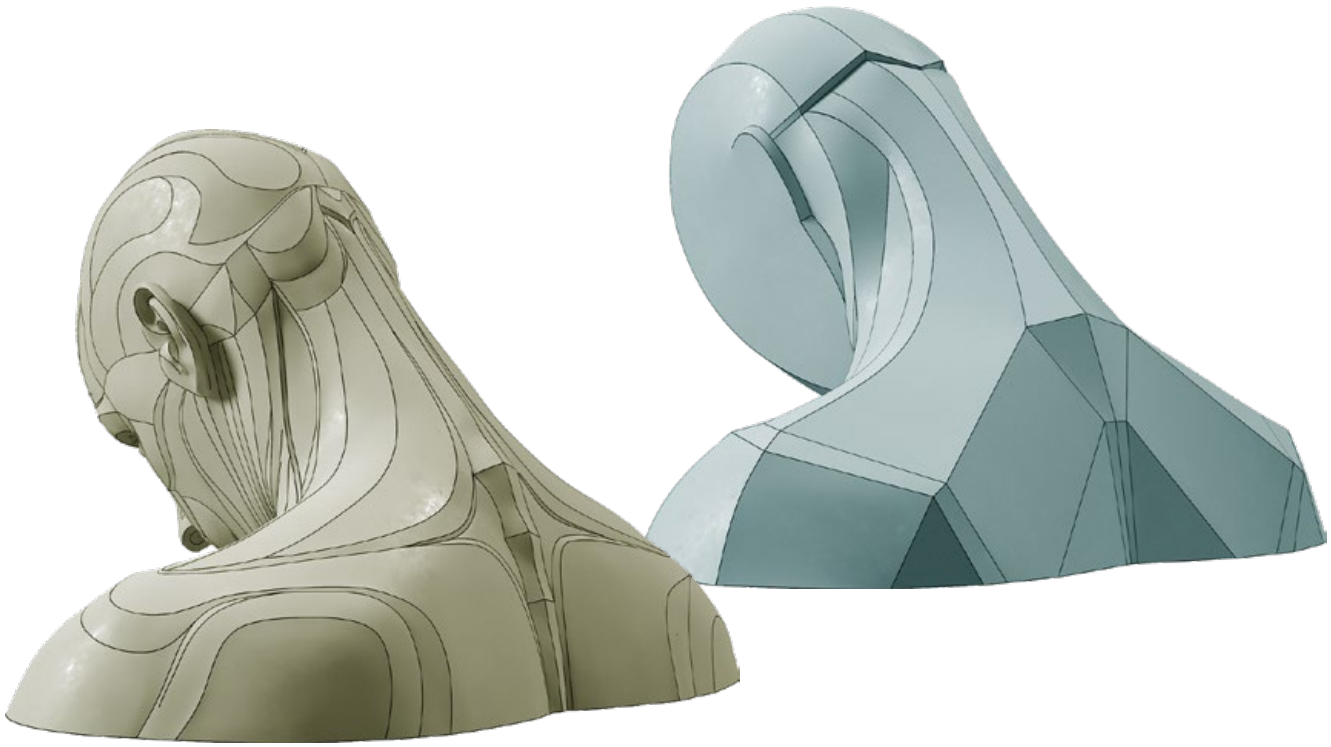
MOVEMENTS OF THE NECK

simple block-out

complex block-out

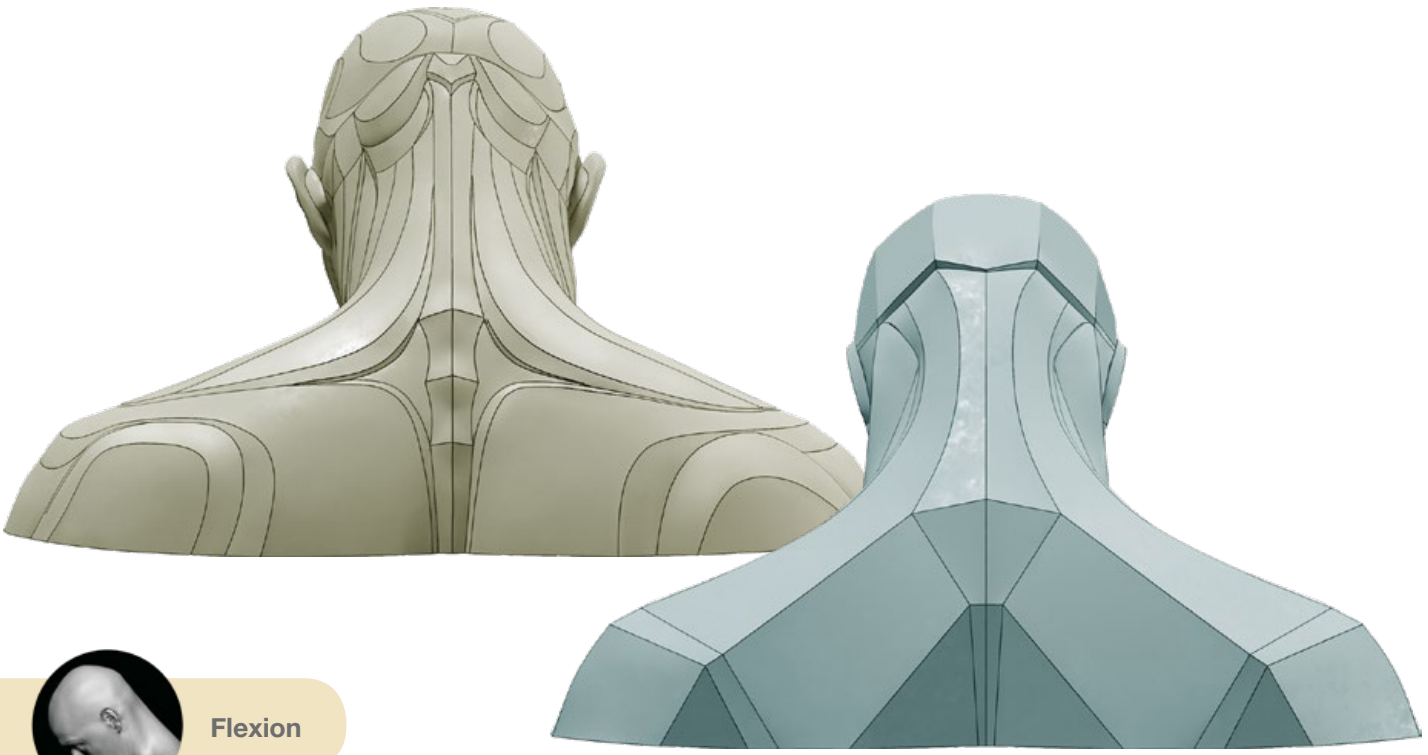
Flexion

MOVEMENTS OF THE NECK



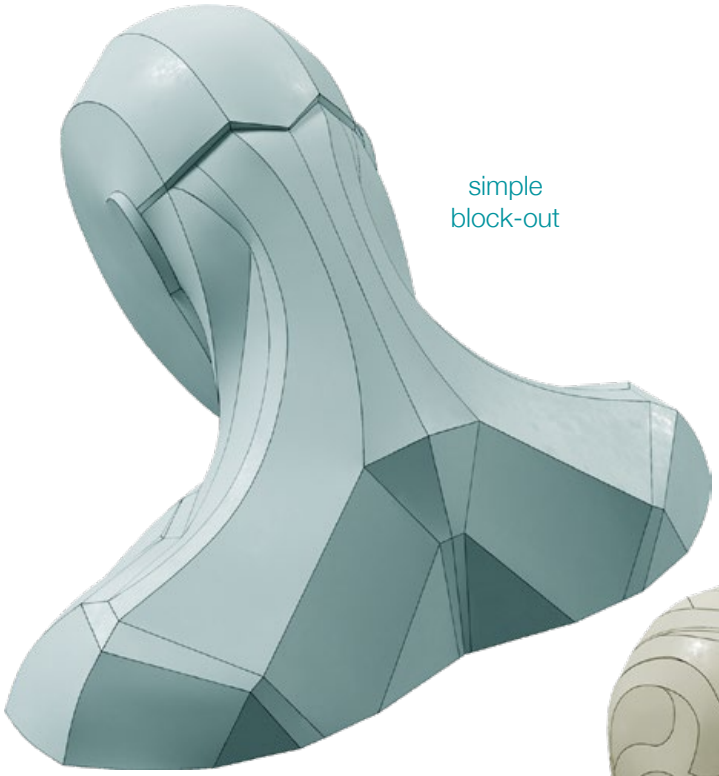
complex block-out

simple block-out



Flexion

MOVEMENTS OF THE NECK



simple
block-out

complex
block-out

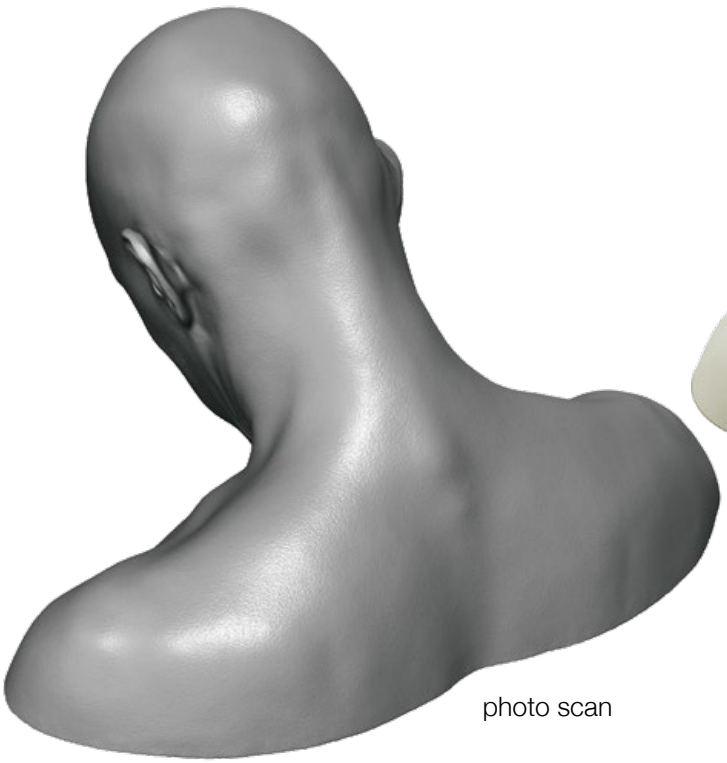
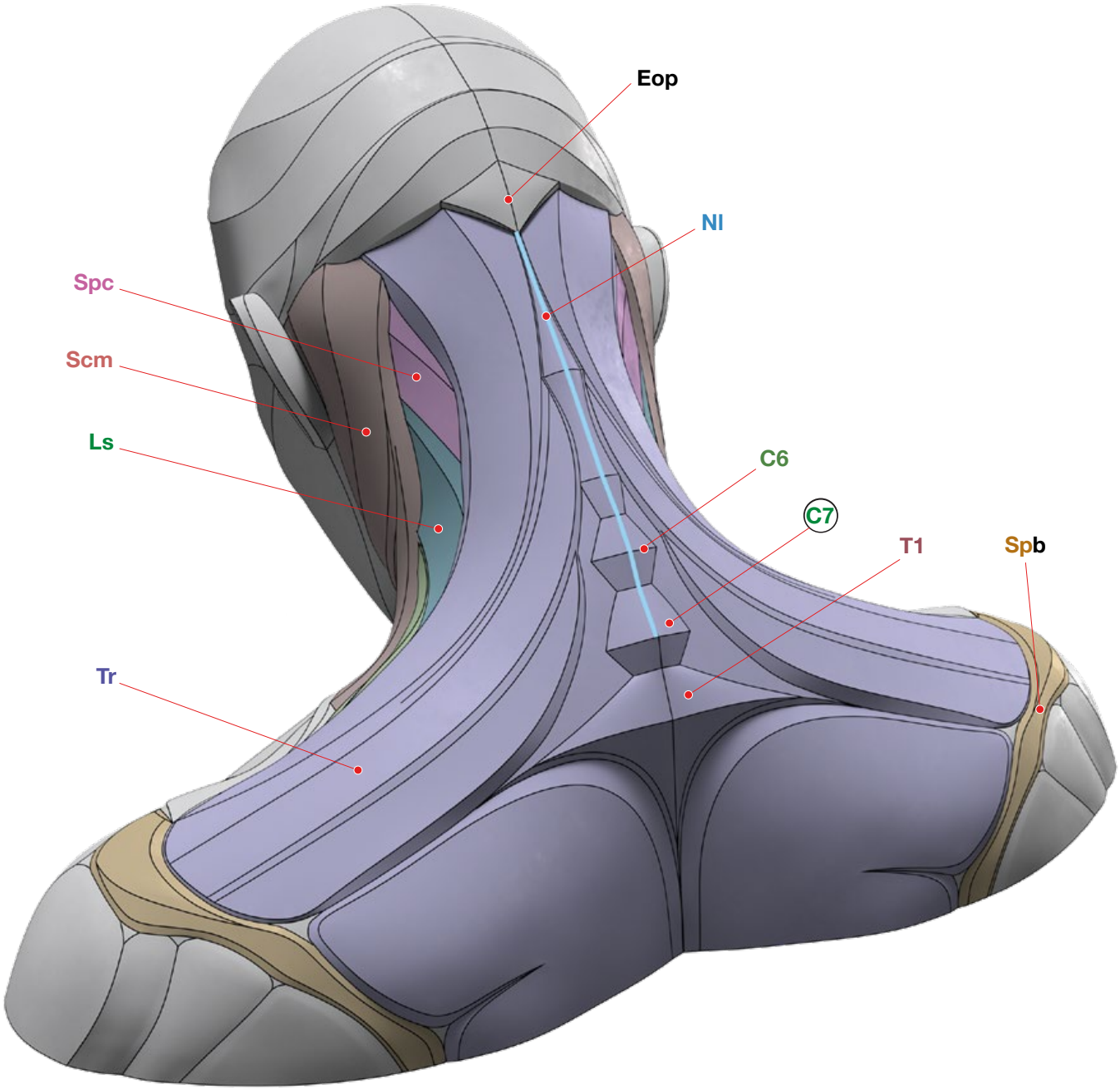


photo scan

Flexion

MOVEMENTS OF THE NECK

Anatomy

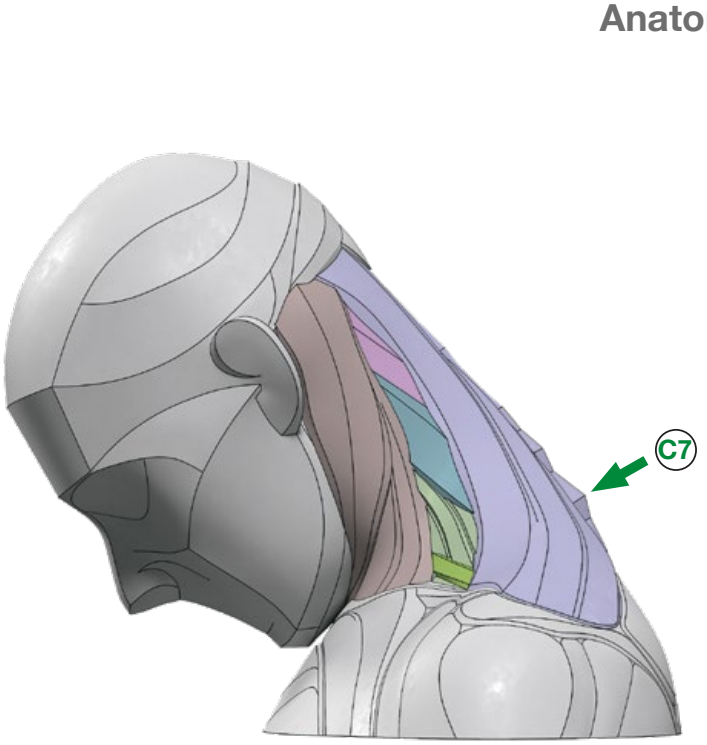


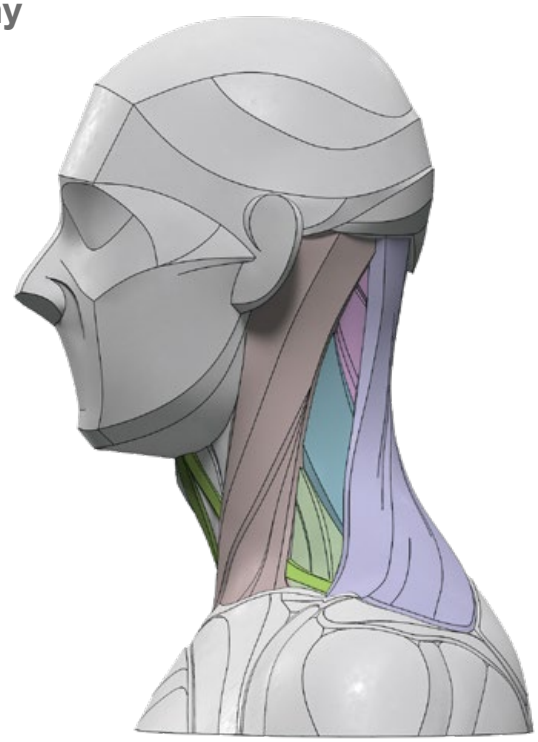
Eop	External occipital protuberance	**Nl**	Nuchal ligament
Spc	Splenius capitis muscle	**C6**	6th cervical vertebra
Scm	Sternocleidomastoid muscle	**C7**	7th cervical vertebra
Ls	Levator scapulae	**T1**	1st Thoracic Vertebra
Tr	Trapezius muscle	**Spb**	Scapula bone (shoulder blade)

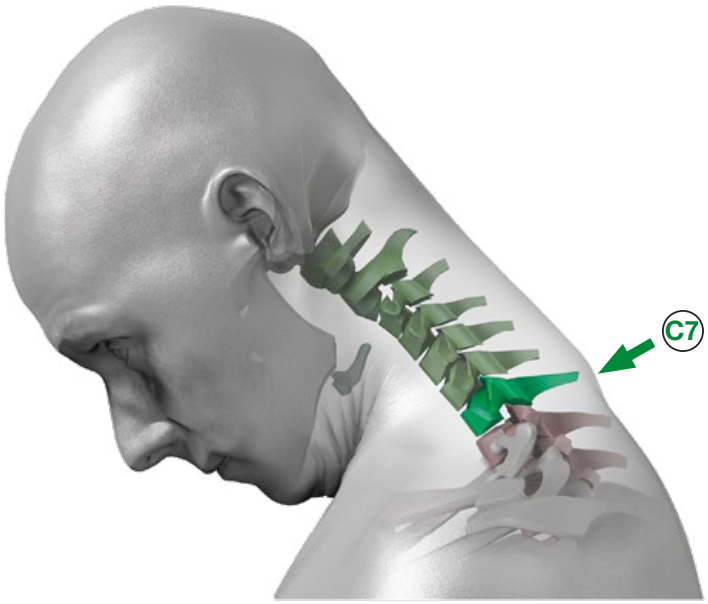
Flexion

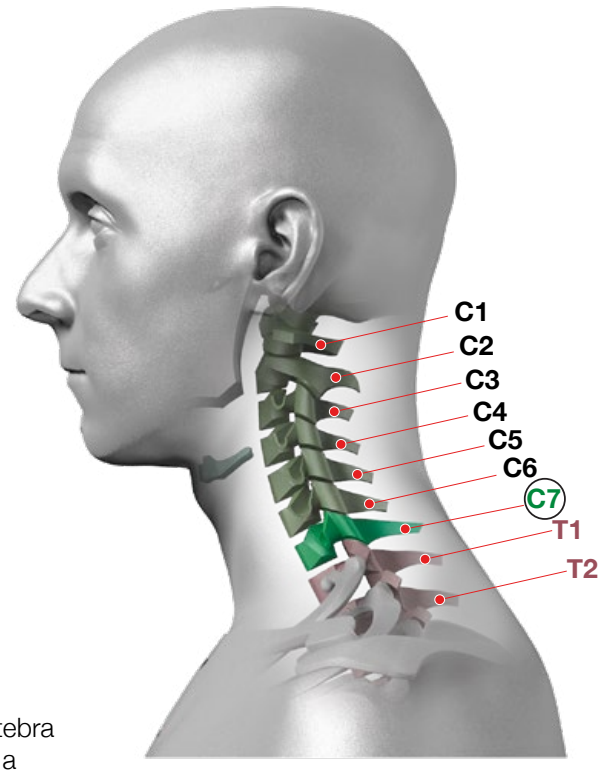
MOVEMENTS OF THE NECK

Anatomy







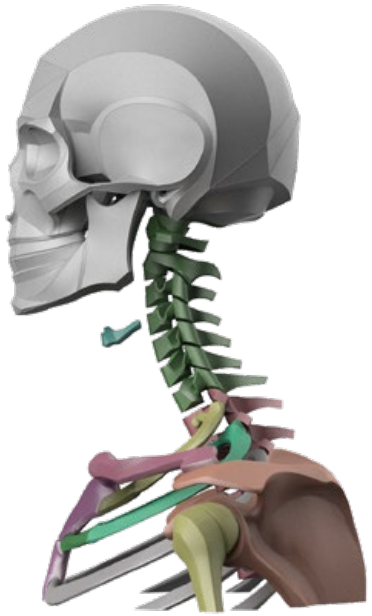


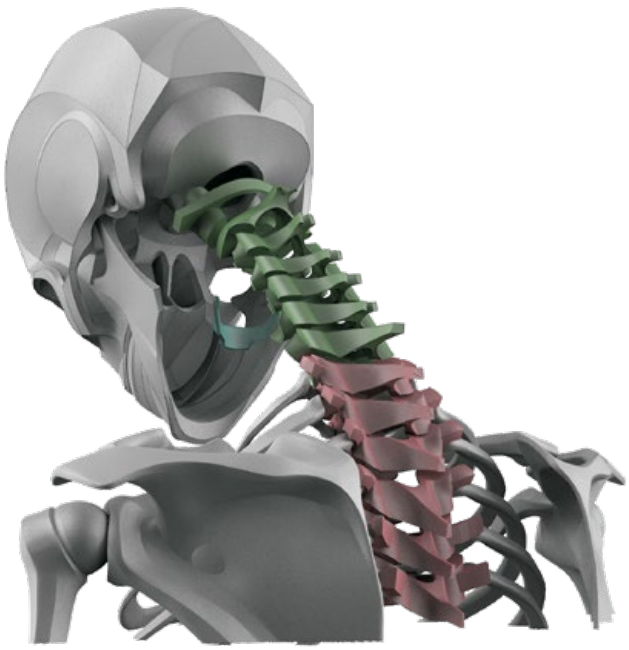
The **7th cervical** (**C7**) vertebra is the largest and most inferior vertebra in the neck region. Unlike the other cervical vertebrae, the **C7** has a large spinous process that protrudes posteriorly toward the skin at the back of the neck. This spinous process can be easily seen and felt at the base of the neck, making it a prominent landmark of the skeleton and giving the **C7** the name vertebra prominens.

Flexion

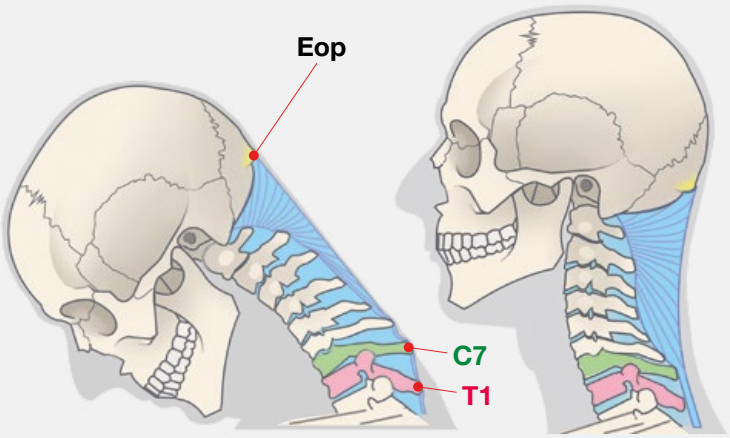
MOVEMENTS OF THE NECK

Anatomy





Nuchal ligament (Nl)

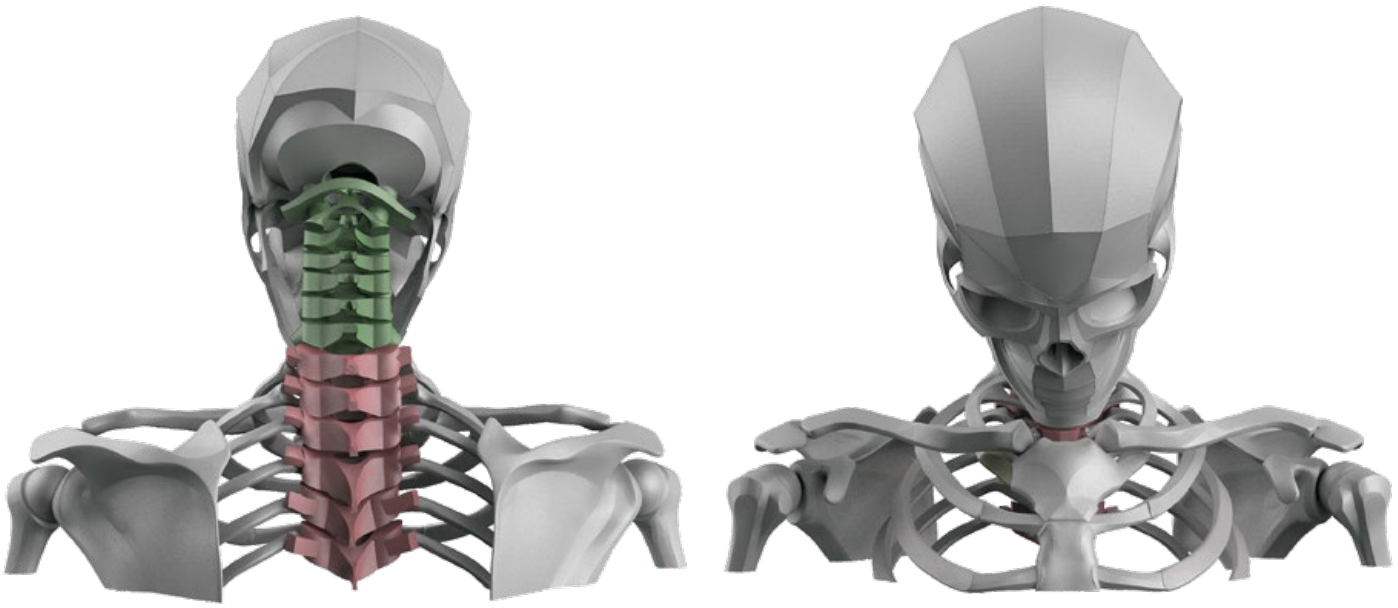


The **nuchal ligament** (**Nl**) is a sheet of strong fibrous tissue that extends from the **external occipital protuberance** (**Eop**) to the **7th cervical vertebra C7**. The function of the nuchal ligament is to limit head and neck hyperflexion and provide an attachment surface for the neck extensor muscles to Trapezius and Splenius capitis.

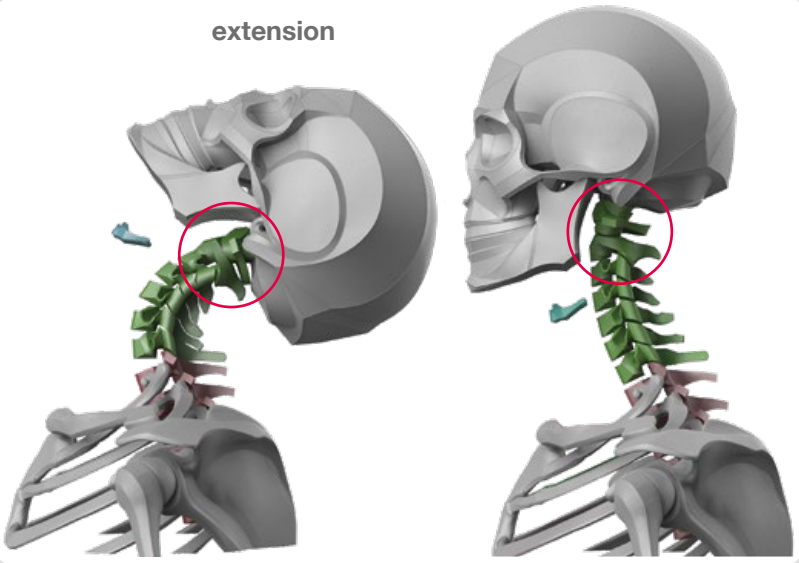
Flexion

MOVEMENTS OF THE NECK

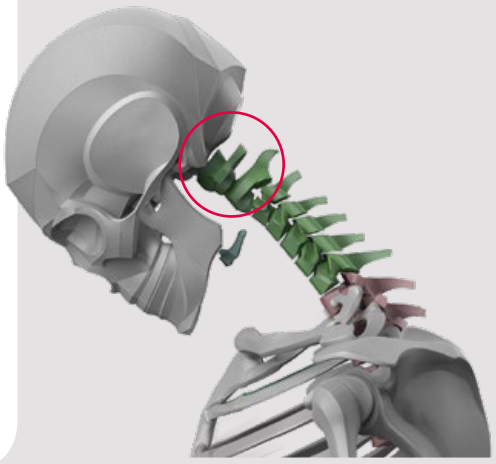
Anatomy



extension



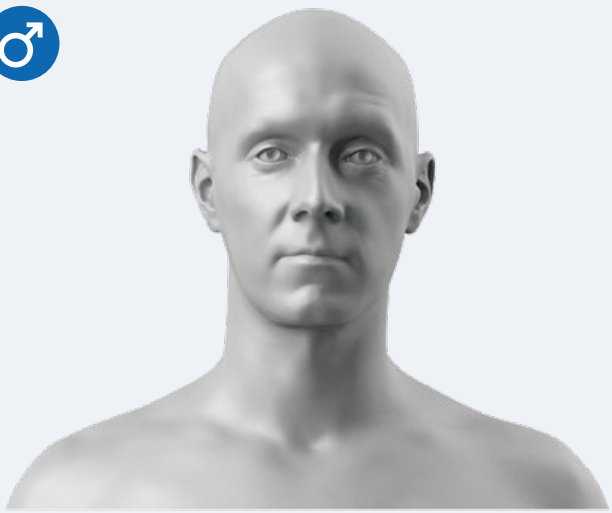
flexion

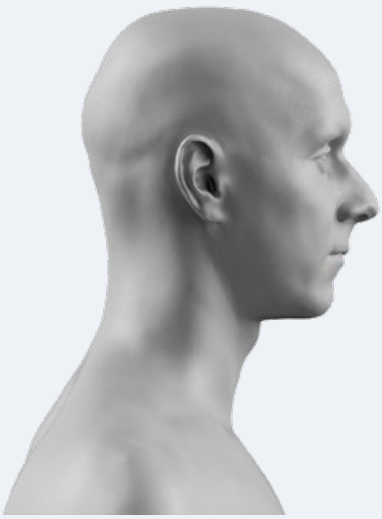


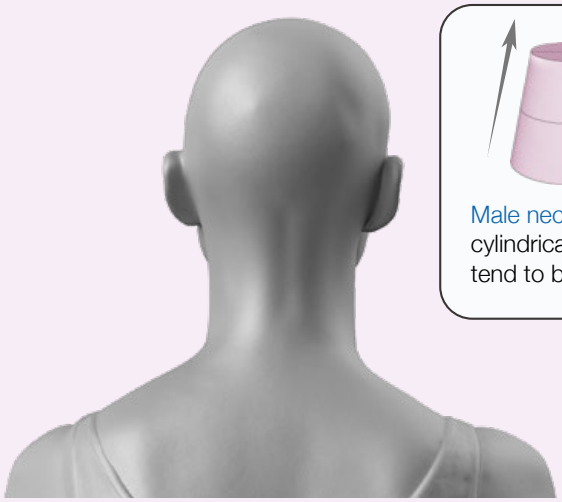
Approximately 50% of cervical flexion-extension and rotation occurs in the upper cervical spine (occiput-C2).

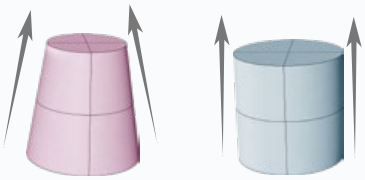
Flexion

FEMALE VS MALE NECK



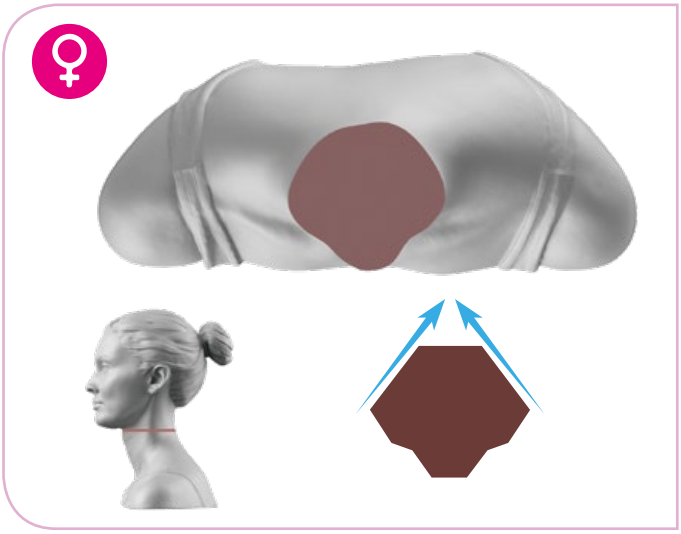


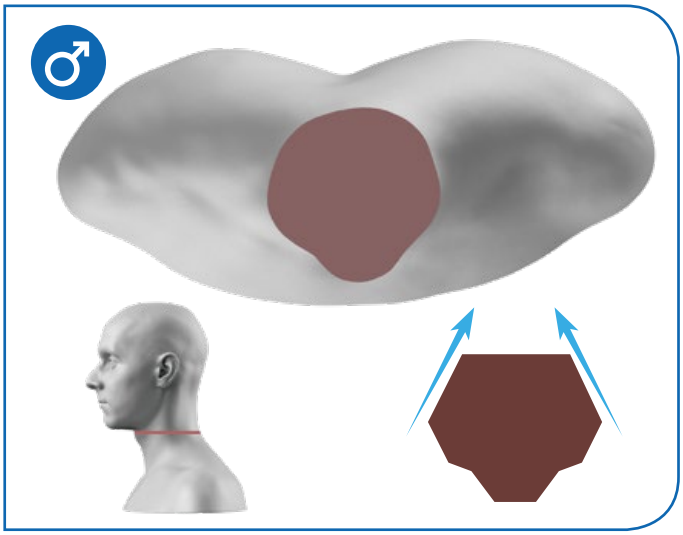




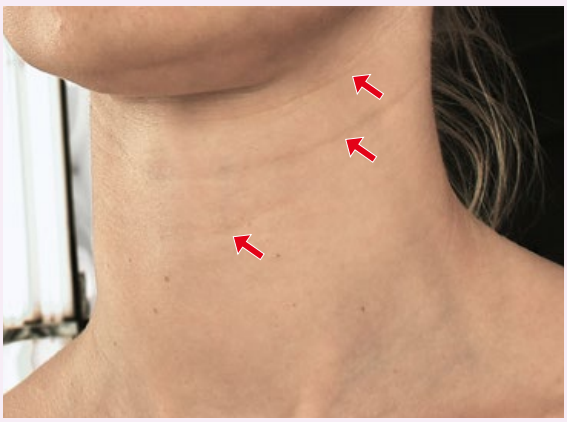
Male neck general shape is roughly cylindrical in shape, female necks tend to be more conical

FEMALE VS MALE NECK

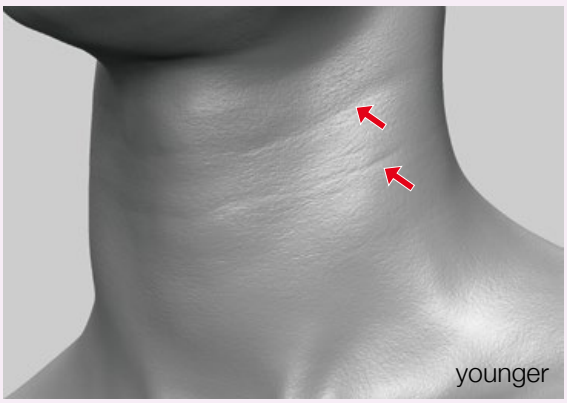


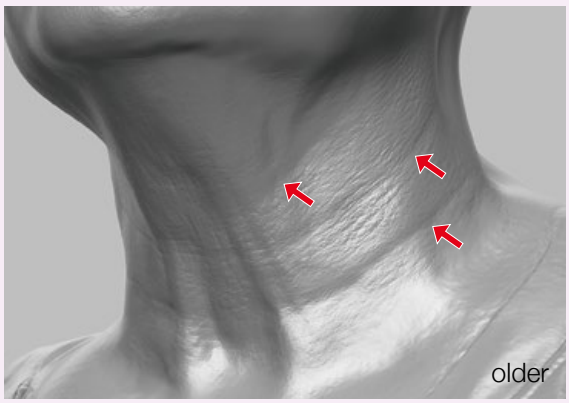


Female necklace lines (Fnl)

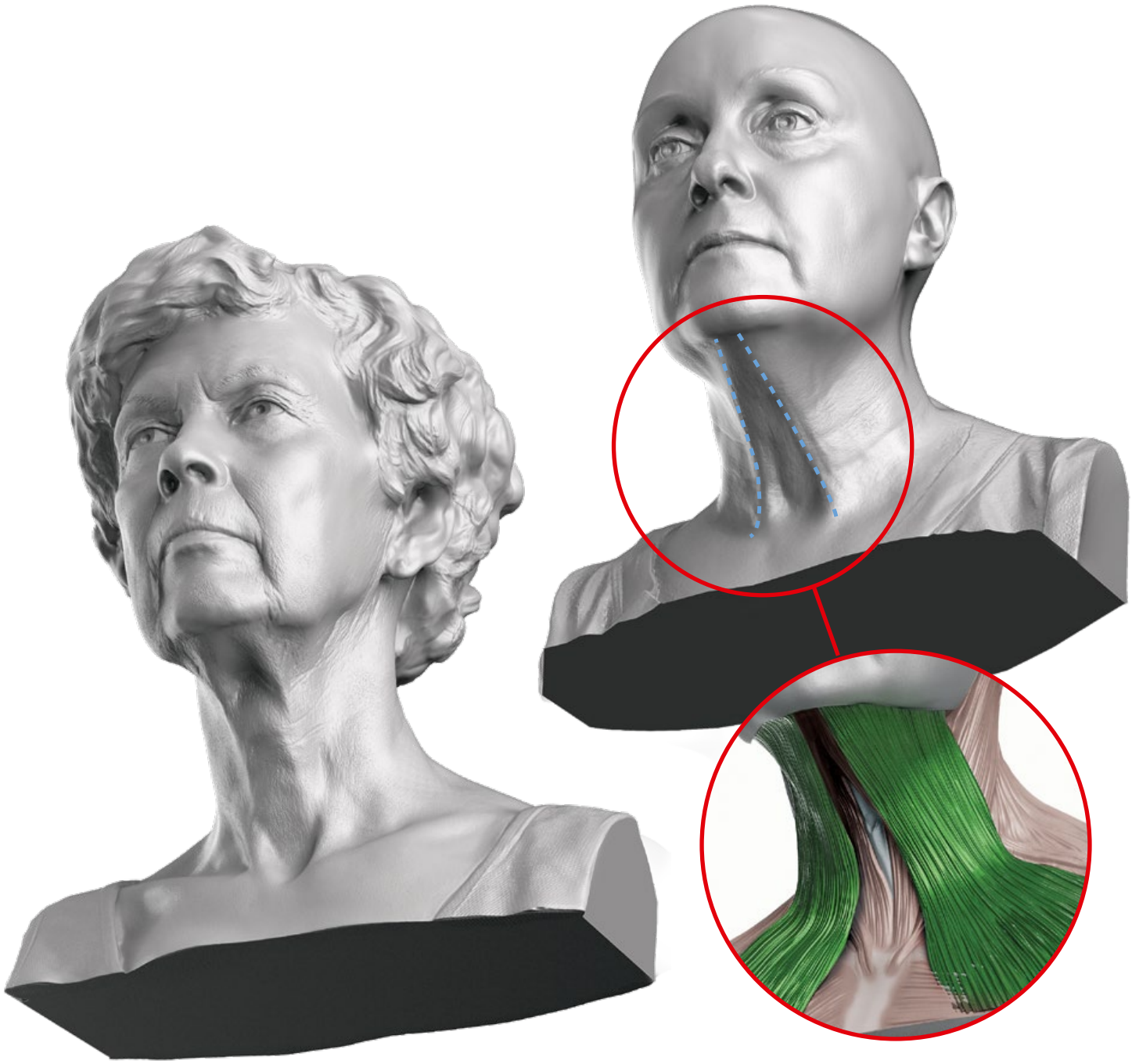


Also known as horizontal neck wrinkles and they can appear on female necks at any age. Some amount of Fnl, usually 2–3, are inevitable. If a woman or young girl has more of these lines, it doesn't mean she is spending more time on the phone.
People with lighter skin tend to be more susceptible to environmental aging and develop Fnl at an earlier age than those with darker skin types. Black women have the fewest Fnl and other wrinkle scores.





AGING OF THE NECK

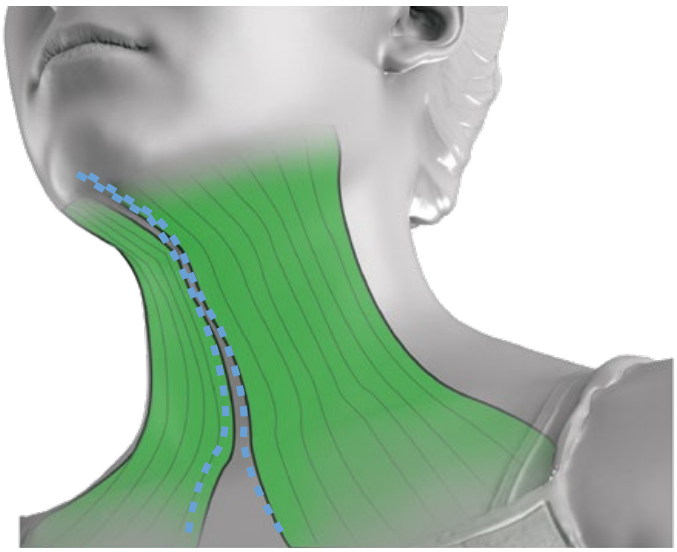


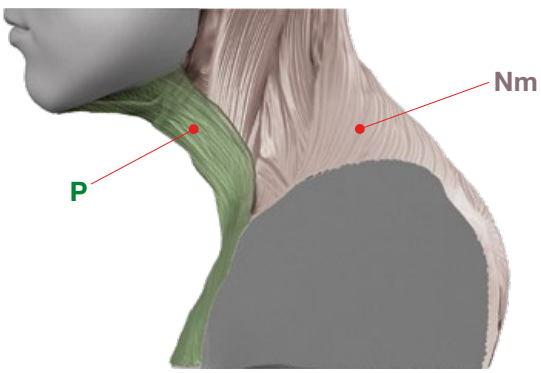
NECK CORDS

The **platysma** is a thin superficial muscle just under the skin of the neck that spreads from the chest and shoulder regions, up the neck to the jaw. As you age, this muscle can appear with very visible **rope-like bands** that, together with sagging skin, creates a 'turkey neck' appearance. These two vertical neck bands become visible due to thin skin, weight loss and aging-related changes in the skin and underlying structures.

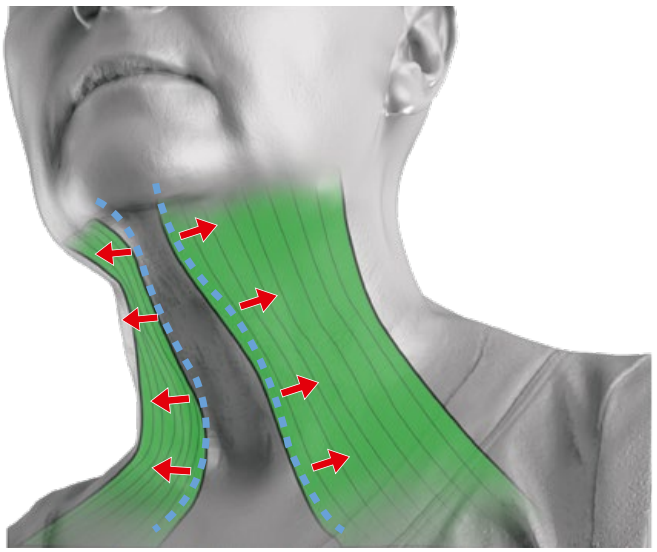
AGING OF THE NECK

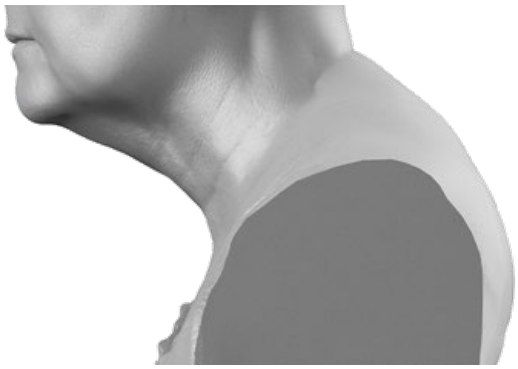
young

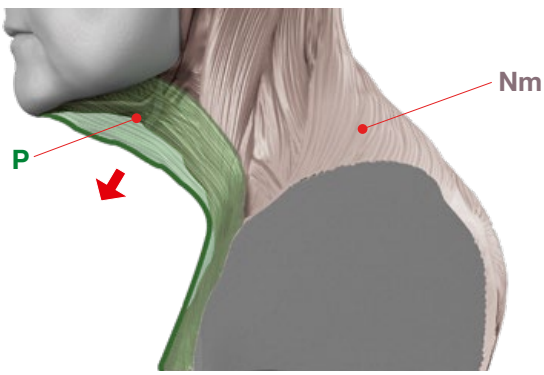




older

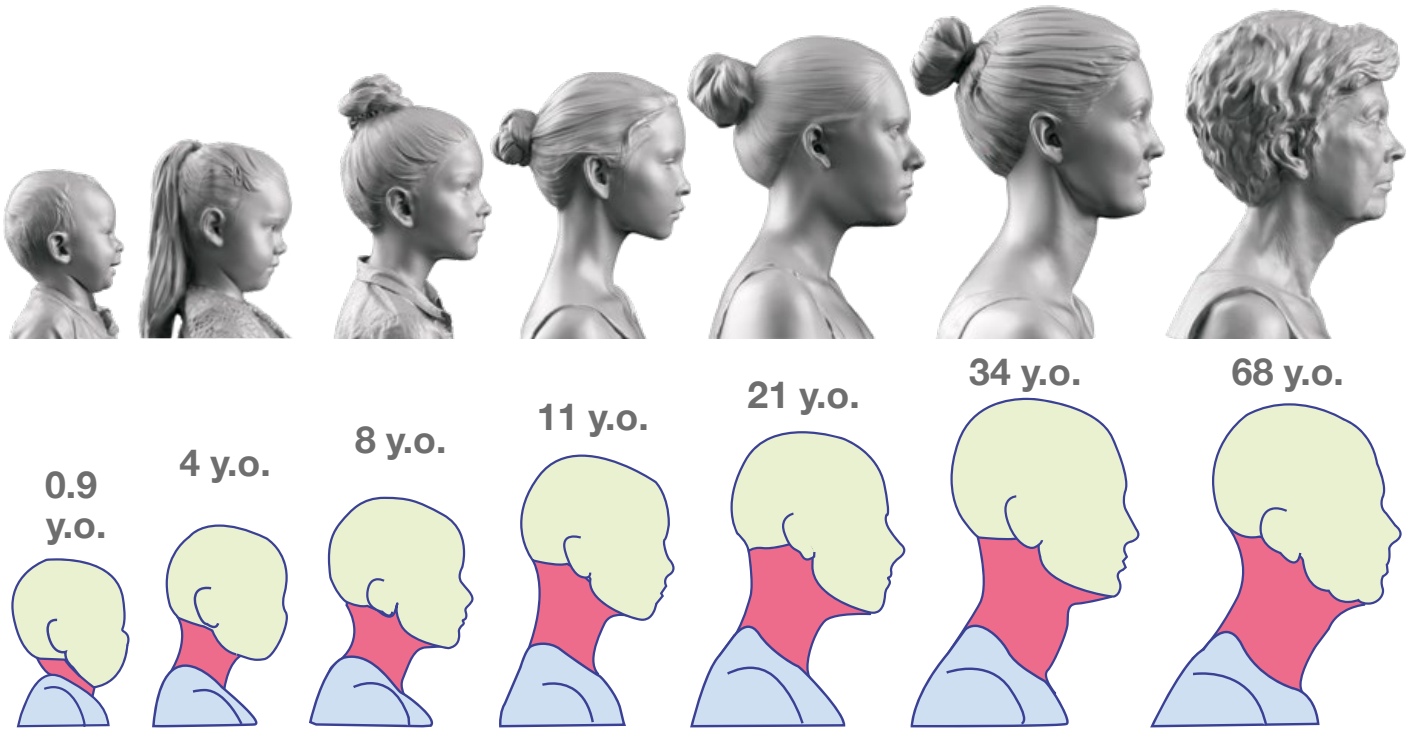


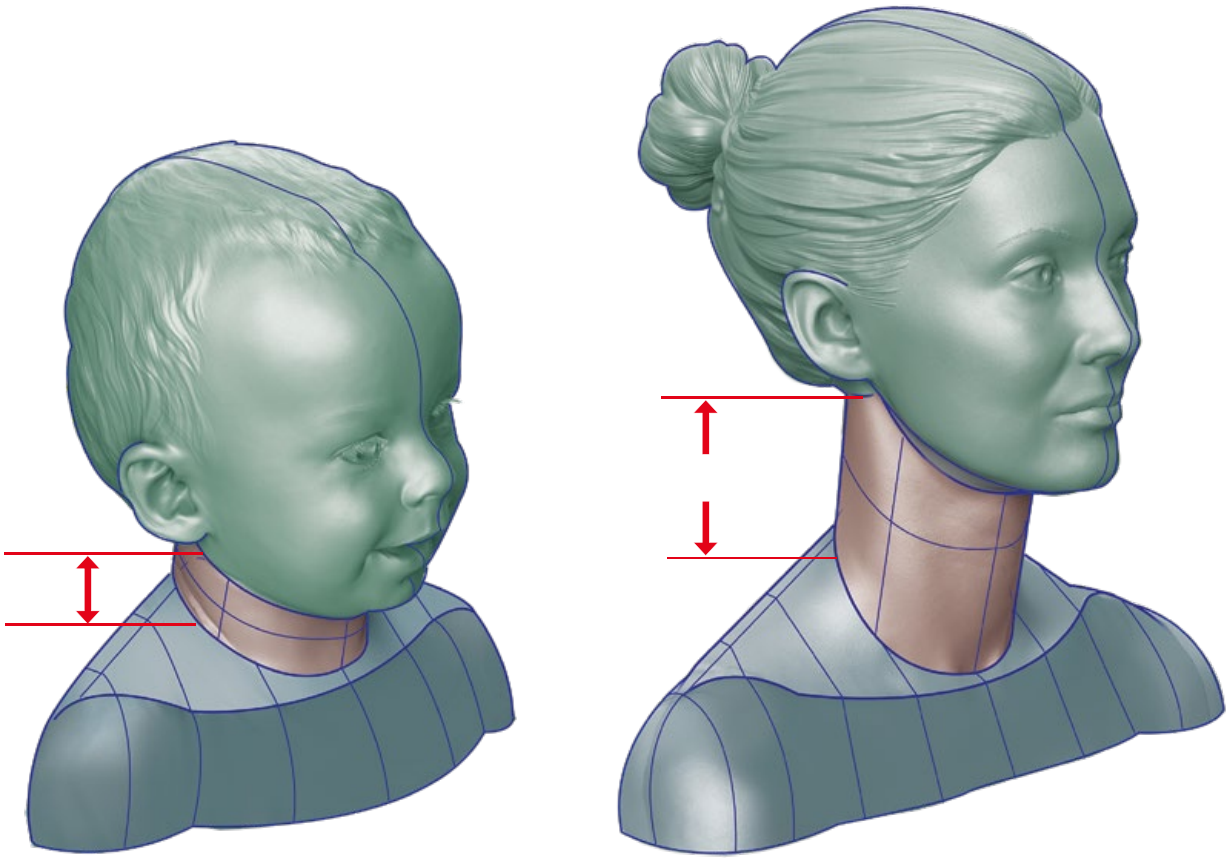




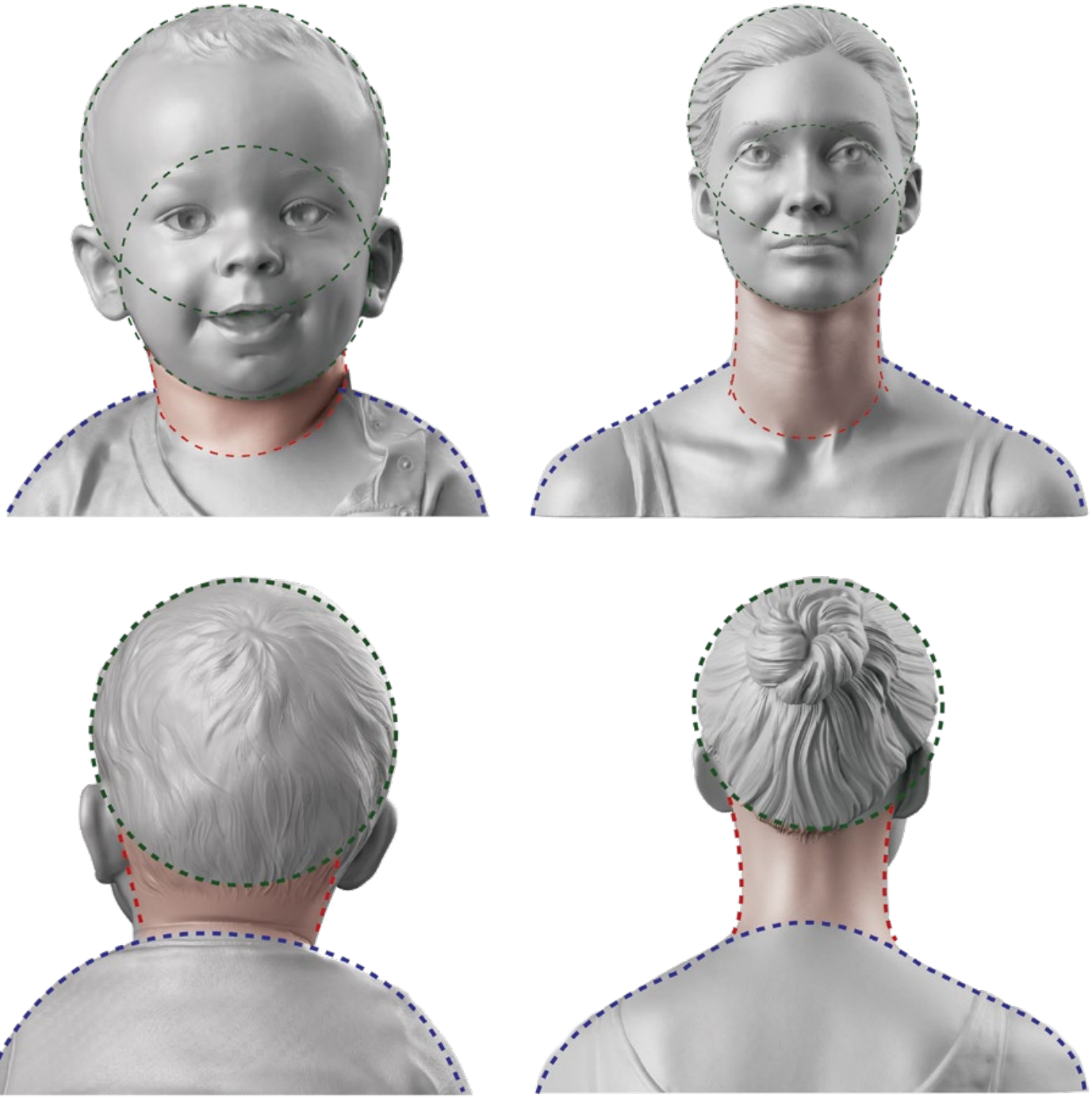
P	Platysma	**Nm**	Neck muscles

DEVELOPMENT OF THE NECK





DEVELOPMENT OF THE NECK



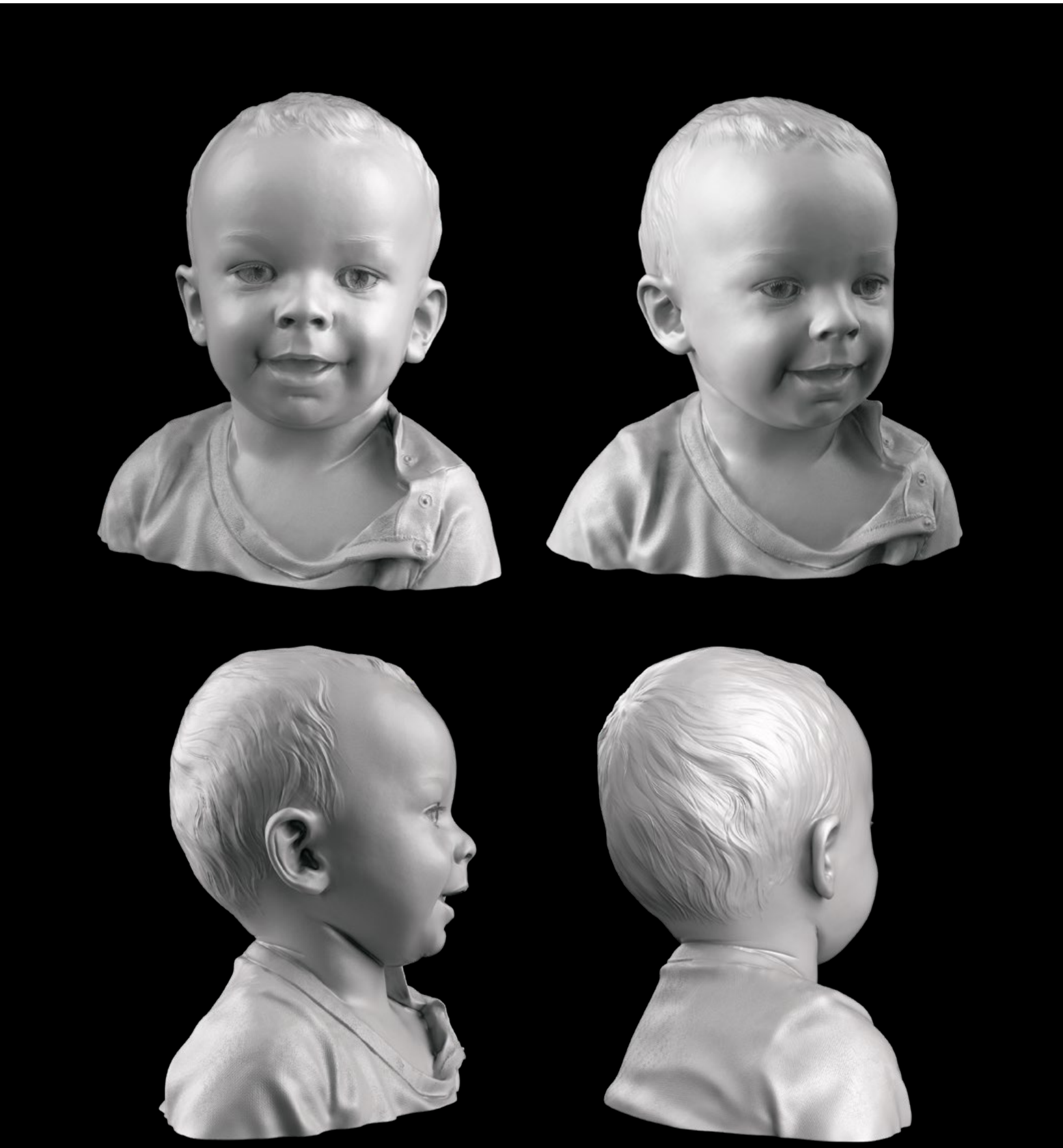
The neck muscles of young children generally are not developed sufficiently to dampen violent head movement. The disproportionately large head, the weak cervical spine musculature, and laxity, can subject the infant to uncontrolled and passive cervical spine movements. Shortness limits of the neck in the first years of life compensate for it and protect the head from trauma.

Photogrammetry scans

and form analysis of the head and neck

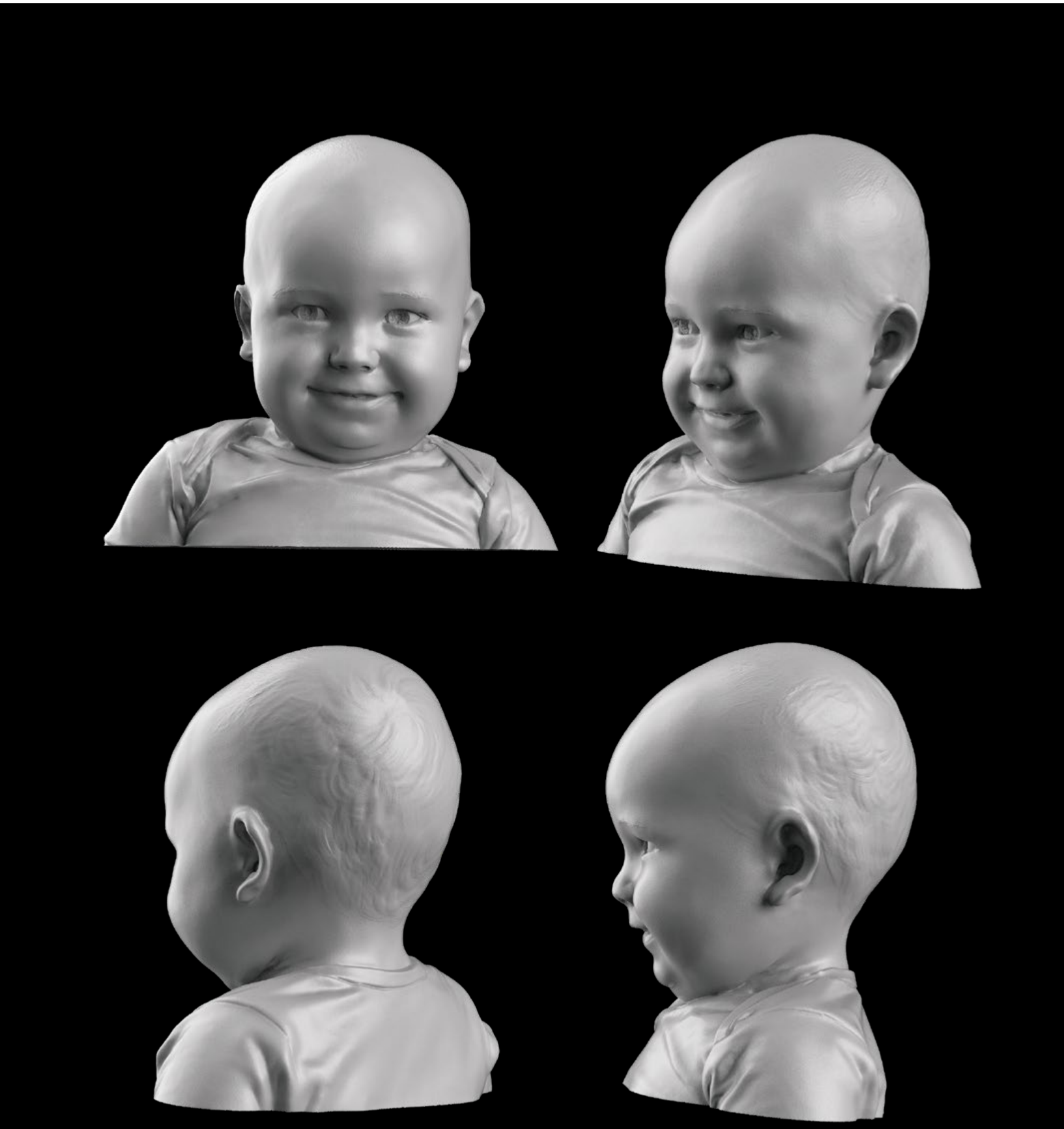
Olivia
sex: female | age: 6 m | type: photoscan

Olivia
sex: female | age: 6 m | type: block-out

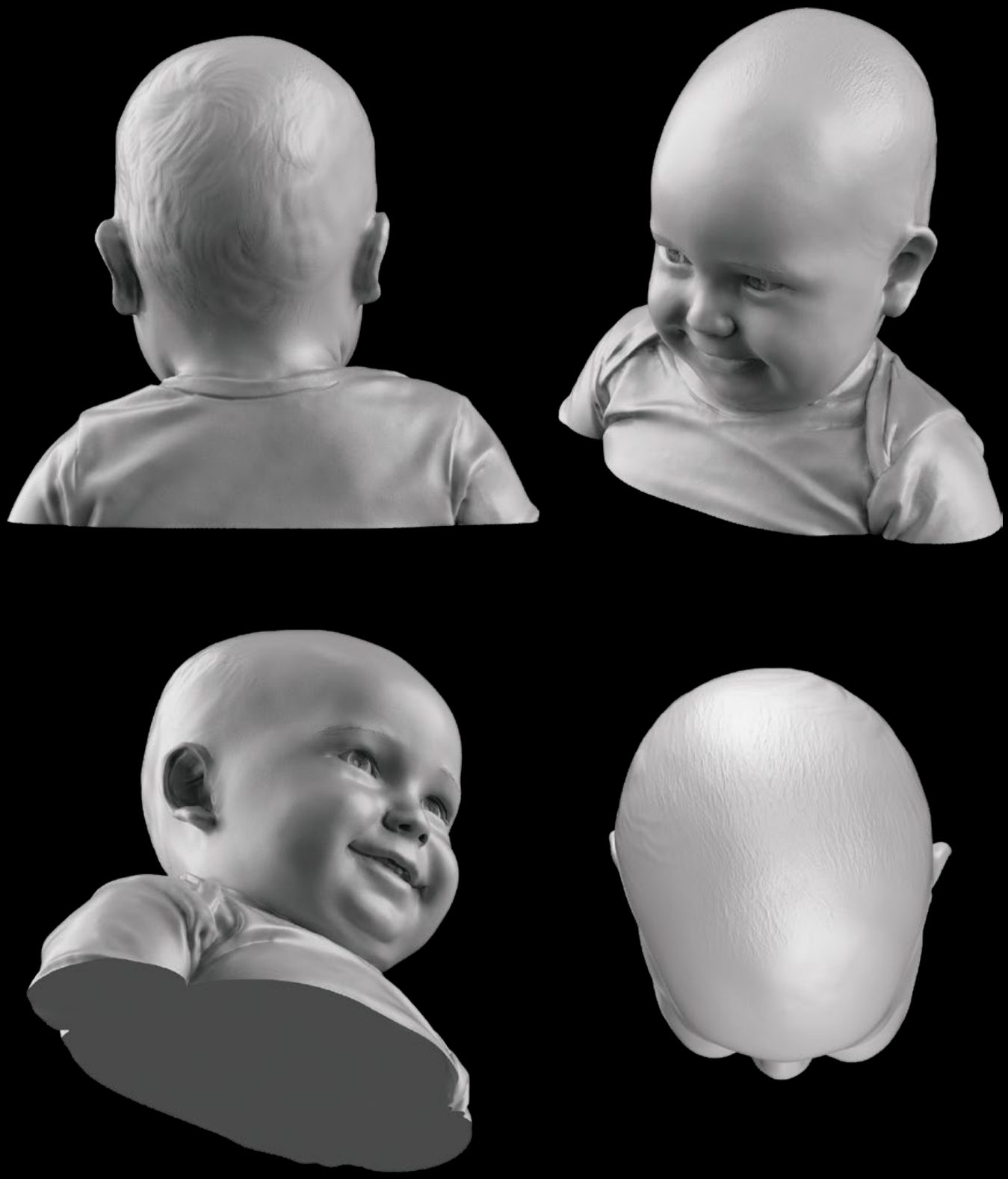


Oliver
sex: male | age: 9 m | type: photoscan

Oliver
sex: male | age: 9 m | type: block-out



Neo
sex: male | age: 1 | type: photoscan



Neo
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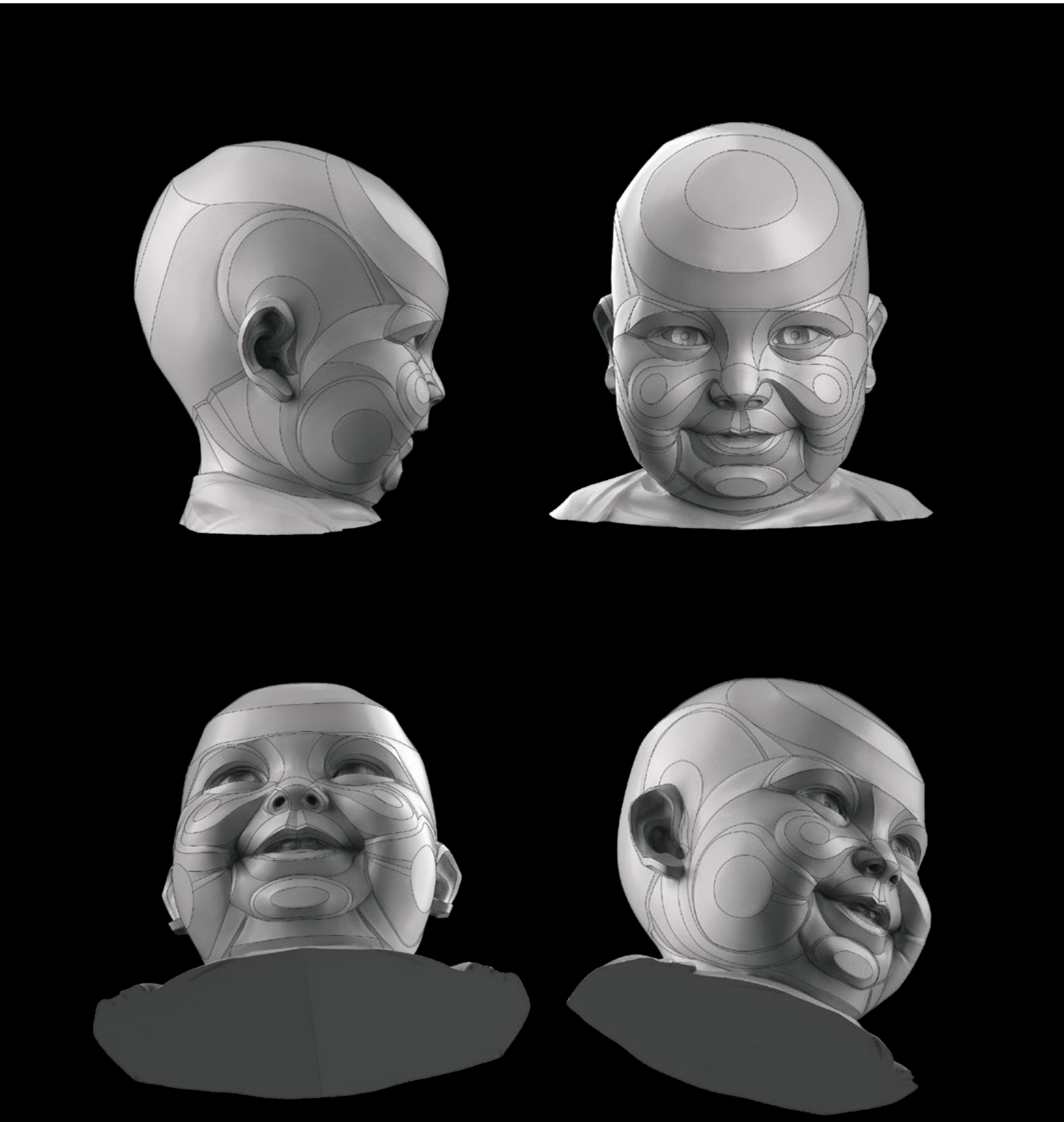

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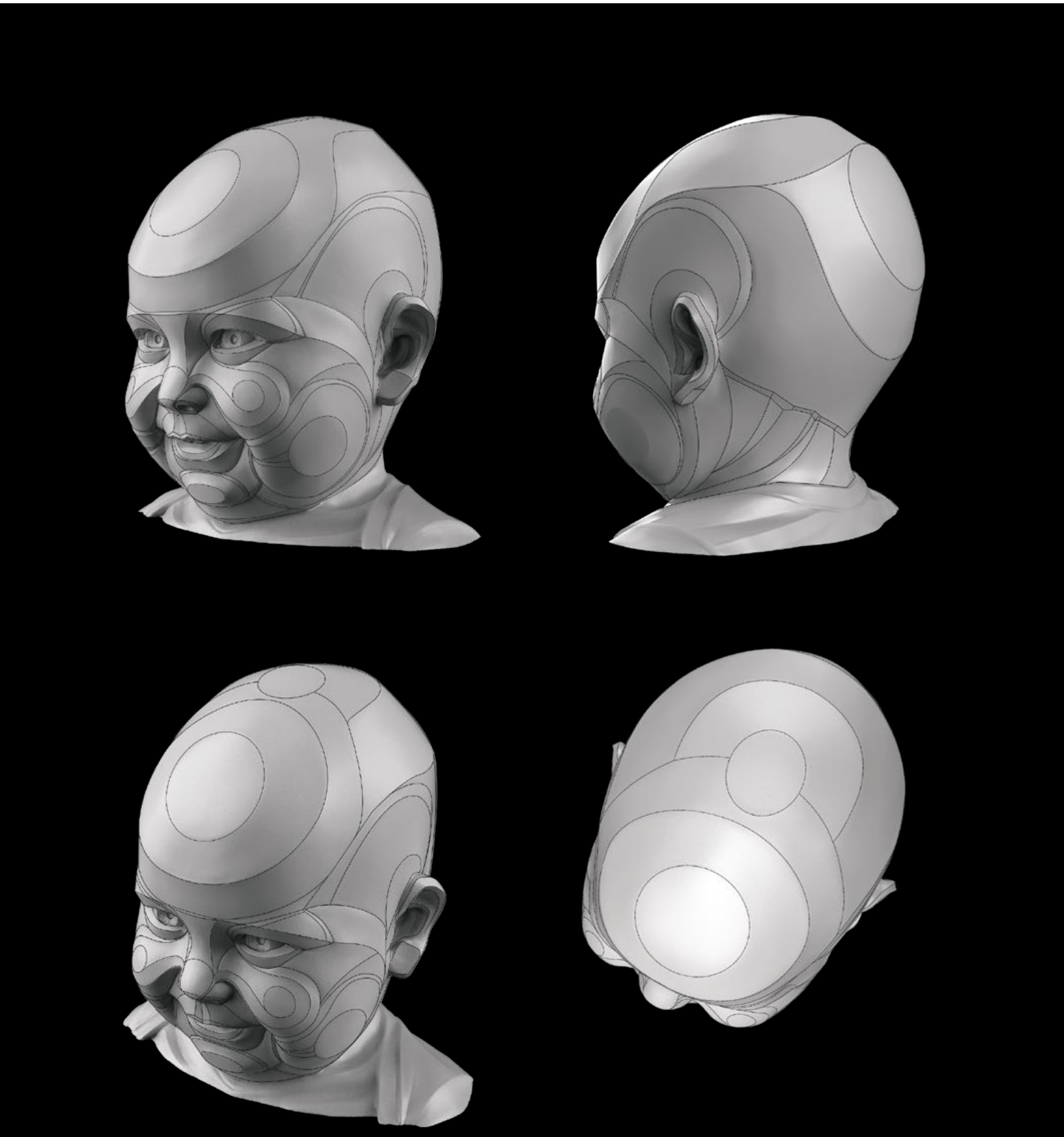

Neo
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Elza
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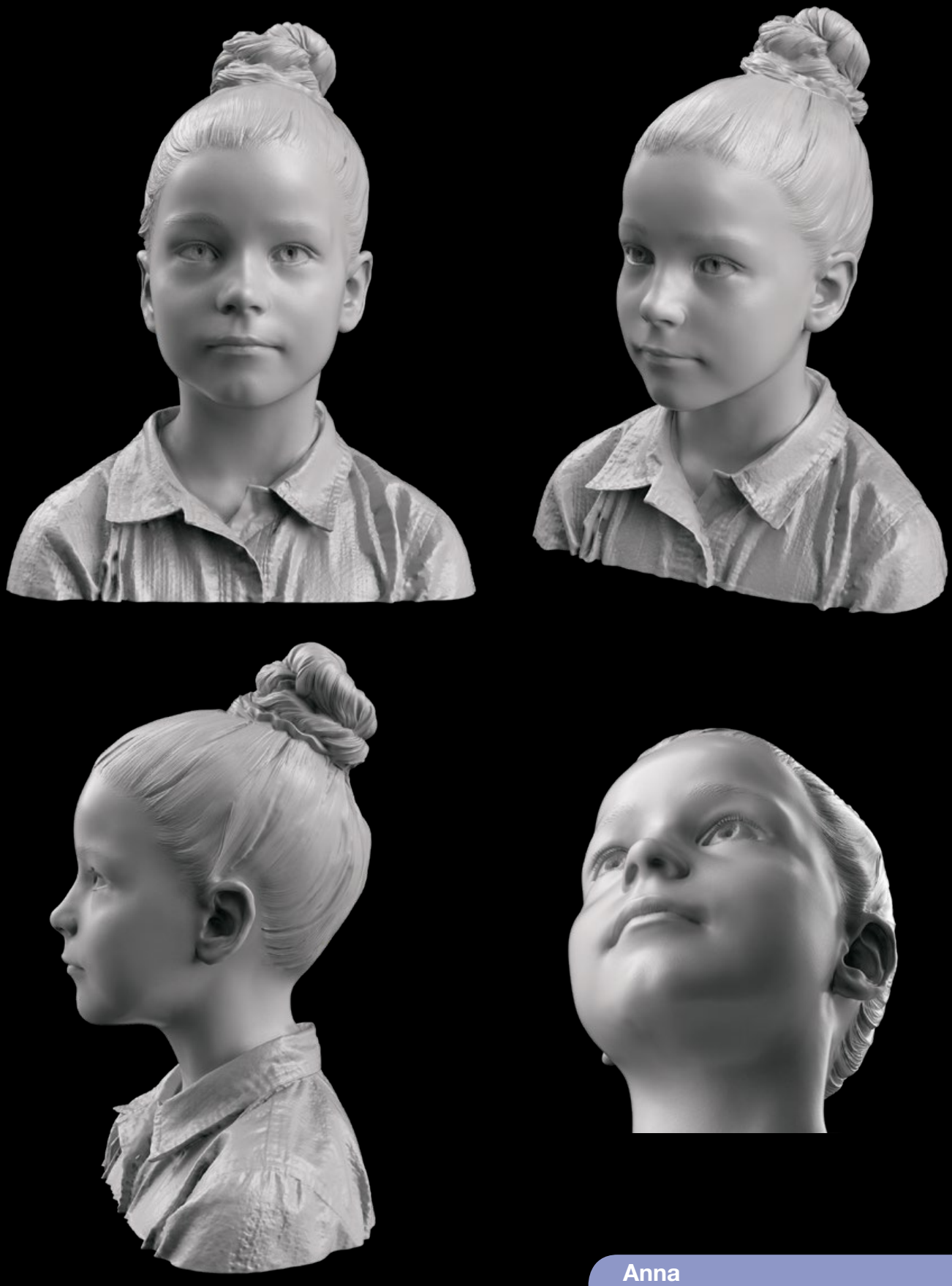

Anna
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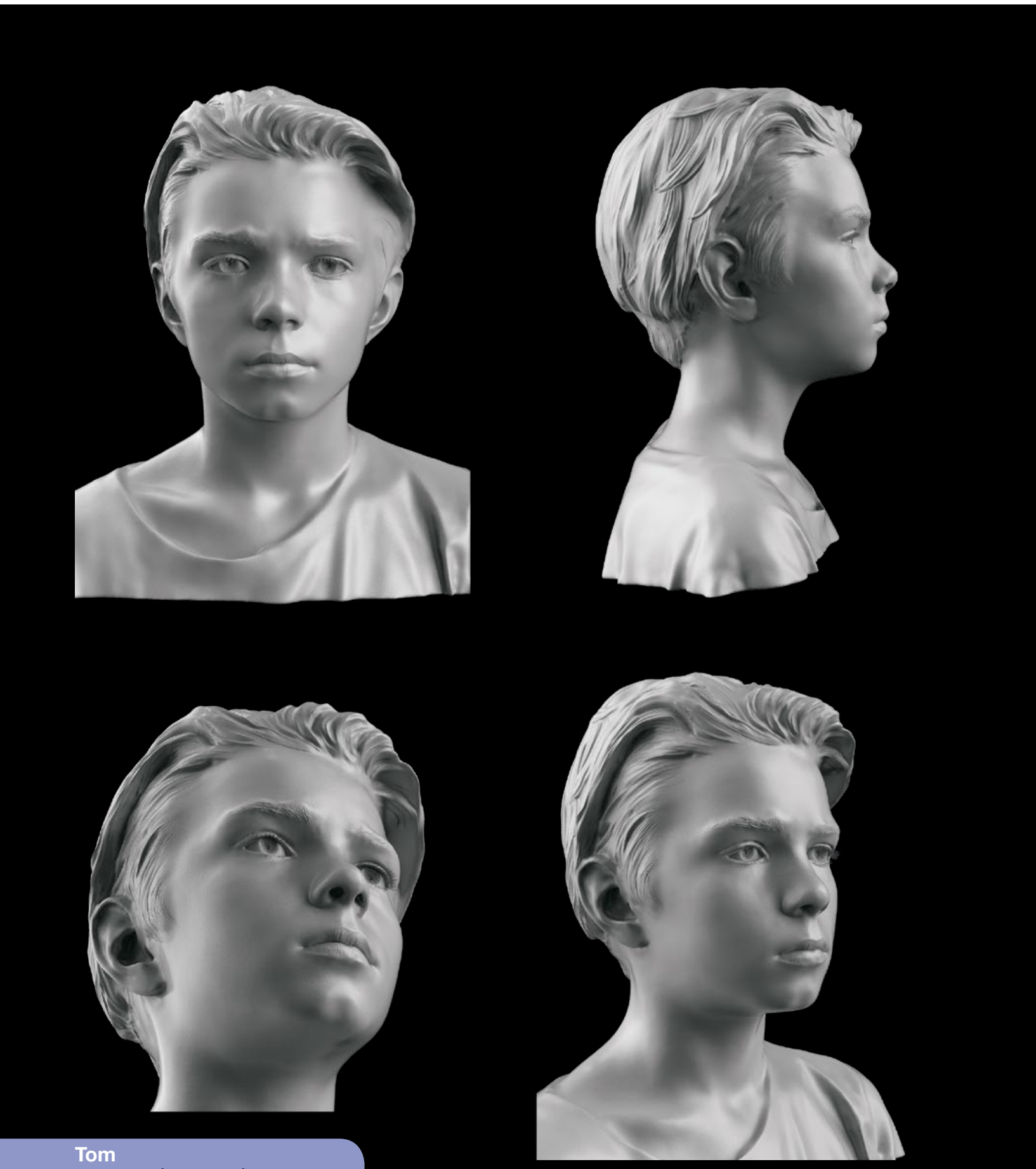

Tom
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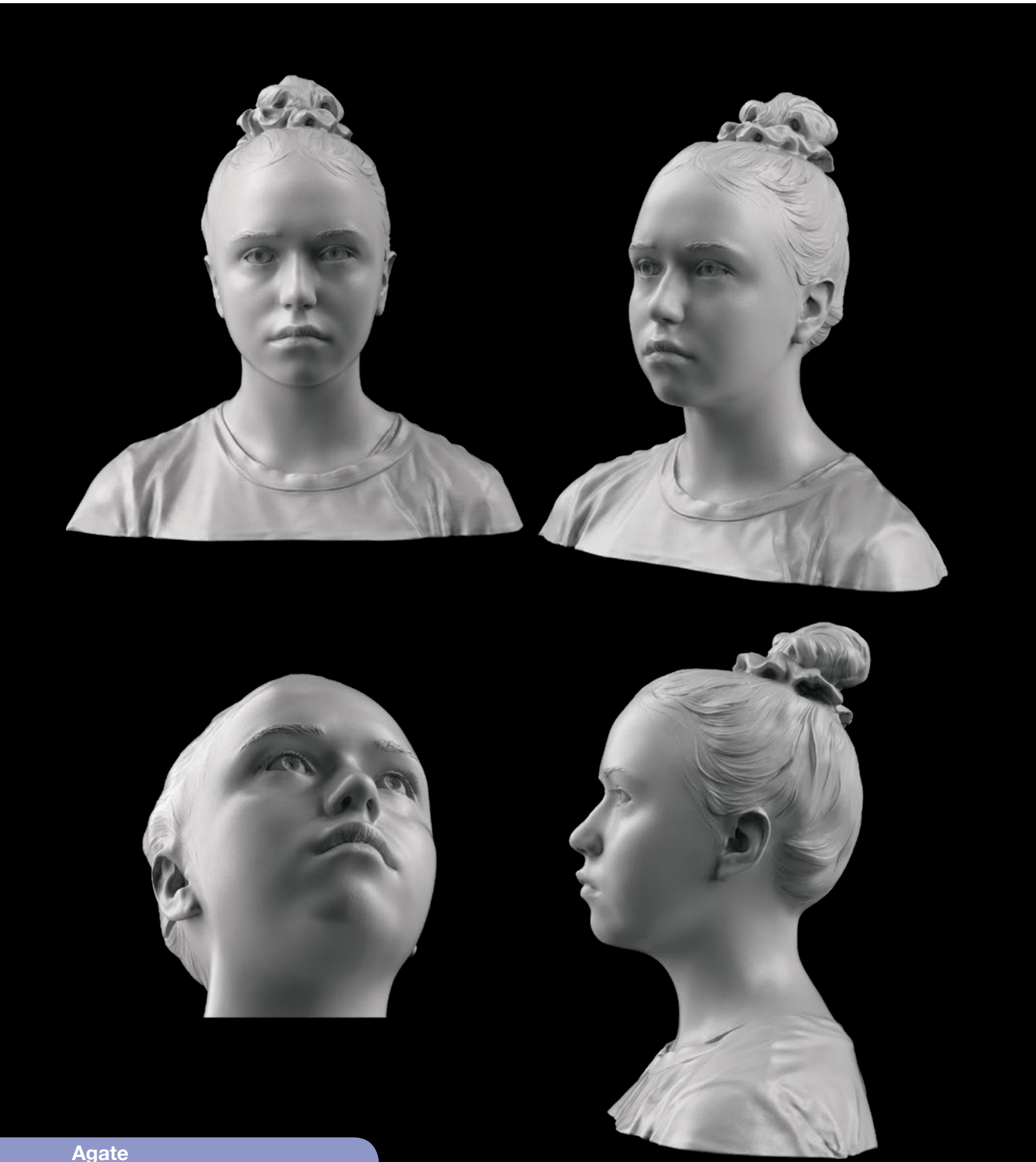
Jacob
sex: male | age: 15 | photoscan



Agate
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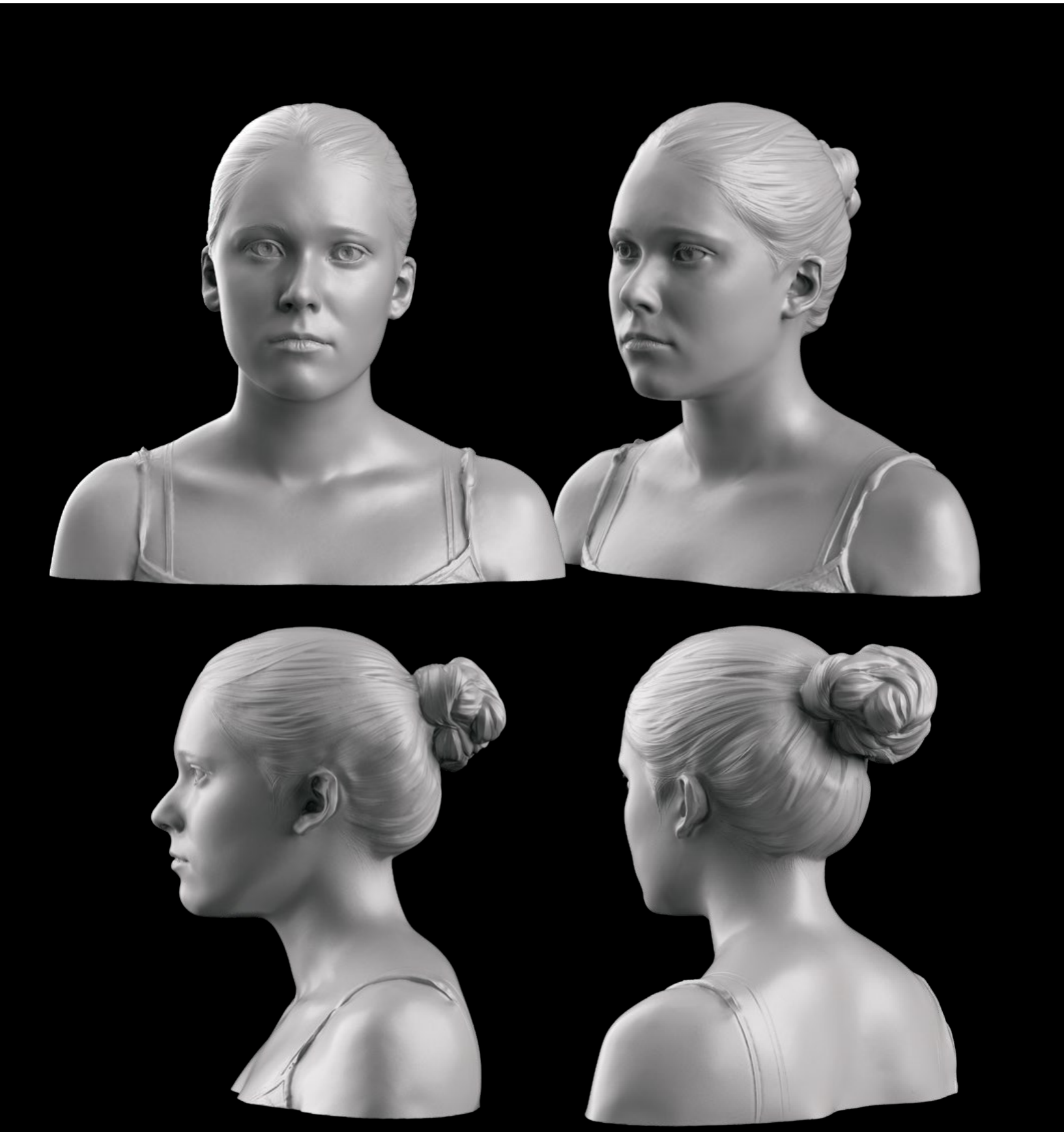
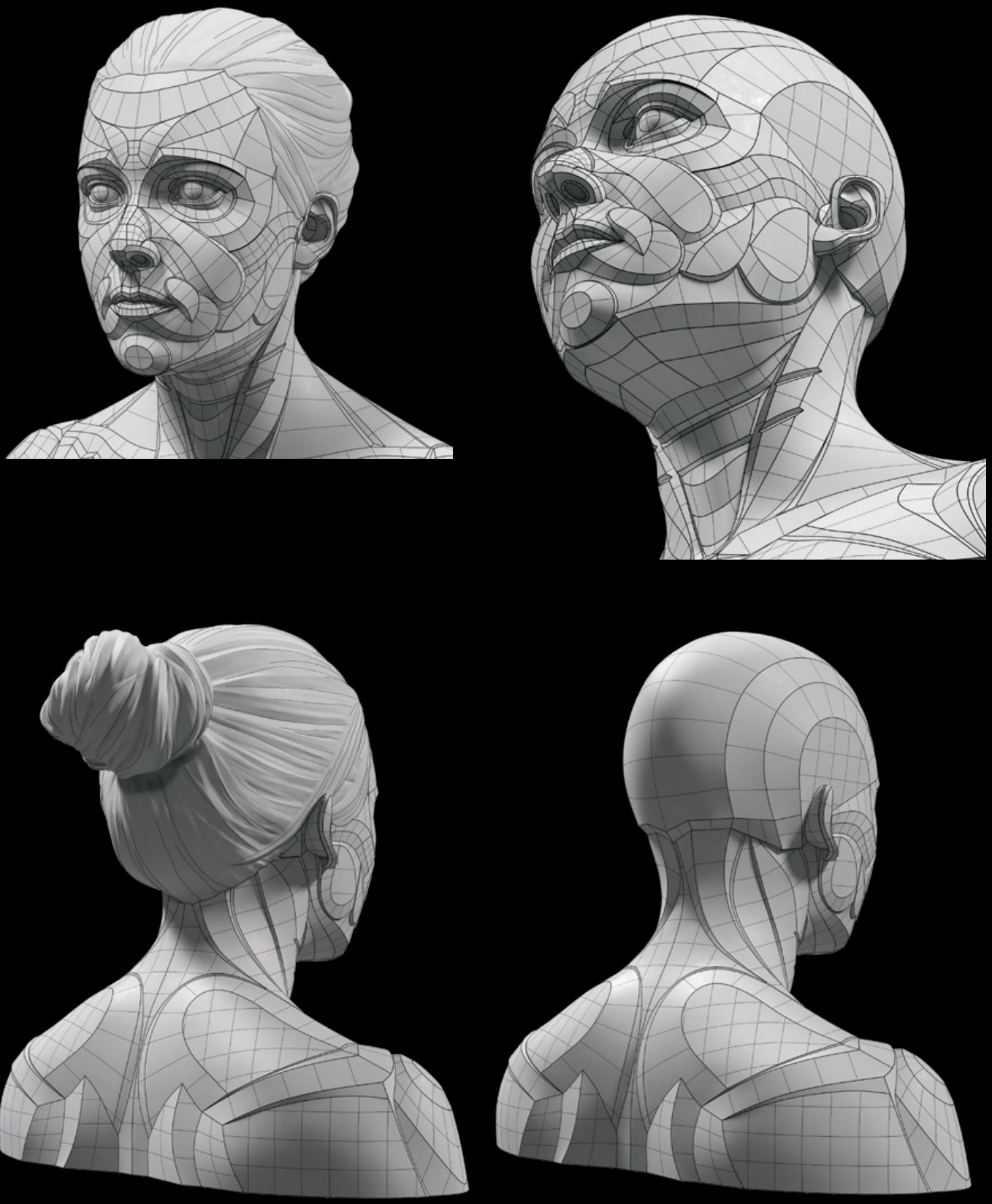
Ulla
sex: female | age: 11 | photoscan



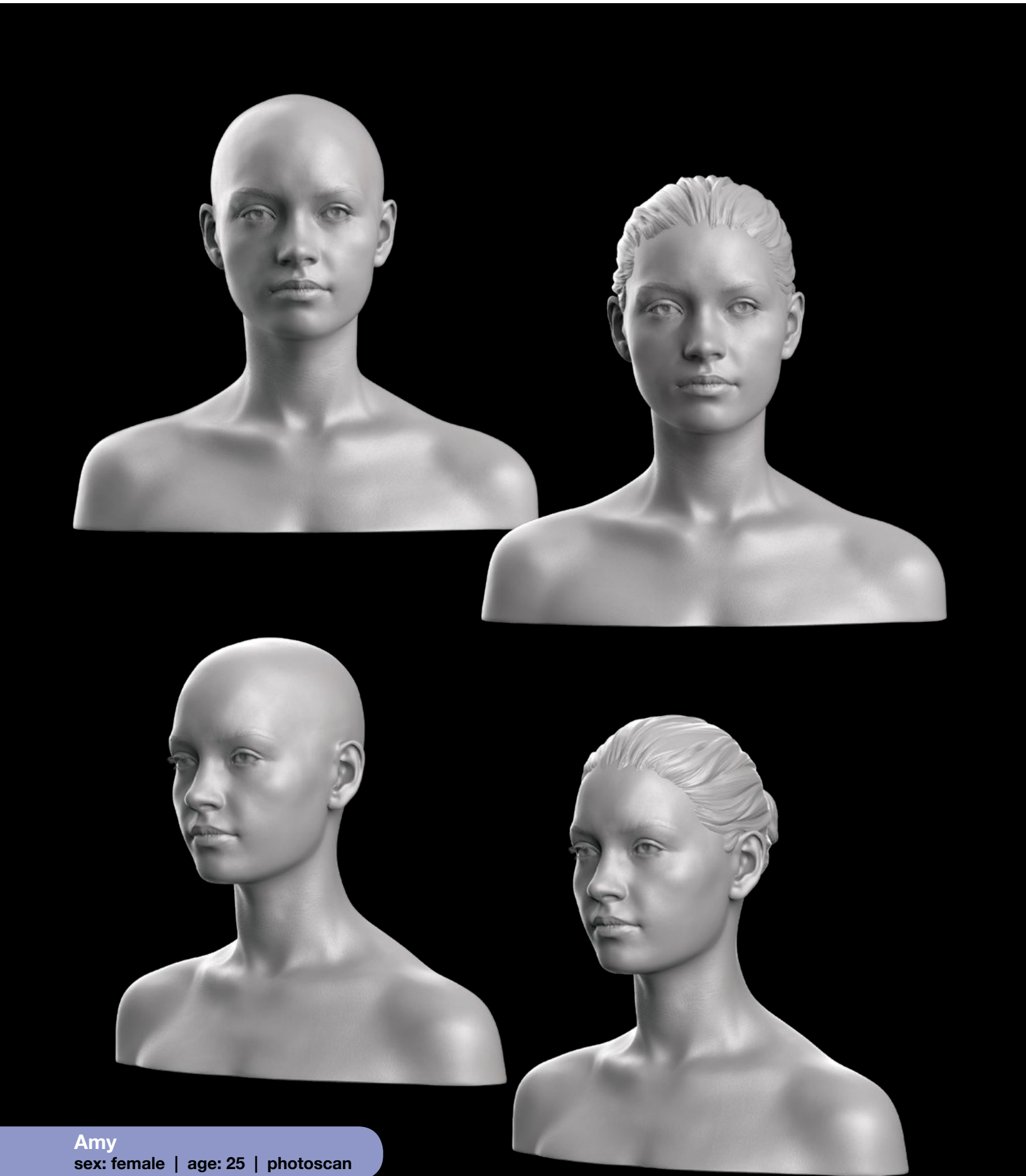
Helena
sex: female | age: 21 | photoscan

Helena
sex: female | age: 21 | photoscan

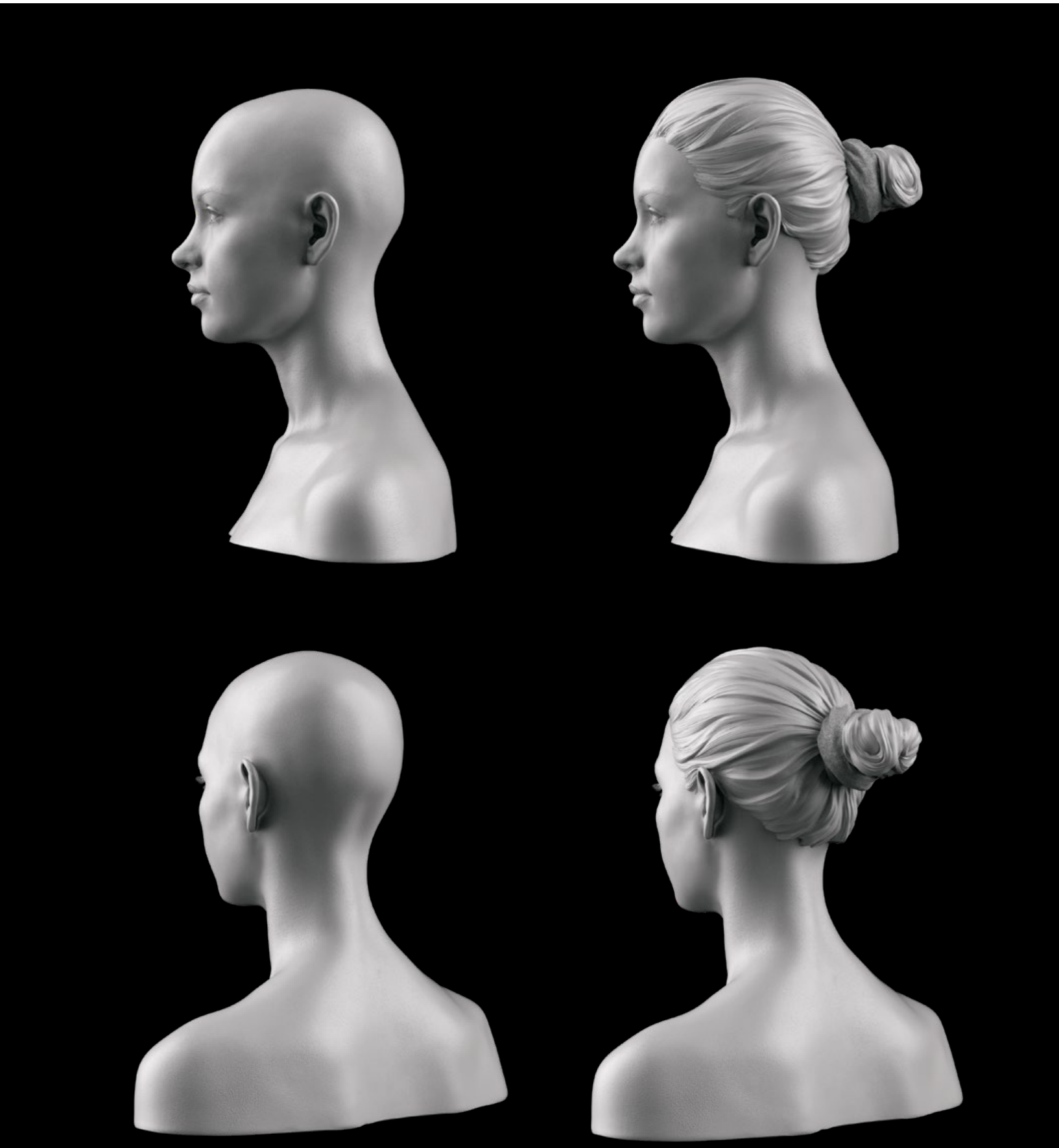
Helena
sex: female | age: 21 | block-out



Helena
sex: female | age: 21 | block-out



Amy
sex: female | age: 25 | photoscan



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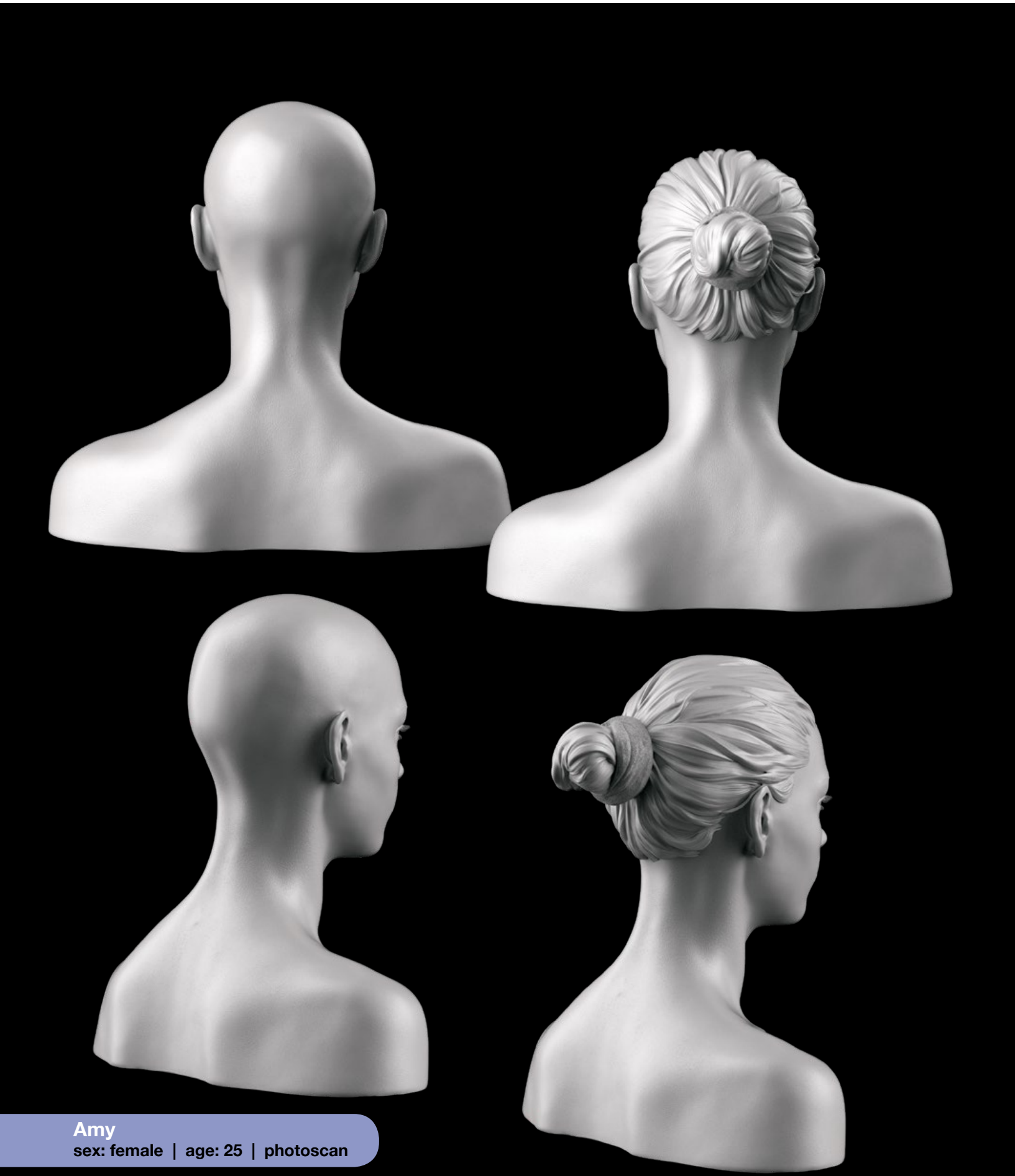
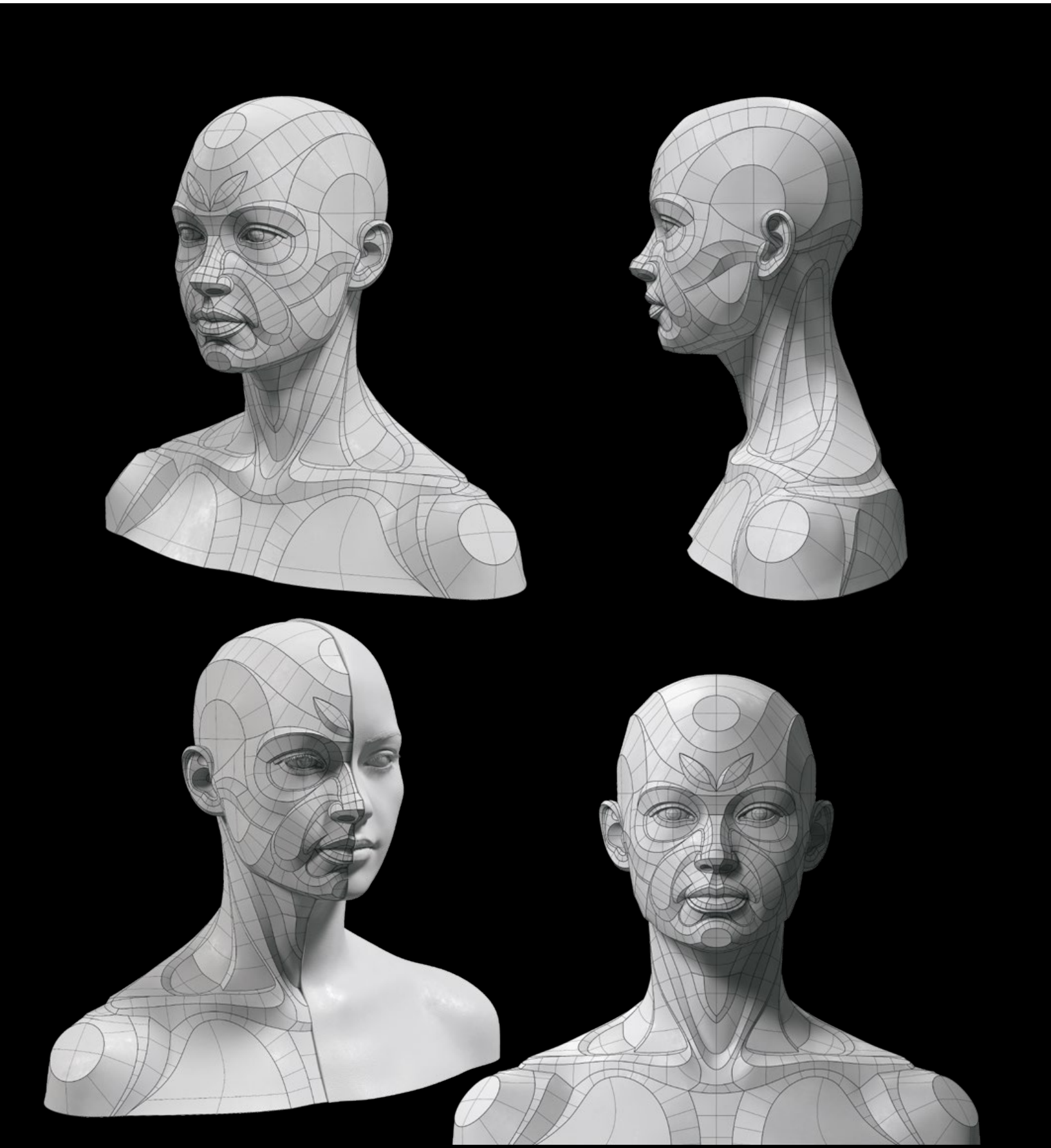
sex: female | age: 25 | photoscan



Amy
sex: female | age: 25 | photoscan

Amy
sex: female | age: 25 | photoscan



Amy
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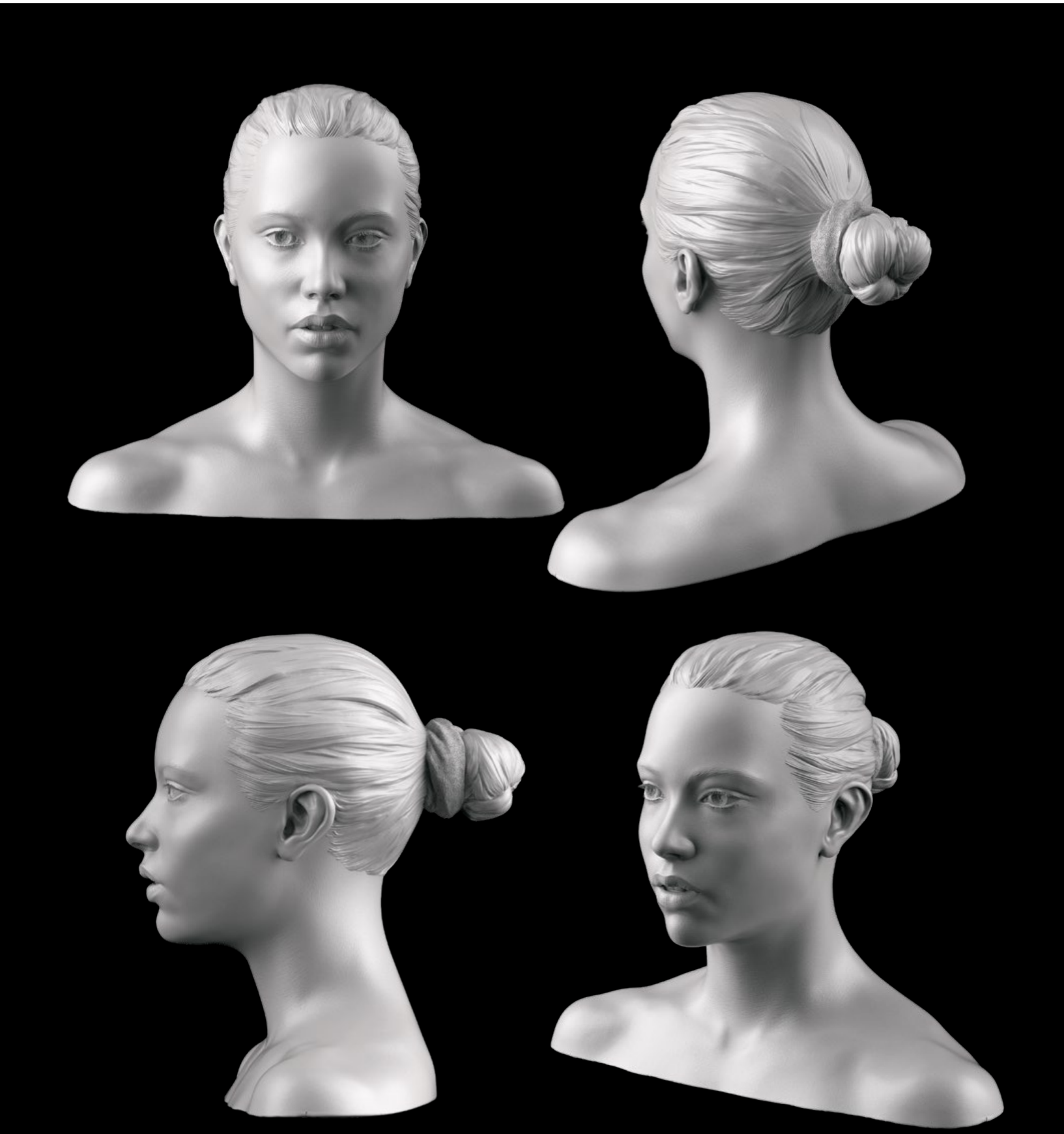
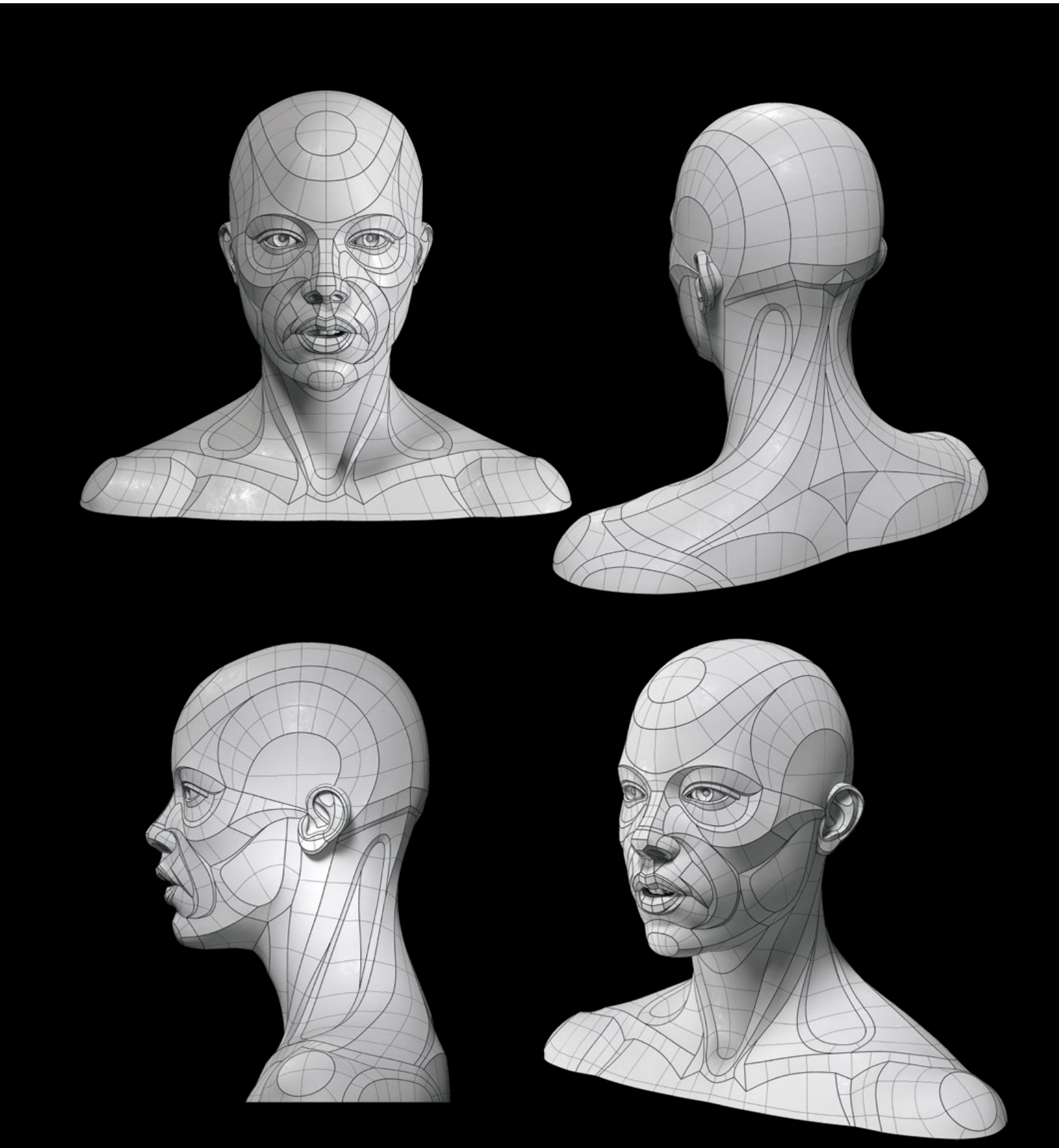


Anete
sex: female | age: 27 | photoscan

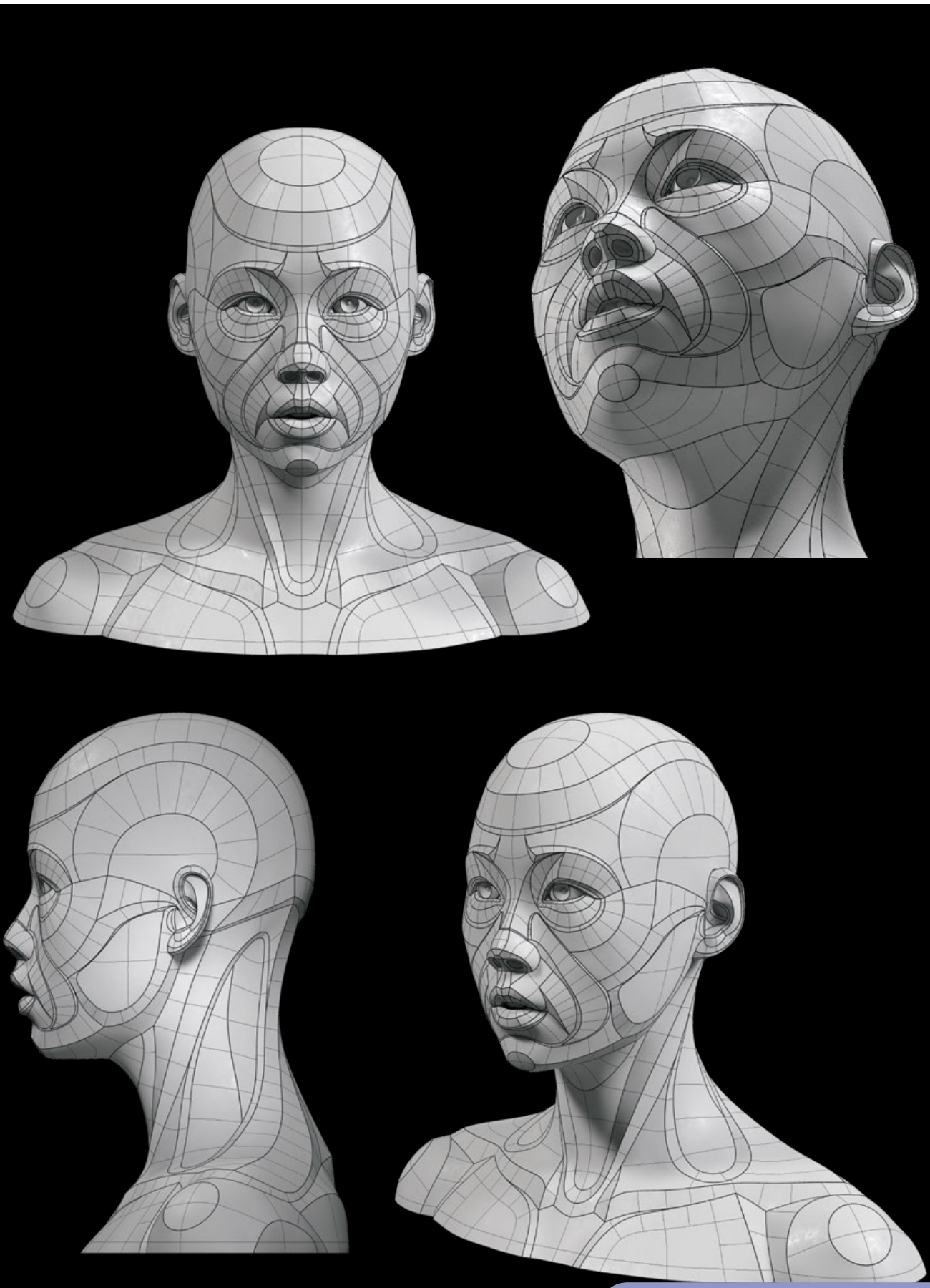


Anete
sex: female | age: 27 | block-out

Lelde
sex: female | age: 34 | photoscan/ block-out

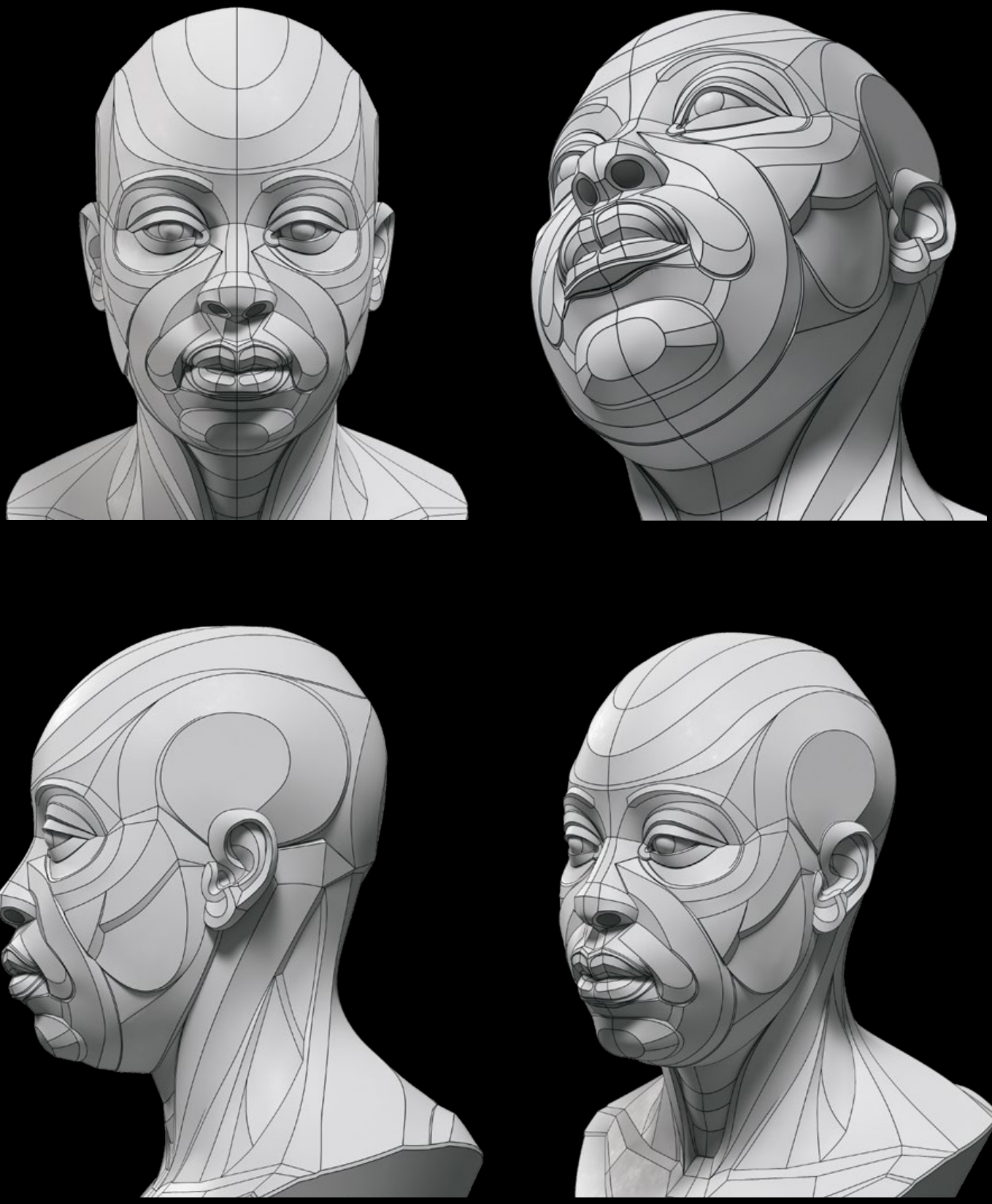
Lelde
sex: female | age: 34 | photoscan/ block-out

Lily
sex: female | age: 22 | photoscan



Lily
sex: female | age: 22 | block-out

Veronica
sex: female | age: 25 | photoscan

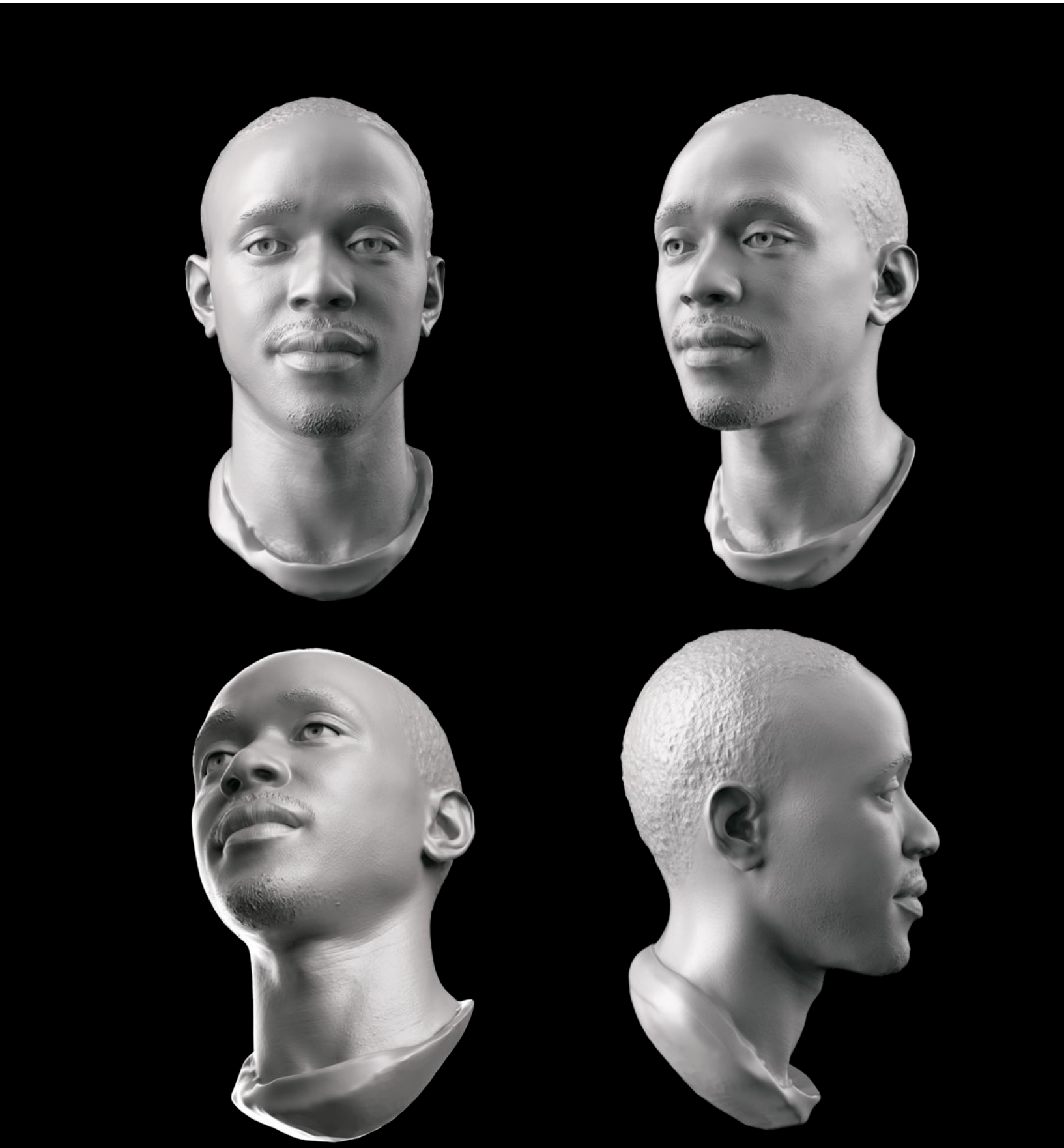


Veronica
sex: female | age: 25 | block-out

Saul
sex: male | age: 23 | photoscan

Kang
sex: male | age: 29 | photoscan

Marcus
sex: male | age: 24 | photoscan



Tony
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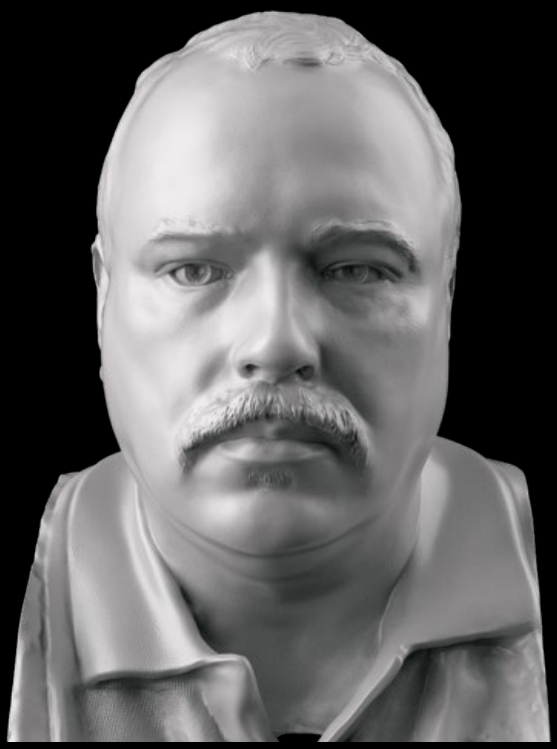

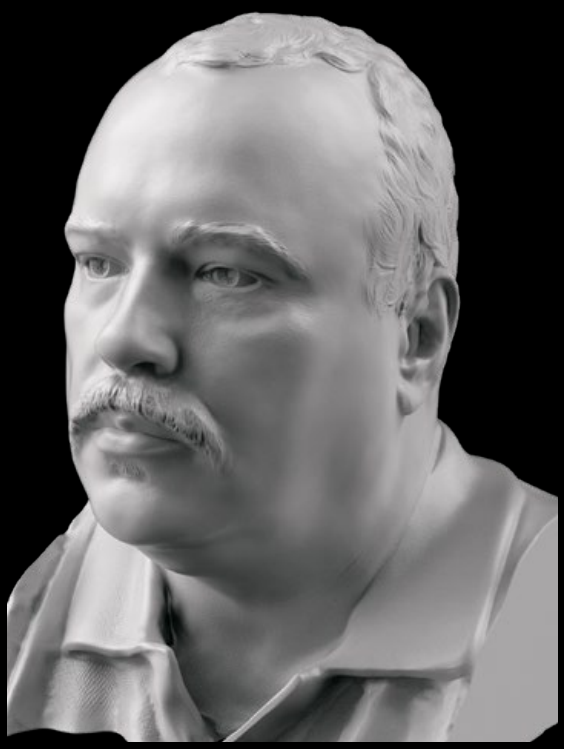

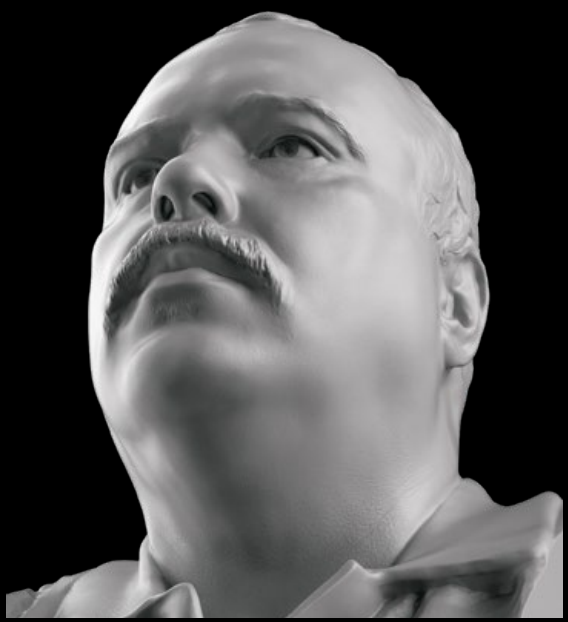

Raimonds
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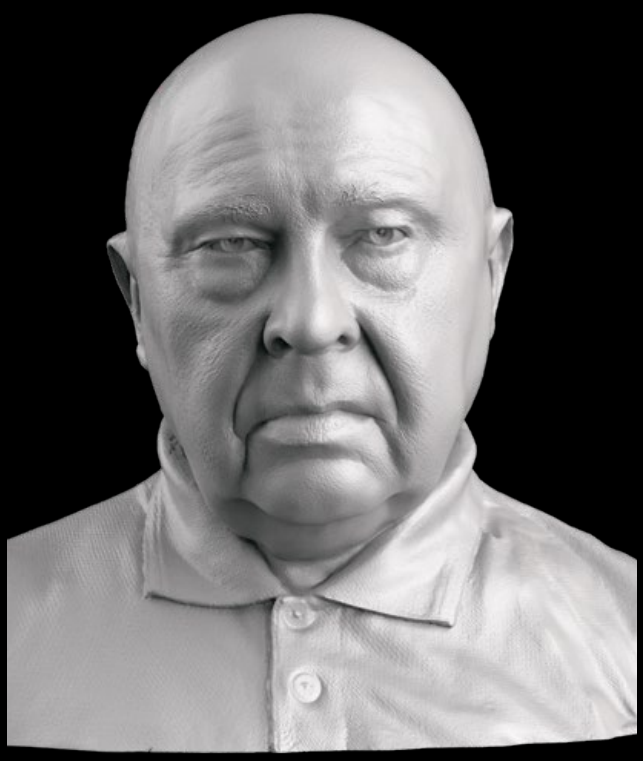
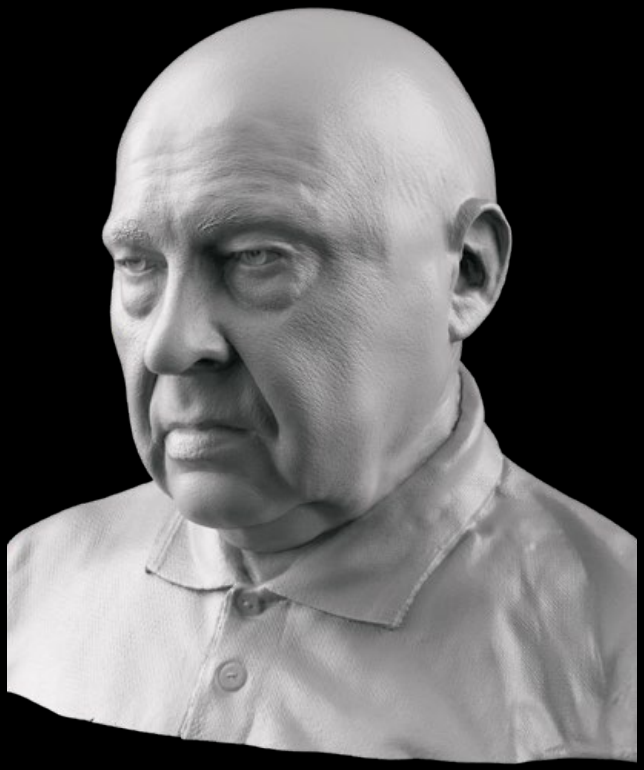
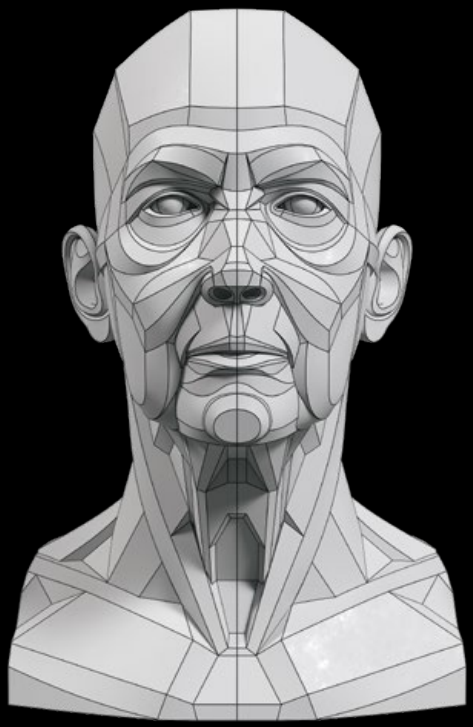
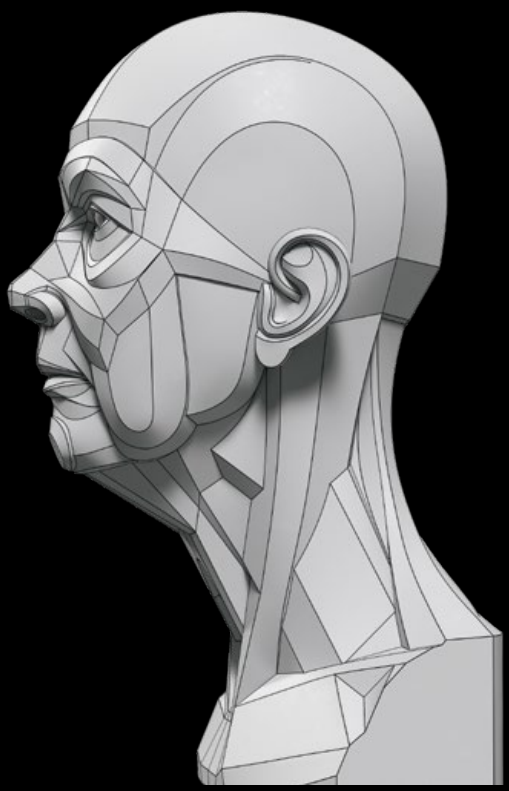




Alexander
sex: male | age: 72 | photoscan

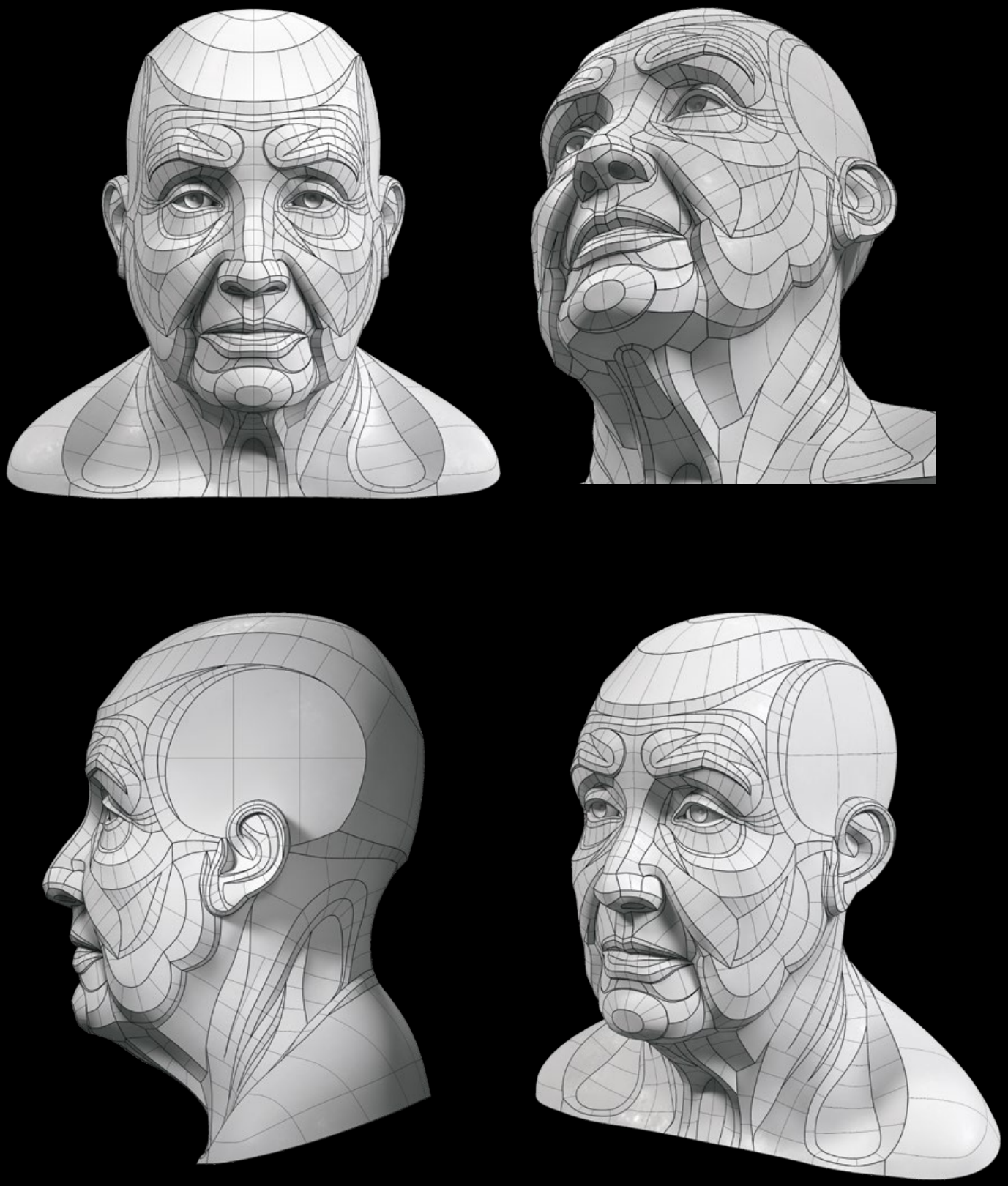
Ilze
sex: female | age: 67 | photoscan





Ilze
sex: female | age: 67 | block-out

Ruth
sex: female | age: 71 | photoscan



Ruth
sex: female | age: 71 | block-out

SPECIAL THANKS TO SUPPORTERS ALL OVER THE WORLD

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Guillaume Marien

Daniel Simon

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Rizal Ulum

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Des Tan
Abros Maria Margiewicz
Toshiyuki Misu

Uldis Zarins

Form of the Head and Neck

Form of the Head and Neck is a good companion for every kind of visual artist!

There is a chance you have discovered this by now: the muscle underneath the skin has little to do with the form of one's face. At the very most, facial muscles are just one of the factors that defines its final appearance. This book is all about that — in addition to illustrating the form of the head and neck, it also dives into the relationship between the visible appearance and the anatomy beneath it.

For true artistic freedom, it's not enough to know how to create a still face of a young Caucasian male. The sculpture of David by Michelangelo is an extraordinary piece of art, but we cannot use it as a reference point every single time. Likewise, the key to success isn't found in copying the form but in understanding it and how it is composed. This gives you incredible creative liberty.

Faces are rarely static and, besides emotions, many other factors make them look different from one another — age, ethnicity, gender, body type, and a little bit of anatomy.

Form of the Head and Neck breaks down the complex structures for each of these categories. Every single element, such as the mouth, eye, or ear, is reduced to block-outs and re-developed gradually into detailed realistic shapes.

Visual and image information, including 3D models, photos, and color-coding, is an essential part of all our books, and this one is no exception. We only use text where necessary, thus keeping the experience intuitive and widely accessible.

ANATOMY FOR SCULPTORS

Our community started specifically with the needs of sculptors in mind — hence, the "Sculptors" in ANATOMY FOR SCULPTORS. But since then, we have shaped the knowledge in an empowering way for all kinds of visual artists — that is the real focus of our team of 3D and 2D artists who work alongside medical and anatomy experts.

Uldis Zarins teaches anatomy at the Art Academy of Latvia and he's an award-winning traditional sculptor with more than 25 years of experience. After years of fruitless searching for a comprehensive visual anatomy book for his students, he decided to create a book with reliable anatomical references for any aspiring artist. This task turned out to be larger than expected and has led to this third book of the series. Uldis is also the author of **UNDERSTANDING THE HUMAN FIGURE** and **ANATOMY OF FACIAL EXPRESSIONS**.

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