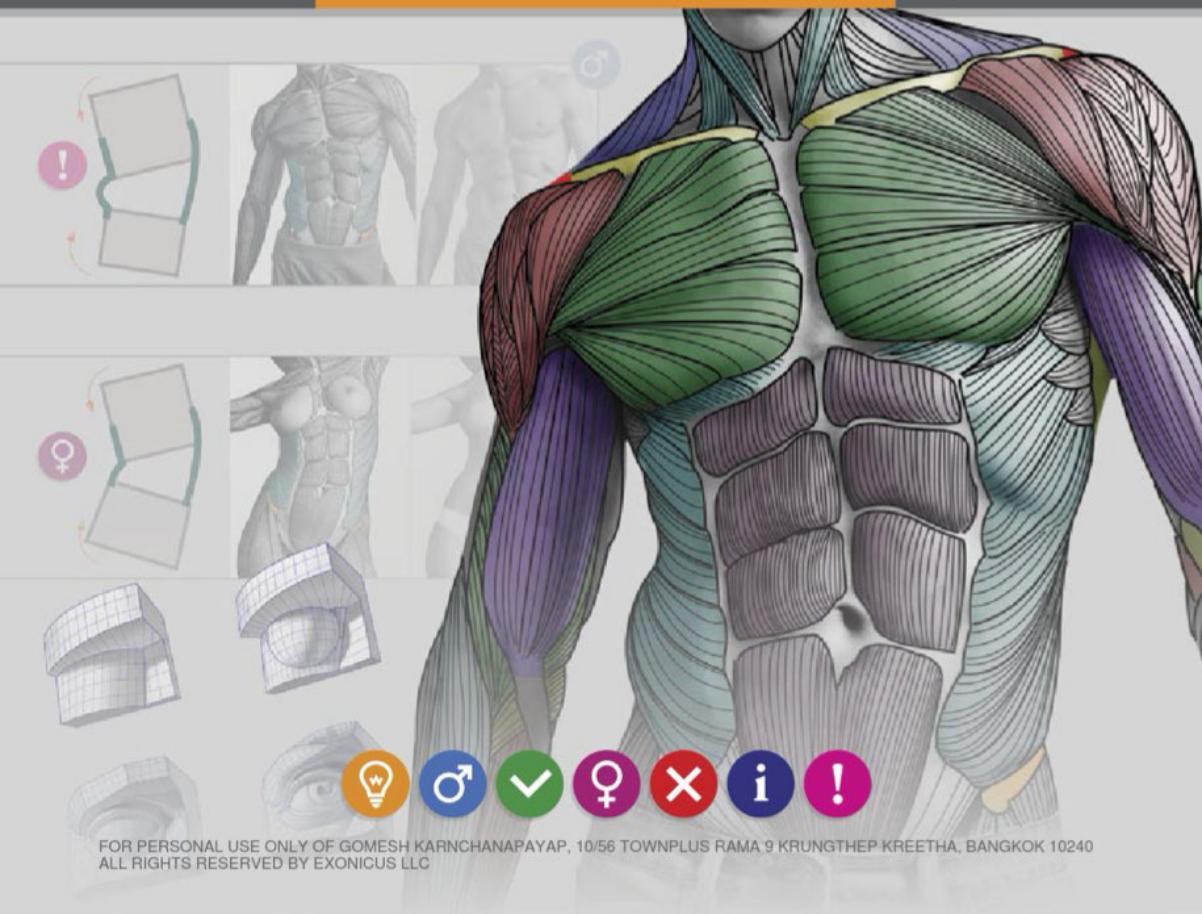


ULDIS ZARINS
WITH
SANDIS KONDRATS

ANATOMY FOR SCULPTORS

UNDERSTANDING THE HUMAN FIGURE



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2014

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ABOUT, HISTORY, BACKGROUND

High Hopes

At the beginning of the 1990s, on the ruins of the USSR, in the newly formed Latvian nation, a young person, named Uldis Zarins, full of ideals and hopes, dreamed of becoming a sculptor. In 1994, he was accepted to the Art College of Riga. Studies were difficult and competition was fierce, but they resulted in satisfaction. Every day he replicated famous classical Greek portraits, busts, and figures in clay. The outlook prevailed, that frequent replication of antique sculptures would facilitate the understanding of form creation. After only half a year, Uldis understood that eyes, of course, adapt, and hands become more agile; however, understanding of the form did not materialize.

The Cheek of the Amazon

One day, when replicating the head of the Amazon portrait of famous sculptor Polykleitos, he ran into a problem: How to construct a cheek? It was clear that the form was not just a sphere, but several complicated forms combined. He thought: "It would be great to understand what these forms are and how they go together!" Teachers only discouraged, saying: "Study, research, measure!" – But what to measure, when there aren't even any corners, nor facets?! A teacher answered: "Study anatomy, maybe you'll get by somehow."

First Anatomy Studies

A modeling teacher told Uldis: "If you want to understand everything, here is a human skull and anatomy book. Study and create an écorché for us!" Uldis decided to create a bust with shoulders. All of its muscles were in place, however, the sculpture looked bad. The main thing was that his understanding of the form had not increased one bit! In the place of the form, he had studied muscles. In digging through a mountain of anatomy books, Uldis realized that they were all meant for painters and drawers. He found that all of these books were equally boring, with scant, chaotic drawings. "No one, it turns out, has thought about sculptors!" Uldis found only one anatomy book, which only slightly touched on the form – Gottfried Bammes' *Der nackte Mensch*. Then he asked himself the question: "Why are there so few pictures in the books and so much text!"

Academy Studies

After college, Uldis enrolled in the Art Academy of Latvia (Latvijas Mākslas Akademija). There, same as in college, emphasis was placed on exercises, not on the understanding of how to create the form. Each time Uldis created a new sculpture, he made preparations, not only to arrange the frame and the edge, but also drew a small paper sketch where he could analyze the form in an understandable way.

Over the course of several years, drawings, sketches, anatomy books and successful photographs were accrued. Uldis began to notice, that the sketches he had created, as well as images, were in high demand among colleagues. He often heard the suggestion that he should collect them all and publish a book, which would be a composite of form analysis, as well as fundamental information about anatomy that sculptors would need to know. This was how Uldis came up with the idea for the creation of the book.

Kickstarter

Years went by and Uldis created the website anatomy4sculptors.com, a proportion calculator, and Facebook page, where he publishes anatomy reference images and his drawings. On the Facebook page, Uldis engaged in conversations and tested the ways of explaining the human anatomy. In the spring of 2013, with the help of friend Sandis Kondrats, a Kickstarter campaign was organized, creating an international team, with whose help Uldis realized his dream of publishing the book, *Anatomy for Sculptors*. During the project development phase, Sandis and Uldis were joined by friends from Latvia, Sabina Grams and Edgars Viegner, who contributed with their expertise in Graphic Design and Photography. With much help from Sandis' brother Janis Kondrats, we were able to create a unique subscription system on the website to engage and test the book's content with the project supporters. As English is a second language for Uldis and Sandis, the assistance of editors and proofreaders, Monika Hanley and Johannah Larsen, was indispensable. Friendships, created through the project with Chris Rawlinson and Sergio Alessandro Servillo, filled in the blanks with 3D scans and sculpt reference materials. The Shutterstock service, which supplied Uldis with a lot of great artwork to build on the book's content, was also a great help. Thanks to the friends of the international sand sculpting community, with whom Uldis and Sandis had conversations about the book during their travels over the course of the year, which was a great help in the book's development process. The support of the Seattle Latvian community was very special while working on the project. Also, without the support and understanding of the families and friends of Uldis and Sandis, this project would not have been possible.

Finally, the book has come into physical form after hard and passionate work over the course of 20 years, since Uldis came up with the dream of creating such a book. It took him 11 years of classical art studies, over 200 international sculpting festivals, symposiums and exhibitions in 9 years and the past 4 years spent on reading books, researching human anatomy, and creating illustrations for this book to come to life.

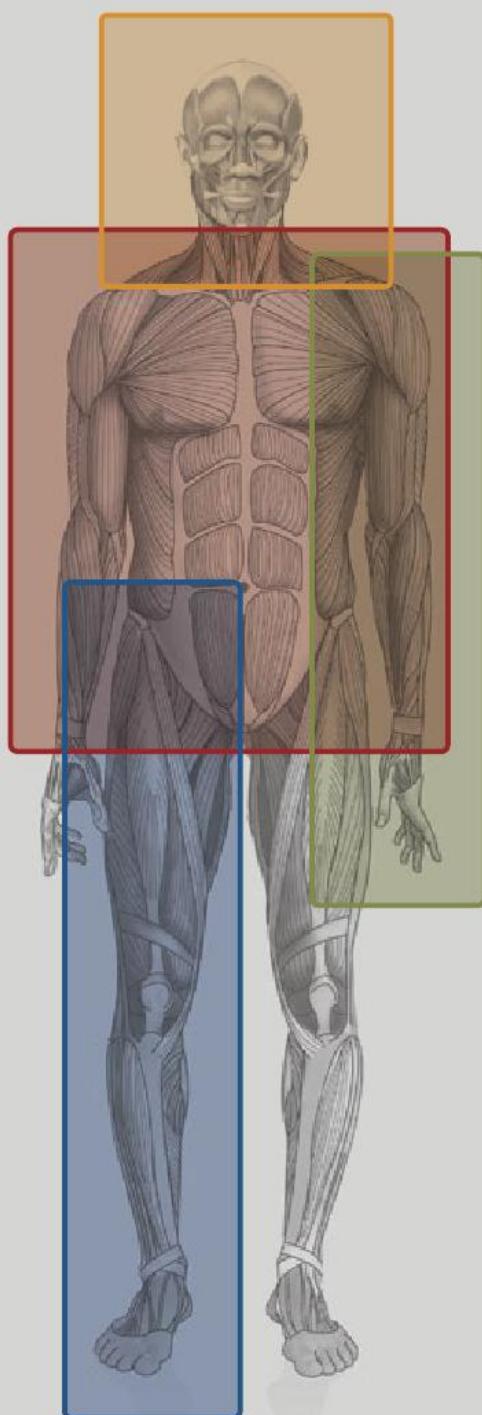
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Rusty Croft
Saitou Takeshi
Sandi "Castle" Stirling
Scott
Solomon Temowo
Steven R. Berkshire
Thomas Stanton
Toban Magee
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Wyeth Johnson



**FIGURE
& TORSO**

7



**HEAD
& NECK**

93



UPPER LIMB

143

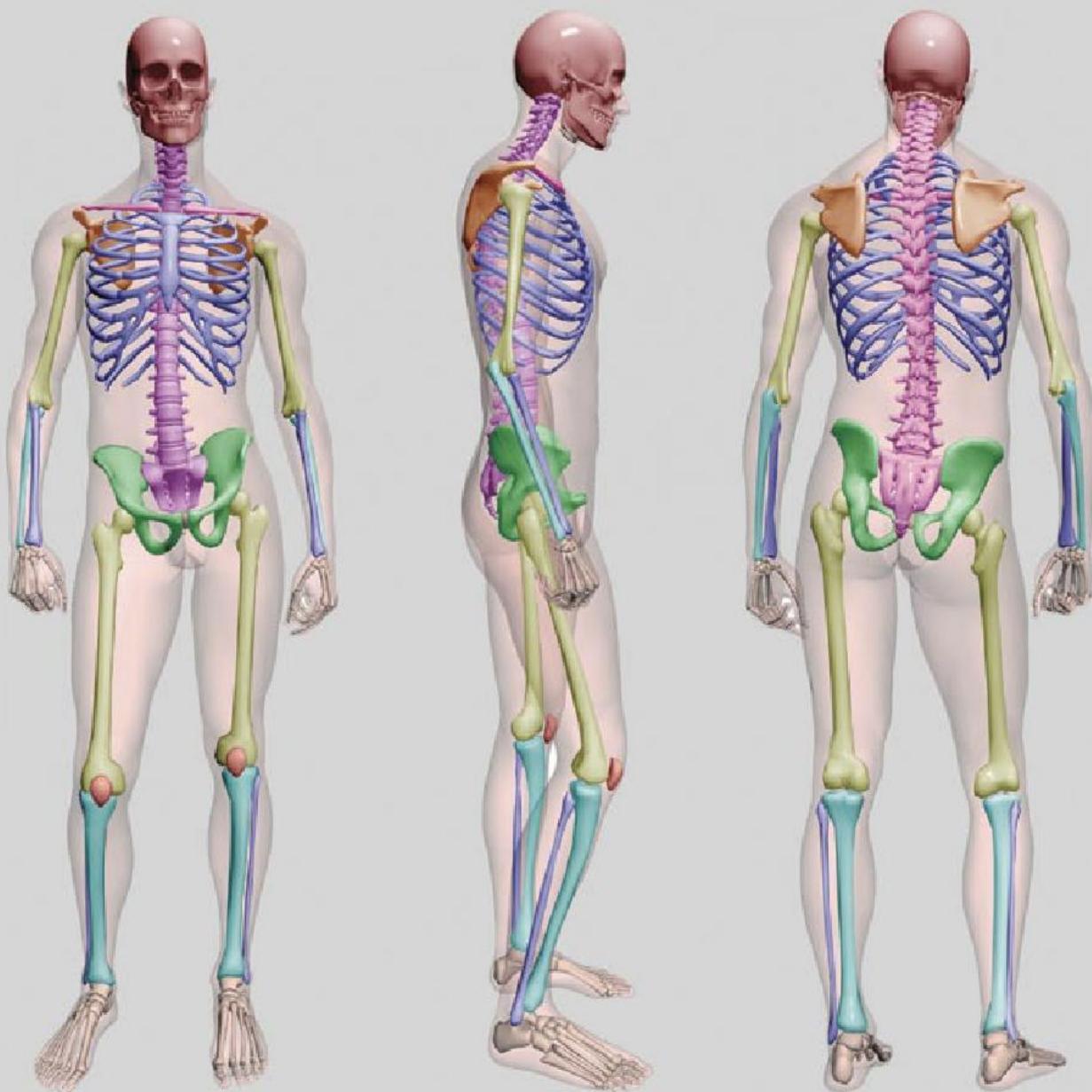


LOWER LIMB

185



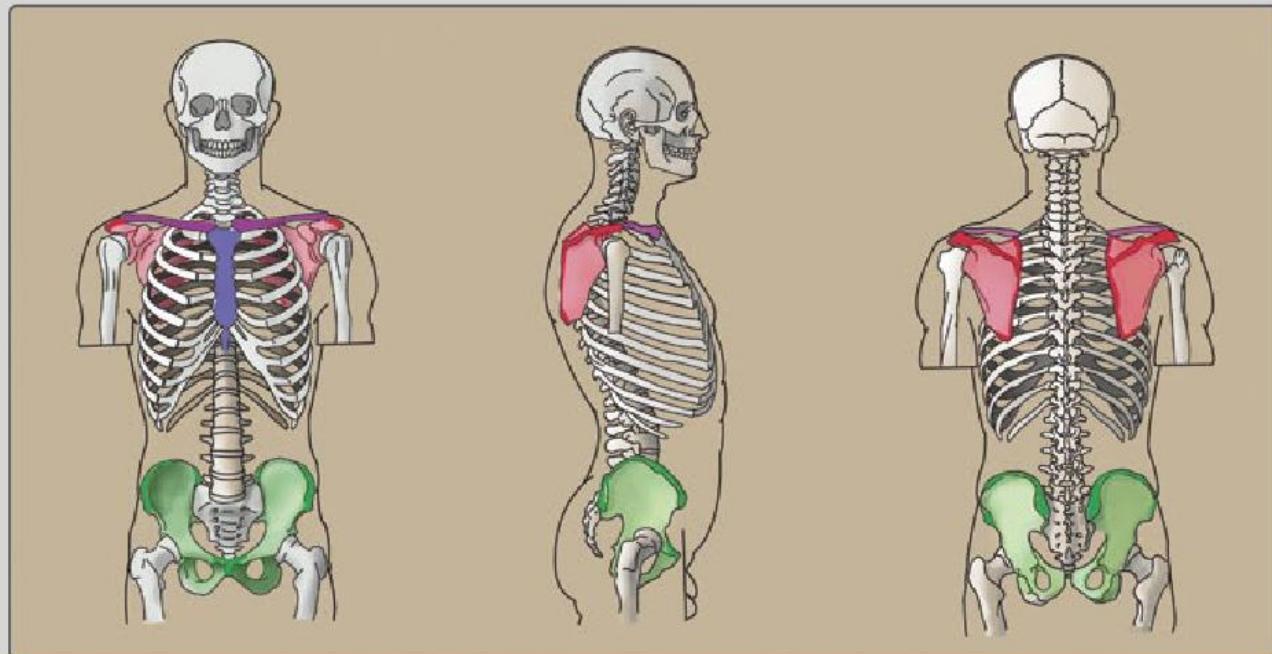
HUMAN SKELETON



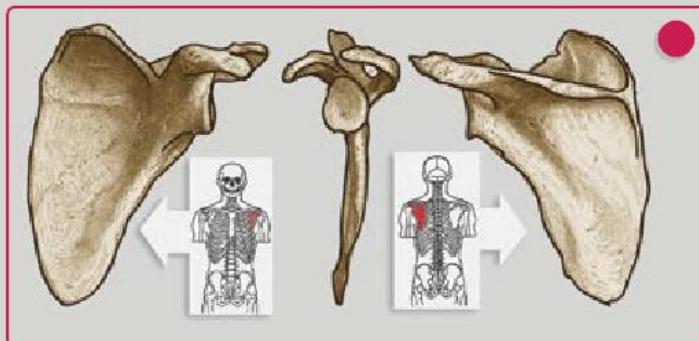
IMPORTANT LANDMARKS OF TORSO

i

PROMINENT SUBCUTANEOUS PROTRUSIONS – GENERALLY POINTS OF BONE, THOUGH SOMETIMES FORMED BY ENTIRE BONES, ARE CALLED BONY LANDMARKS OR SIMPLY LANDMARKS. THEY MAY SERVE AS IMPORTANT PROPORTIONAL MEASURING POINTS OF THE BODY. LANDMARKS ARE THE KEY TO UNDERSTANDING THE EXACT POSITION OF THE ENTIRE SKELETON, WHICH FOR THE MOST PART IS EMBEDDED IN THE SOFT TISSUES OF THE BODY.



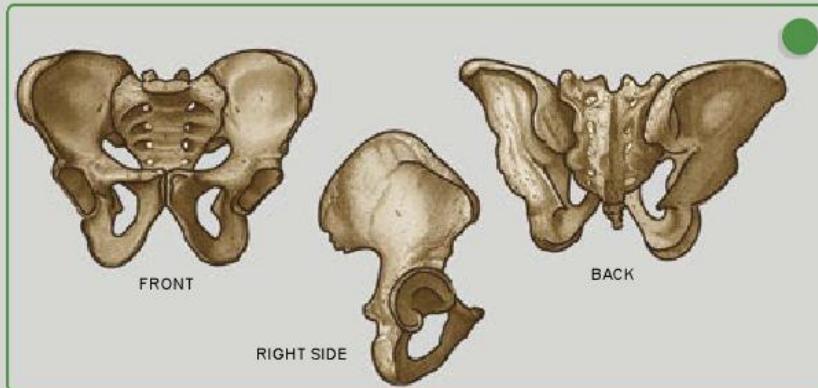
SHOULDER BLADE (SCAPULA)



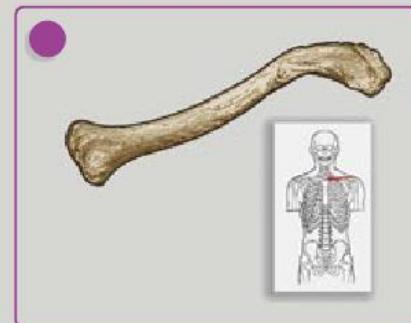
CHEST BONE (STERNUM)



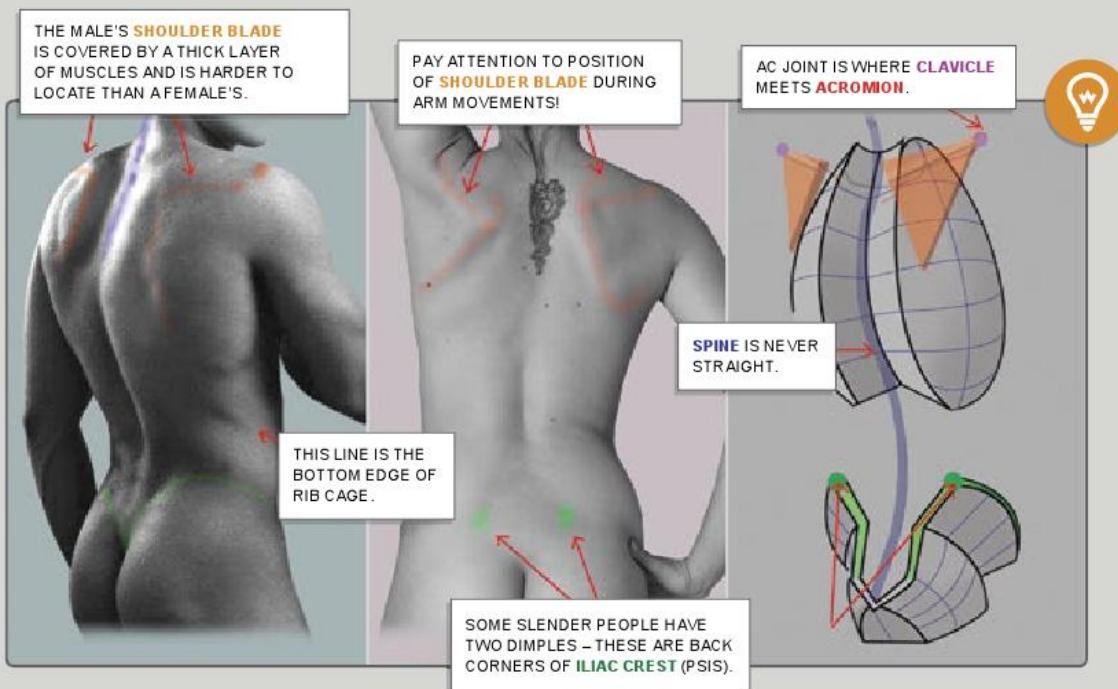
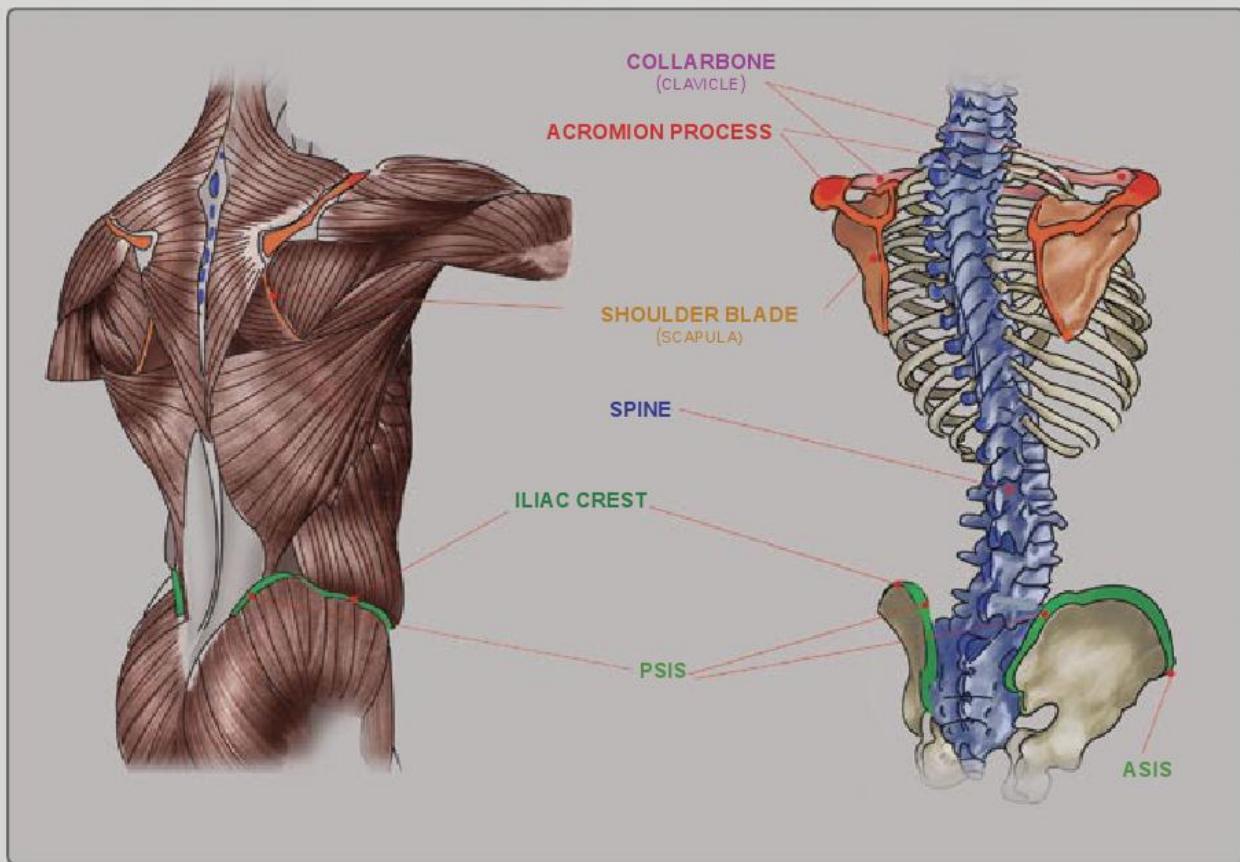
PELVIS



CLAVICLE

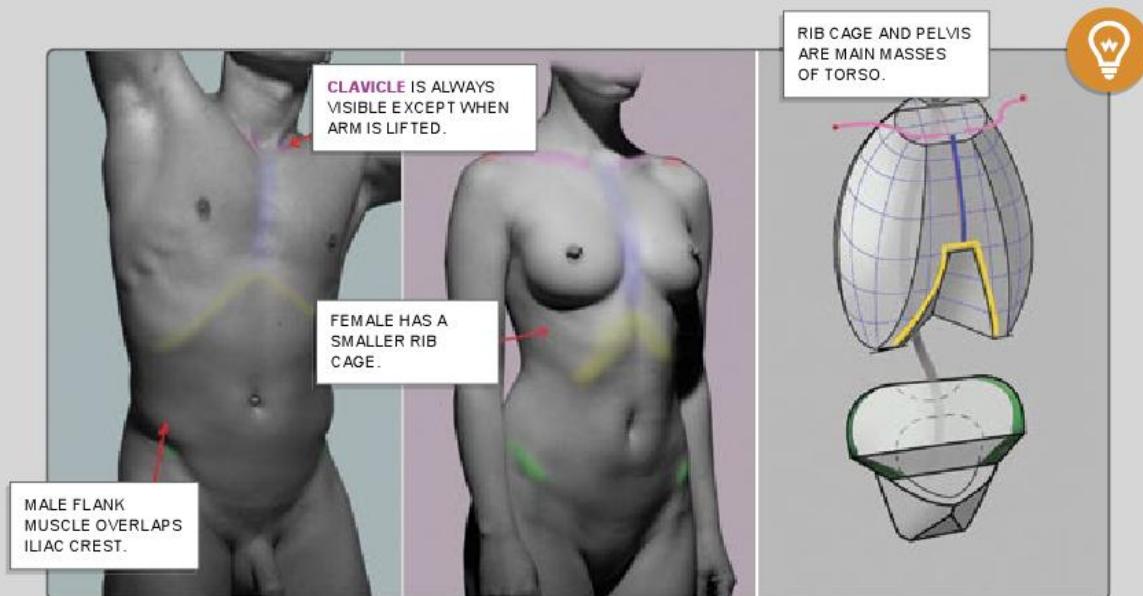
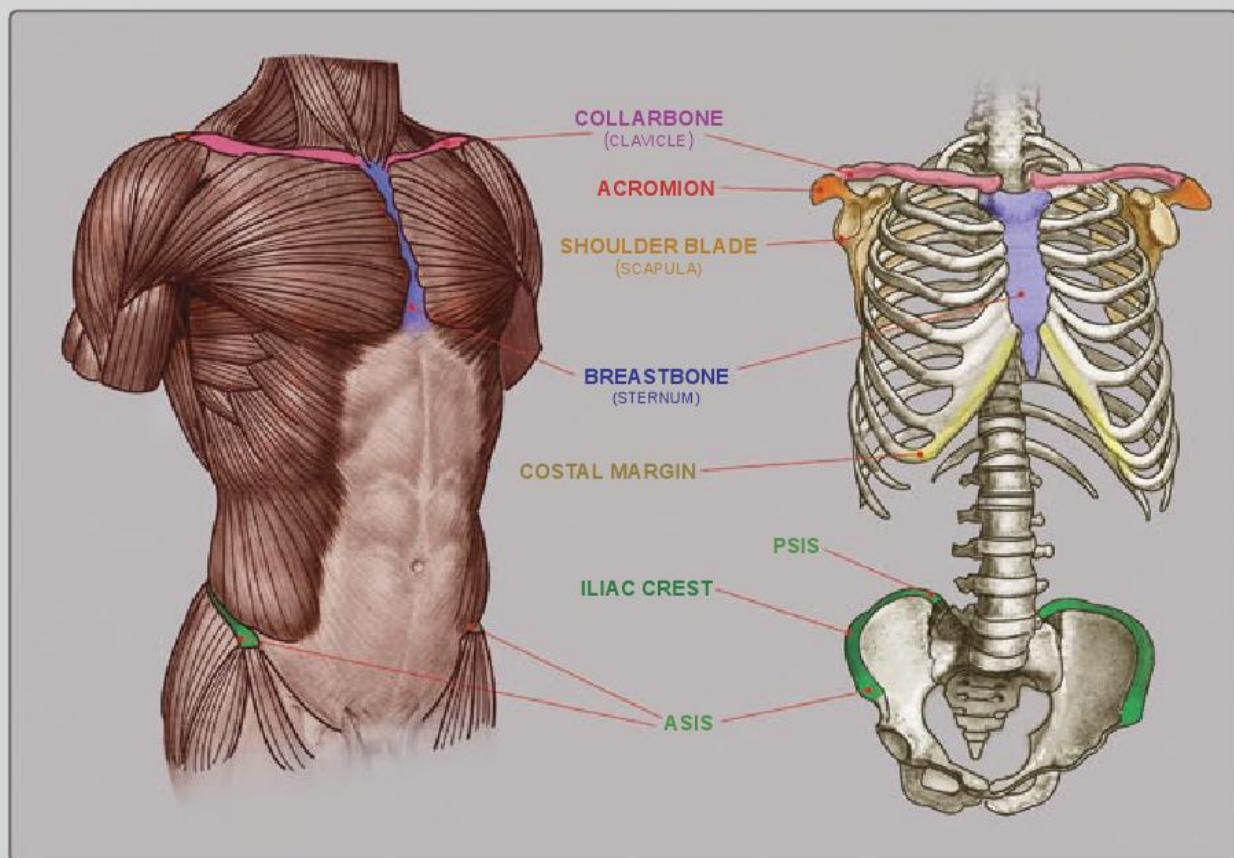


MAIN LANDMARKS OF BACK OF THE TORSO

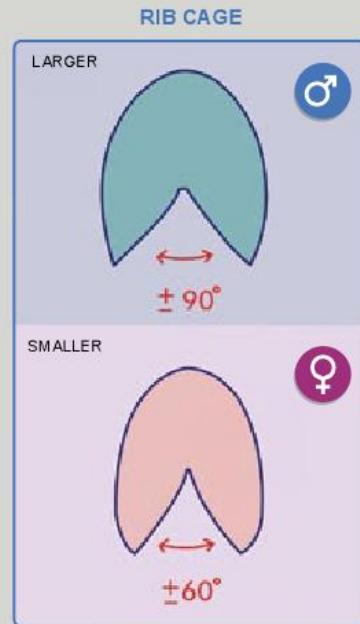
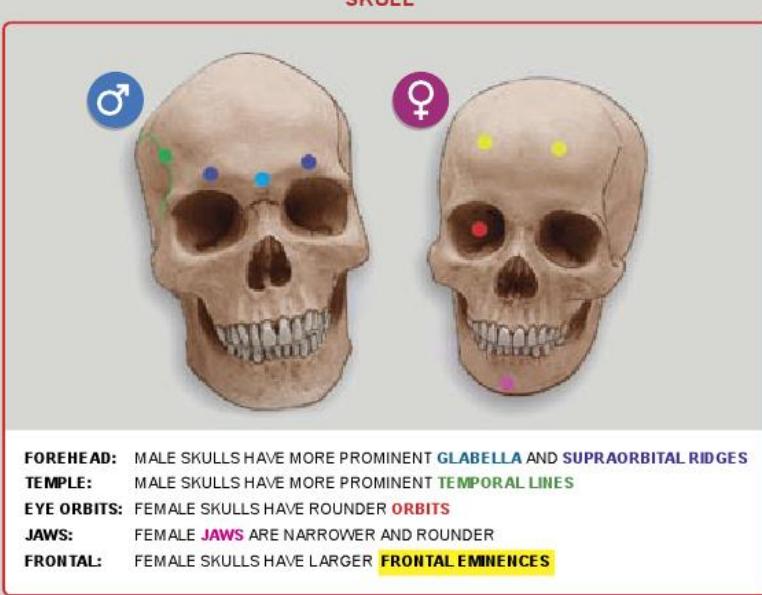
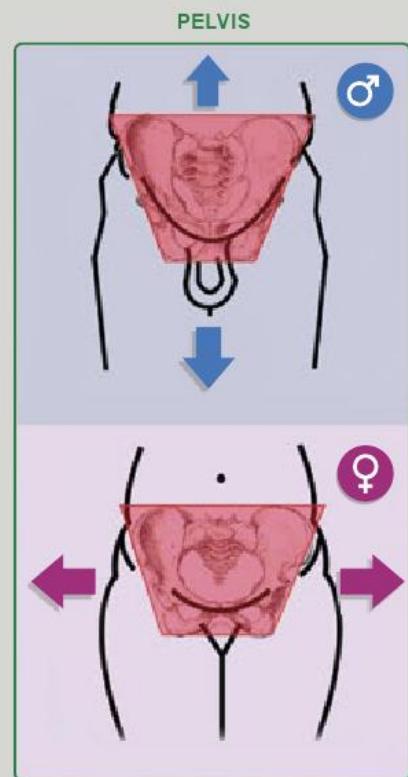
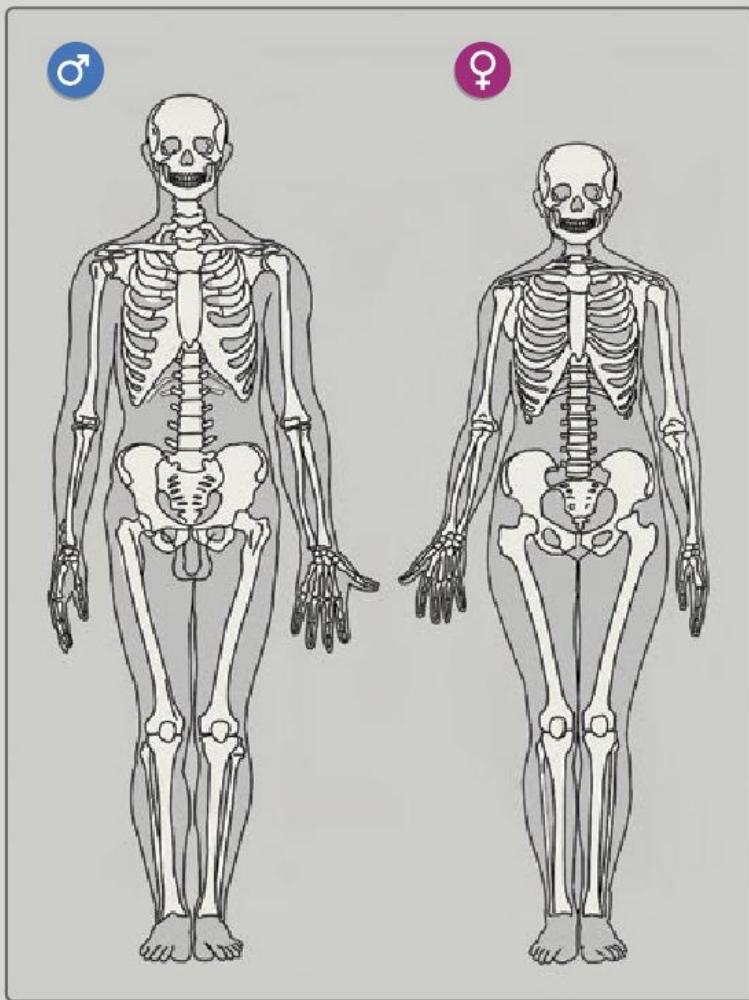


MAIN LANDMARKS OF FRONTAL TORSO

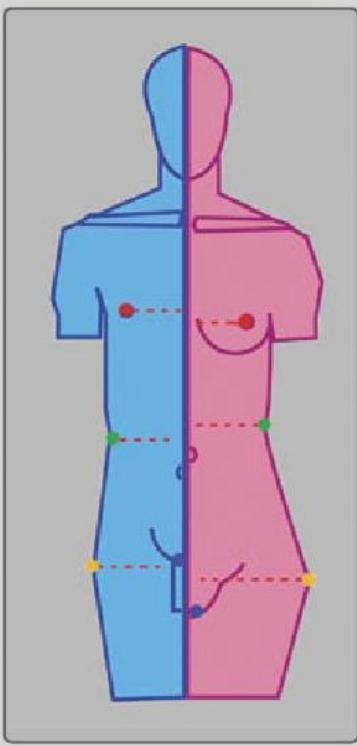
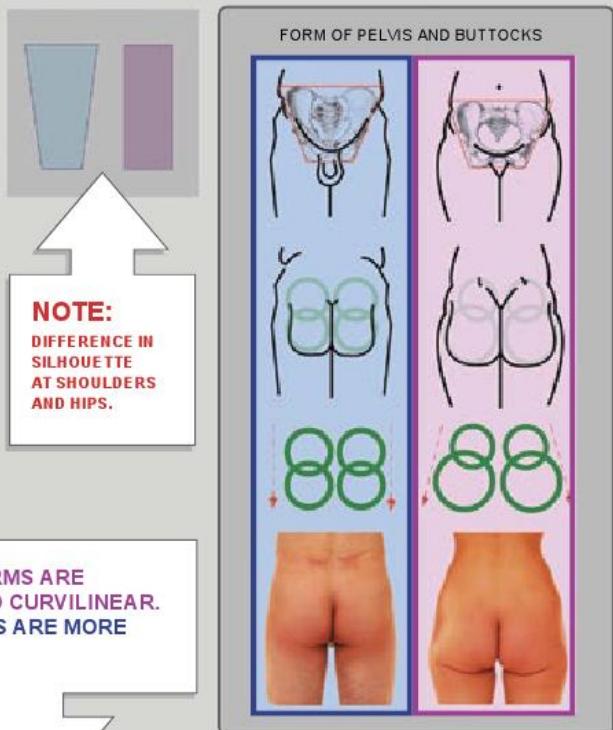
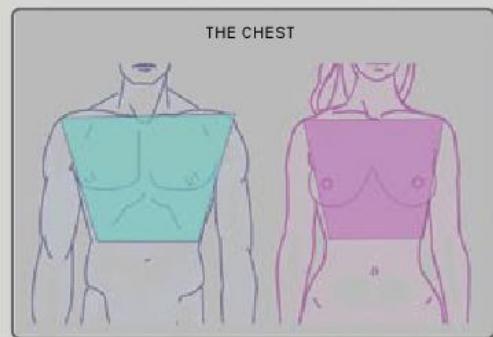
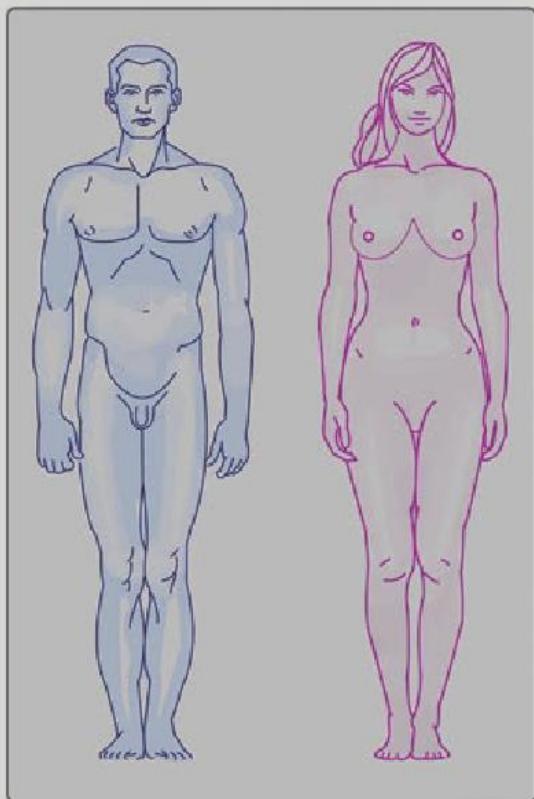
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MAIN DIFFERENCES BETWEEN MALE AND FEMALE SKELETONS

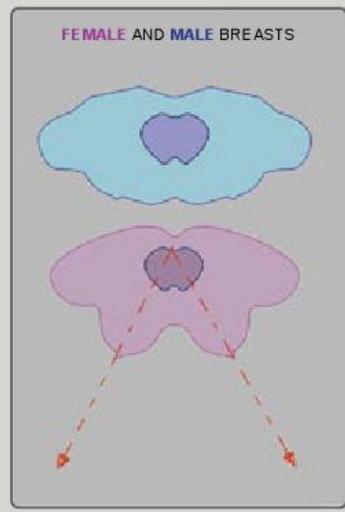
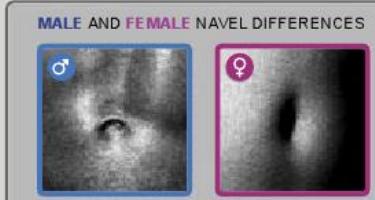


MOST IMPORTANT DIFFERENCES BETWEEN MALE AND FEMALE BODY SHAPES



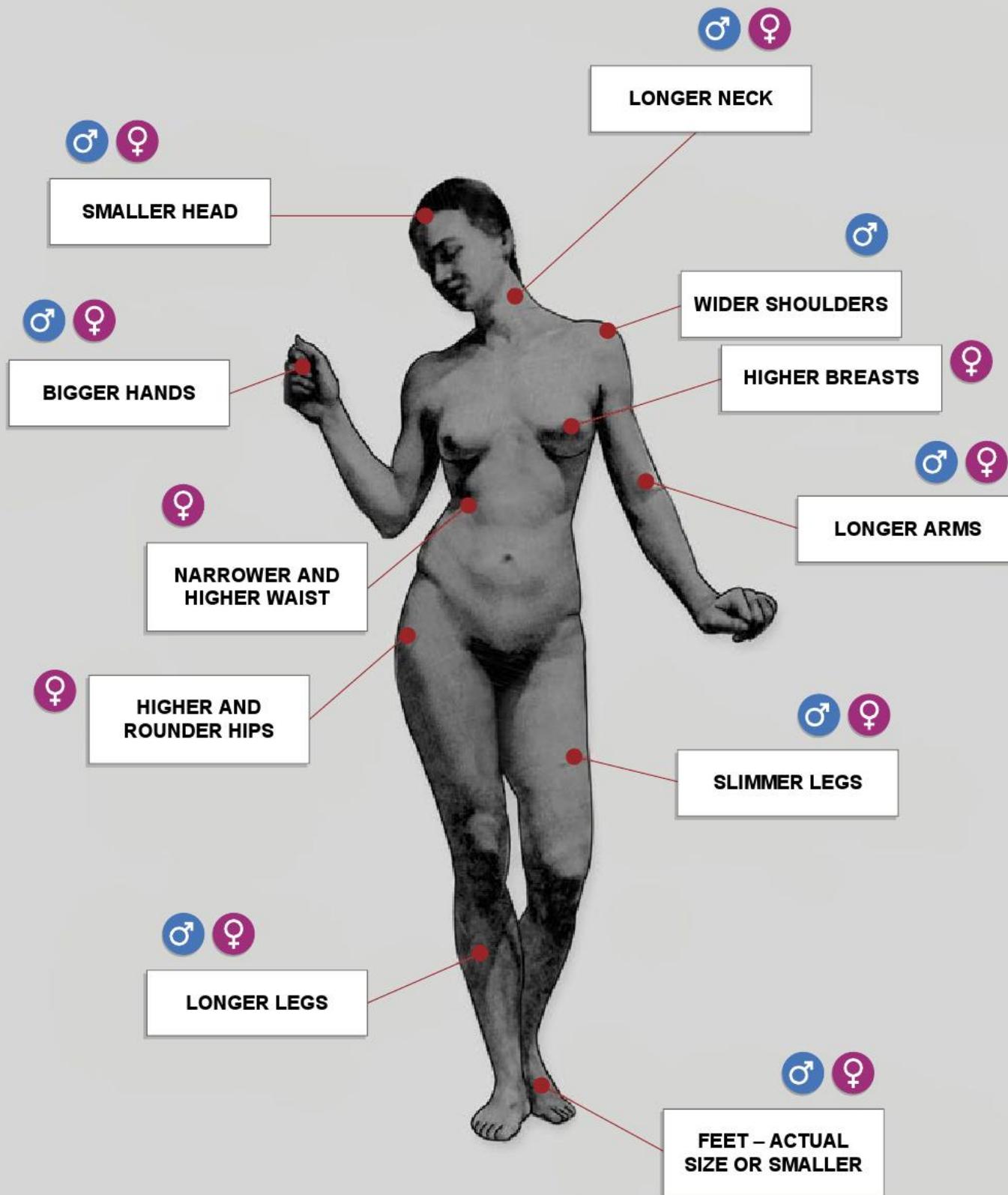
FEMALE FORMS ARE
SOFTER AND CURVILINEAR.
MALE FORMS ARE MORE
ANGULAR.

FEMALE HAS SLIGHTLY
THICKER SUBCUTANEOUS
FAT THAN MALE.

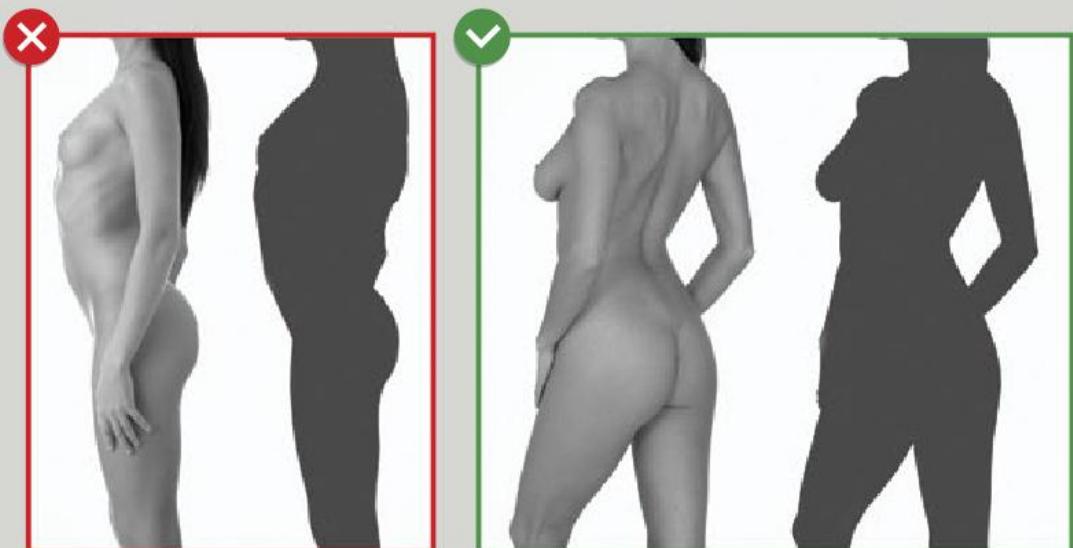


HOW TO MAKE A FIGURE MORE ATTRACTIVE

i



SILENT KILLER



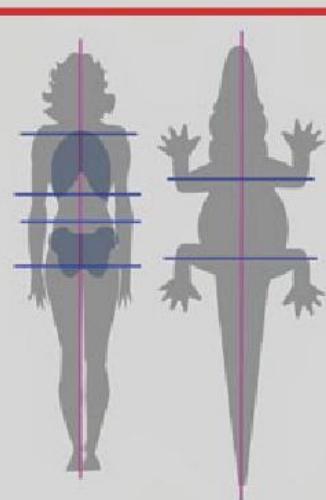
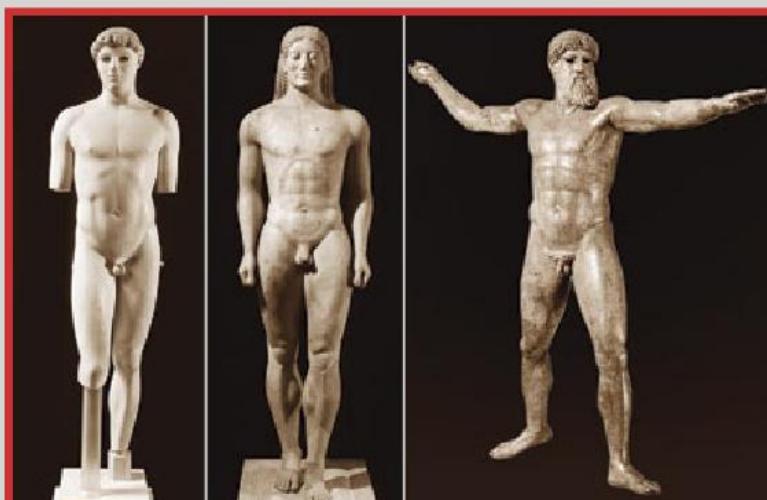
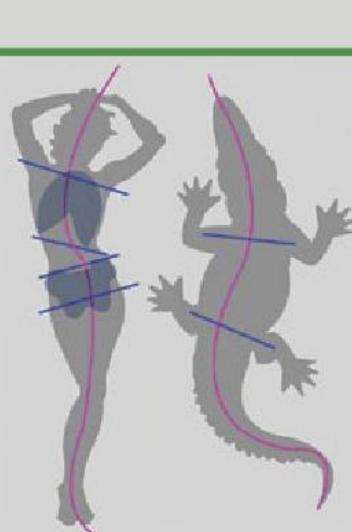
THE MOST ESSENTIAL ELEMENTS IN FIGURE SCULPTURE NEED TO BE FAR ENOUGH FROM THE BODY. IF YOU CAN'T EASILY DISTINGUISH YOUR CHARACTER BY SILHOUETTE ALONE, THEN RECONSIDER THE COMPOSITION! AN UNCLEAR SILHOUETTE IS THE "SILENT KILLER" OF DESIGN!



ANOTHER KILLER IS **SYMMETRY**! SYMMETRICAL FIGURE SEEMS LIFELESS AND BORING.

CONTRAPPOSTO

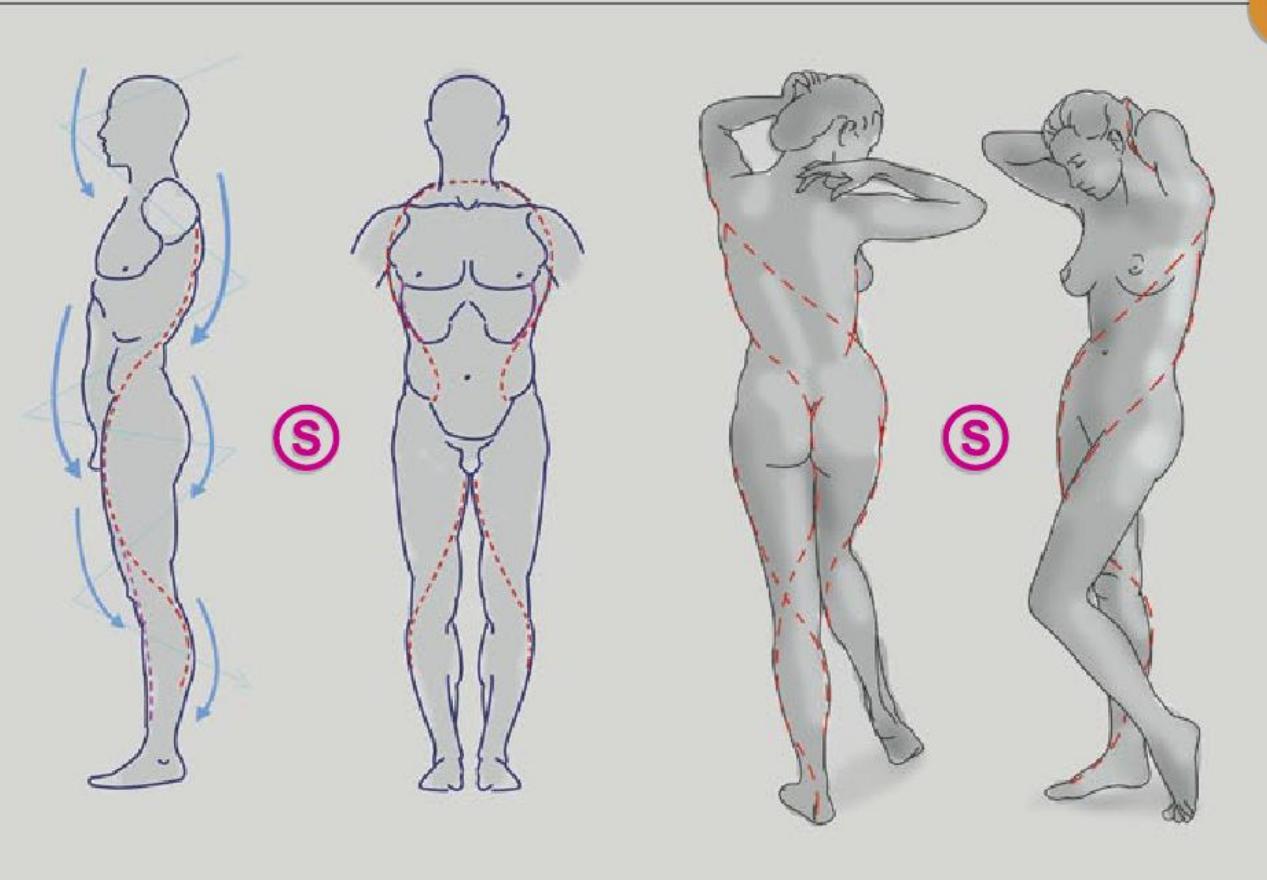
THIS TERM DESCRIBES THE POSITION OF A FIGURE IN WHICH THE HIPS AND LEGS ARE TURNED IN A DIFFERENT DIRECTION FROM THAT OF THE SHOULDERS AND HEAD; THE FIGURE TWISTS ON ITS OWN VERTICAL AXIS. THE FIGURE'S BODY AND POSTURE IS DEPICTED AS A SINUOUS OR SERPENTINE "S" SHAPE.



LAZY "S" 

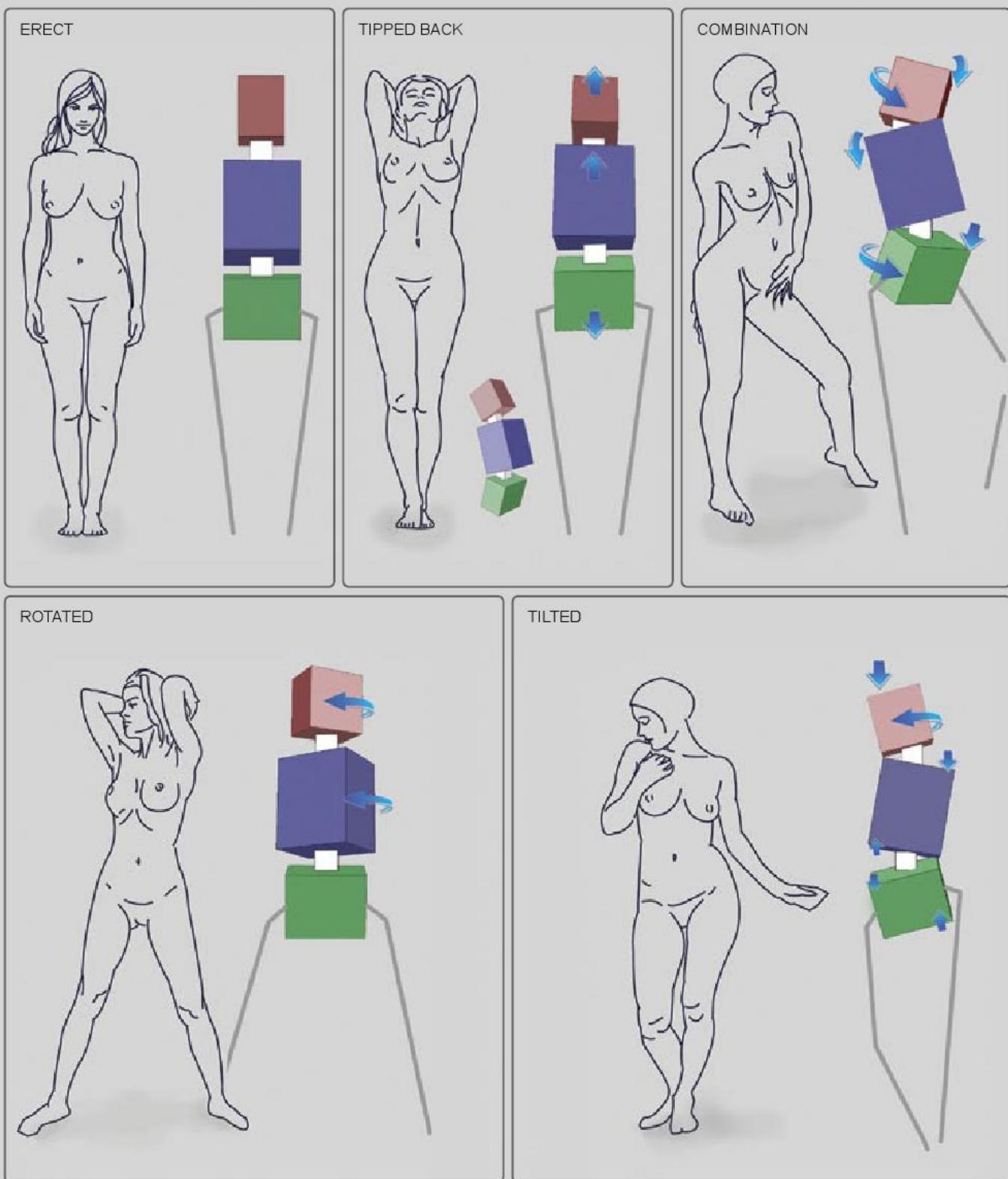


DRAW IMAGINARY S-SHAPED LINES AND BY FOLLOWING THEM,
YOU CAN EASILY CONSTRUCT THE CURVES OF THE BODY.

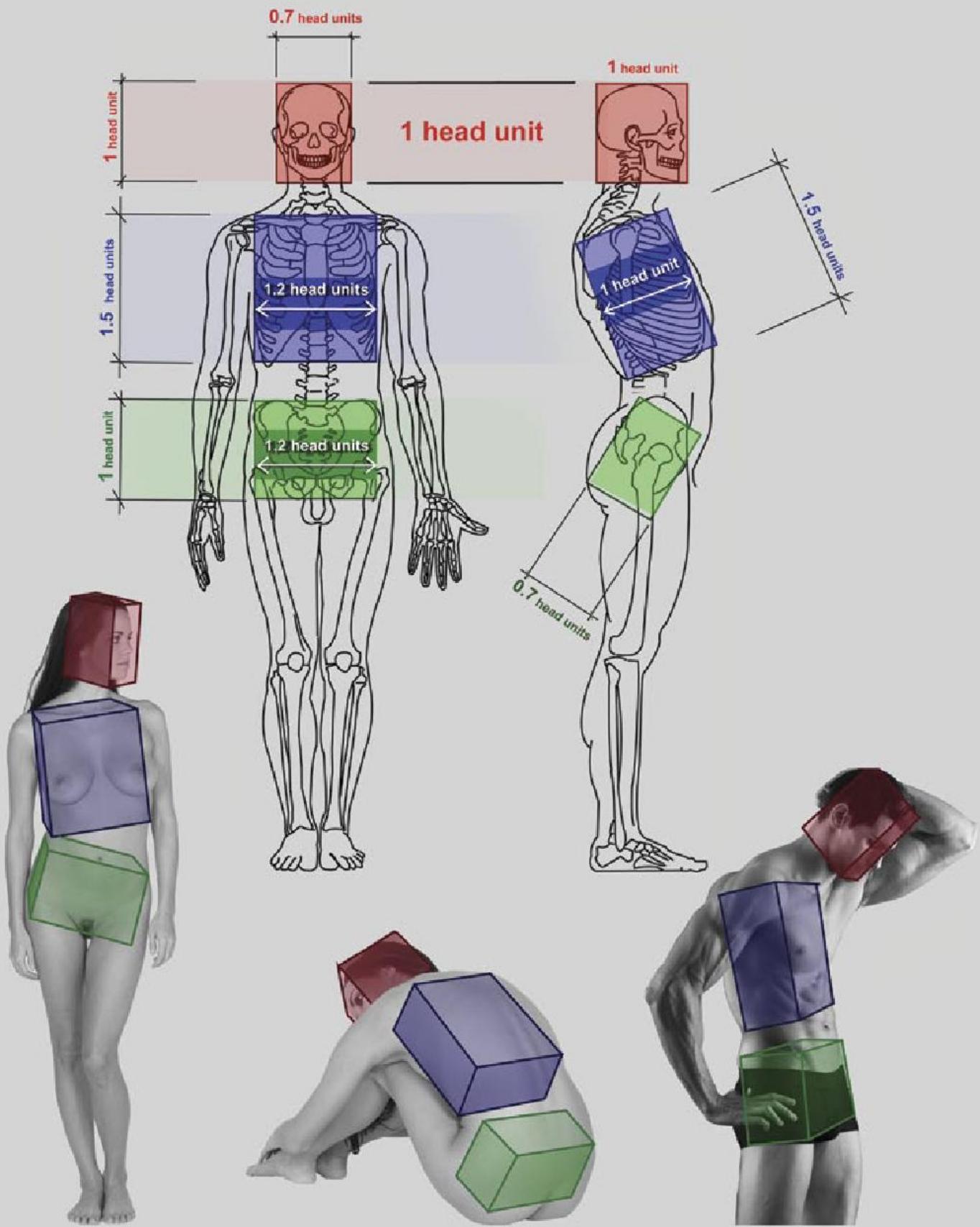


5 POSITION COMBINATIONS OF MOVABLE MASSES

i

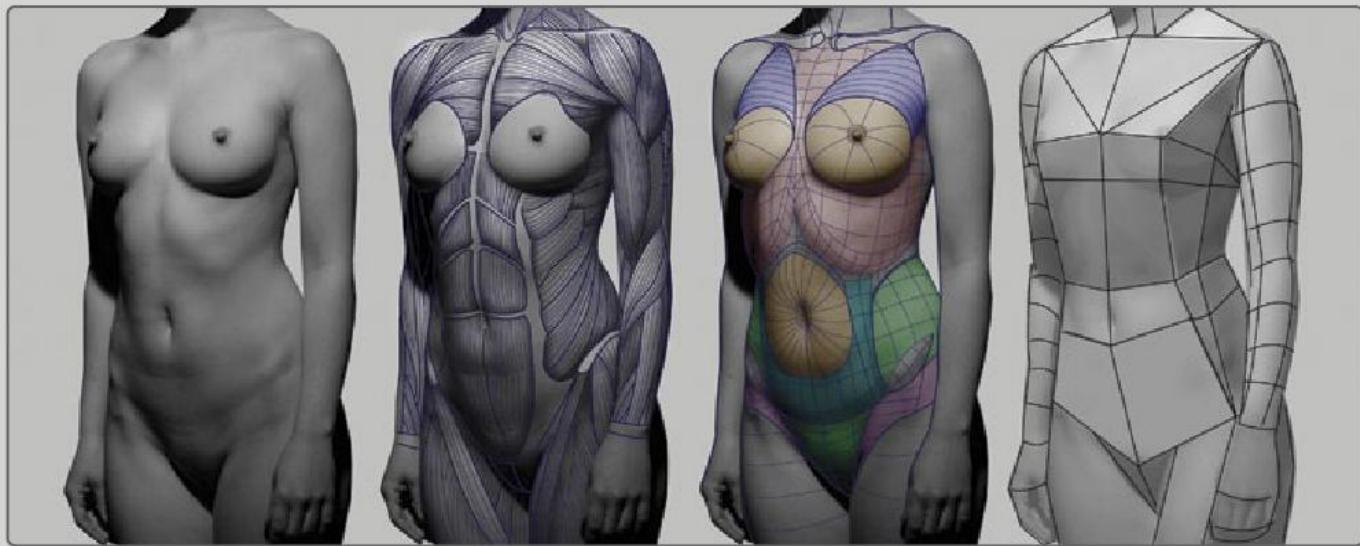


PROPORTIONS IN HEAD UNITS OF MOVABLE MASSES



FEMALE TORSO FROM REALISTIC TO SIMPLIFIED

i

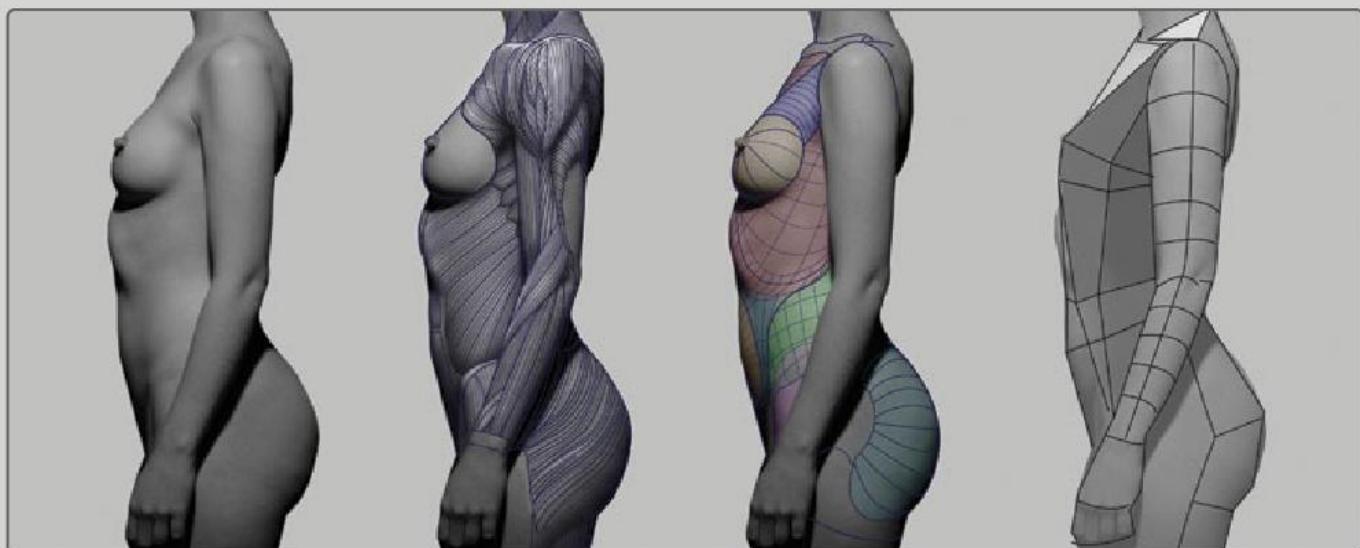


REAL

MUSCLES

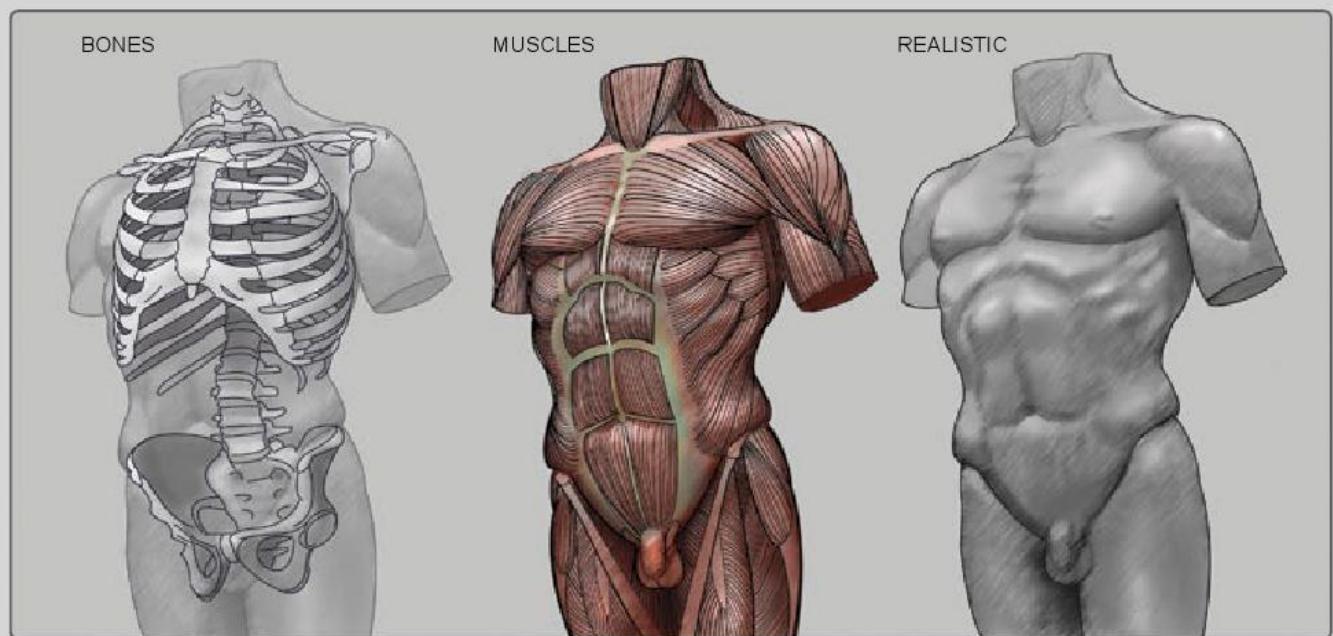
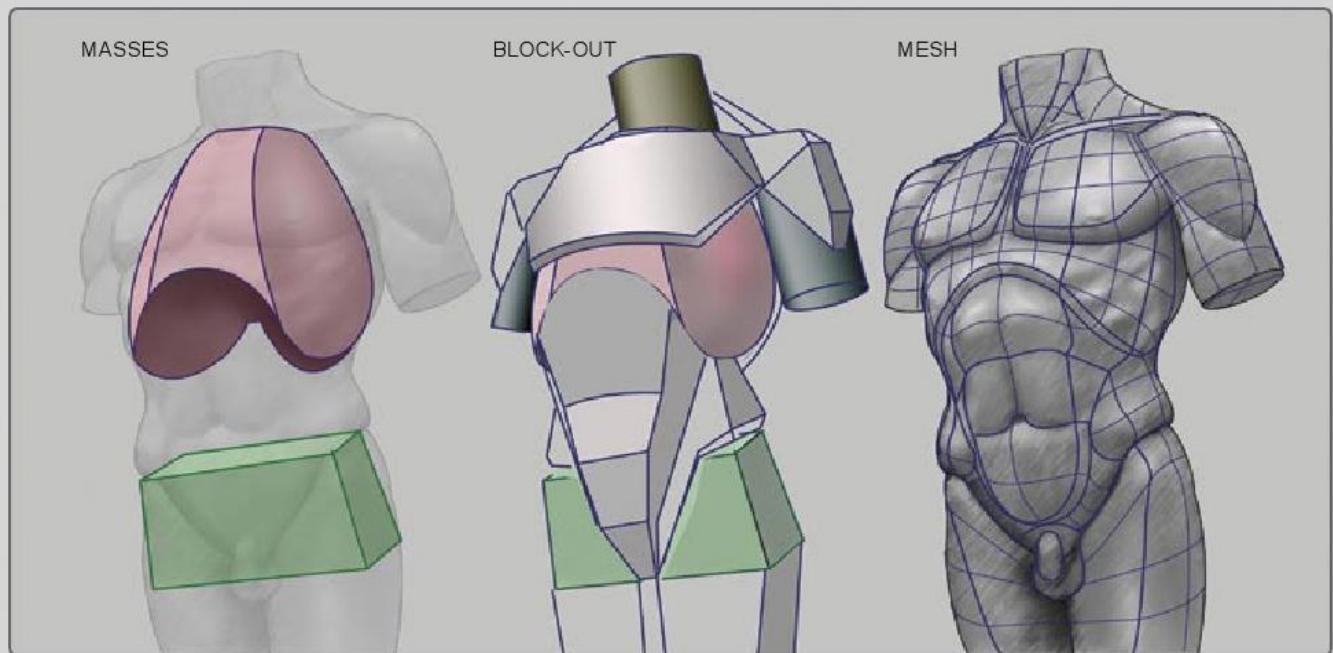
SHAPES

BLOCK-OUT

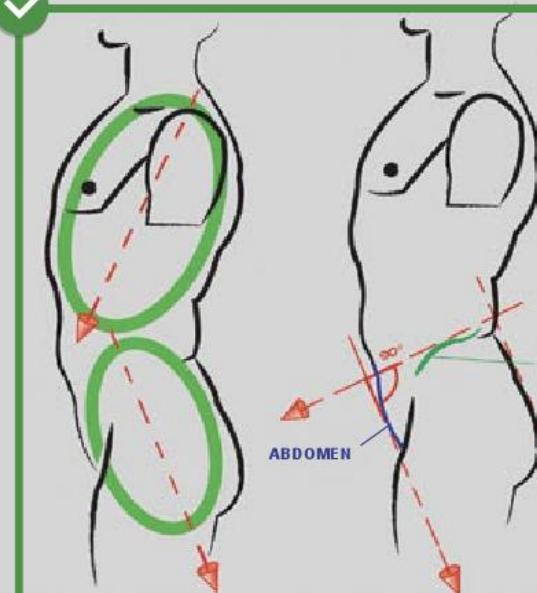
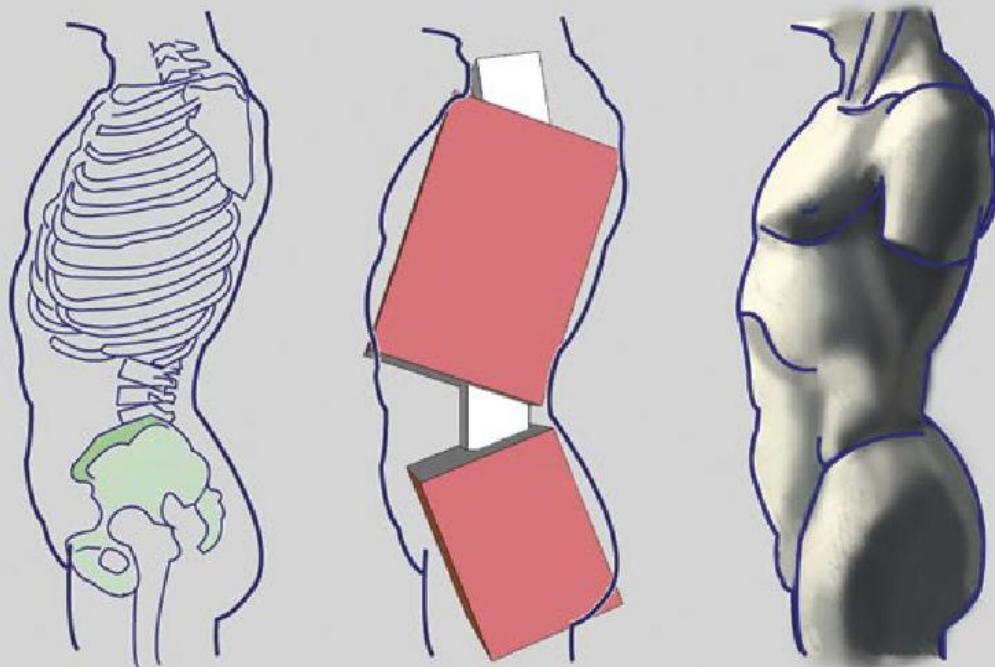


MALE TORSO FROM REALISTIC TO SIMPLIFIED

i



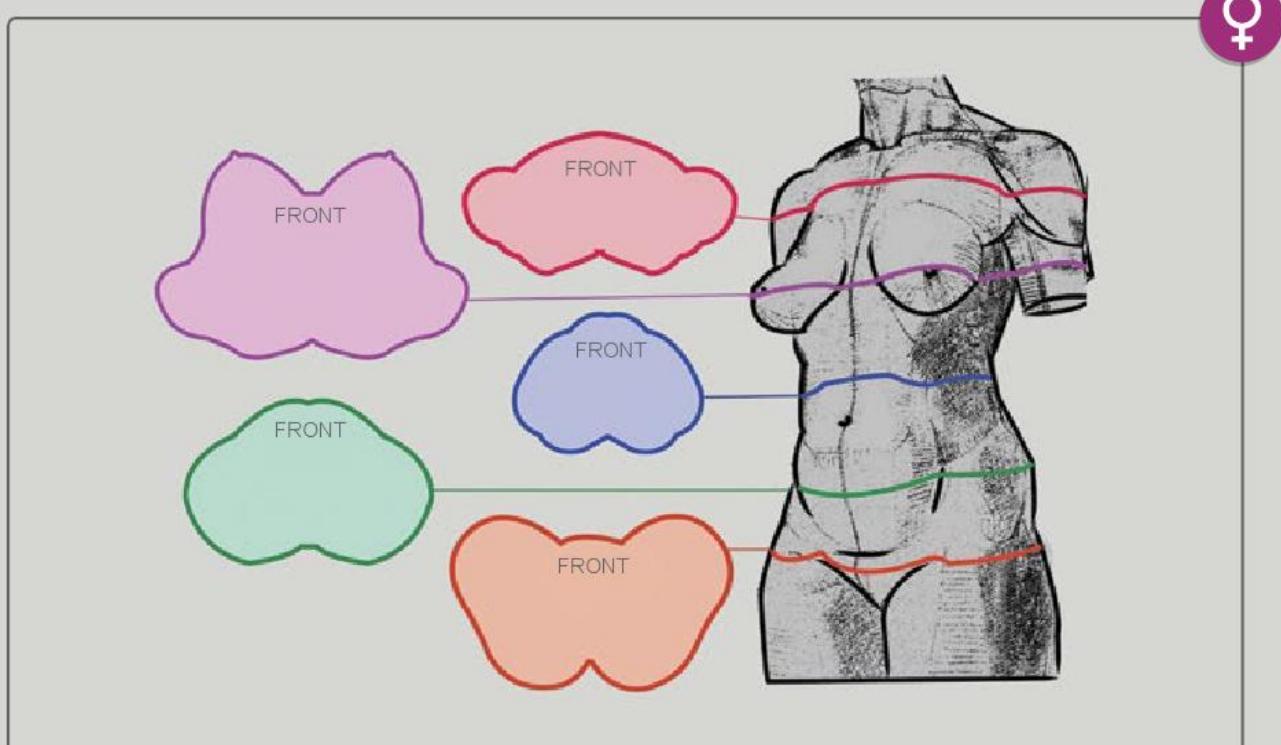
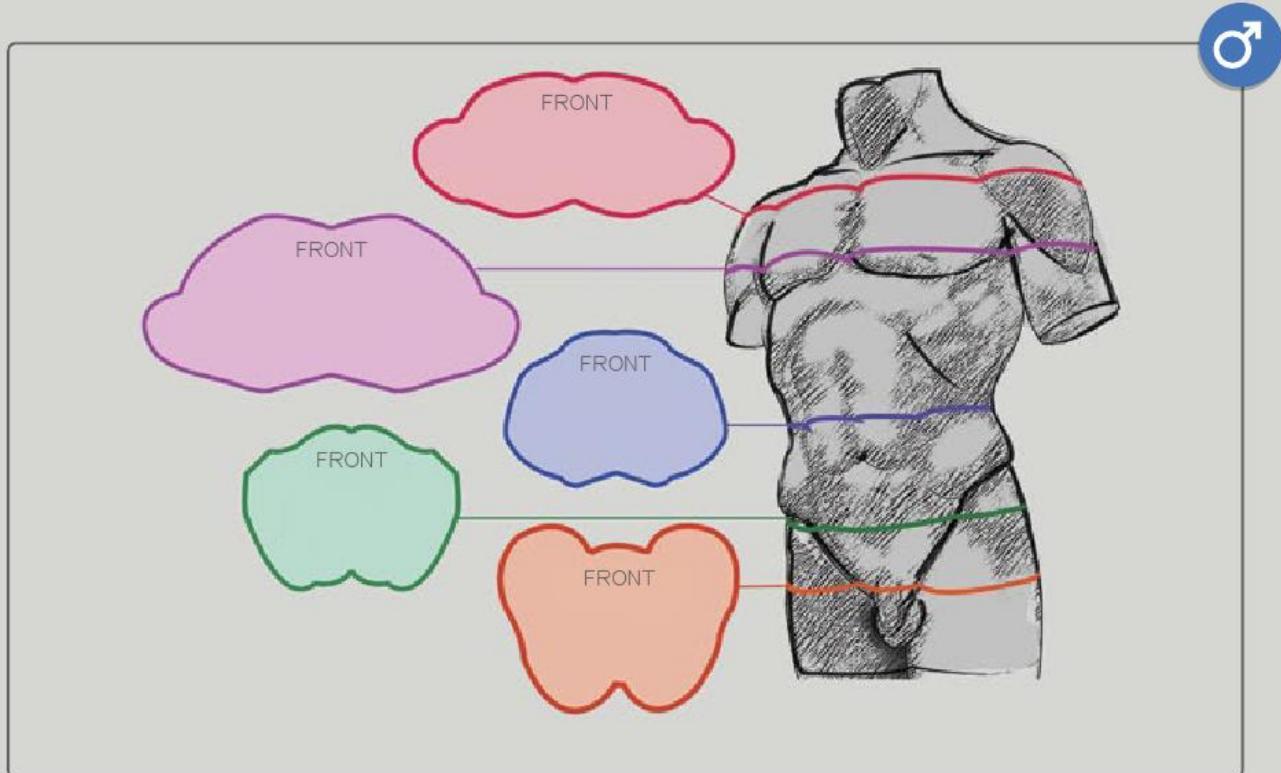
ANGULAR RELATIONSHIP OF MOVABLE MASSES OF TORSO



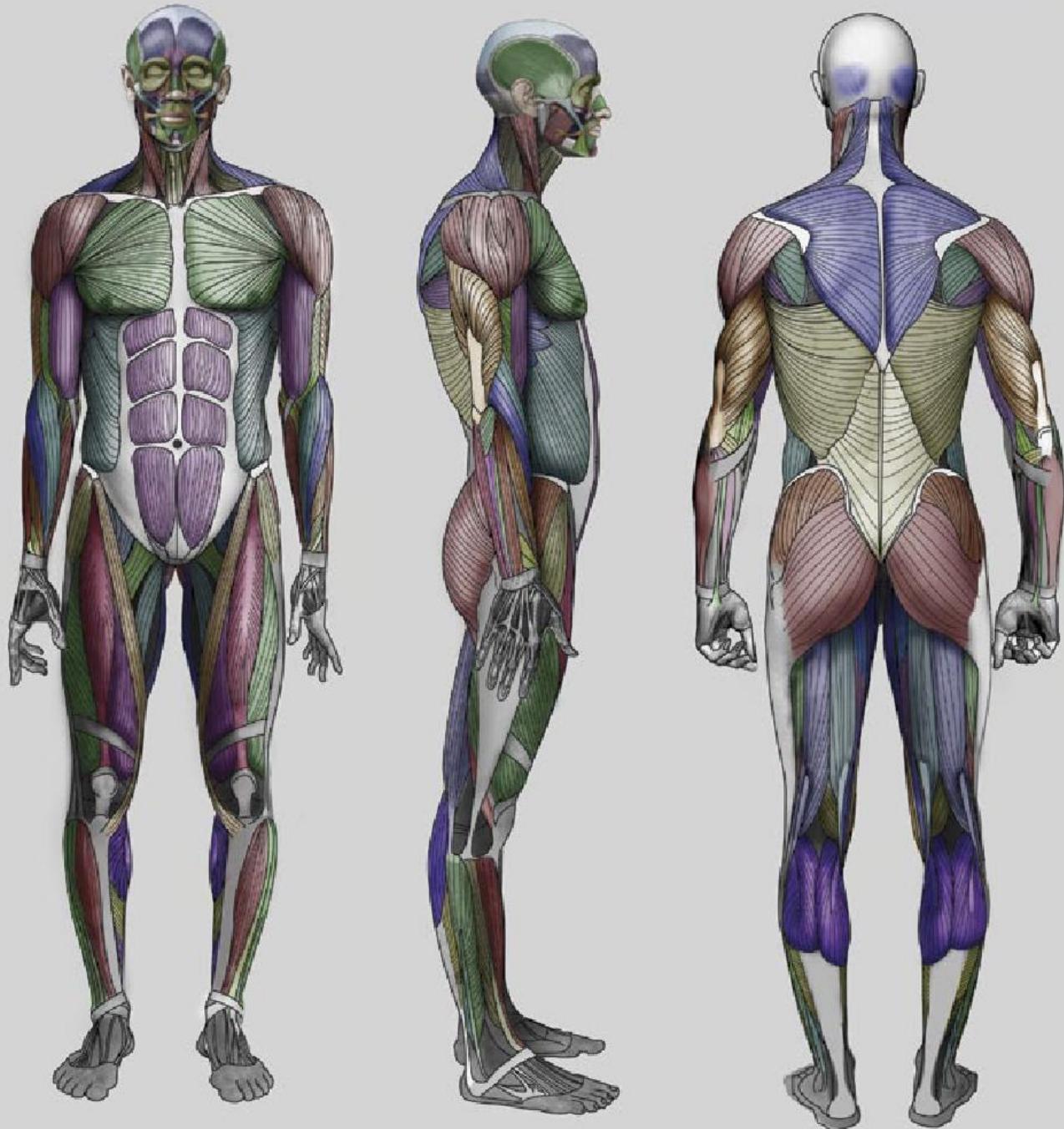
ILIAC CREST LINE

HORIZONTAL CROSS SECTIONS OF TORSO

i



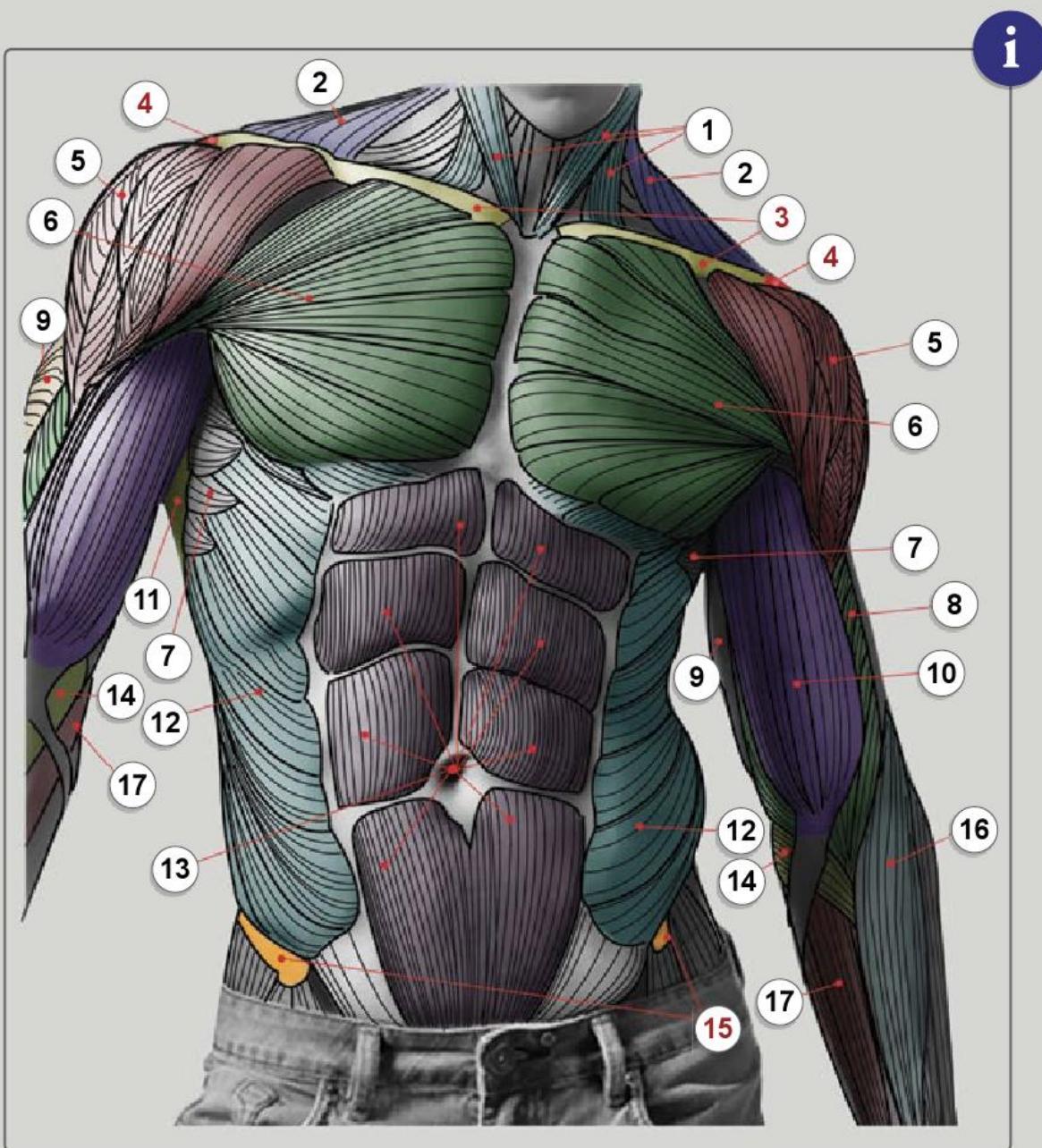
ÉCORCHÉ



MALE FIGURE



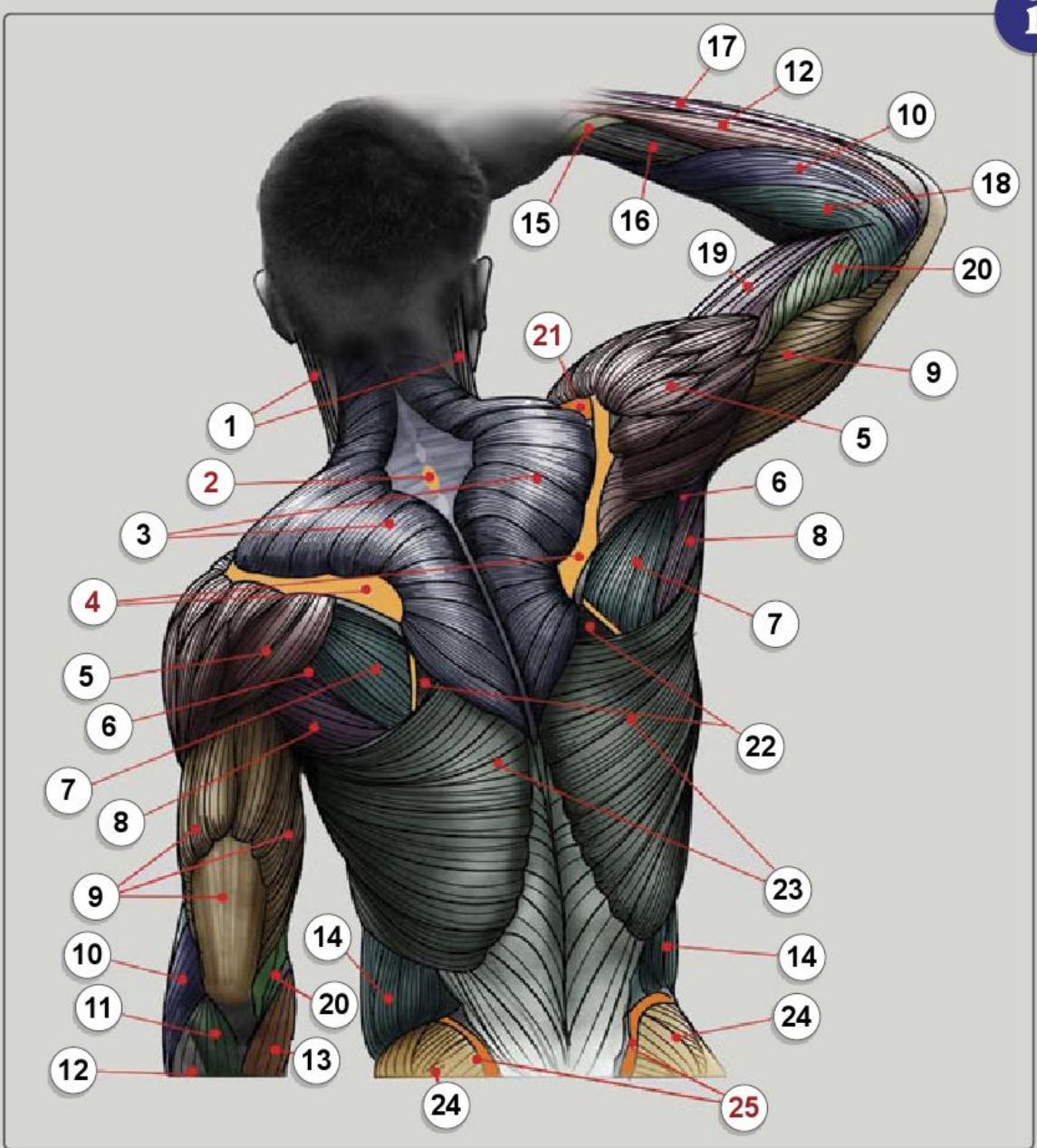
MAIN MUSCLES AND LANDMARK POINTS OF FRONTAL TORSO



1 STERNOCLÉIDOMASTOID	7 SERRATUS ANTERIOR	13 RECTUS ABDOMINIS
2 TRAPEZIUS	8 BRACHIALIS	14 PRONATOR TERES
3 CLAVICLE	9 TRICEPS BRACHII	15 ANTERIOR SUPERIOR ILIAC SPINE
4 SHOULDER BLADE	10 BICEPS BRACHII	16 BRACHIORADIALIS
5 DELTOID	11 LATISSIMUS DORSI	17 FLEXOR CARPI RADIALIS
6 PECTORALIS	12 EXTERNAL OBLIQUE	

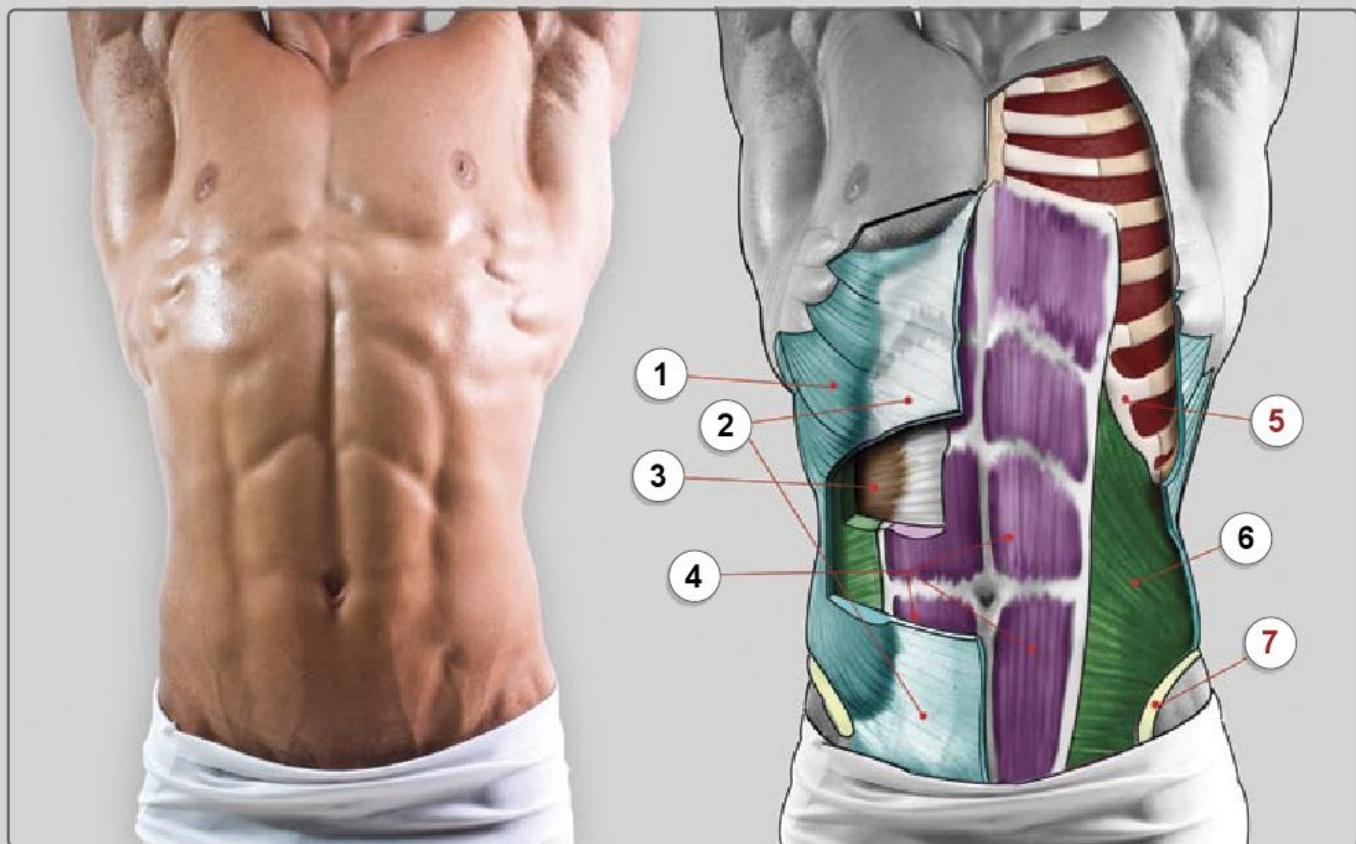
MAIN MUSCLES AND BONES OF THE BACK

i



1	STERNOCLEIDOMASTOID	10	EXTENSOR CARPI RADIALIS LONGUS	19	BICEPS BRACHII
2	7TH VERTEBRAE	11	ANconeus	20	BRACHIALIS
3	TRAPEZIUS	12	EXTENSOR DIGITORUM	21	CLAVICLE
4	SPINE OF SCAPULA	13	FLEXOR CARPI ULNARIS	22	RHOMBoid MAJOR
5	DELTOID	14	EXTERNAL OBLIQUE	23	LATISSIMUS DORSI
6	TERES MINOR	15	ABDUCTOR POLLICIS LONGUS	24	GLUTEUS MAXIMUS
7	INFRASPINATUS	16	EXTENSOR CARPI RADIALIS BREVIS	25	POSTERIOR SUPERIOR ILIAC SPINE
8	TERES MAJOR	17	EXTENSOR CARPI ULNARIS		
9	TRICEPS BRACHII	18	BRACHIORADIALIS		

ABDOMINAL MUSCLES



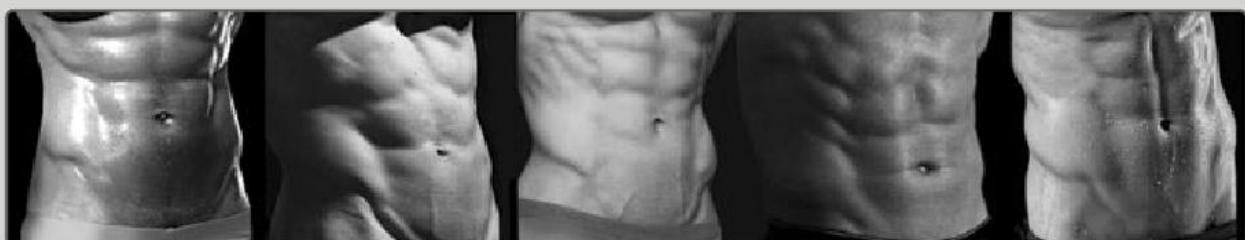
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- 1 **EXTERNAL OBLIQUE:** LOCATED ON SIDE AND FRONT OF ABDOMEN
- 2 **APONEUROYSIS OF EXTERNAL OBLIQUE:**
BROAD, FLAT, TENDINOUS PORTION OF **EXTERNAL OBLIQUE** MUSCLE
- 3 **TRANSVERSUS ABDOMINIS:** LOCATED UNDER **OBLIQUES**, IT IS THE DEEPEST OF ABDOMINAL MUSCLES AND WRAPS AROUND SPINE FOR PROTECTION AND STABILITY
- 4 **RECTUS ABDOMINIS:** ALSO KNOWN AS “**ABS**” OR **SIX-PACK** – LOCATED ALONG FRONT OF THE ABDOMEN. THIS IS THE MOST WELL-KNOWN ABDOMINAL MUSCLE
- 5 **RIB CAGE (THORACIC CAGE OR THORAX)**
- 6 **INTERNAL ABDOMINAL OBLIQUE:** LOCATED UNDER **EXTERNAL OBLIQUES** AND RUNS IN THE OPPOSITE DIRECTION
- 7 **WING OF ILIUM** – COMMONLY CALLED “**HIP BONE**” (ILIAC CREST)

IS A “SIX-PACK” REALLY AN “EIGHT-PACK”?



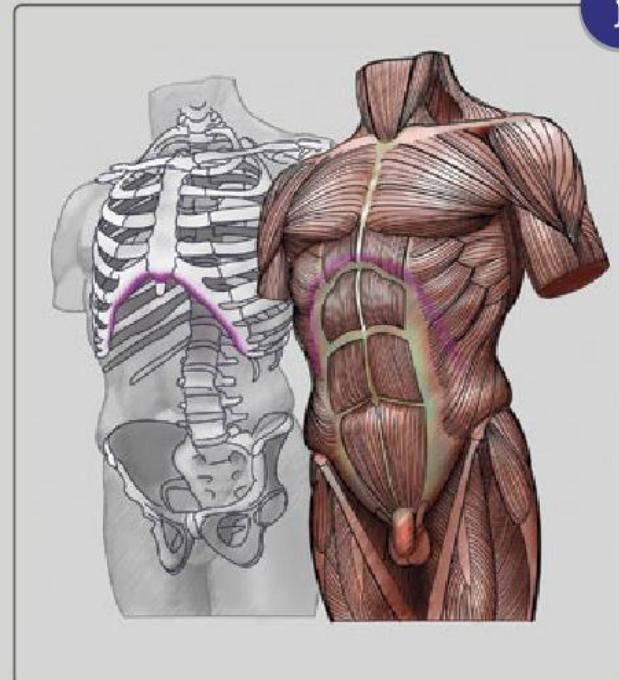
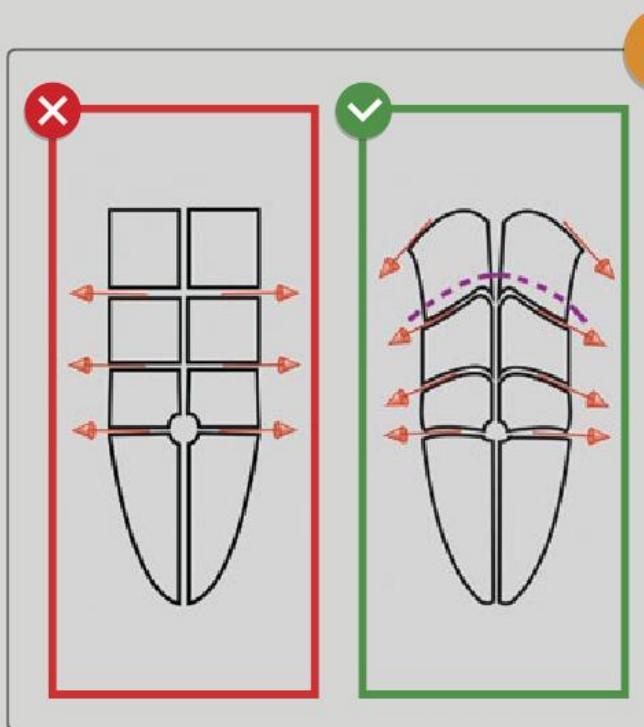
CLASSIC SCULPTURE



FITNESS



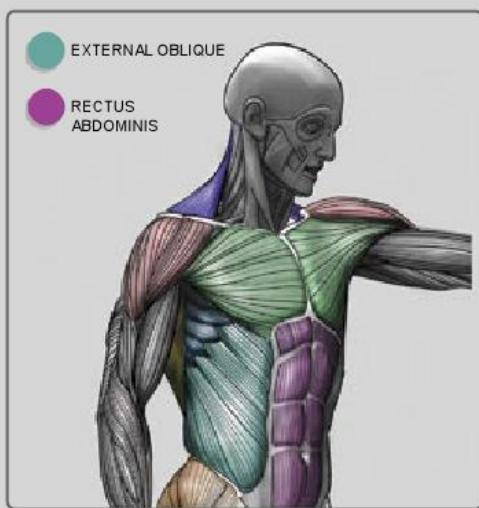
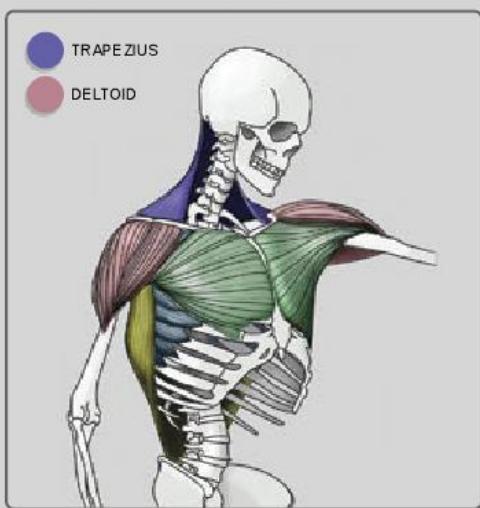
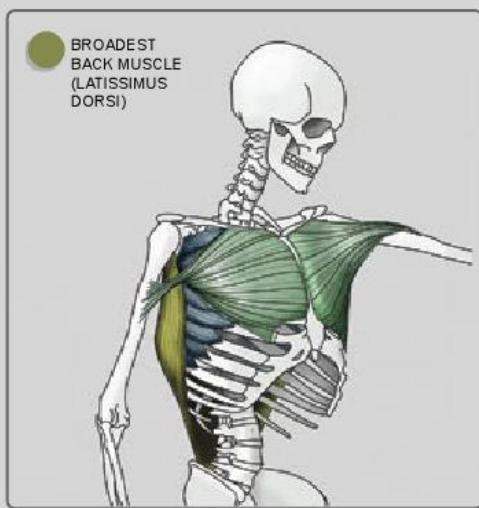
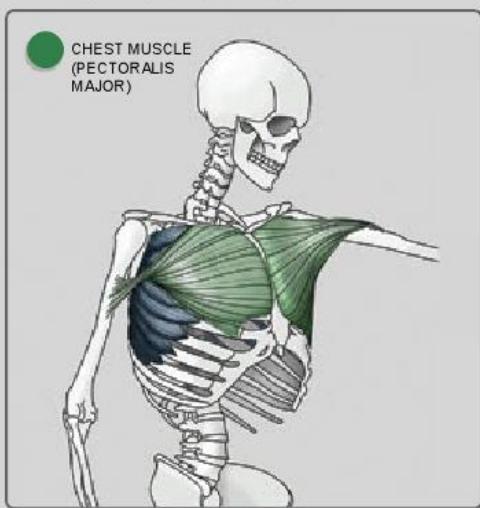
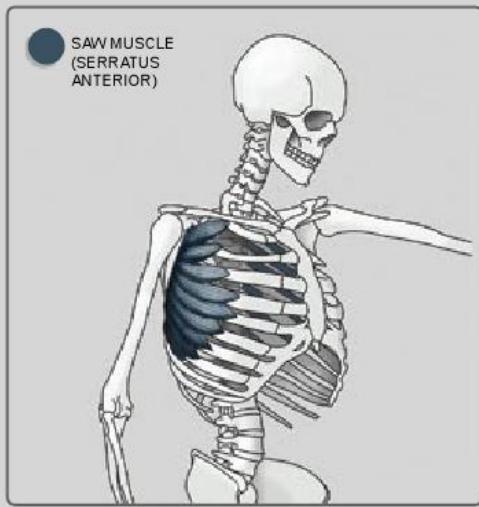
SKINLESS

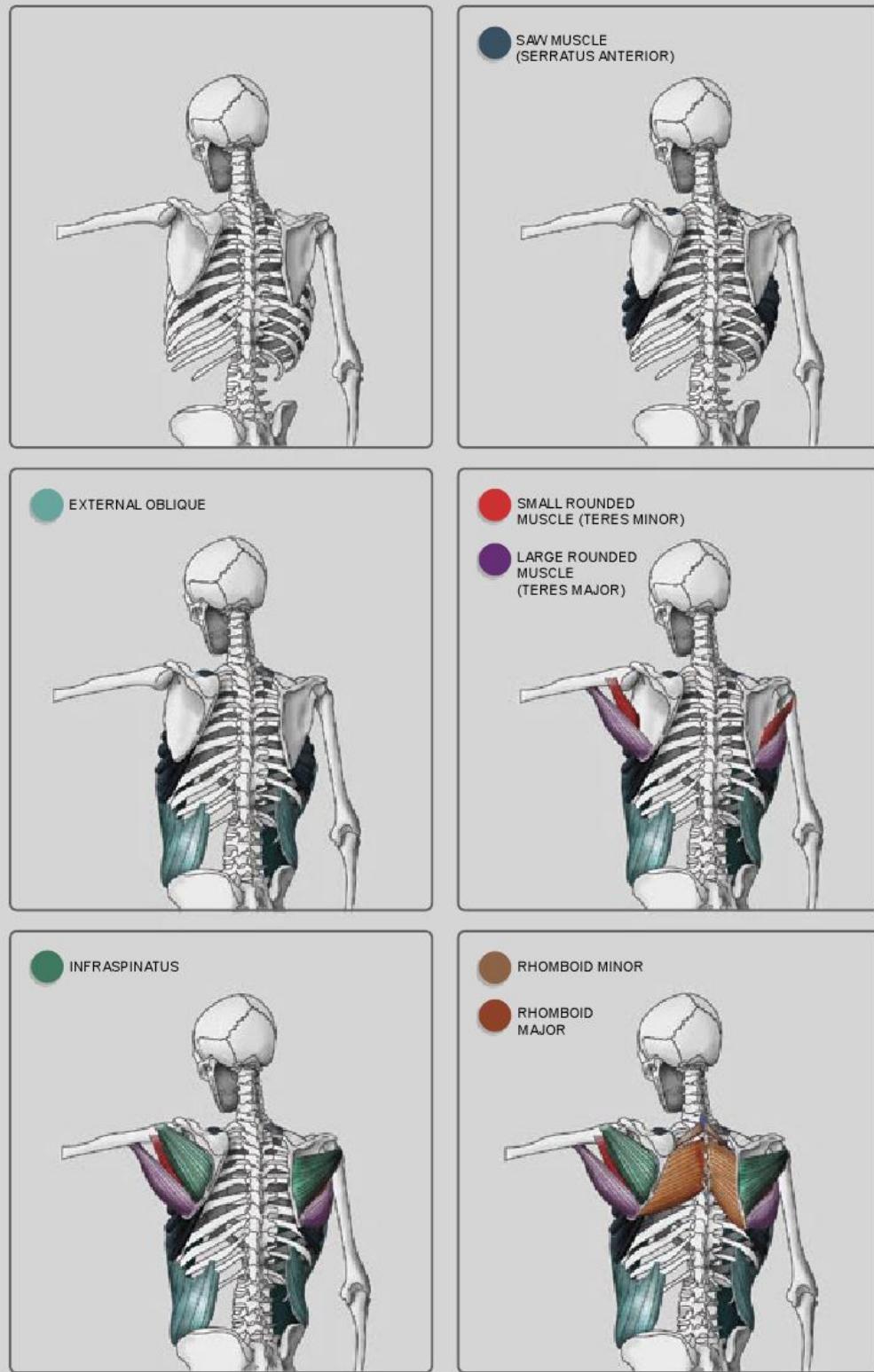


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MOST IMPORTANT MUSCLES OF FRONTAL TORSO (LAYER BY LAYER)

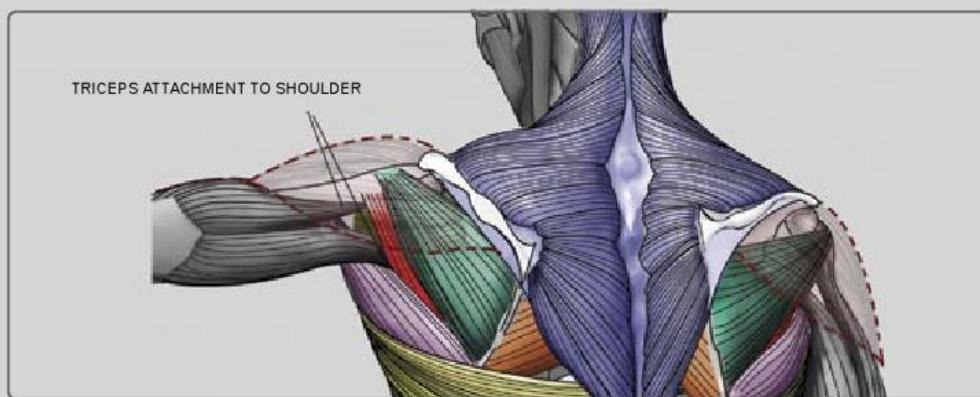
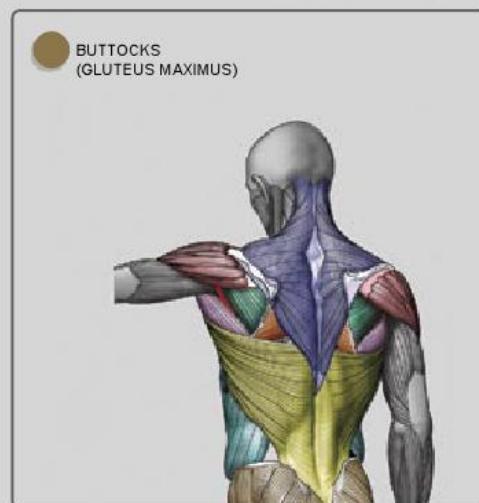
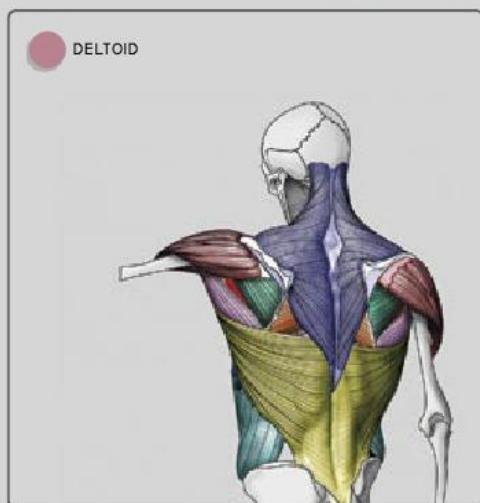
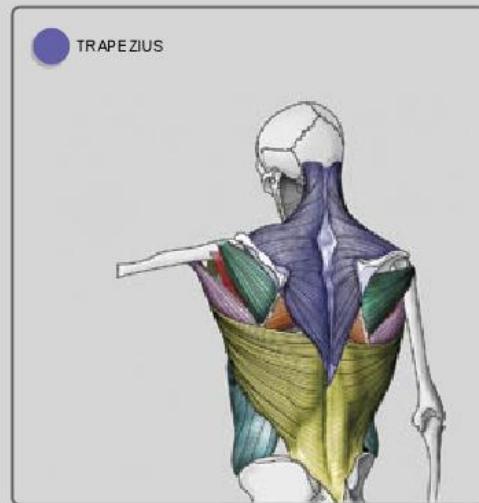
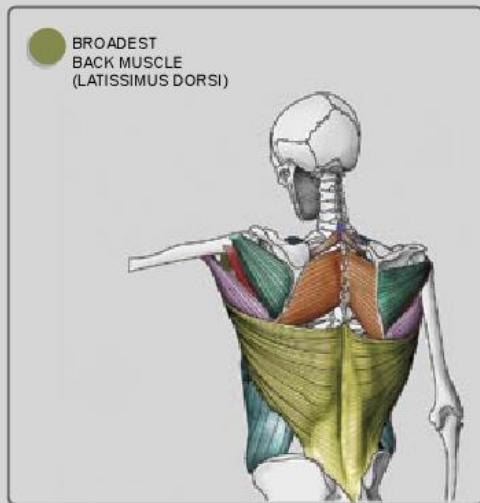
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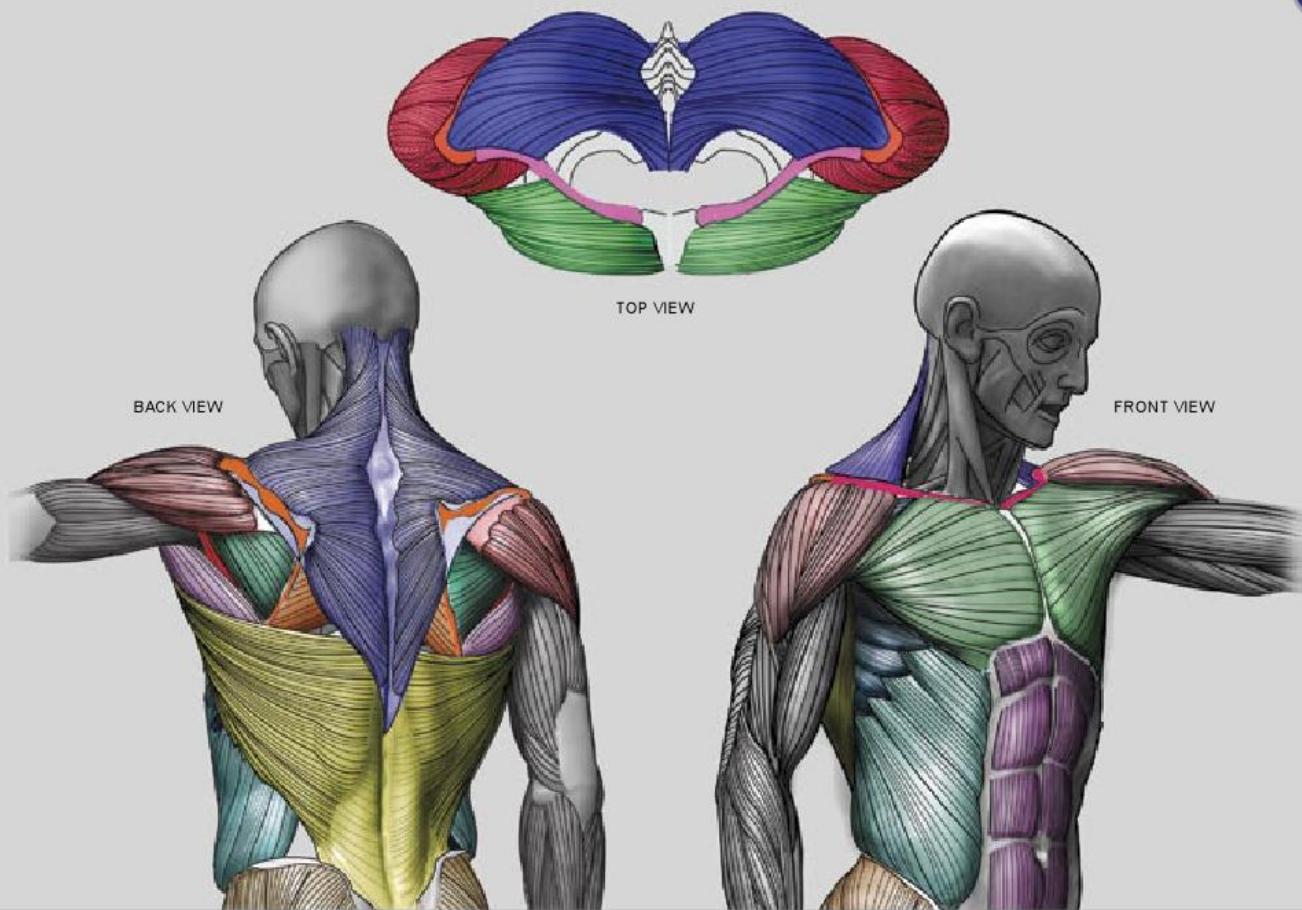
MOST IMPORTANT BACK MUSCLES
(LAYER BY LAYER)

MOST IMPORTANT BACK MUSCLES (LAYER BY LAYER)

i



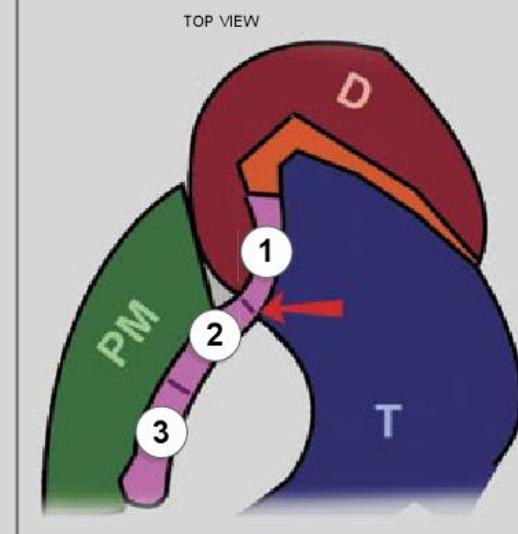
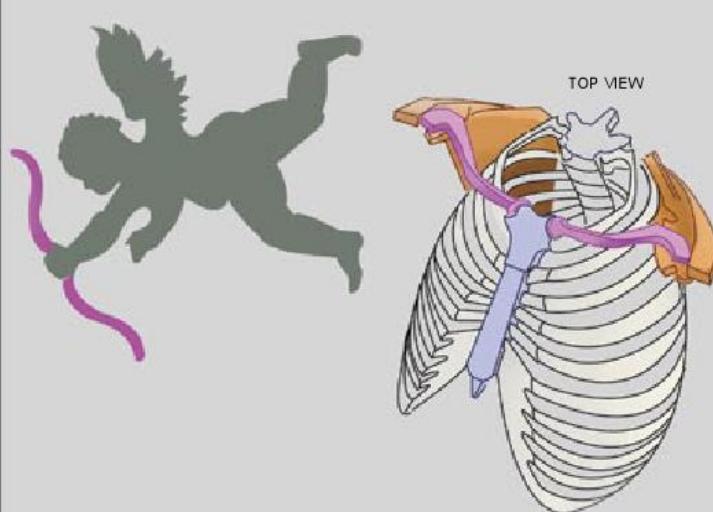
CLAVICLE – SHAPE AND CONNECTIONS



IF YOU LOOK AT THE CLAVICLE FROM ABOVE, YOU CAN SEE IT'S AN "S" SHAPE.

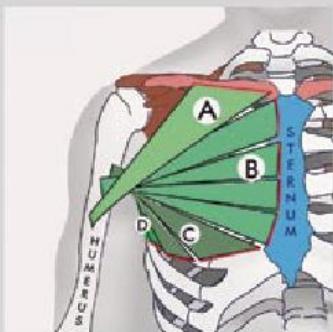


BOTH, (D) AND (T) CONNECT ON THE LATERAL THIRD OF THE CLAVICLE.



GREAT CHEST MUSCLE

(PECTORALIS MAJOR)



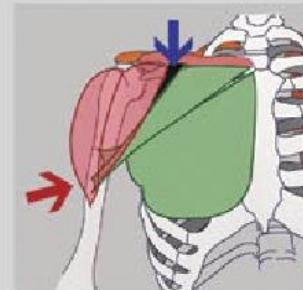
ONE END OF PM IS CONNECTED TO THE HUMERUS AND OTHER END CONNECTS:

- A: TO 3/5 OF CLAVICLE
- B: TO STERNUM BONE
- C: TO RIBS
- D: LYING ON ABDOMINAL MUSCLES

A: THIS PORTION IS OFTEN VISIBLE AS SEPARATE PART OF PM.



HOLLOW AREA BETWEEN PM AND DELTOID IS ALWAYS VISIBLE!



PM IS PARTIALLY COVERED BY DELTOID MUSCLE.

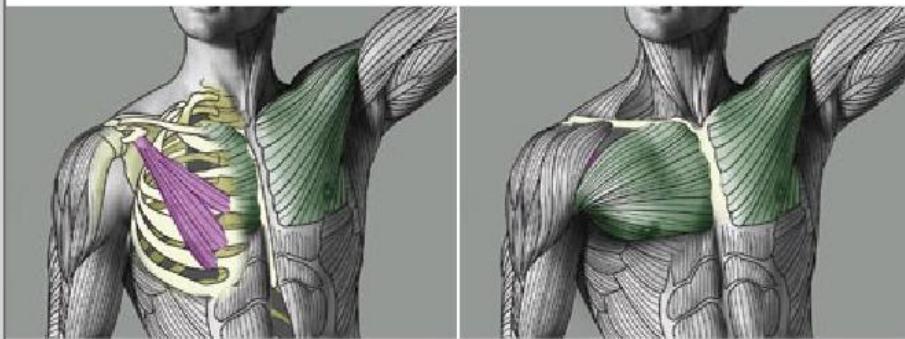


WHAT IS THIS BULGE?

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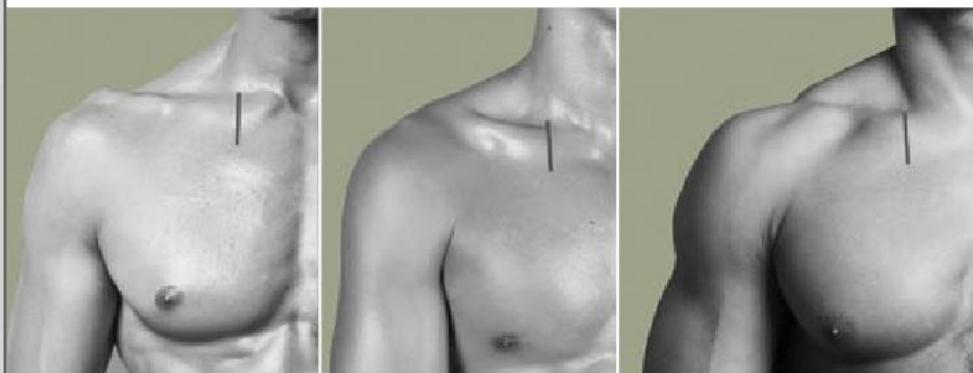
THE PECTORALIS MINOR MUSCLE PUSHING PECTORALIS MAJOR OUTWARD FROM UNDERNEATH.



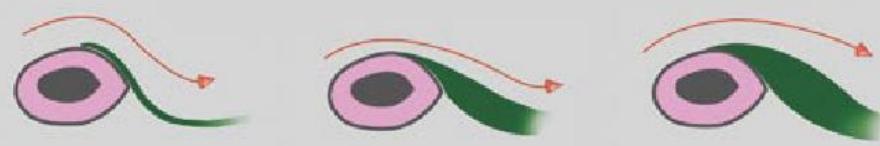
ORIGIN: STERNUM ENDS AT 3-5 RIBS
 INSERTION: CORACOID PROCESS OF SCAPULA
 ACTION: MOVES SHOULDER BLADE FORWARD AND DOWNWARD



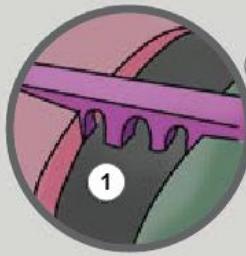
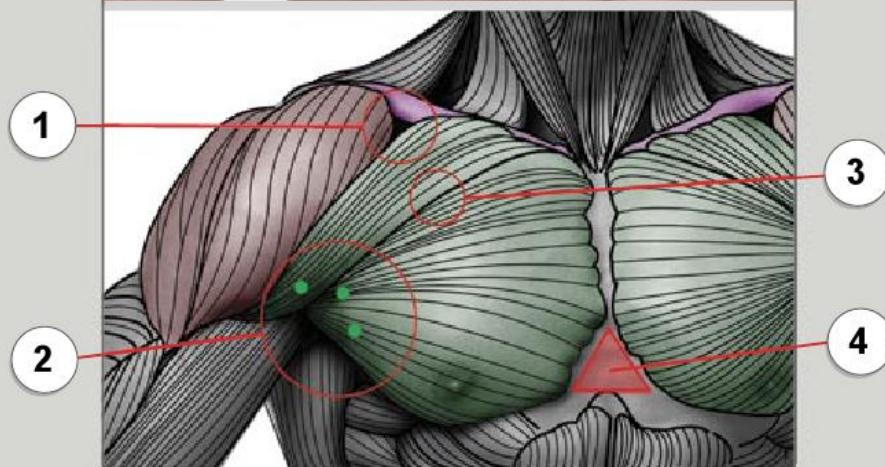
AS CHEST MUSCLES BECOME MORE DEVELOPED, LESS COLLAR BONE (CLAVICLE) IS VISIBLE.



CROSS SECTION OF COLLAR BONE (CLAVICLE) AND CHEST MUSCLE (PECTORALIS MAJOR).

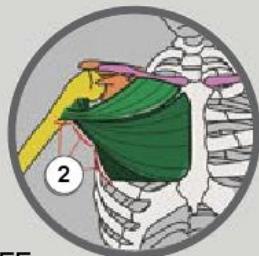


CHEST AND SHOULDER FEATURES



1 **COLLARBONE (CLAVICLE)** IS LIKE A BRIDGE OVER A VALLEY. UNDERNEATH THE COLLARBONE IS THE **INFRACLAVICULAR TRIANGLE (INFRACLAVICULAR FOSSA)**, WHICH IS A PIT BETWEEN THE CHEST MUSCLE (PECTORALIS MAJOR) AND SHOULDER MUSCLE (DELTOID). THE **COLLARBONE (CLAVICLE)** IS ALWAYS VISIBLE.

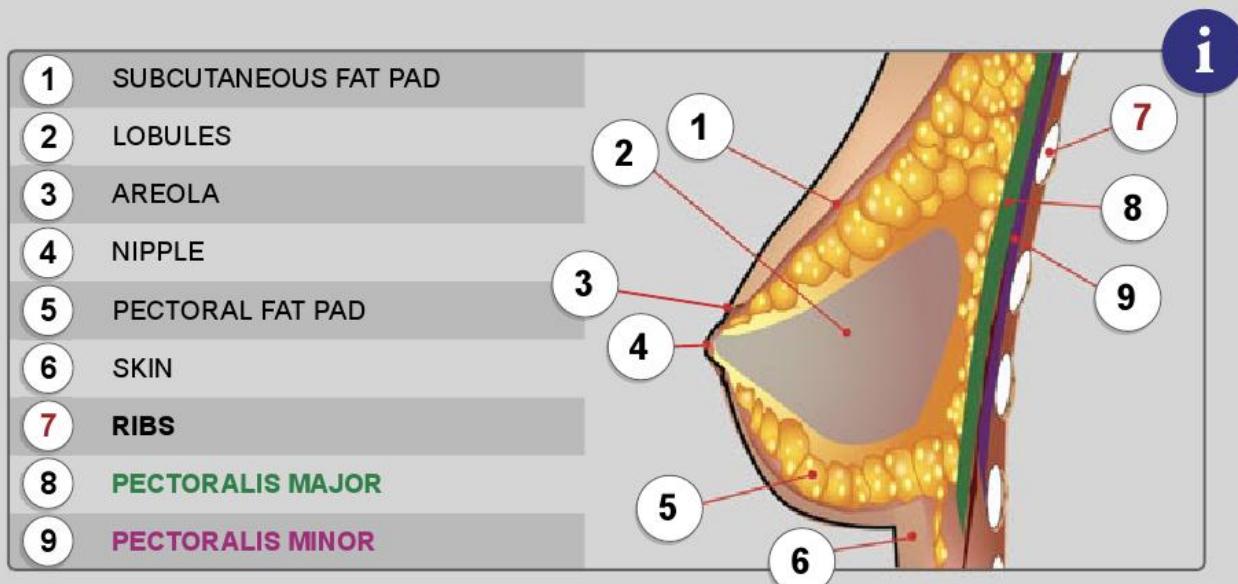
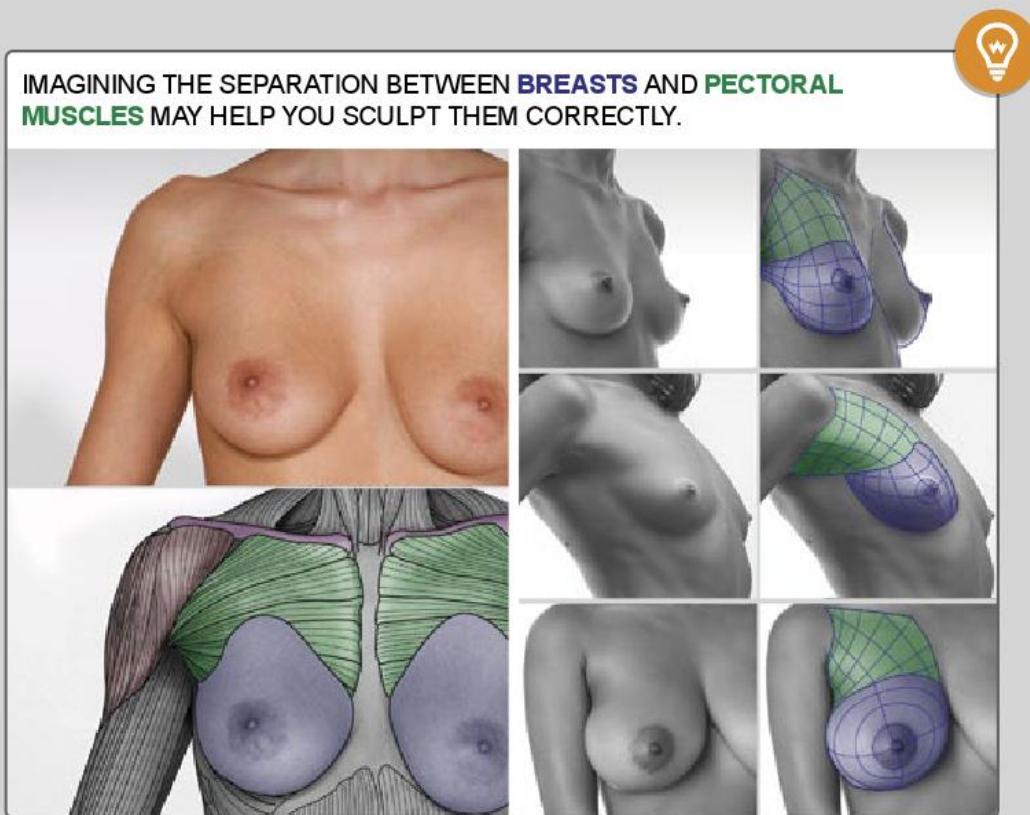
2 EACH BODY ●●● OF THE CHEST MUSCLE (PECTORALIS MAJOR) HAS DIFFERENT INSERTIONS ON **THE HUMERUS**. FIBERS CHANGE DIRECTIONS, CROSSING OVER EACH OTHER AND CREATING **MULTIPLE MASSES ON THE EDGE OF THE ARMPIT**.



3 SOMETIMES IN VERY MUSCULAR INDIVIDUALS, YOU CAN SEE A SEPARATION BETWEEN THE **CLAVICULAR SECTION** AND **STERNAL SECTION** OF THE CHEST MUSCLE (PECTORALIS MAJOR).

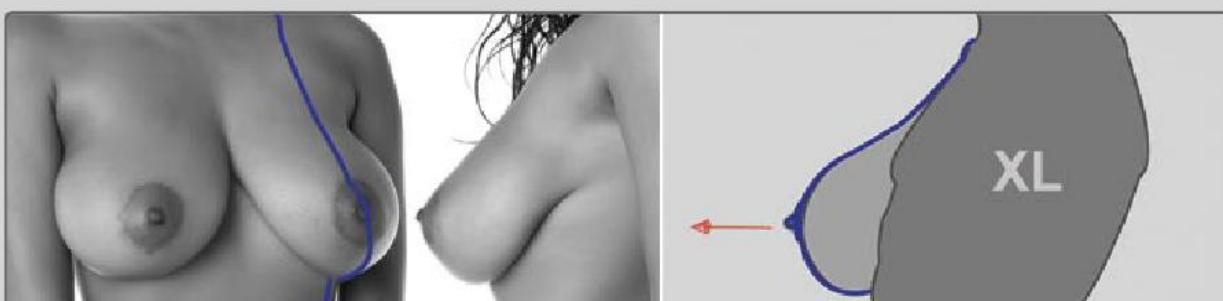
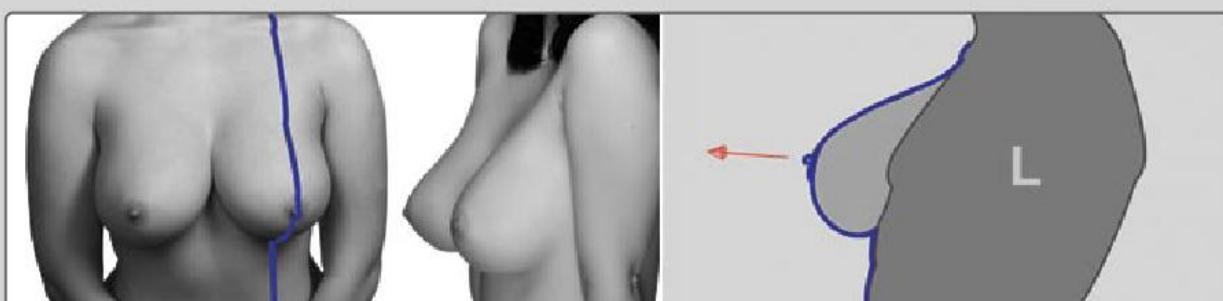
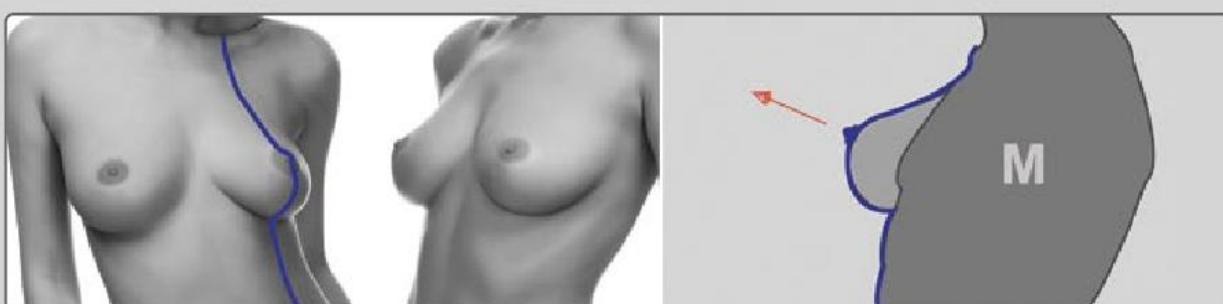
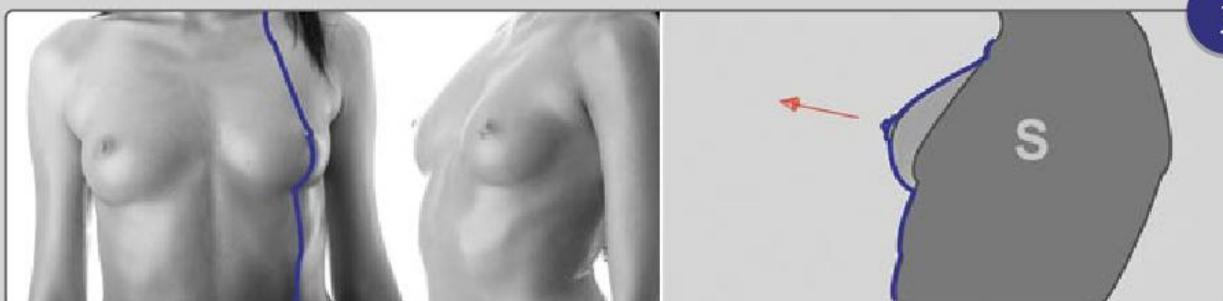
4 **BONY TRIANGLE** BETWEEN CHEST MUSCLES AND **ABDOMINAL SIX-PACK**.

FEMALE BREAST

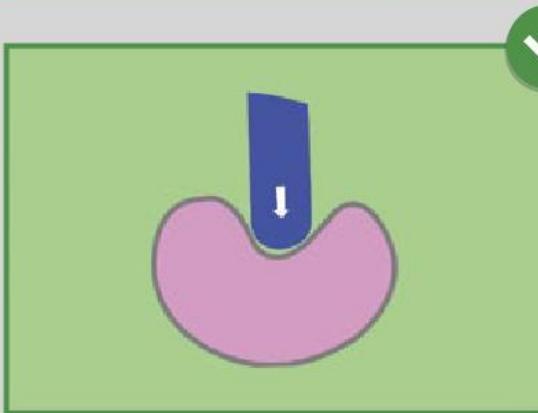
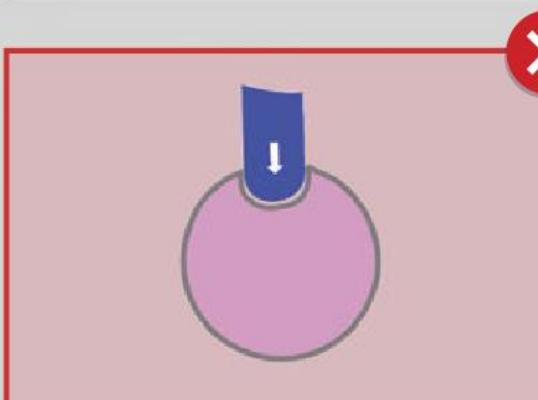
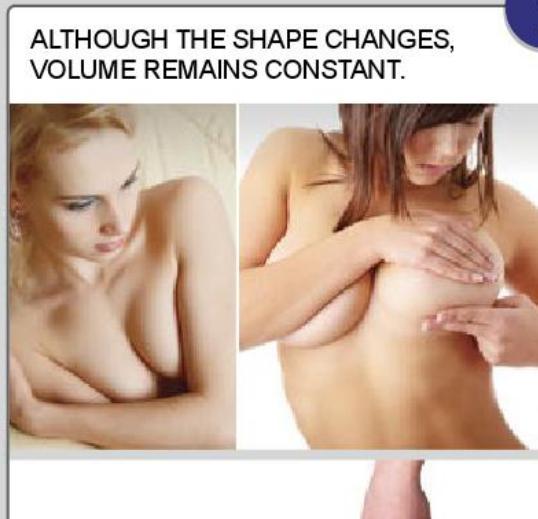


FEMALE BREAST ANGLES VARY DEPENDING ON SHAPE AND SIZE

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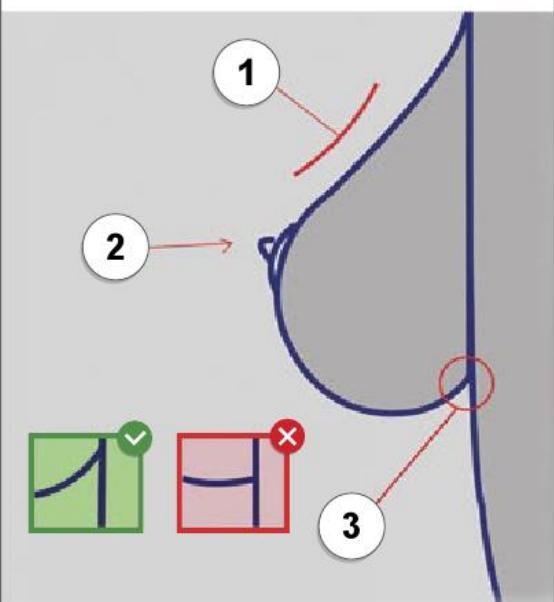
BREAST VOLUME AND POSITIONING



THE LARGER THE BREASTS, THE MORE THEY ARE SHAPED BY GRAVITY WHEN A WOMAN IS LYING ON HER BACK.



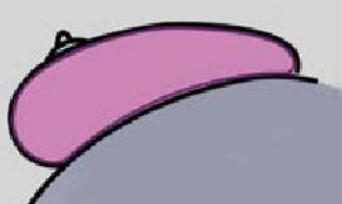
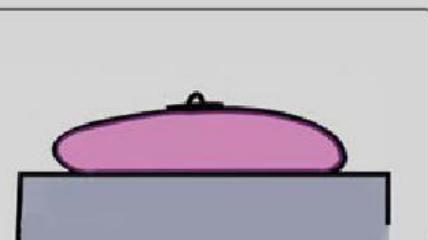
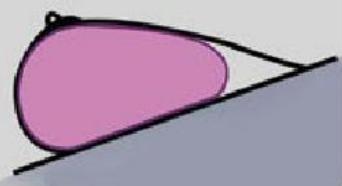
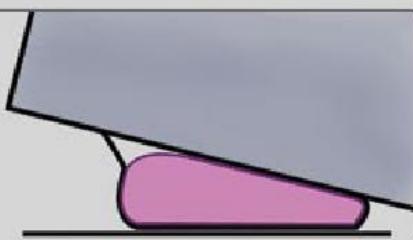
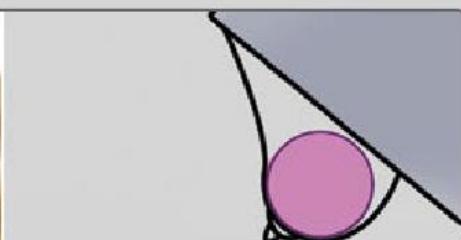
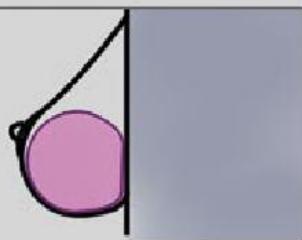
3 TIPS ON HOW TO MAKE FEMALE BREASTS LOOK YOUTHFUL.



- 1 TOP SIDE: STRAIGHT OR CONCAVE, BUT NEVER CONVEX
- 2 NIPPLE POINTS UPWARD
- 3 LIFT LOWER BORDER WHERE BREAST CONNECTS TO CHEST WALL

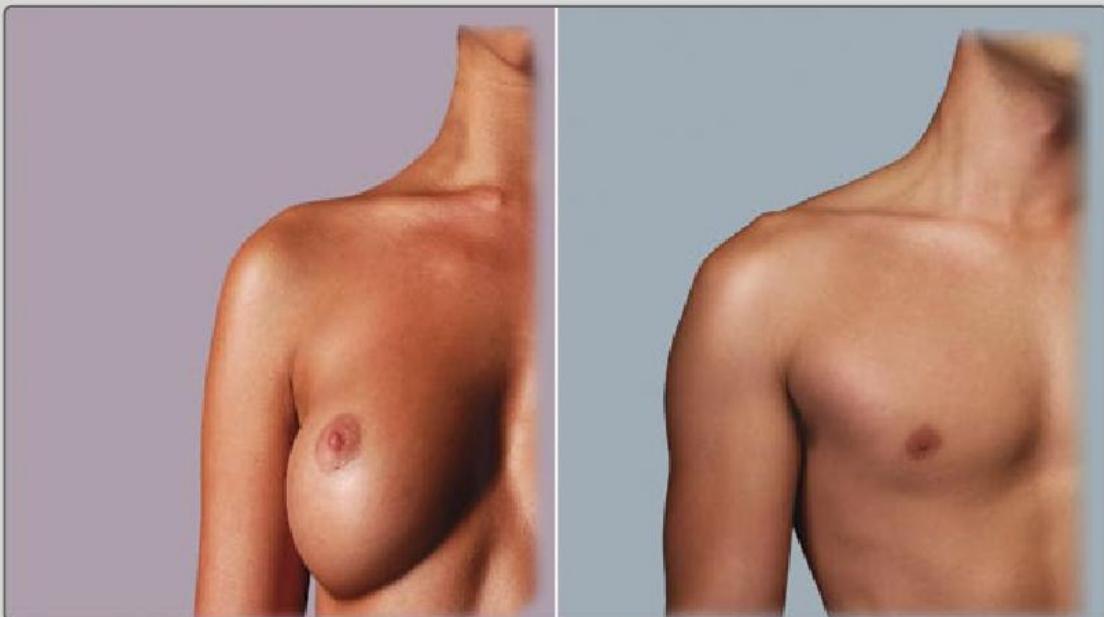
WEIGHT AND MASS DISTRIBUTION OF FEMALE BREAST

i

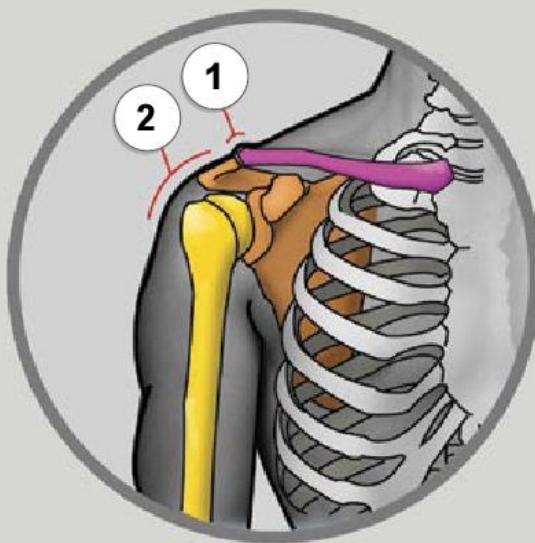


WHAT CREATES A SHOULDER'S SILHOUETTE?

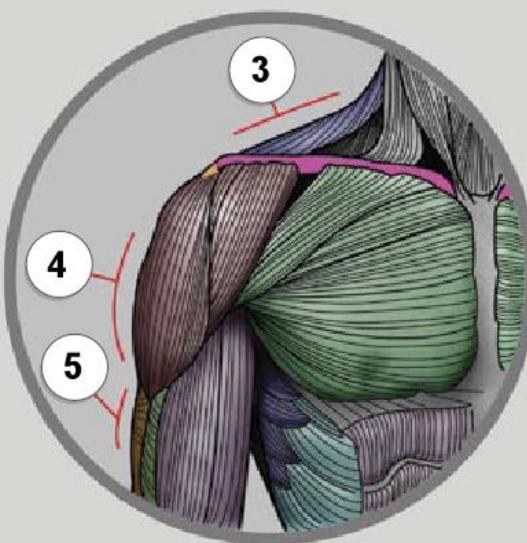
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BONES



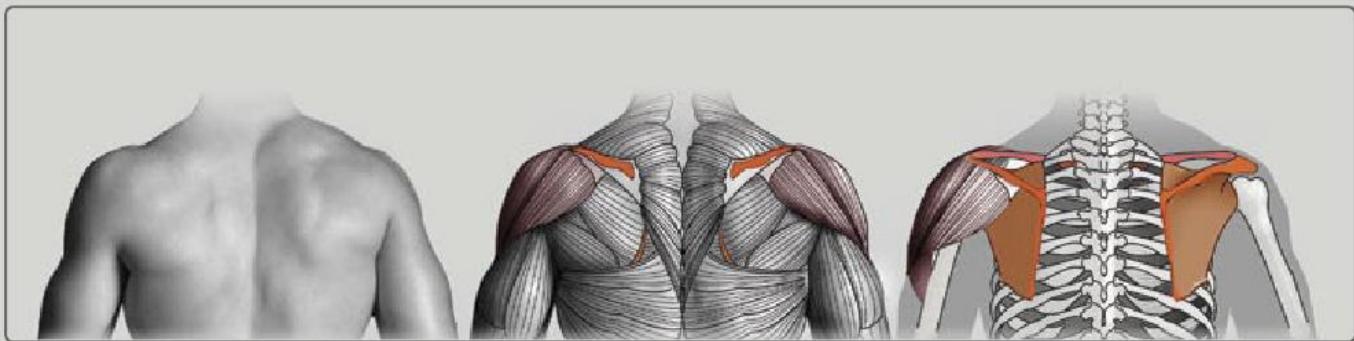
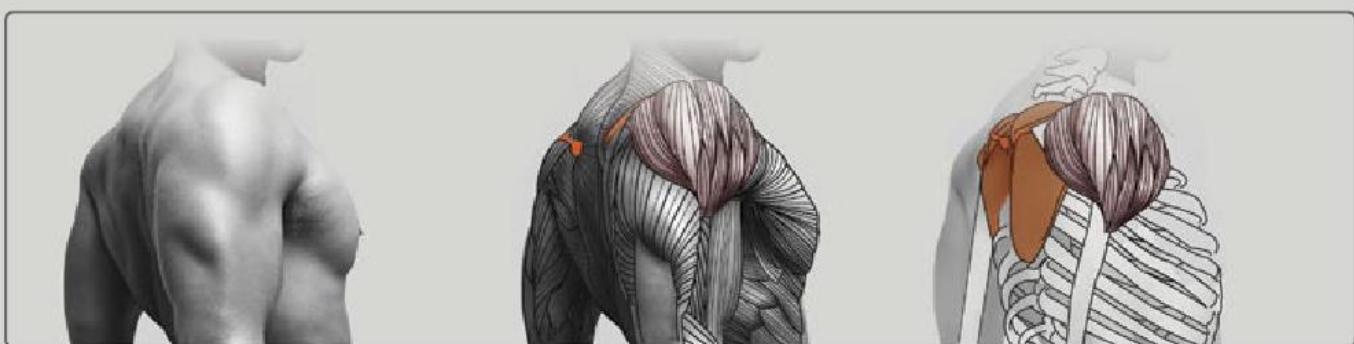
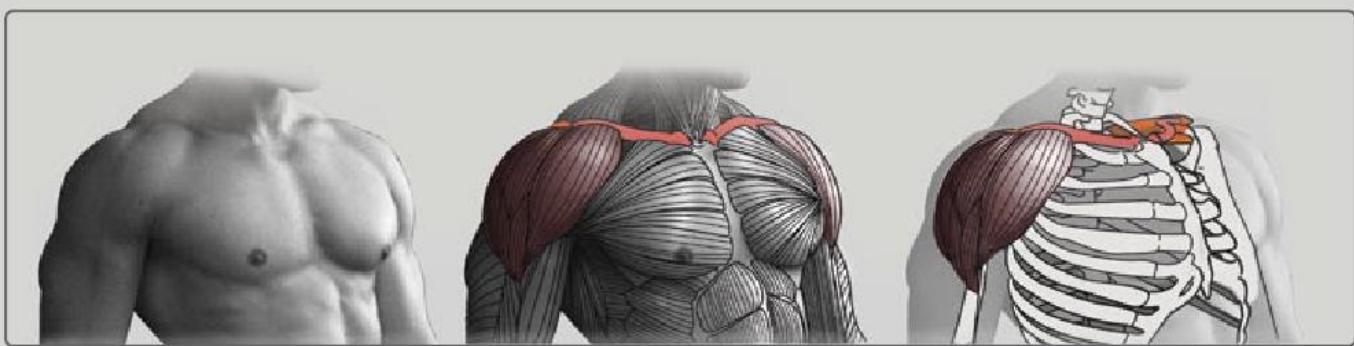
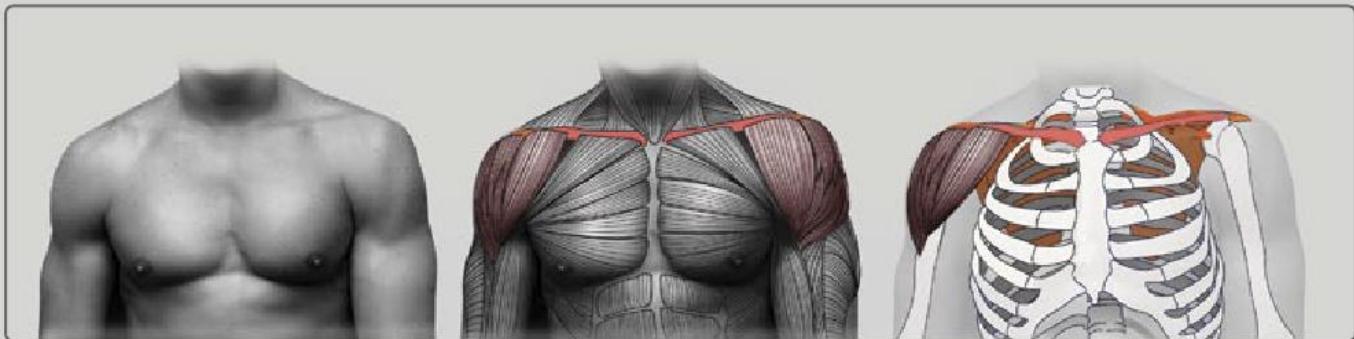
MUSCLES



- 1 LATERAL END OF **COLLARBONE (CLAVICLE)**
- 2 HEAD OF **HUMERUS** PUSHES **SHOULDER MUSCLE (DELTOID)** OUTWARD.
- 3 **TRAPEZIUS**
- 4 LATERAL HEAD OF **SHOULDER MUSCLE (DELTOID)**
- 5 LATERAL HEAD OF **TRICEPS**

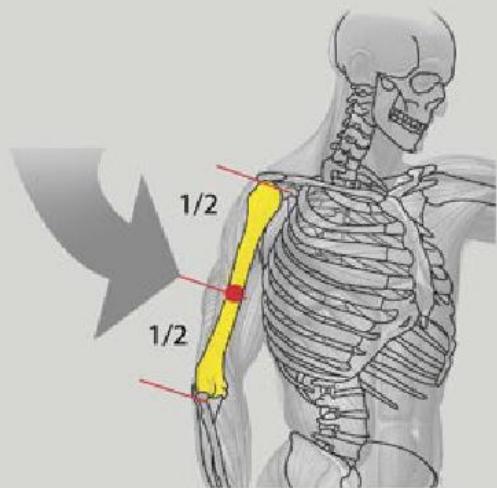
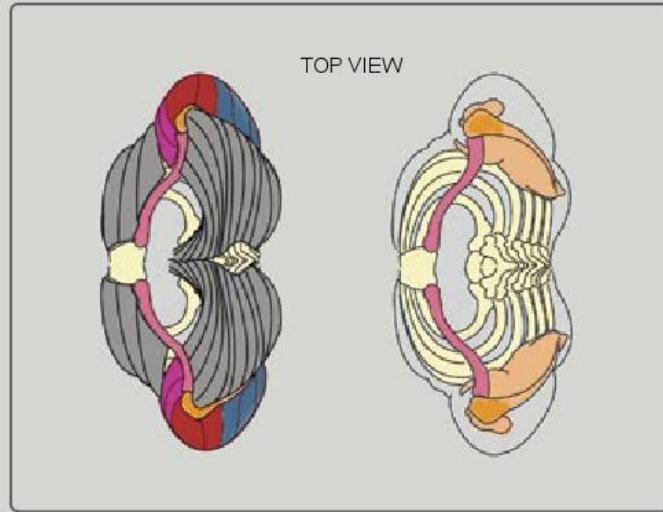
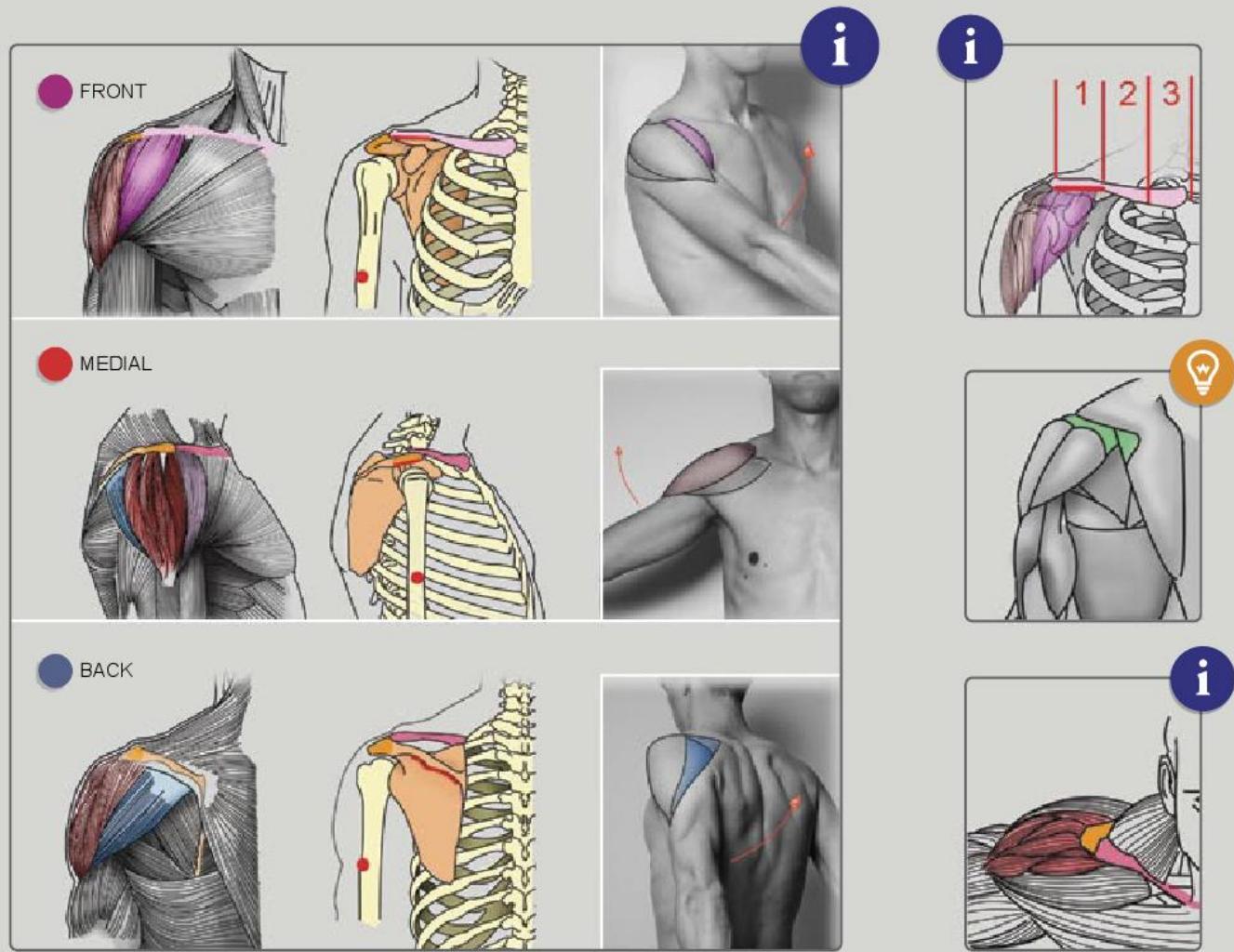
SHOULDER MUSCLE
(DELTOID)

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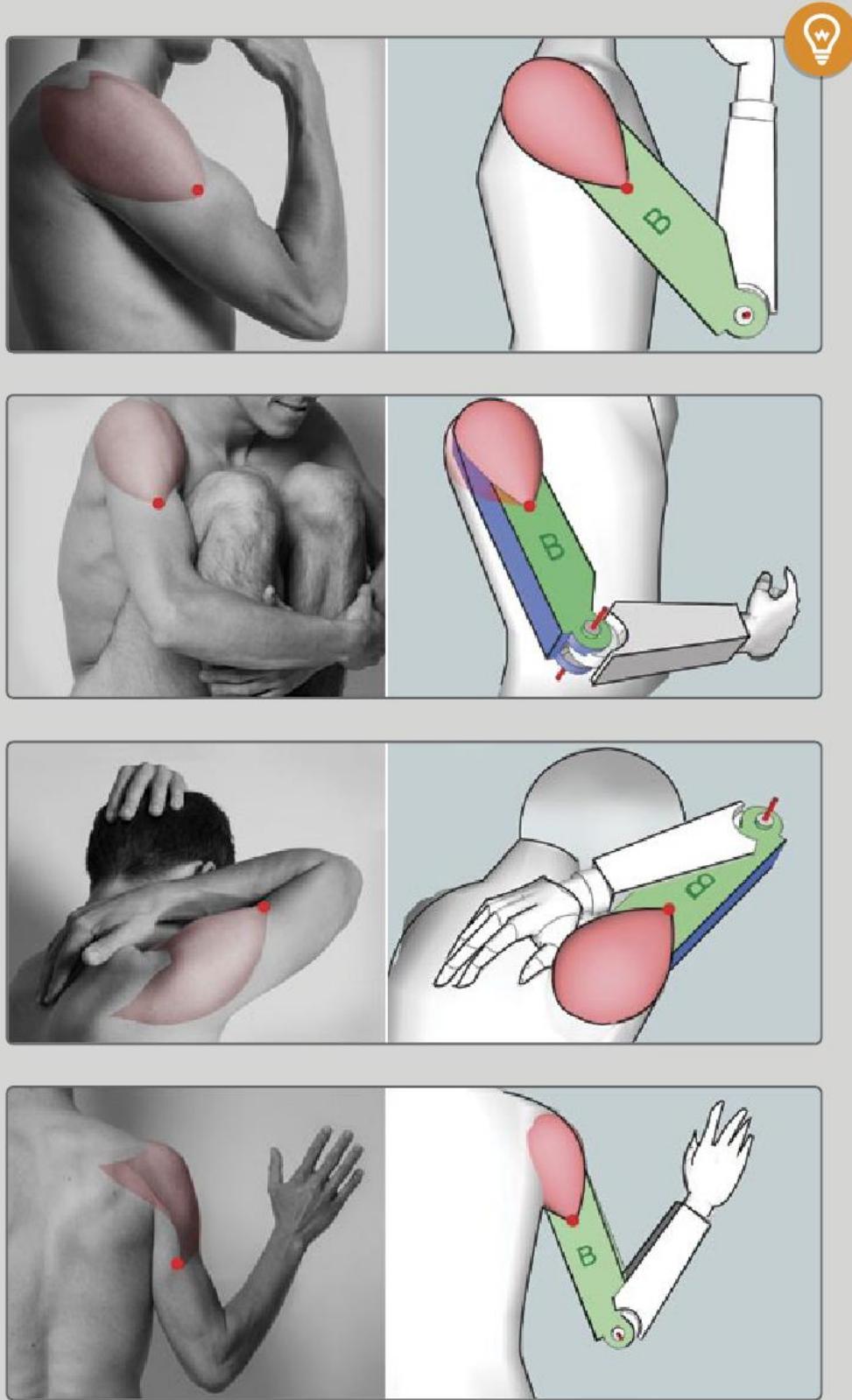


SHOULDER MUSCLE (DELTOID) HAS 3 SECTIONS:

FRONT (ANTERIOR PART), MEDIAL (LATERAL PART) AND BACK (POSTERIOR PART)



WHICHEVER WAY YOU TURN YOUR ARM, **THE DELTOID'S LOWER, TAPERED END IS ALWAYS ON THE "B" SURFACE!**

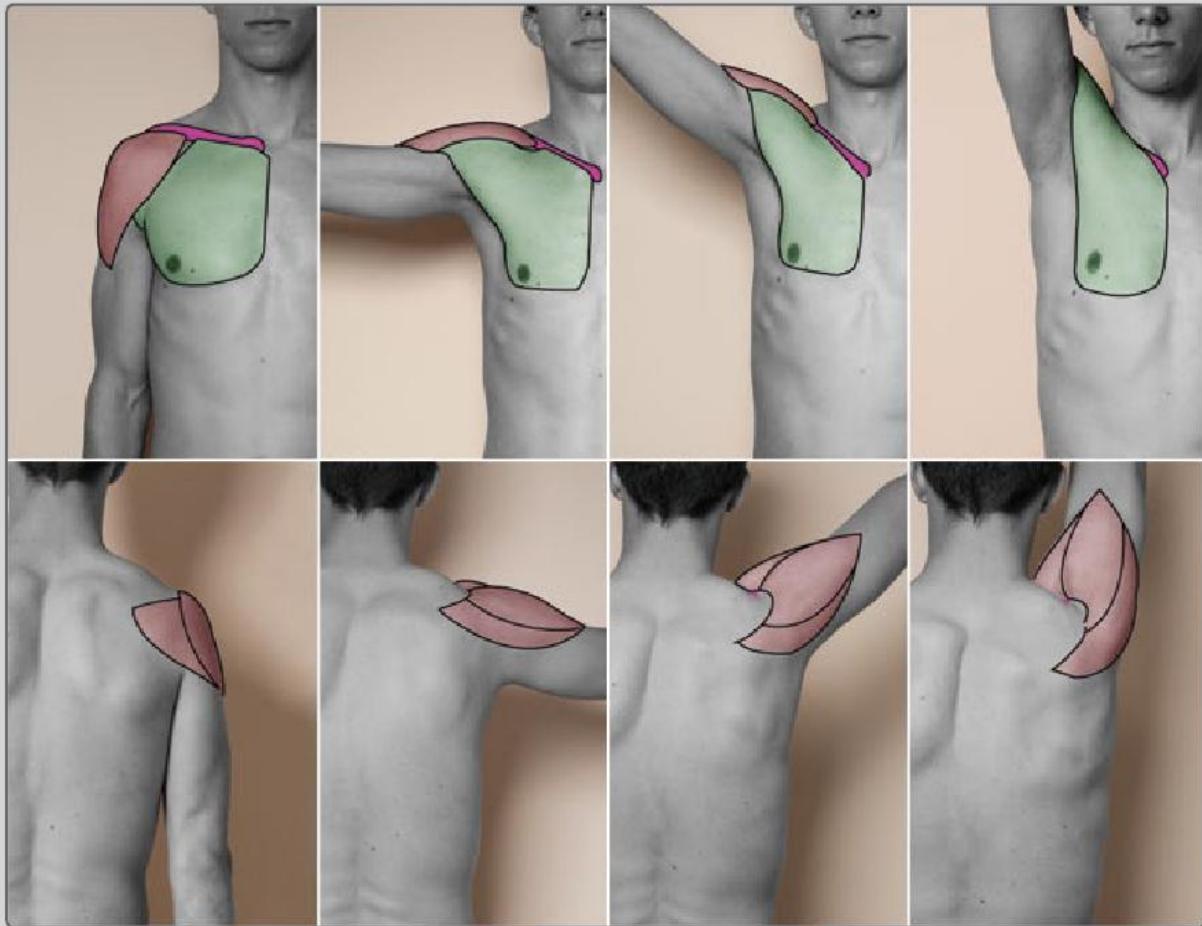
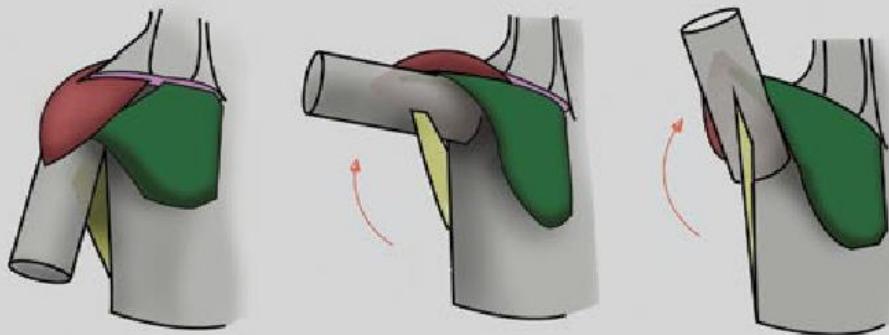


WHERE DOES IT GO?



WHERE DOES THE SHOULDER MUSCLE (DELTOID) DISAPPEAR TO WHEN THE ARM IS LIFTED UP? IT JUST TURNS TOWARD THE BACK AND YOU WILL SEE IT IF YOU LOOK FROM THE OTHER SIDE.

THE CLAVICLE IS ONLY COVERED BY SKIN. IT IS ALWAYS VISIBLE EXCEPT WHEN ARMS ARE LIFTED. THEN, THE CLAVICLE IS HIDDEN BEHIND THE GREAT CHEST MUSCLE (PECTORALIS MAJOR).



TRAPEZIUS MUSCLE

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ORIGIN: MEDIAL SUPERIOR NUChAL LINE & EXTERNAL PROTuberANCE OF THE SKULL

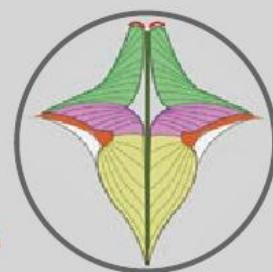
INSERTION: LATERAL CLAVICLE, ACROMION AND SPINE OF SCAPULA

ACTIONS:

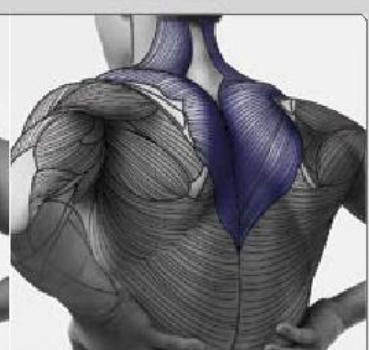
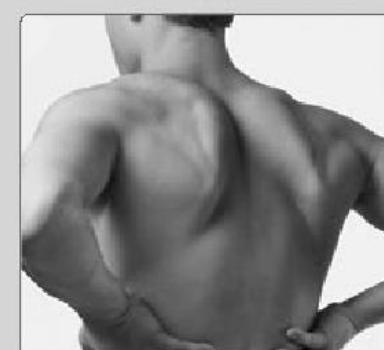
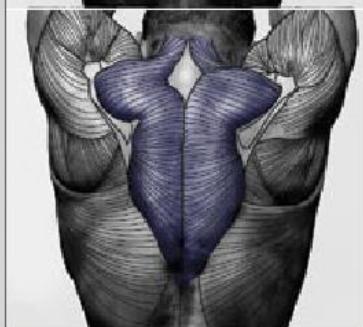
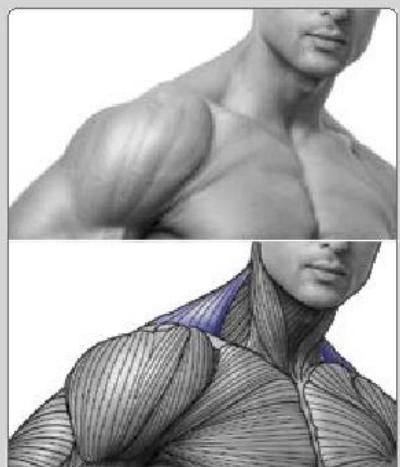
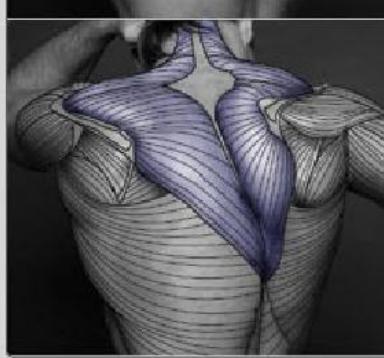
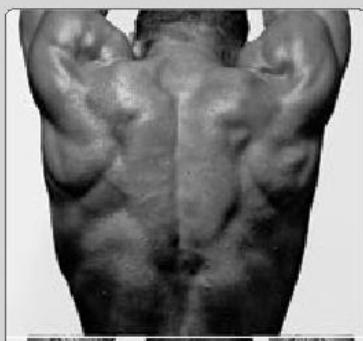
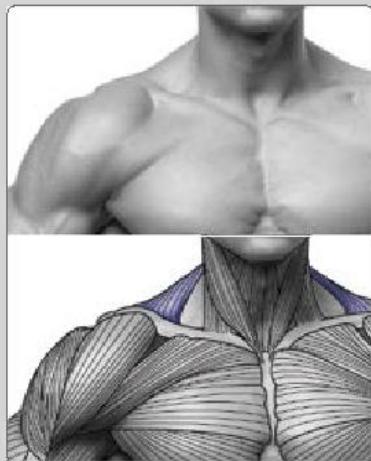
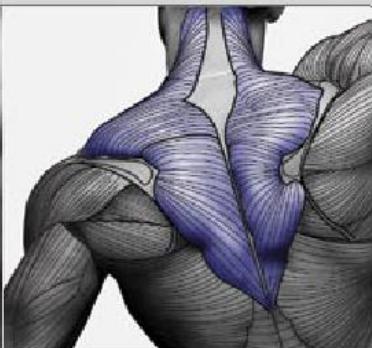
UPPER FIBERS: ELEVATE AND UPWARDLY ROTATE SCAPULA; EXTEND NECK

MIDDLE FIBERS: ADDUCT (RETRACT) SCAPULA

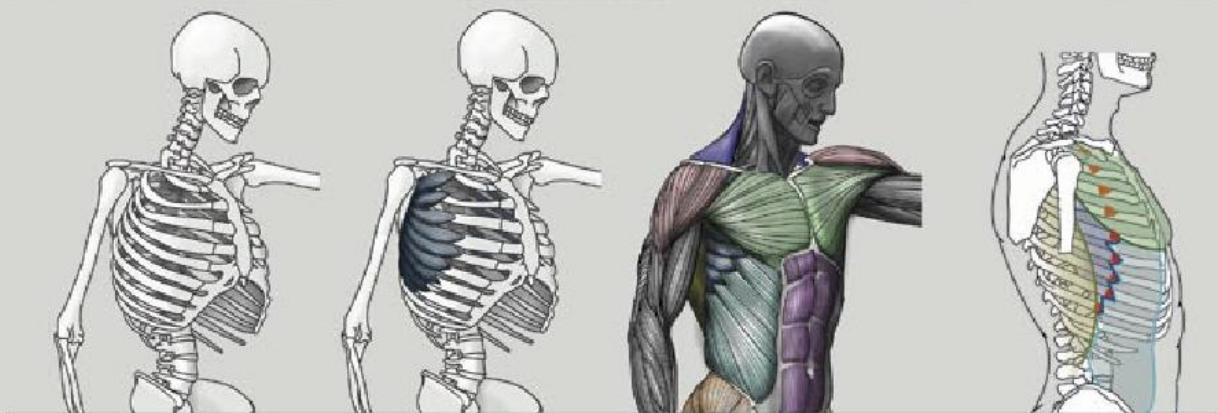
LOWER FIBERS: DEPRESS AND HELP UPPER FIBERS UPWARDLY ROTATE SCAPULA



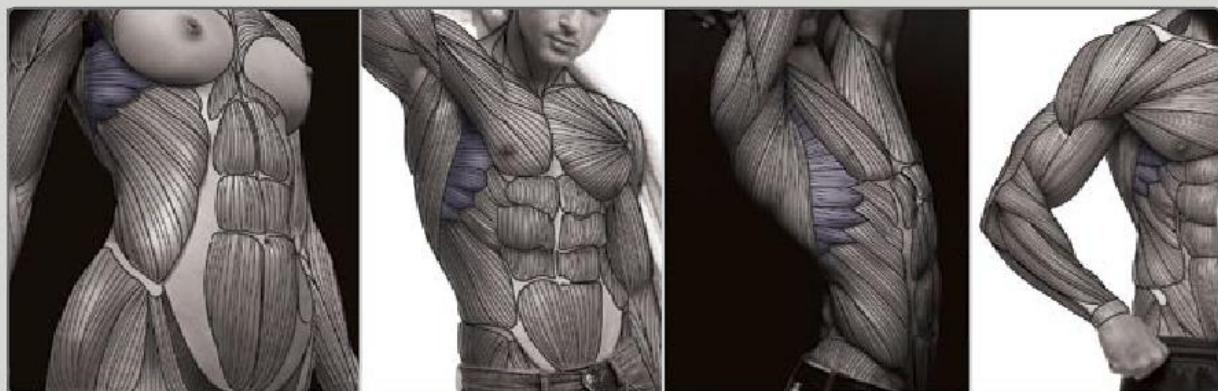
TRAPEZIUS MUSCLE



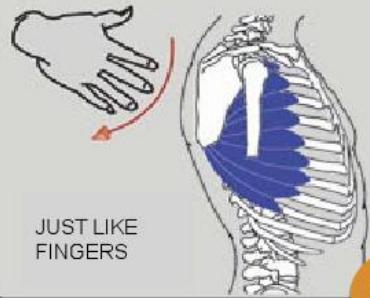
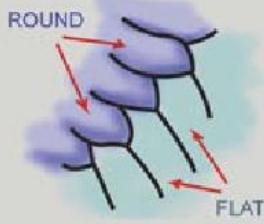
ARE THESE RIBS?



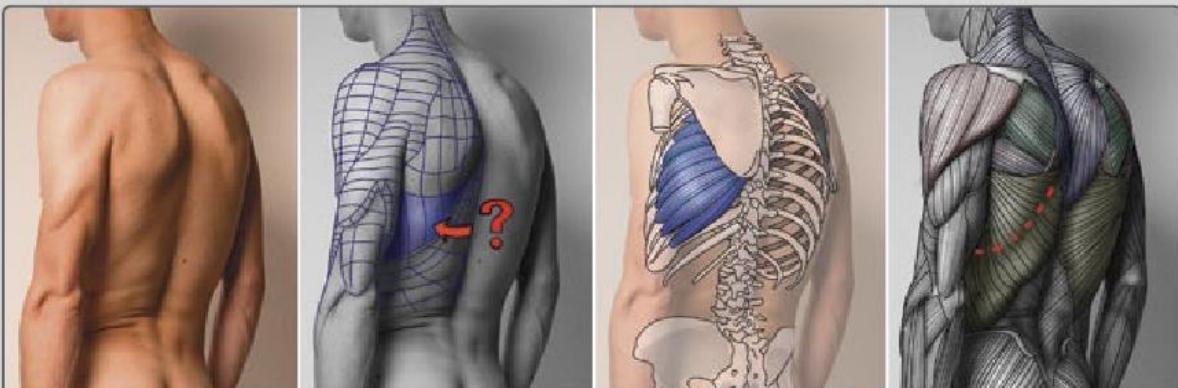
THIS IS A MUSCLE, CALLED **SERRATUS ANTERIOR**



IF PERSON IS SKINNY,
THEN **SERRATUS** IS TOO
FLAT TO BE VISIBLE.



WHAT IS THIS BULGE UNDER THE SHOULDER BLADE?

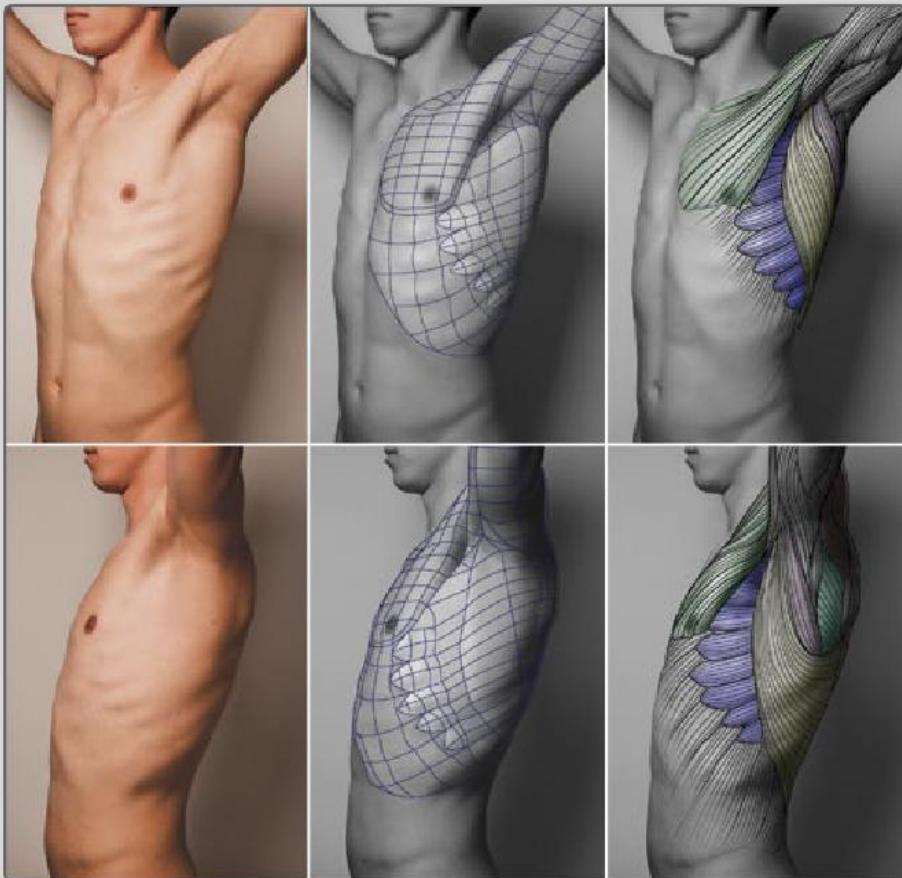


IT IS **THE SERRATUS ANTERIOR MUSCLE**, PUSHING THE **LATISSIMUS DORSI** OUTWARD FROM BENEATH.

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SERRATUS ANTERIOR IS A MUSCLE THAT ORIGINATES ON THE SURFACES OF THE **1ST TO 8TH RIBS** ON THE LATERAL CHEST AND INSERTS ALONG THE ENTIRE ANTERIOR LENGTH OF THE MEDIAL BORDER OF THE SCAPULA.

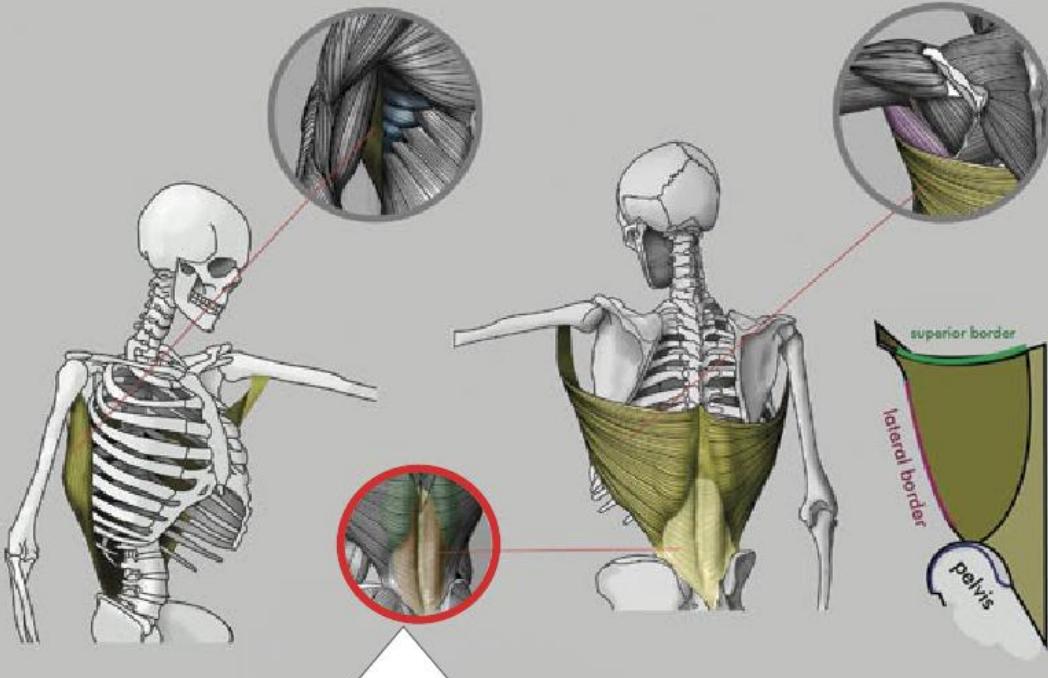
1/4 AND SIDE VIEW



BROADEST MUSCLE OF THE BACK

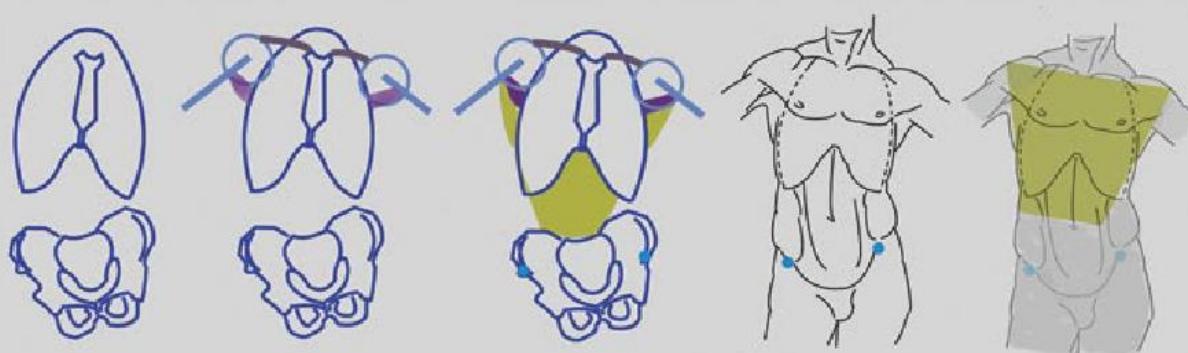
(LATISSIMUS DORSI – LD)

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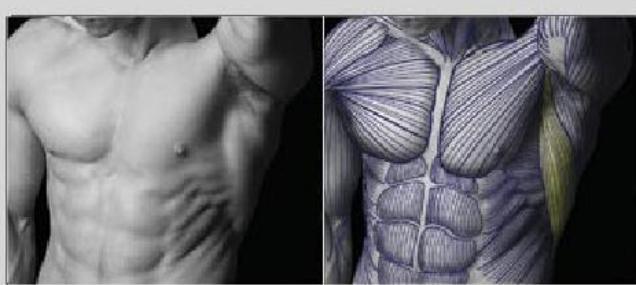
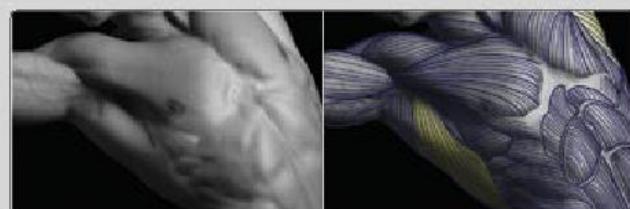
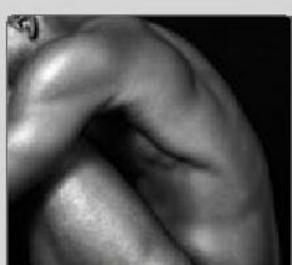
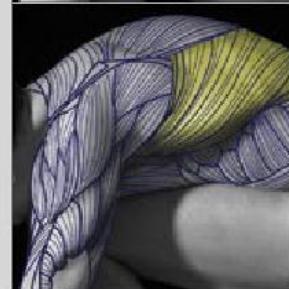
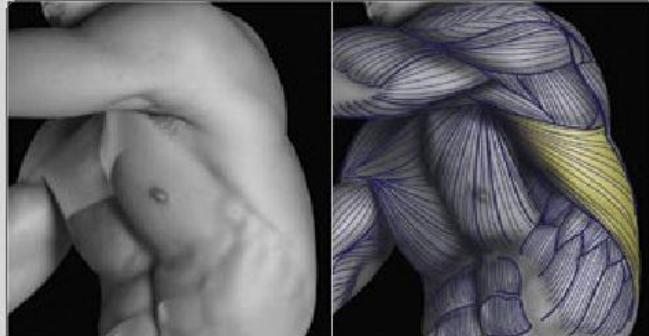
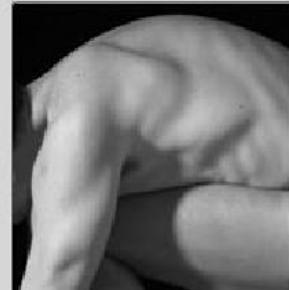
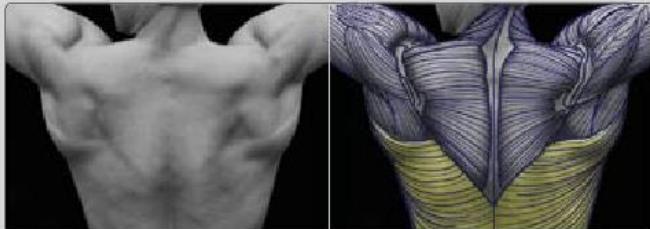


TERES MAJOR COVERED WITH LATISSIMUS DORSI CREATES THE TRIANGULAR SHAPE OF A MALE TORSO.

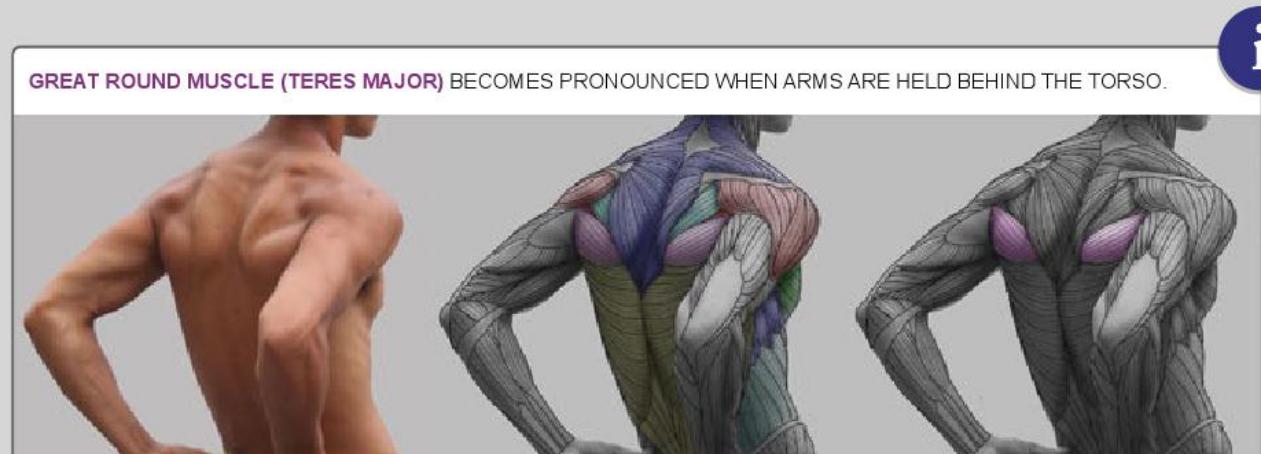
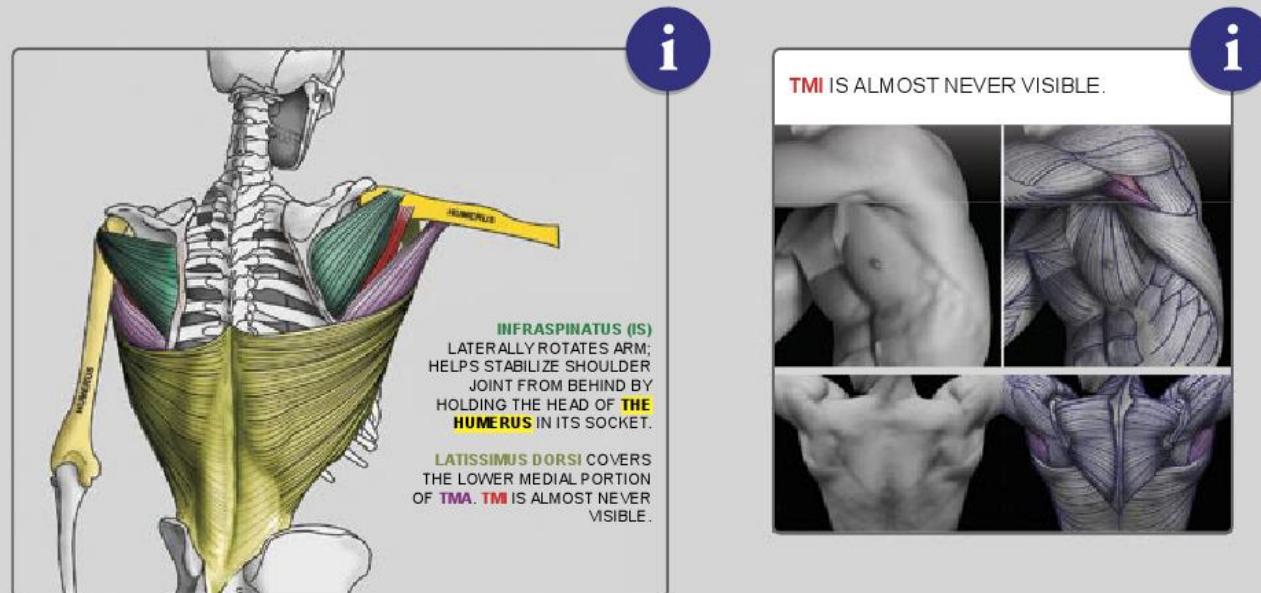
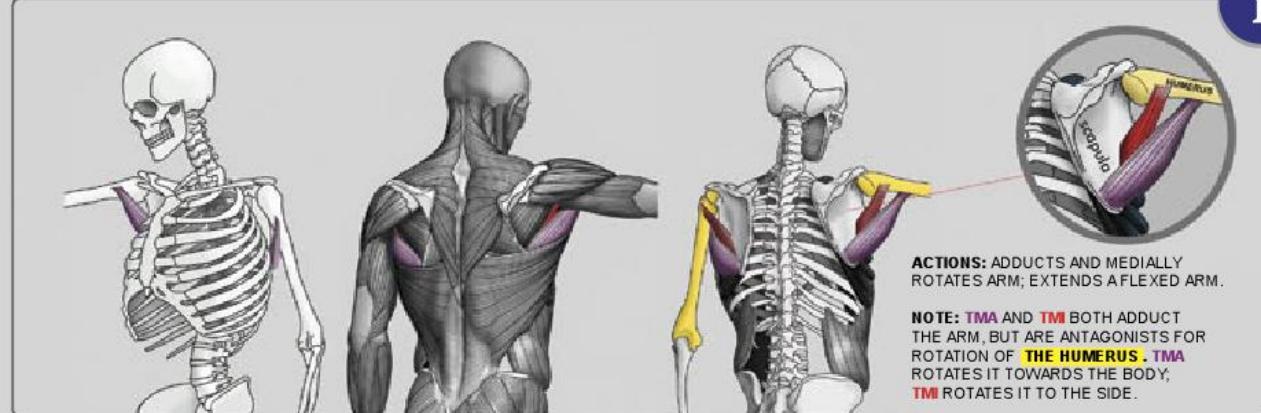
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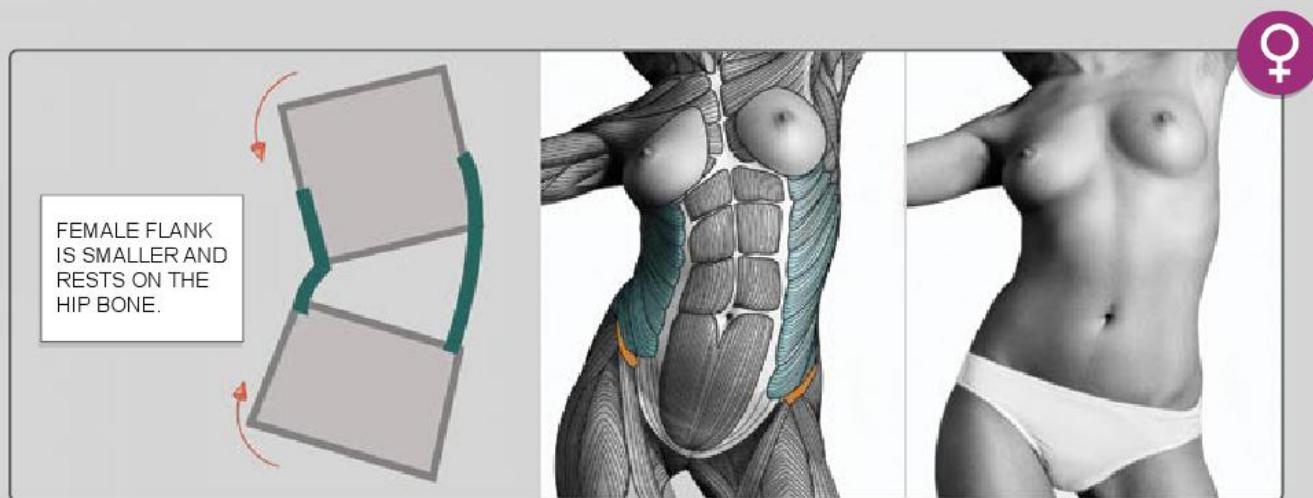
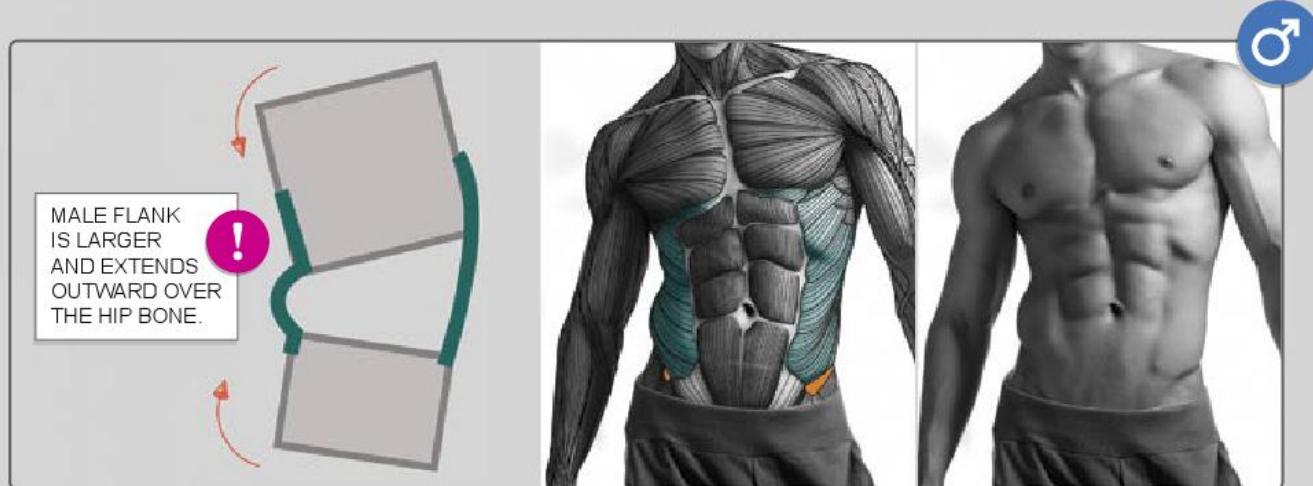
IDENTIFY THE BROADEST MUSCLE OF THE BACK!
(LATISSIMUS DORSI)



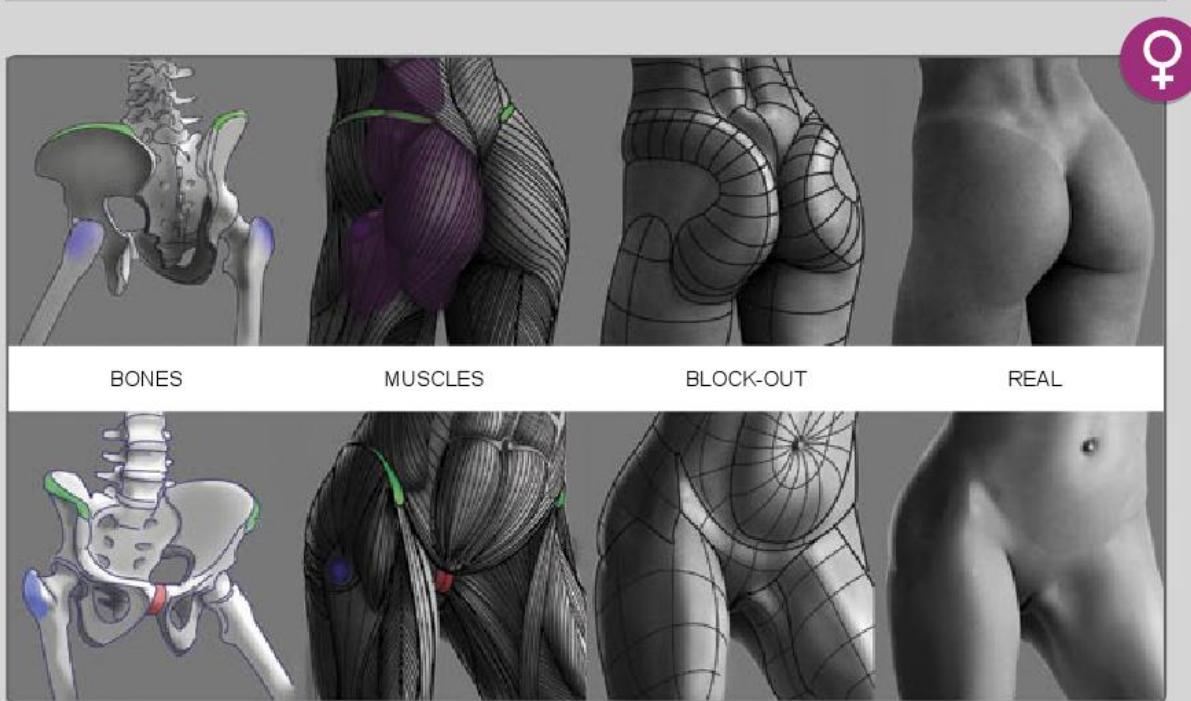
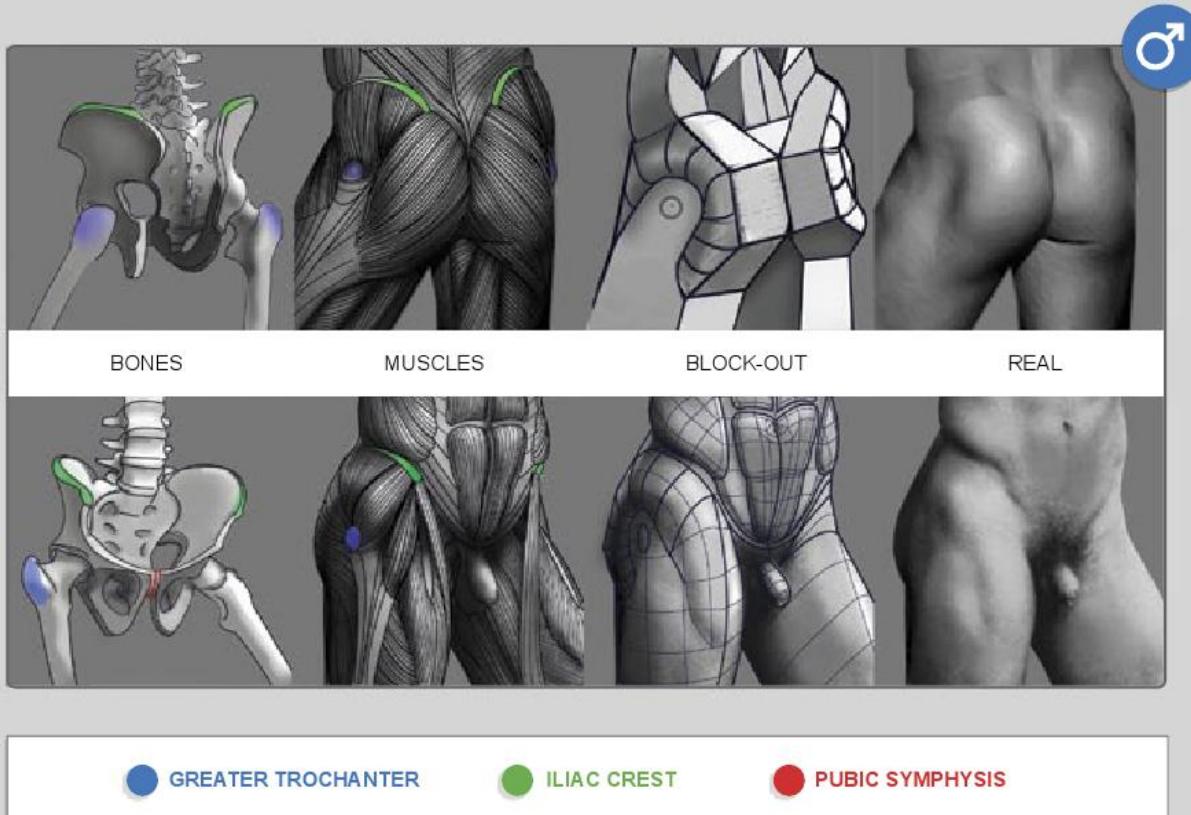
GREAT ROUND MUSCLE (TERES MAJOR TMA), LITTLE ROUND MUSCLE (TERES MINOR TMI) AND INFRASPINATUS MUSCLE (IS)



ABDOMINAL EXTERNAL OBLIQUE MUSCLE (EO)



MALE AND FEMALE HIPS

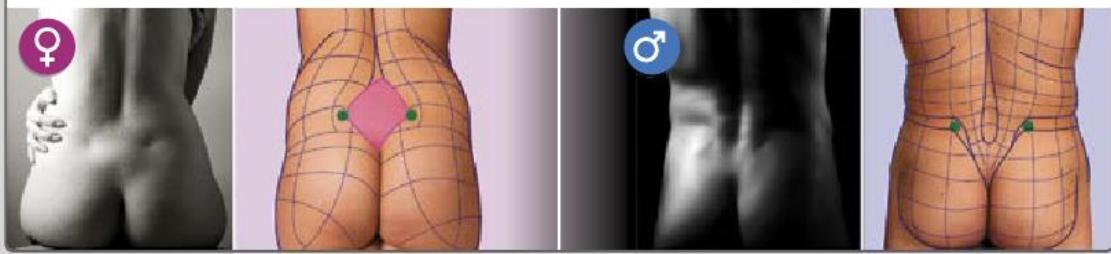


SUBCUTANEOUS **FAT PADS** UNDER THE SKIN GIVE FEMALE HIPS THEIR CURVY SHAPE.

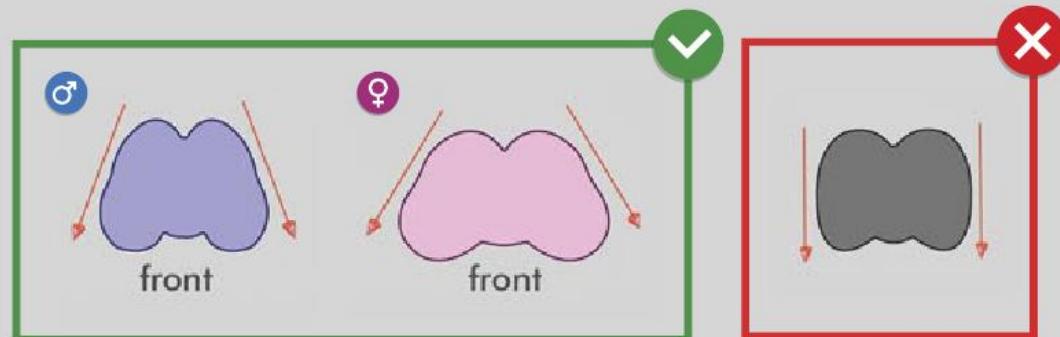
ALL ABOUT "BACKSIDES"



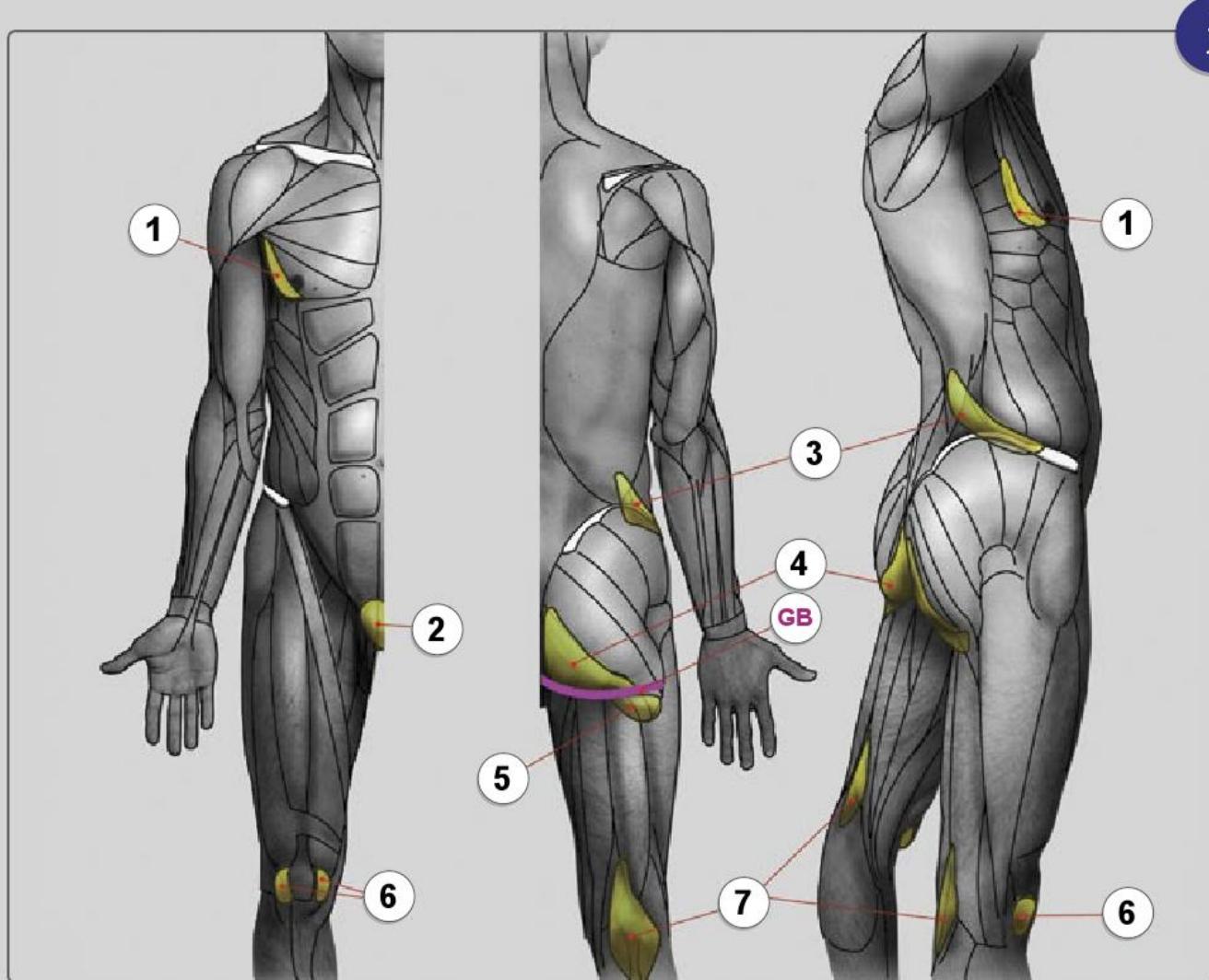
THE "RHOMBUS OF MICHAELIS" IS A FAT PAD THAT IS SOMETIMES VISIBLE ON THE LOWER BACK OF FEMALES.



HORIZONTAL CROSS SECTIONS OF MALE AND FEMALE PELVIS.



MALE SUBCUTANEOUS FAT PADS



1 PECTORAL FAT PAD

2 PUBIC FAT PAD

3 FLANK FAT PAD

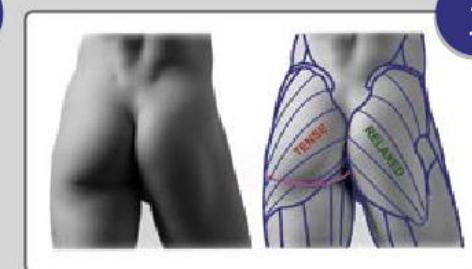
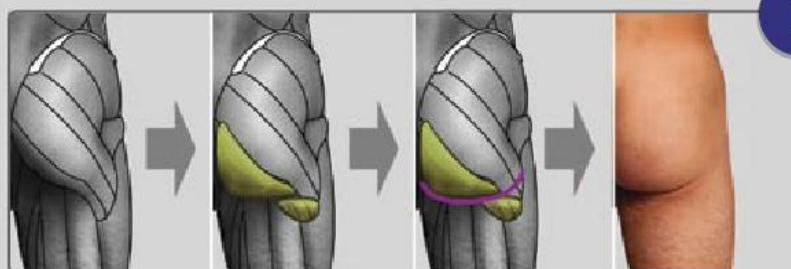
4 LATERAL GLUTEAL FAT PAD

5 INFERIOR GLUTEAL FAT EXTENSION

6 INFRAPATELLAR FAT PAD

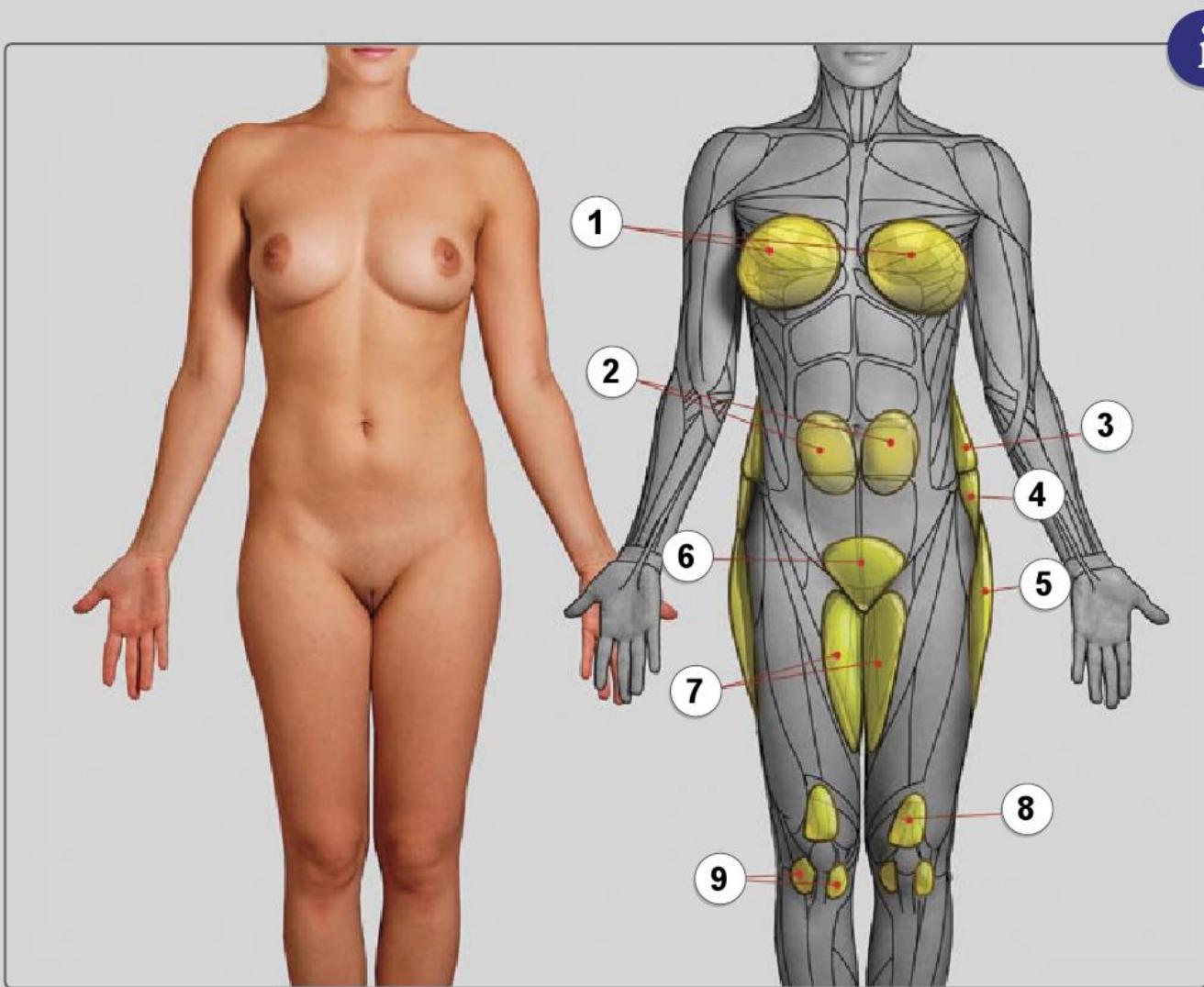
7 POPLITEAL FAT PAD

GB GLUTEAL BAND – CREATES SKIN FOLD. WHEN THE THIGH FLEXES, GLUTEAL FOLD DISAPPEARS.



FEMALE SUBCUTANEOUS FAT PADS

(FRONT VIEW)



1 BREAST FAT

2 ABDOMINAL WALL FAT PAD

3 FLANK FAT PAD

4 LATERAL GLUTEAL FAT PAD

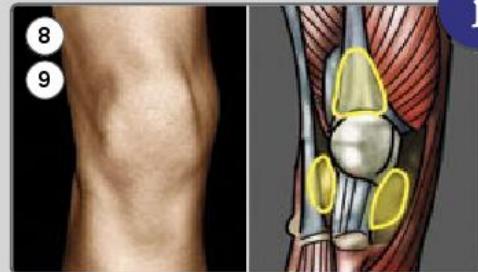
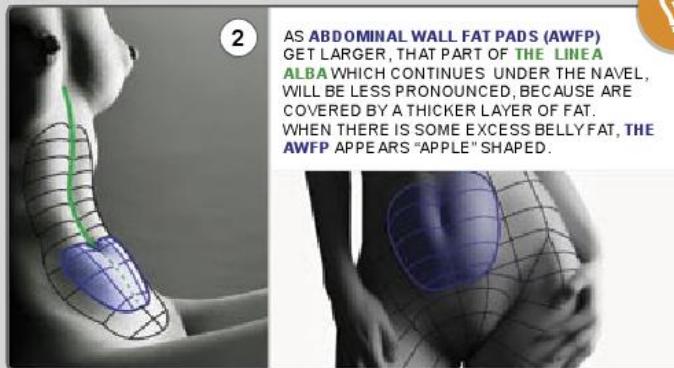
5 OUTER THIGH FAT PAD

6 PUBIC FAT PAD

7 INNER THIGH FAT PAD

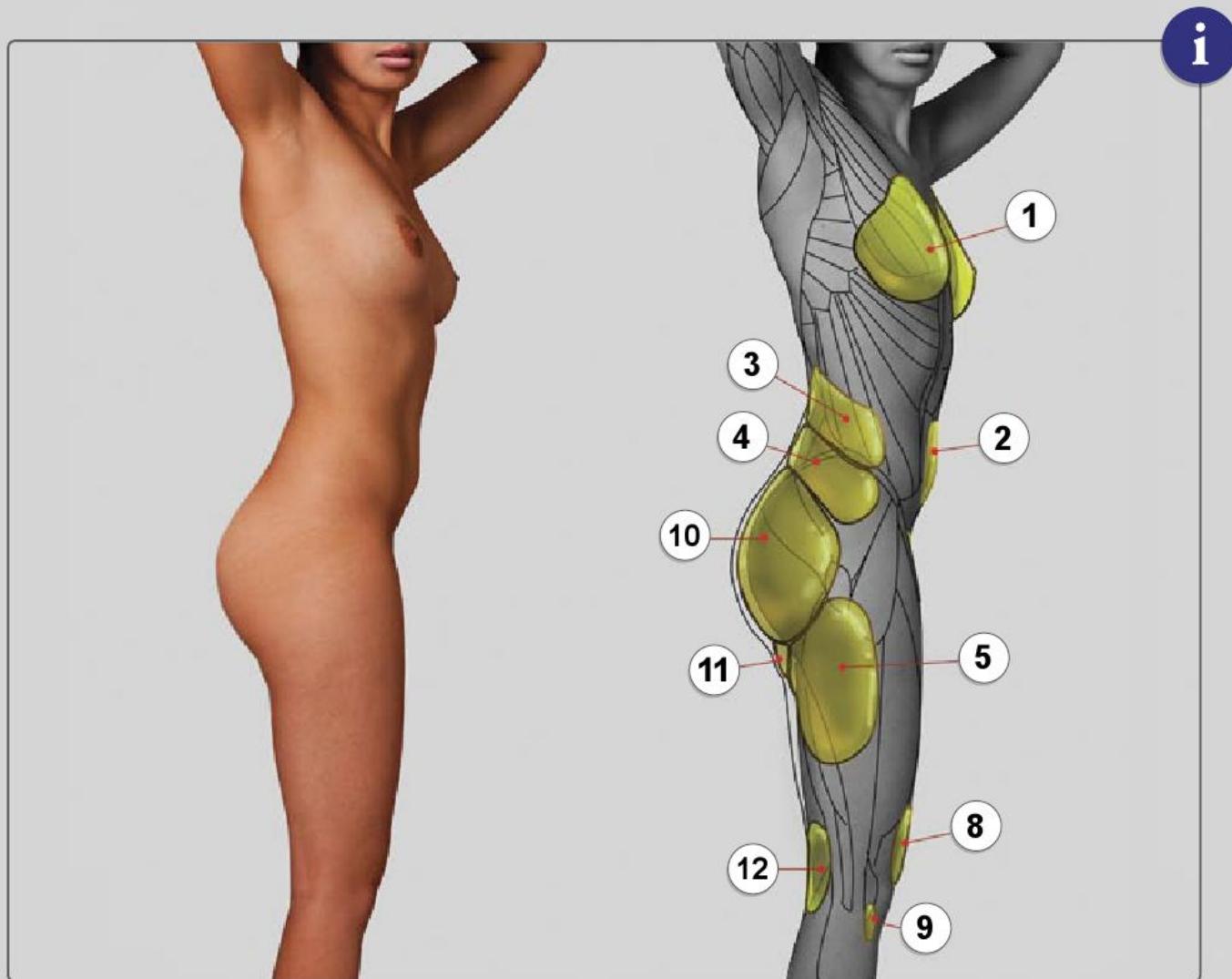
8 LOWER ANTERIOR THIGH FAT PAD

9 INFRAPATELLAR FAT PAD

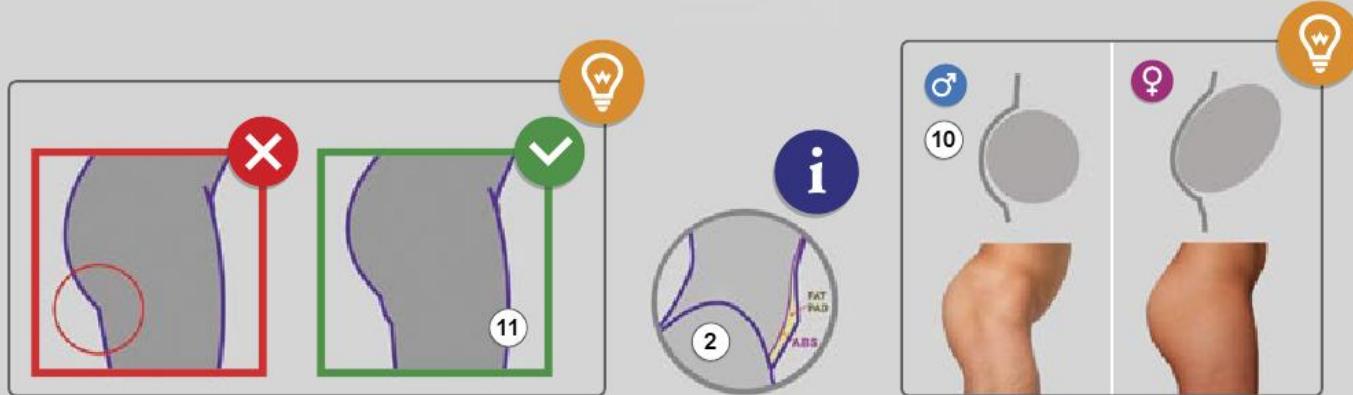


FEMALE SUBCUTANEOUS FAT PADS

(SIDE VIEW)



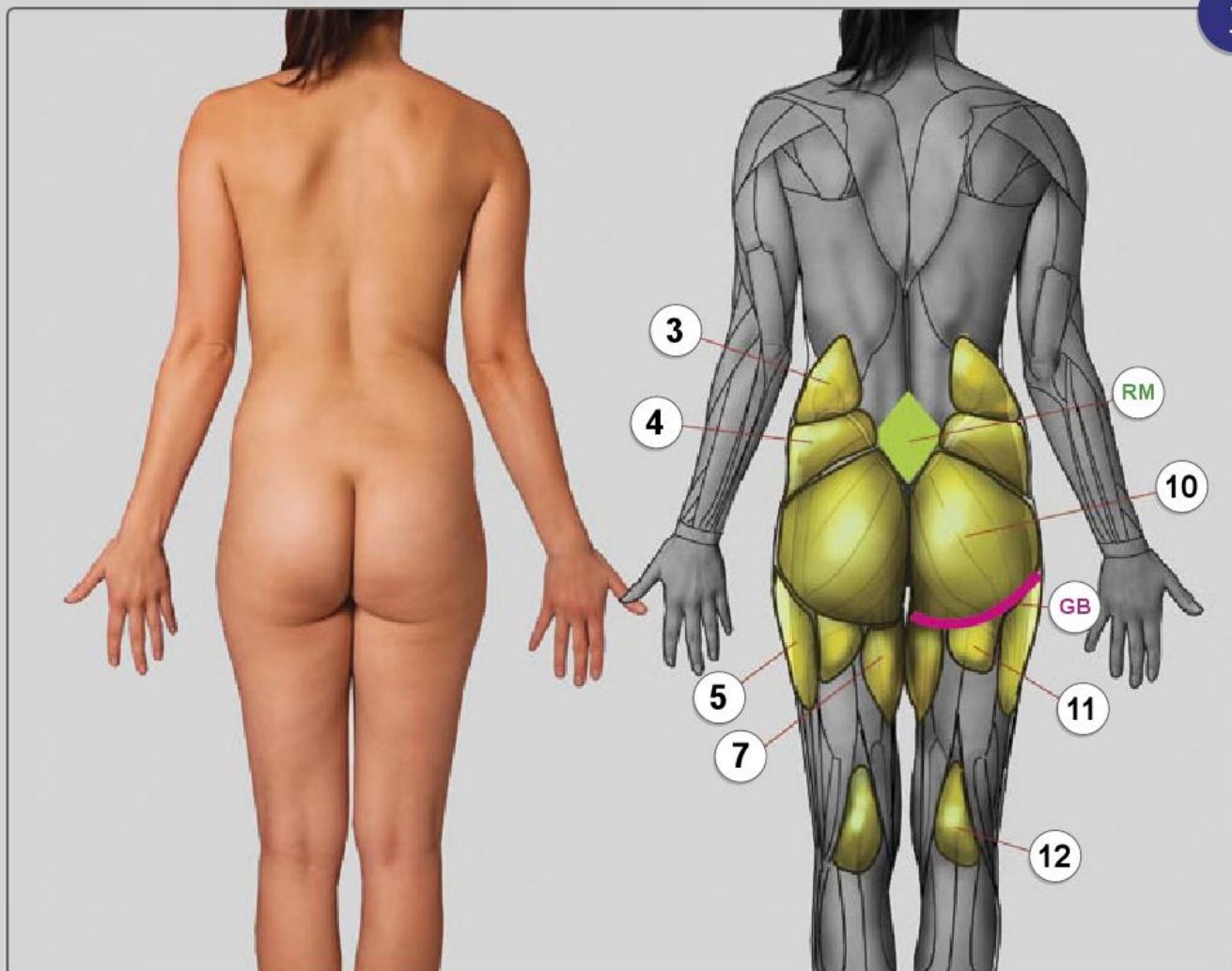
1 BREAST FAT	5 OUTER THIGH FAT PAD	11 INFERIOR GLUTEAL FAT EXTENSION
2 ABDOMINAL FAT PAD	8 LOWER ANTERIOR THIGH FAT PAD	
3 FLANK FAT PAD	9 INFRAPATELLAR FAT PAD	12 POPLITEAL FAT PAD
4 LATERAL GLUTEAL FAT PAD	10 POSTERIOR GLUTEAL FAT PAD	



FEMALE SUBCUTANEOUS FAT PADS

(BACK VIEW)

i



3 FLANK FAT PAD

4 LATERAL GLUTEAL FAT PAD

12 POPLITEAL FAT PAD

5 OUTER THIGH FAT PAD

7 INNER THIGH FAT PAD

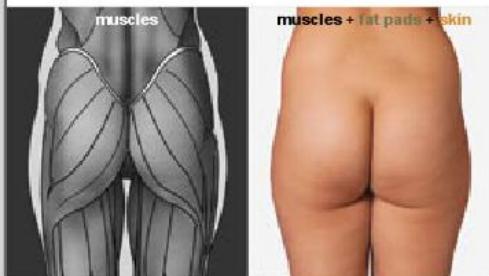
RM "RHOMBUS OF MICHAELIS"

10 POSTERIOR GLUTEAL FAT PAD

11 INFERIOR GLUTEAL FAT EXTENSION

GB GLUTEAL BAND – CREATES SKIN FOLD.
WHEN THE THIGH IS FLEXED, GLUTEAL FOLD DISAPPEARS

FEMALES HAVE MORE AND MUCH THICKER SUBCUTANEOUS FAT PADS THAN MALES. THIS IS WHY "TYPICAL FEMALE CURVES" APPEAR.



WHEN THE LEG IS STRAIGHT,
POPLITEAL FAT PAD POPS OUT!

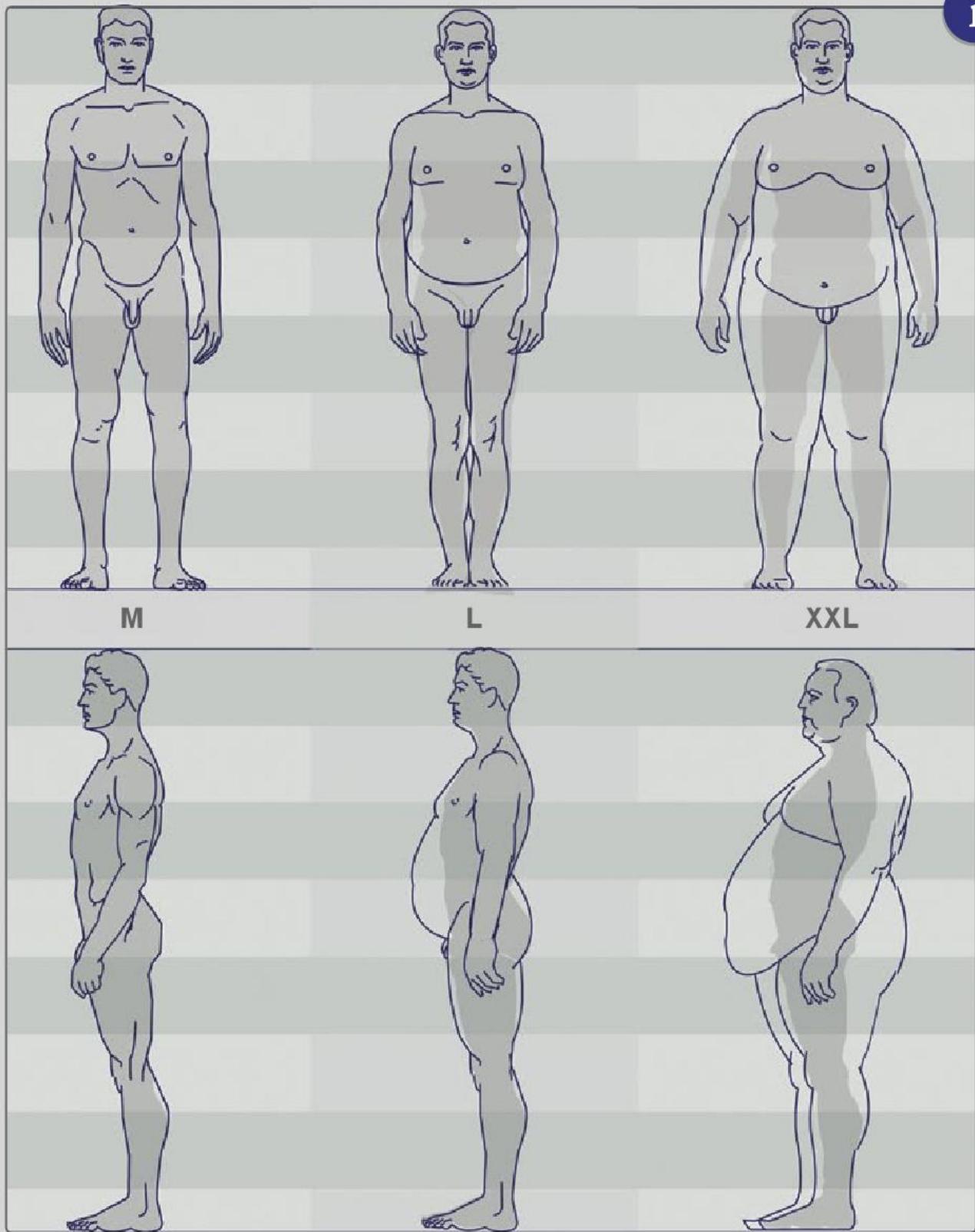


EXTREMELY FATLESS (DRY)
BODY CASE.

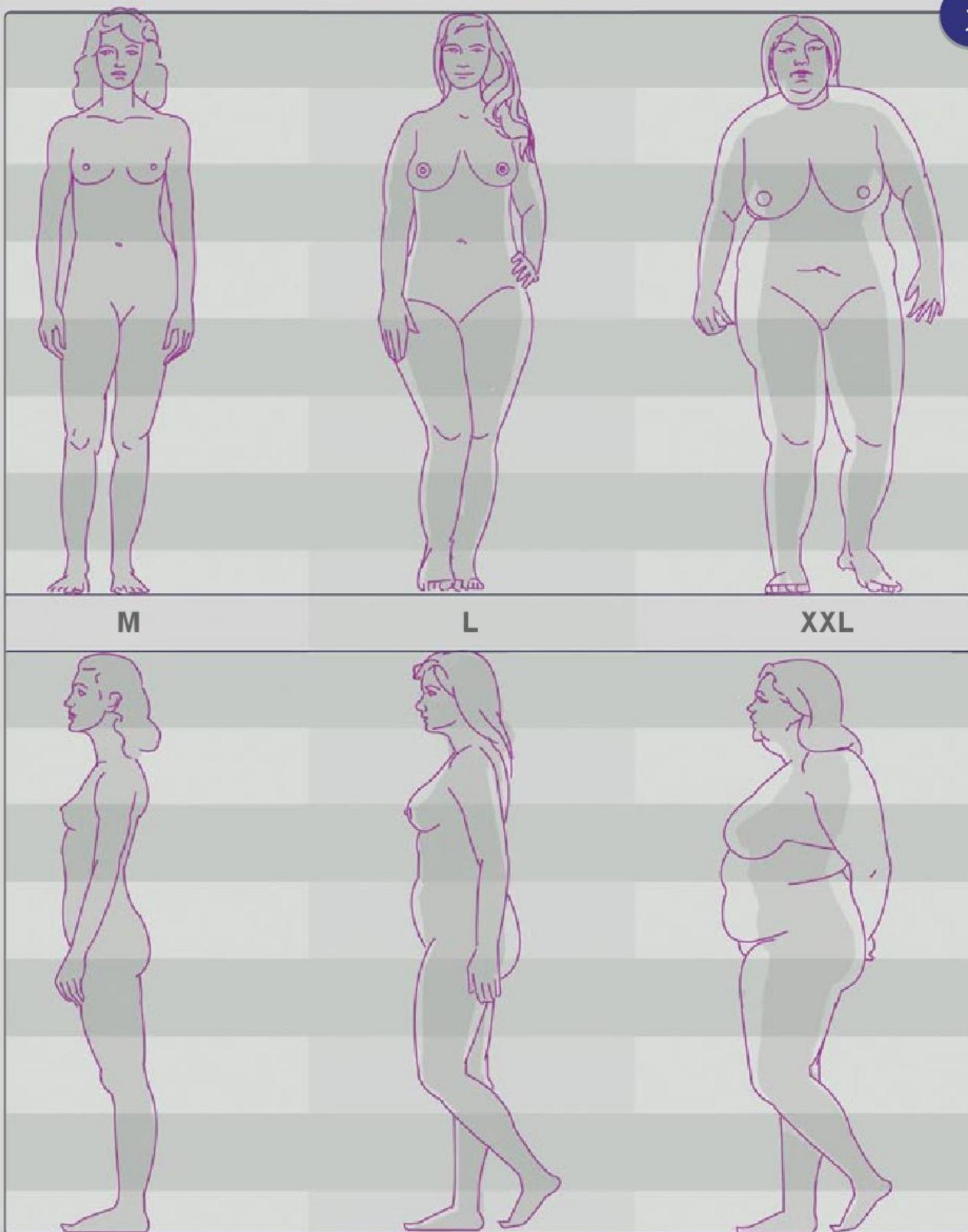


PROPORTIONAL CHANGES OF AN OBESE MALE: 7.5 HEAD UNITS

i

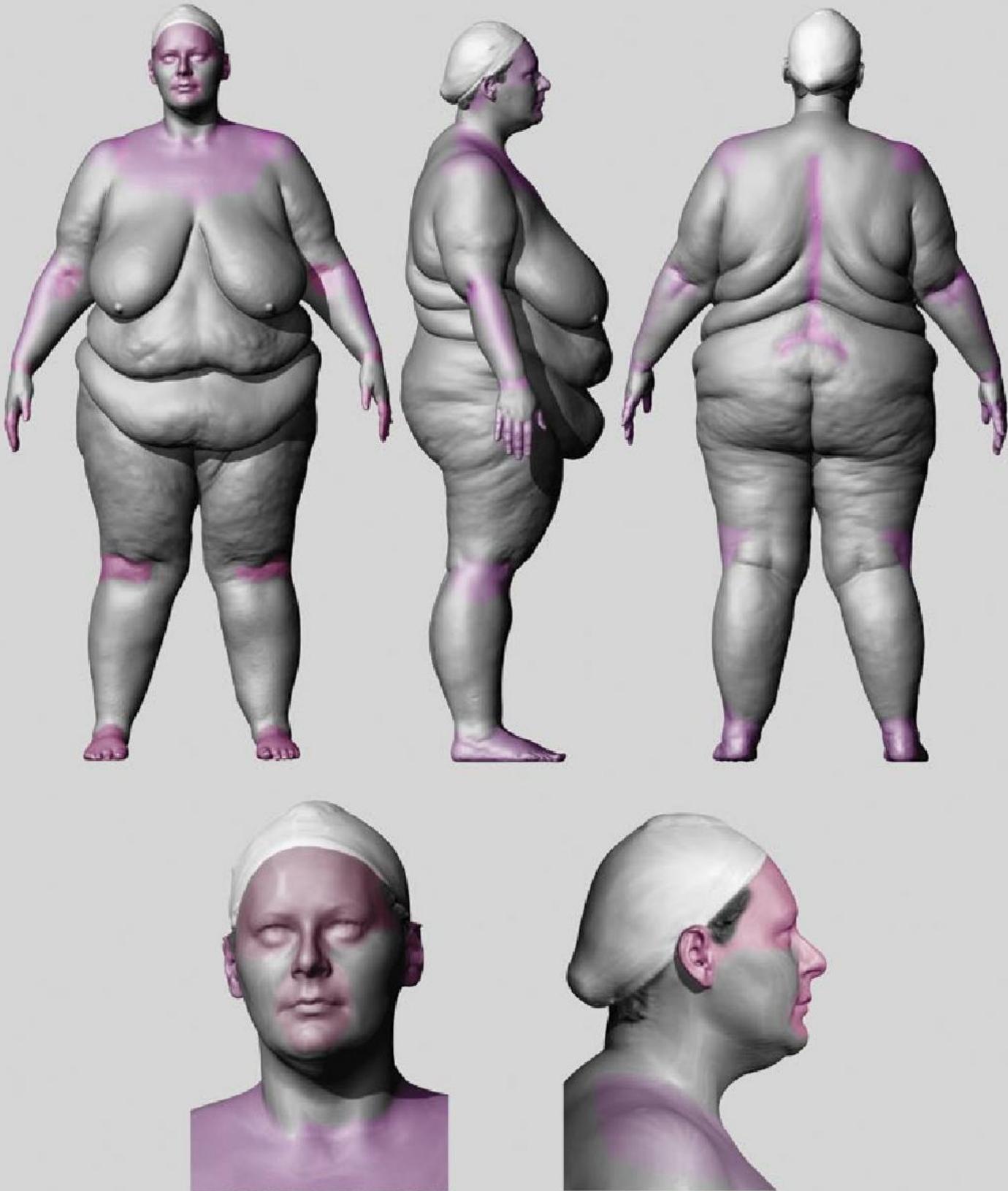


PROPORTIONAL CHANGES OF AN OBESE FEMALE: 7.5 HEAD UNITS

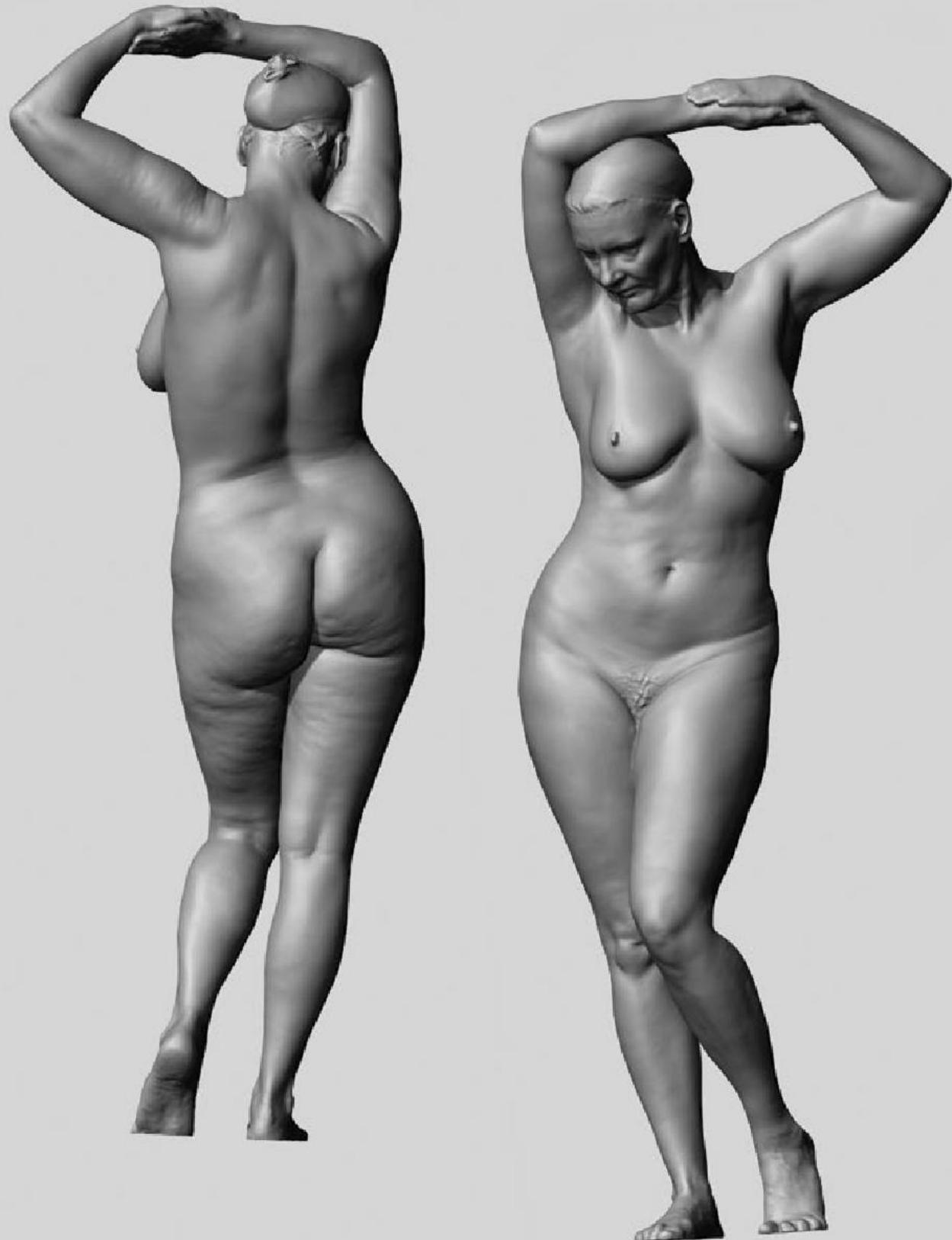


i

AREAS OF THE BODY THAT ARE LESS AFFECTED BY FAT ACCUMULATION



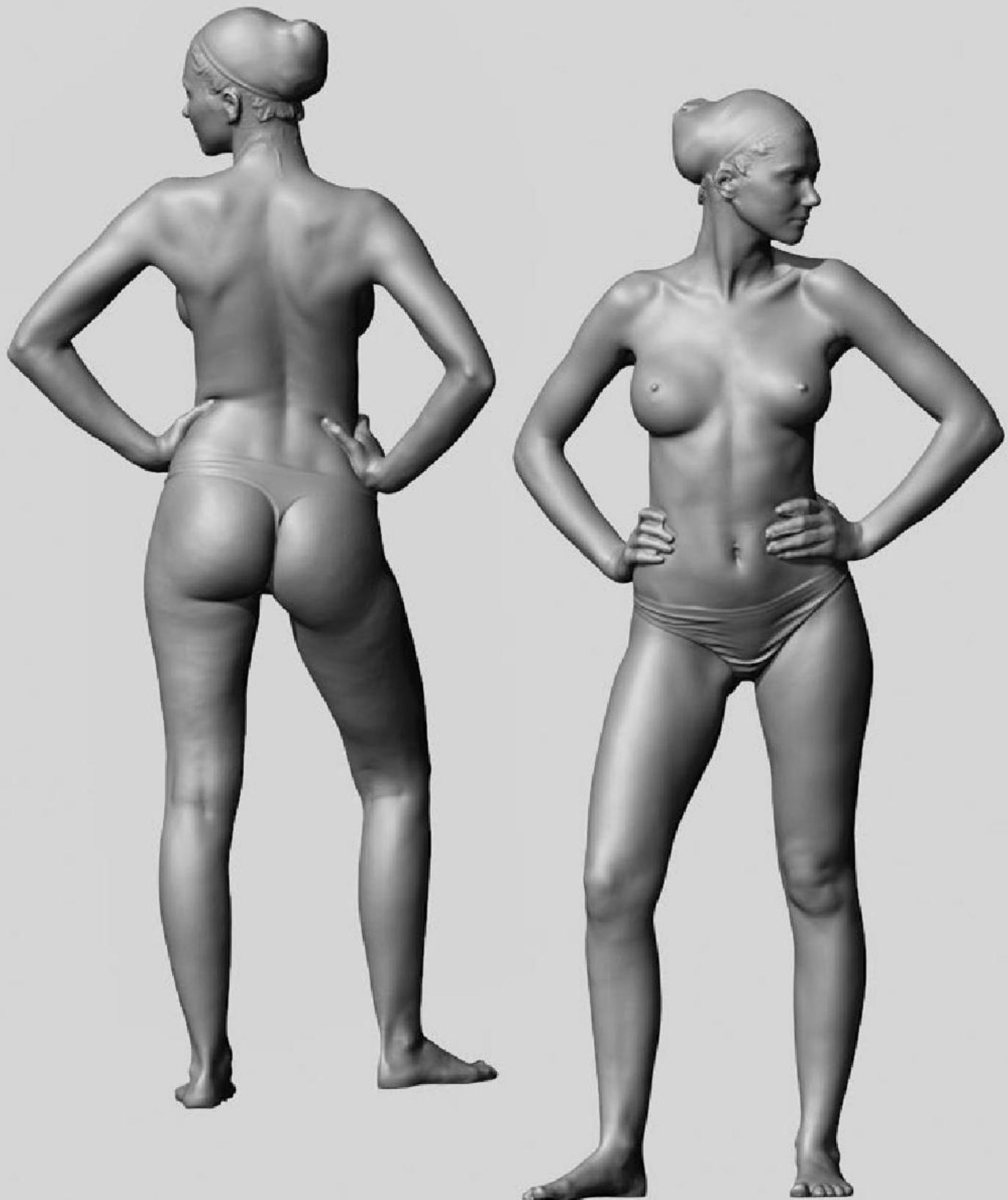
3D SCAN OF MIDDLE-AGED WOMAN



3D SCAN OF YOUNG FEMALE



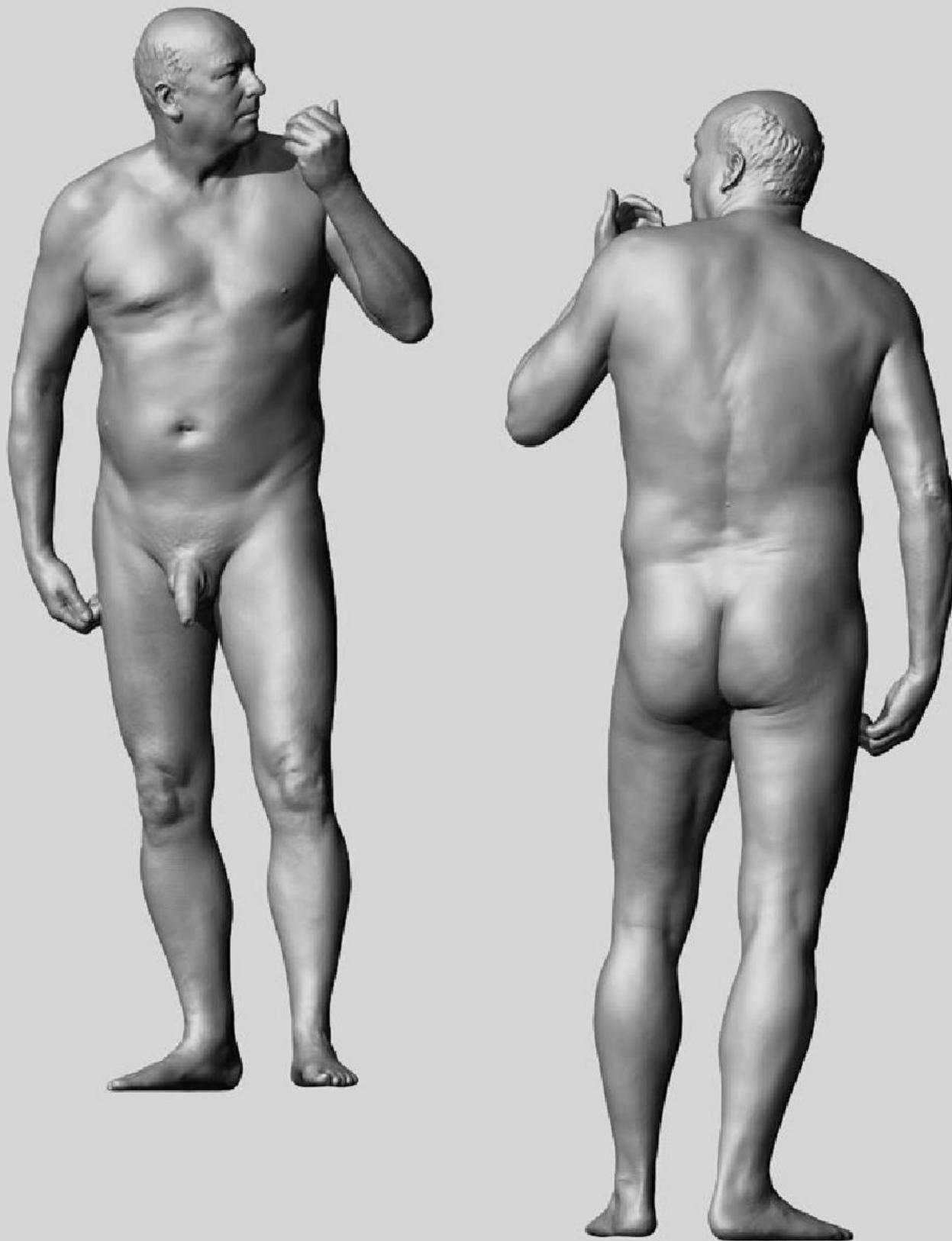
3D SCAN OF YOUNG FEMALE



3D SCAN OF YOUNG MAN



3D SCAN OF MIDDLE-AGED MAN



ARMS REACHING BEHIND BODY



3/4



3/4



FRONT



BACK



LEFT SIDE

ARMS AT SIDES



3/4



3/4

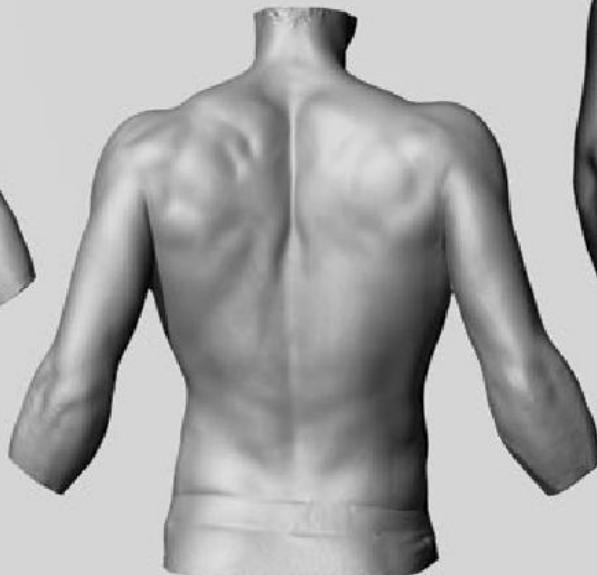


3/4



FRONT

LEFT SIDE



BACK



RIGHT SIDE

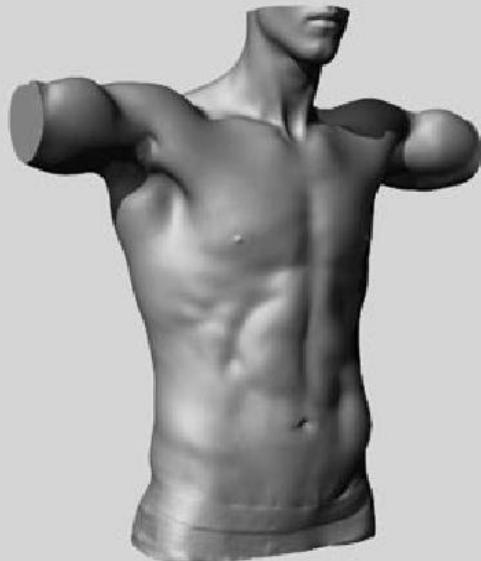
ARMS HELD STRAIGHT OUT TO SIDES



3/4



LEFT SIDE



3/4



FRONT



BACK



RIGHT SIDE

ARMS IN A "Y" POSITION



3/4



3/4



FRONT

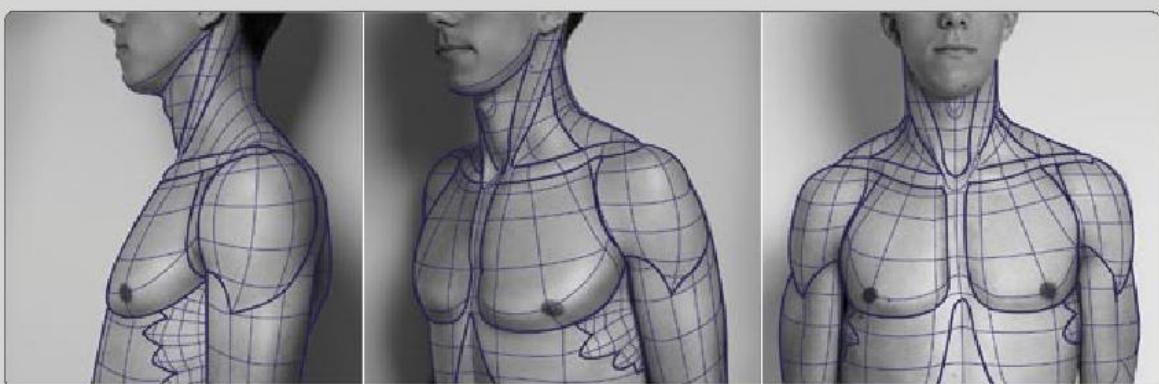
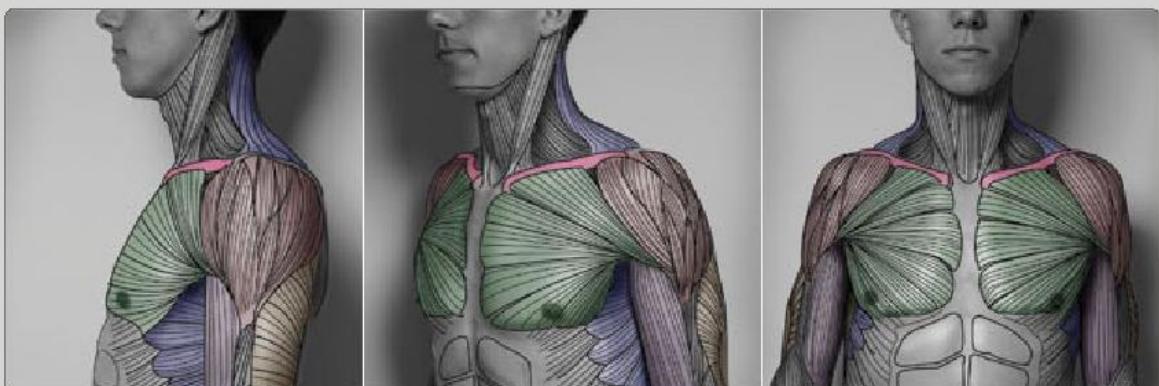
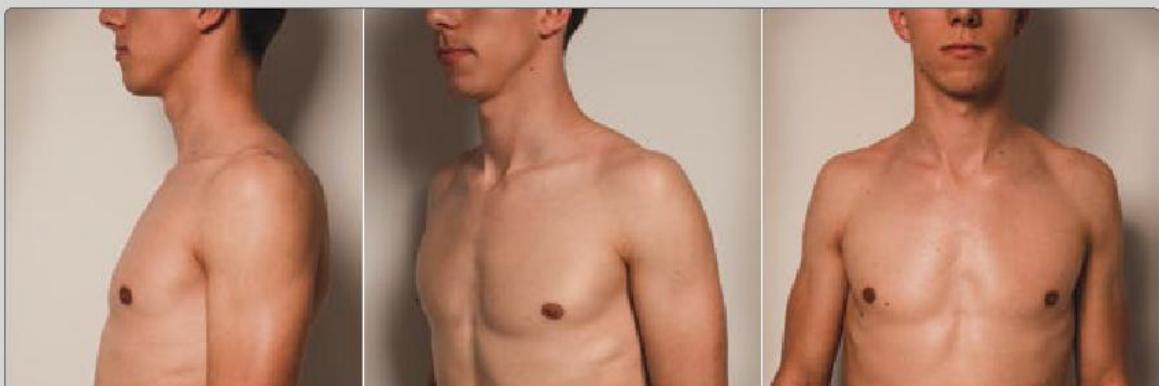


BACK

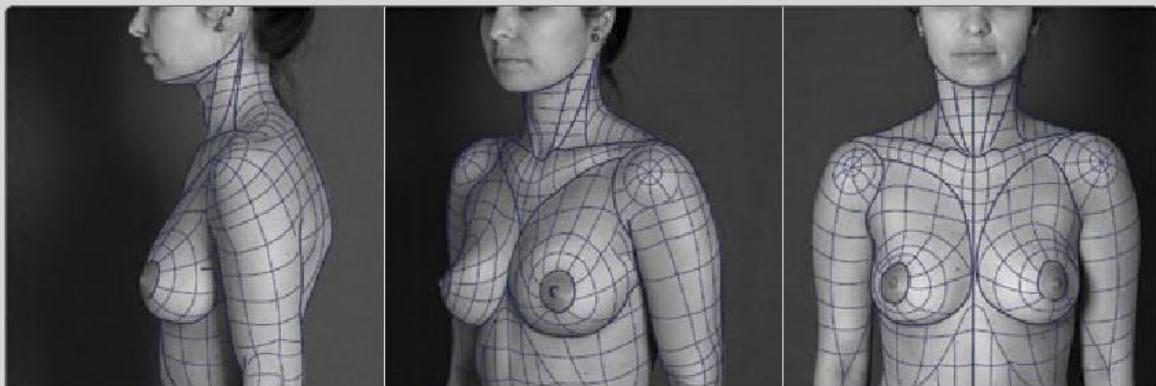
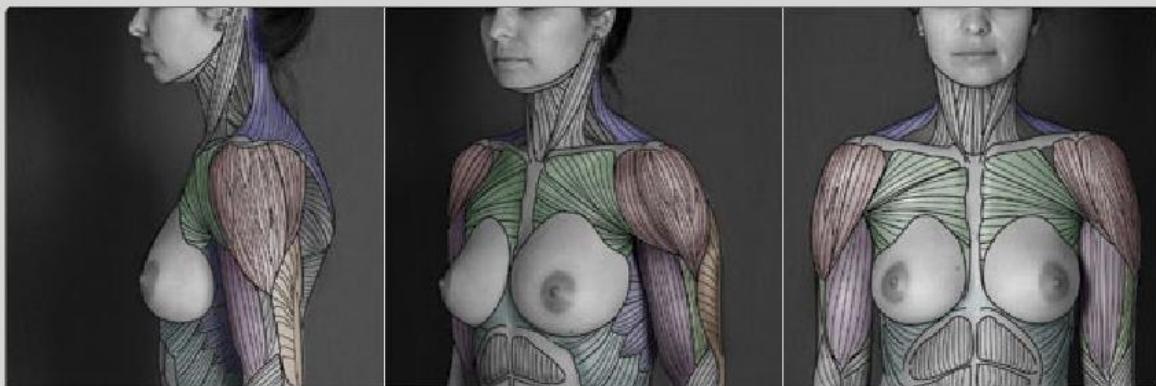


RIGHT SIDE

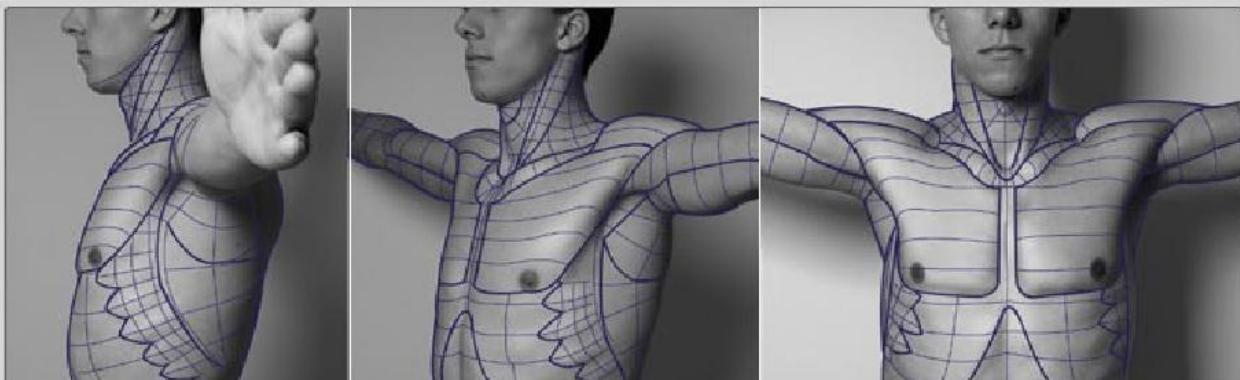
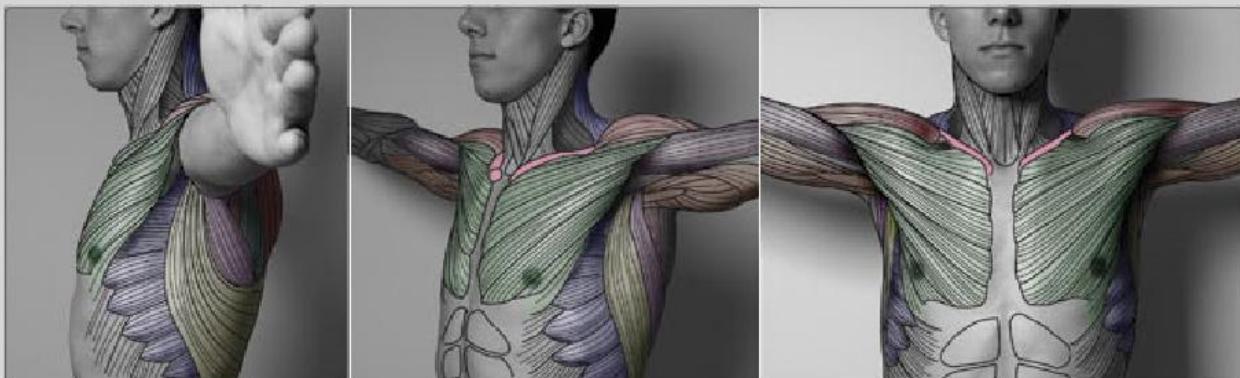
ARMS HANGING NATURALLY – MALE



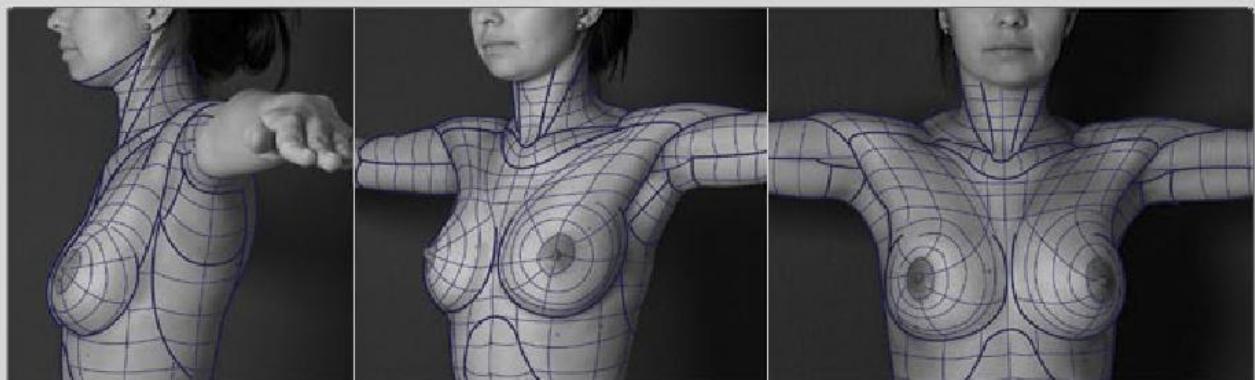
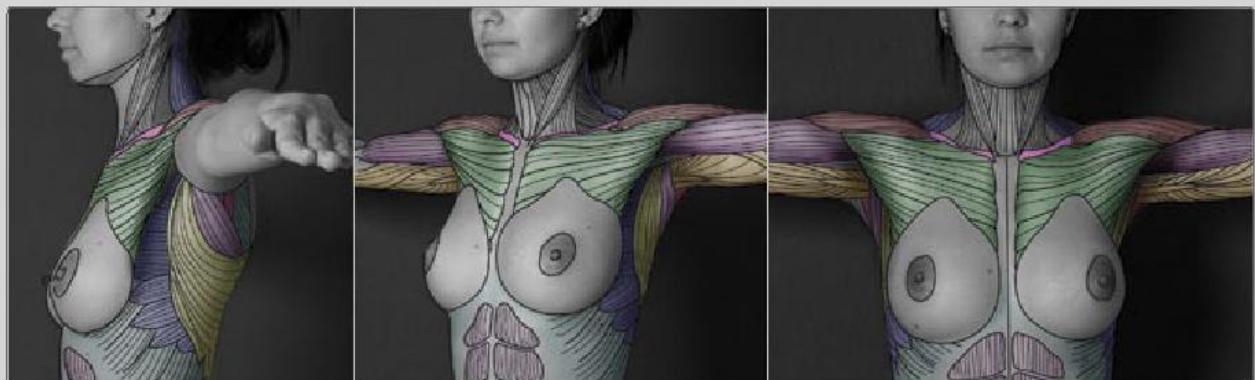
ARMS HANGING NATURALLY – FEMALE



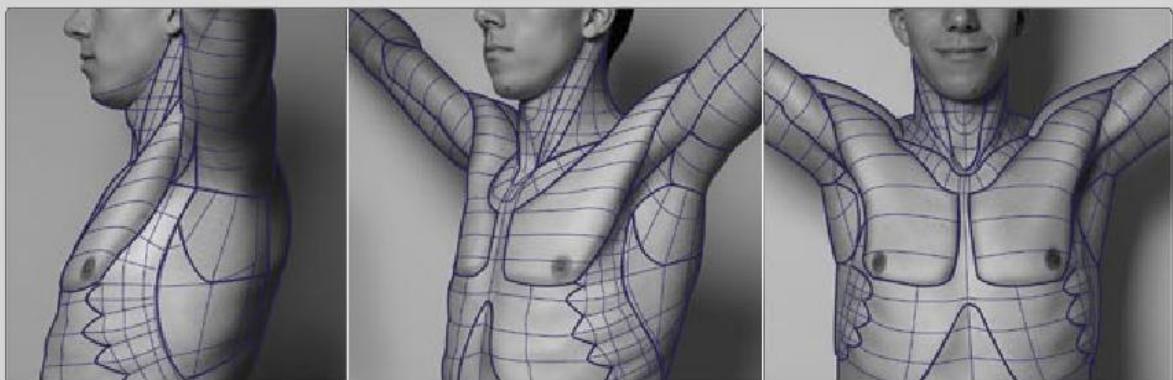
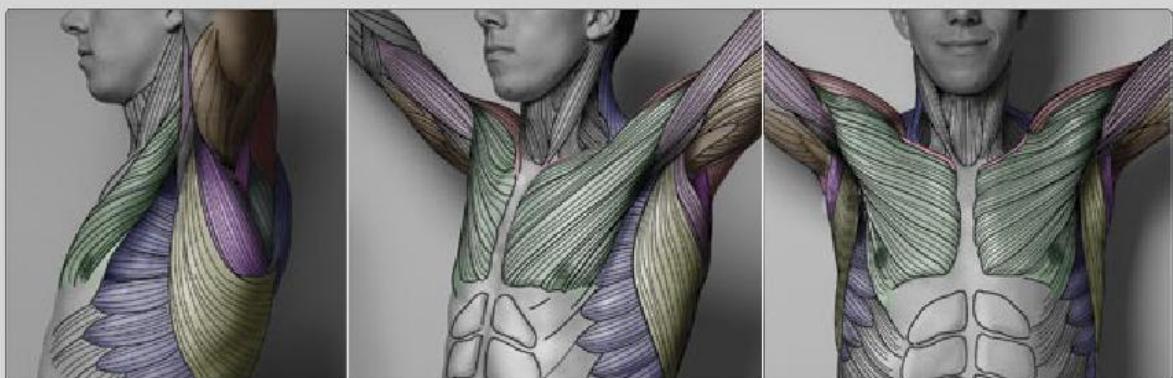
ARMS HELD STRAIGHT OUT TO SIDES – MALE



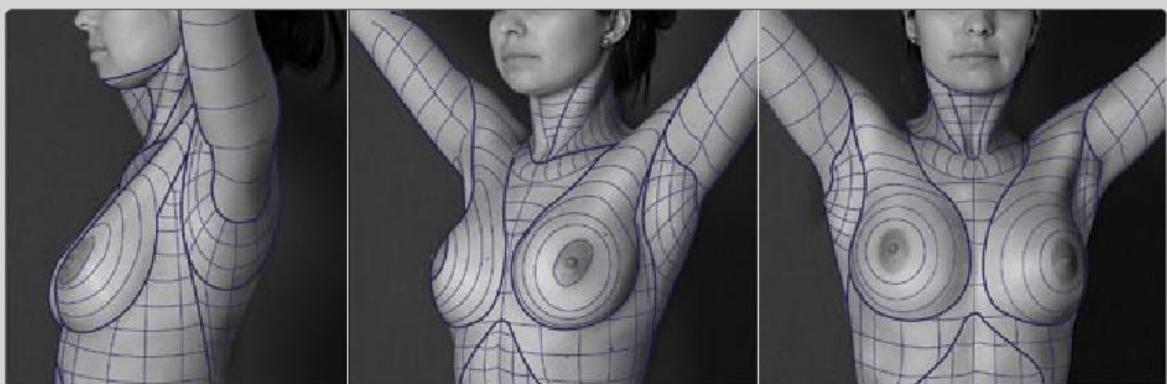
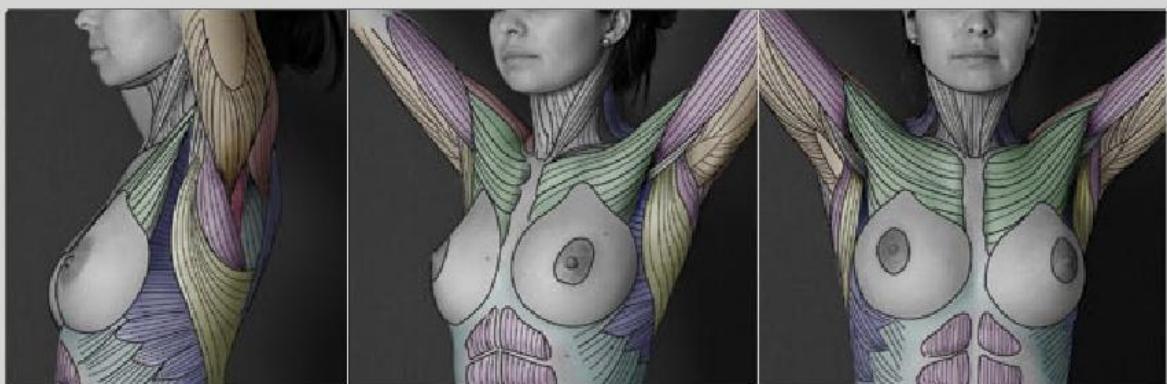
ARMS HELD STRAIGHT OUT TO SIDES – FEMALE



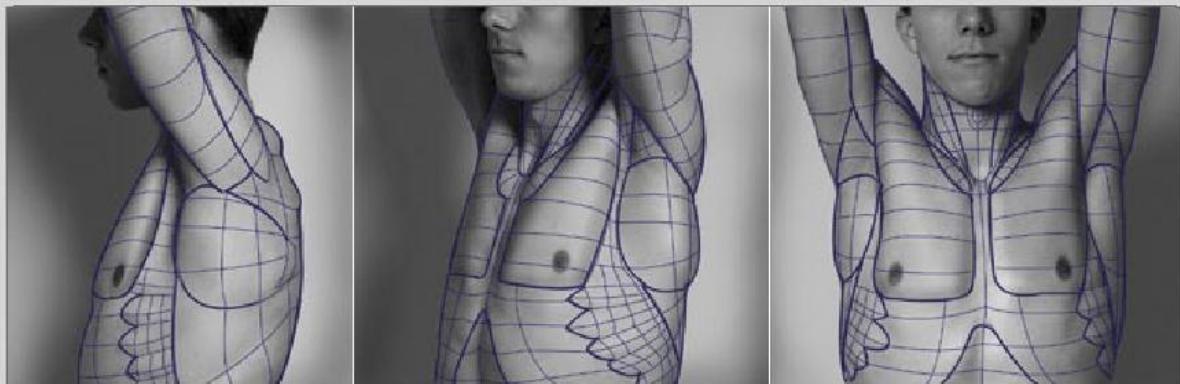
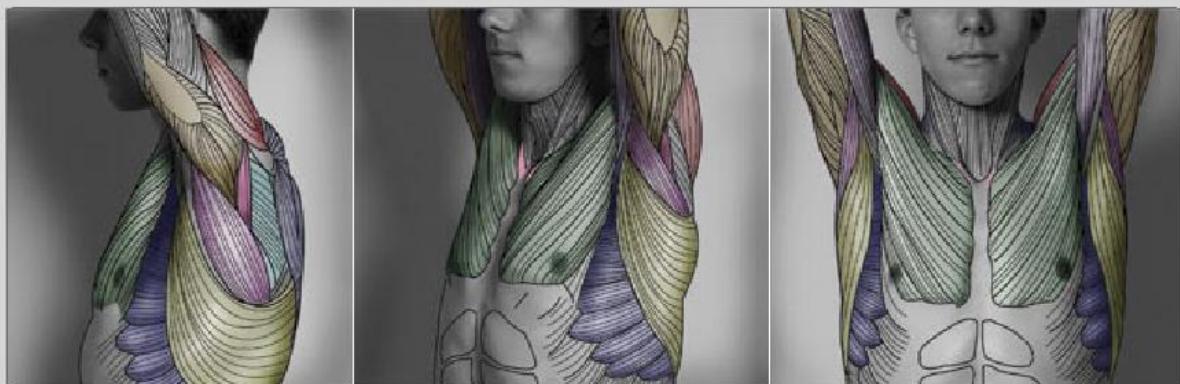
ARMS IN A "Y" POSITION – MALE



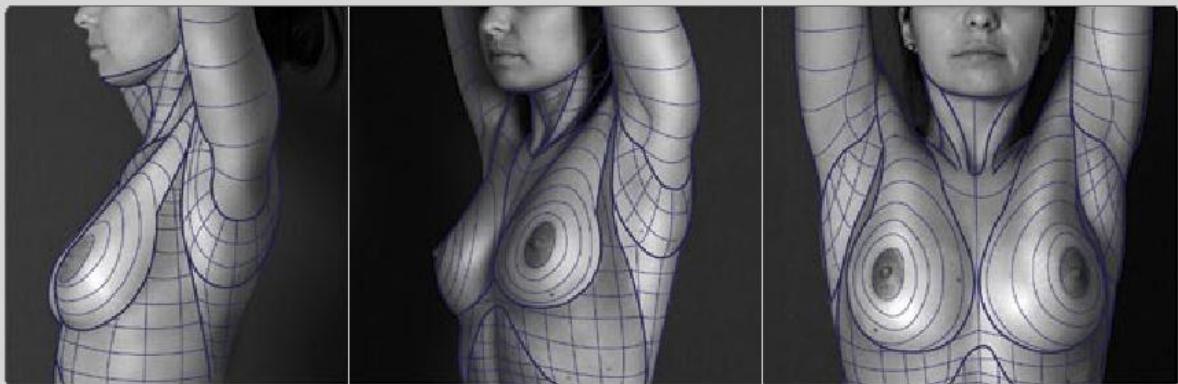
ARMS IN A "Y" POSITION – FEMALE



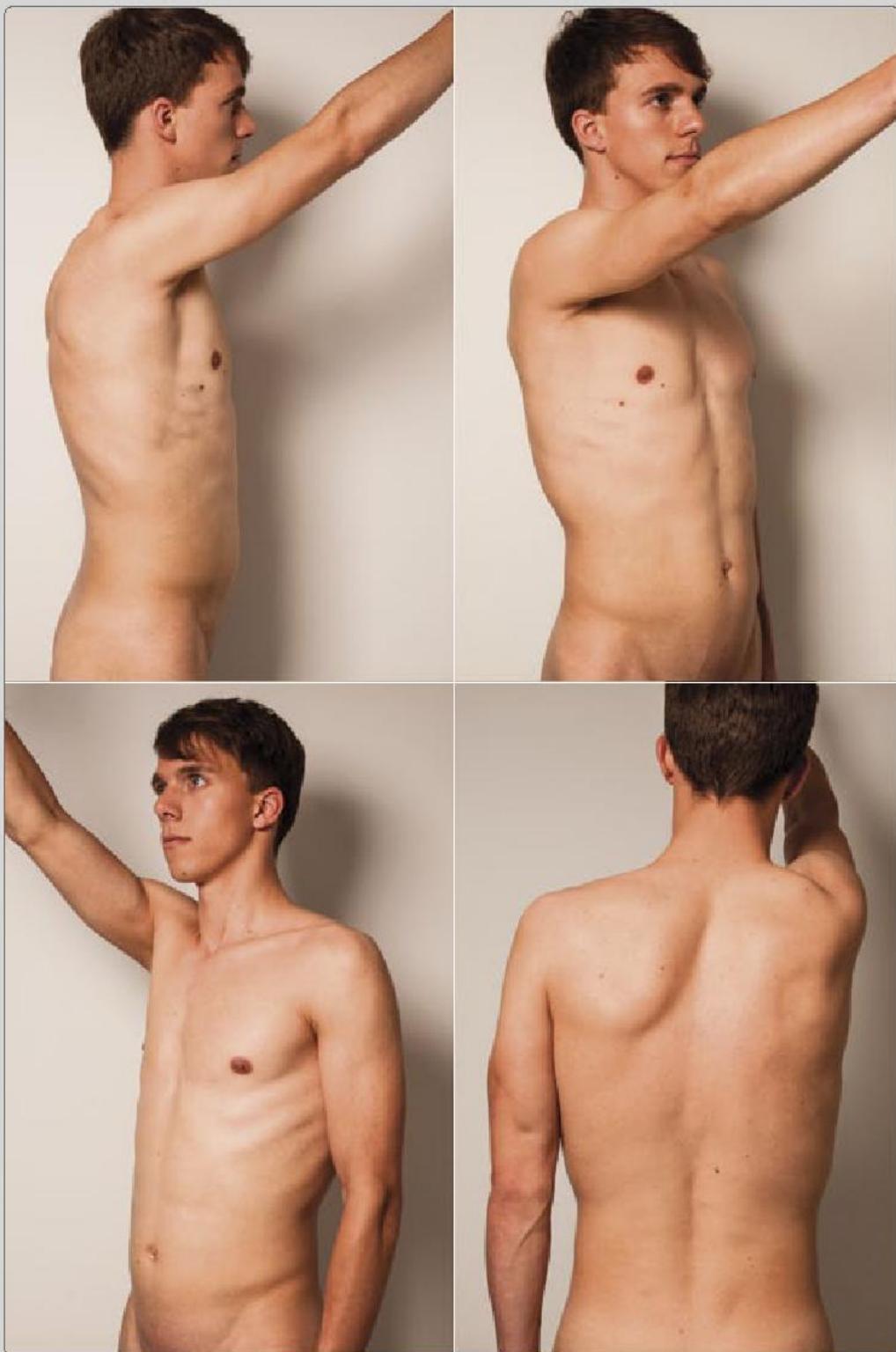
ARMS STRAIGHT UP – MALE



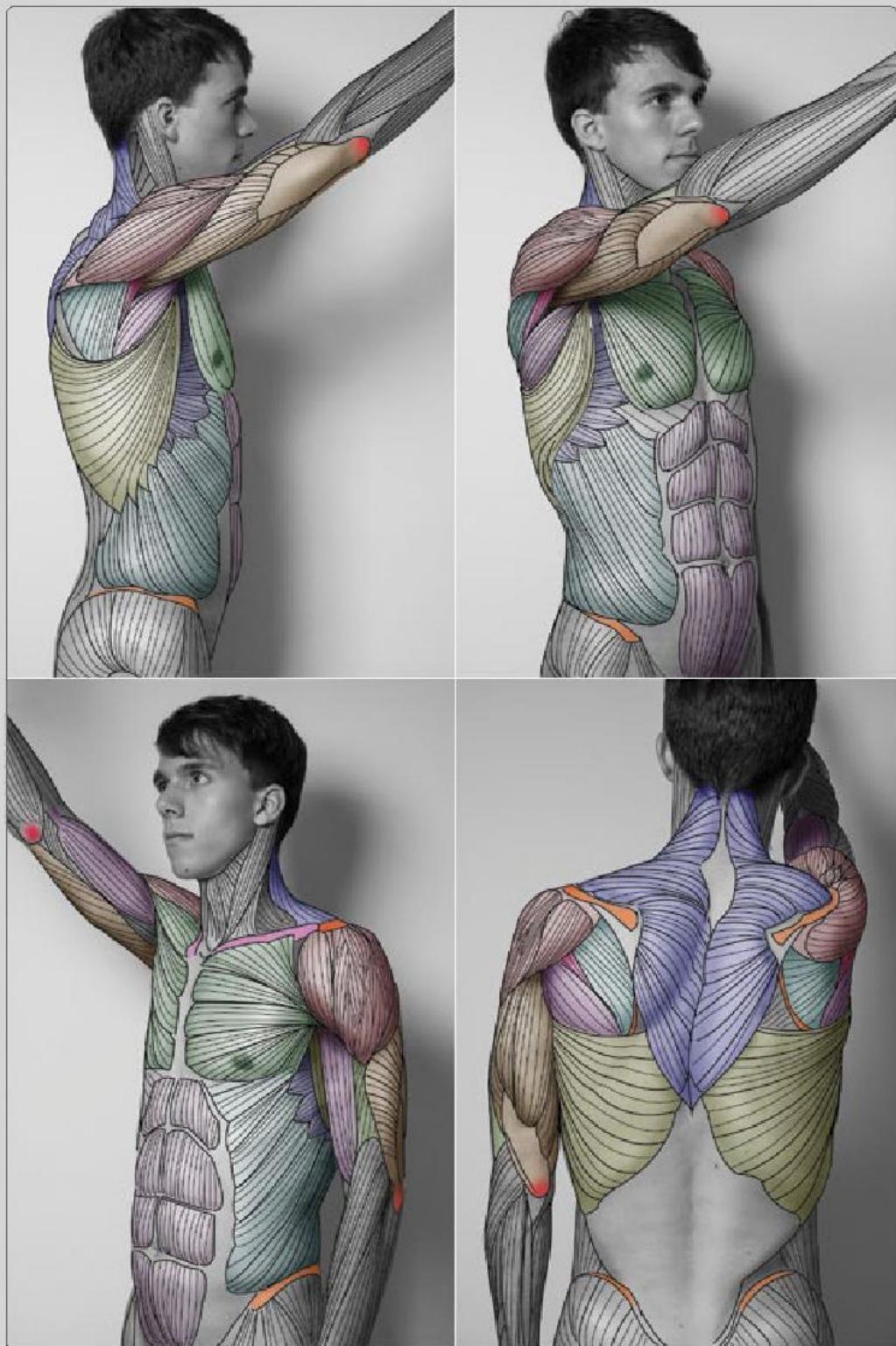
ARMS STRAIGHT UP – FEMALE



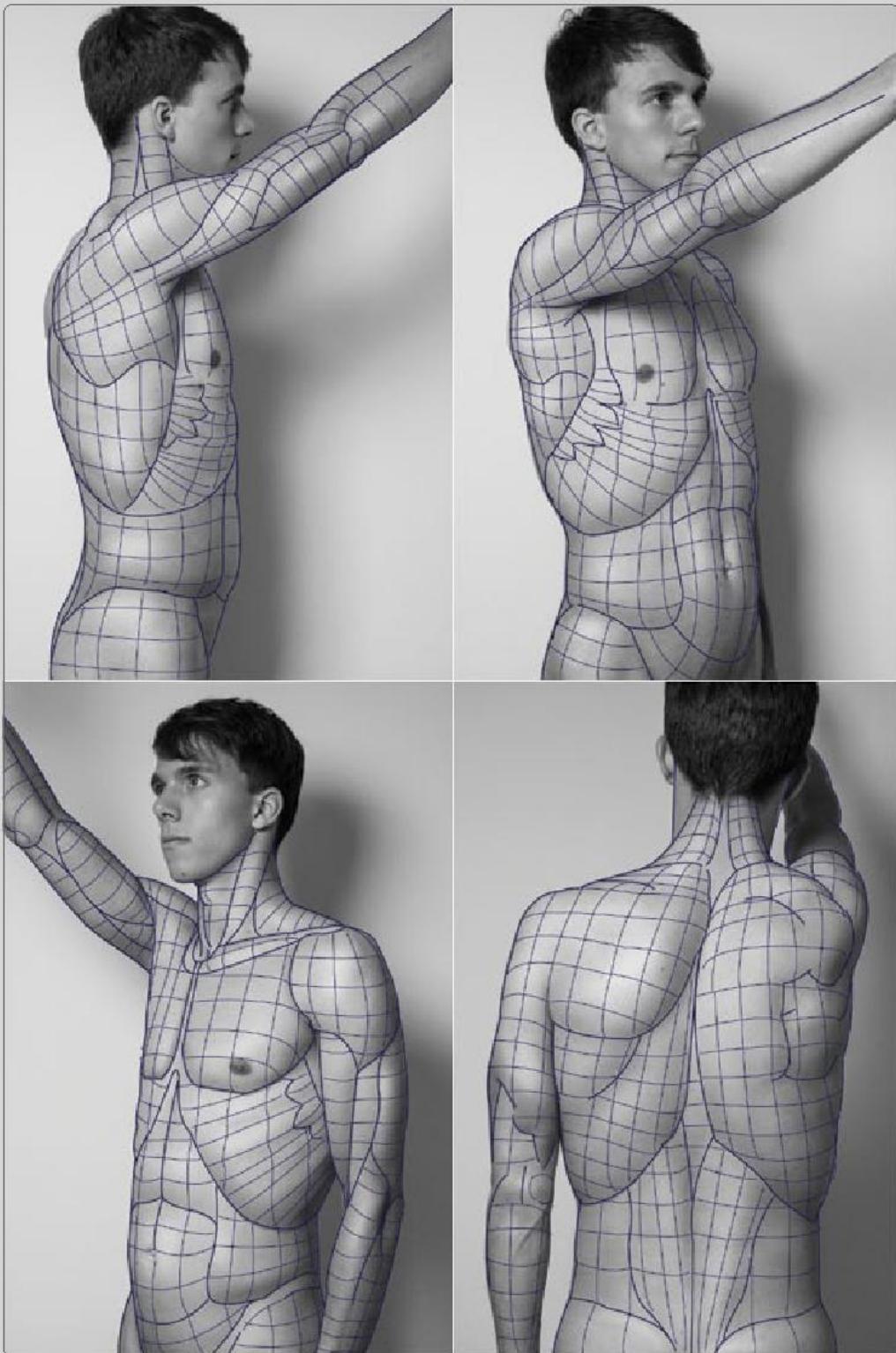
ARM REACHING UP AND FORWARD



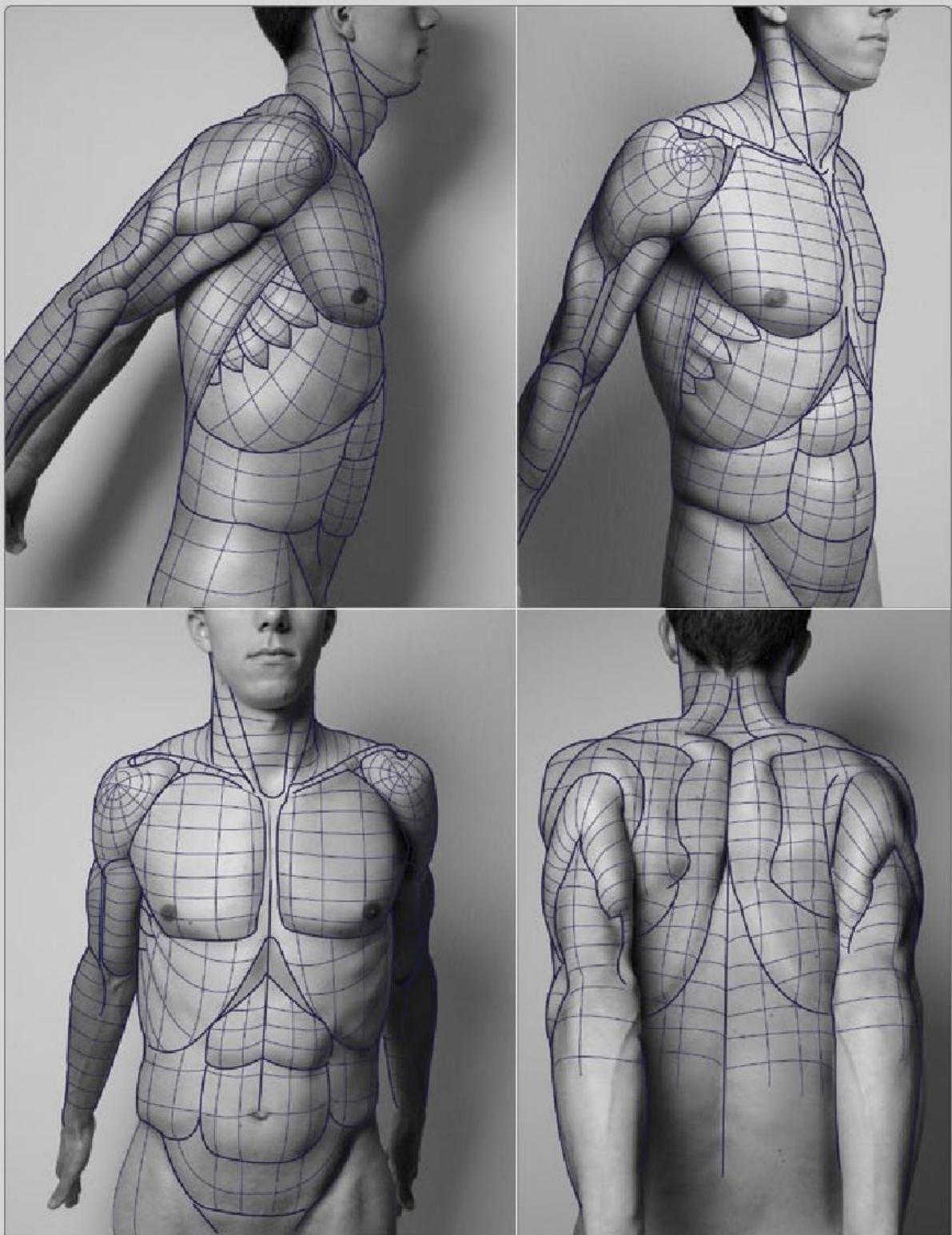
ARM REACHING UP AND FORWARD



ARM REACHING UP AND FORWARD



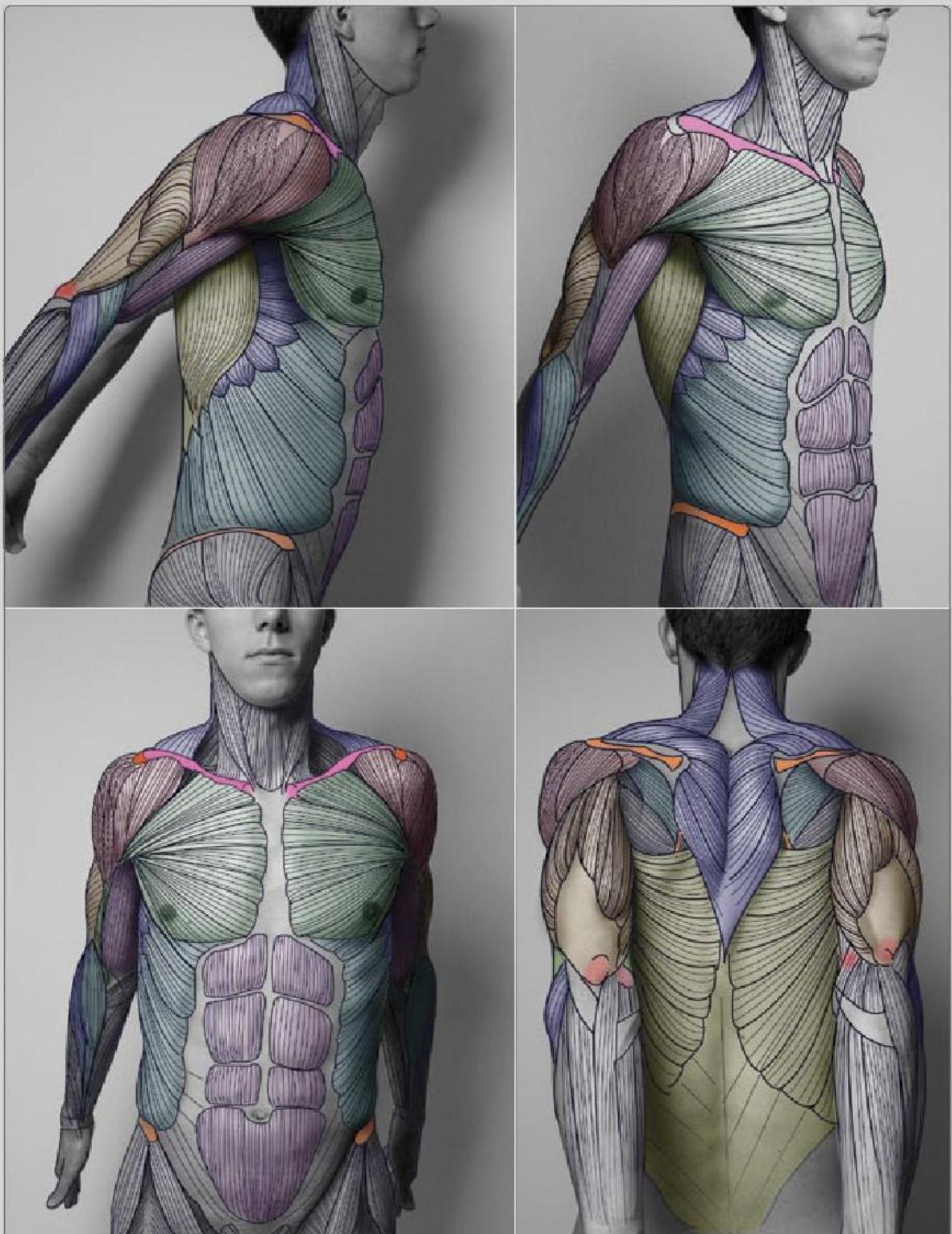
REACHING BACK



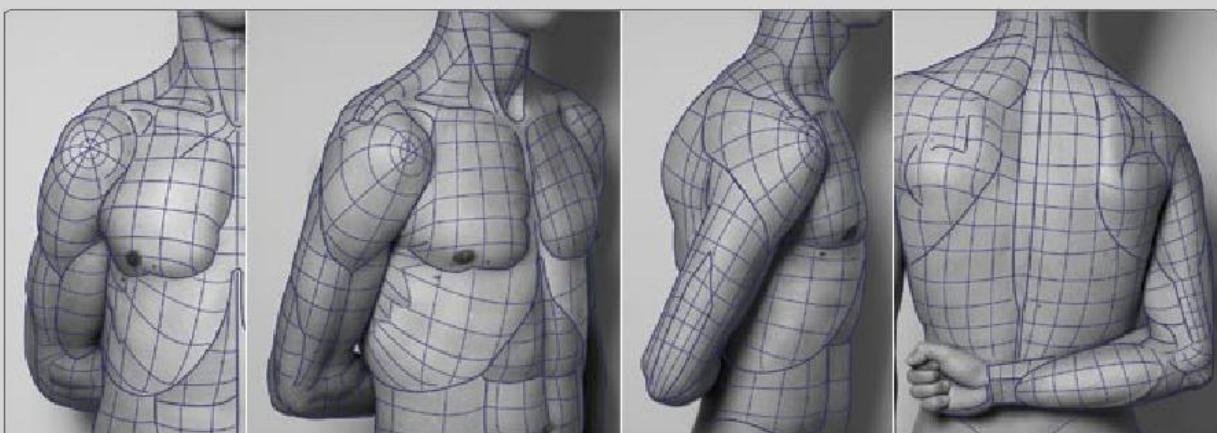
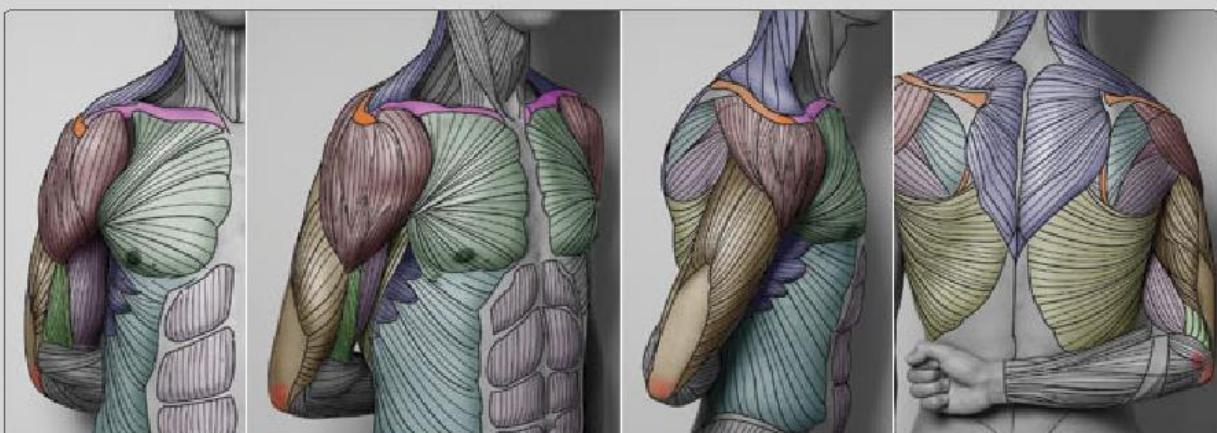
REACHING BACK



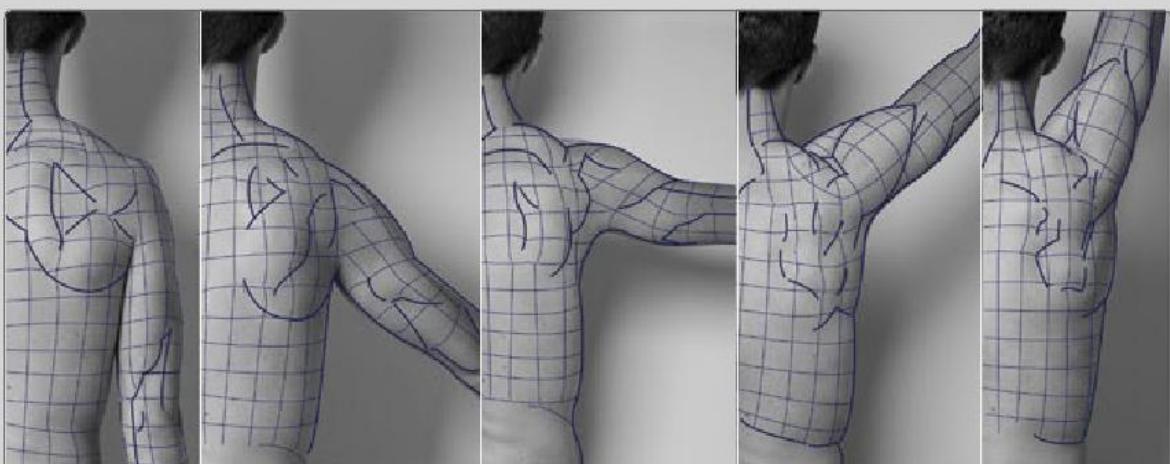
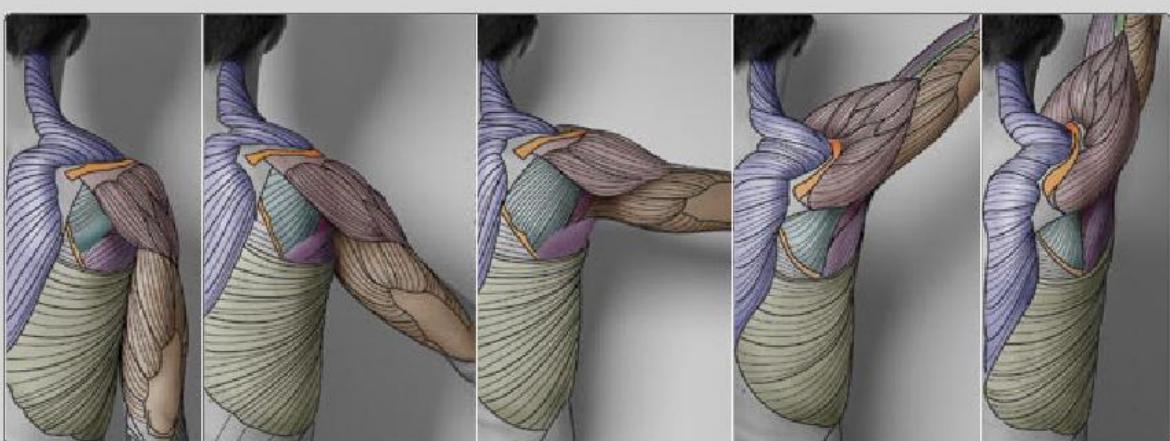
REACHING BACK



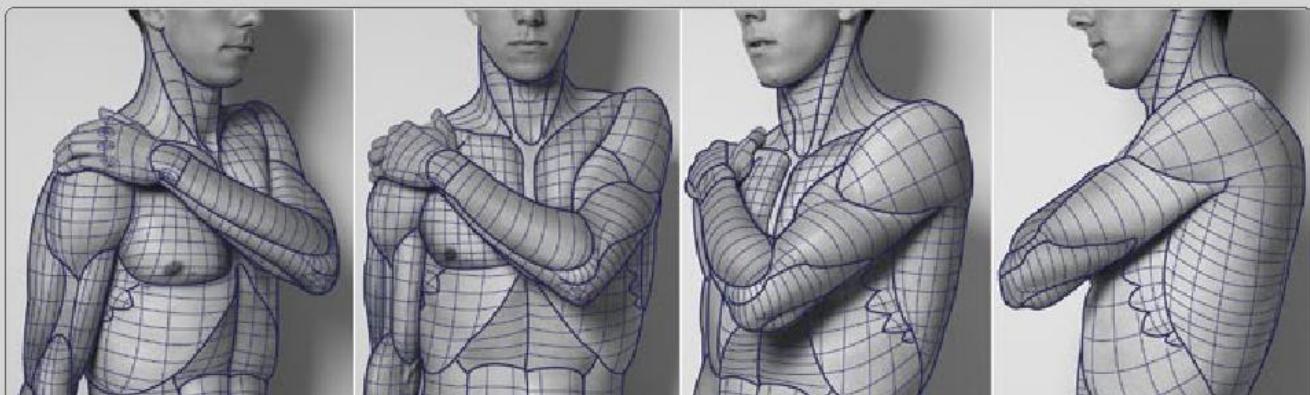
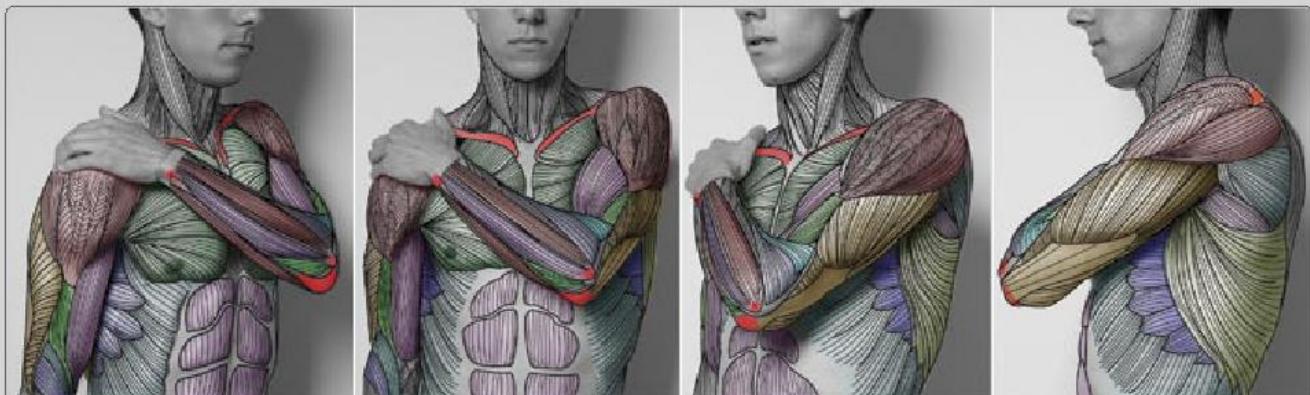
ONE ARM BEHIND BACK



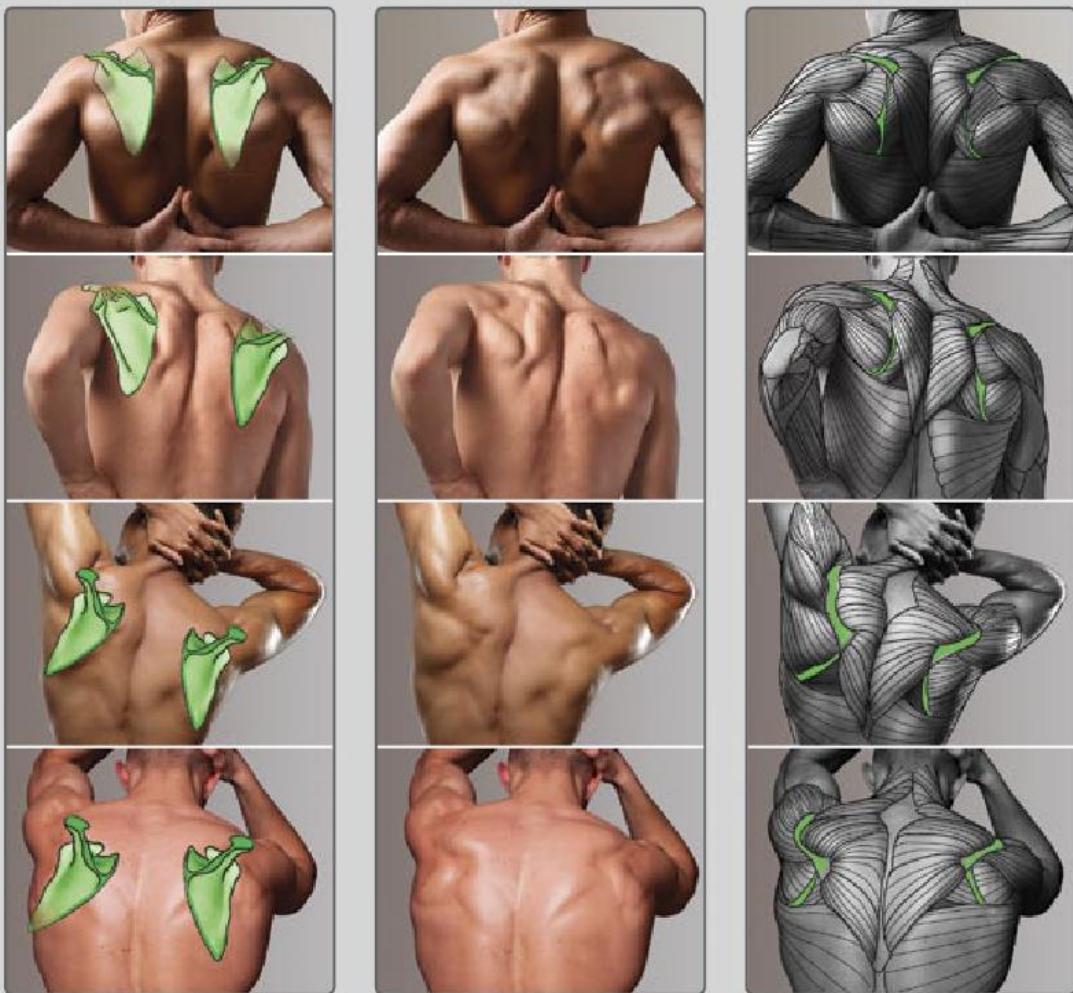
LIFTING ARM HIGHER AND HIGHER



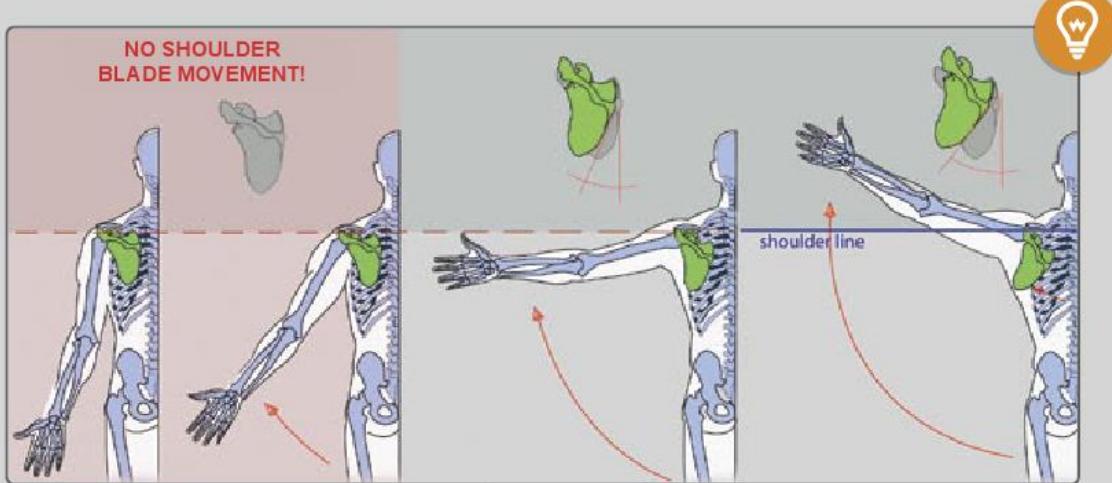
HAND HOLDING OPPOSITE SHOULDER



LET'S FIND SHOULDER BLADES (SCAPULA)!

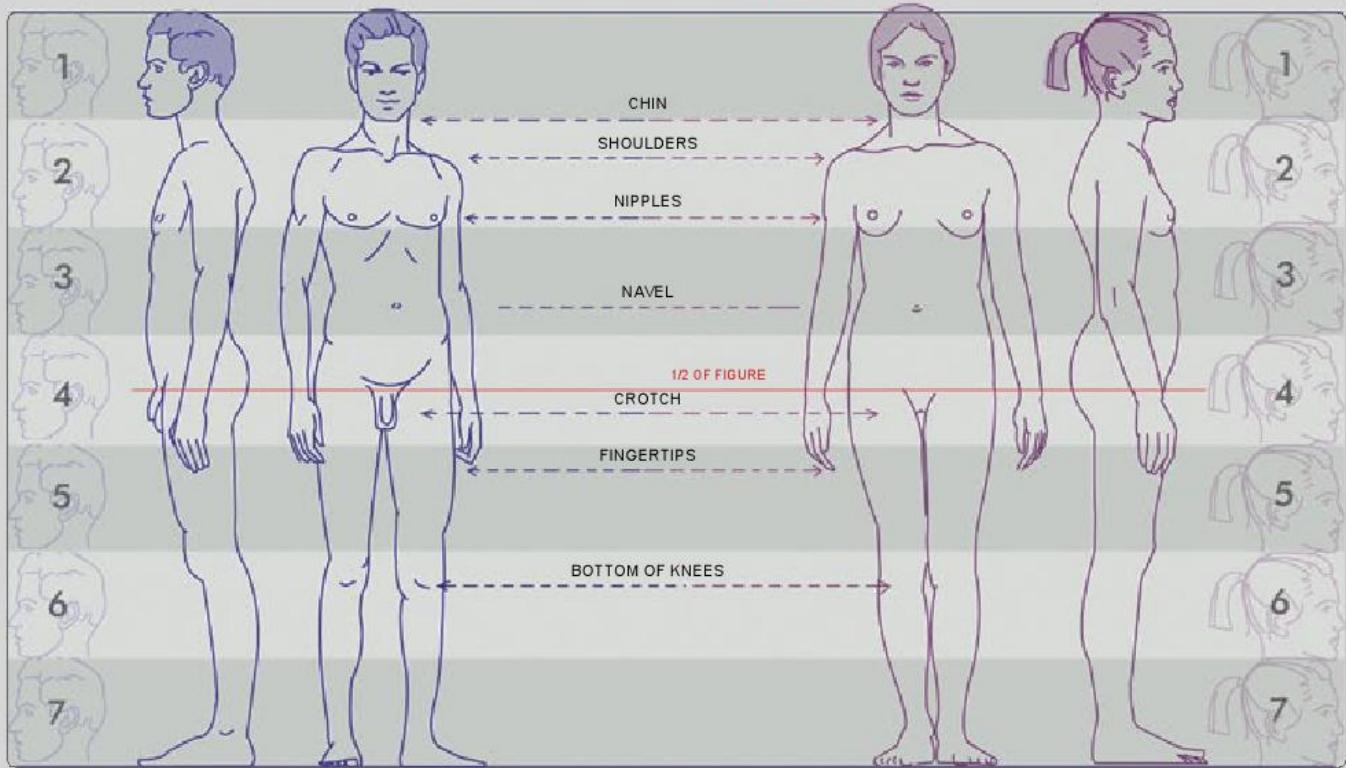


ROTATION OF THE SHOULDER BLADE

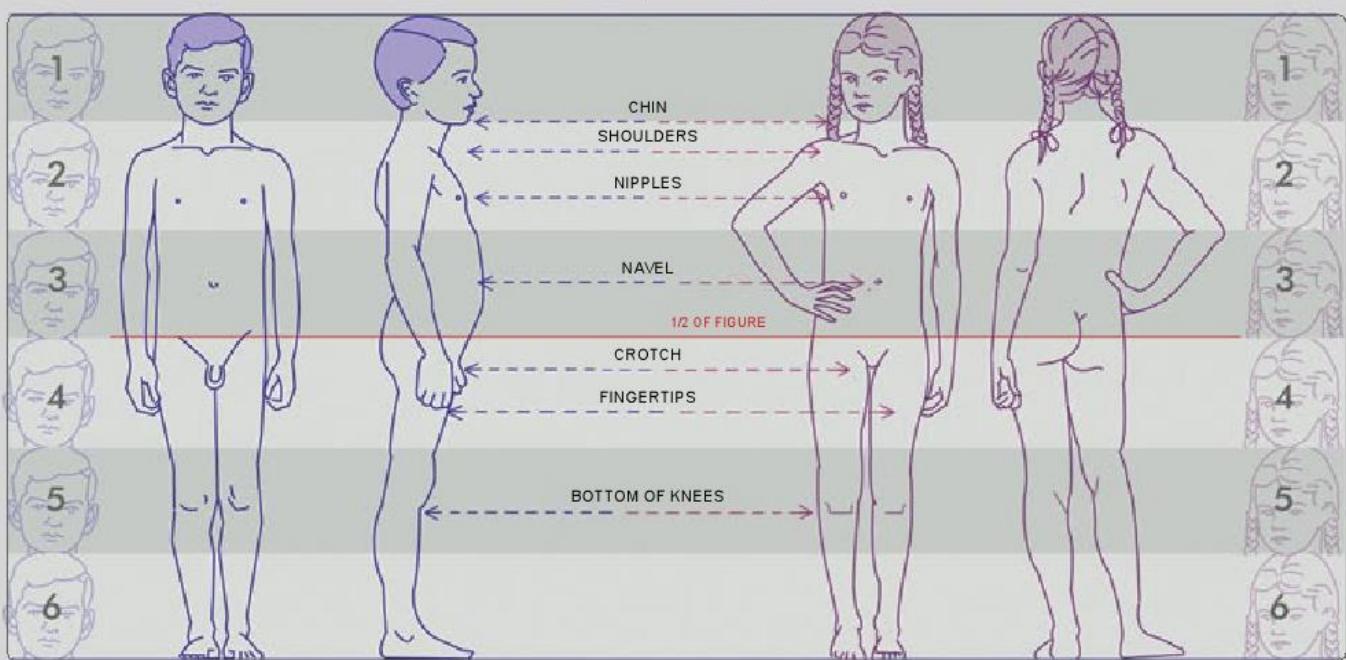


PROPORTIONS OF TEENAGER AND CHILD

TEENAGER PROPORTIONS - 7 HEAD UNITS

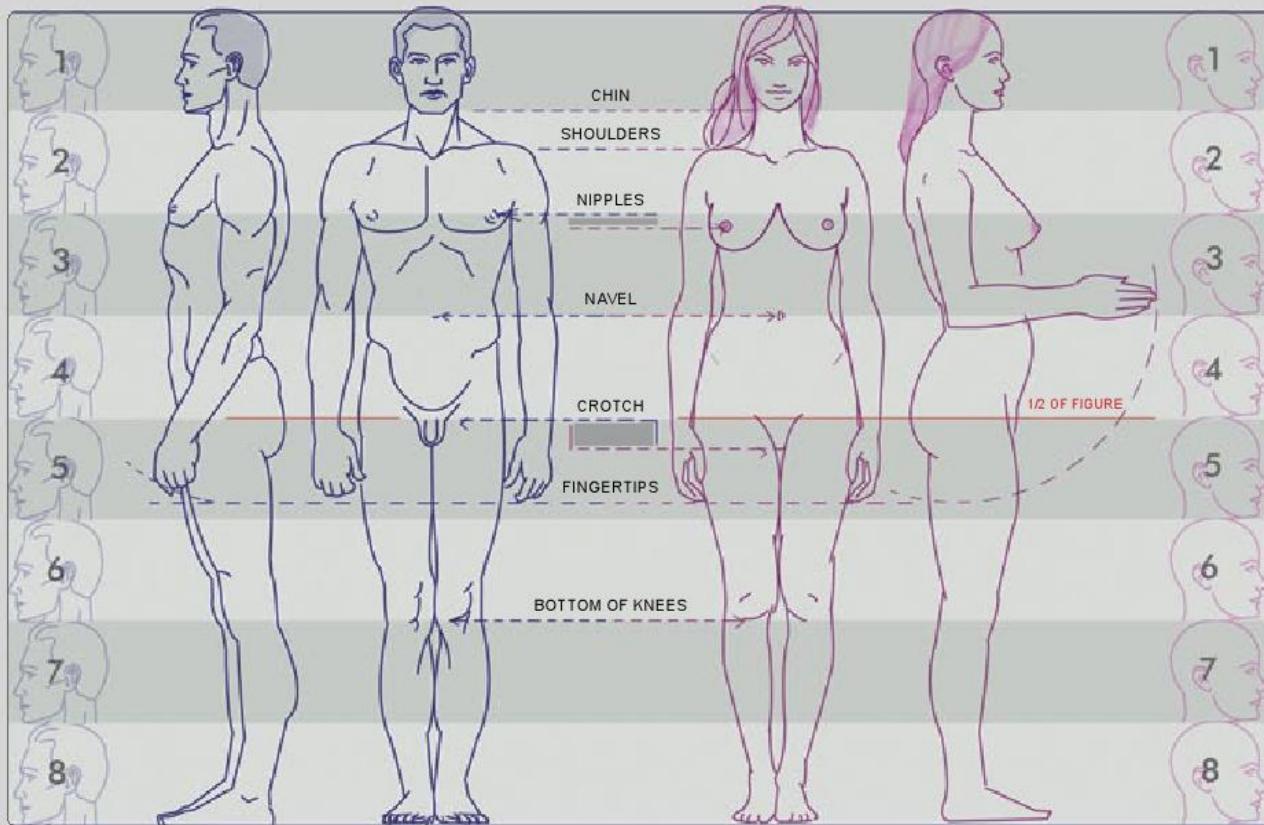


CHILD PROPORTIONS (AGES 8 - 12) - 6 HEAD UNITS

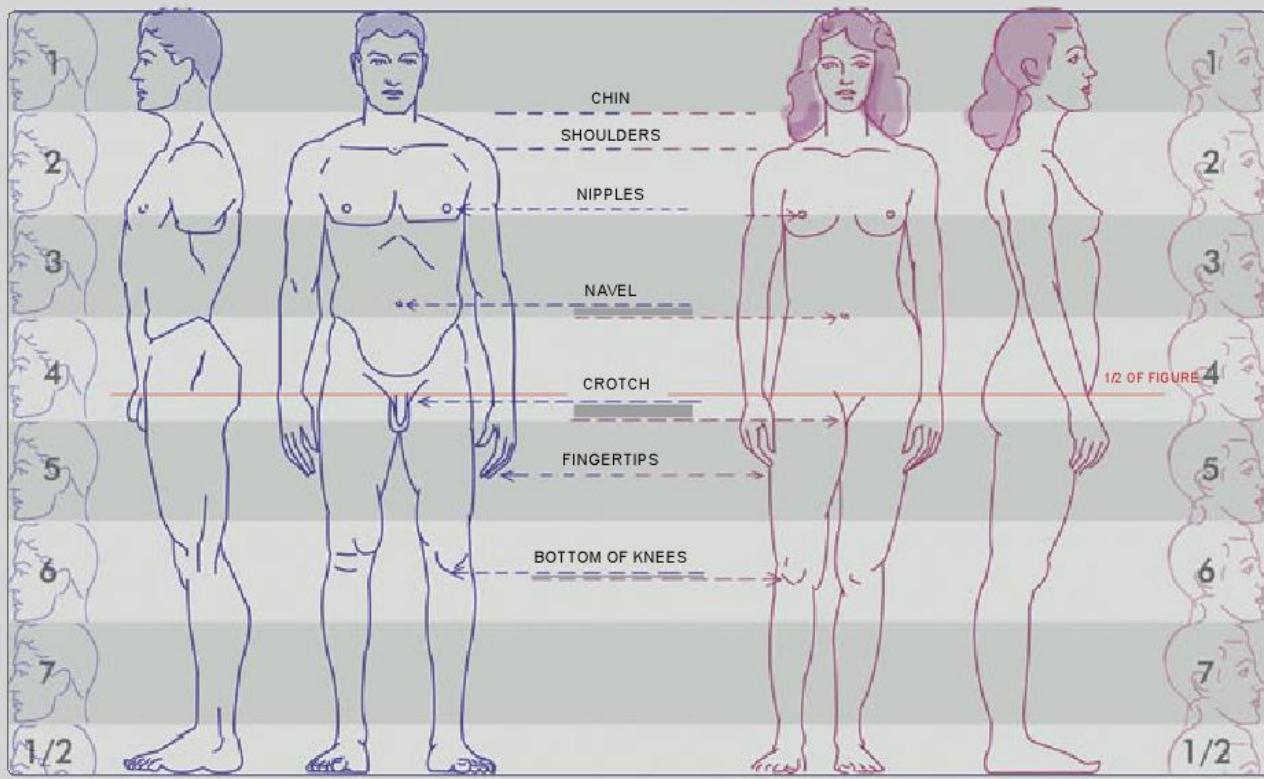


PROPORTIONS OF ADULT MALE AND FEMALE

IDEALIZED ADULT PROPORTIONS - **8 HEAD UNITS**

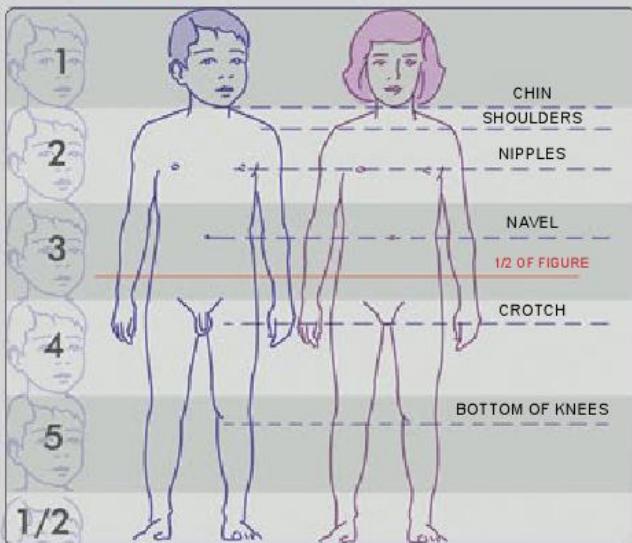


REALISTIC ADULT PROPORTIONS - **7.5 HEAD UNITS**

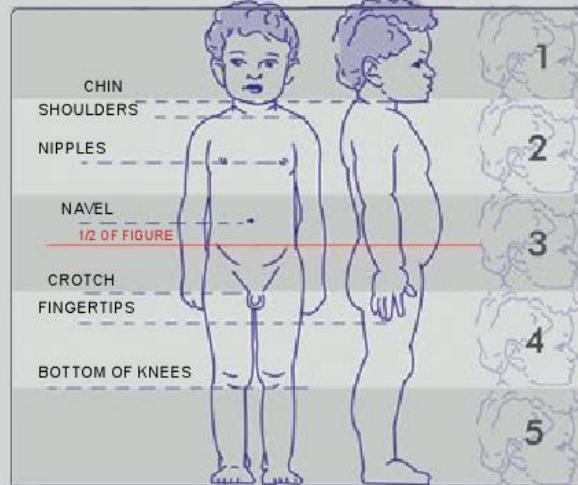


PROPORTIONS OF CHILD, TODDLER, NEWBORN AND SENIOR

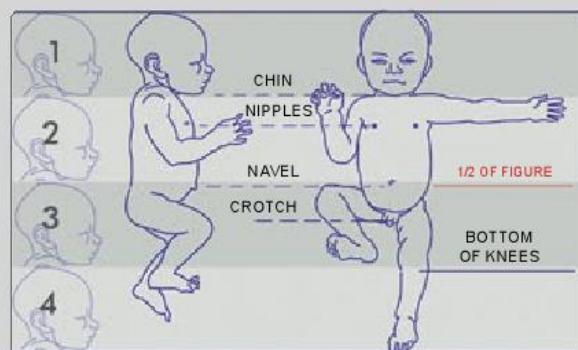
CHILD: 5.5 HEAD UNITS



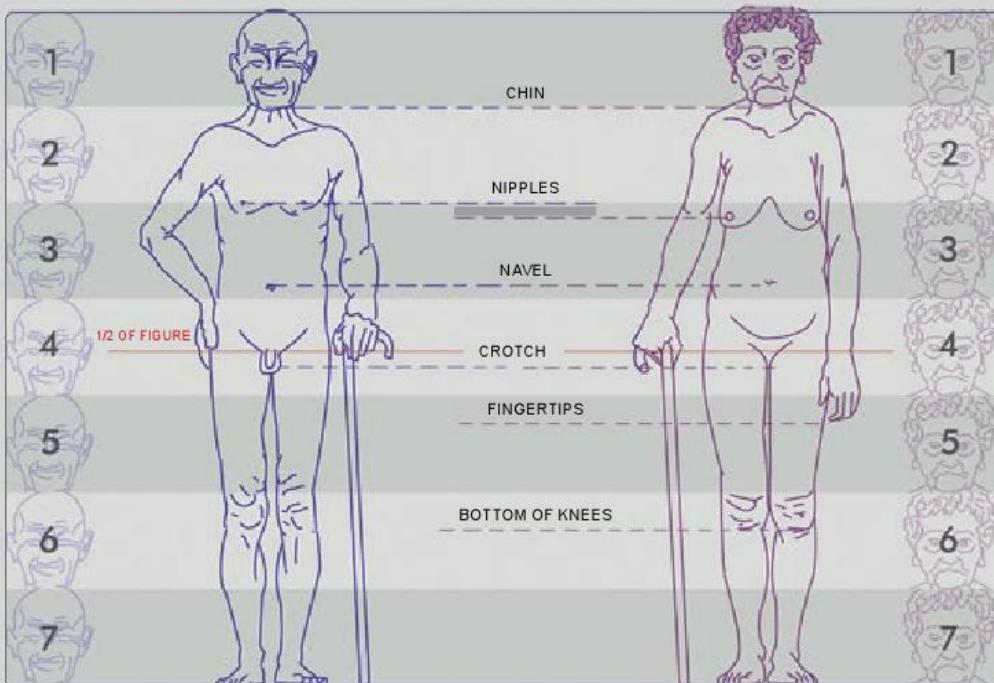
TODDLER: 5 HEAD UNITS



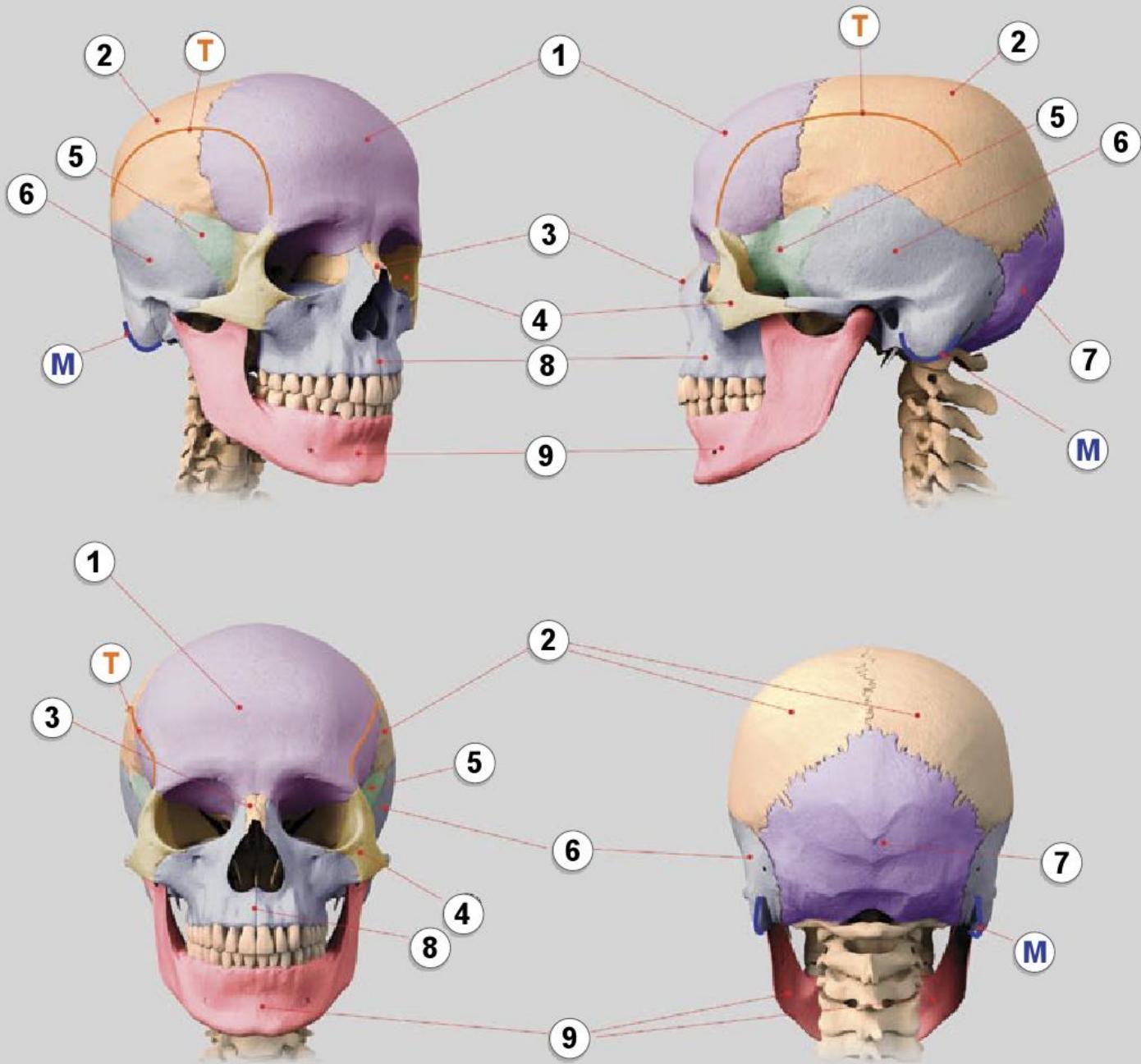
NEWBORN: 4 HEAD UNITS



SENIOR: 7 HEAD UNITS



MAJOR SKULL BONES



1 FRONTAL BONE

2 PARIETAL BONE

3 NASAL BONE

T TEMPORAL LINE

4 ZYGOMATIC BONE

5 SPHENOID BONE

6 TEMPORAL BONE

M MASTOID PROCESS

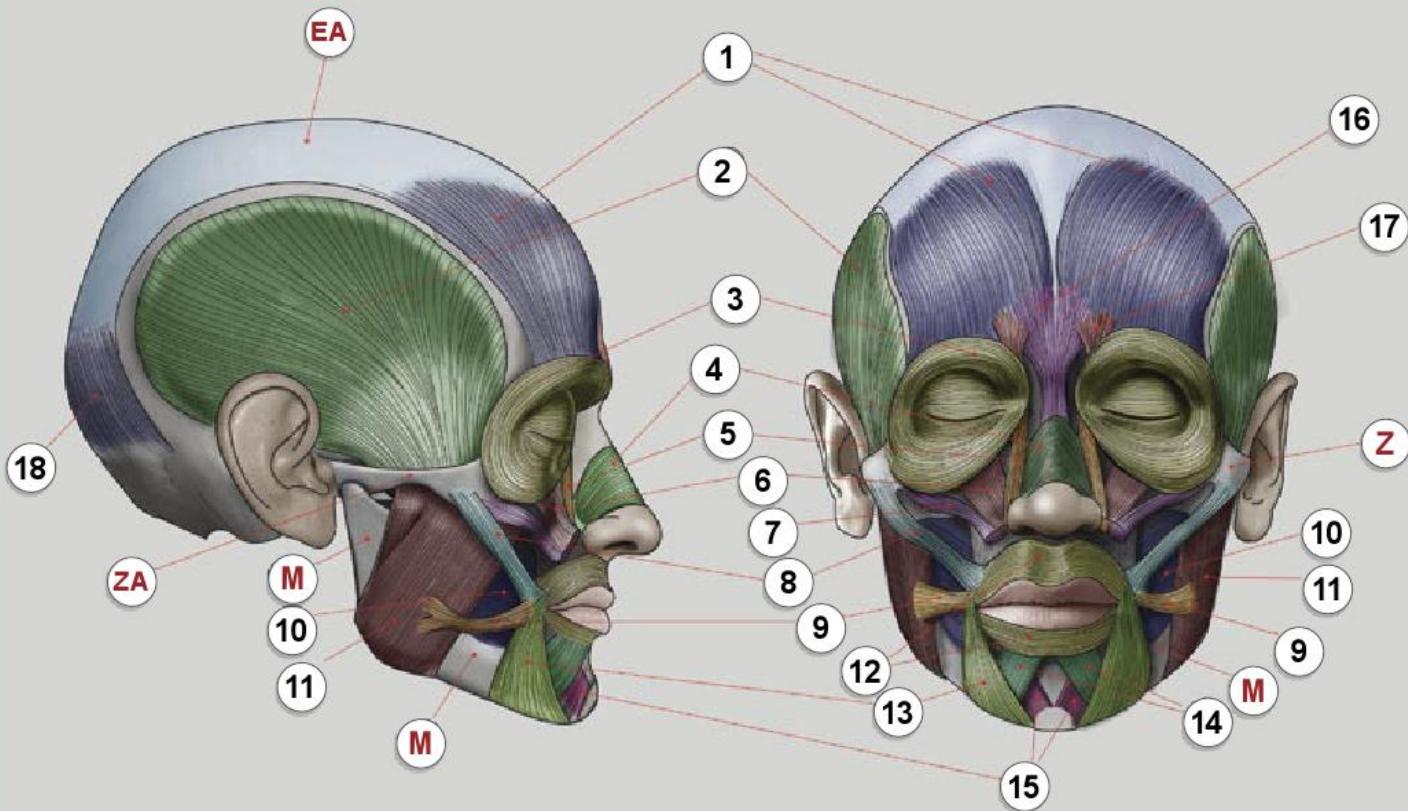
7 OCCIPITAL BONE

8 MAXILLA BONE

9 MANDIBLE BONE

MAJOR HEAD MUSCLES

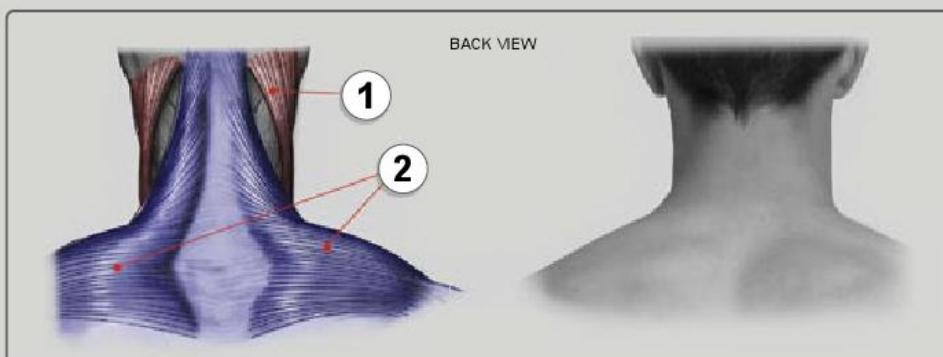
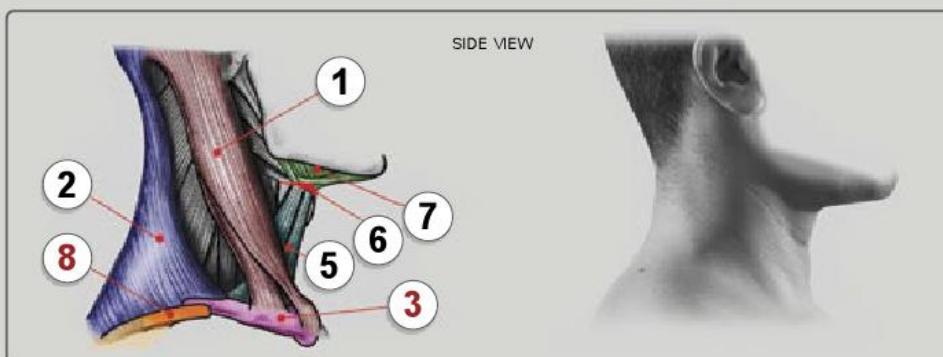
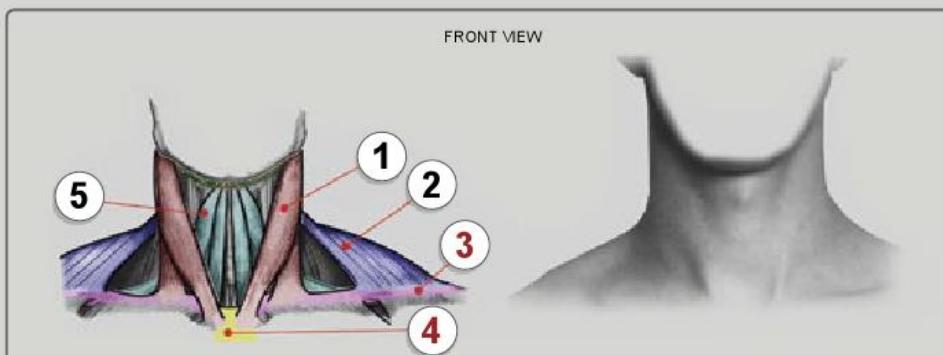
i



1	FRONTALIS MUSCLE	11	MASSETER MUSCLE
2	TEMPORAL MUSCLE	12	ORBICULARIS ORIS MUSCLE
3	ORBICULARIS OCULI MUSCLE	13	DEPRESSOR ANGULI ORIS MUSCLE
4	NASALIS MUSCLE	14	DEPRESSOR LABII INFERIORIS MUSCLE
5	OTTO'S MUSCLE	15	MENTALIS MUSCLE
6	LEVATOR LABII SUPERIORIS MUSCLE	16	PROCERUS MUSCLE
7	ZYGOMATICUS MINOR MUSCLE	17	CORRUGATOR MUSCLE
8	ZYGOMATICUS MAJOR MUSCLE	18	OCCIPITALIS MUSCLE
9	RISORIUS MUSCLE	Z	ZYGOMATIC BONE
10	BUCCINATOR MUSCLE	ZA	ZYGOMATIC ARCH
M	MANDIBLE (LOWER JAW)	EA	EPICRANIAL APONEUROSIS

MAIN NECK MUSCLES

i



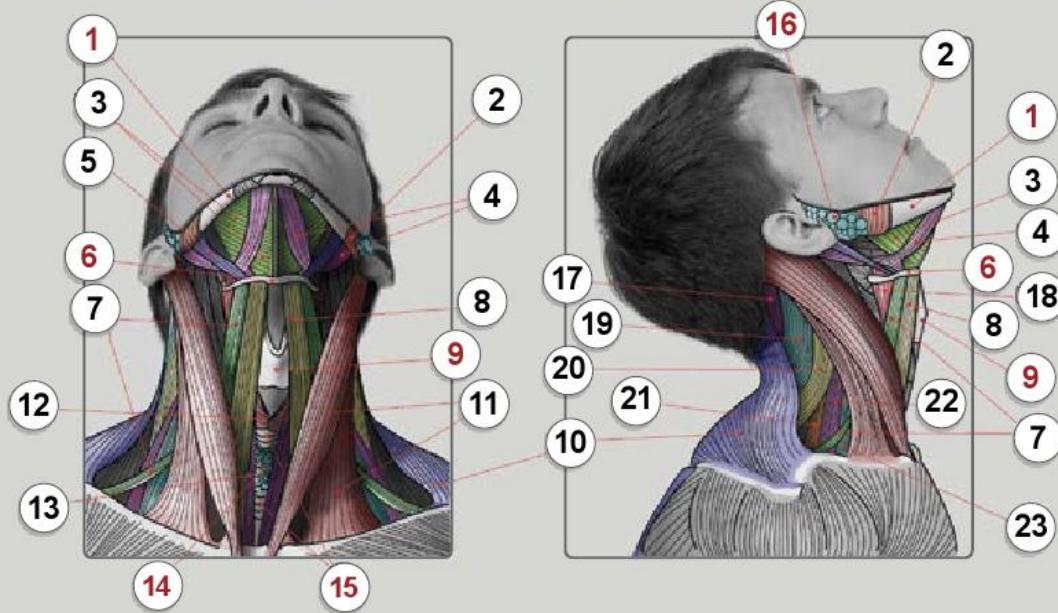
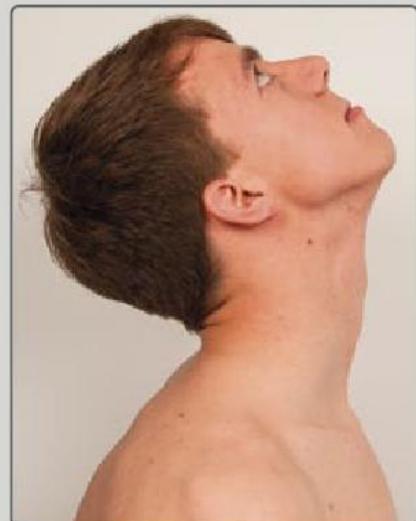
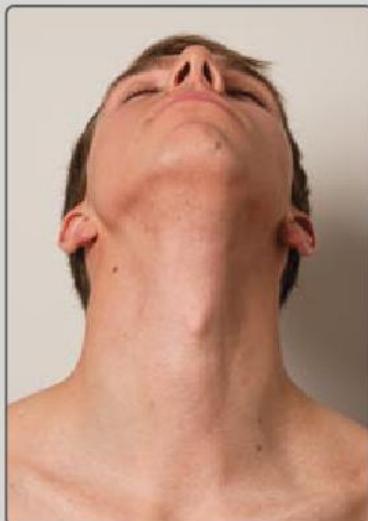
1 STERNOCLIDOMASTOID
2 TRAPEZIUS
3 COLLAR BONE (CLAVICLE)

4 CHEST BONE (STERNUM)
5 INFRAHYOID MUSCLES
6 HYOID BONE

7 SUPRAHYOID MUSCLES
8 SHOULDER BLADE (SCAPULA)

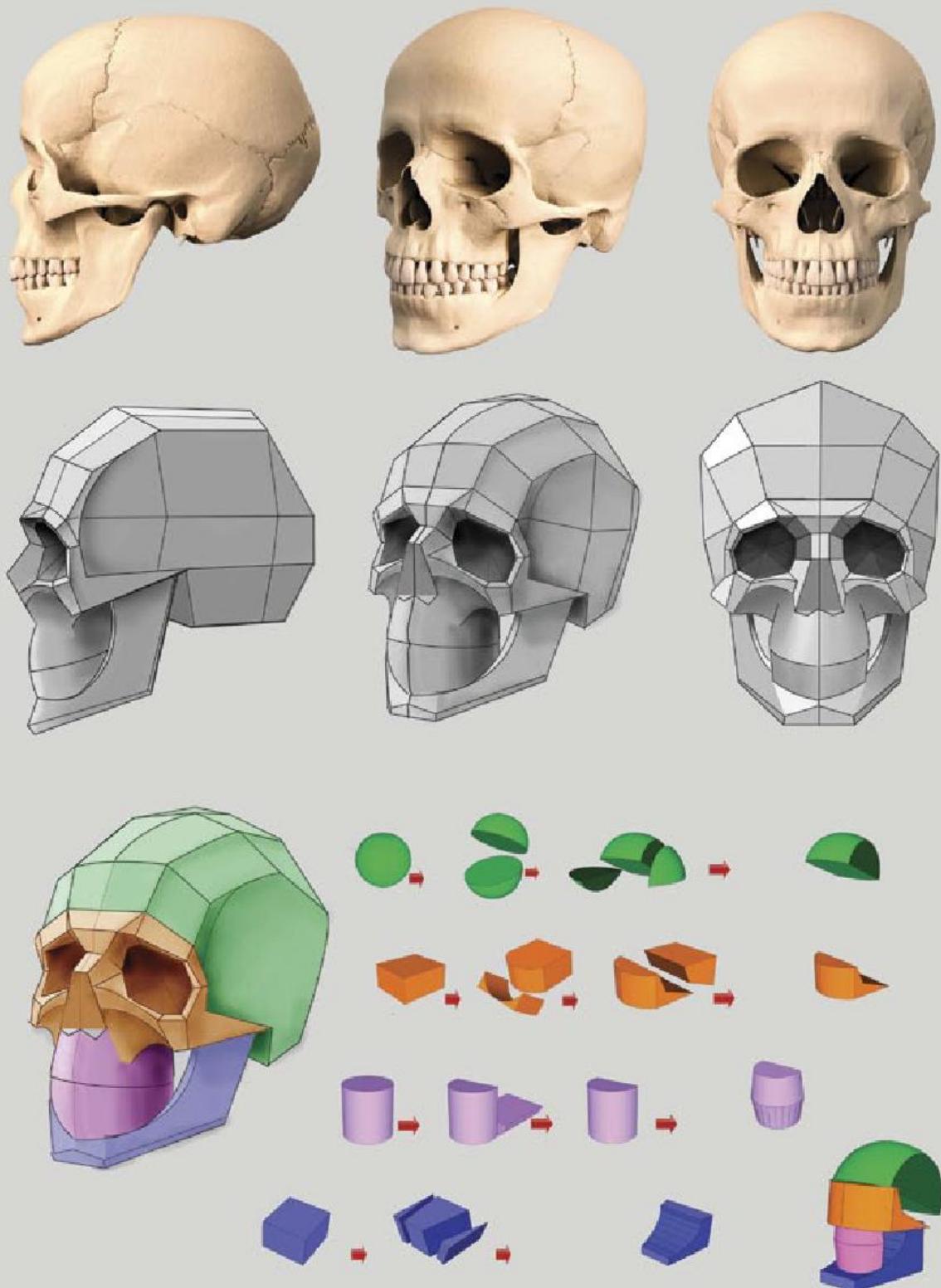
MAIN NECK MUSCLES

i

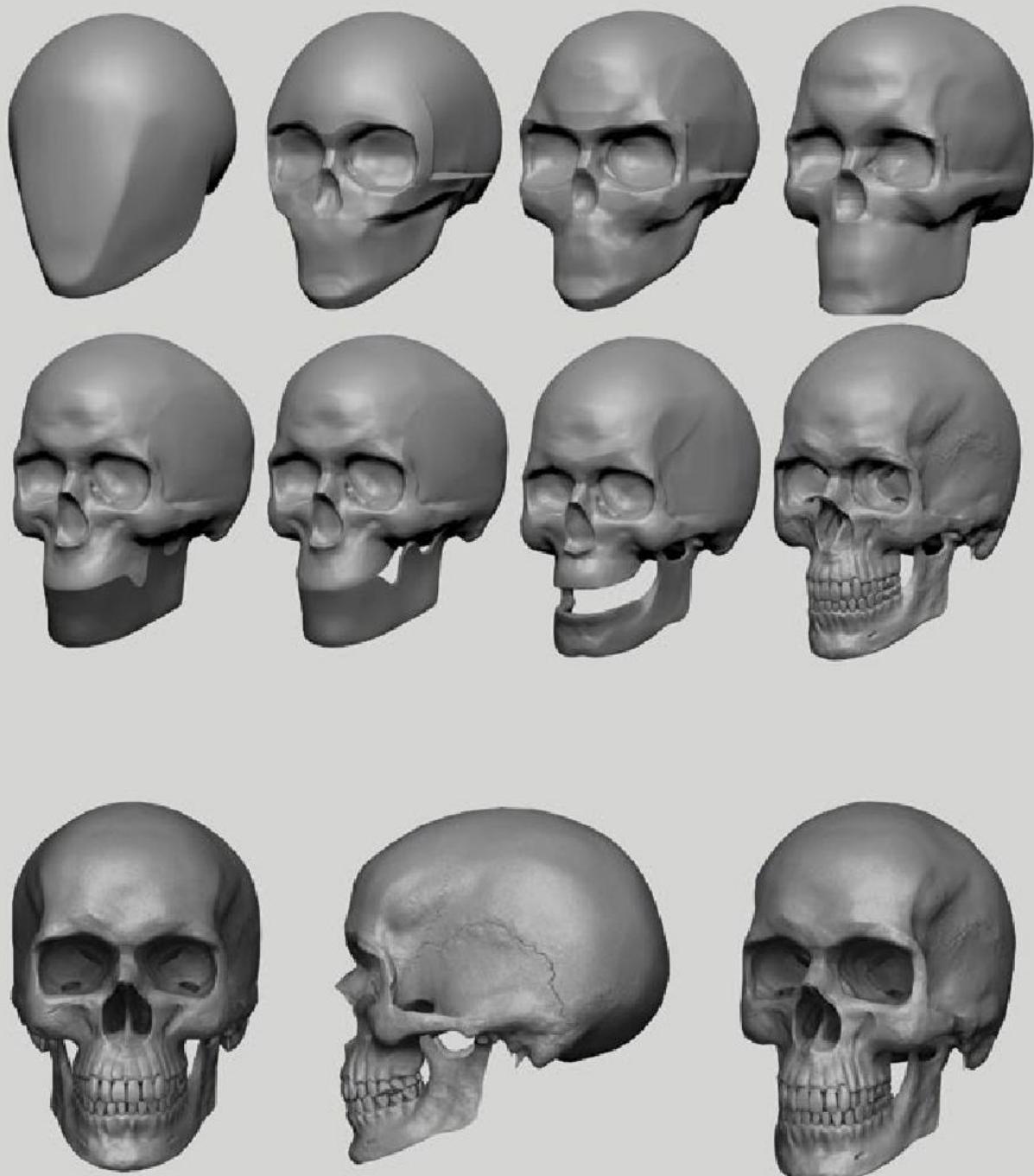


1 LOWER JAW (MANDIBLE)	9 ADAM'S APPLE (LARYNGEAL PROMINENCE)	17 SEMISPINALIS CAPITIS
2 MASSETER	10 TRAPEZIUS	18 HYOGLOSSUS
3 MYLOHYOID	11 STERNOCLIDOMASTOID	19 SPLENIUS CAPITIS
4 DIGASTRIC	12 CRICOHYOID	20 LEVATOR SCAPULAE
5 STYLOHYOID	13 STERNOHYOID	21 SCALENUS POSTERIOR
6 HYOID BONE	14 THYROID GLAND	22 SCALENUS MEDIUS
7 OMOHYOID	15 TRACHEA	23 SCALENUS ANTERIOR
8 STERNOHYOID	16 PAROTID GLAND	

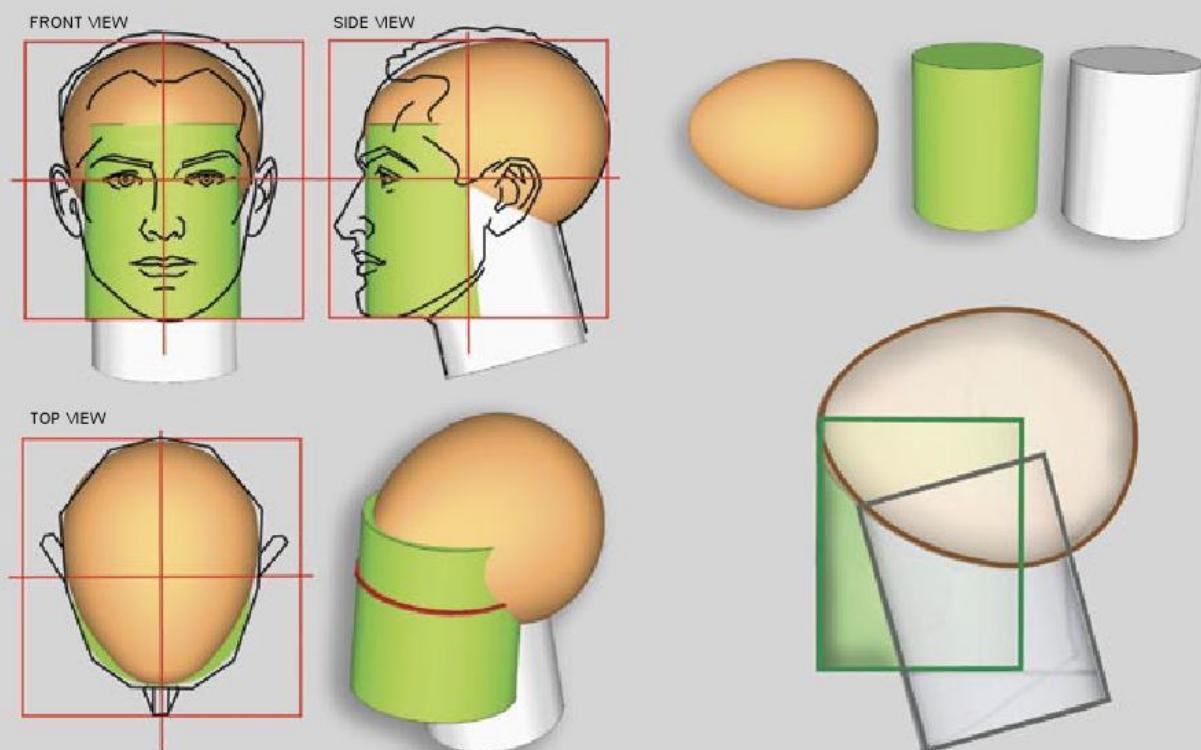
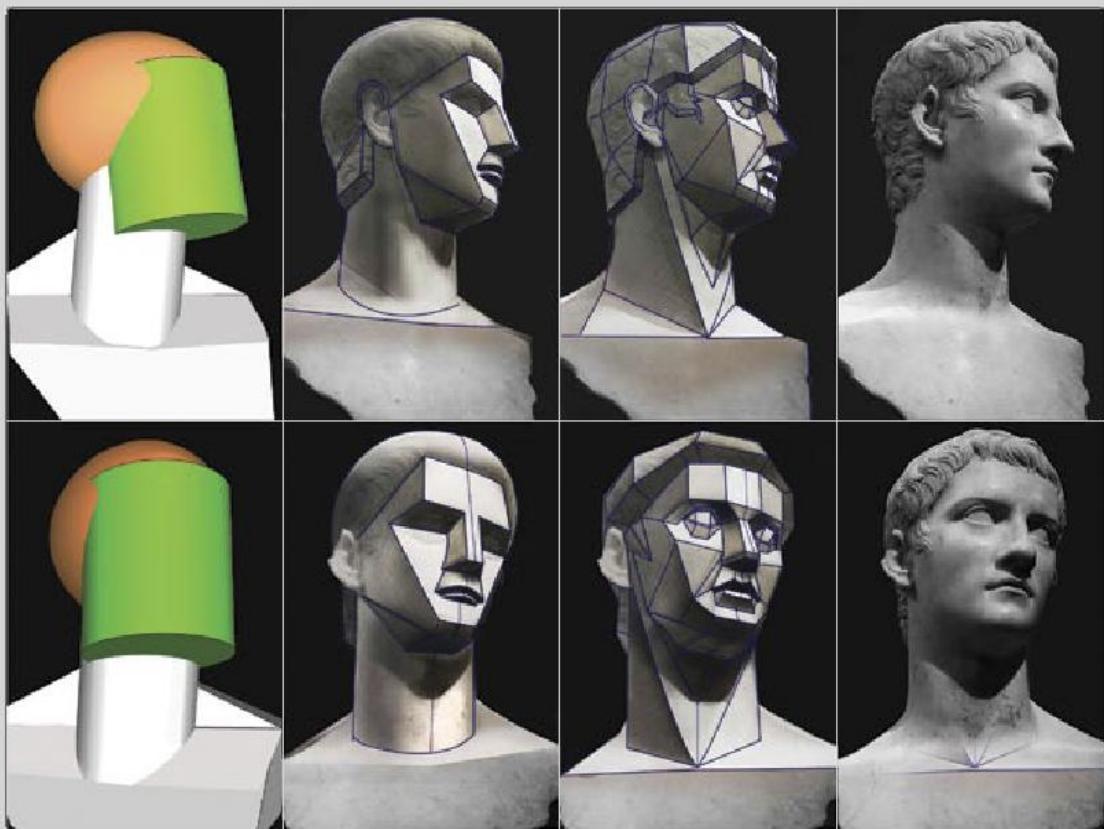
SHAPES THAT FORM A SKULL



MODELING A 3D SKULL



HEAD SHAPE AND MASSES

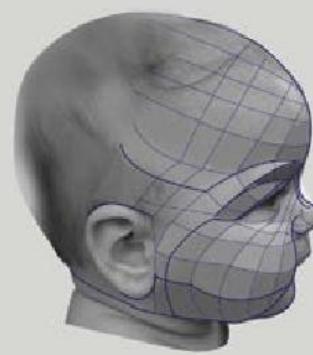
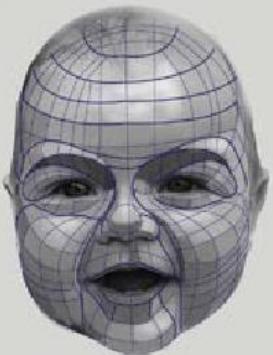


BABY HEAD

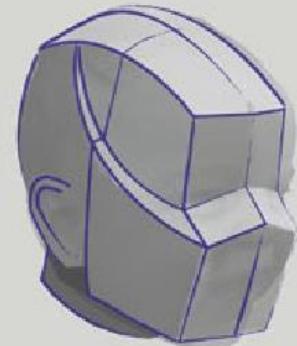
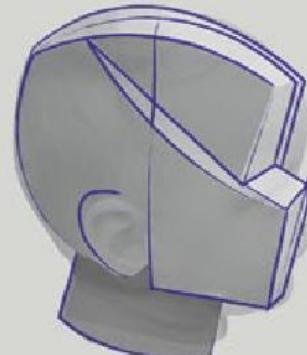
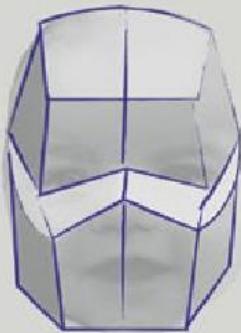
REAL



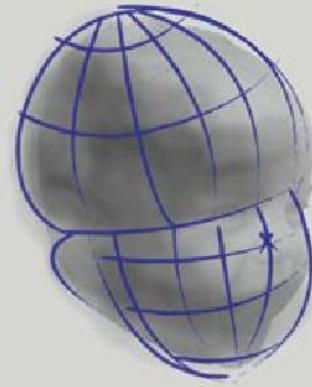
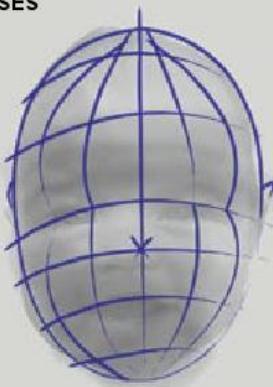
MESH



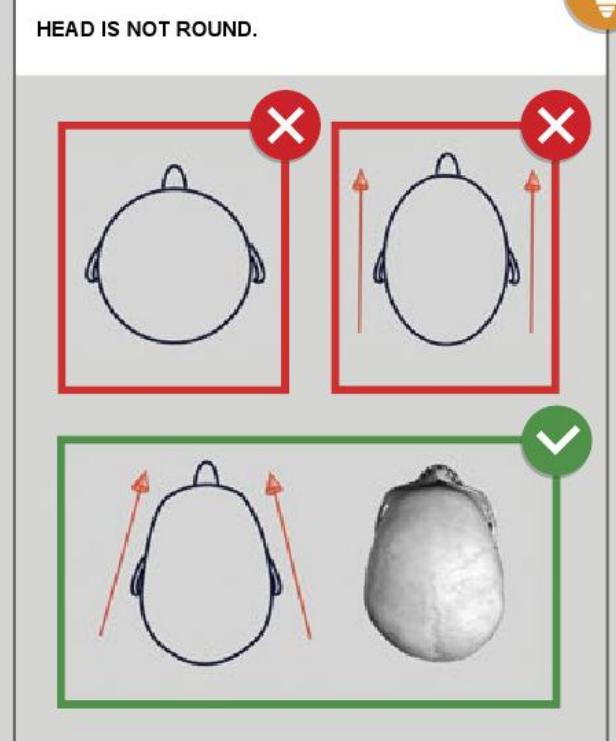
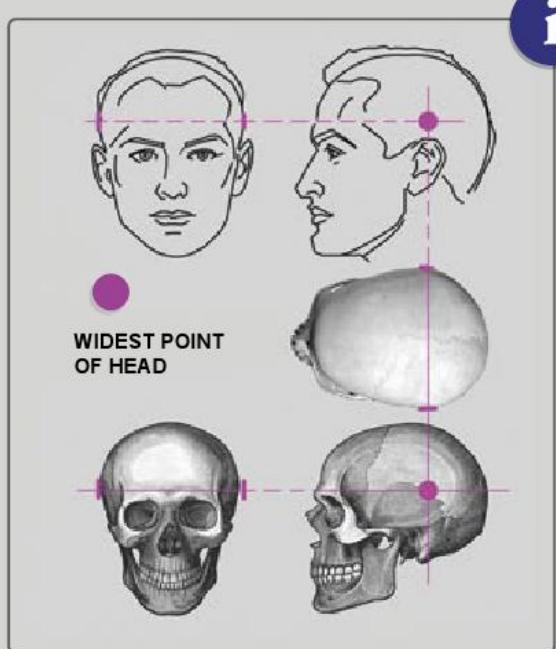
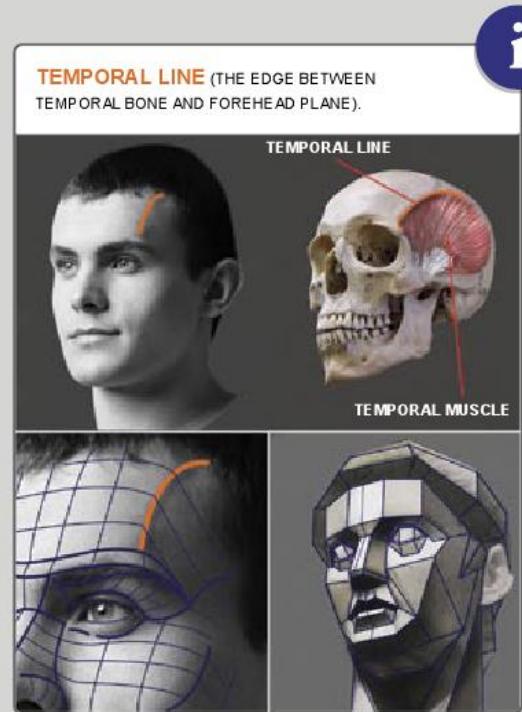
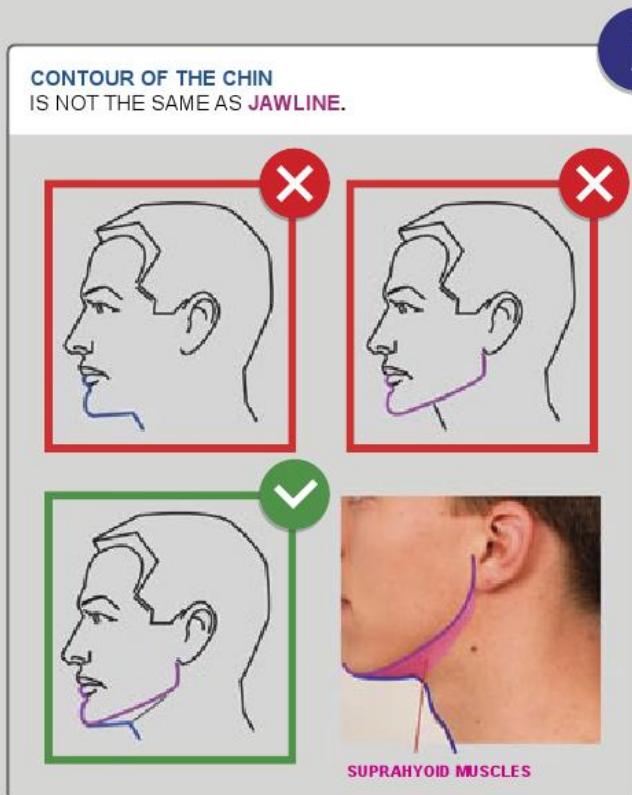
BLOCK-OUT



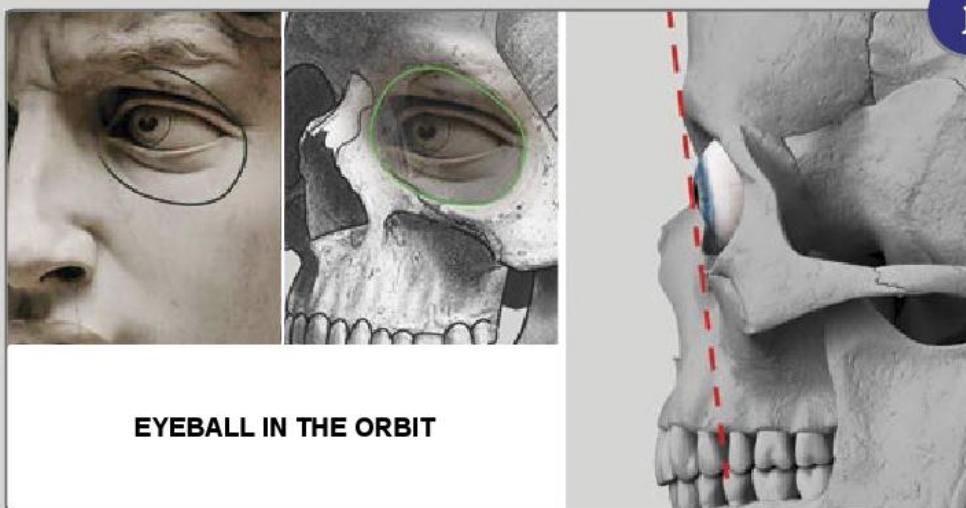
MASSES



THE HEAD SHAPE



FRAMING THE EYES

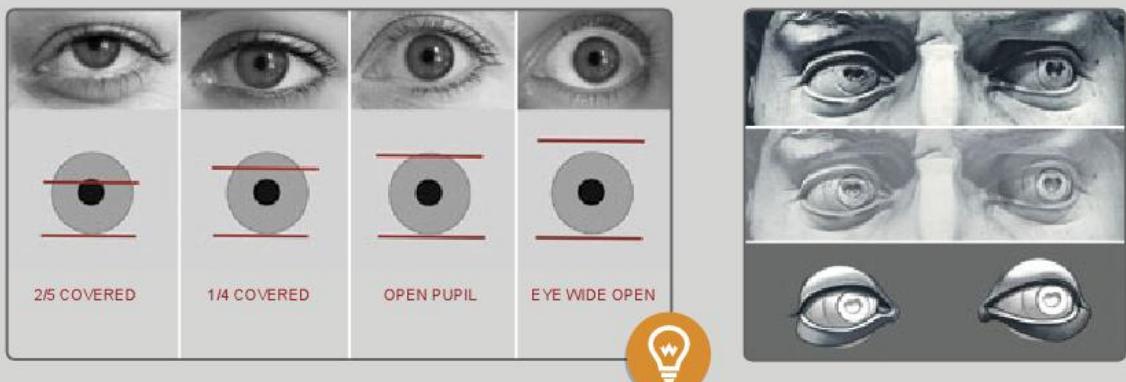
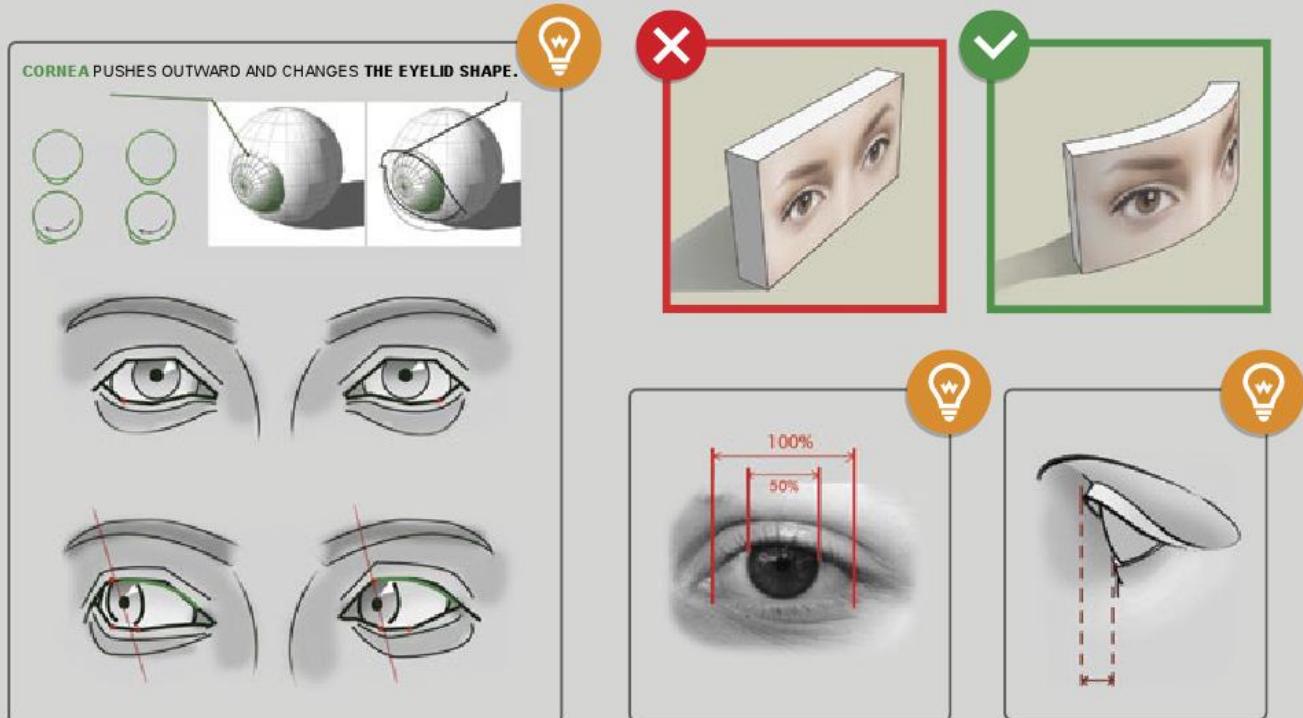
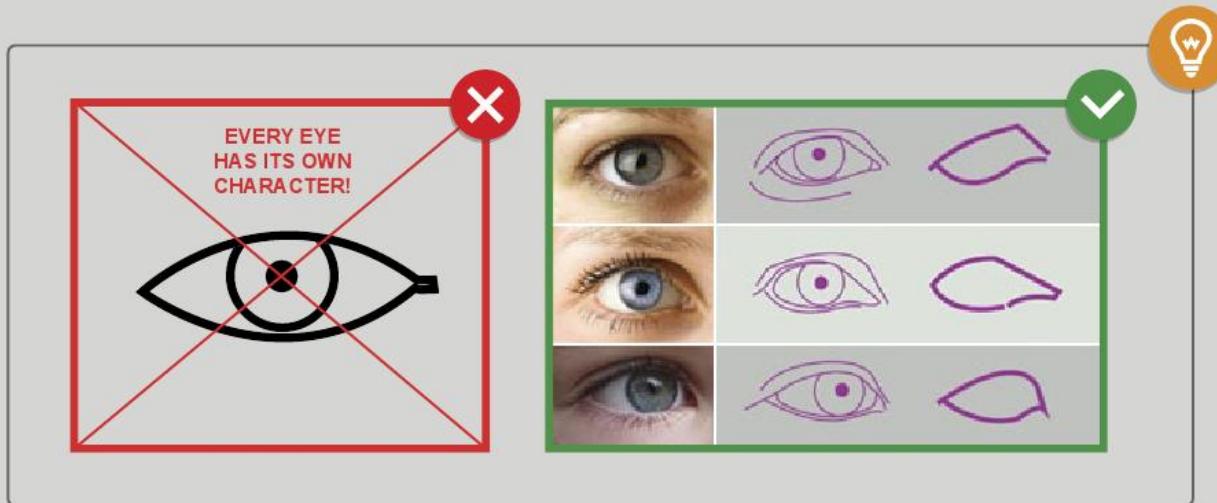


EYEBALL IN THE ORBIT

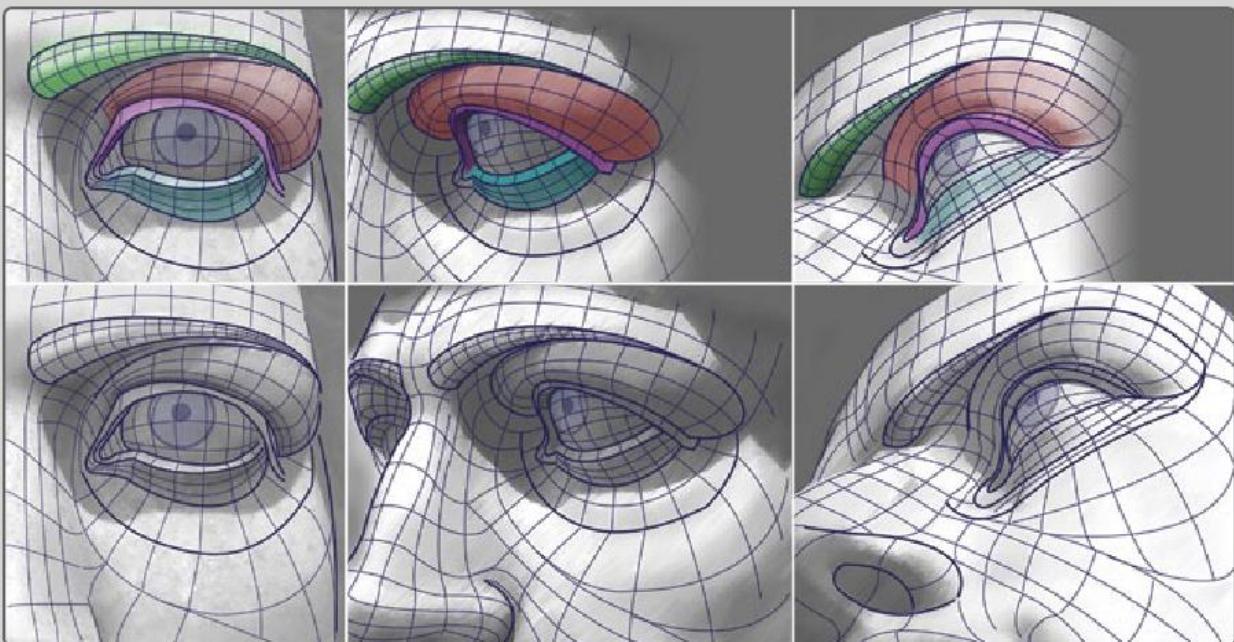
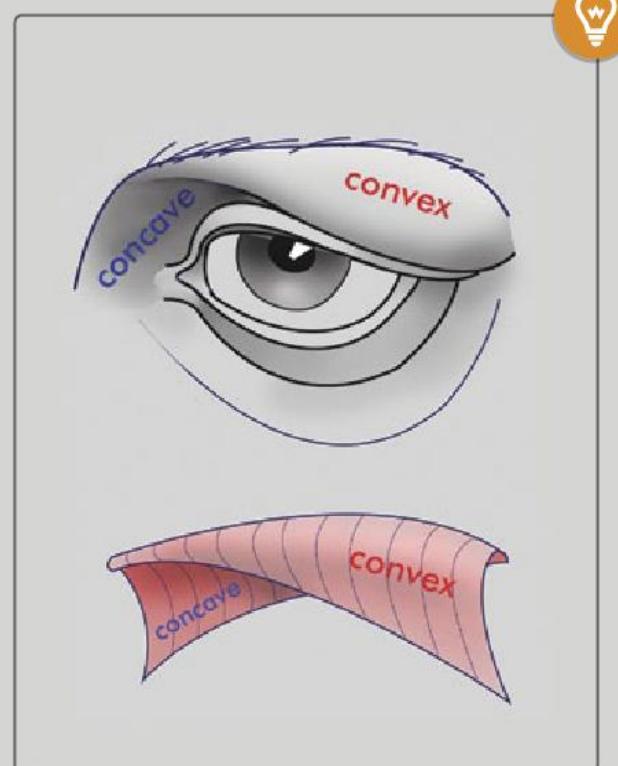
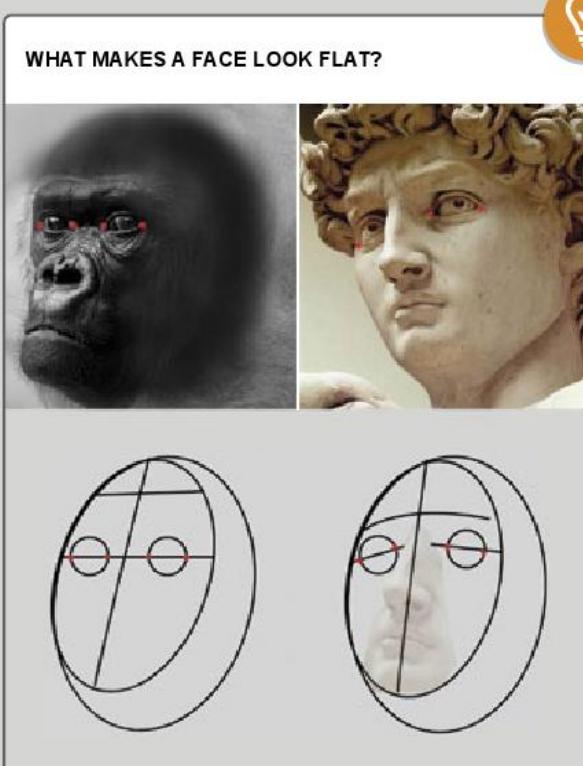
EYEBROWS

! **EYEBROW** CHANGES DIRECTION AS IT RUNS ACROSS **THE TEMPORAL LINE**, SLOPING DOWN AND BACK TOWARD THE EAR.

ALL ABOUT EYES

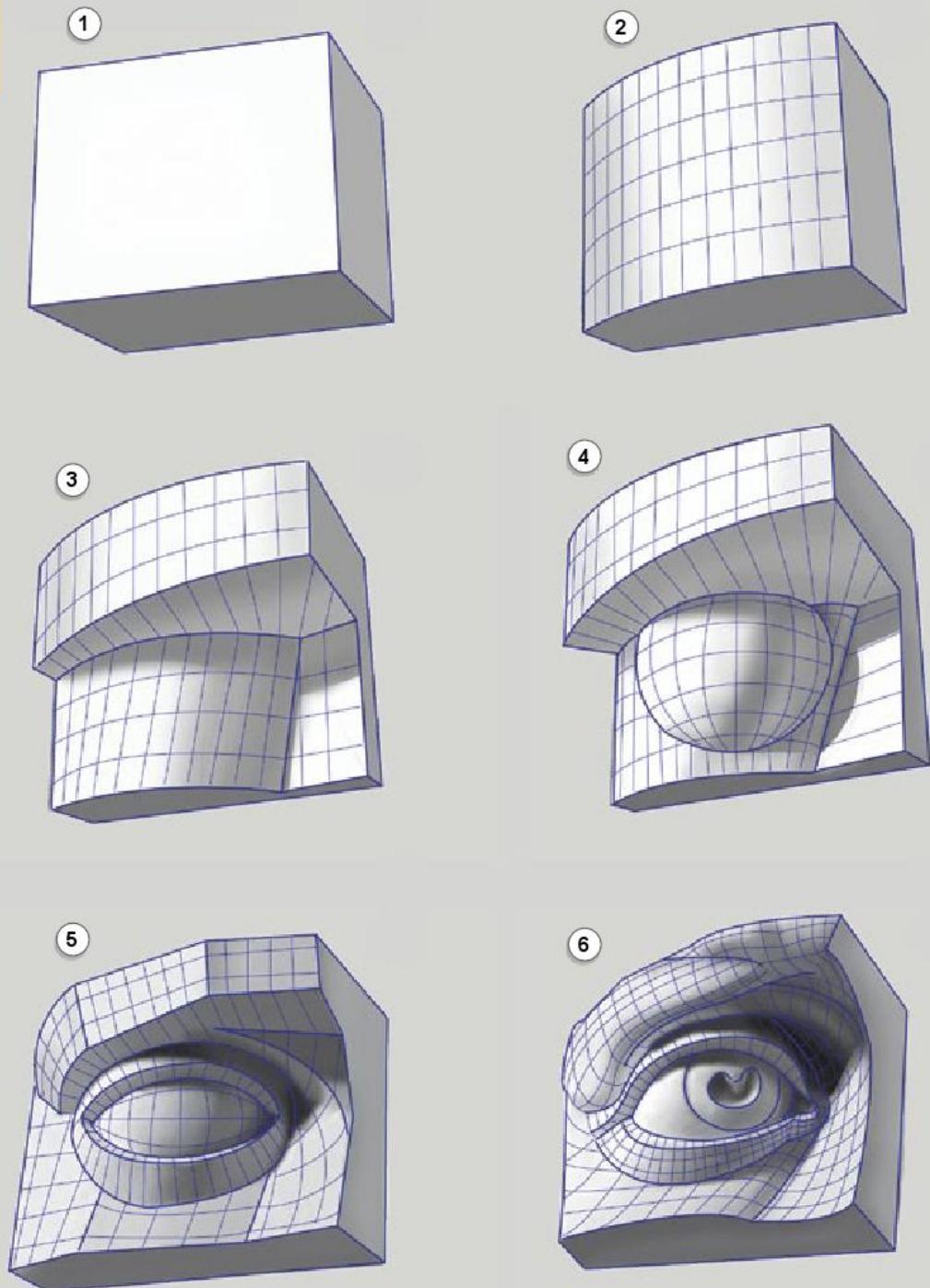


EYE



BLOCKING-OUT A CLASSICAL EYE

(STEP-BY-STEP)



EYES COME IN A VARIETY OF SHAPES

ADULT FEMALE



ADULT MALE



BABY



CHILD



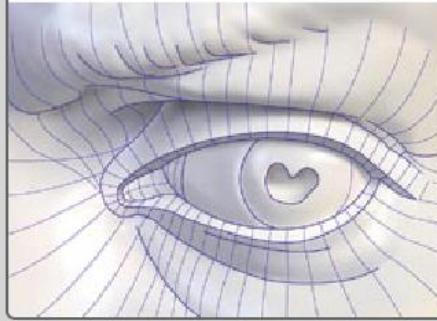
ASIAN



BLACK



CLASSICAL SCULPTURE



SENIOR



EYE MOVEMENTS (EXPRESSIONS)

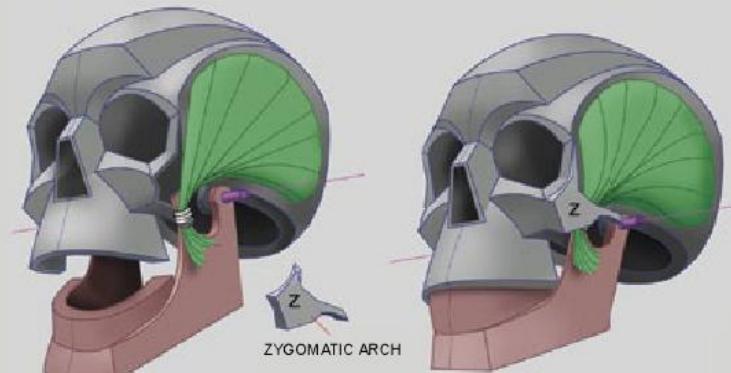


EYE MOVEMENTS (EXPRESSIONS)

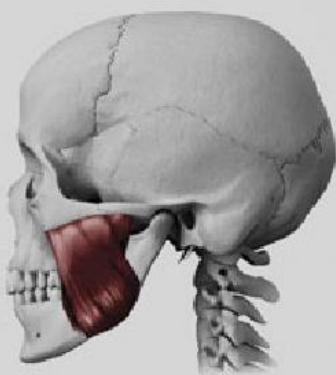


WHAT STRONG JAWS YOU HAVE!

TEMPORALIS MUSCLE – HELPS TO CLOSE THE MOUTH AND KEEP IT SHUT!

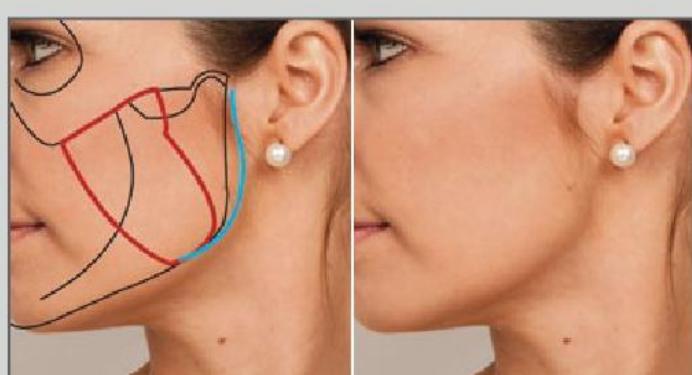
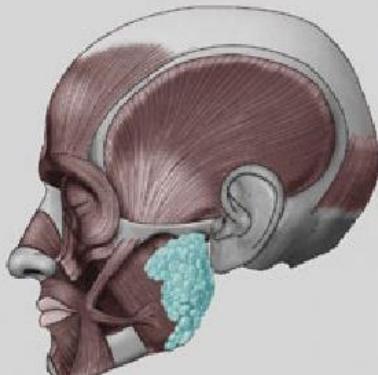


THE CHEWING MUSCLE (MASSETER MUSCLE).

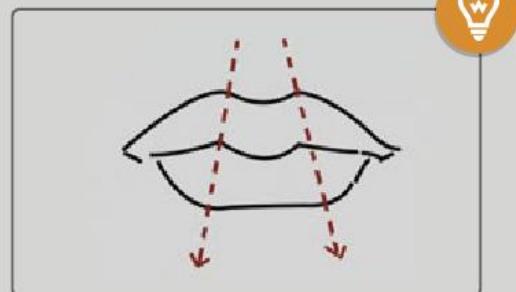
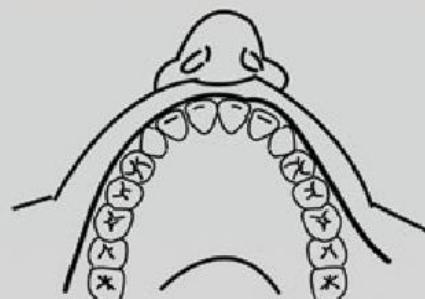
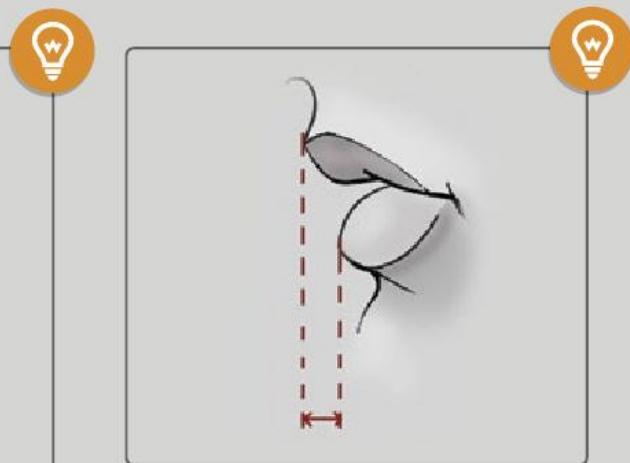
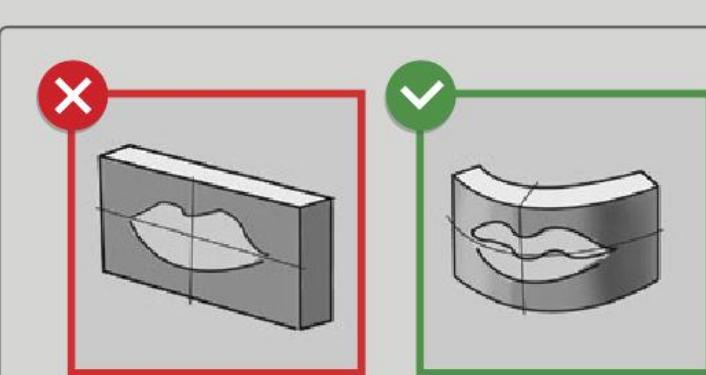
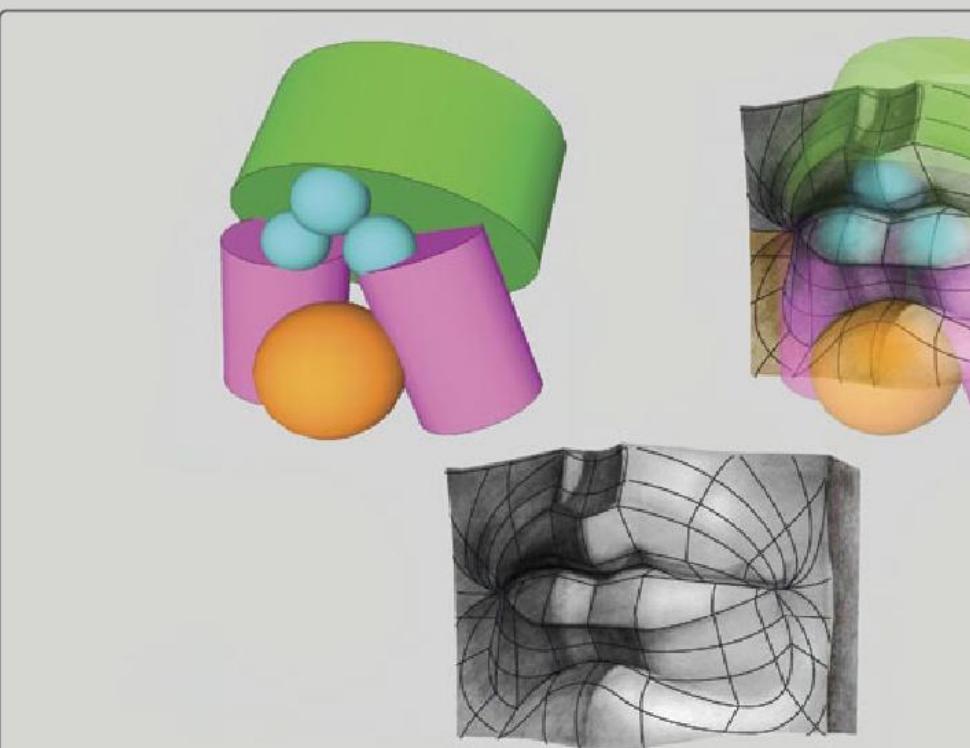


IT IS THE PRIMARY CHEWING MUSCLE AND PULLS THE JAWS CLOSED. ITS OUTER PORTION ORIGINATES FROM THE ZYGOMATIC ARCH AND INSERTS ON THE SURFACE OF THE RAMUS OF THE MANDIBLE.

PAROTID GLAND (SALIVARY GLAND) ALSO PLAYS IMPORTANT ROLE IN SHAPING THE JAWLINE AND FACE.

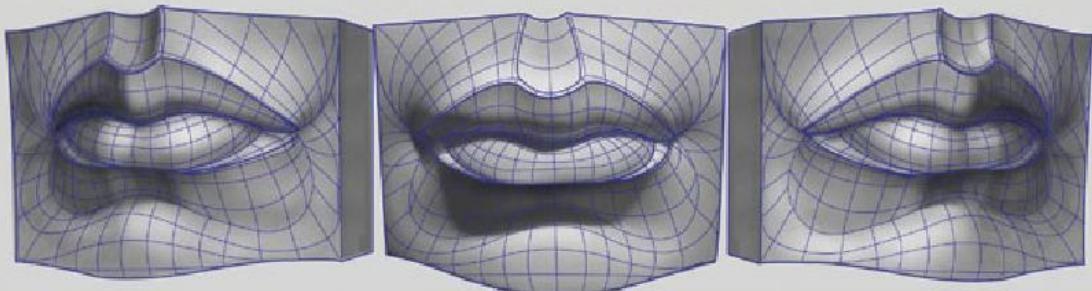


UNDERSTANDING MOUTH CURVATURE

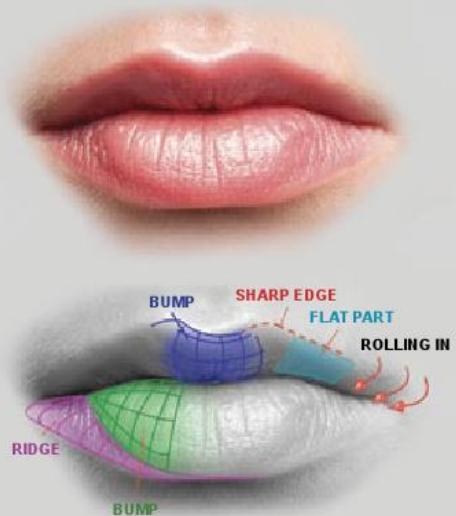


SHAPE OF STILL LIPS

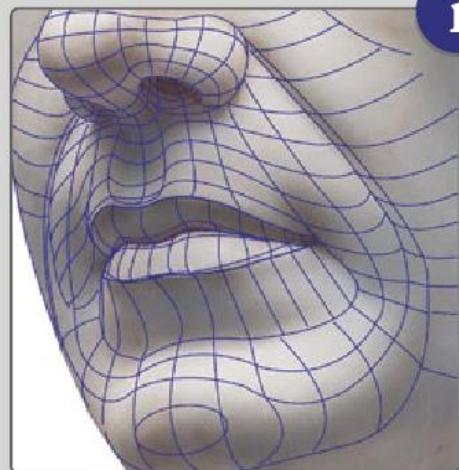
i



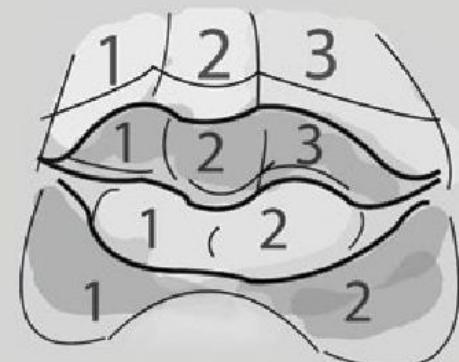
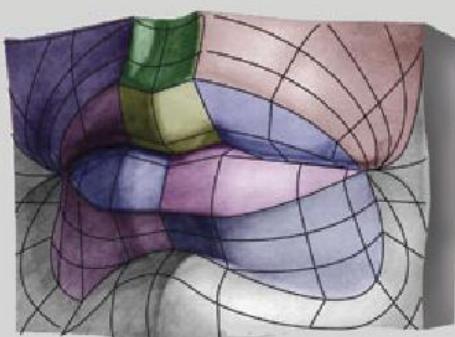
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i



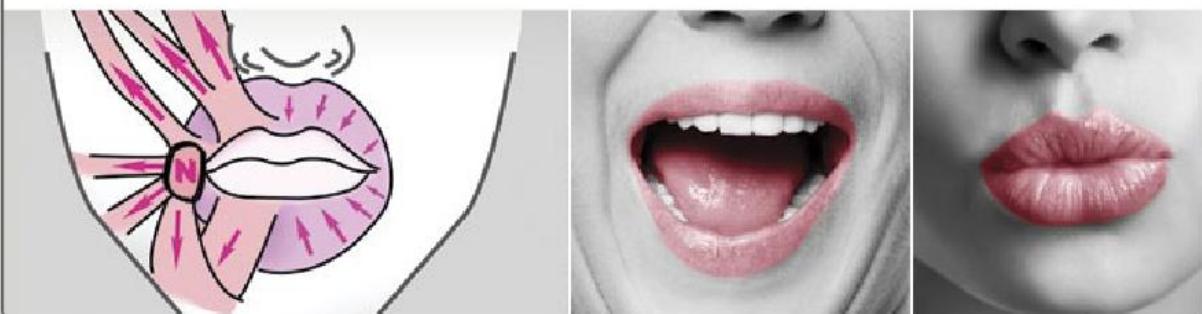
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MOUTH

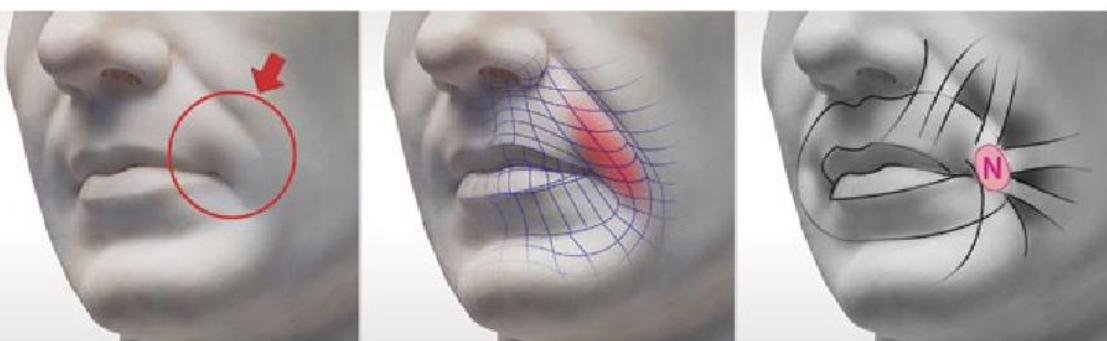
i

MOUTH EXPRESSIONS – IT'S ALL ABOUT PULLING AND SQUEEZING.



i

WHAT IS THIS BUMP?

**IT IS CALLED THE "NODE".**

IT IS THE POINT WHERE SEVERAL FACIAL MUSCLES CONNECT TO THE CORNER OF THE MOUTH.



WHEN YOU SCULPT EXPRESSIONS, REMEMBER BONY LANDMARKS! BY PULLING IN DIFFERENT DIRECTIONS, THESE MUSCLES CREATE THE EXPRESSIONS, WHILE SKULL REMAINS THE SAME.



MOUTH EXPRESSIONS



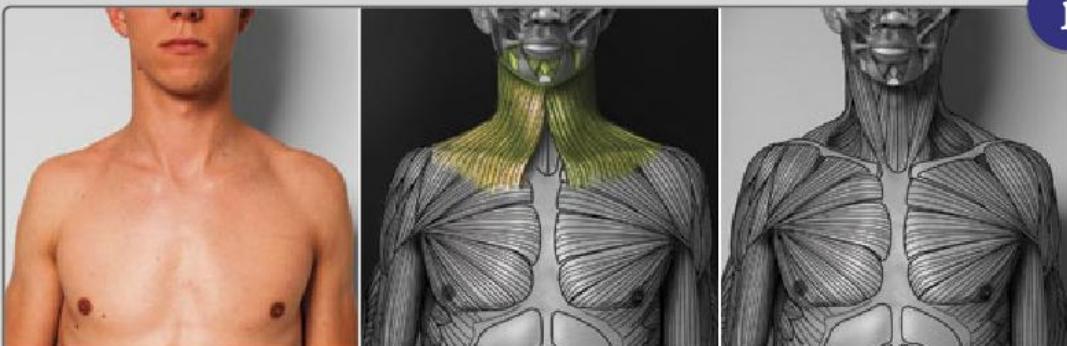
MORE MOUTH EXPRESSIONS



EVEN MORE MOUTH EXPRESSIONS



PLATYSMA MUSCLE



i

THE PLATYSMA IS A BROAD, THIN LAYER OF MUSCLE THAT IS SITUATED ON EACH SIDE OF THE NECK IMMEDIATELY UNDER THE SUPERFICIAL FASCIA.



i

THE PLATYSMA BELONGS TO THE GROUP OF FACIAL MUSCLES AND DRAWS THE CORNERS OF THE LOWER LIP AND MOUTH TO THE SIDES AND DOWNWARD. WHEN FLEXED FORCEFULLY, IT EXPANDS THE NECK AND DRAWS ITS SKIN UPWARD.



!

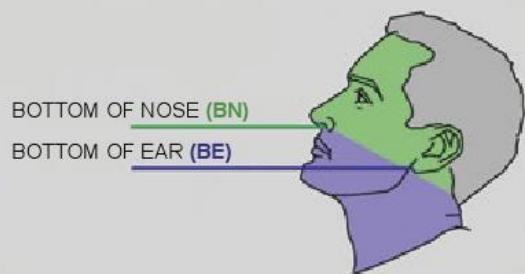
WEAKNESS OF THIS MUSCLE IS OFTEN THE MAJOR FACTOR IN CAUSING SAGGING UNDER THE CHIN IN OLDER PEOPLE (THIS IS NOT DUE TO AGING SKIN OR FROM FAT ACCUMULATION).

STERNOCLIDEOMASTOID MUSCLE IN ACTION

i

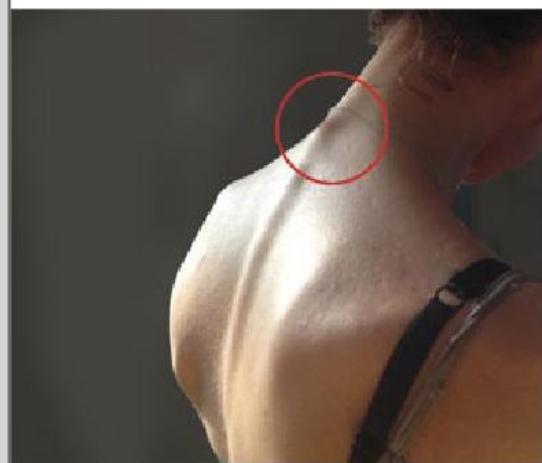


HEAD UP (BN) ABOVE (BE)

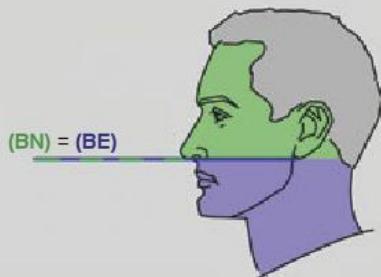
7TH CERVICAL VERTEBRAL BONE
(WHERE THE NECK MEETS THE SHOULDERS).

WHEN HEAD IS BENT FORWARD, YOU CAN SEE PROMINENT VERTEBRA AT THE TOP OF THE SPINE PROTRUDING OUTWARD SLIGHTLY.

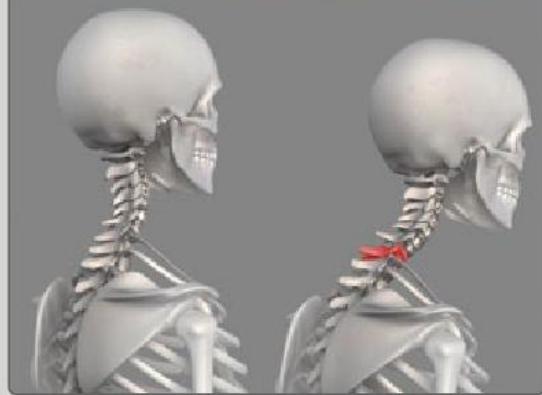
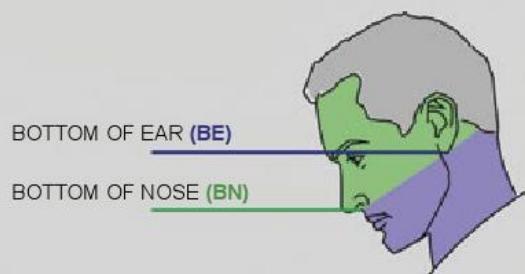
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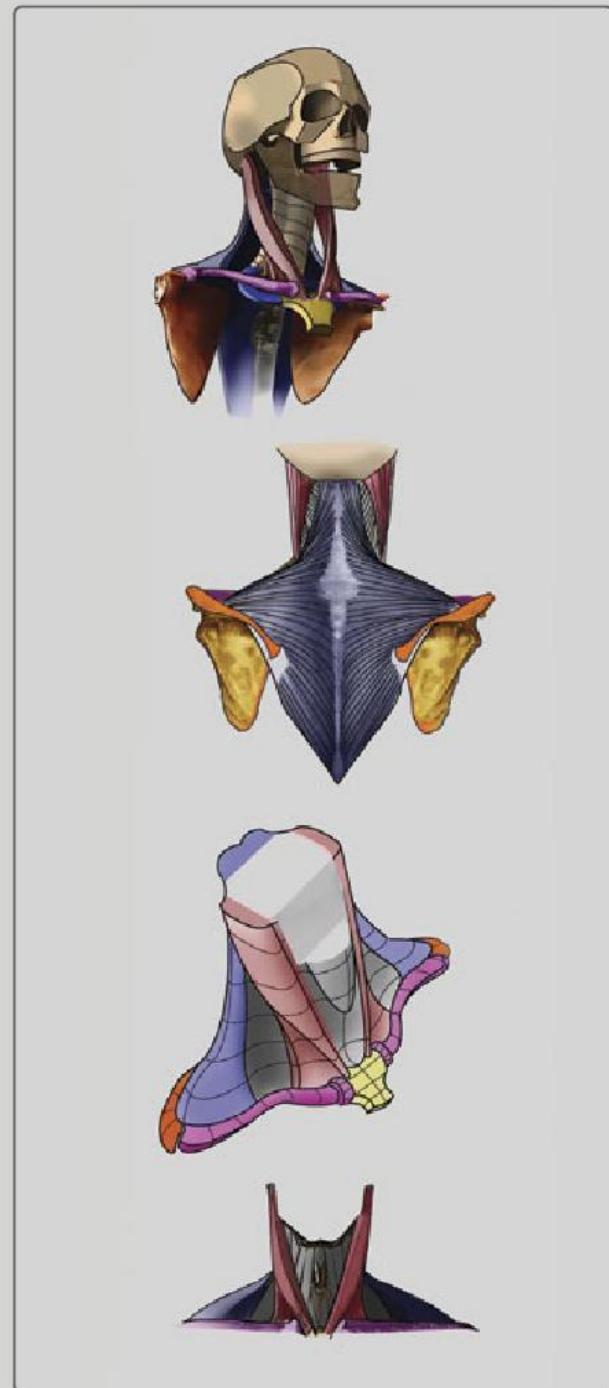
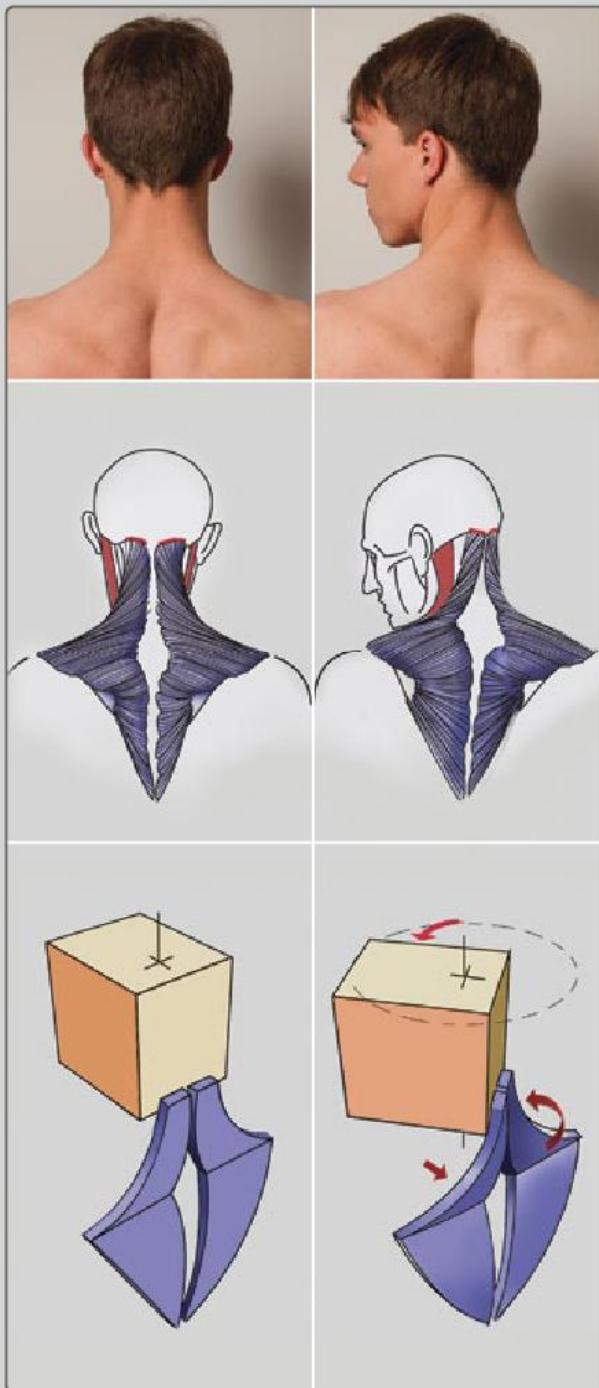
HEAD STRAIGHT (BN) LINED UP WITH (BE)



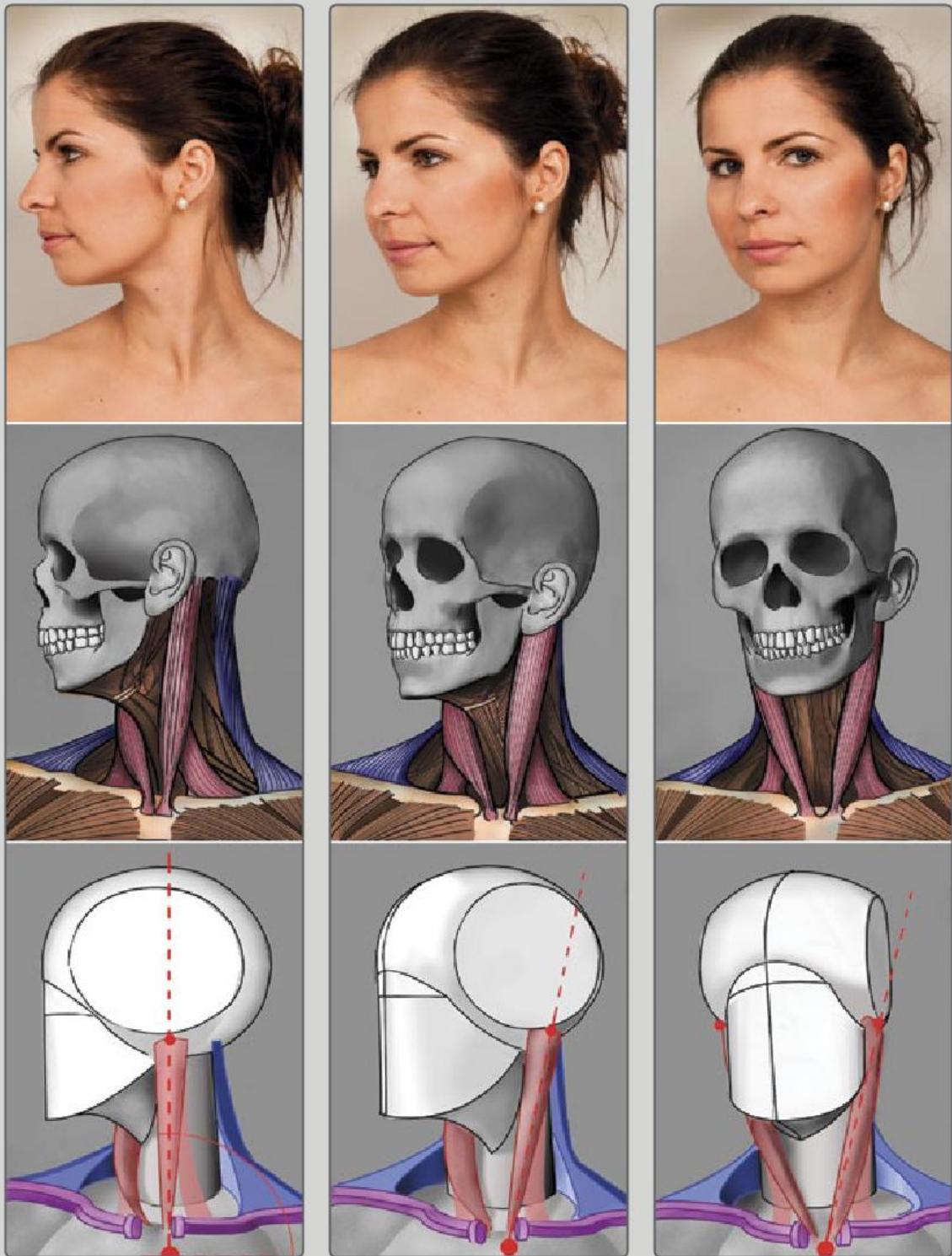
HEAD DOWN (BE) ABOVE (BN)



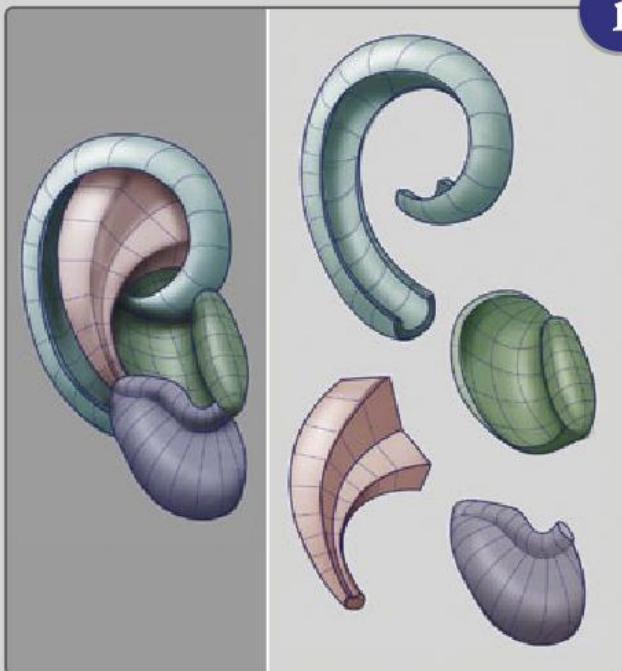
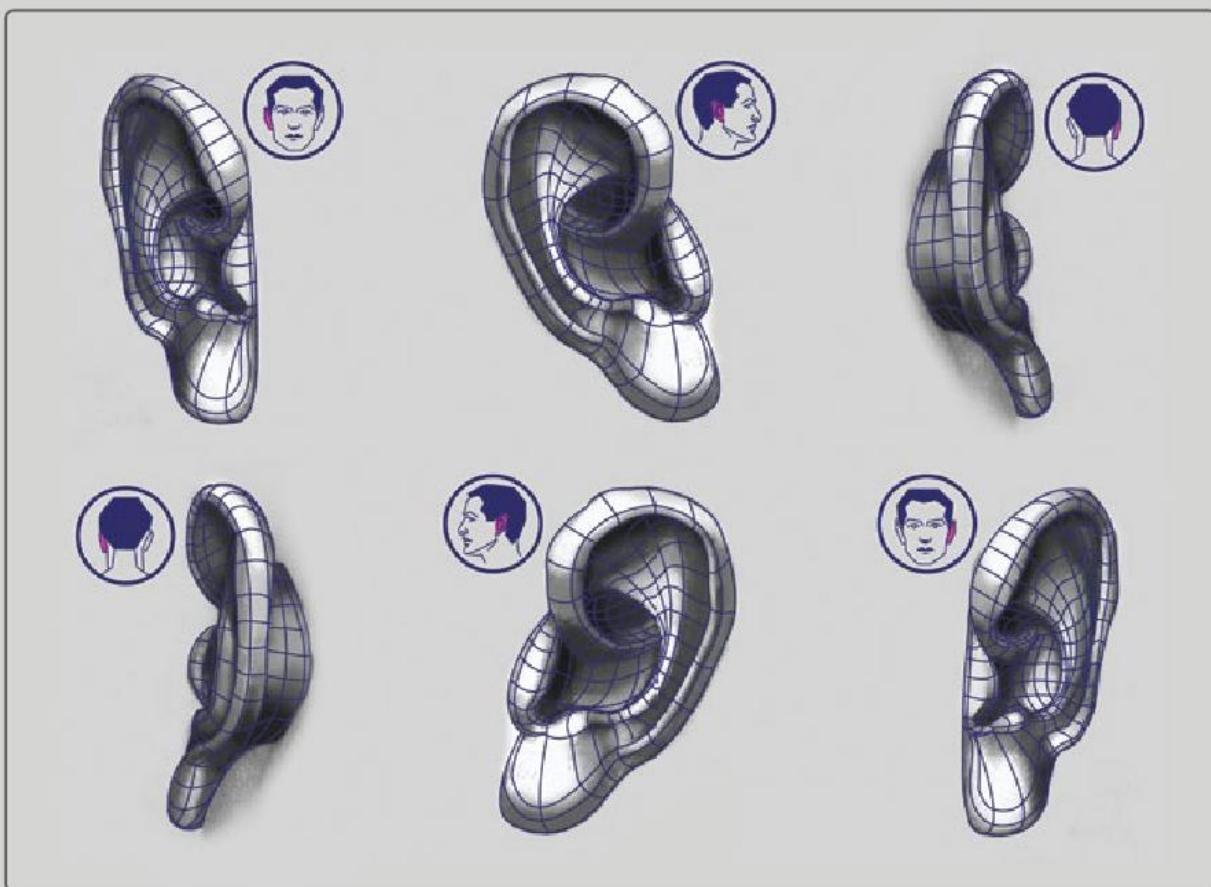
TRAPEZIUS MUSCLE, STERNOCLÉIDOMASTOID MUSCLE



MAJOR NECK MUSCLES (TRAPEZIUS AND STERNOCLIDEOMASTOID)

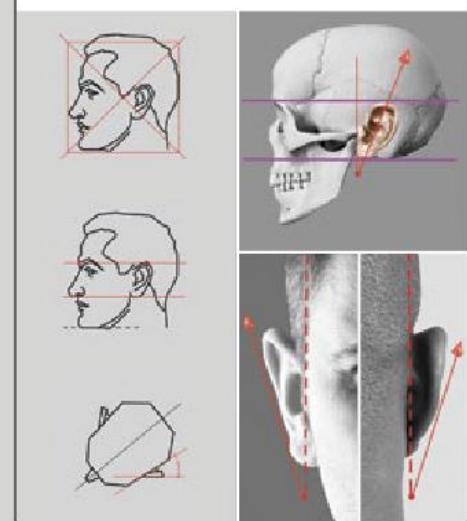


EAR



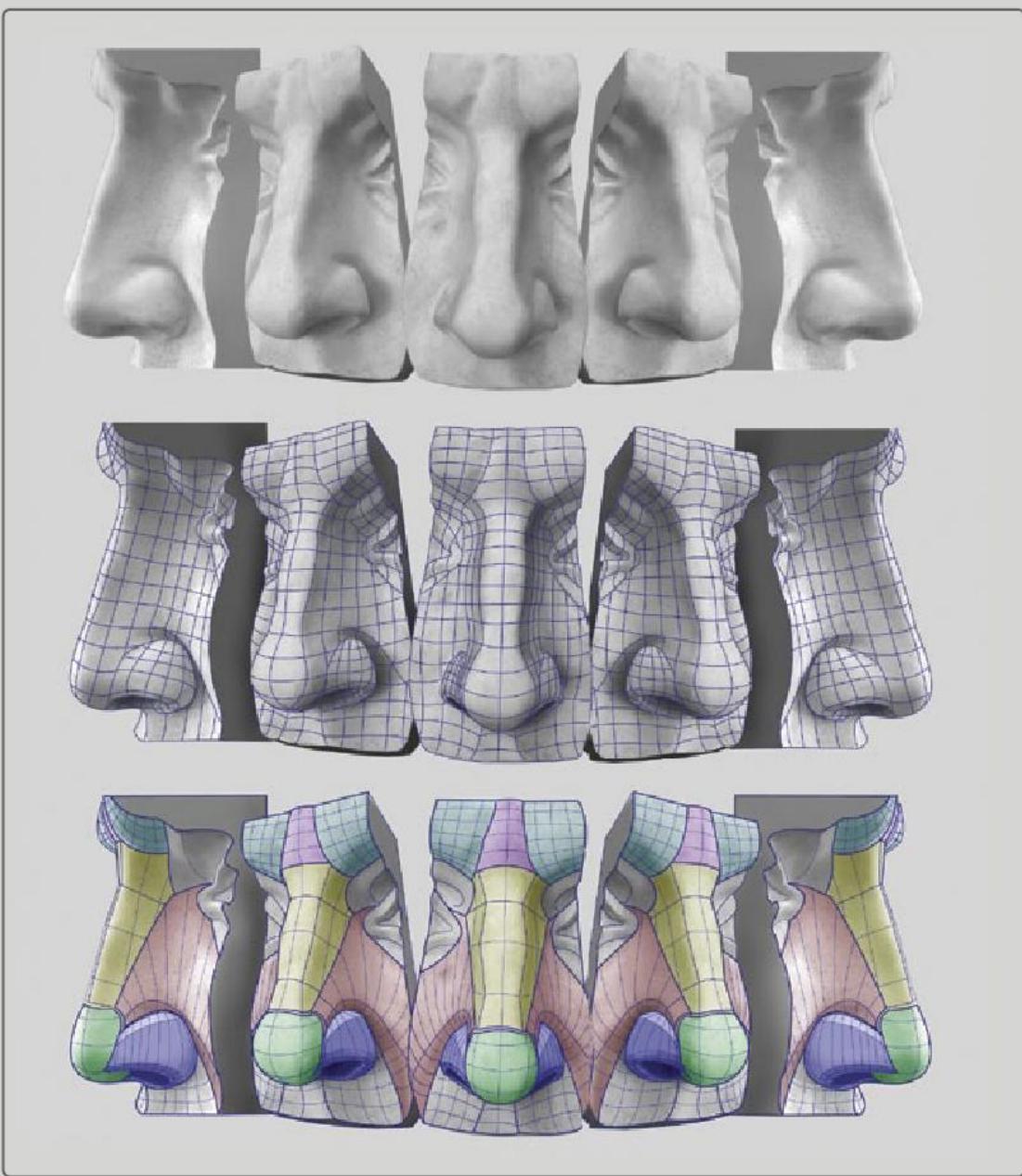
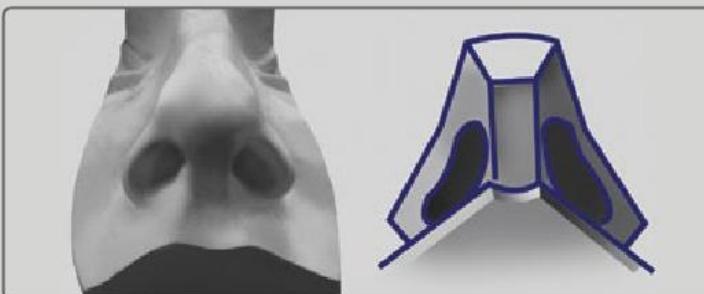
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LOCATION & ORIENTATION

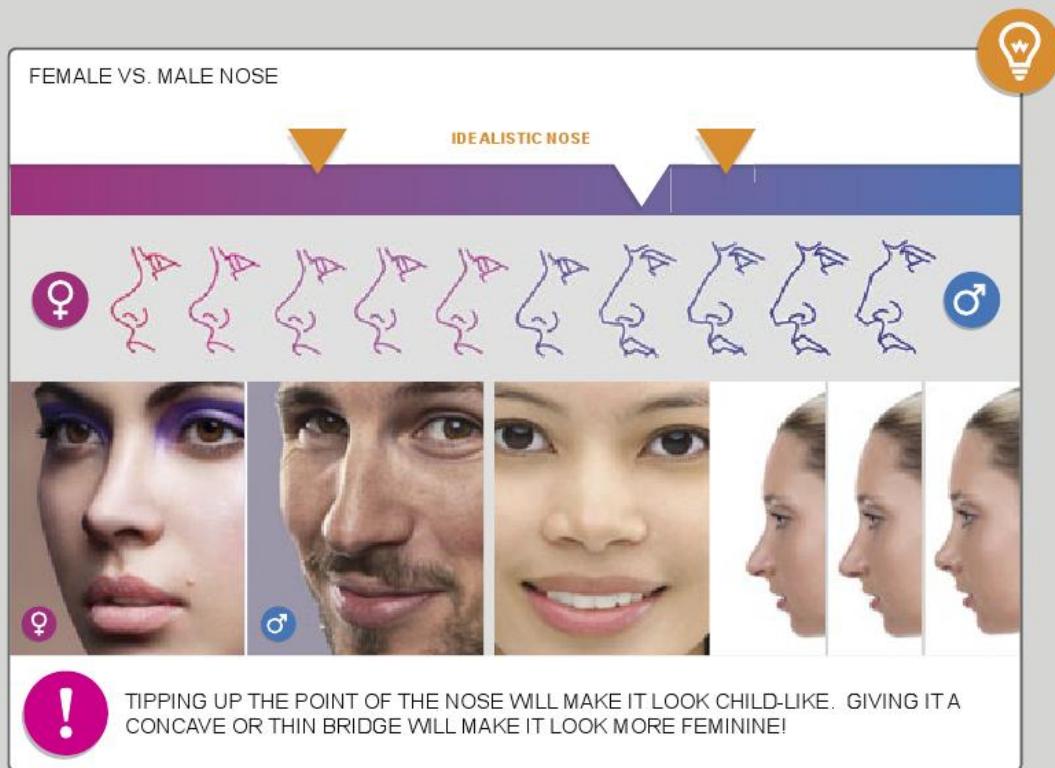
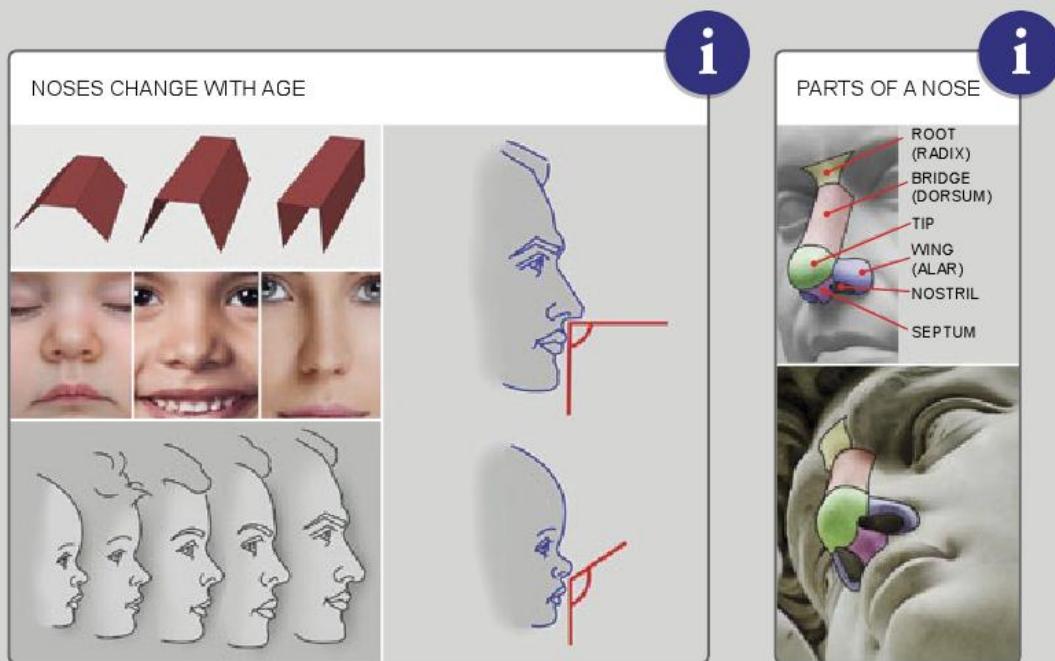


i

CLASSICAL NOSE



ALL ABOUT NOSES



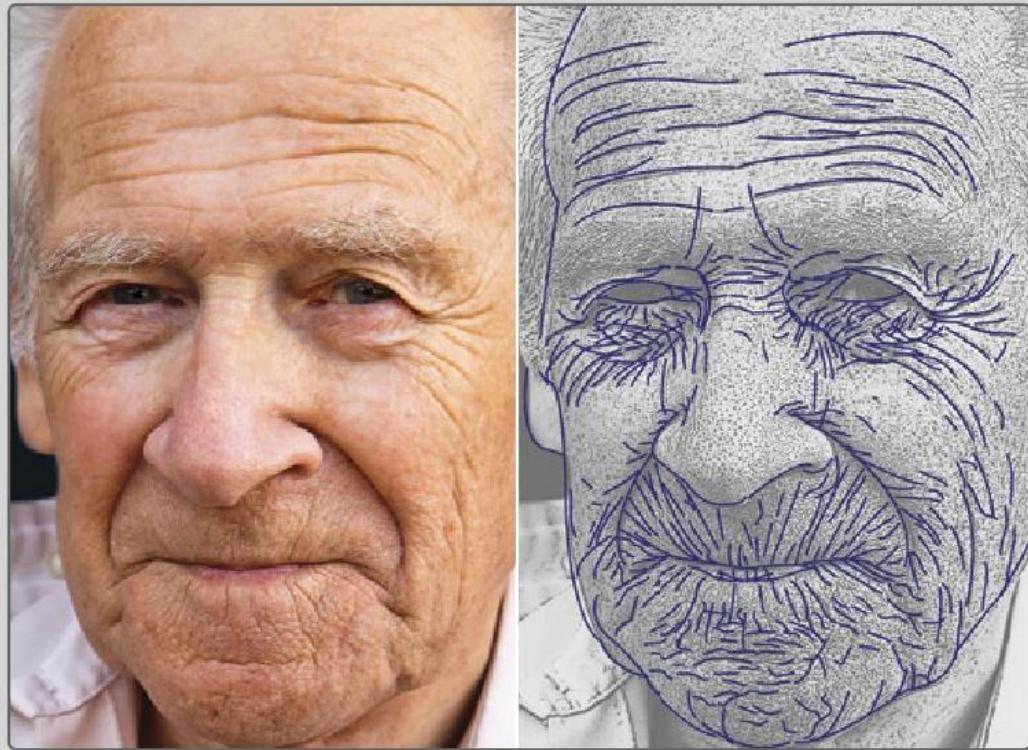
FUNCTIONS OF FACIAL MUSCLES



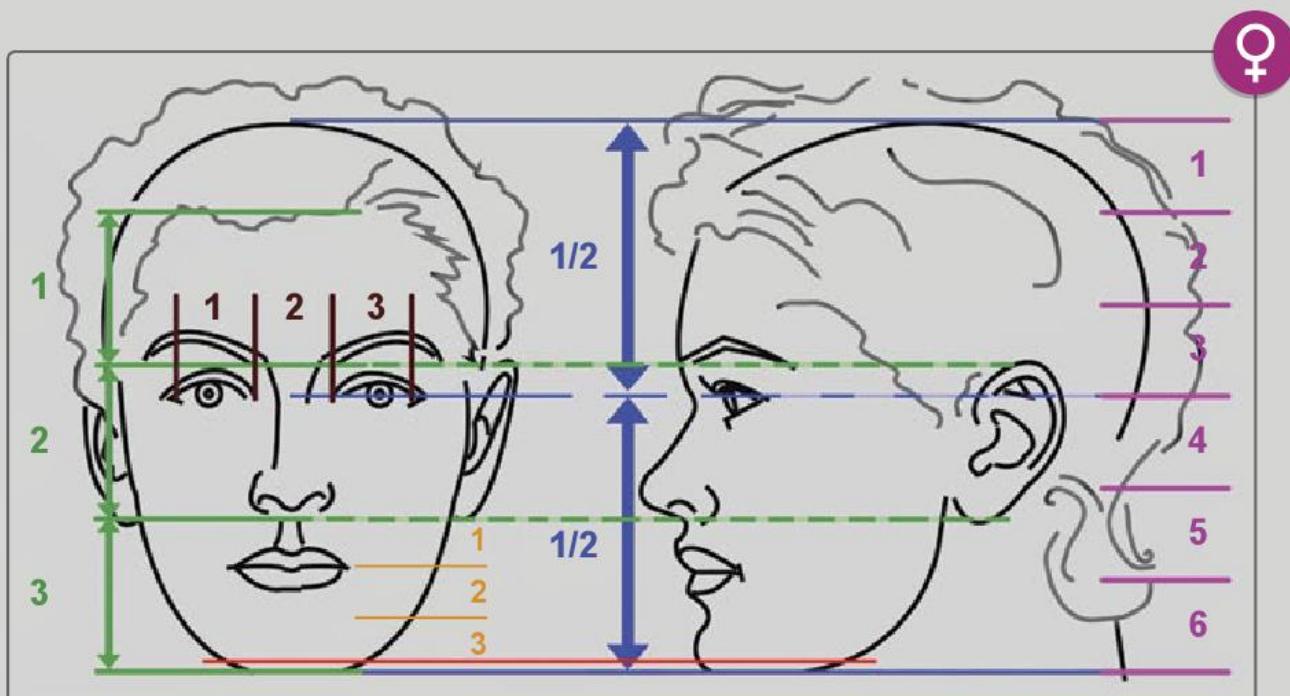
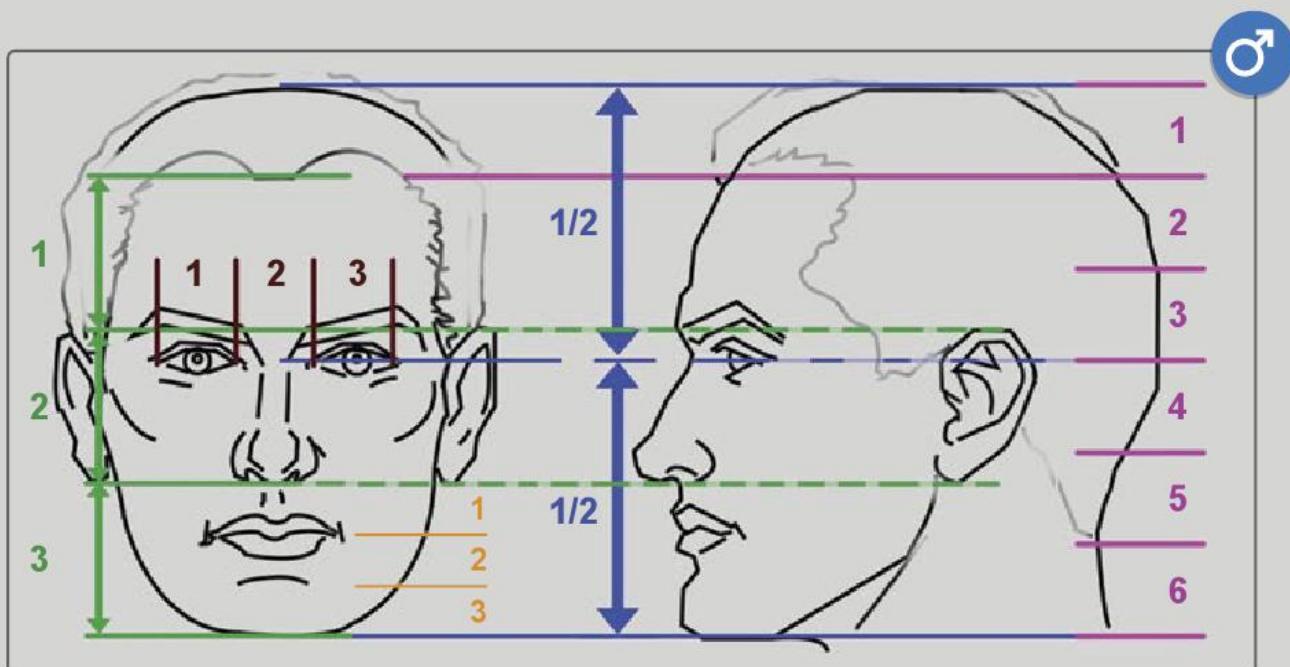
DYNAMIC WRINKLES



AGING WRINKLES

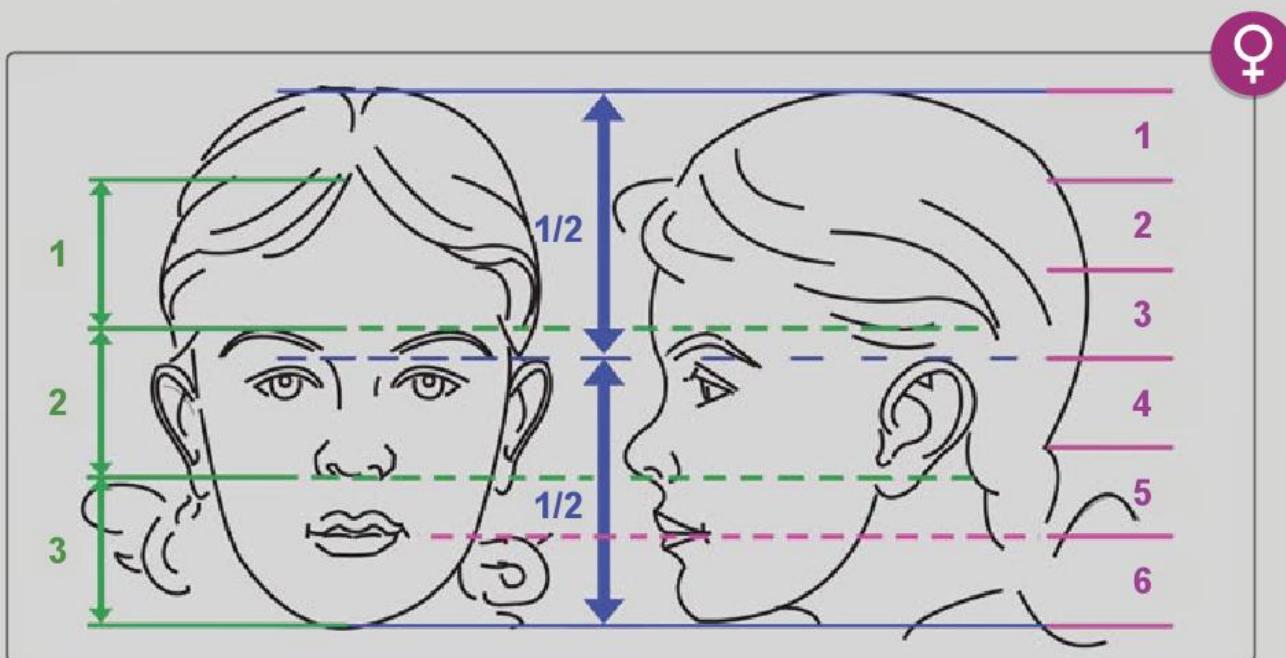
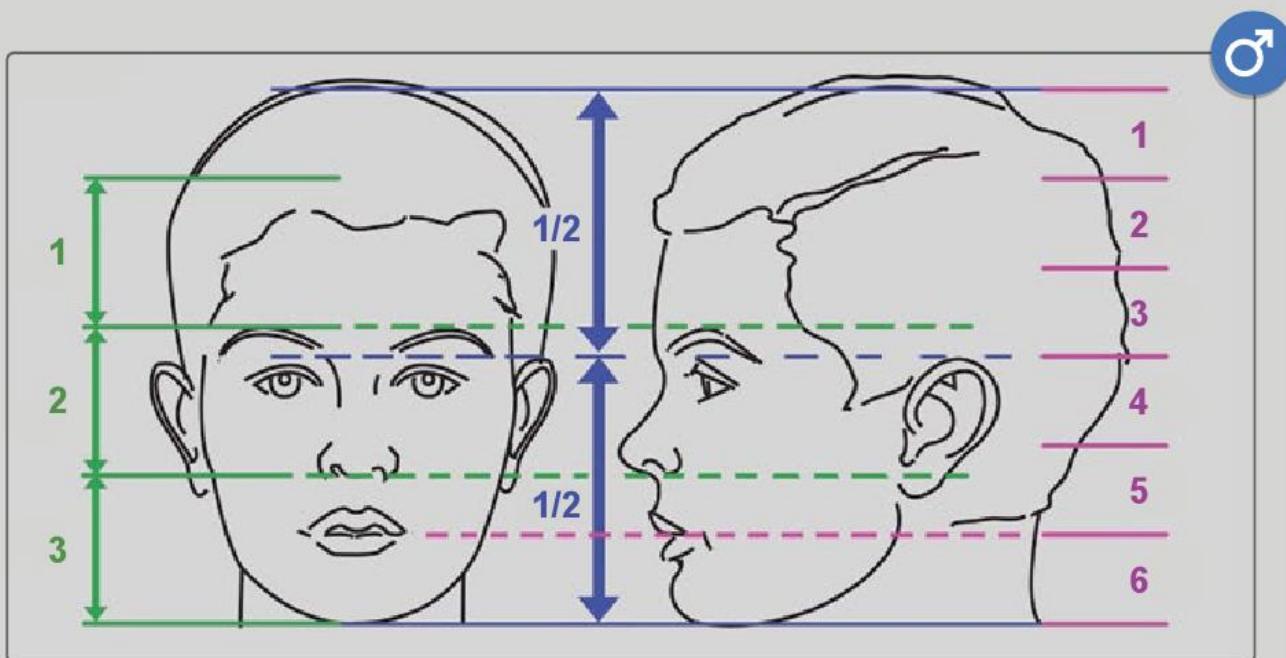


IDEALIZED PROPORTIONS OF ADULT HEADS

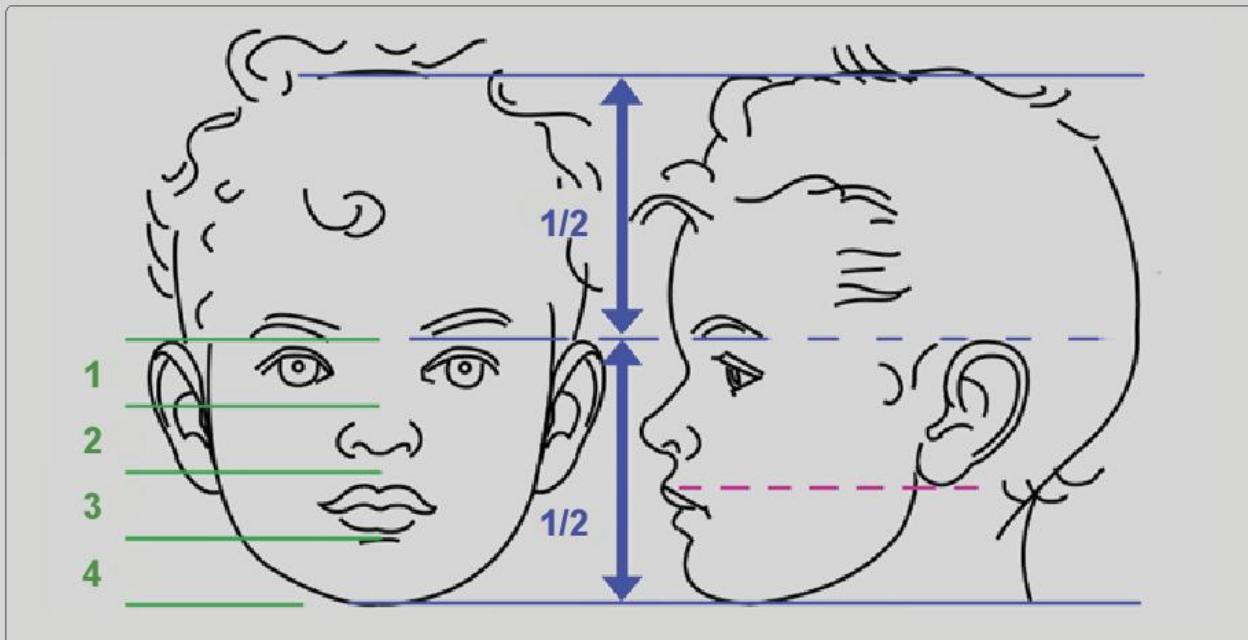
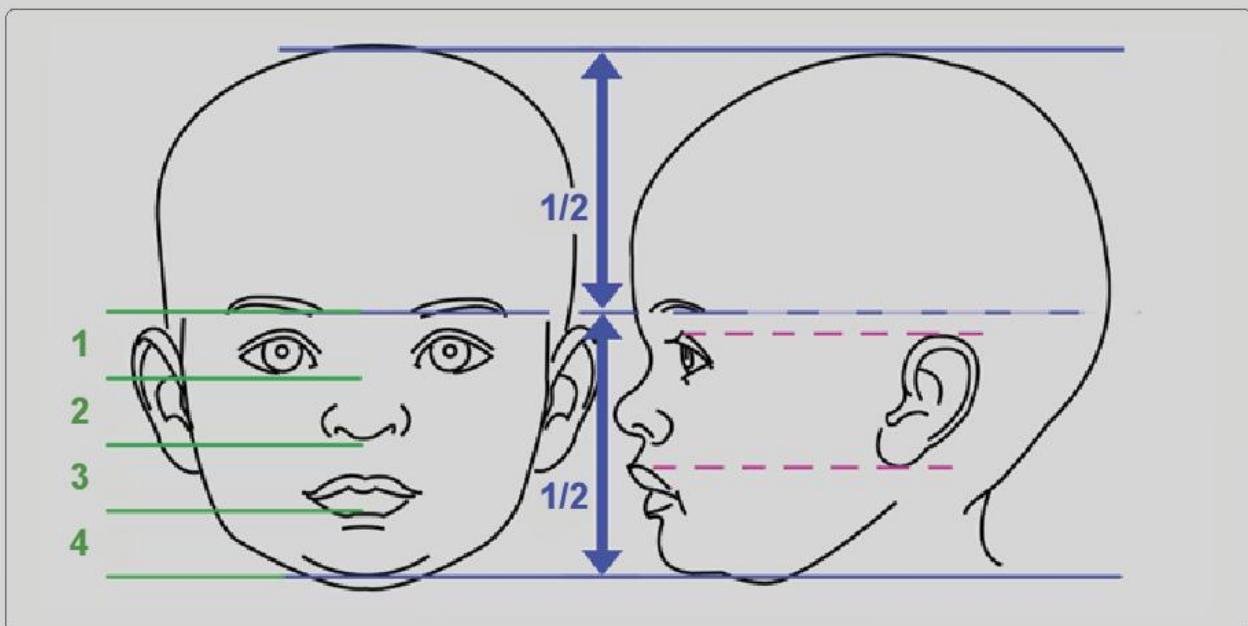


FEMALES HAVE A SLIGHTLY THINNER CHIN AND JAW.

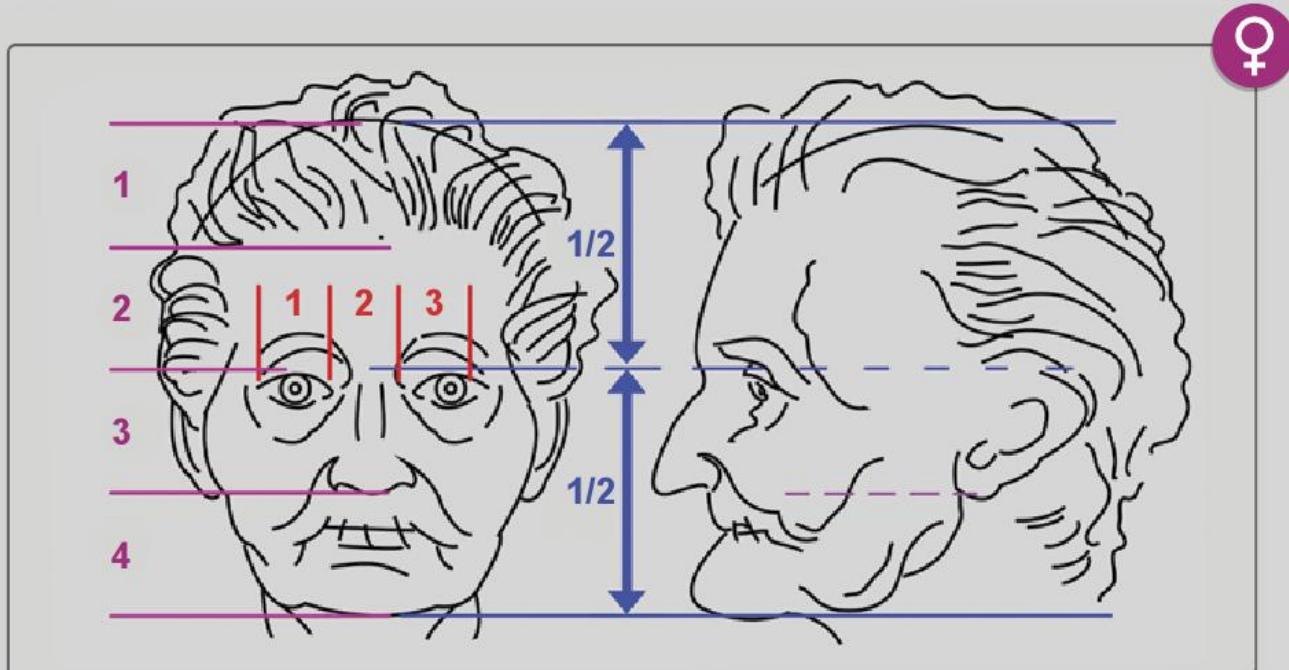
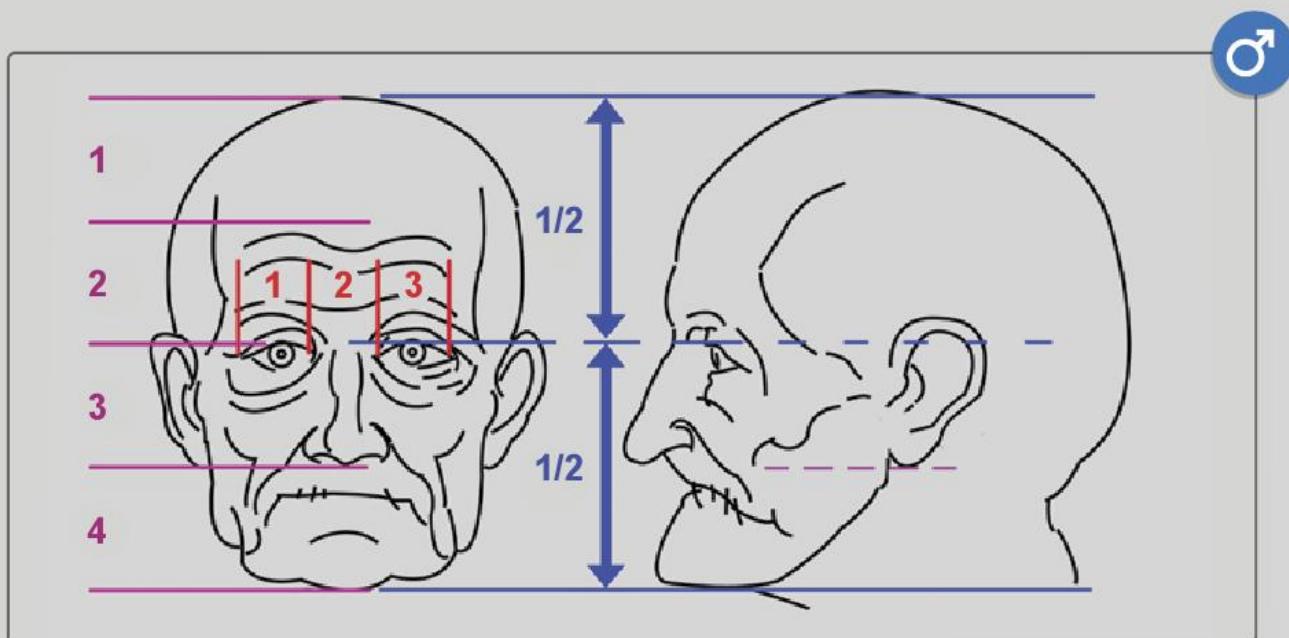
PROPORTIONS OF CHILDREN'S HEADS



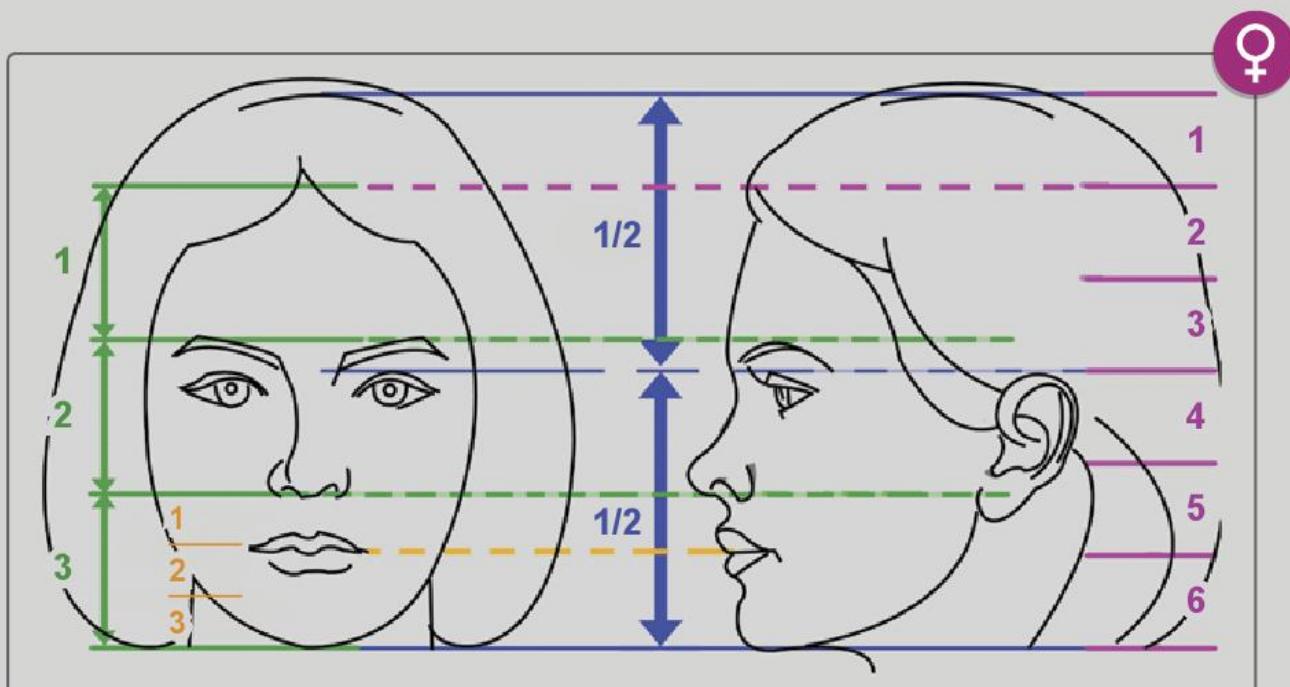
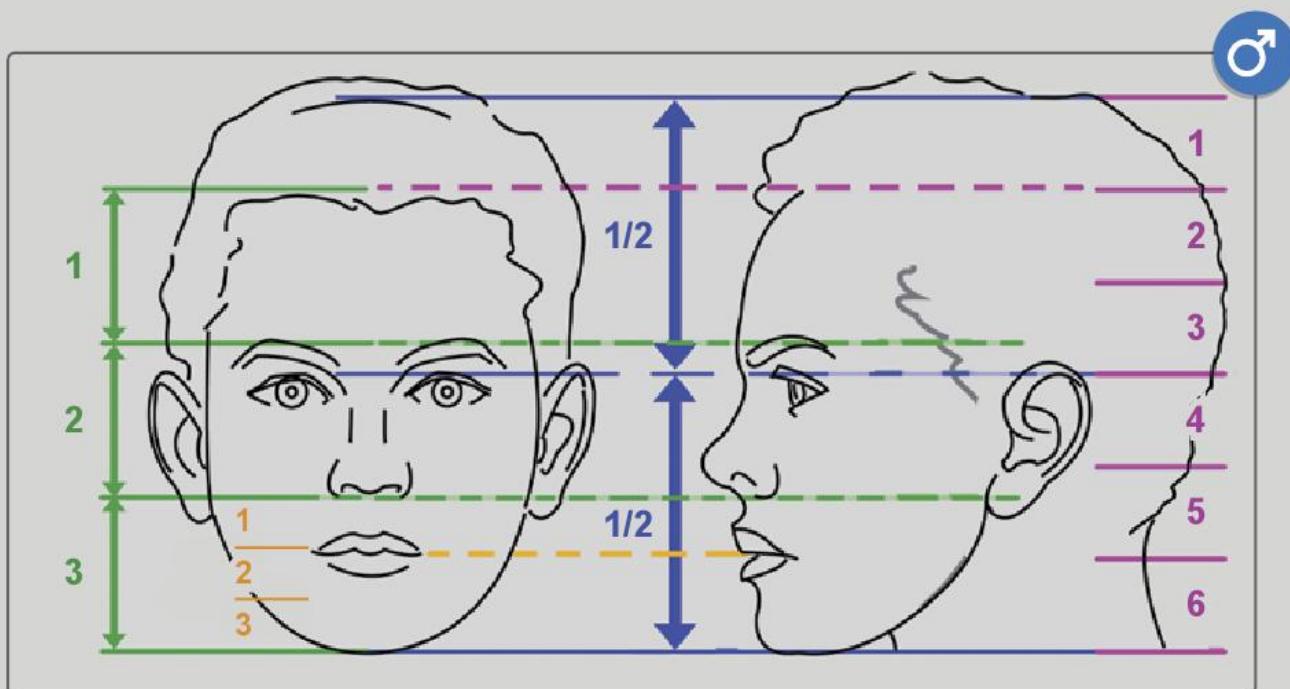
PROPORTIONS OF BABY AND TODDLER HEADS



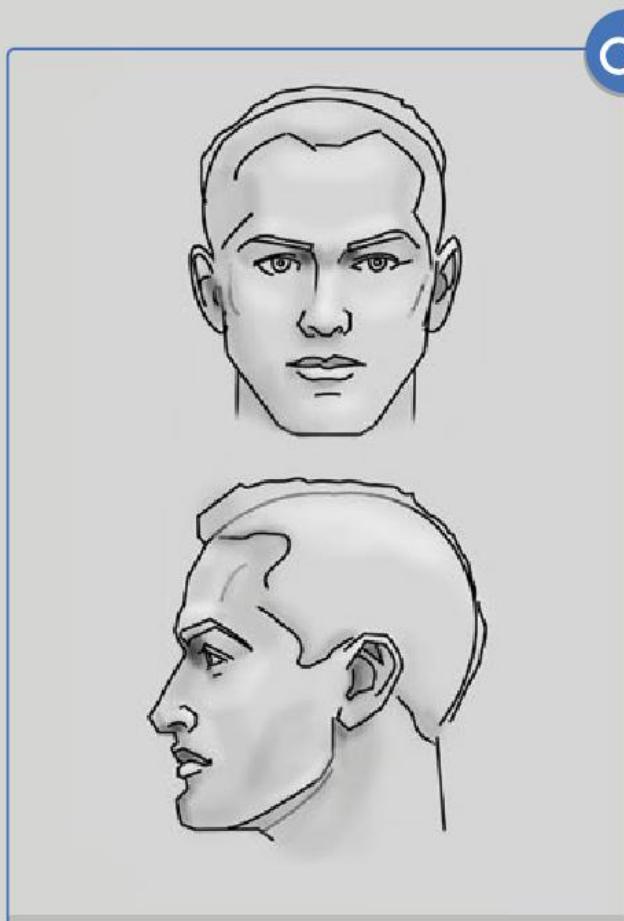
PROPORTIONS OF ELDERLY HEADS



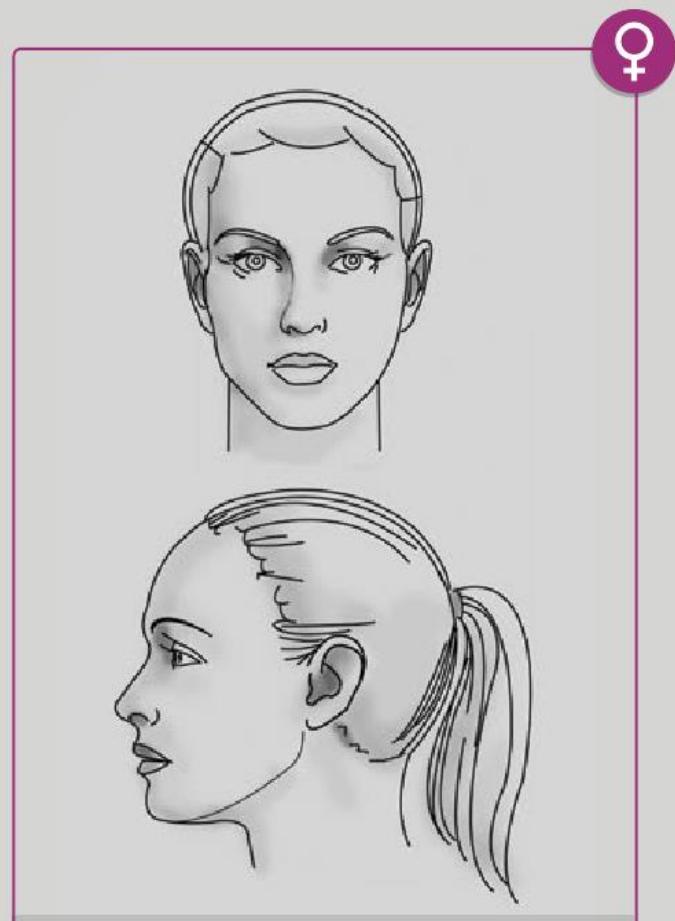
PROPORTIONS OF TEEN HEADS



GENDER DIFFERENCES BETWEEN IDEALIZED ADULT HEADS



- **DISTINCT PROTRUDING BROW RIDGES**
- **NOSE ROOT** IS USUALLY EXPRESSED CLEARLY AND CAN BE QUITE DEEP
- **PLANE OF FOREHEAD** HAS A SMALL SLOPE TOWARDS THE REAR, CONTOUR OF FOREHEAD IS NOT STRAIGHT BUT SOMEWHAT WAVY
- **CHEEKBONES** EXPRESSED CLEARLY
- **BUSHY EYEBROWS** STAND OUT, AS A RULE ARE LESS ARCHED SHAPE AND SIT LOWER OVER EYES
- **UPPER EYELID** IS NOT PARTICULARLY DISTINGUISHED AND IS LOCATED CLOSE TO EDGE OF THE INFRAORBITAL FORAMEN
- **LONGER NOSE** COMPARED TO A FEMALE
- **UNDERLYING THE NOSE** IS A CLEARLY VISIBLE BONE-SKELETAL STRUCTURE, IT IS USUALLY LARGE. FORM IS ALMOST STRAIGHT OR SLIGHTLY CONVEX.
- **NOSE** IS THICK AND BROAD
- **BASE OF NOSE** LIES ON A HORIZONTAL PLANE
- **TIFF OF NOSE** IS LARGE AND ROUNDED
- **FOLD CONTOUR OF UPPER LIP** IS SLIGHTLY CONVEX
- **CAUCASIAN MALE LIPS** ARE NOT AS FULL AND PUFFY AS A FEMALE'S
- **PROTRUDING CHEEKBONES**
- **CHIN** IS MASSIVE, CLEARLY DEFINED, OFTEN DIMPLED
- **LOWER JAW'S WIDEST CORNERS** ARE MARKED CLEARLY AND SOMEWHAT SHIFTED LATERALLY (DUE TO DEVELOPED CHEWING MUSCLES)



- **CLEARLY EXPRESSED EYEBROWS**
- **SMALLER NOSE ANGLE**
- **MORE VERTICAL, PROMINENT AND ROUNDER PLANE OF FOREHEAD**
- **PROTRUDING CHEEKBONES**
- **THIN EYEBROWS** WITH AN ARCHED FORM, USUALLY MUCH HIGHER THAN THE EYES OF MALES
- **LARGER UPPER EYELID**
- **DEEPENING OF ROOT OF THE NOSE** IS ALMOST UNNOTICEABLE
- **STRUCTURE OF NOSE** IS THIN AND USUALLY STRAIGHT OR SLIGHTLY CONCAVE
- **NOSE**, THIN WELL-DEFINED
- **BASE OF NOSE** ON PLANE, TILTED SOMEWHAT UPWARD
- **TIFF OF THE NOSE** CLEARLY EXPRESSED (DUE TO CARTILAGE STRUCTURE)
- **UPPER LIP** OFTEN HAS A SLIGHT INDENTATION CENTERED UNDER THE NOSE CALLED THE PHILTRUM
- **LIPS** ARE SMALL, OFTEN FULL AND POUTY
- **CHEEKS** ARE SMOOTH, AND SOMETIMES PUBESCENT, FLAT OR SLIGHTLY CONVEX
- **A SMALL CHIN** WITH A ROUND SHAPE
- **LOWER JAW** IS MARKEDLY DEFINED, WITH A ROUNDED ANGLE
- **IN RELATION TO THE SIZE OF HEAD AND SHOULDERS, WOMEN HAVE A LONG, SLENDER NECK**

EMOTION – EXCITEMENT



EMOTION – HAPPINESS



EMOTION – ANGER



EMOTION – SURPRISE



EMOTION – DISGUST



EMOTION – FEAR



EMOTION – INTEREST



EMOTION – WORRY



ETHNICITIES



BABY EMOTIONS

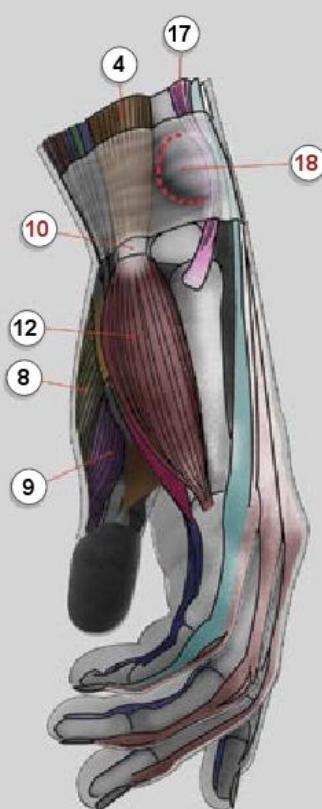
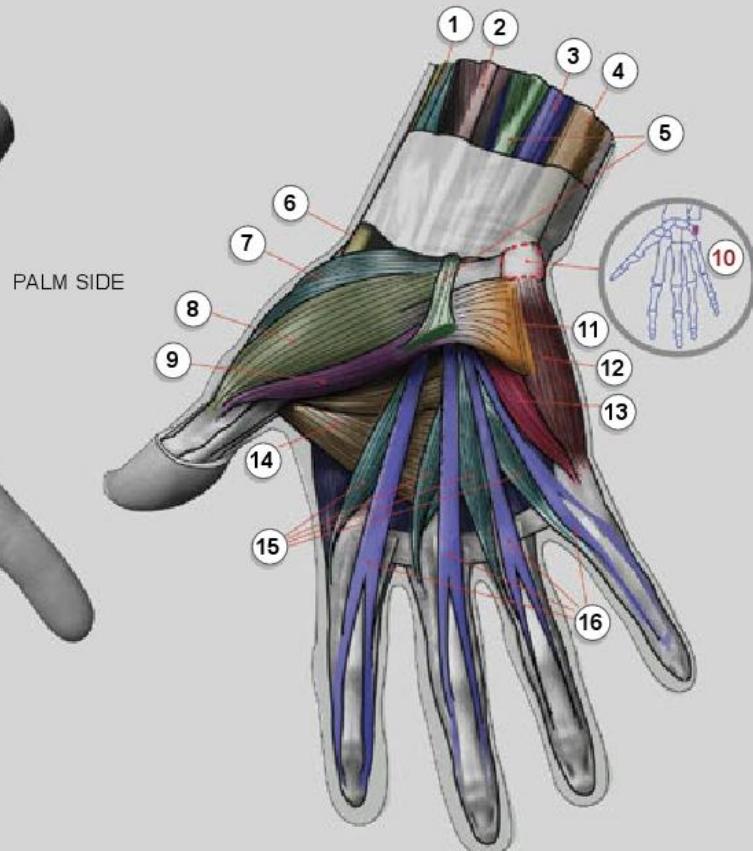


SENIOR EMOTIONS





HAND AND WRIST MUSCLES

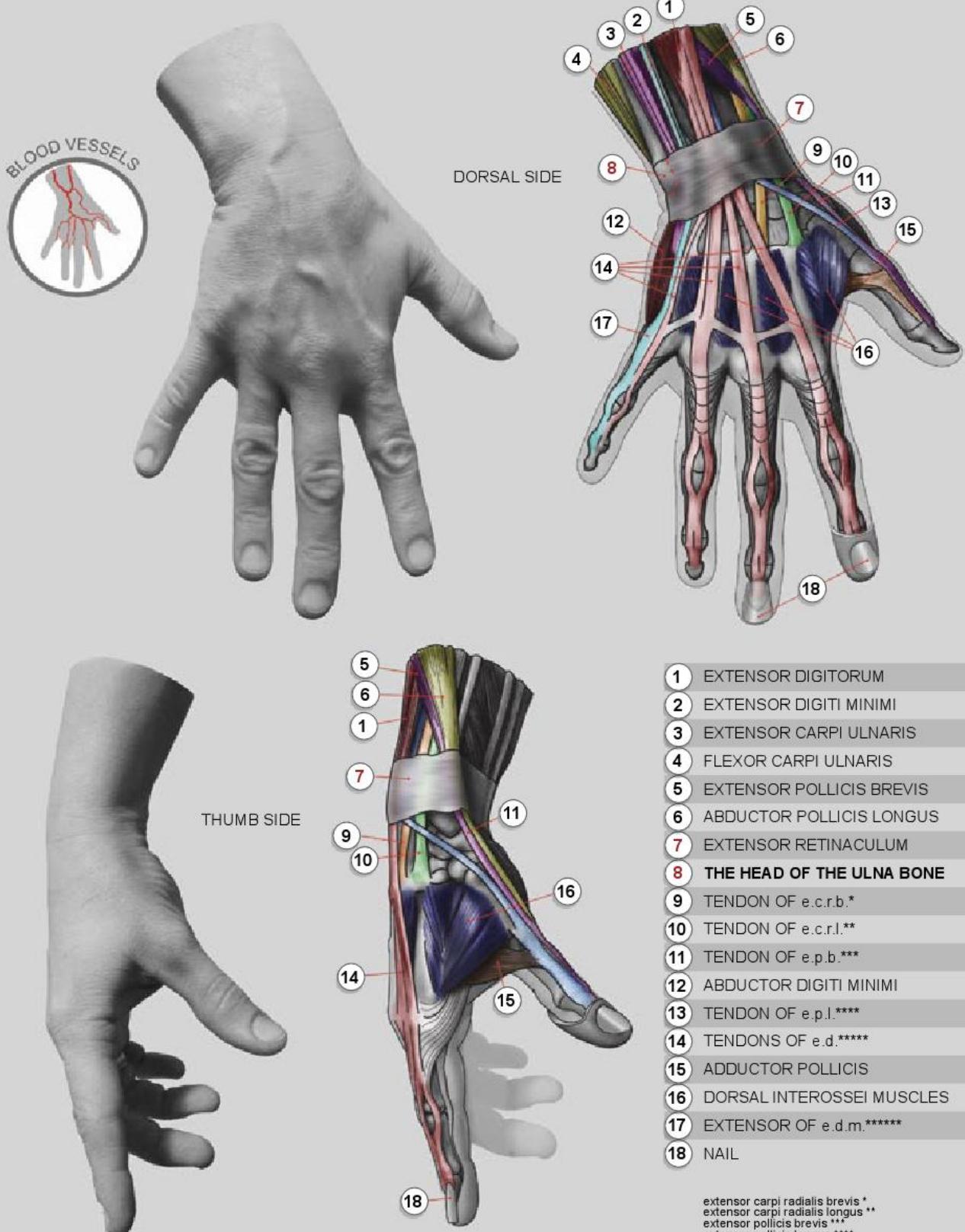


1	BRACHIORADIALIS
2	FLEXOR CARPI RADIALIS
3	f.d.s.*
4	FLEXOR CARPI ULNARIS
5	PALMARIS LONGUS
6	ABDUCTOR POLLICIS LONGUS
7	OPPONENTS POLLICIS
8	ABDUCTOR POLLICIS BREVIS
9	FLEXOR POLLICIS BREVIS
10	PISIFORM BONE
11	PALMARIS BREVIS
12	ABDUCTOR DIGITI MINIMI
13	FLEXOR DIGITI MINIMI BREVIS
14	ADDUCTOR POLLICIS
15	LUMBRICALS
16	TENDONS OF f.d.s.*
17	EXTENSOR CARPI ULNARIS
18	THE HEAD OF THE URNA

flexor digitorum superficialis *

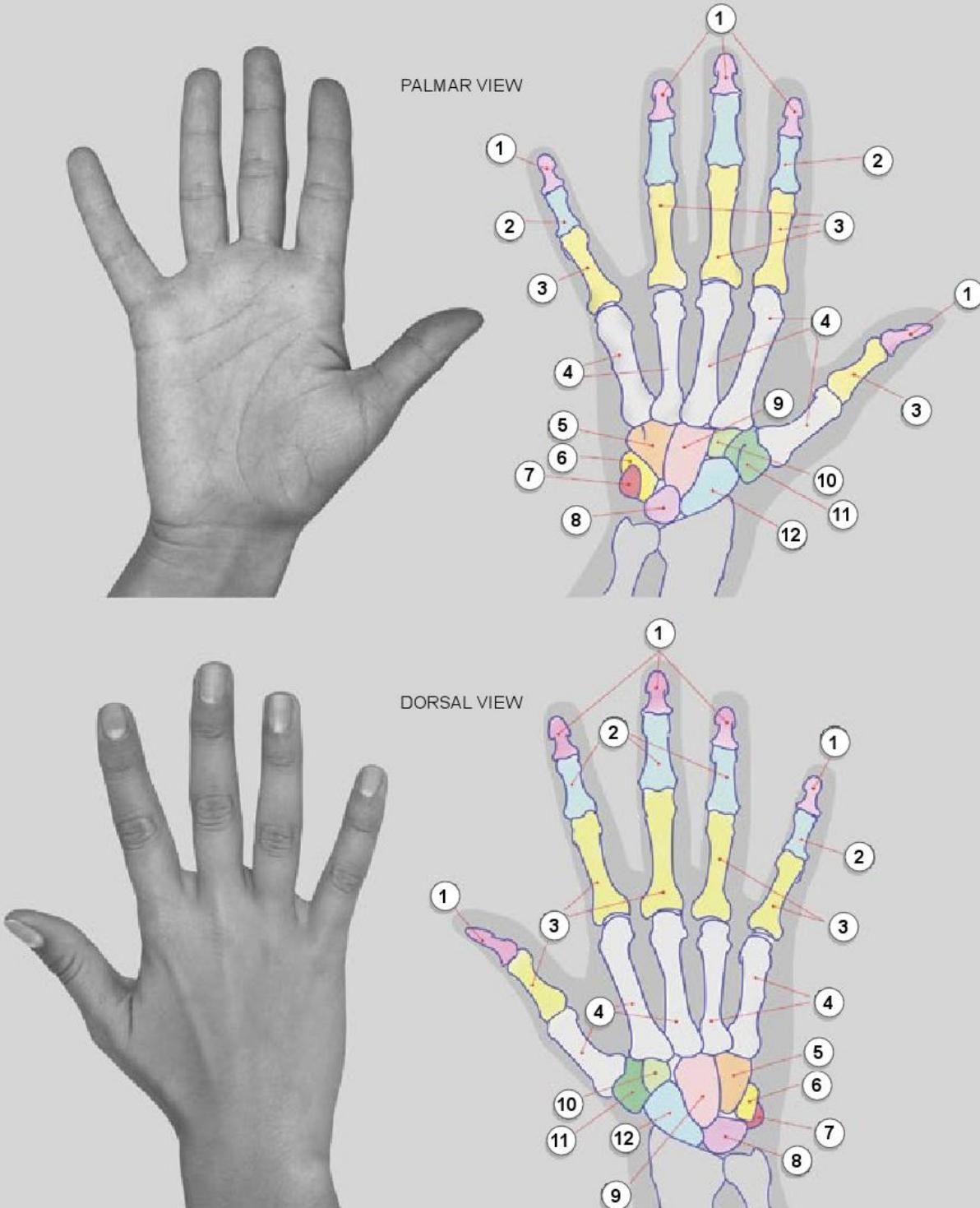
HAND AND WRIST MUSCLES

i



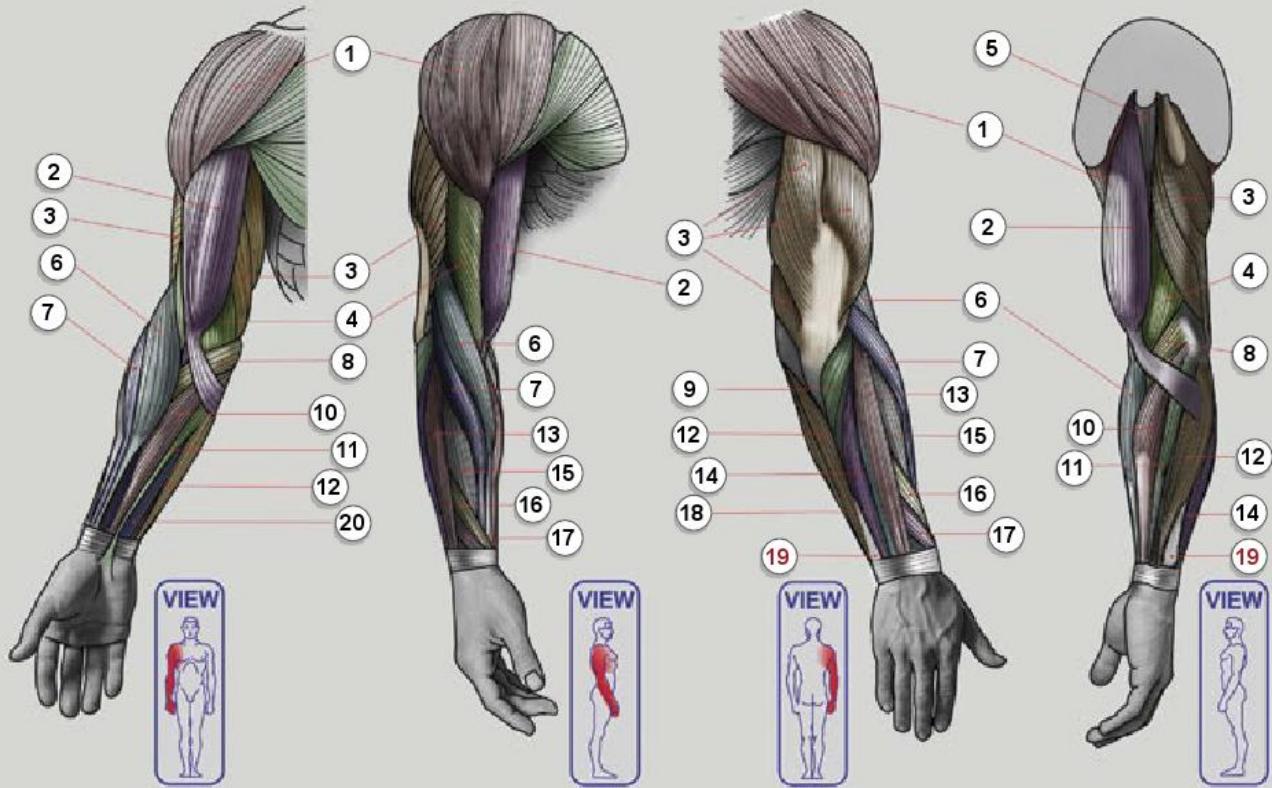
HAND AND WRIST BONES

i



1 DISTAL PHALANGES	4 METACARPALS	7 PISIFORM	10 TRAPEZOID
2 MIDDLE PHALANGES	5 HAMATE	8 LUNATE	11 TRAPEZIUM
3 PROXIMAL PHALANGES	6 TRIQUETRUM	9 CAPITATE	12 SCAPHOID

MAJOR MUSCLES OF UPPER LIMB

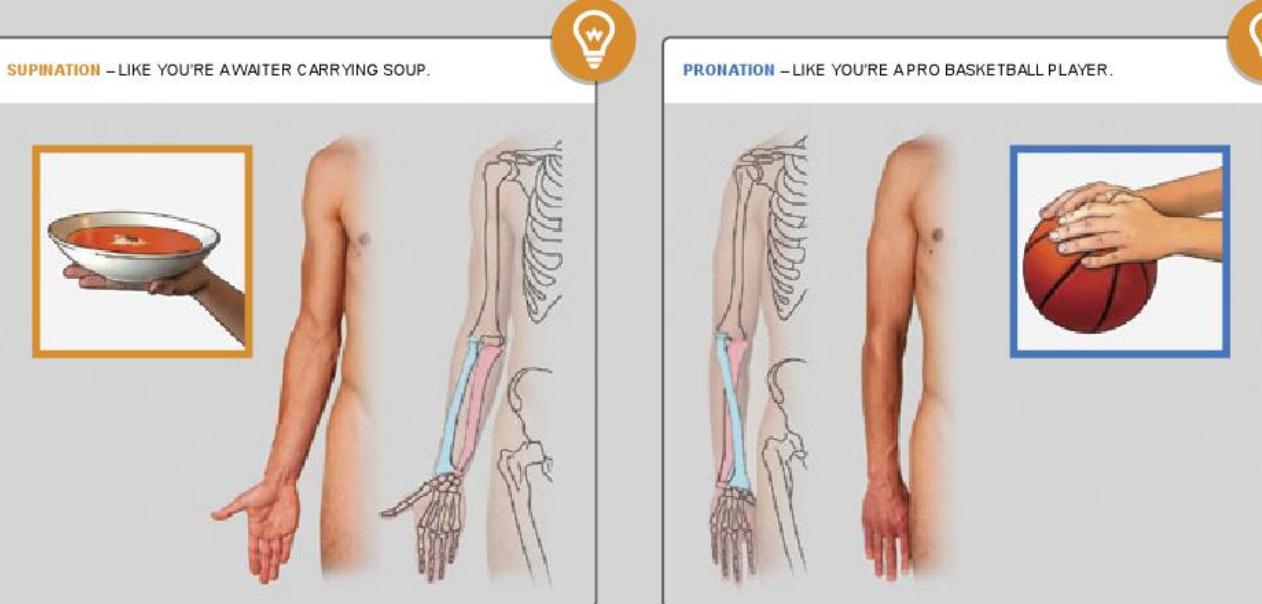


1 SHOULDER MUSCLE (deltoid)	11 PALMARIS LONGUS
2 BICEPS BRACHII	12 FLEXOR CARPI ULNARIS
3 TRICEPS BRACHII	13 EXTENSOR DIGITORUM
4 BRACHIALIS	14 EXTENSOR CARPI ULNARIS
5 CORACOBRACHIALIS	15 EXTENSOR CARPI RADIALIS BREVIS
6 BRACHIORADIALIS	16 ABDUCTOR POLLICIS LONGUS
7 EXTENSOR CARPI RADIALIS LONGUS	17 EXTENSOR POLLICIS BREVIS
8 PRONATOR TERES	18 EXTENSOR DIGITI MINIMI
9 ANconeus	19 THE HEAD OF URNA BONE
10 FLEXOR CARPI RADIALIS	20 FLEXOR DIGITORUM SUPERFICIALIS

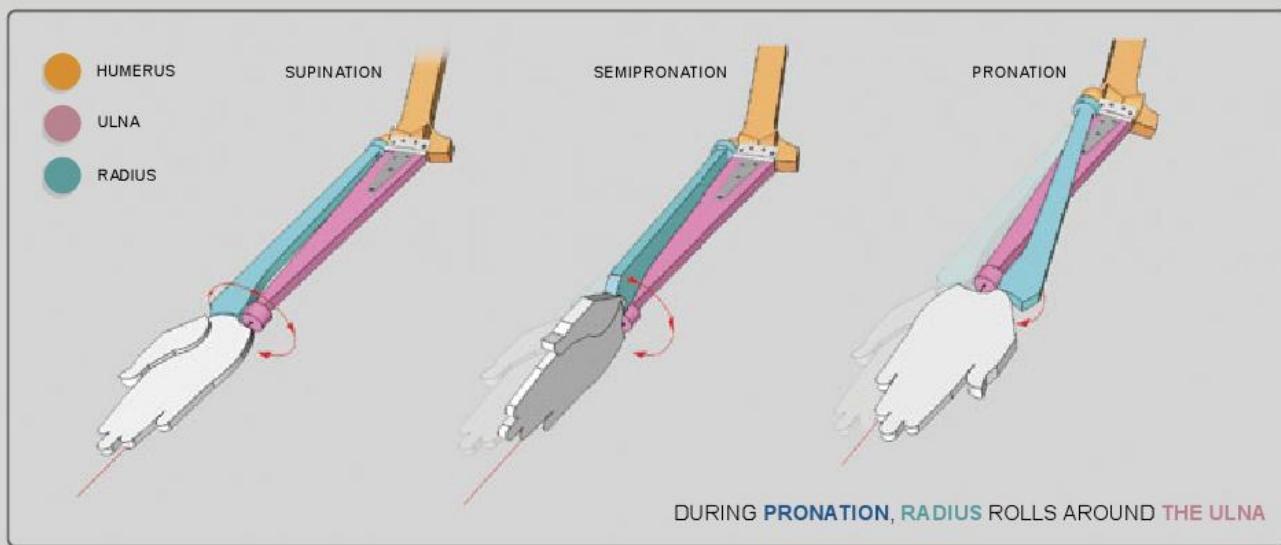
SUPINATION AND PRONATION

i

IN THE POSITION OF THE ARM CALLED **SUPINATION**, **THE RADIUS** AND **ULNA** ARE PARALLEL, THE PALM OF THE HAND FACES FORWARD OR UPWARD, AND THE THUMB IS AWAY FROM THE BODY. IN THE POSITION CALLED **PRONATION**, **THE RADIUS** AND **ULNA** ARE CROSSED, THE PALM FACES TO THE REAR OR DOWNWARD, AND THE THUMB IS TOWARD THE BODY.

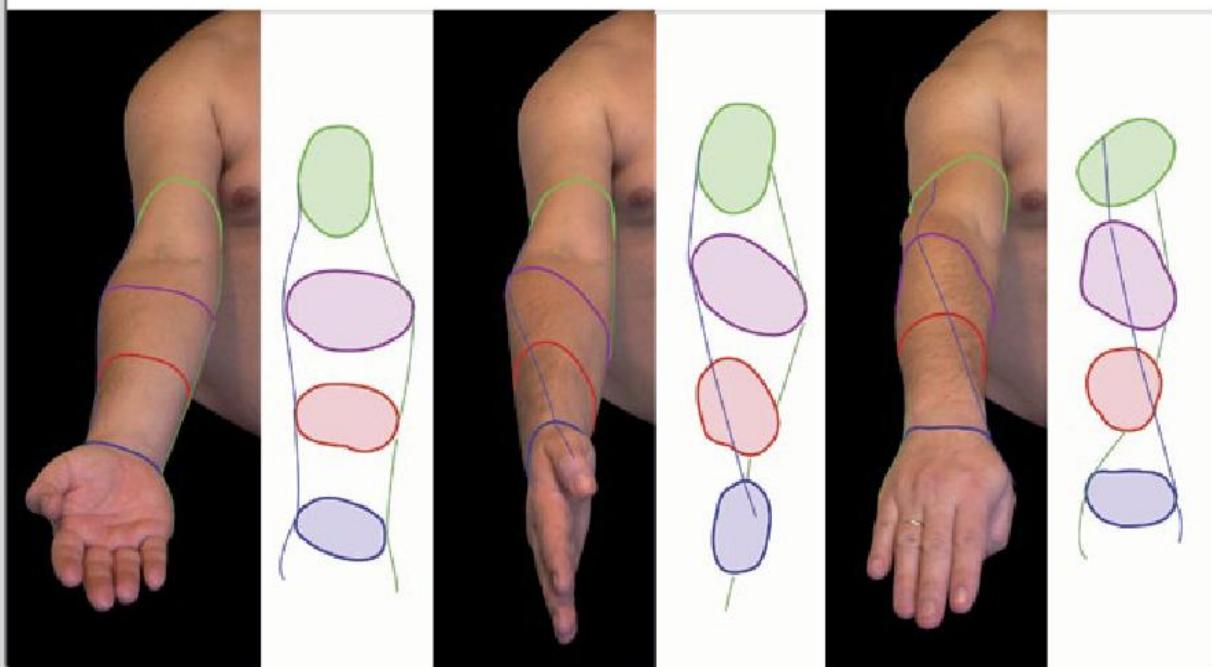


NOTE THAT PRONATION OF THE FOREARM DOES NOT INVOLVE ROTATION OF THE UPPER-ARM FROM THE SHOULDER JOINT!

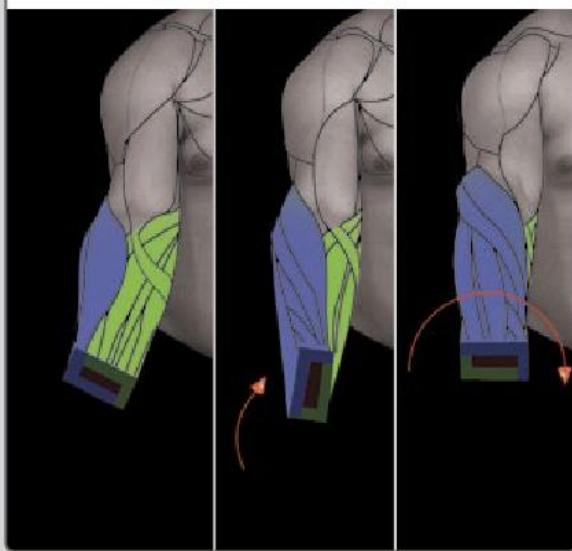


PRONATION AND FORM CHANGES

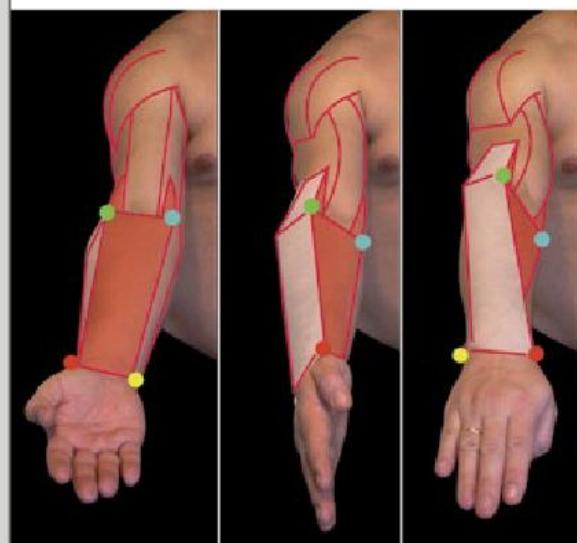
CROSS SECTIONS OF ARM DURING PRONATION



FLEXORS AND EXTENSORS



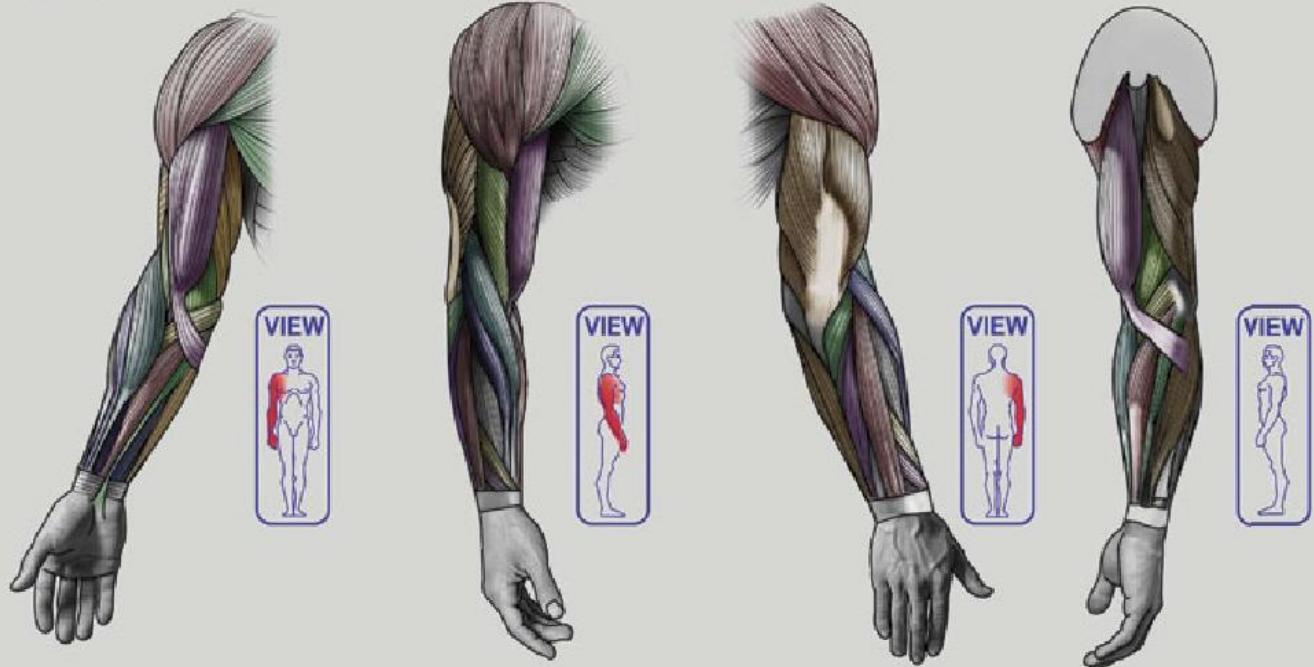
THIS IS AN EXAMPLE OF HOW IMPORTANT IT IS TO KNOW THE ORIGIN AND INSERTION POINTS OF MUSCLES.



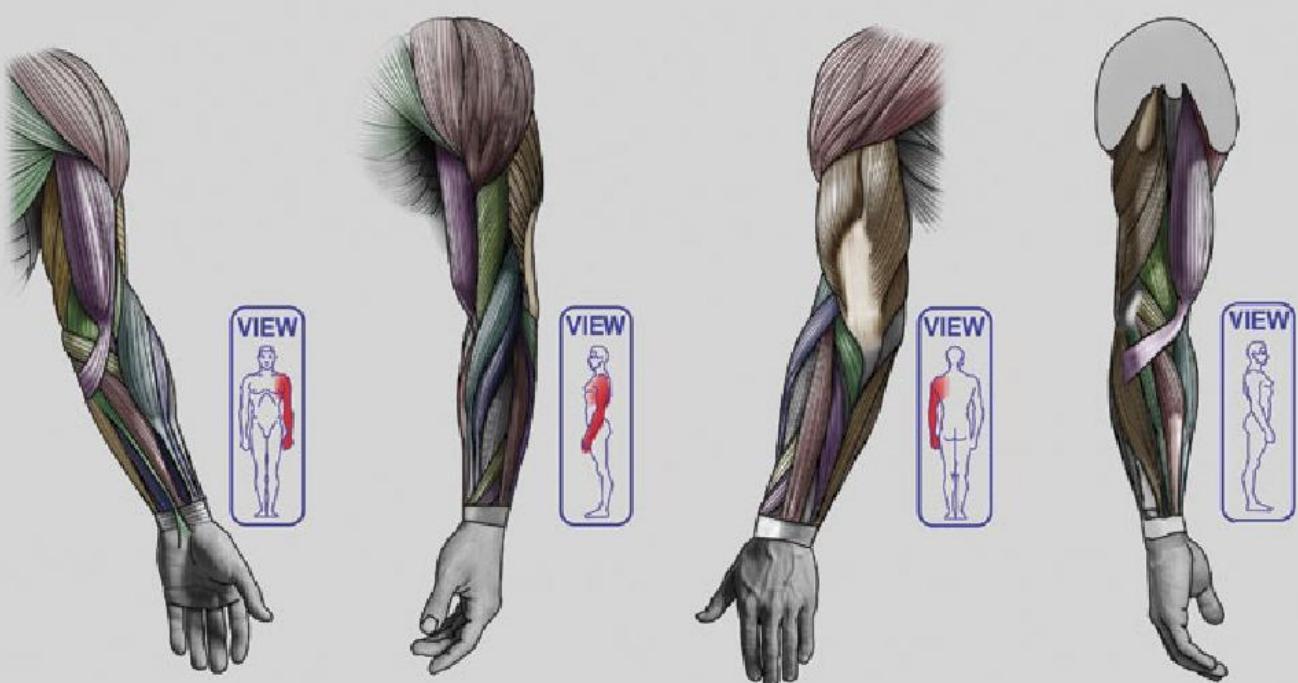
SUPINATED UPPER LIMB

(WHEN THE FOREARM OR PALM FACES TOWARD THE FRONT)

RIGHT



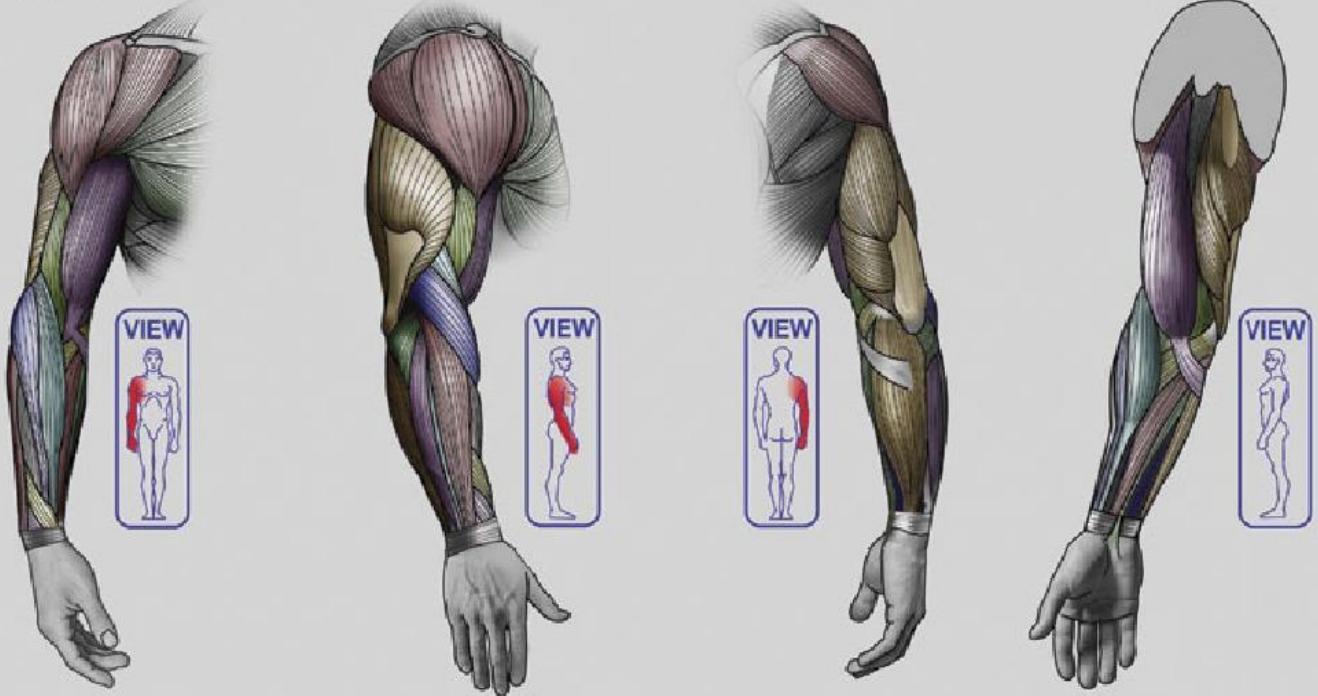
LEFT



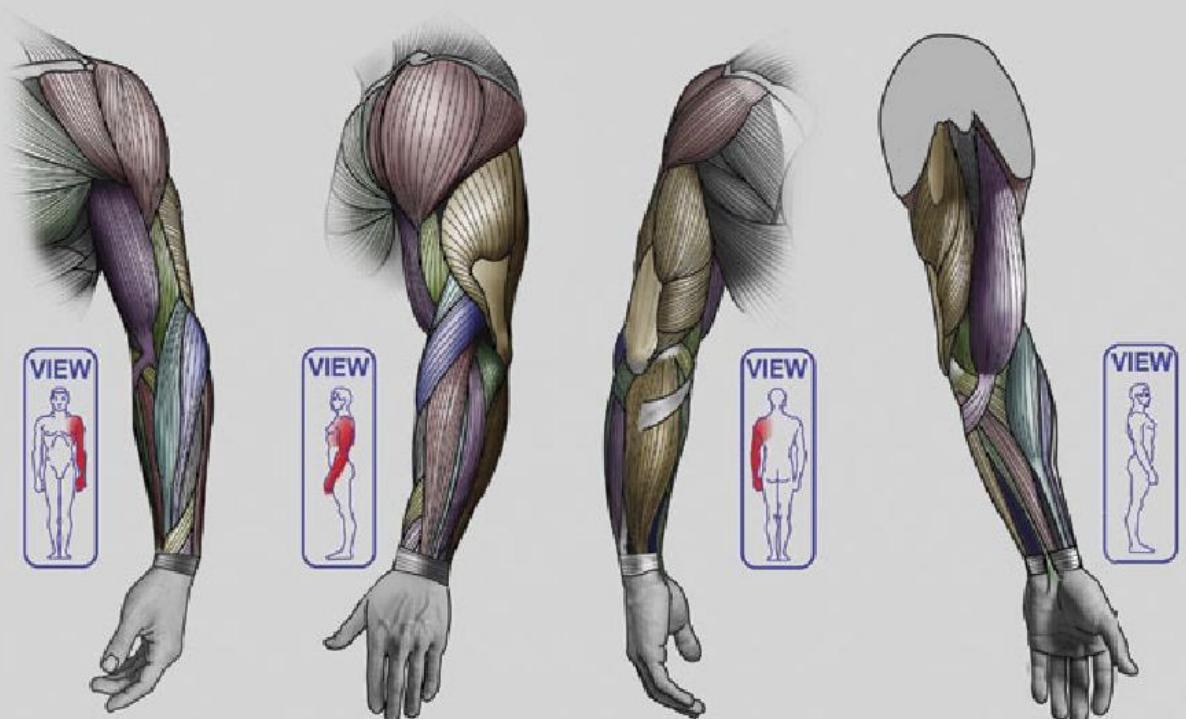
SEMIPRONATED UPPER LIMB

(WHEN THE FOREARM OR PALM FACES TOWARD THE TRUNK)

RIGHT



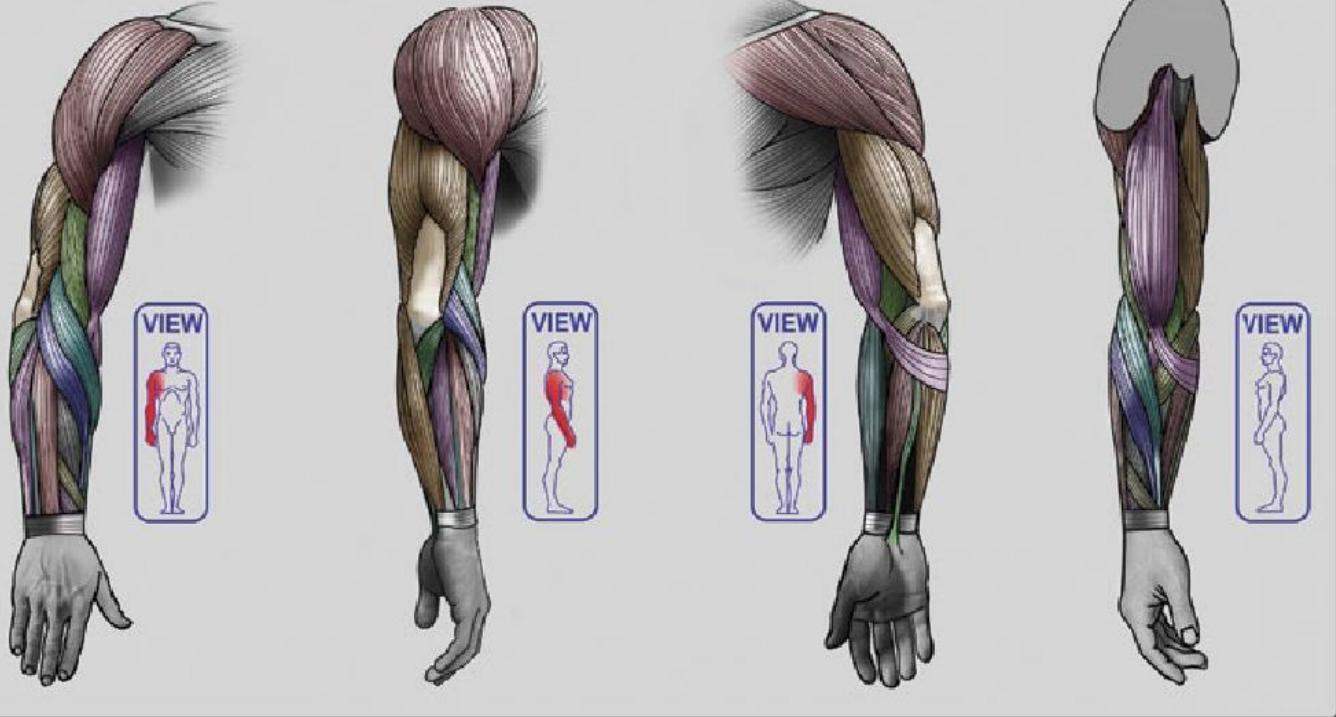
LEFT



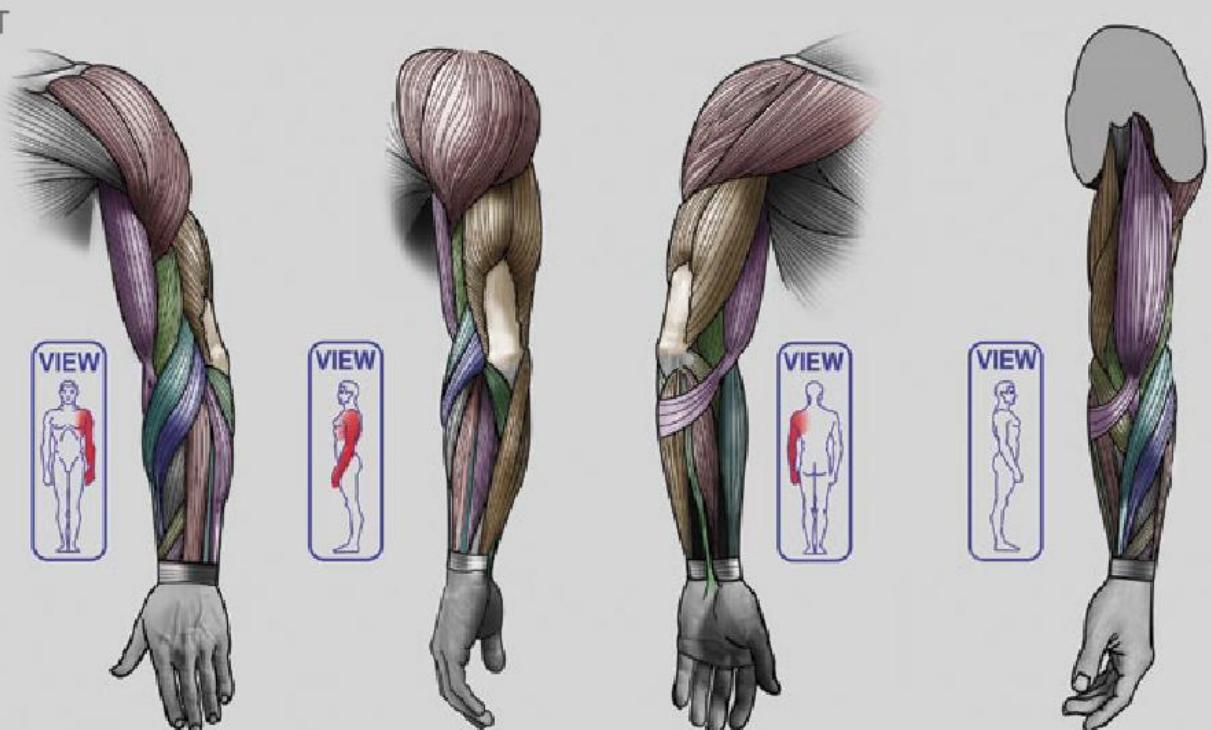
PRONATED UPPER LIMB

(WHEN FOREARM OR PALM FACES TOWARD THE BACK)

RIGHT



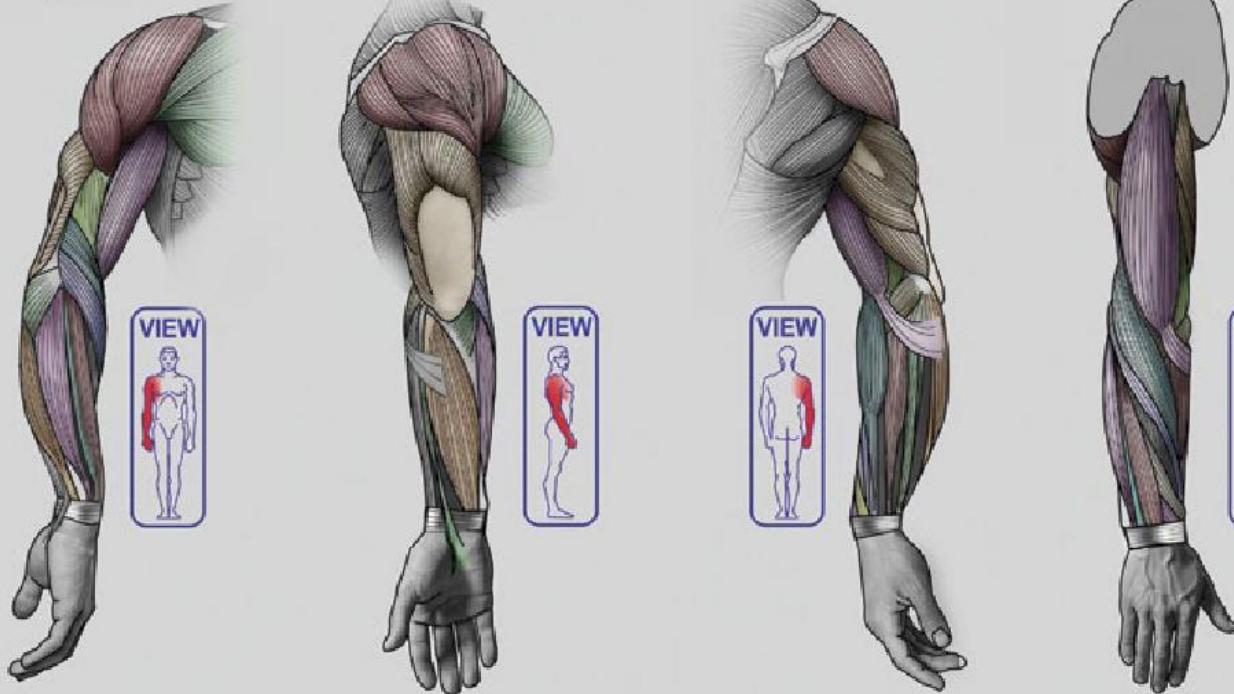
LEFT



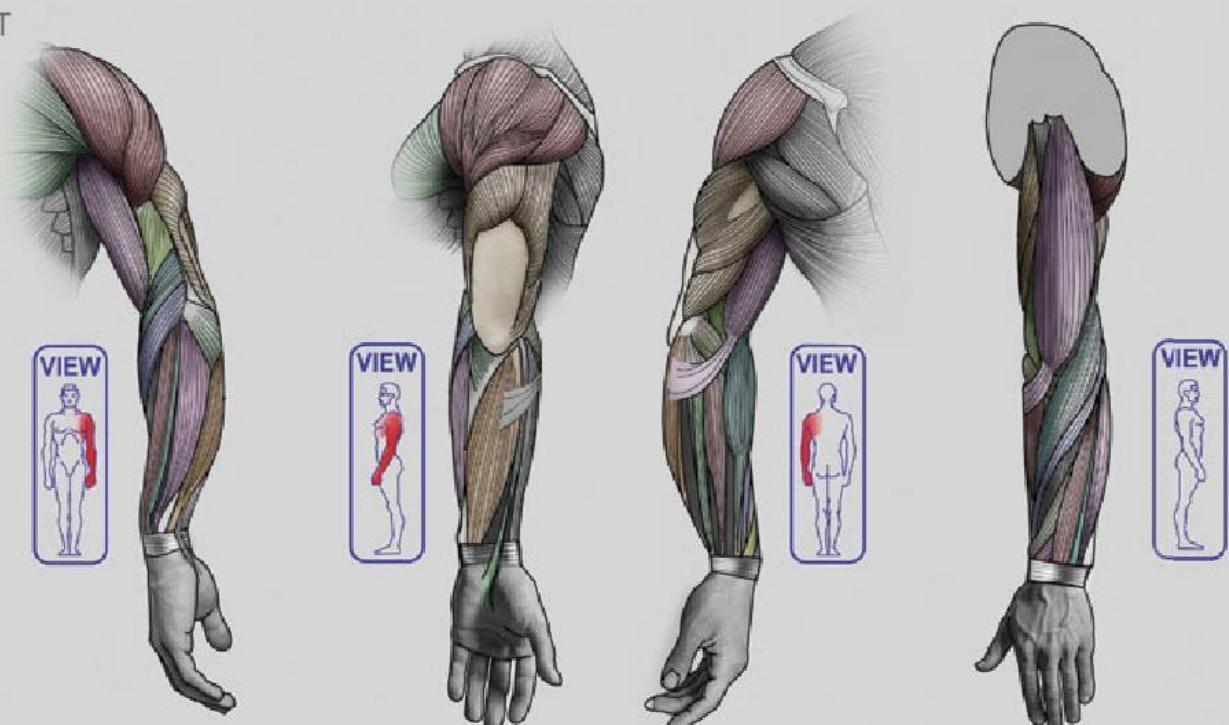
FORCED PRONATION OF THE UPPER LIMB

(WHEN THE FOREARM OR PALM FACES AWAY FROM THE TRUNK)

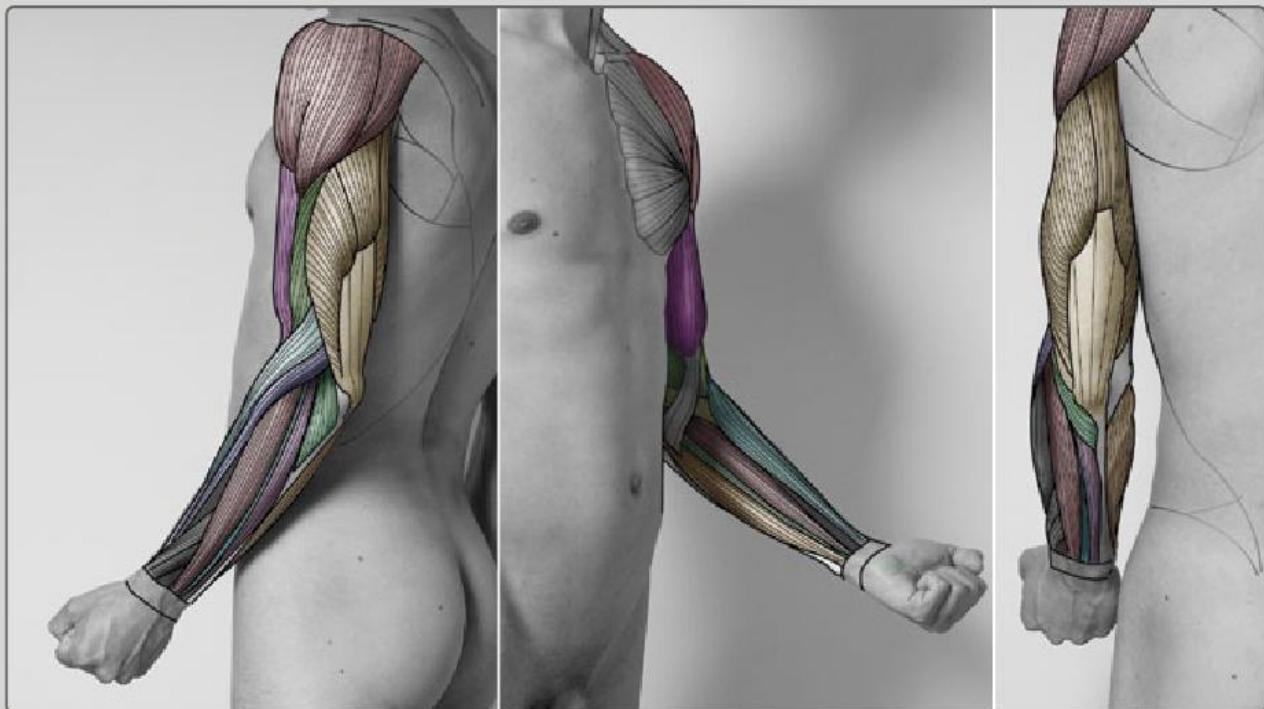
RIGHT



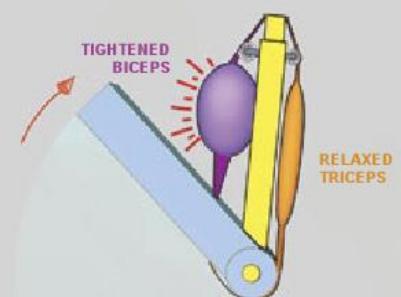
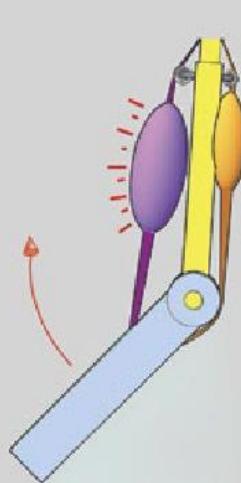
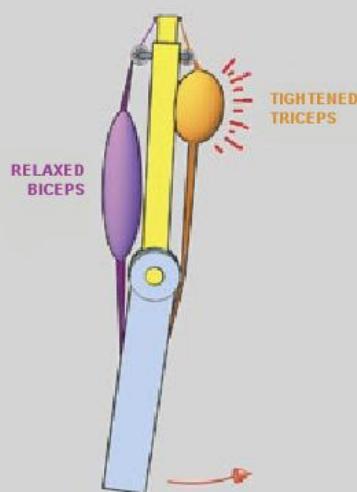
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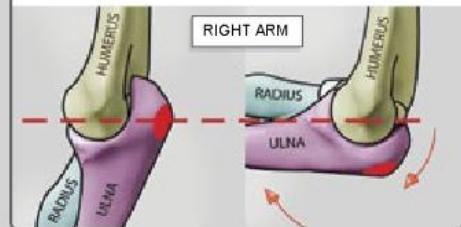
PARTIALLY FLEXED ARM
(AS IF HOLDING AN OBJECT)



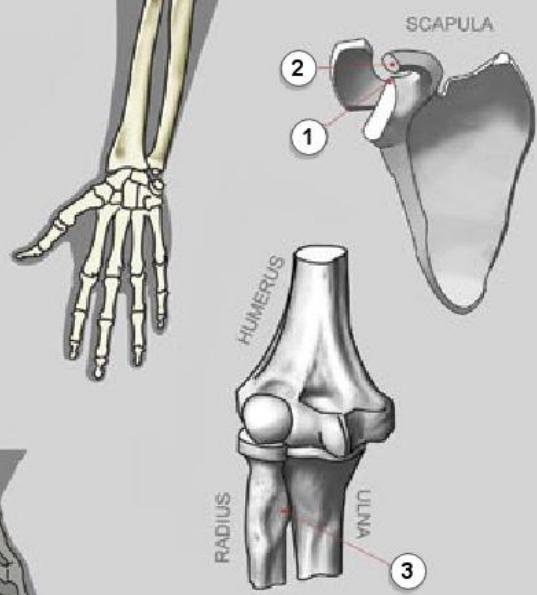
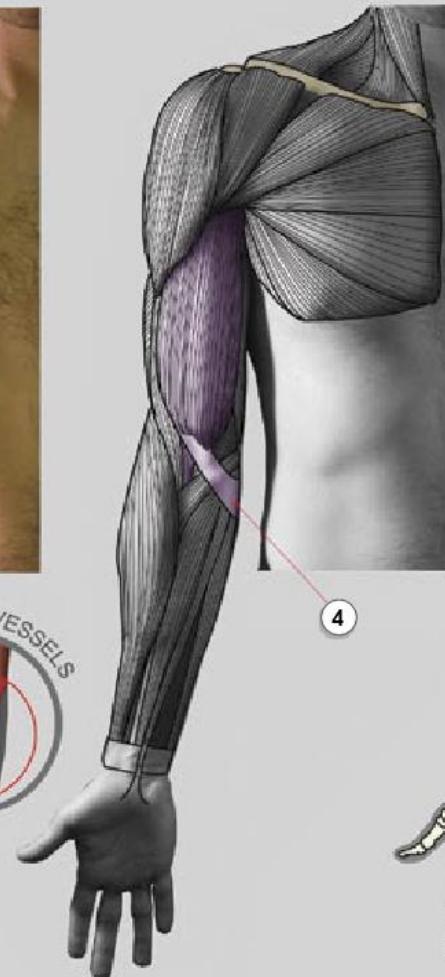
BICEPS AND TRICEPS IN ACTION



ELBOW BELONGS TO THE FORE ARM.

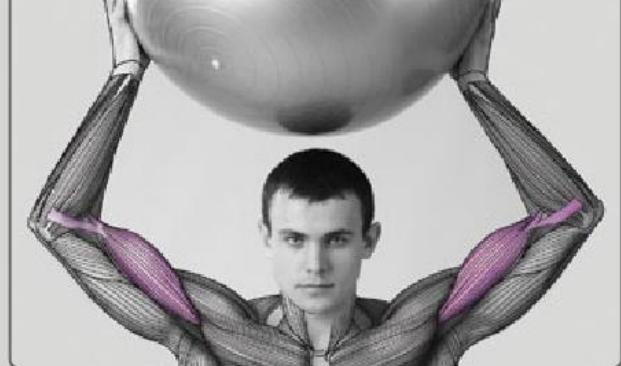
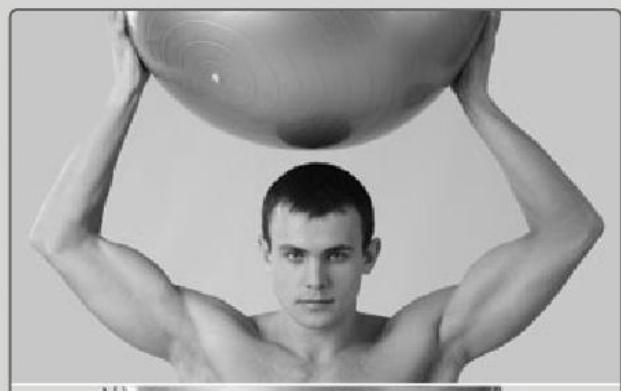
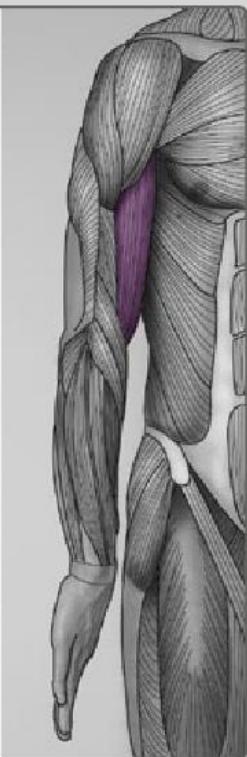
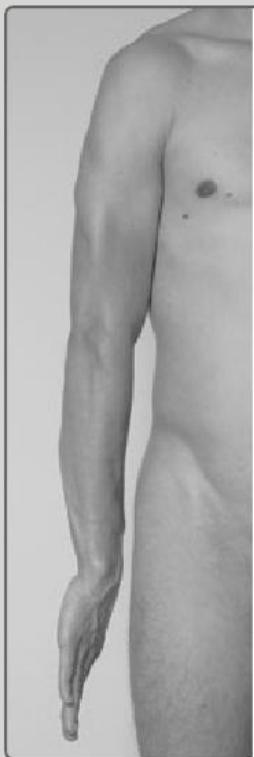
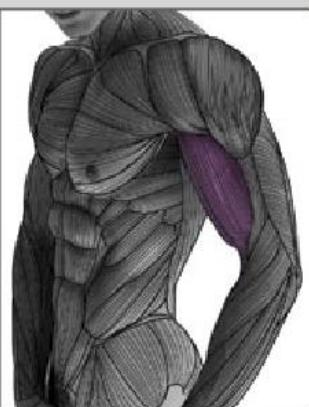
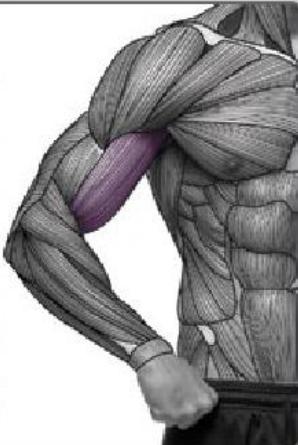
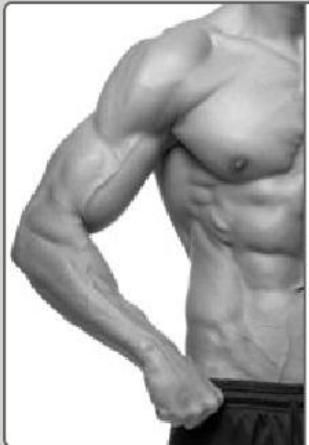
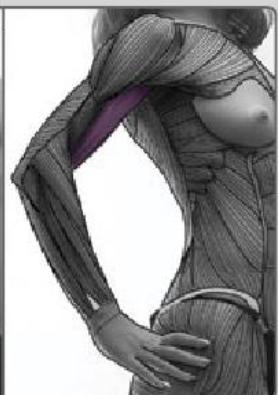
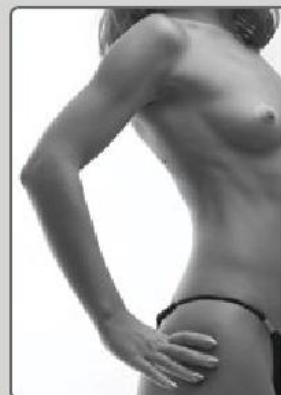
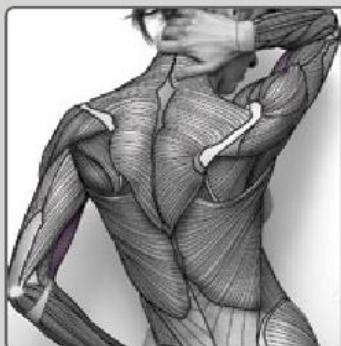


BICEPS BRACHII MUSCLE

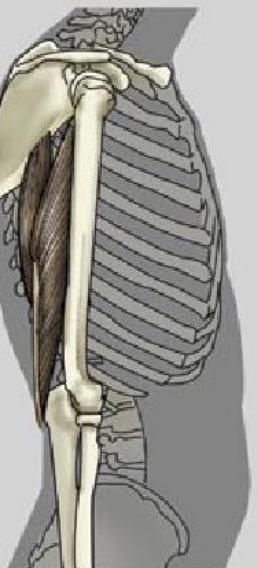
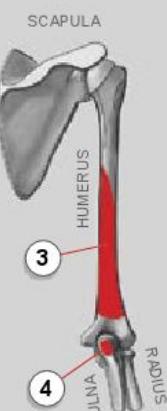
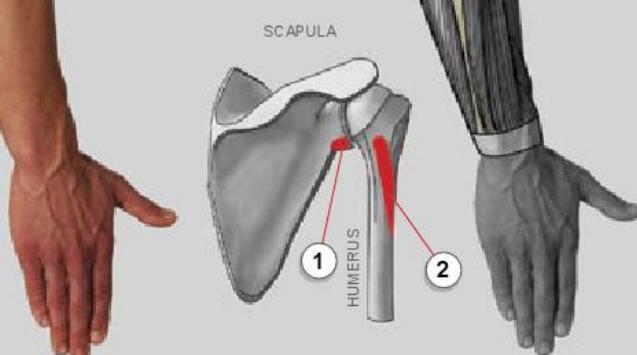


ACTION:	
MOVES THE ARM FORWARD AND ASSISTS IN TURNING THE HAND OUTWARDS (SUPINATION)	
ORIGIN: SCAPULA	
1	SUPRAGLENOID TUBEROSITY
2	CORACOID PROCESS
INSERTION:	
3	RADIAL TUBEROSITY
4	AND BICIPITAL APONEUROYSIS INTO DEEP FASCIA ON MEDIAL PART OF FOREARM

BICEPS BRACHII MUSCLE



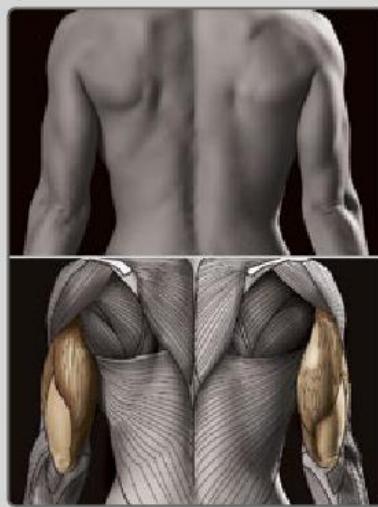
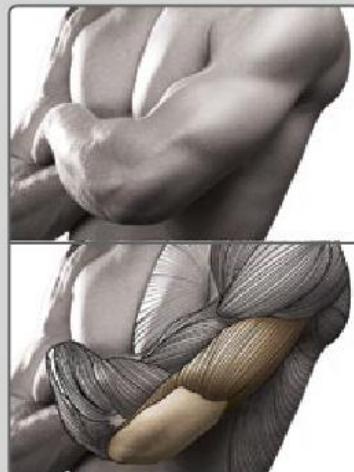
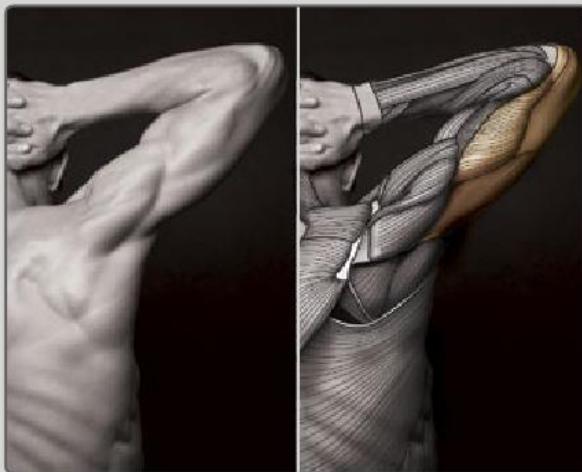
TRICEPS BRACHII MUSCLE



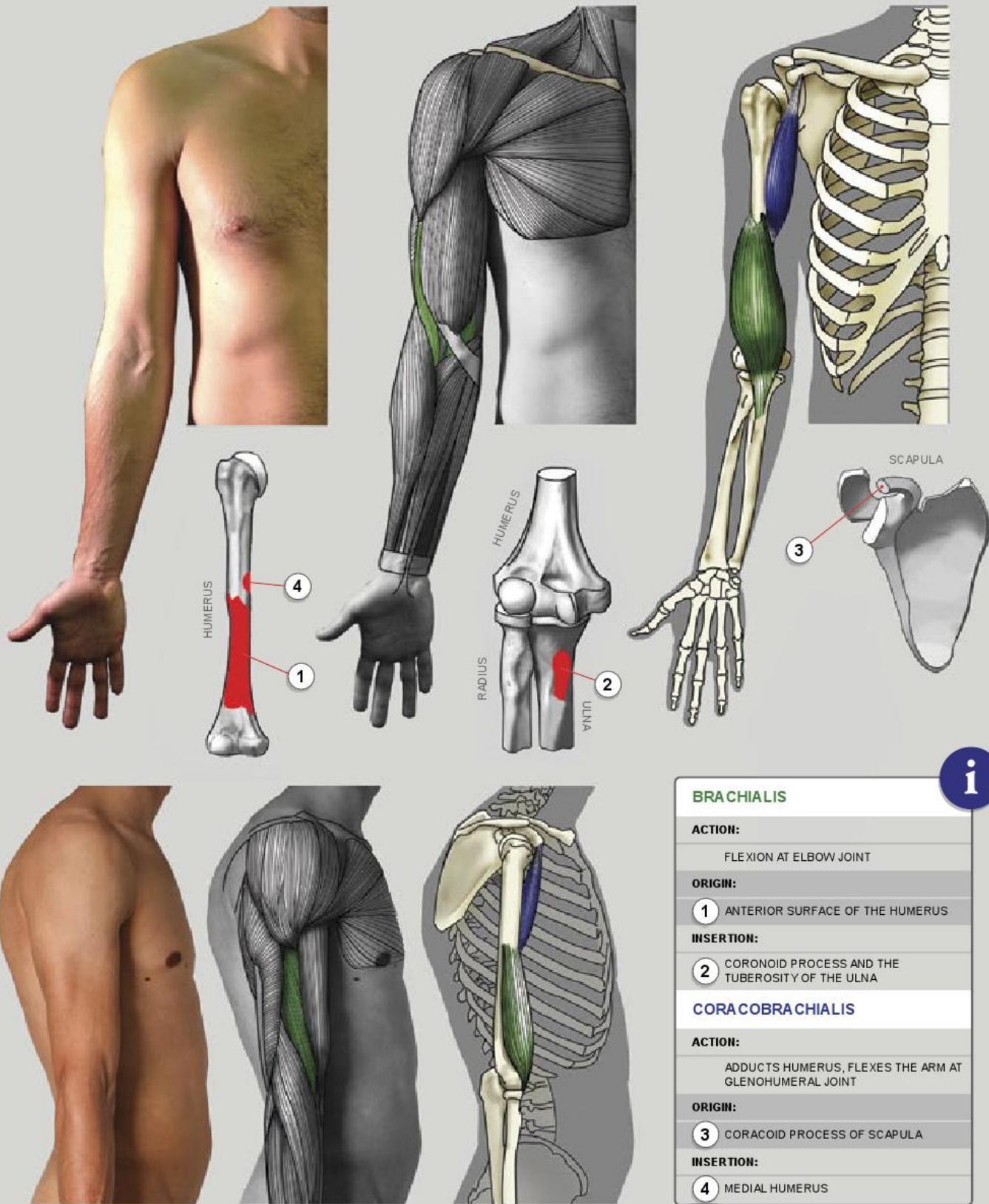
ACTION:
EXTENDS FOREARM LONG HEAD EXTENDS SHOULDER
ORIGIN:
1 LONG HEAD: INFRAGLENOID TUBERCLE OF SCAPULA
2 LATERAL HEAD: ABOVE THE RADIAL SULCUS
3 MEDIAL HEAD: BELOW THE RADIAL SULCUS
INSERTION:
4 OLECRANON PROCESS OF Ulna

i

TRICEPS BRACHII MUSCLE



BRACHIALIS AND CORACOBRAHIALIS MUSCLES



i

BRACHIALIS

ACTION:
FLEXION AT ELBOW JOINT

ORIGIN:
1 ANTERIOR SURFACE OF THE HUMERUS

INSERTION:
2 CORONOID PROCESS AND THE TUBEROSITY OF THE Ulna

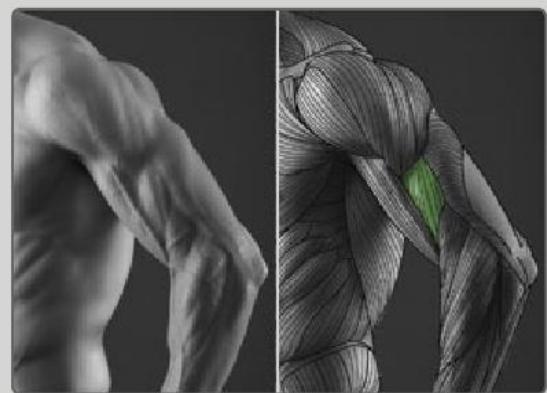
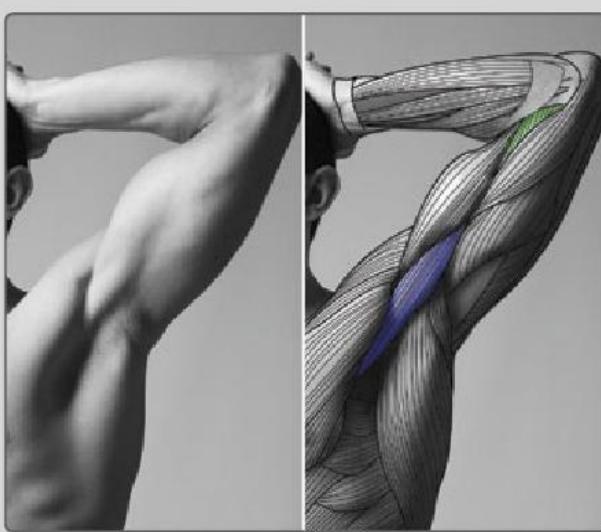
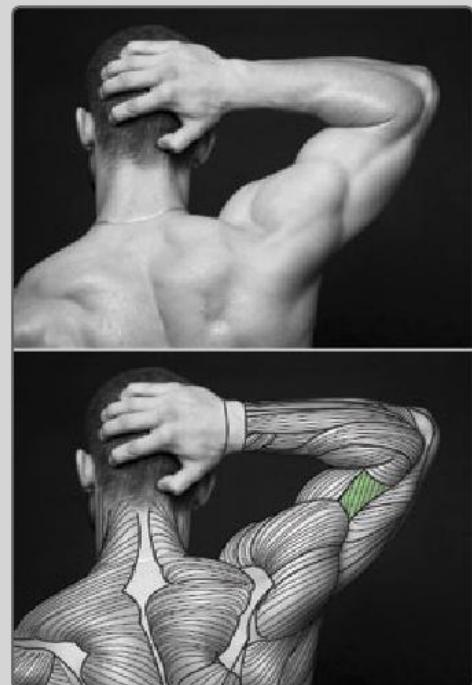
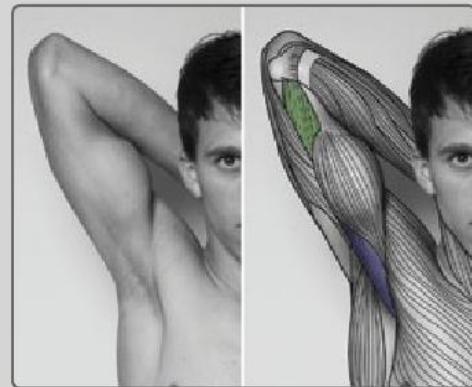
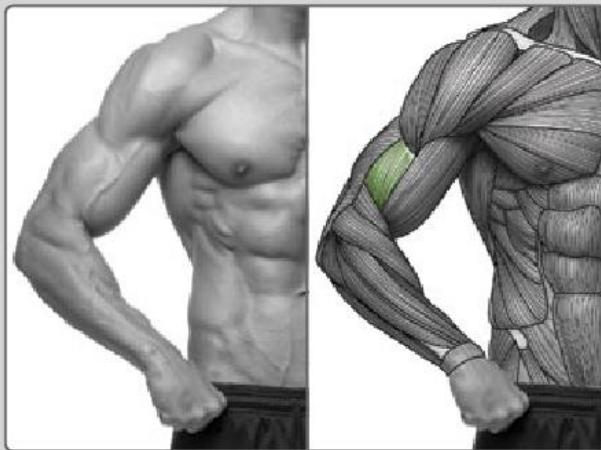
CORACOBRAHIALIS

ACTION:
ADDUCTS HUMERUS, FLEXES THE ARM AT GLENOHUMERAL JOINT

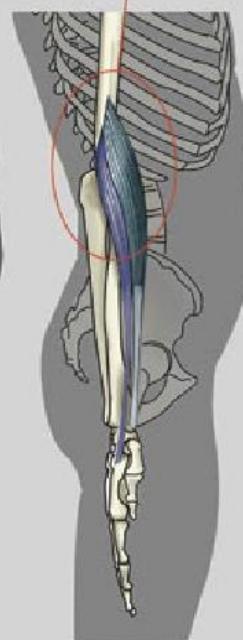
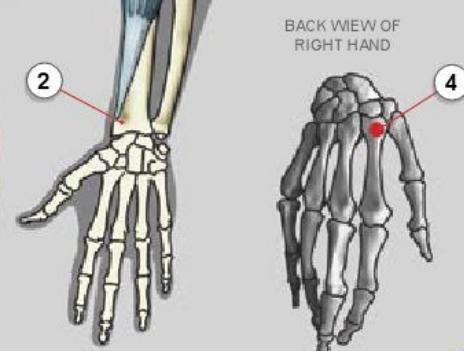
ORIGIN:
3 CORACOID PROCESS OF SCAPULA

INSERTION:
4 MEDIAL HUMERUS

BRACHIALIS AND CORACOBRACHIALIS MUSCLES



BRACHIORADIALIS AND EXTENSOR CARPI RADIALIS LONGUS



BRACHIORADIALIS

ACTION:

FLEXION OF ELBOW

ORIGIN:

1 LATERAL SUPRACONDYLAR RIDGE OF THE HUMERUS

INSERTION:

2 DISTAL RADIUS (RADIAL STYLOID PROCESS)

EXTENSOR CARPI RADIALIS LONGUS

ACTION:

EXTENSOR AT THE WRIST JOINT, ABDUCTS THE HAND AT THE WRIST

ORIGIN:

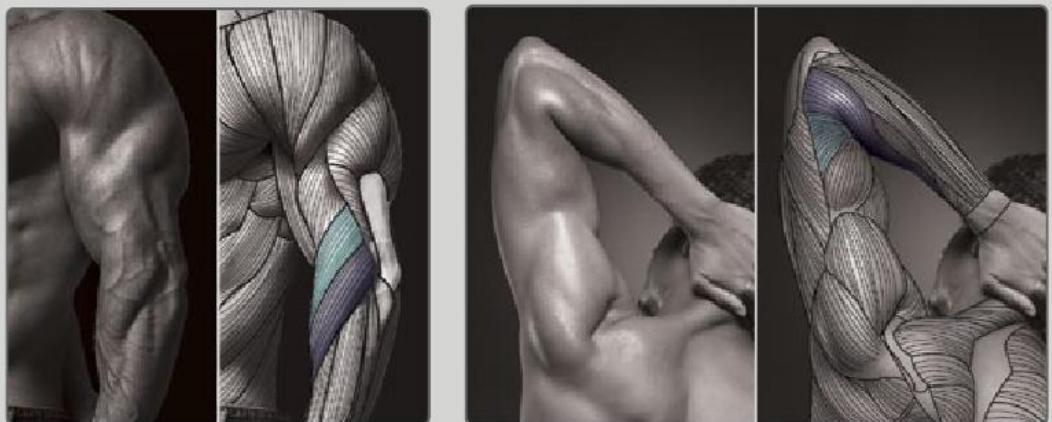
3 LATERAL SUPRACONDYLAR RIDGE

INSERTION:

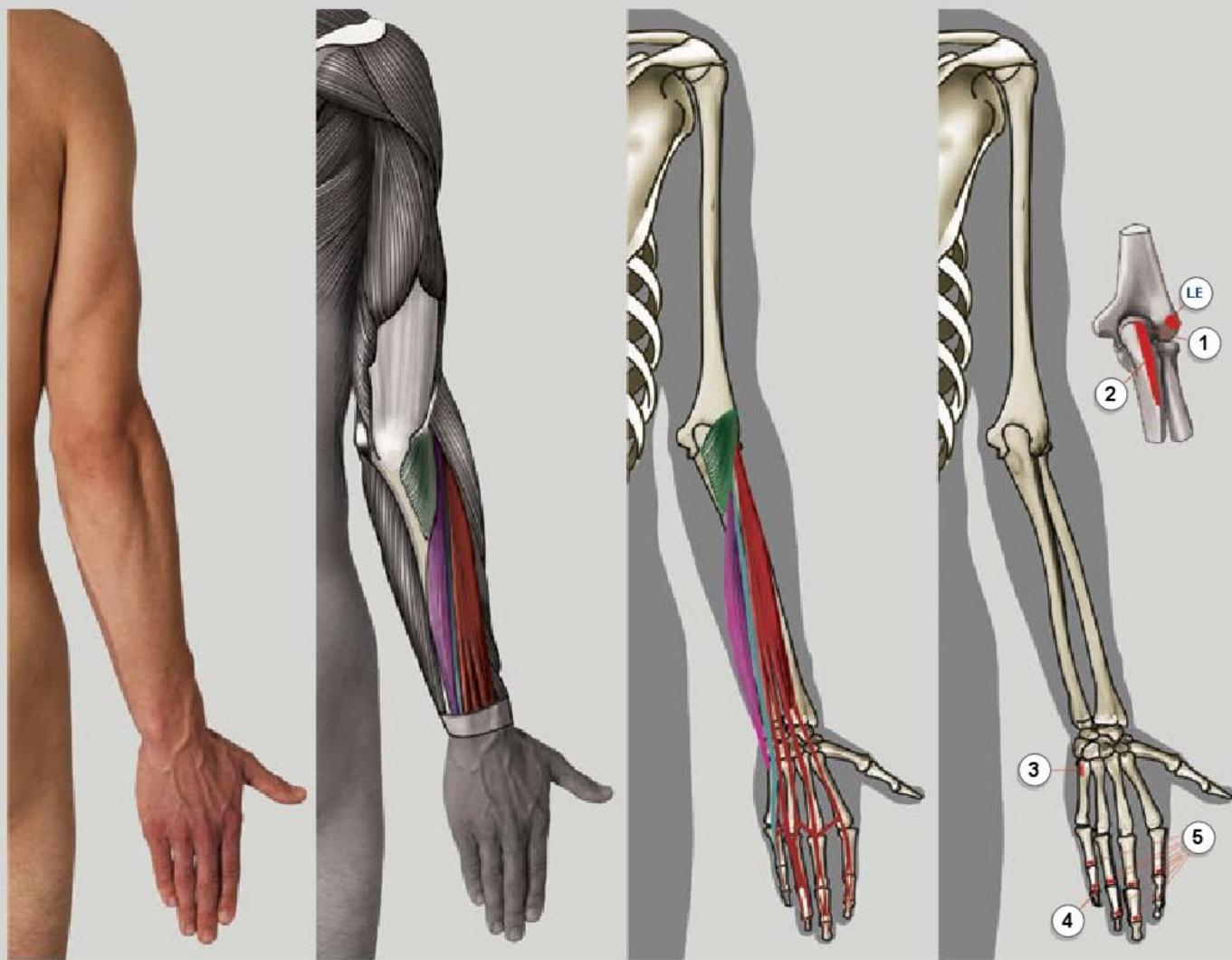
4 2nd METACARPAL



BRACHIORADIALIS AND EXTENSOR CARPI RADIALIS LONGUS



ANconeus, Extensor carpi ulnaris, Extensor digiti minimi and Extensor digitorum muscles



ANconeus

ACTION:

Stabilizes the elbow

ORIGIN:

LE Lateral epicondyle of the humerus

INSERTION:

- 1 Lateral surface of the olecranon process
- 2 Superior part of the posterior ulna distally

Extensor carpi ulnaris

ACTION:

Extends and adducts the wrist

ORIGIN:

LE Lateral epicondyle of the humerus, ulna

INSERTION:

- 3 5th metacarpal

Extensor digiti minimi

ACTION:

Extends the wrist and the little finger at all joints

ORIGIN:

LE Lateral epicondyle of the humerus

INSERTION:

- 4 At the extensor expansion on proximal phalanx of the little finger

Extensor digitorum

ACTION:

Extends hand, wrist and fingers

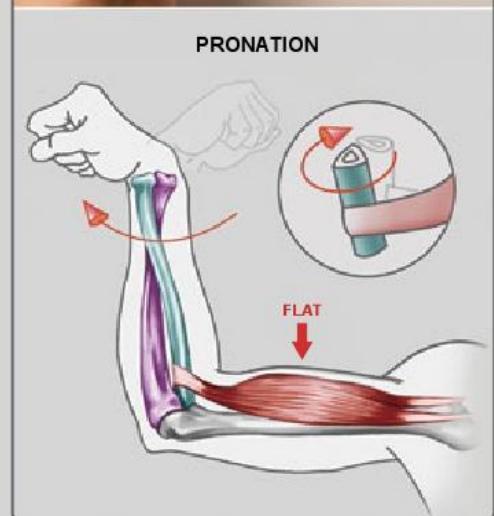
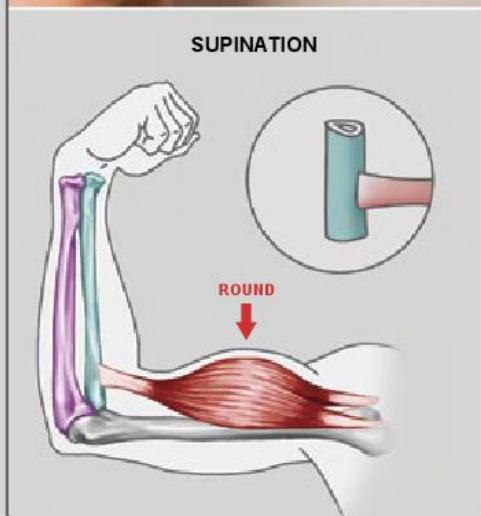
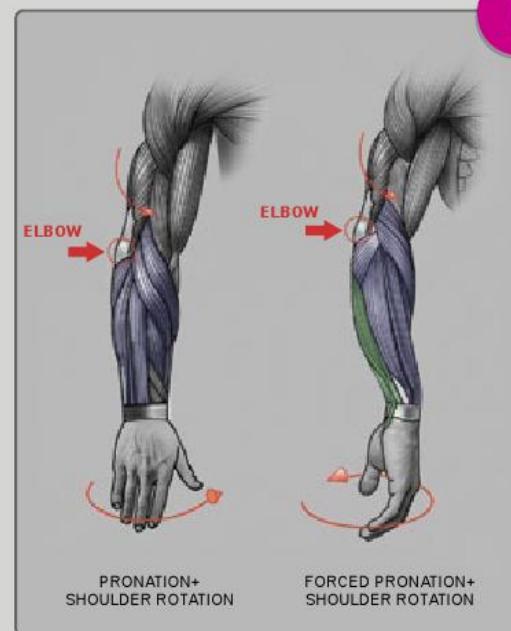
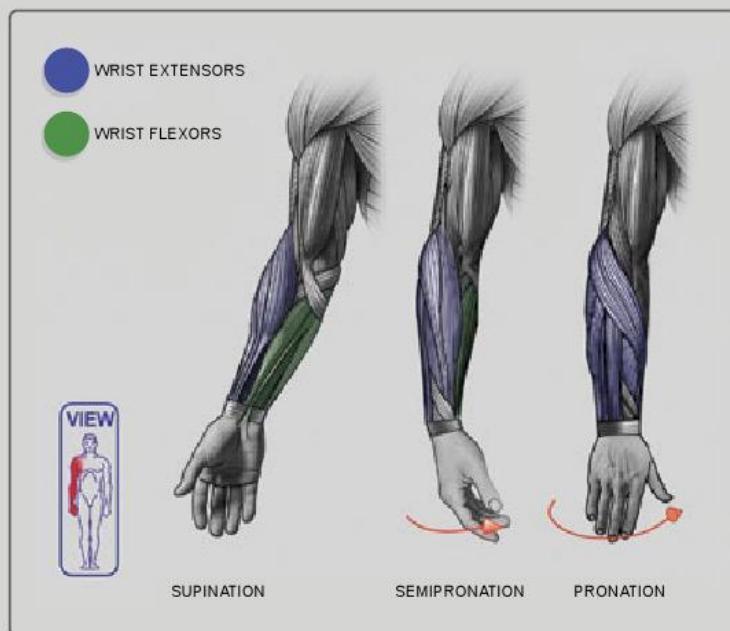
ORIGIN:

LE Lateral epicondyle of the humerus

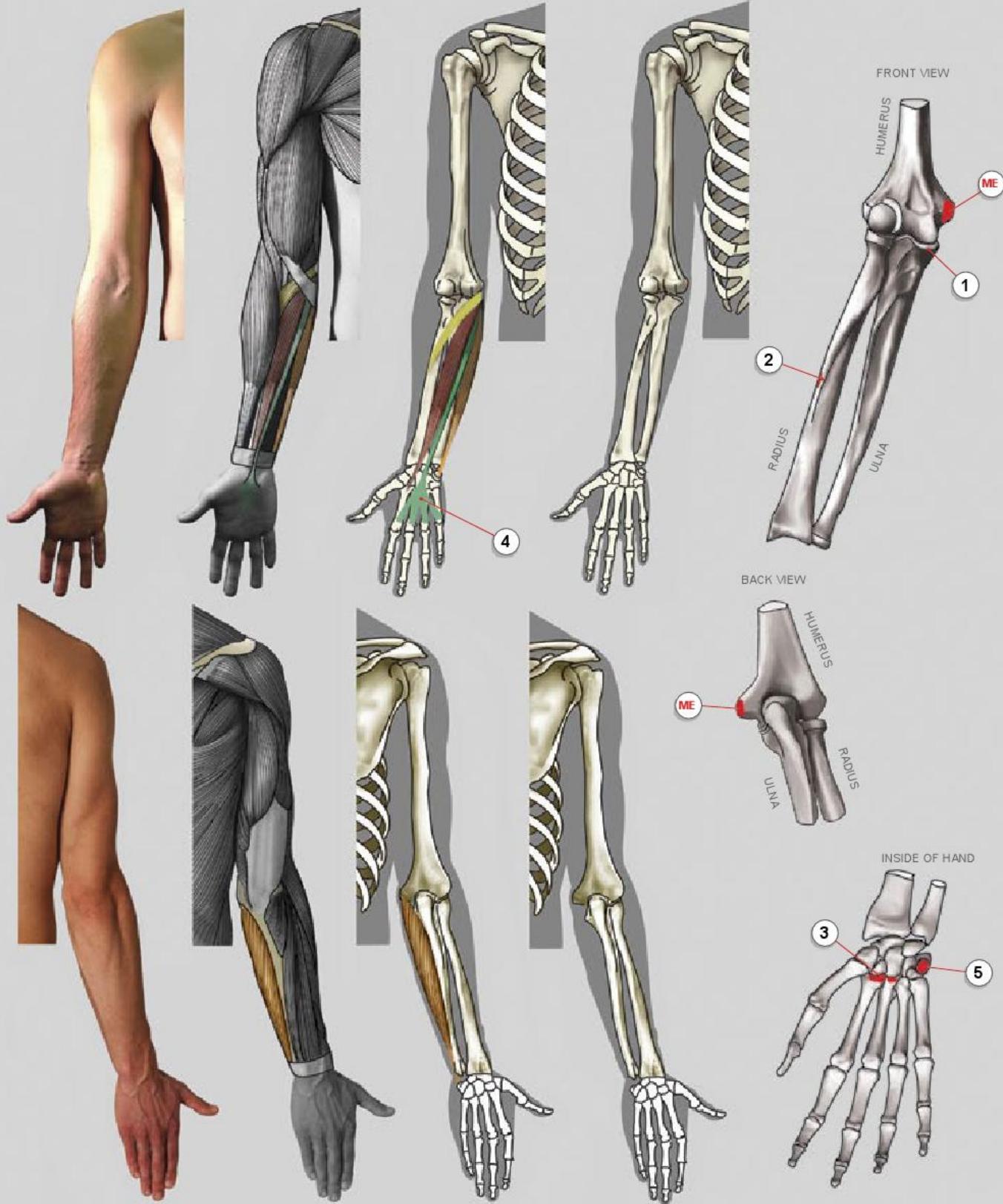
INSERTION:

- 5 Extensor expansion of middle and distal phalanges of the 2nd, 3rd, 4th and 5th fingers

SUPINATION AND PRONATION

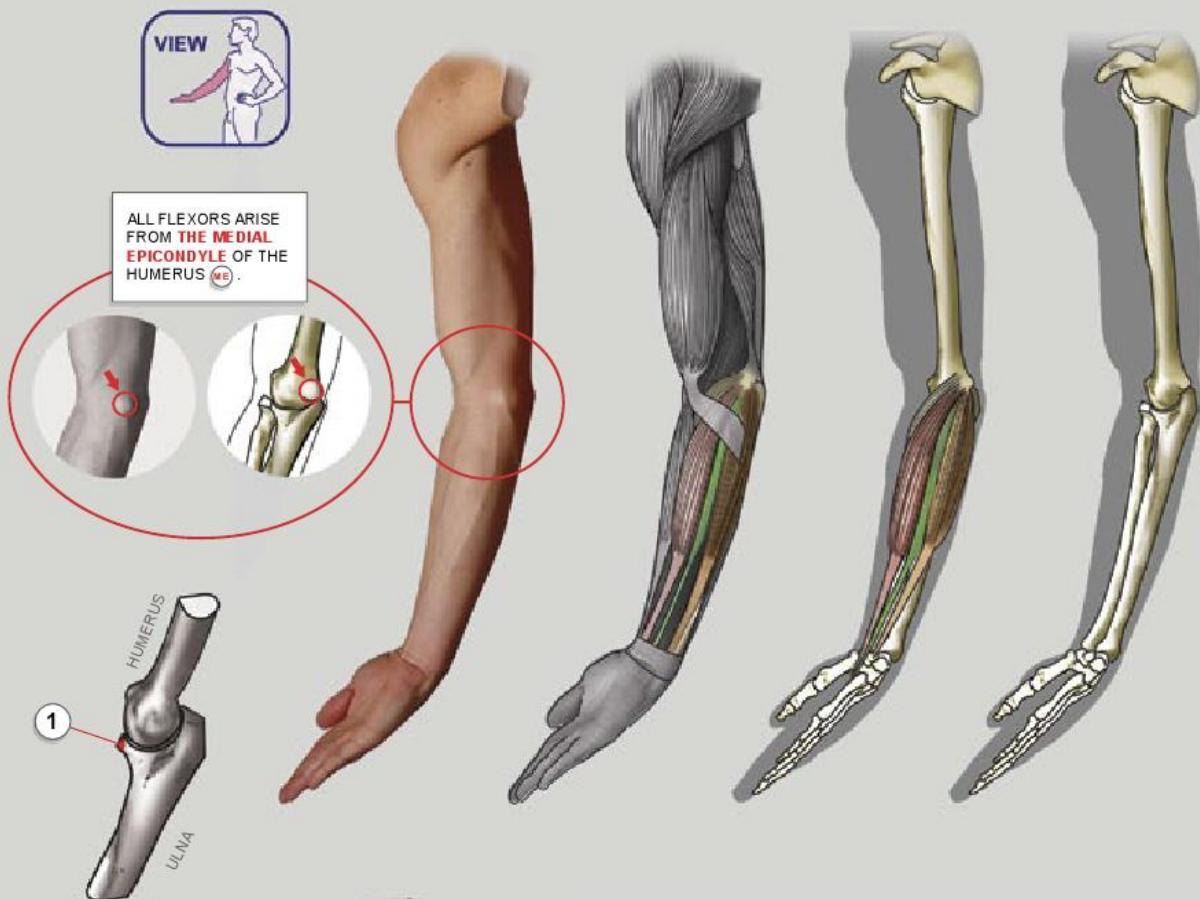


FLEXOR MUSCLES



FLEXOR MUSCLES

(FROM INNER SIDE)



PRONATOR TERES

ACTION:

PRONATION OF FOREARM, FLEXES ELBOW

ORIGIN:

(ME) MEDIAL EPICONDYLE OF HUMERUS (COMMON FLEXOR TENDON)

1 ULRNAR HEAD: CORONOID PROCESS OF ULRNA

INSERTION:

2 MIDDLE OF THE LATERAL SURFACE OF THE RADIUS

FLEXOR CARPI RADIALIS

ACTION:

FLEXION AND ABDUCTION AT WRIST

ORIGIN:

(ME) MEDIAL EPICONDYLE OF HUMERUS (COMMON FLEXOR TENDON)

INSERTION:

3 BASE OF SECOND AND THIRD METACARPAL BONES

PALMARIS LONGUS

ACTION:

WRIST FLEXOR

ORIGIN:

(ME) MEDIAL EPICONDYLE OF HUMERUS (COMMON FLEXOR TENDON)

INSERTION:

4 PALMAR APONEUROYSIS

FLEXOR CARPI ULNARIS

ACTION:

FLEXION AND ABDUCTION AT WRIST

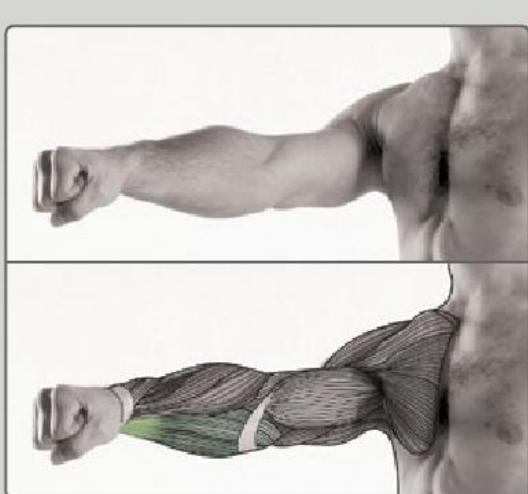
ORIGIN:

(ME) MEDIAL EPICONDYLE OF HUMERUS (COMMON FLEXOR TENDON)

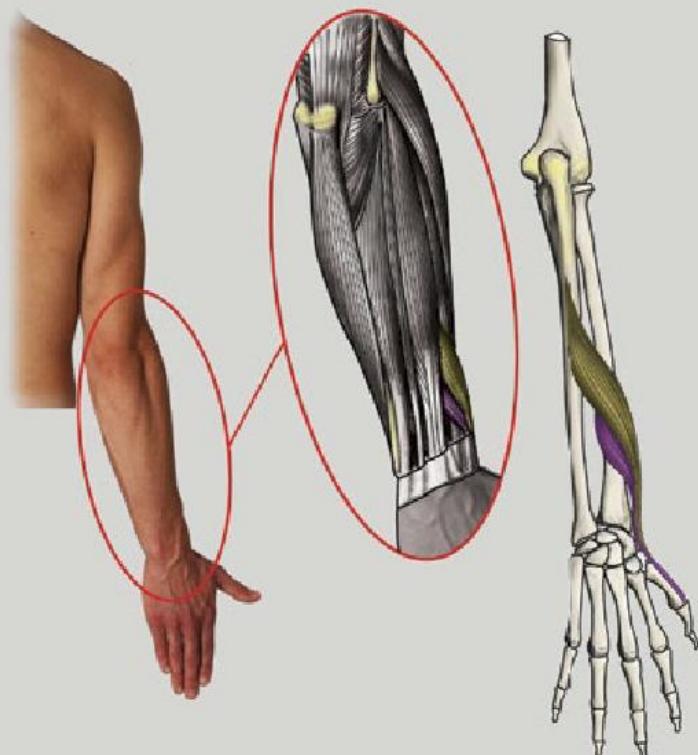
INSERTION:

5 PISIFORM

FLEXOR MUSCLES



ABDUCTOR POLLICIS LONGUS AND EXTENSOR POLLICIS BREVIS MUSCLES



ABDUCTOR POLLICIS LONGUS

ACTION:

ABDUCTION, EXTENSION OF THUMB

ORIGIN:

ULNA, RADIUS,
INTEROSSEOUS MEMBRANE

INSERTION:

FIRST METACARPAL

EXTENSOR POLLICIS BREVIS

ACTION:

EXTENSION OF THUMB AT
METACARPOPHALANGEAL JOINT

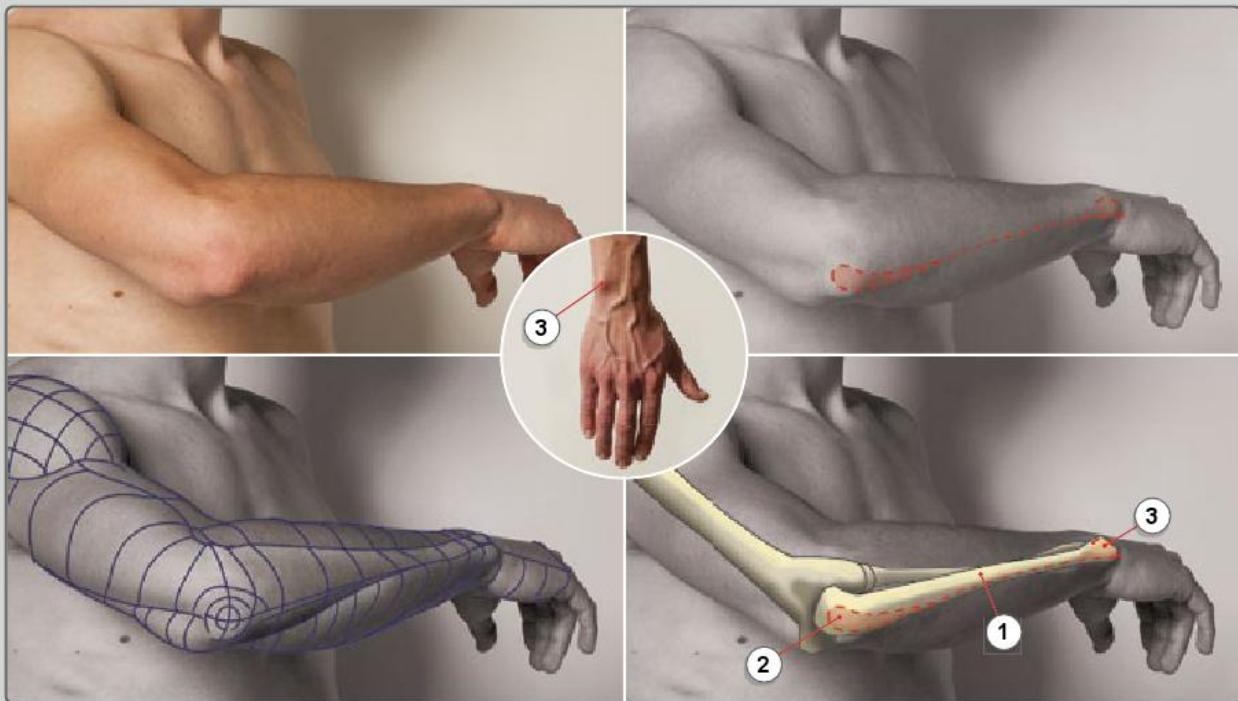
ORIGIN:

RADIUS AND THE INTEROSSEOUS MEMBRANE

INSERTION:

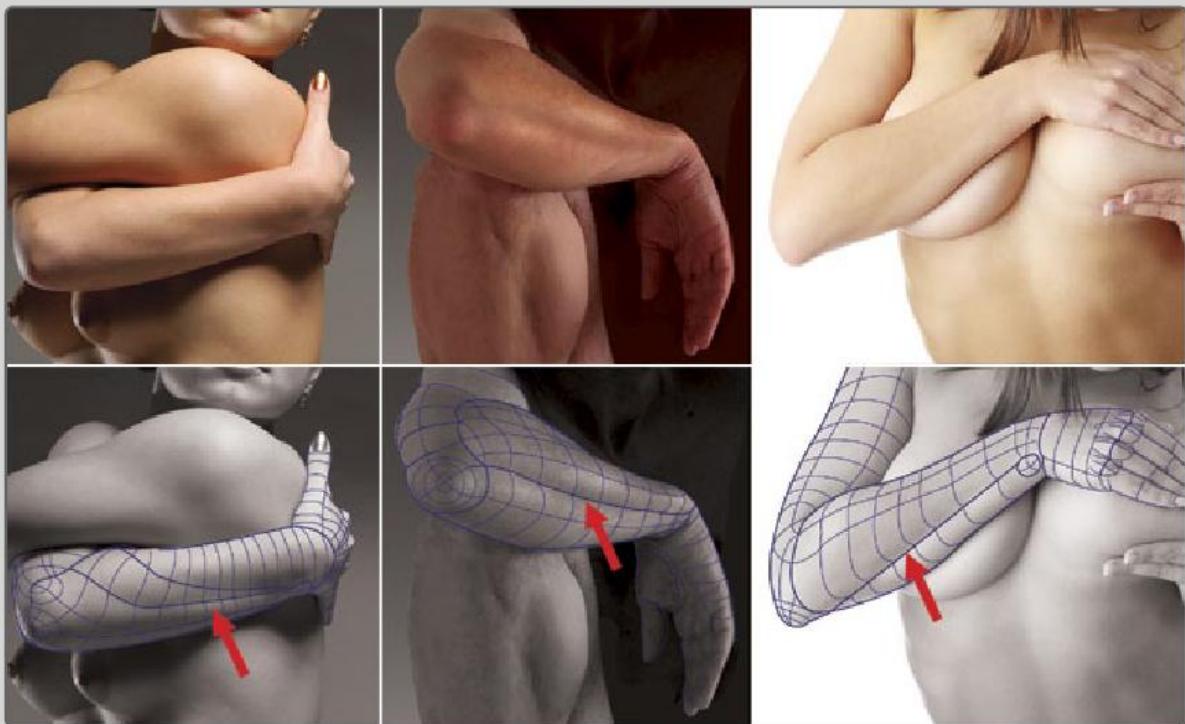
THUMB, PROXIMAL PHALANX

THE BODY OF THE ULNA

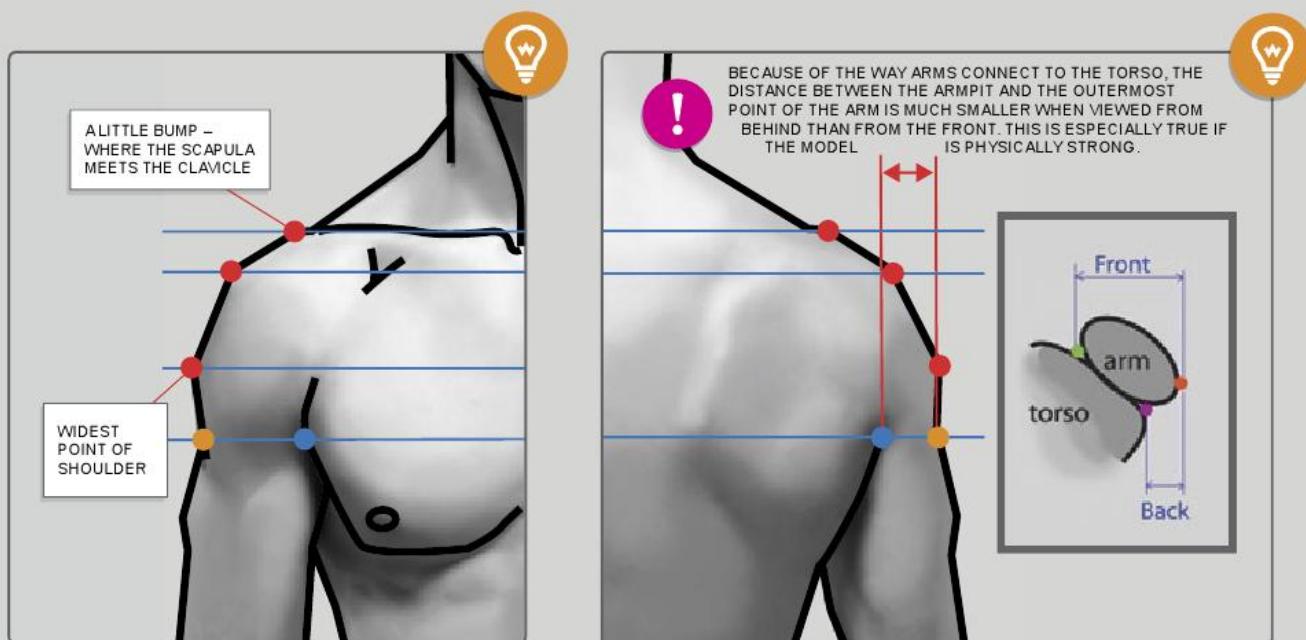
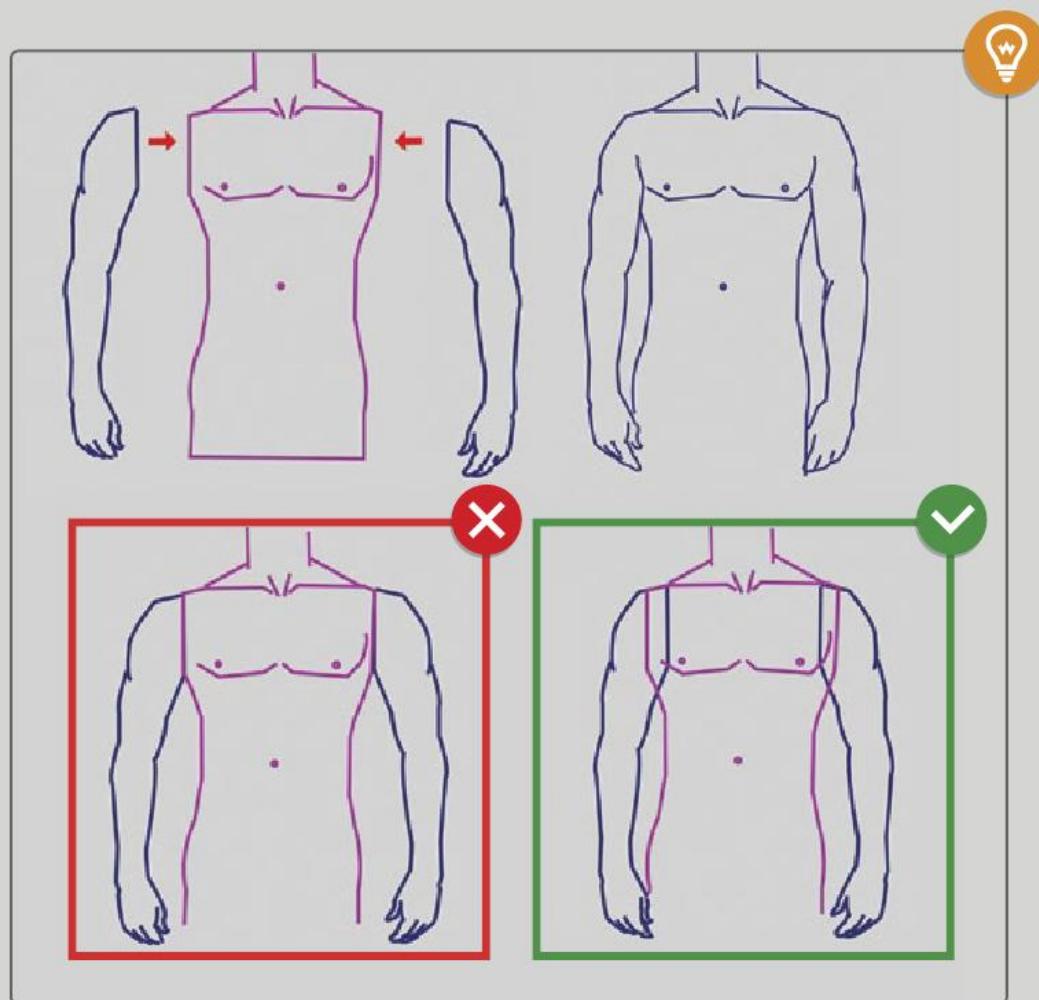


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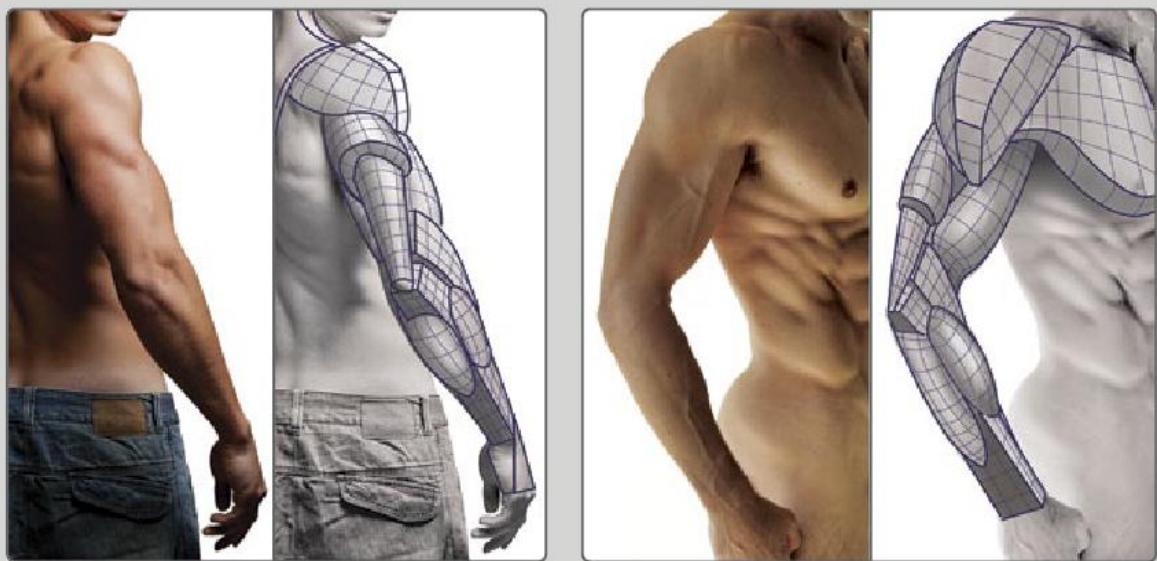
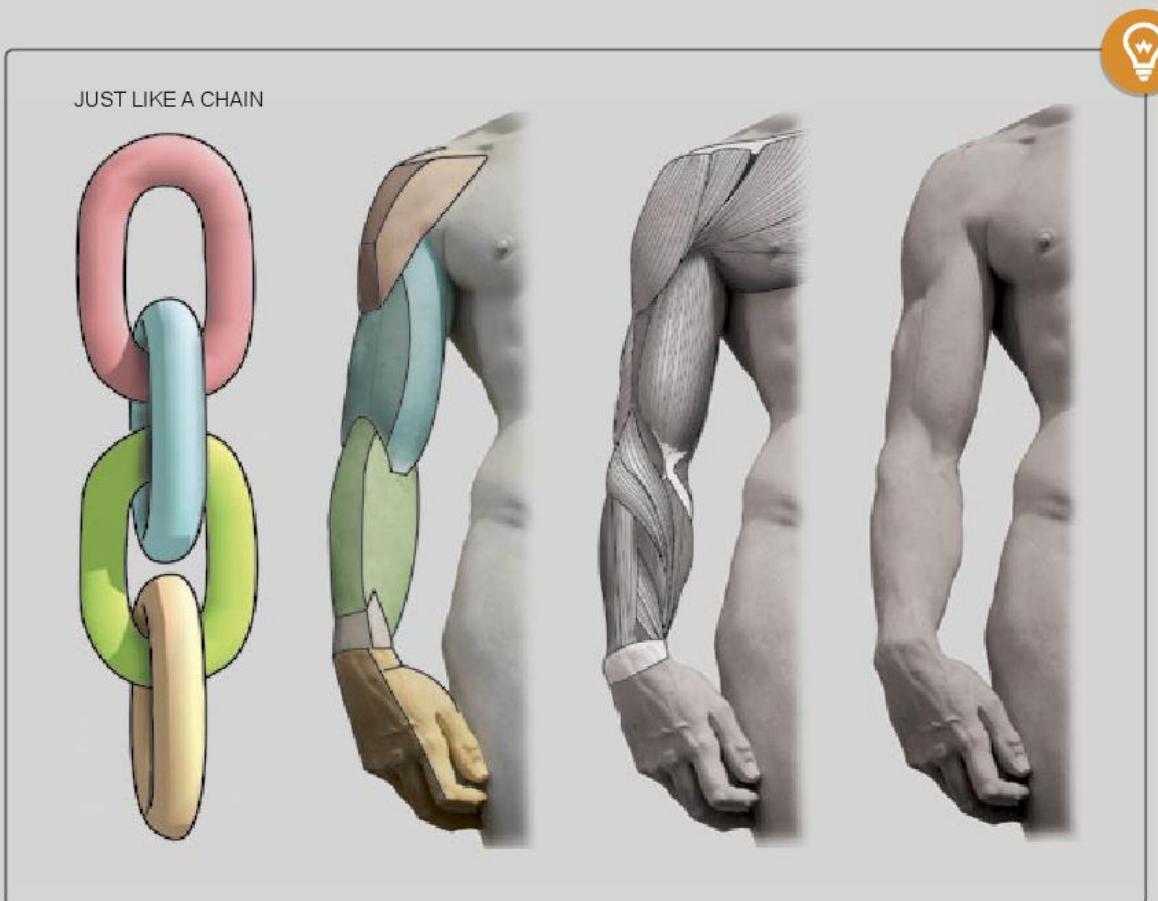
THE BODY OF THE ULNA ① IS AN IMPORTANT LANDMARK. WHEREVER YOU TURN THE HAND, THE ULNA ALWAYS EXTENDS FROM THE ELBOW ② TO LITTLE FINGER SIDE OF THE HAND, WHERE IT IS VISIBLE AS A BUMP ③. IT IS ALWAYS VISIBLE AS A RIDGE OR FURROW. BOTH ENDS OF THE BONE ARE NOT COVERED BY MUSCLES, ONLY BY THIN LAYER OF SKIN.



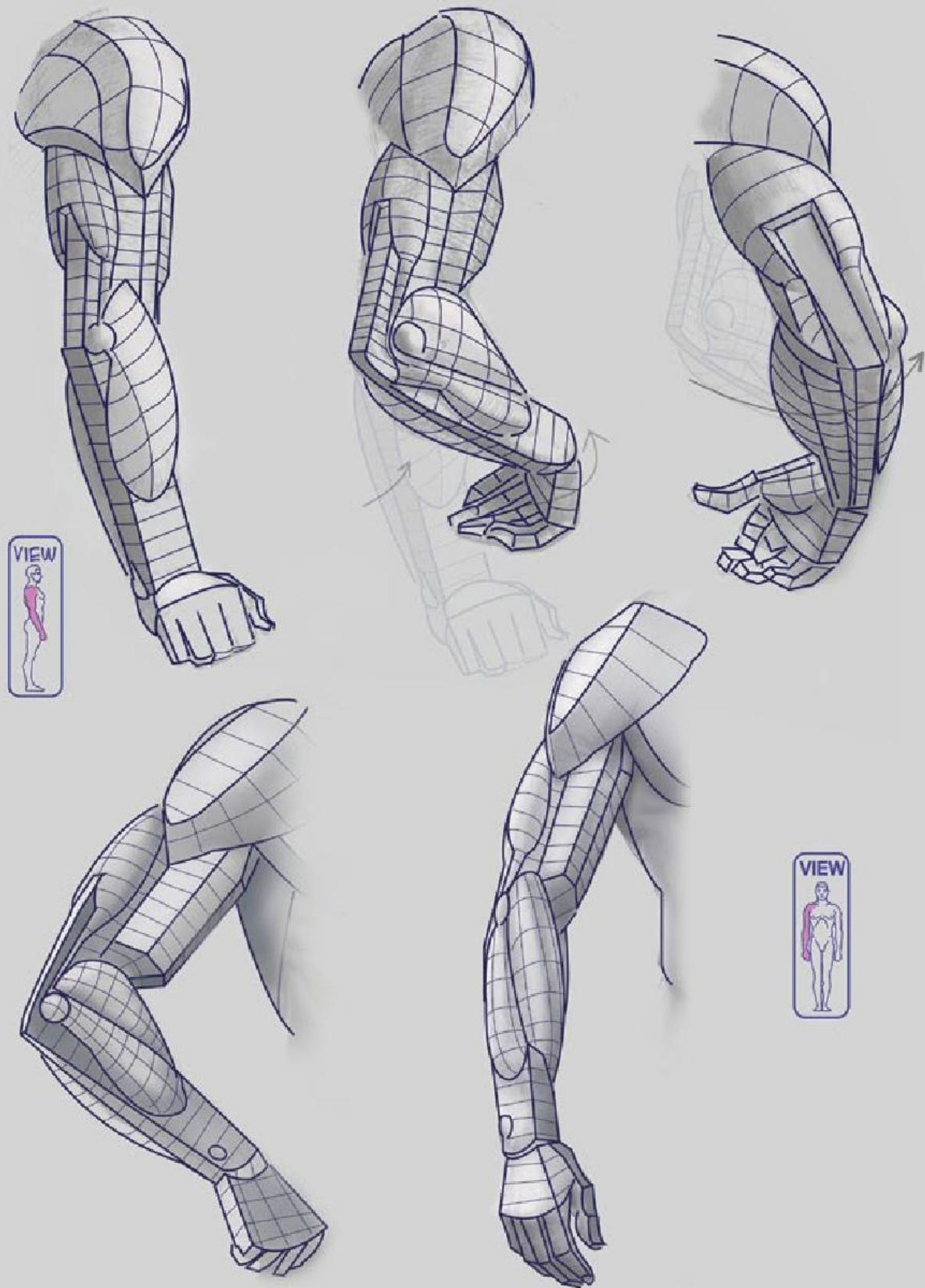
HOW ARMS CONNECT TO THE BODY



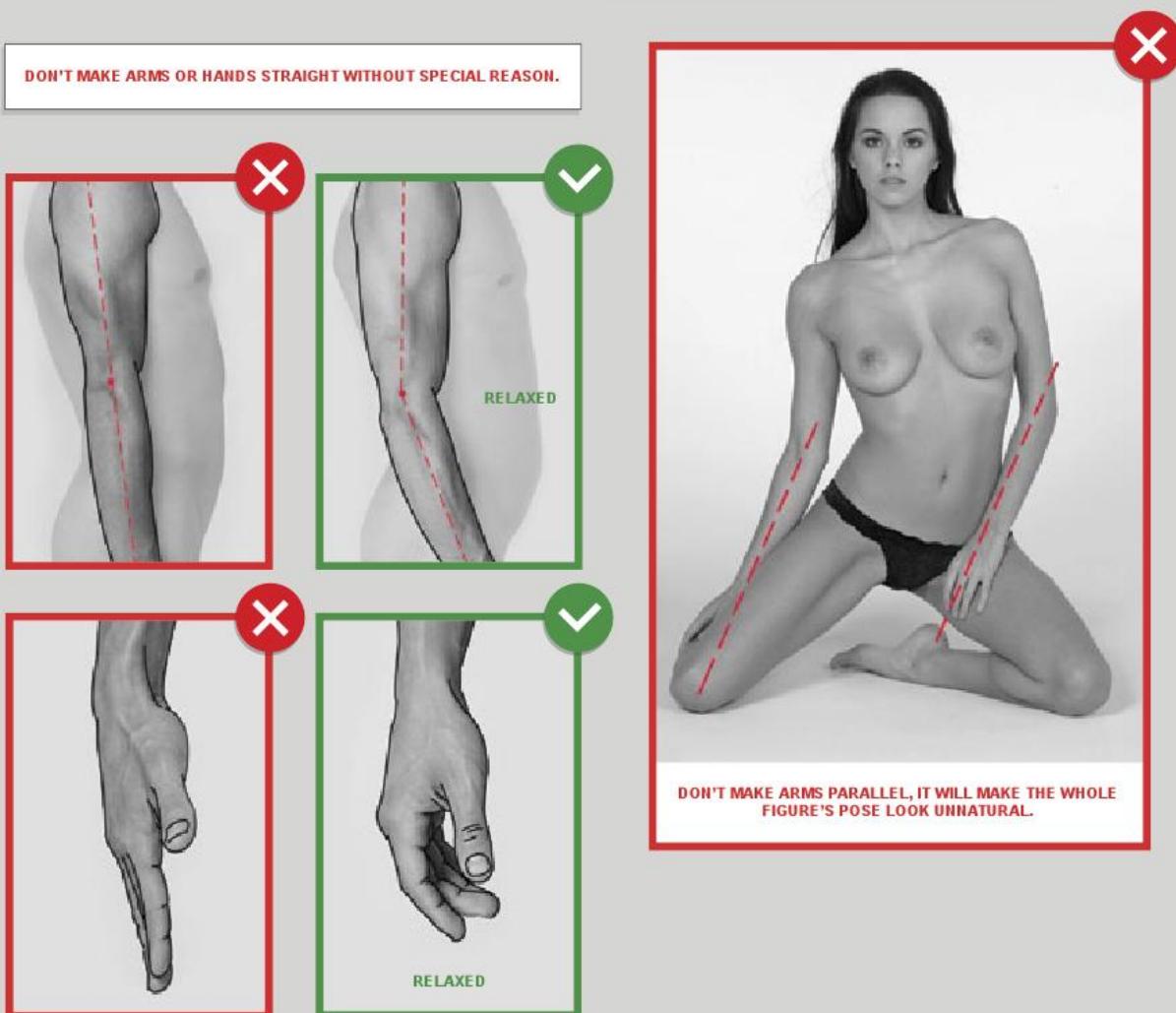
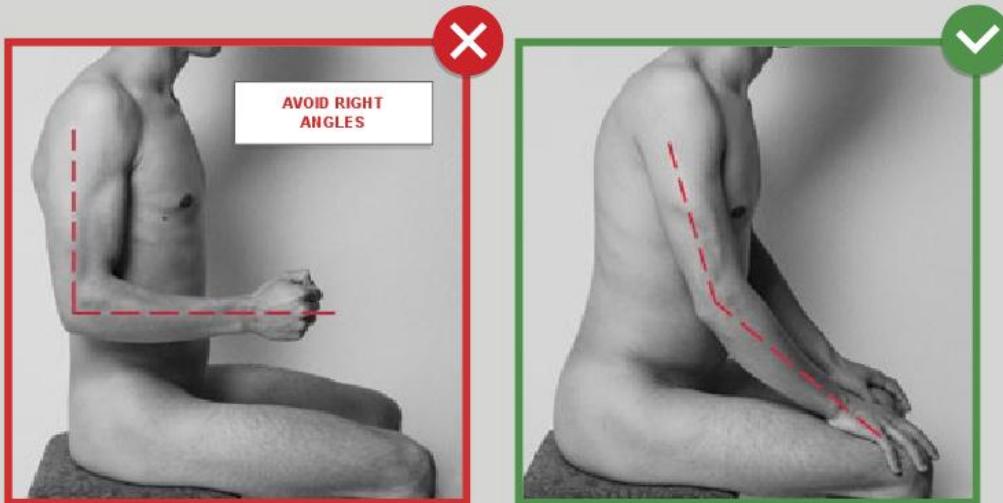
BLOCKING OUT A SEMIPRONATED ARM



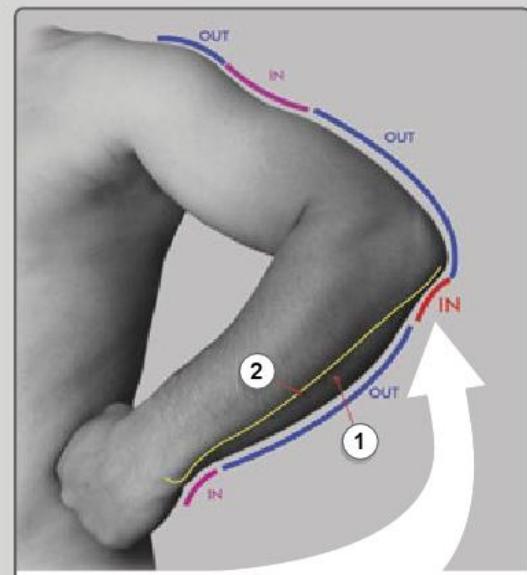
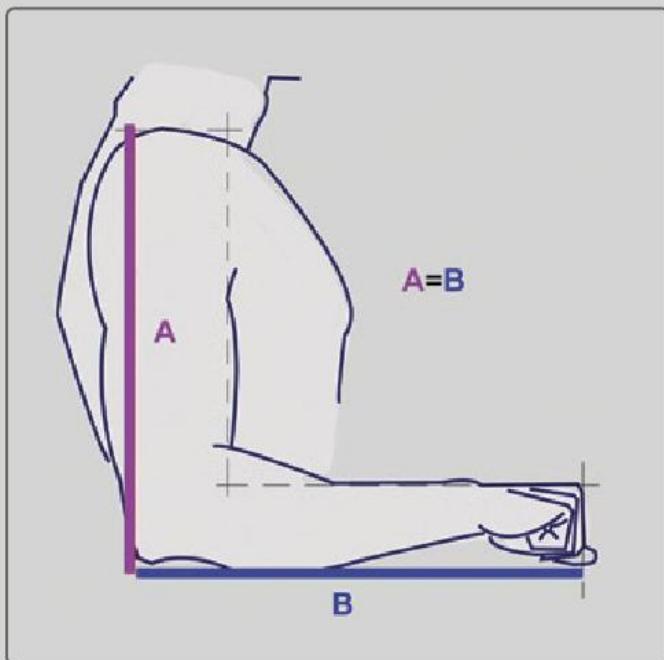
BLOCKING OUT AN ARM



HOW DO YOU MAKE ARMS AND HANDS LOOK LESS STIFF?

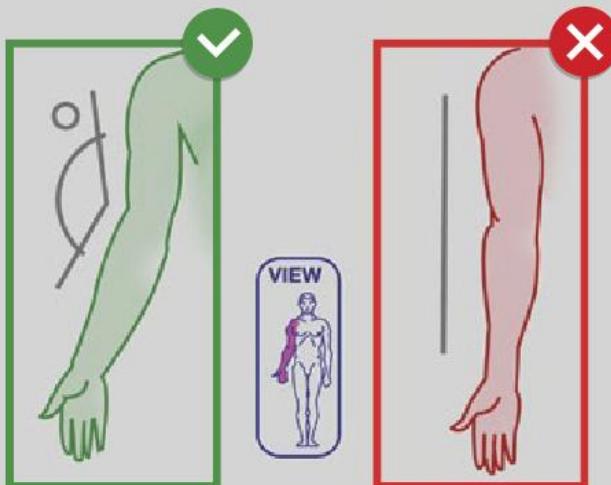


HANDY TIPS



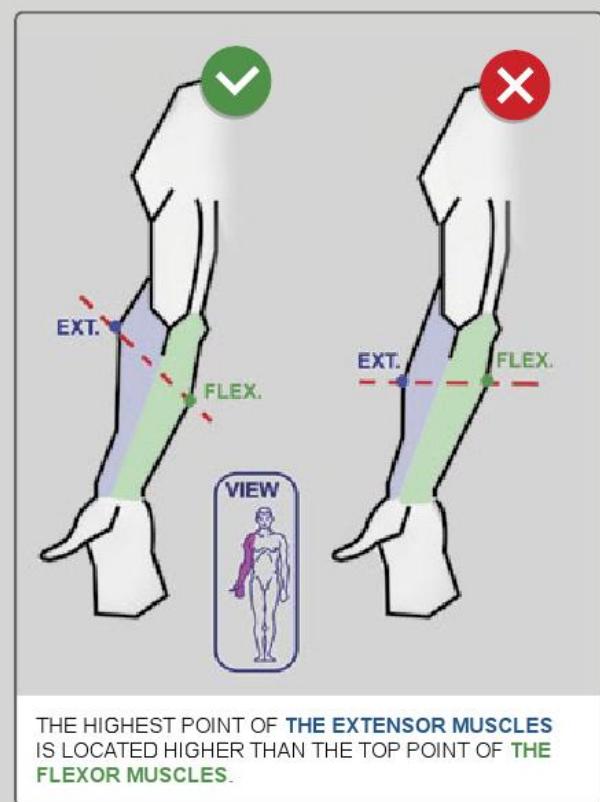
BODY SILHOUETTE APPEARS TO BEND **INWARD** RIGHT BELOW THE ELBOW DUE TO THE FLEXOR CARPI ULRNARIS MUSCLE ① **POPPING OUTWARD**.

ULNA BONE ② REMAINS STRAIGHT.



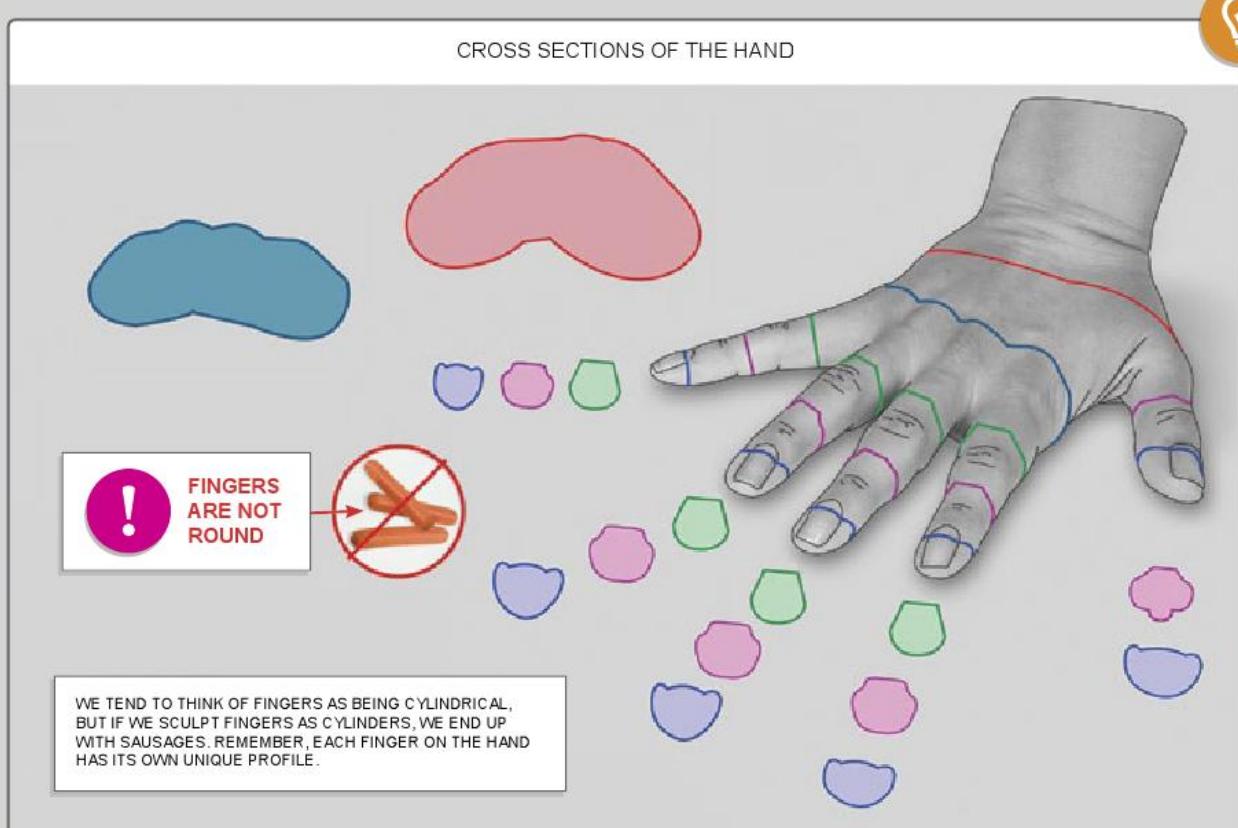
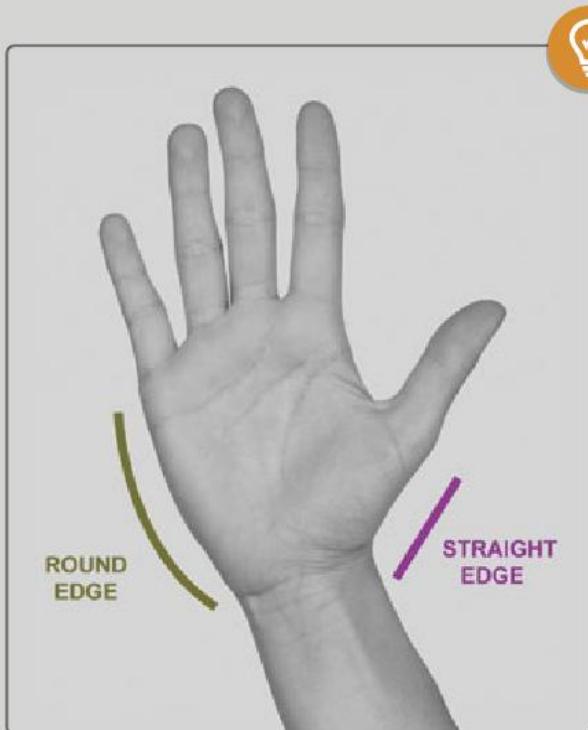
WHEN ARMS ARE HELD OUT AT THE SIDES WITH PALMS FACING FORWARD (SUPINATION), FOREARM AND HAND ARE ABOUT 5 TO 15 DEGREES AWAY FROM THE BODY. THIS IS CALLED "THE CARRYING ANGLE".

FEMALE ARMS HAVE A GREATER C.A.

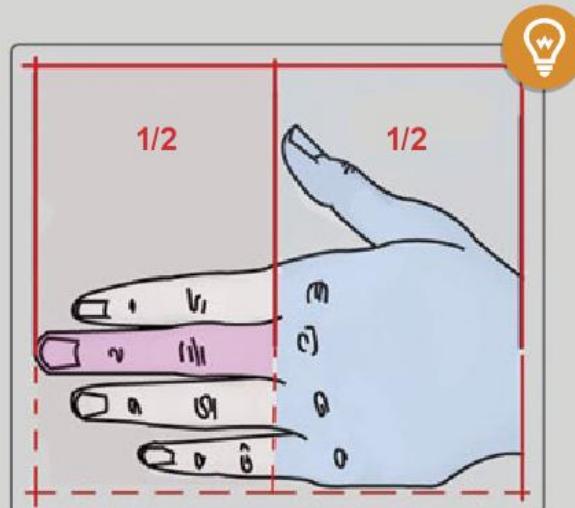
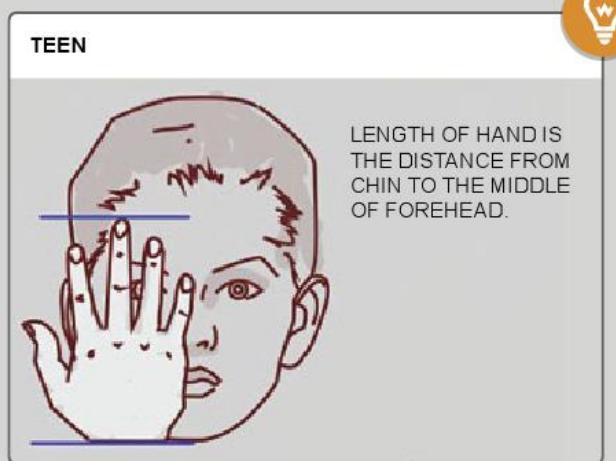
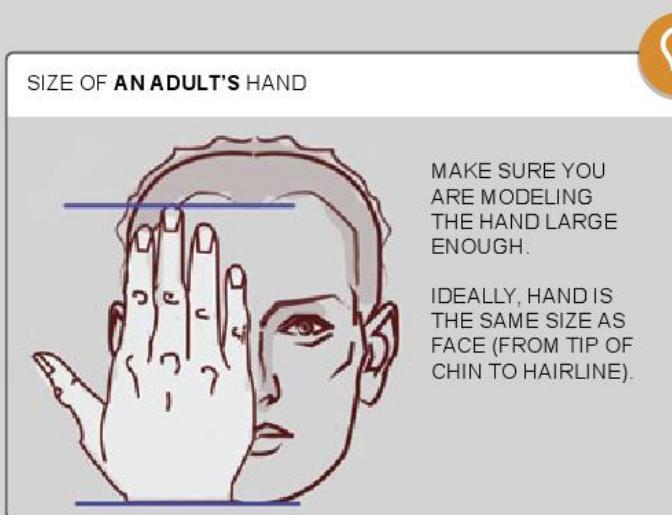


THE HIGHEST POINT OF **THE EXTENSOR MUSCLES** IS LOCATED HIGHER THAN THE TOP POINT OF **THE FLEXOR MUSCLES**.

SHAPES OF THE HAND

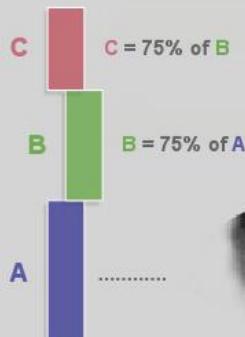


IDEALIZED HAND PROPORTIONS

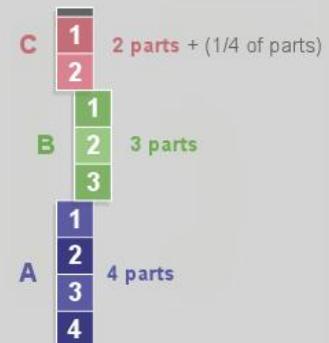


THERE ARE TWO METHODS YOU CAN USE TO CALCULATE FINGER LENGTH.

1st METHOD



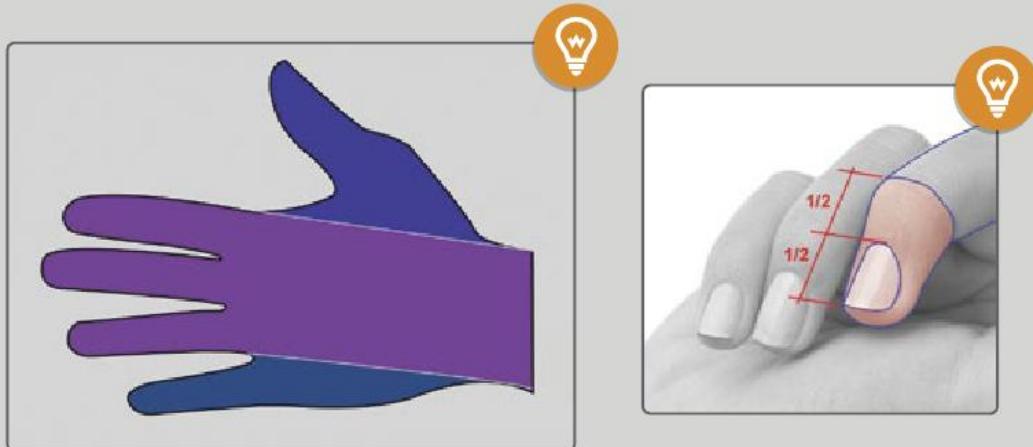
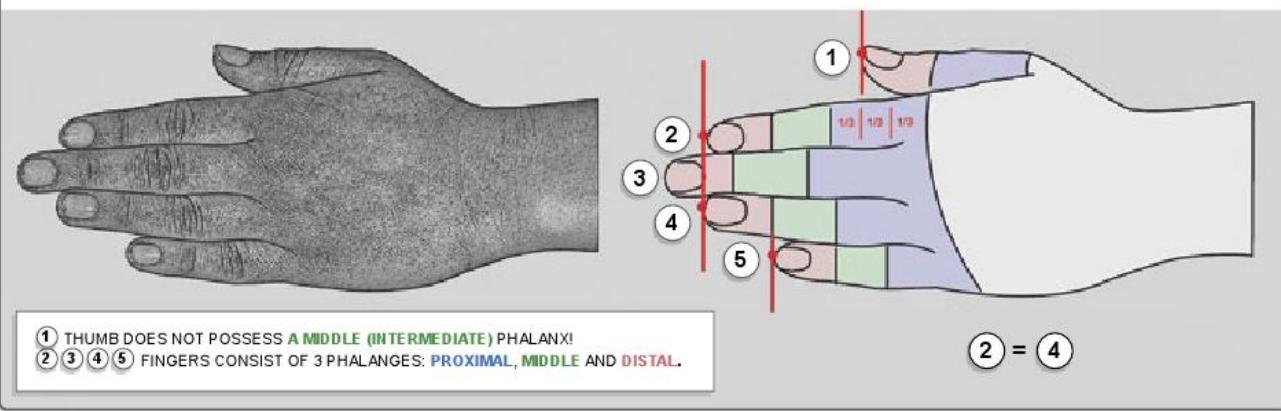
2nd METHOD (9+1/4 parts)



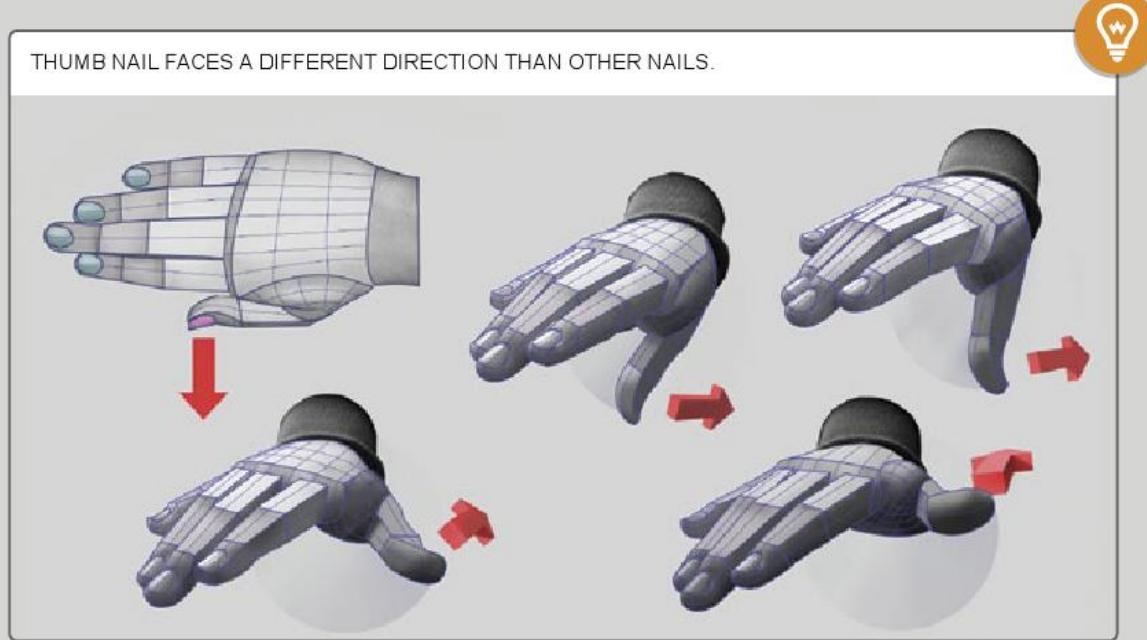
HAND

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FINGER LENGTHS OF AN IDEALIZED HAND

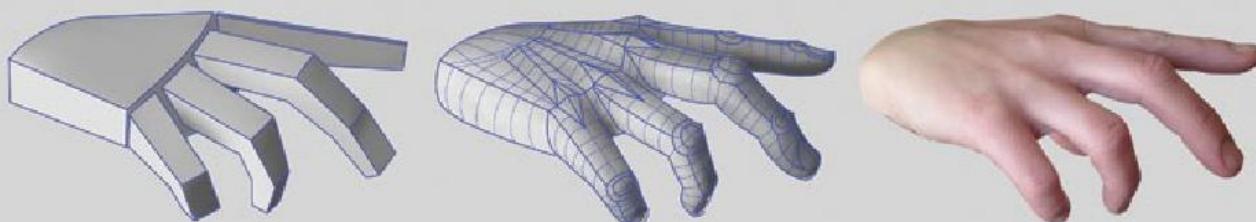


THUMB NAIL FACES A DIFFERENT DIRECTION THAN OTHER NAILS.

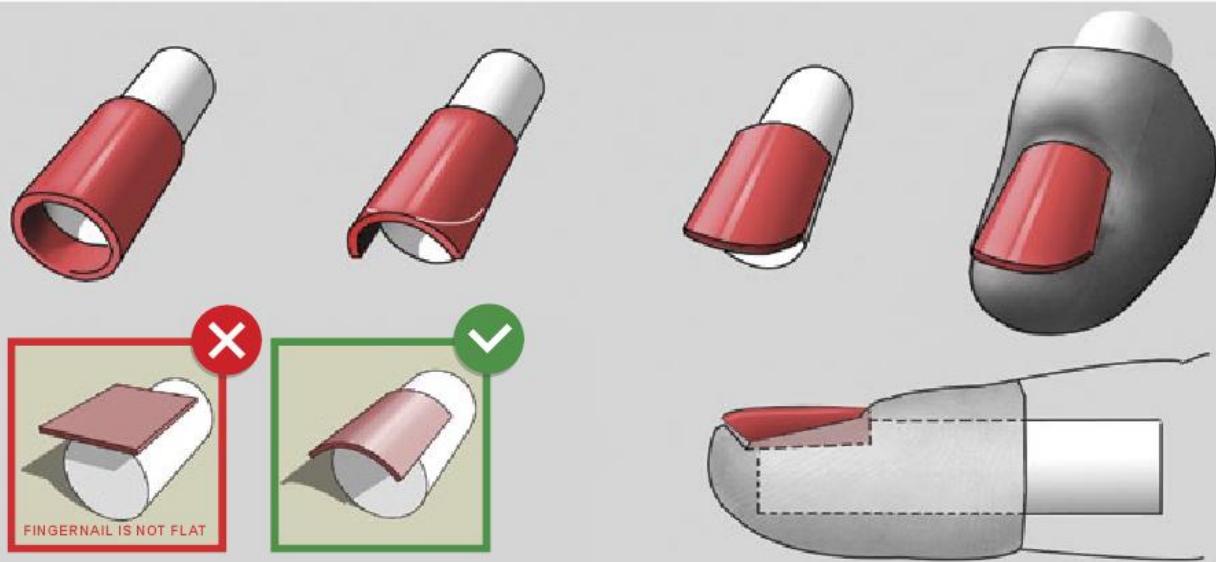


SHAPING HAND AND FINGERS

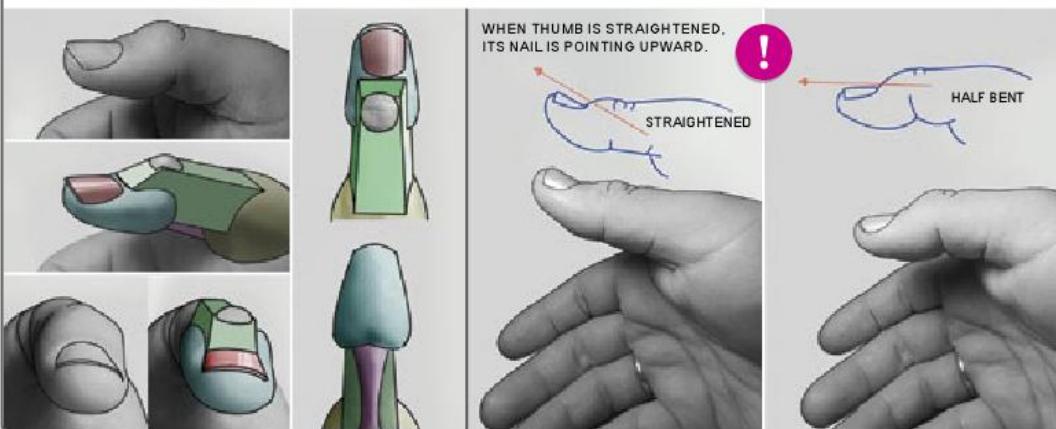
IT IS MUCH EASIER TO BEGIN MODELING FINGERS FROM SIMPLE SQUARE FORMS.



FINGERNAIL

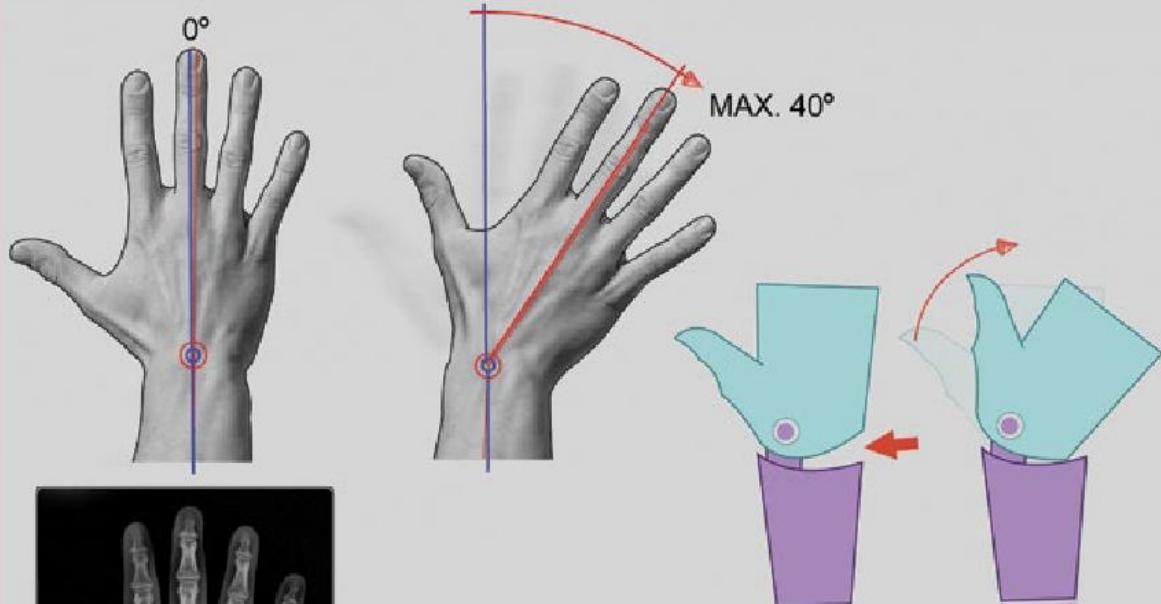


THUMB IS SHAPED DIFFERENTLY THAN OTHER FINGERS.



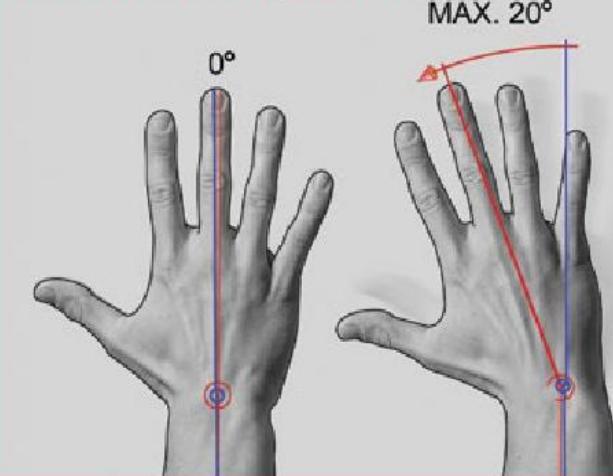
HAND MOVEMENTS

ULNAR DEVIATION (ADDITION)



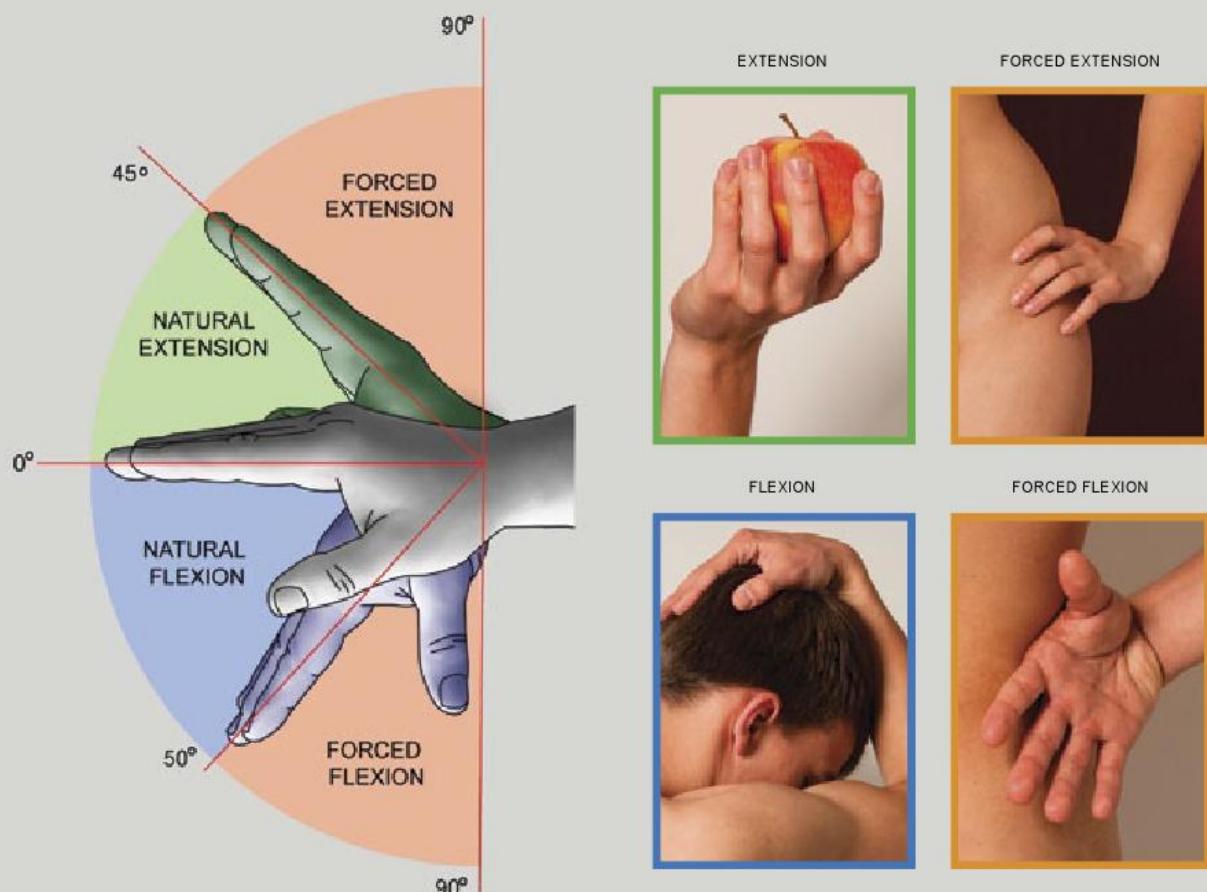
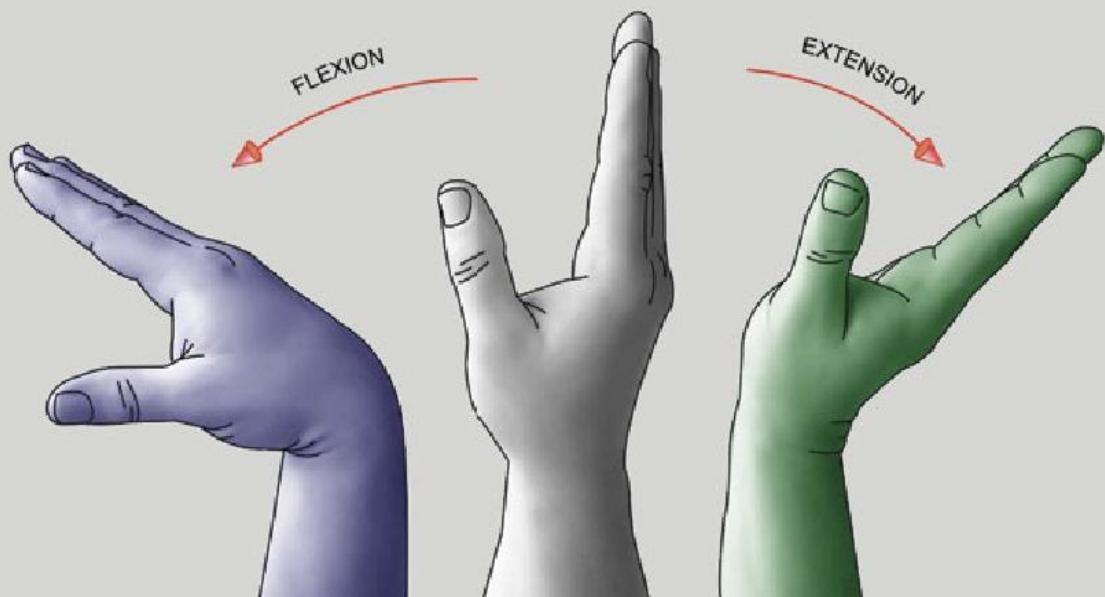
THIS GAP BETWEEN THE PISIFORM BONE AND THE HEAD OF THE URNA, MAKES THIS MOVEMENT POSSIBLE / ULNAR DEVIATION (ADDITION).

RADIAL DEVIATION (ABDUCTION)

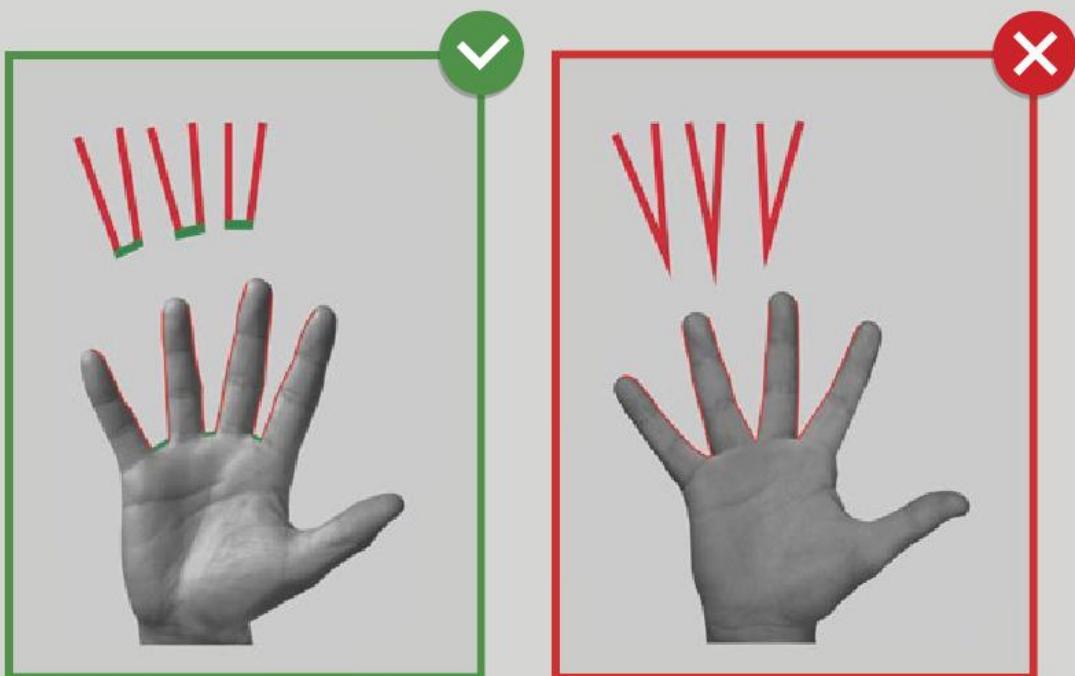
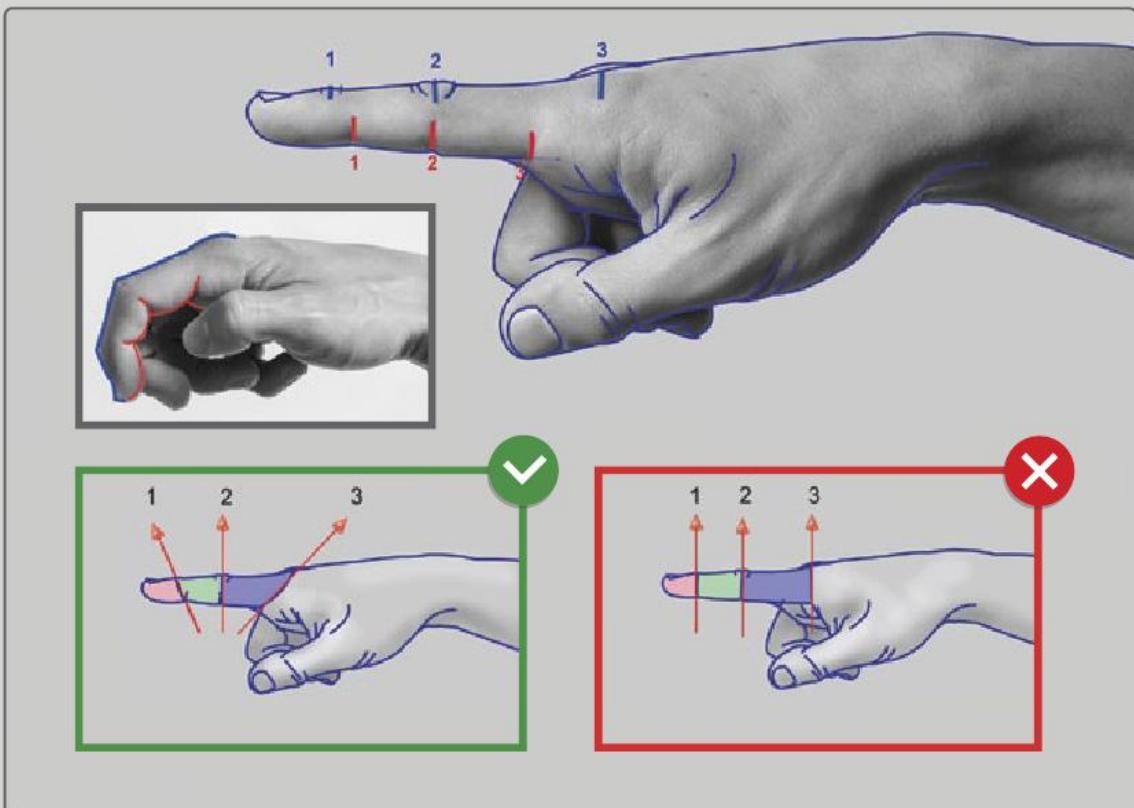


IT'S AN UNNATURAL MOTION: THERE AREN'T ANY MUSCLES DESIGNED SPECIFICALLY TO DO THIS MOVEMENT, SO THE EFFORT COMES FROM THE FLEXOR AND EXTENSOR TENDONS. **WOULD BE BETTER TO AVOID SCULPTING THIS HAND POSITION!**

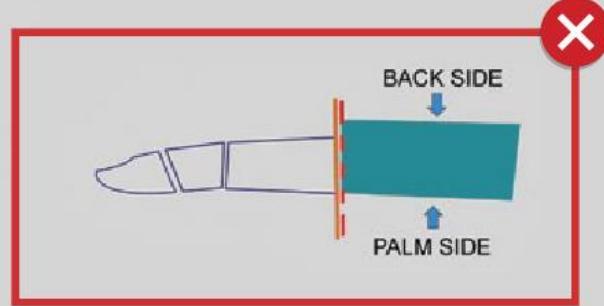
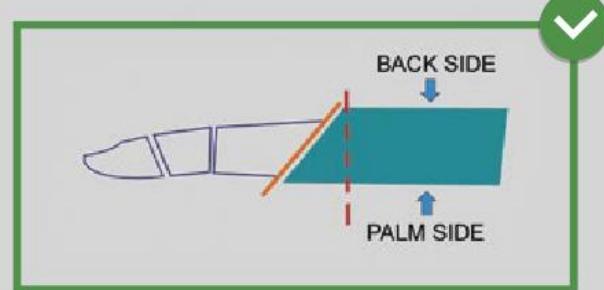
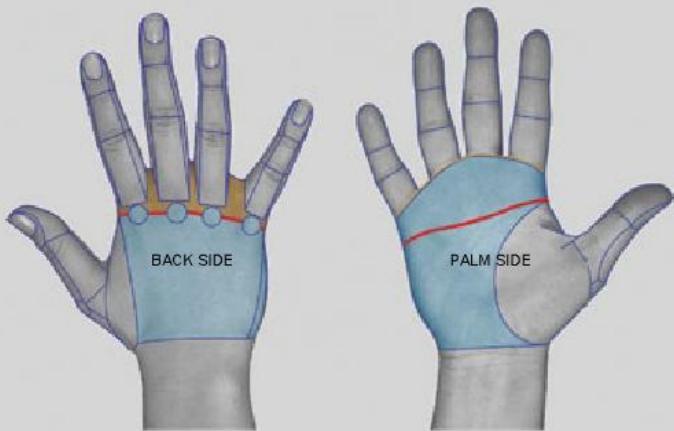
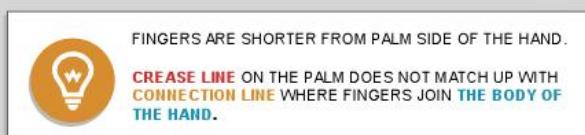
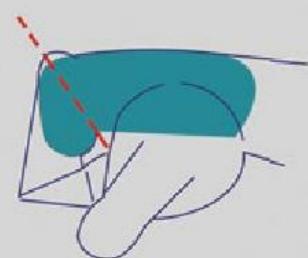
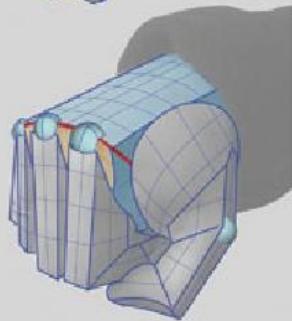
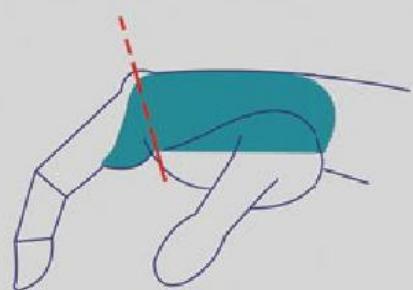
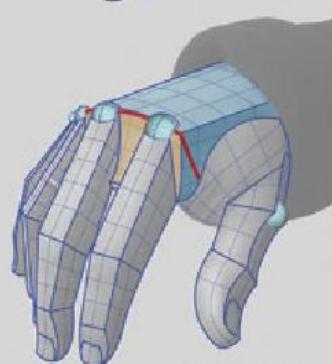
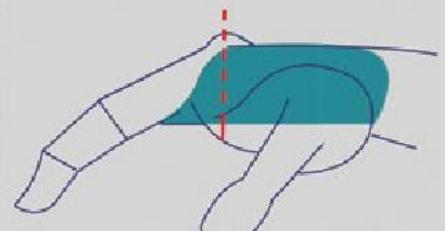
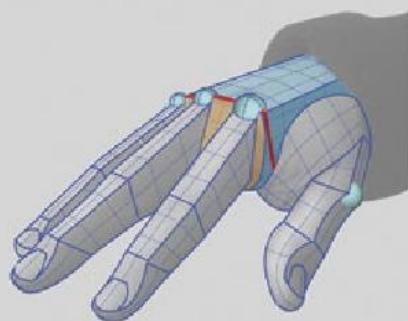
WRIST POSITIONS



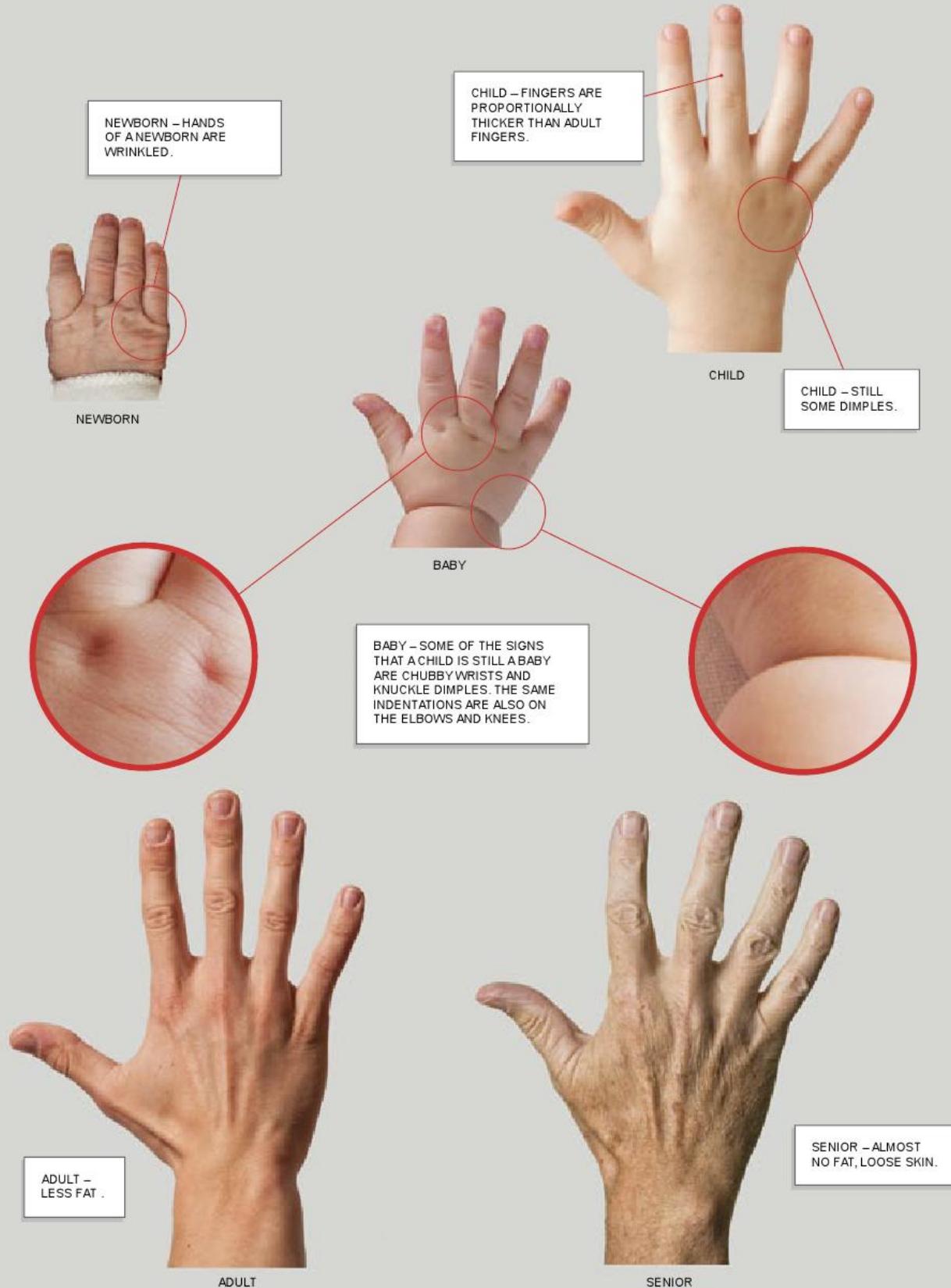
CREASES AND GAPS OF FINGERS



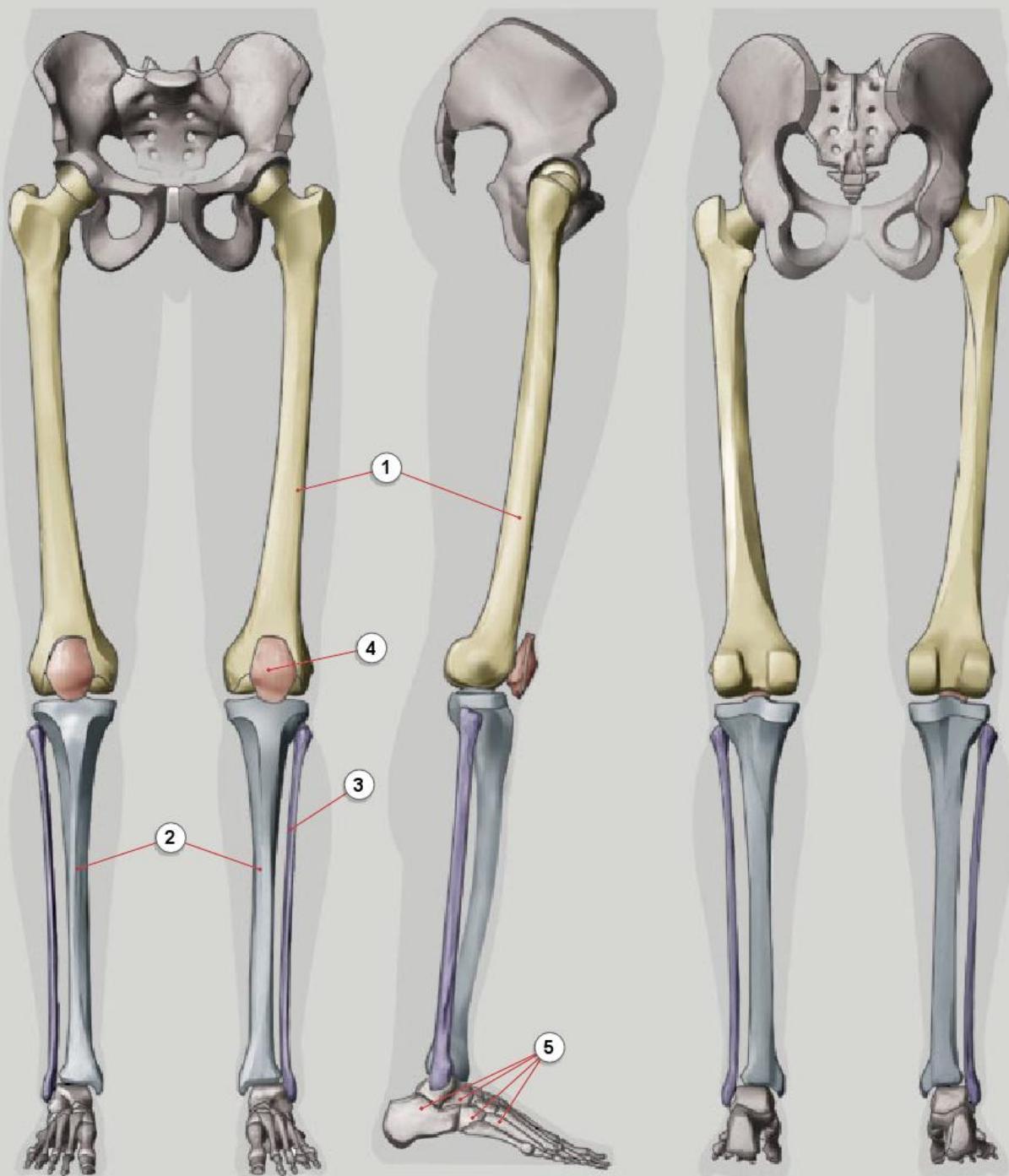
BENDING AND CONNECTION LINE OF FINGERS



HOW HANDS AGE



BONES OF LOWER LIMB



1 FEMUR

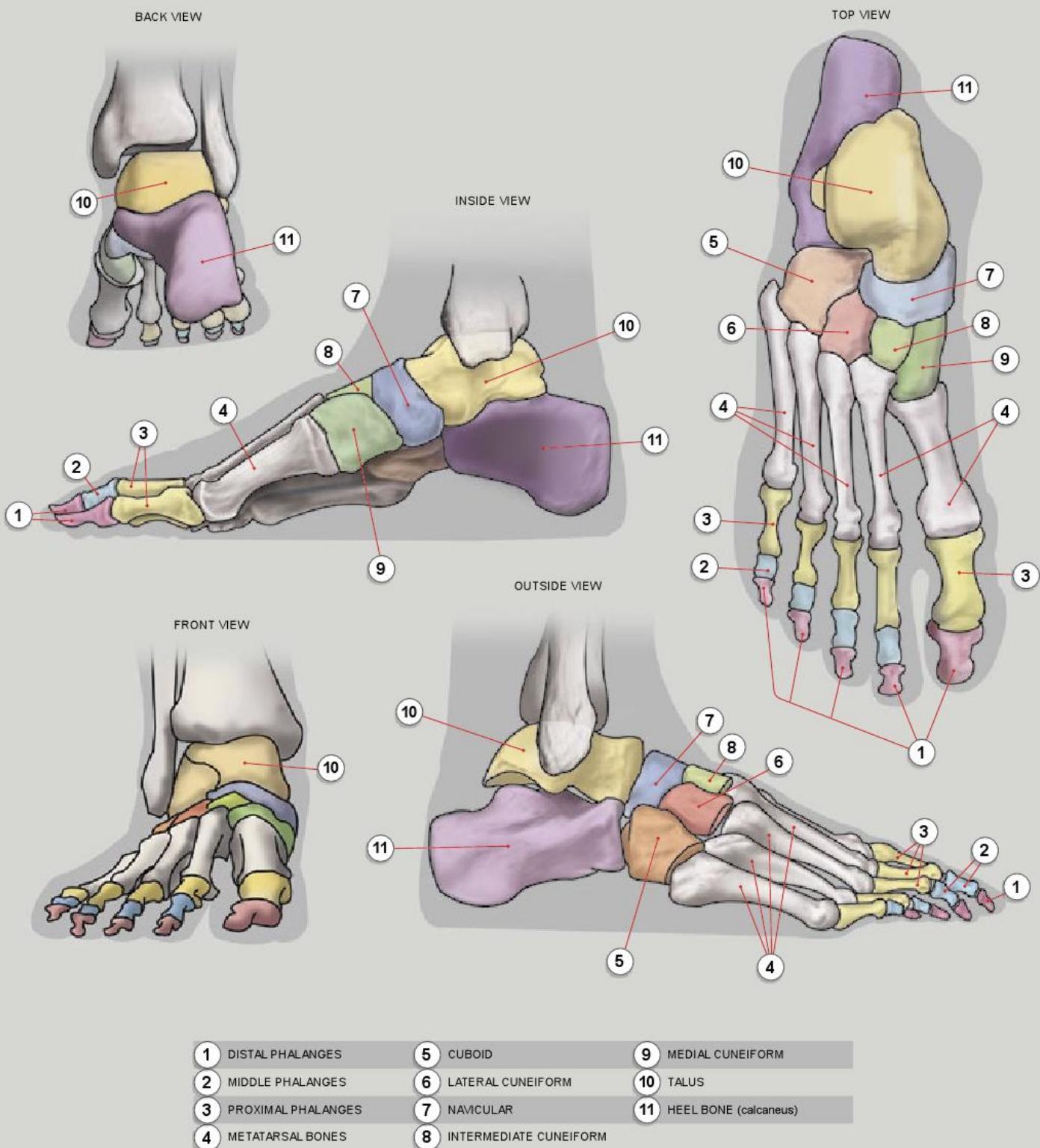
4 KNEE CAP (patella)

2 TIBIA

5 BONES OF THE FOOT

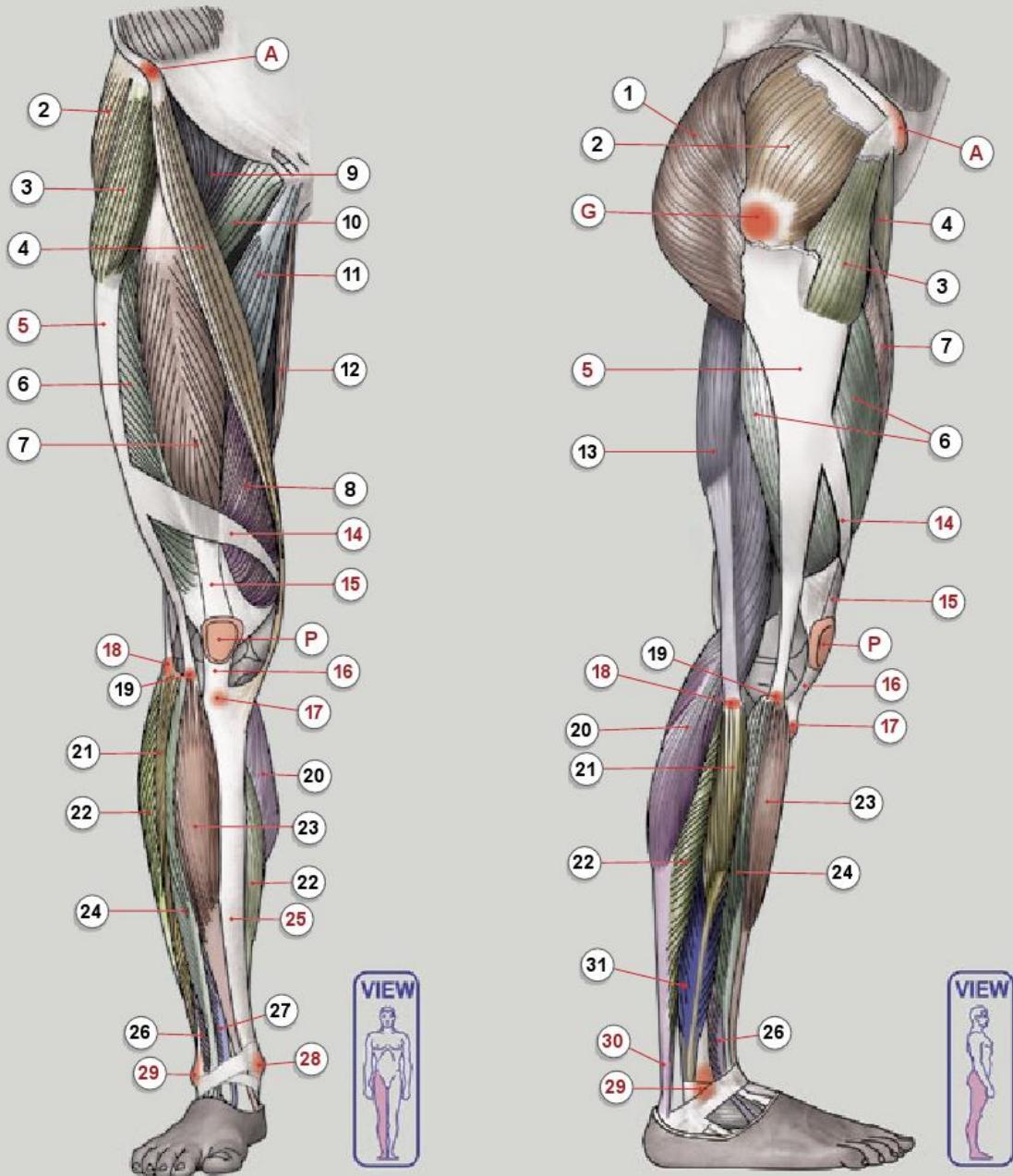
3 FIBULA

BONES OF THE FOOT



MUSCLES OF LOWER LIMB

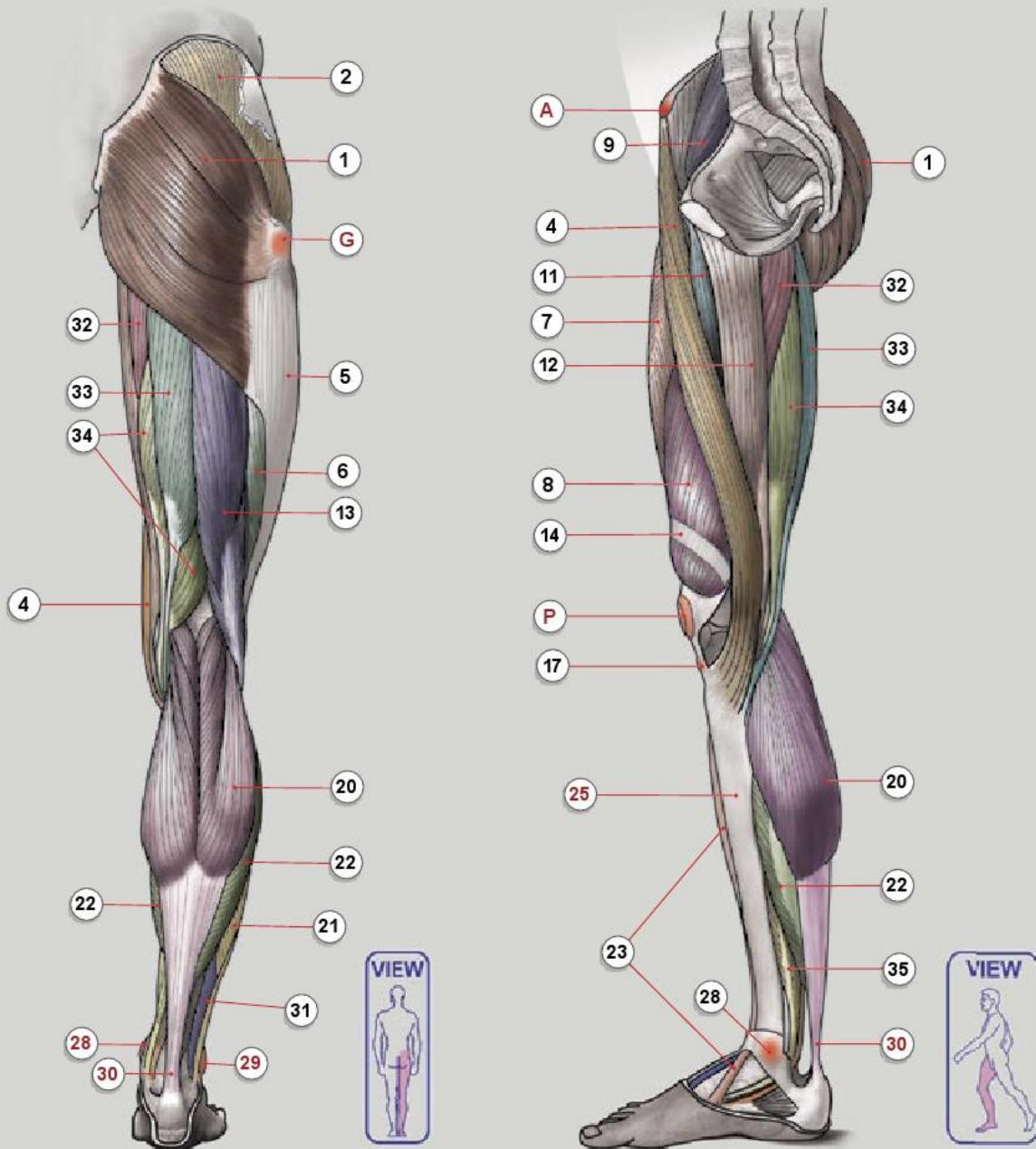
i



A	A.S.I.S.	5	ILIOTIBIAL BAND	12	GRACILIS
G	GREATER TROCHANTER	6	VASTUS LATERALIS	13	BICEPS FEMORIS
P	KNEE CAP (PATELLA)	7	RECTUS FEMORIS	14	RICHER'S BAND
1	GLUTEUS MAXIMUS	8	VASTUS MEDIALIS	15	QUADRICEPS TENDON
2	GLUTEUS MEDIUS	9	ILIOPSOAS	16	PATELLAR LIGAMENT
3	TENSOR FASCIAE LATAE	10	PECTINEUS	17	TIBIAL TUBEROSITY
4	SARTORIUS	11	ADDUCTOR LONGUS	18	HEAD OF FIBULA

MUSCLES OF LOWER LIMB

i

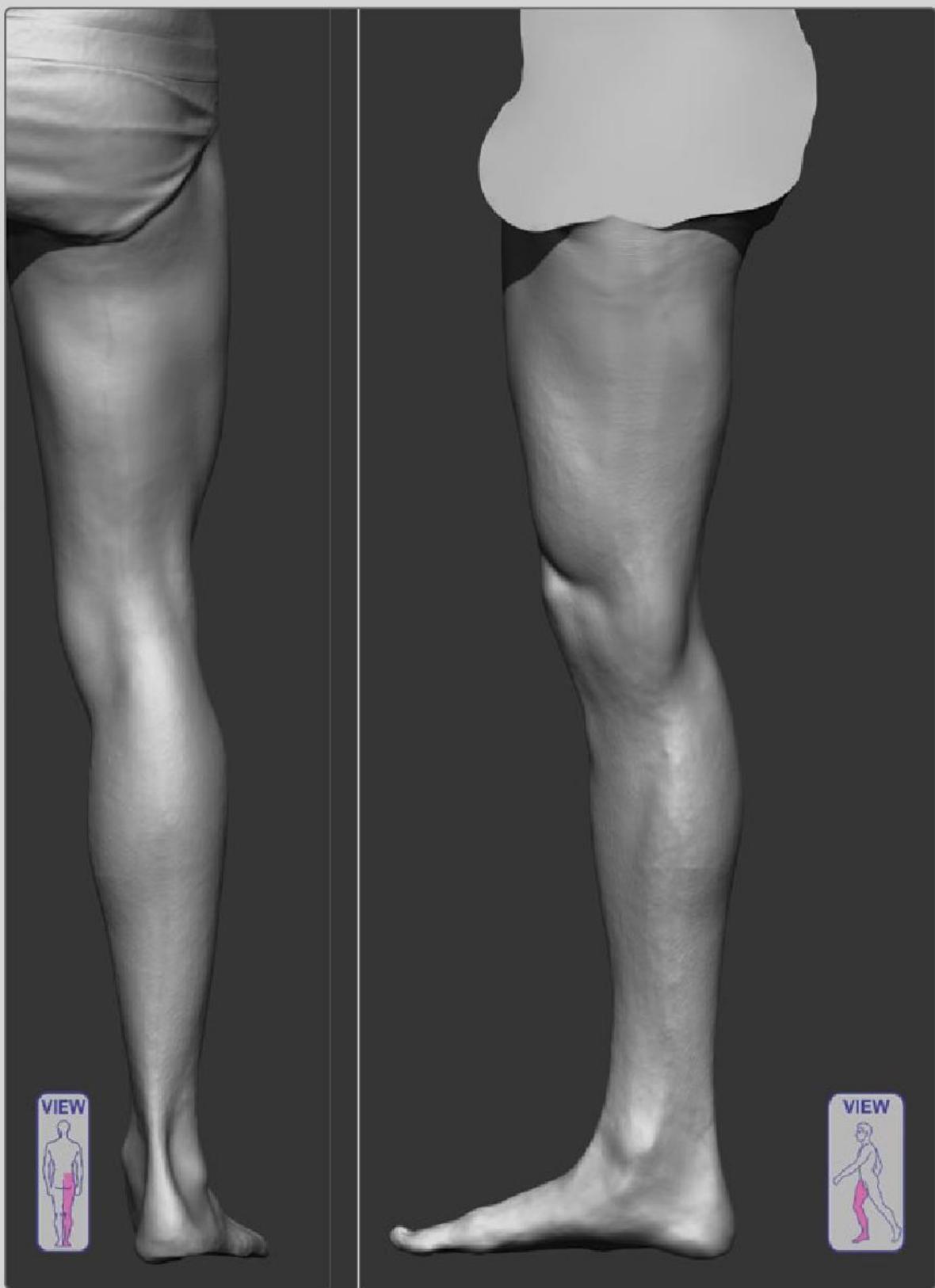


19	LATERAL TIBIAL CONDYLE	25	MEDIAL SURFACE OF TIBIA	31	PERONEUS BREVIS
20	GASTROCNEMIUS	26	PERONEUS TERTIUS	32	ADDUCTOR MAGNUS
21	PERONEUS LONGUS	27	EXTENSOR HALLUCIS LONGUS	33	SEMITENDINOSUS
22	SOLEUS	28	MEDIAL ANKLE (M. MALLEOLUS)	34	SEMIMEMBRANOSUS
23	TIBIALIS ANTERIOR	29	LATERAL ANKLE (L. MALLEOLUS)	35	FLEXOR DIGITORUM LONGUS
24	EXTENSOR DIGITORUM LONGUS	30	ACHILLES TENDON		

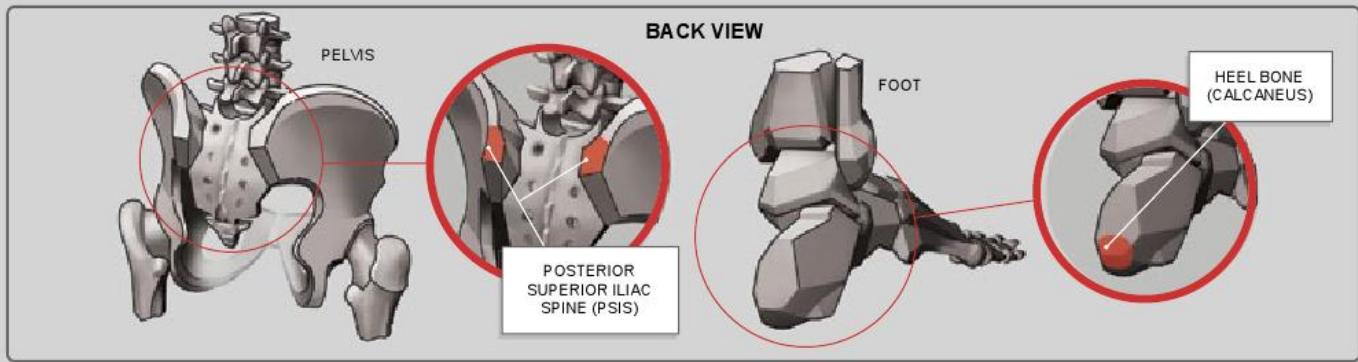
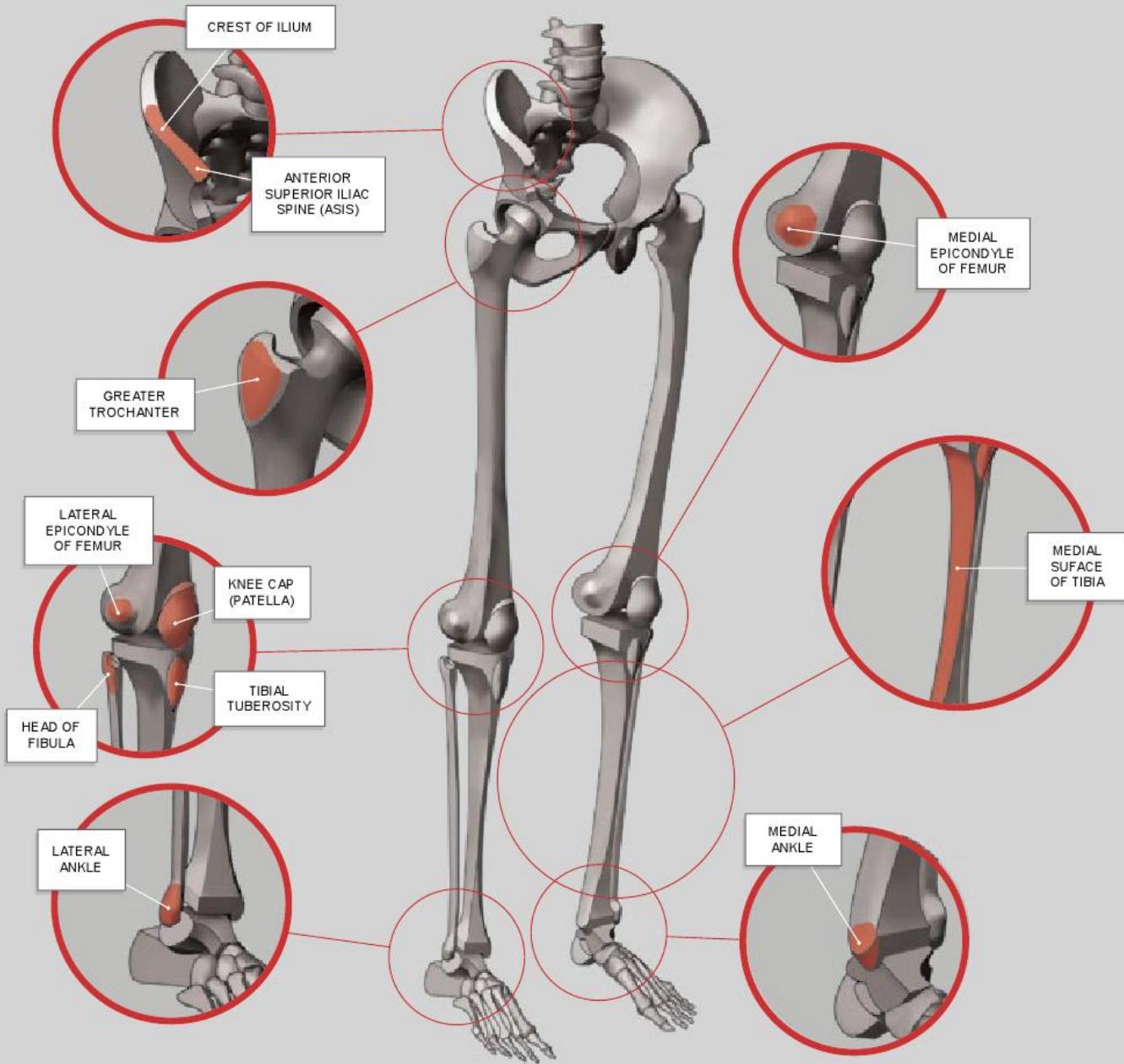
3D SCAN OF RIGHT LEG



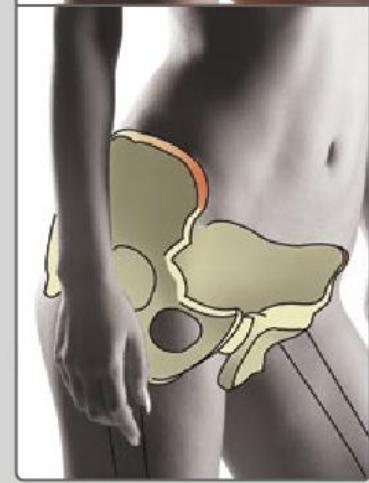
3D SCAN OF RIGHT LEG



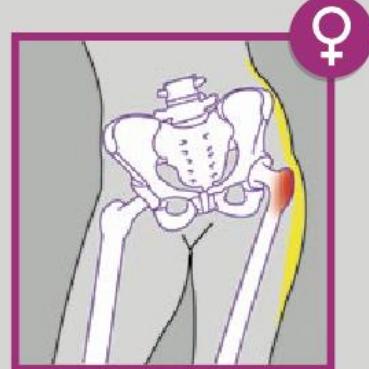
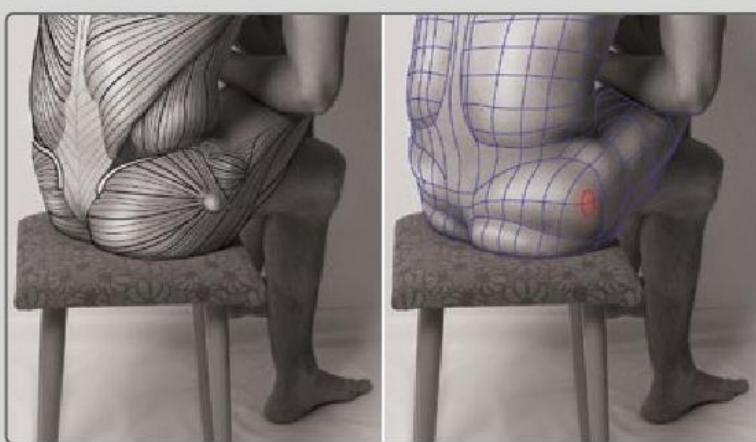
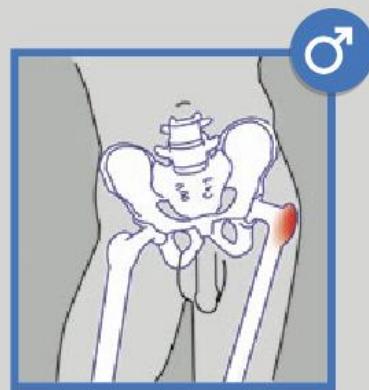
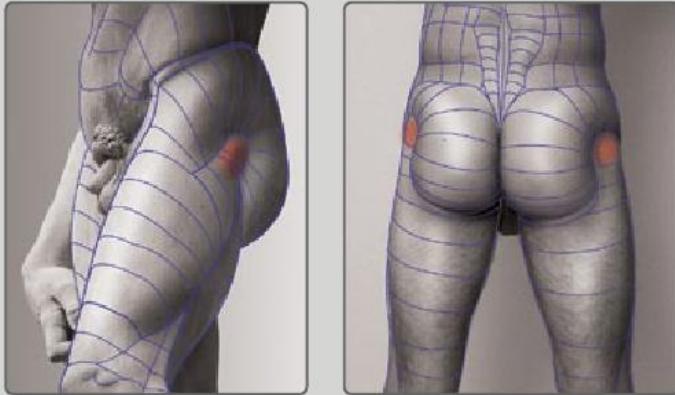
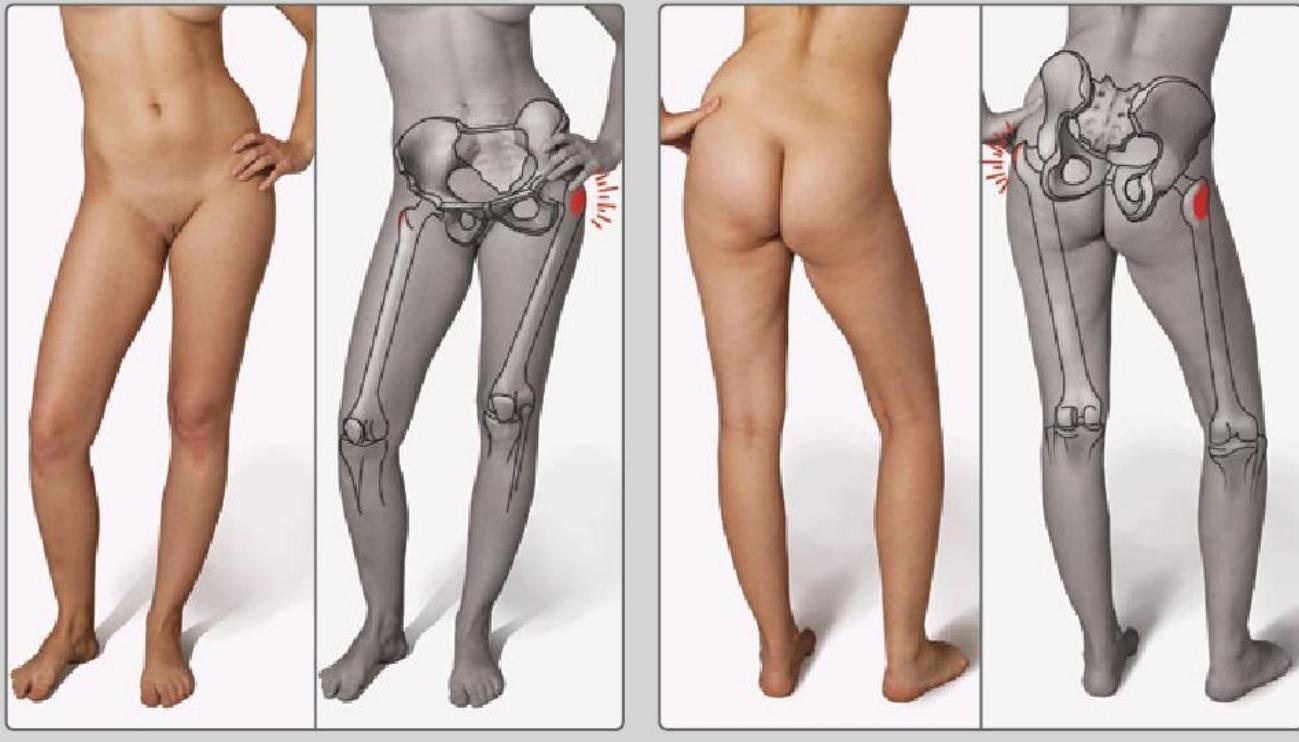
BONY LANDMARKS OF LOWER LIMB



BONY LANDMARKS OF PELVIS



BONY LANDMARKS OF LOWER LIMB GREATER TROCHANter



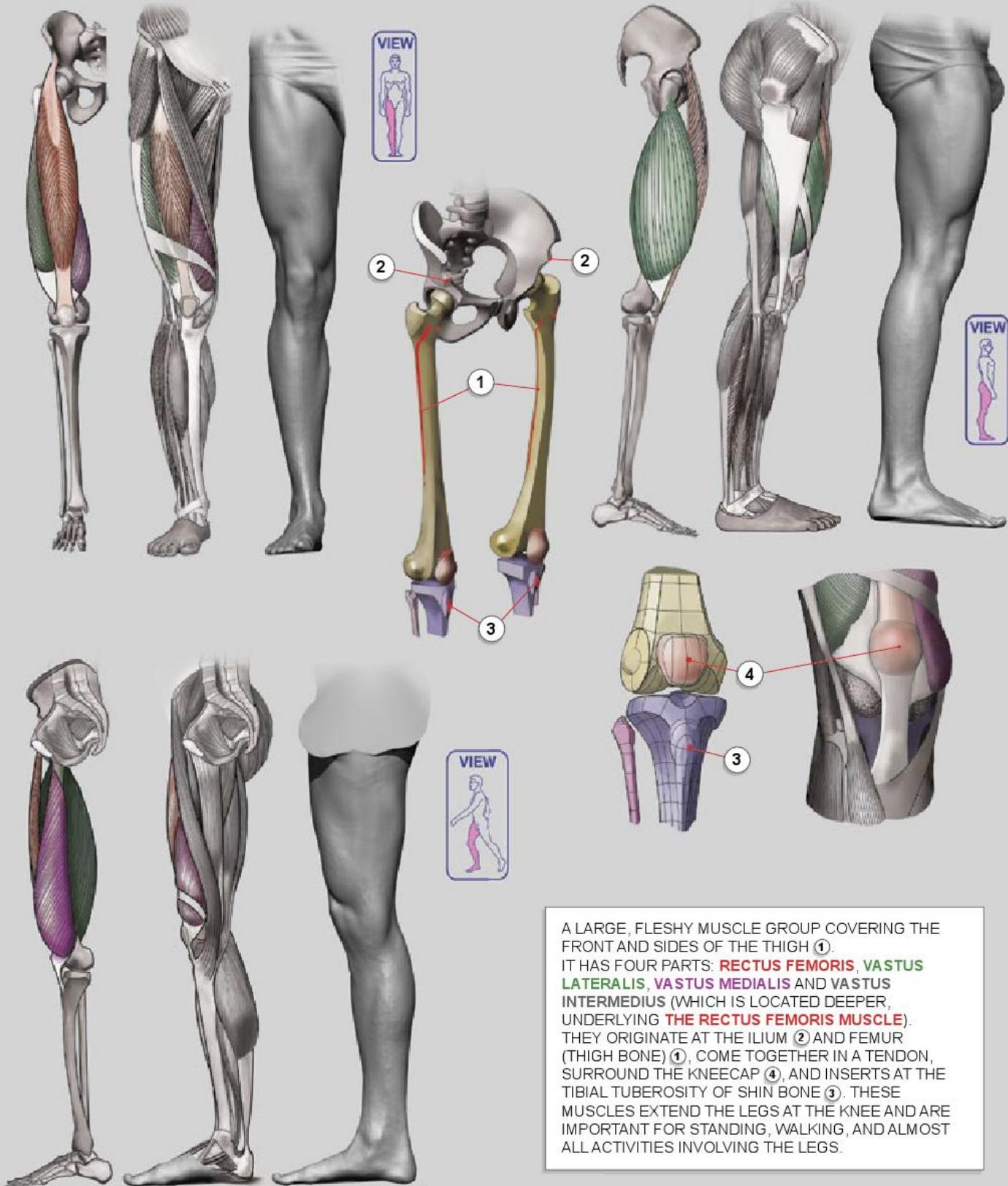
IN FEMALE HIPS, **SUBCUTANEOUS FAT** COVERS
GT AT THE TOP OF FEMUR AND THEREFORE
MAKES IT LESS PROMINENT.

MALE LEG SHAPES



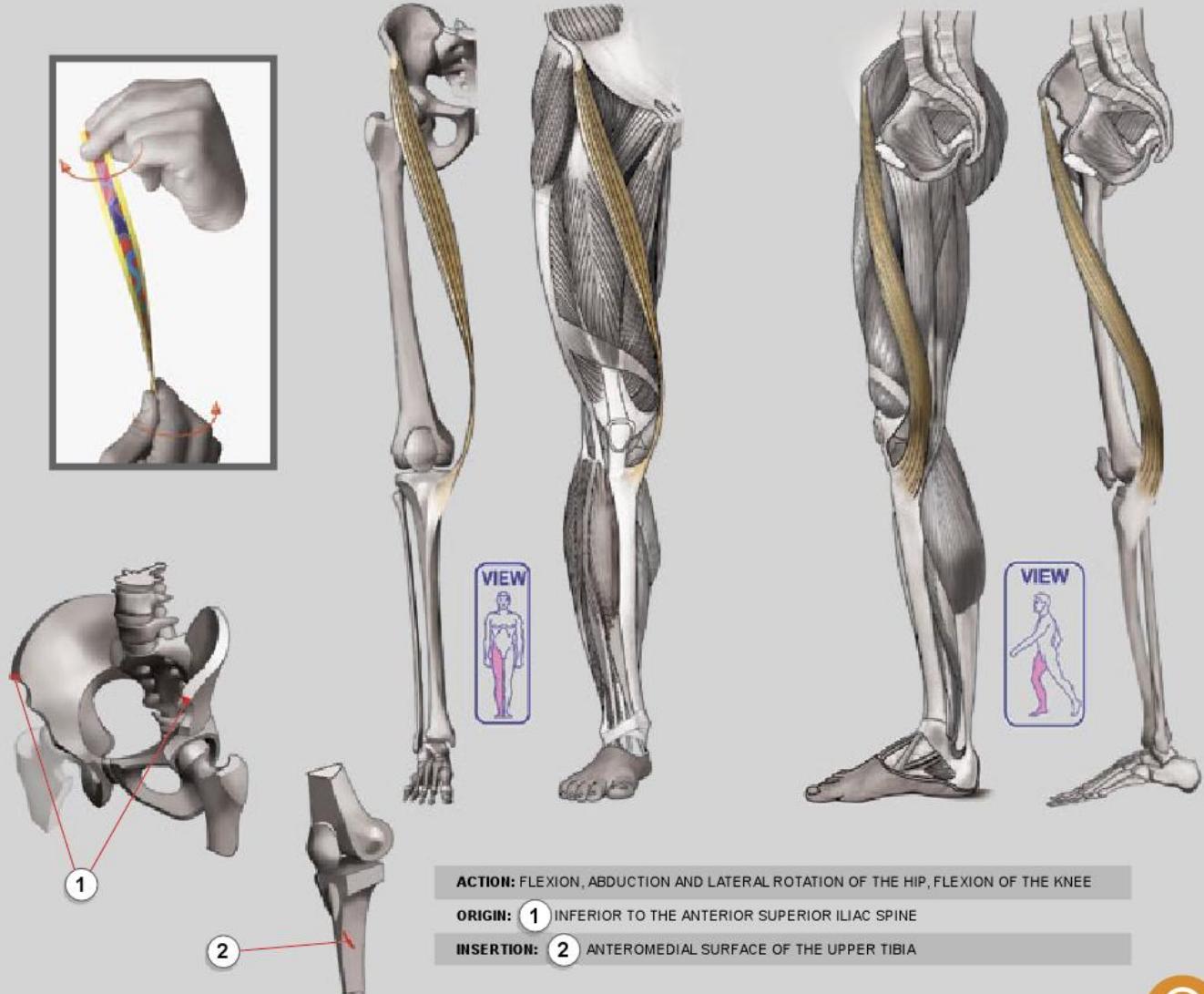
QUADS

(QUADRICEPS FEMORIS MUSCLE)

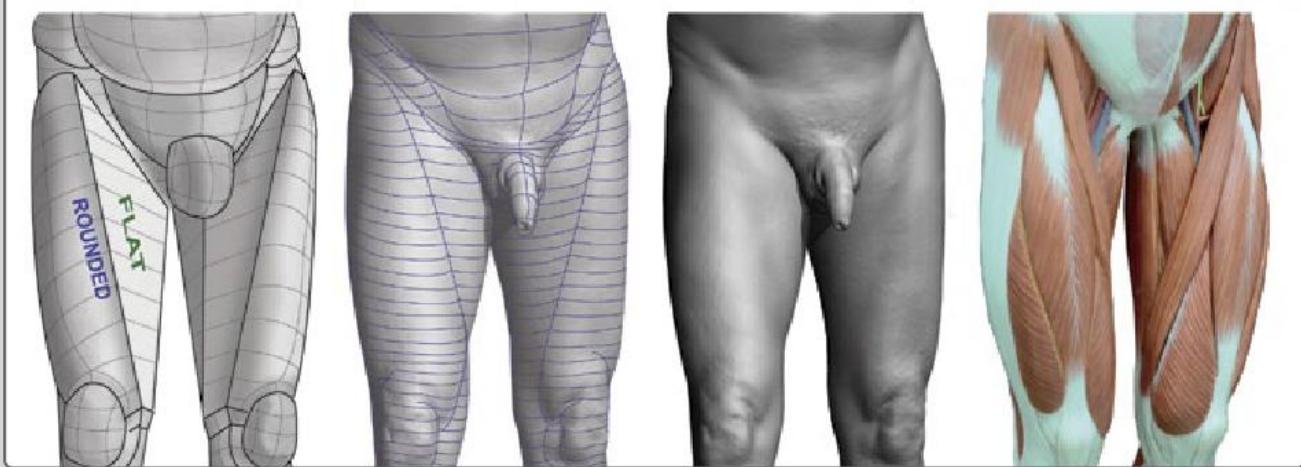


A LARGE, FLESHY MUSCLE GROUP COVERING THE FRONT AND SIDES OF THE THIGH ①. IT HAS FOUR PARTS: **RECTUS FEMORIS**, **VASTUS LATERALIS**, **VASTUS MEDIALIS** AND **VASTUS INTERMEDIUS** (WHICH IS LOCATED DEEPER, UNDERLYING **THE RECTUS FEMORIS MUSCLE**). THEY ORIGINATE AT THE ILIUM ② AND FEMUR (THIGH BONE) ①, COME TOGETHER IN A TENDON, SURROUND THE KNEECAP ④, AND INSERTS AT THE TIBIAL TUBEROSITY OF SHIN BONE ③. THESE MUSCLES EXTEND THE LEGS AT THE KNEE AND ARE IMPORTANT FOR STANDING, WALKING, AND ALMOST ALL ACTIVITIES INVOLVING THE LEGS.

SARTORIUS MUSCLE

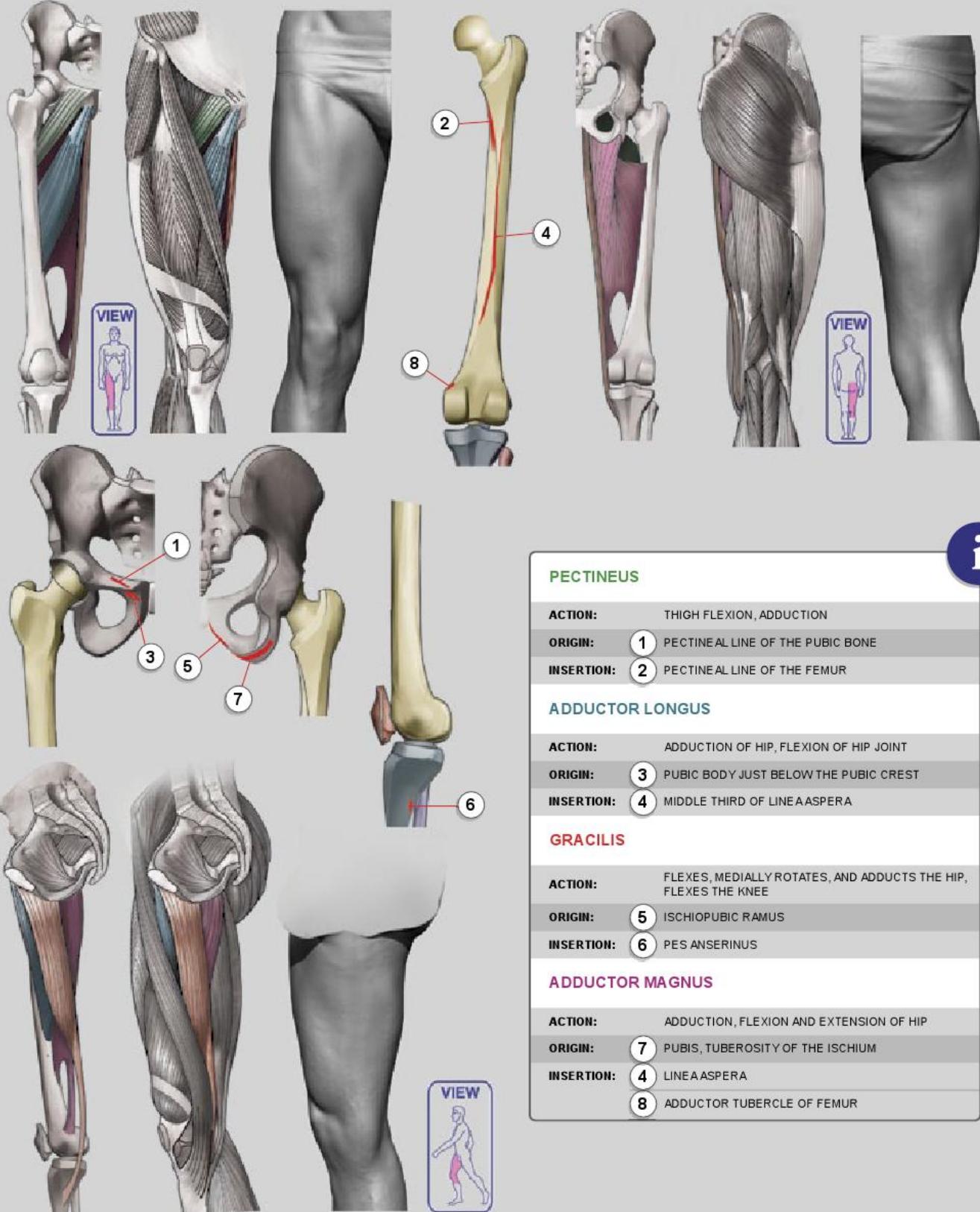


SARTORIUS MUSCLE DIVIDES THIGH INTO TWO PLANES



PECTINEUS, ADDUCTOR LONGUS, GRACILIS, AND ADDUCTOR MAGNUS

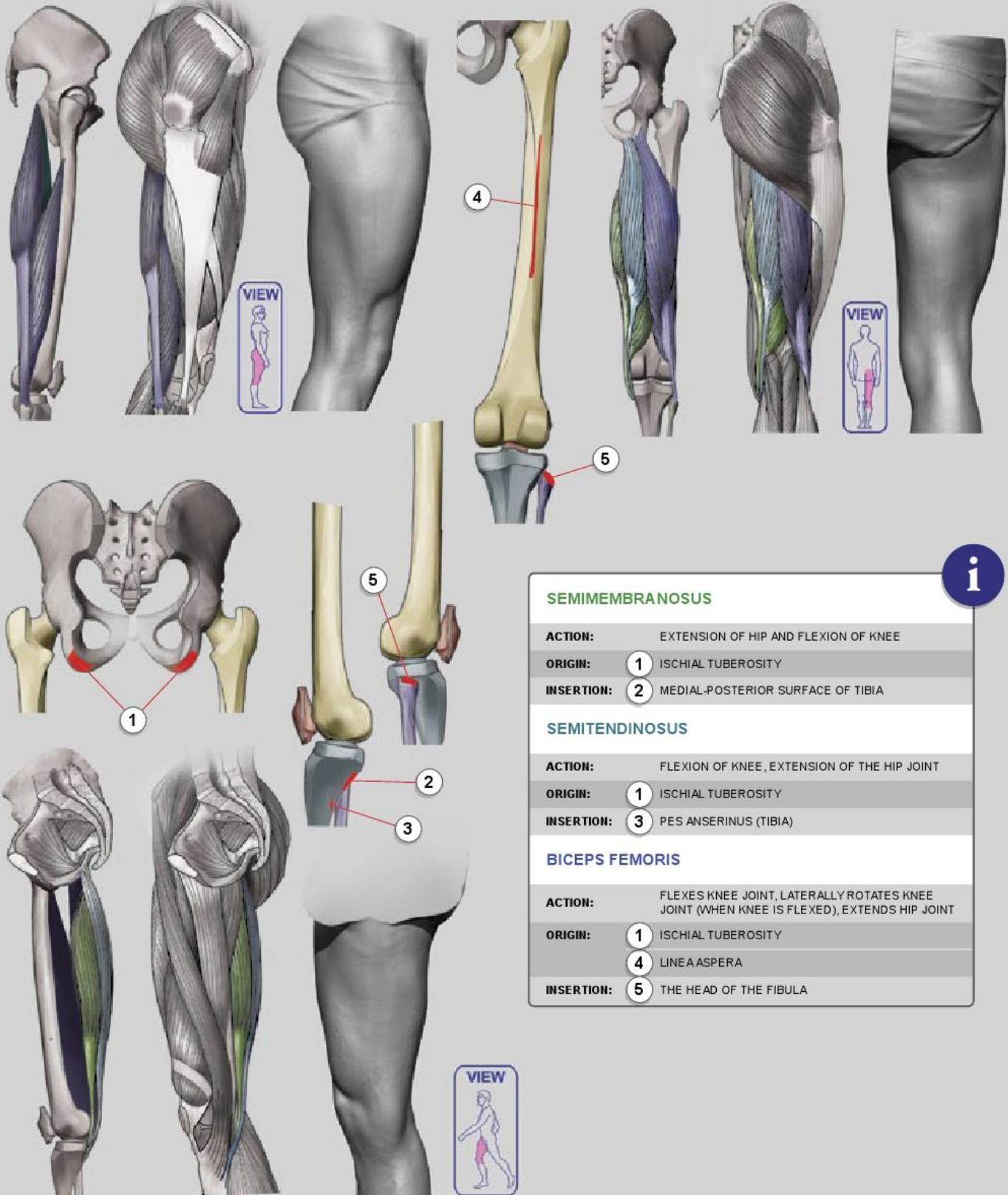
(ADDUCTOR MUSCLES OF THE HIP)



HAMSTRINGS

(FLEXORS OF THE THIGH)

SEMITENDINOSUS, SEMIMEMBRANOSUS AND BICEPS FEMORIS MUSCLES

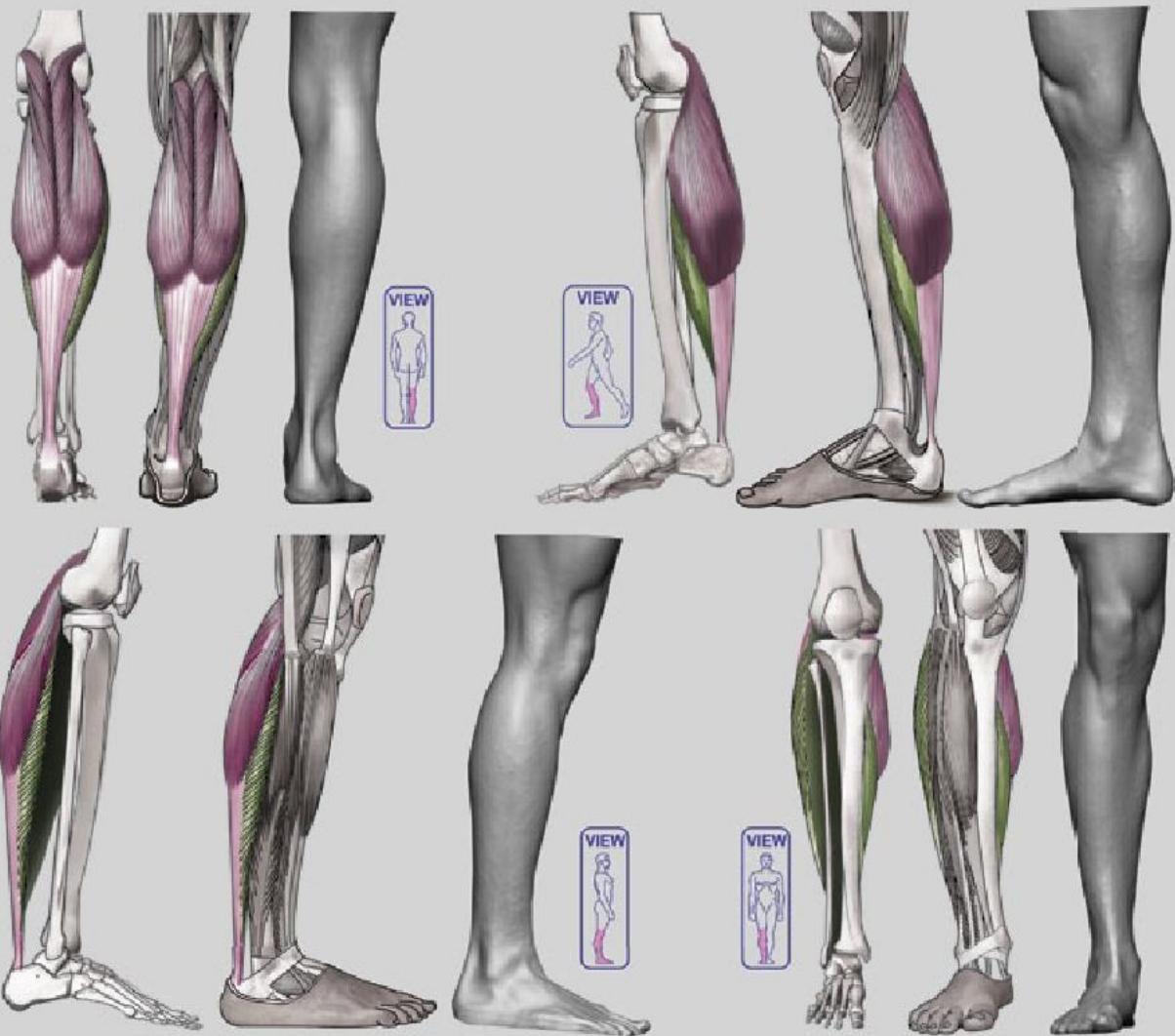


CALVES



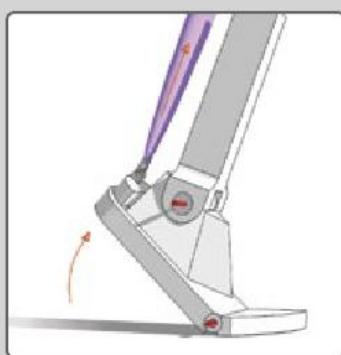
THE CALF

(GASTROCNEMIUS AND SOLEUS MUSCLES)

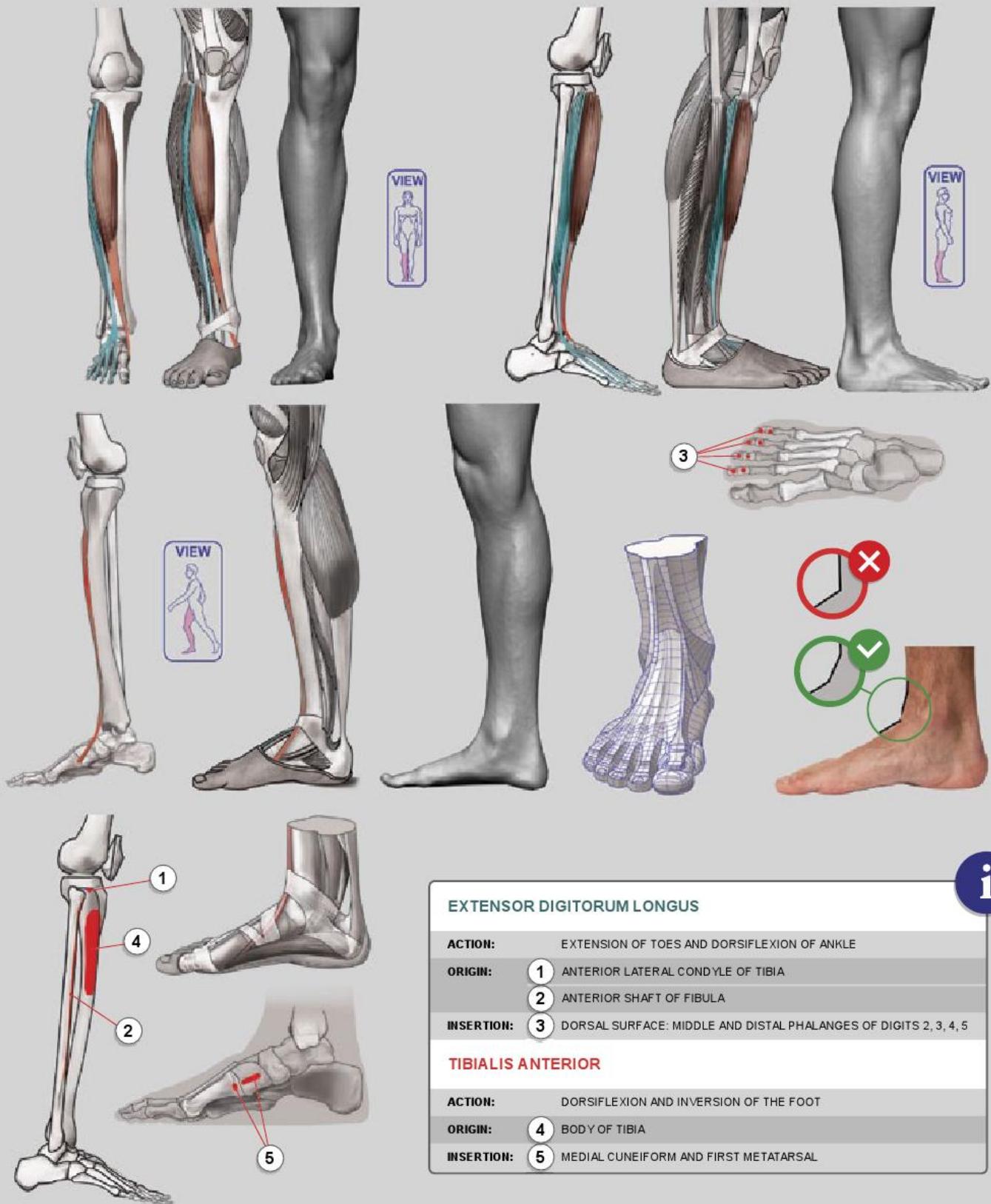


GASTROCNEMIUS MUSCLE IS THE LARGER CALF MUSCLE, FORMING A BULGE VISIBLE BEHIND THE SKIN. **THE GASTROCNEMIUS** HAS TWO PARTS OR 'HEADS', WHICH TOGETHER CREATE ITS DIAMOND SHAPE. **THE SOLEUS** IS A SMALLER, FLAT MUSCLE THAT LIES UNDERNEATH THE **GASTROCNEMIUS** MUSCLE. CONNECTIVE TISSUE AT THE BOTTOM OF THE CALF MUSCLE MERGES WITH THE ACHILLES TENDON. THE ACHILLES TENDON INSERTS INTO THE HEEL BONE (CALCANEUS).

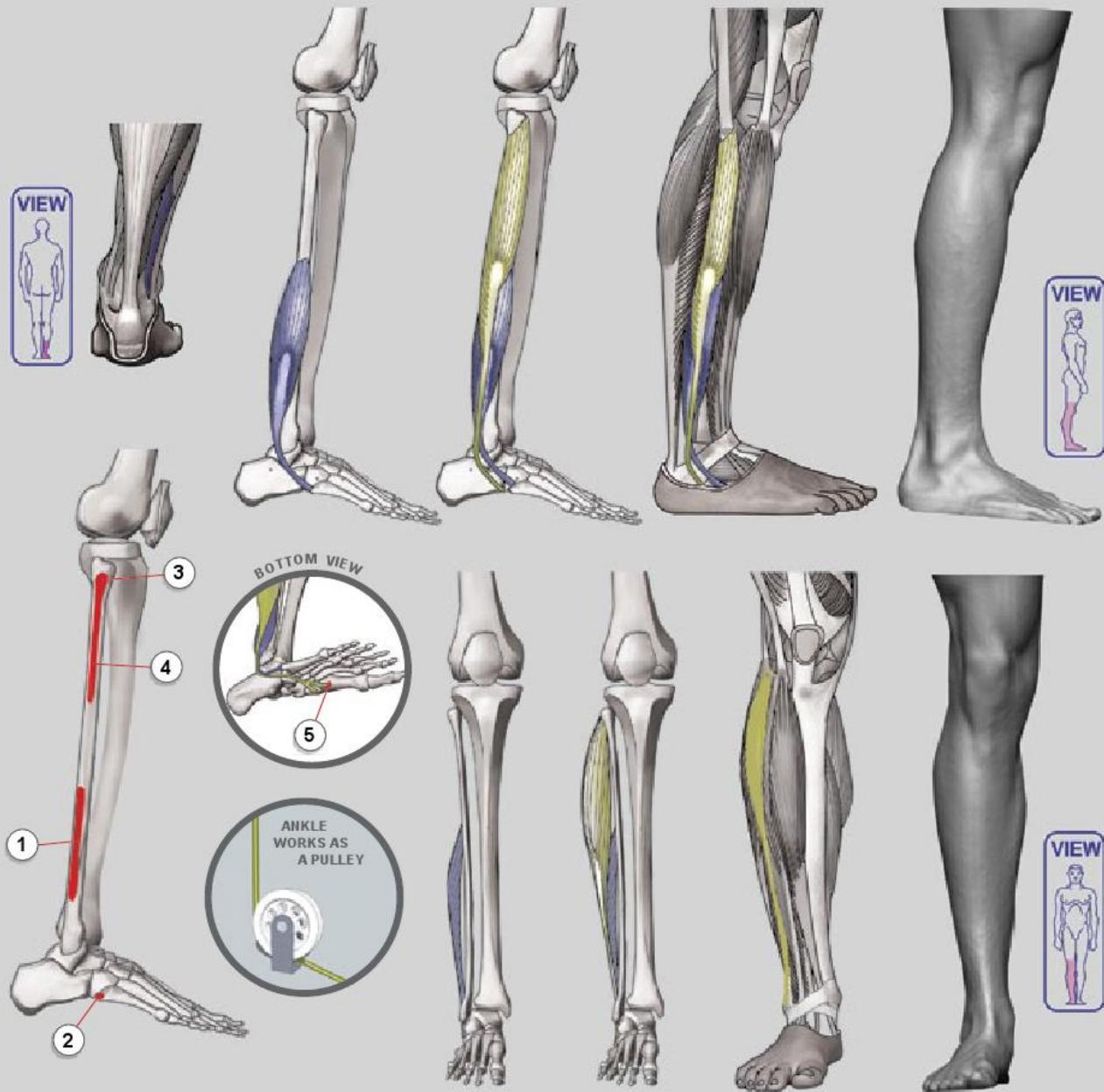
i



EXTENSOR DIGITORUM LONGUS AND TIBIALIS ANTERIOR MUSCLES



PERONEUS BREVIS AND PERONEUS LONGUS MUSCLES



PERONEUS BREVIS

ACTIONS: EVERTS AND PLANTAR FLEXES THE FOOT

ORIGIN: 1 LOWER 2/3 OF THE LATERAL FIBULA

INSERTION: 2 ENLARGED BASE OF THE 5TH METATARSAL

PERONEUS LONGUS

ACTIONS: EVERTS AND PLANTAR FLEXES THE FOOT, MAINTAINS THE ARCH OF THE FOOT

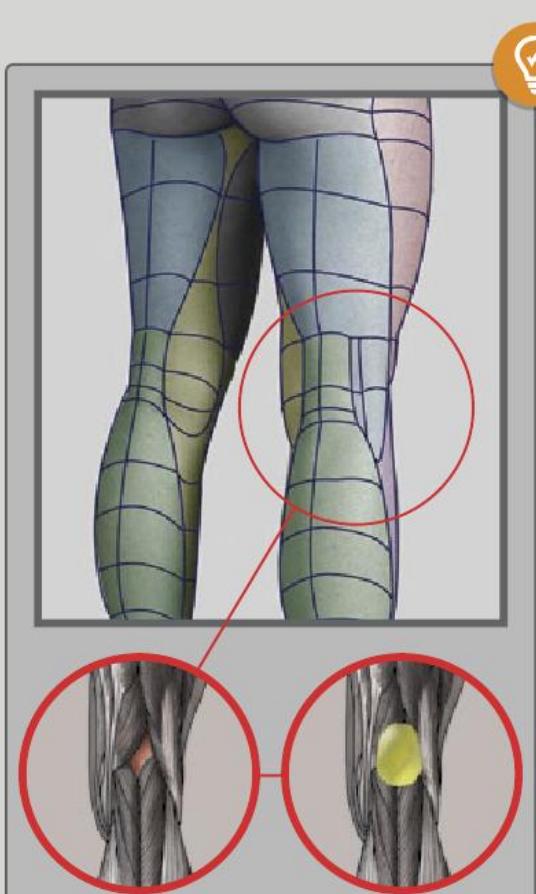
ORIGIN: 3 HEAD OF FIBULA

INSERTION: 4 UPPER 2/3 OF THE SHAFT OF FIBULA

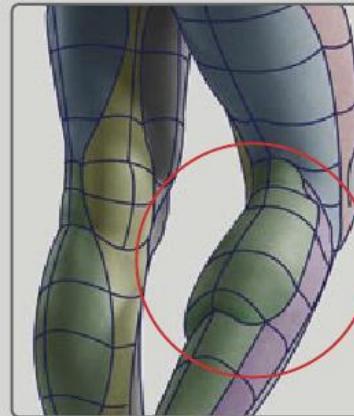
INSERTION: 5 UNDER THE FOOT INTO THE BASE OF THE 1st METATARSAL BONE, AND MEDIAL CUNEIFORM

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TIPS FOR BACKSIDE OF LEGS

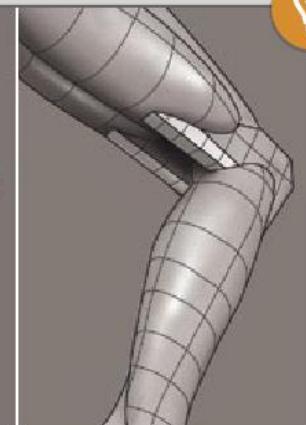
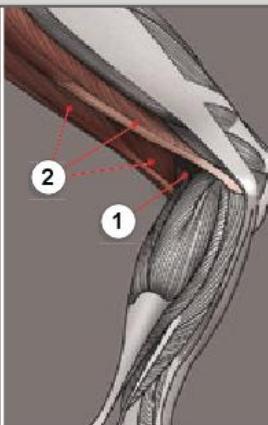


HERE, IN THE MUSCLE VIEW, THE BACK OF THE KNEE IS A SHALLOW DEPRESSION. BUT IN REAL LIFE, WHEN THE LEG IS STRAIGHT, THIS AREA POPS OUTWARD. THIS IS BECAUSE OF A FAT PAD LOCATED RIGHT ON TOP OF THE POPLITEAL FOSSA.

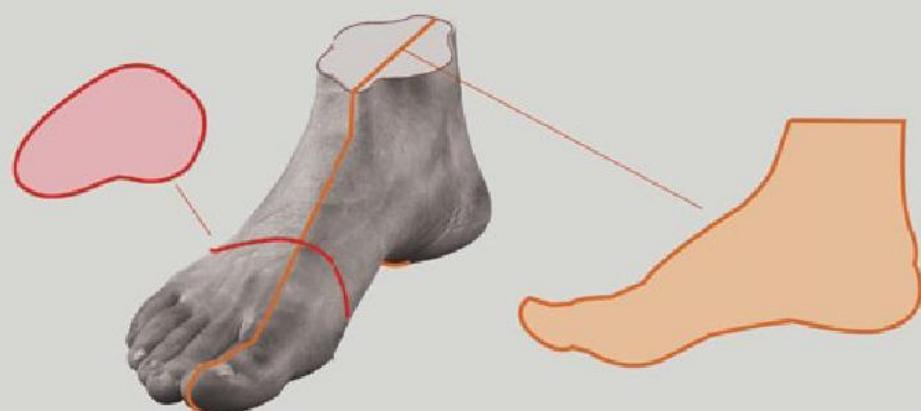
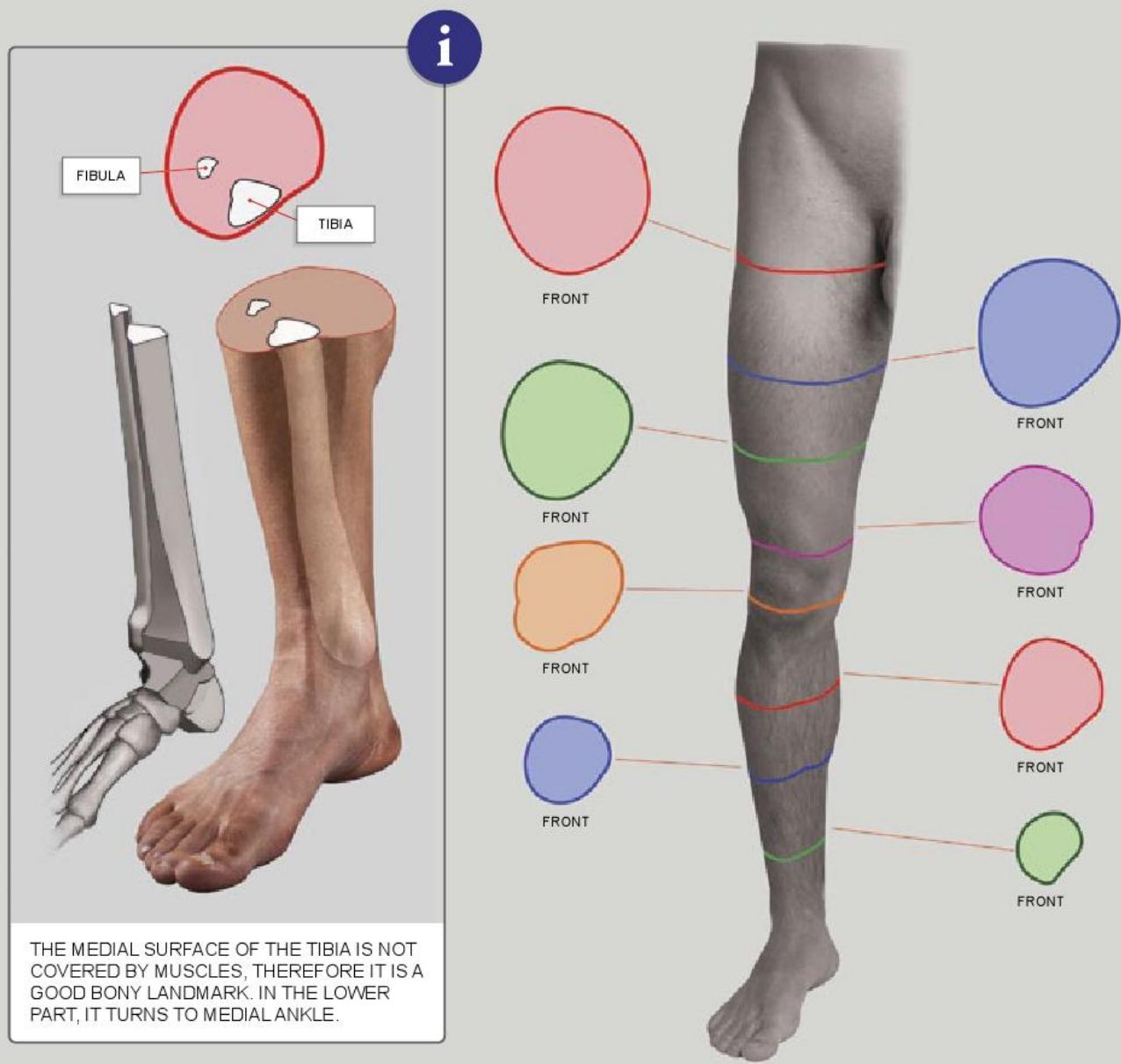


AS THE LEG IS BENT FURTHER, THE DEPRESSION, CALLED THE POPLITEAL FOSSA (THE KNEE PIT), BECOMES DEEPER.

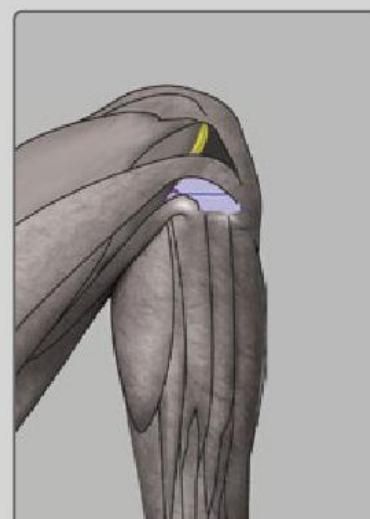
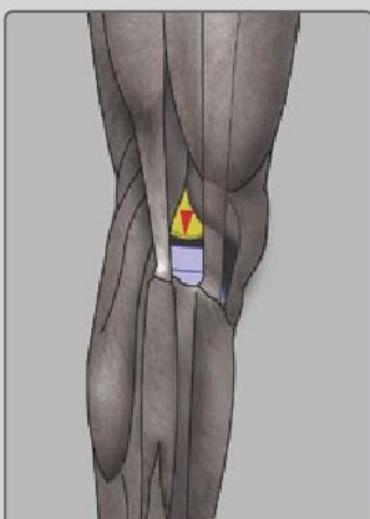
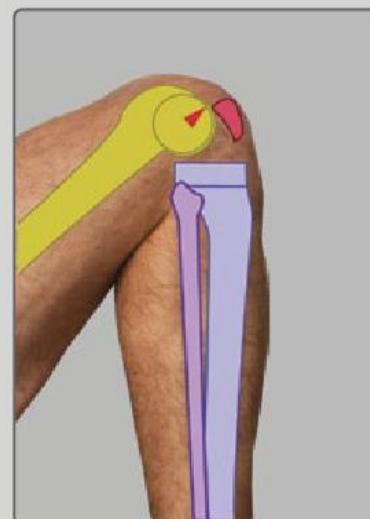
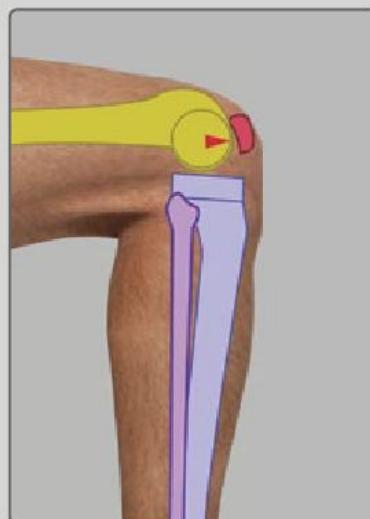
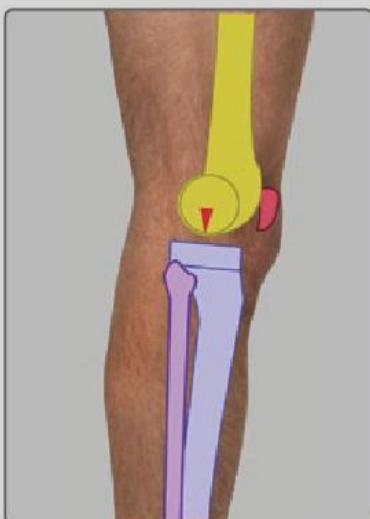
- ① FOSSA (THE KNEE PIT) BECOMES PROMINENT
- ② HAMSTRING MUSCLES



CROSS SECTION OF THE LOWER LIMB

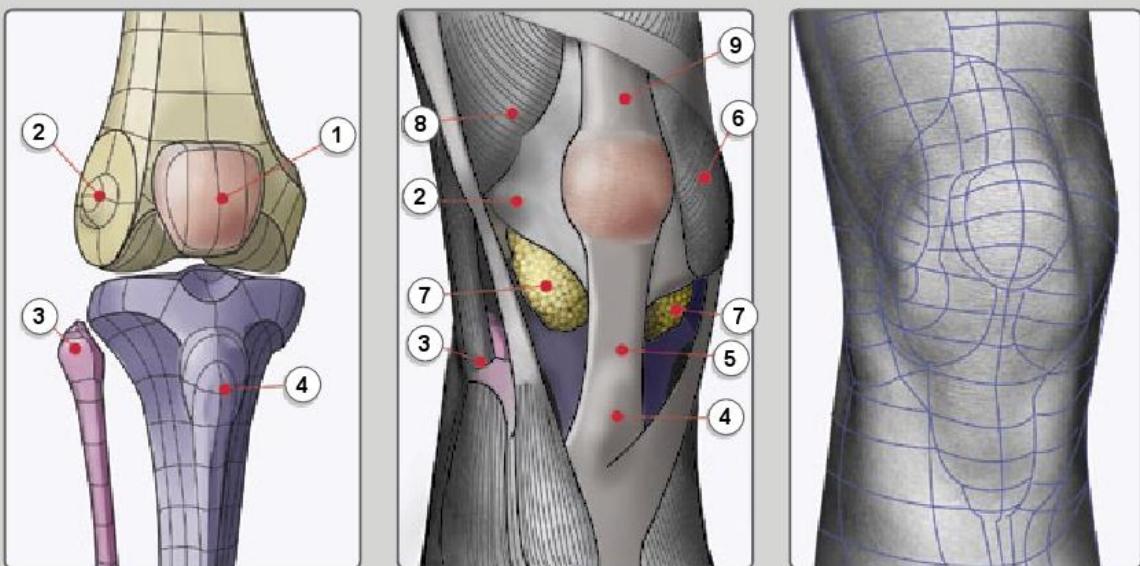


KNEE MECHANICS



THE KNEE

(WHAT ARE THESE BUMPS?)



1 KNEE CAP (PATELLA)

2 LATERAL EPICONDYLE OF FEMUR

3 HEAD OF FIBULA

4 TIBIAL TUBEROSITY

5 PATELLAR LIGAMENT

6 VASTUS MEDIALIS

7 INFRAPATELLAR FAT PAD

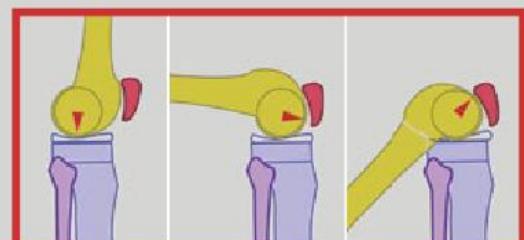
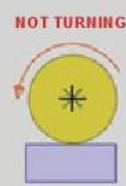
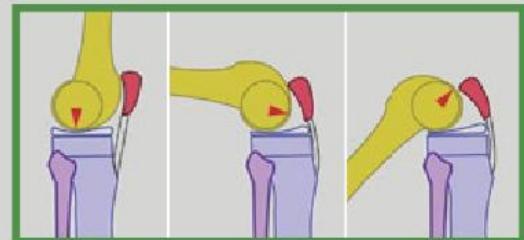
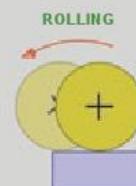
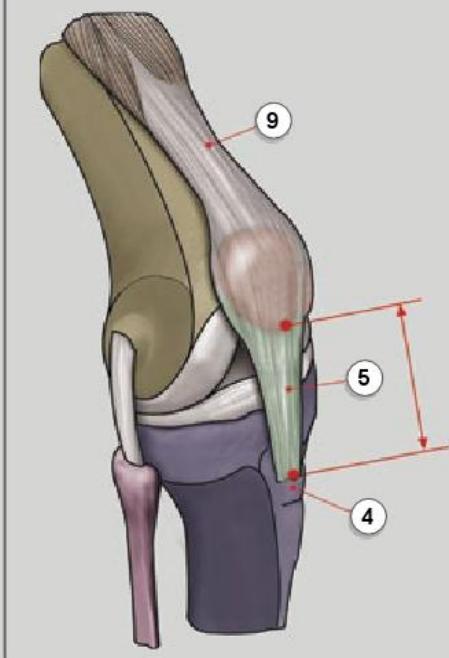
8 VASTUS LATERALIS

9 QUADRICEPS TENDON

PATELLAR LIGAMENT ⑤ DO NOT STRETCH LIKE TENDONS ⑨ SO THE DISTANCE BETWEEN KNEE CAP AND TIBIAL TUBEROSITY ④ REMAINS CONSISTENT.

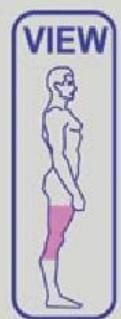
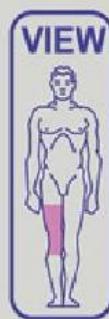
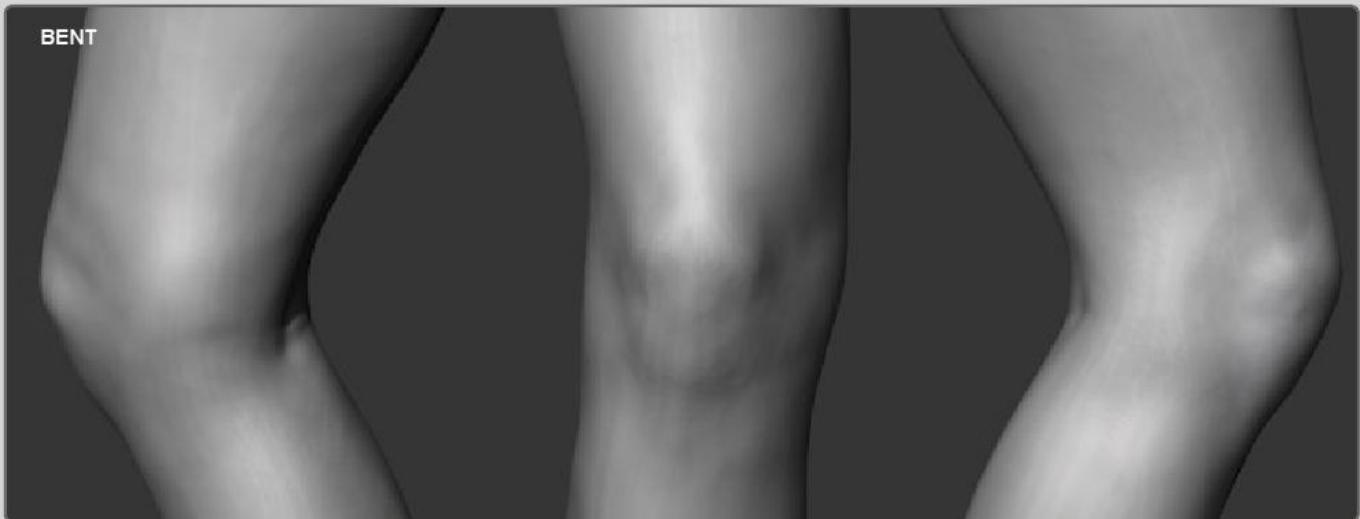


THE HEAD OF THE **FEMUR** IS **ROLLING** OVER THE TOP OF THE **TIBIA**, **NOT TURNING**.



3D SCAN OF RIGHT KNEE

BENT

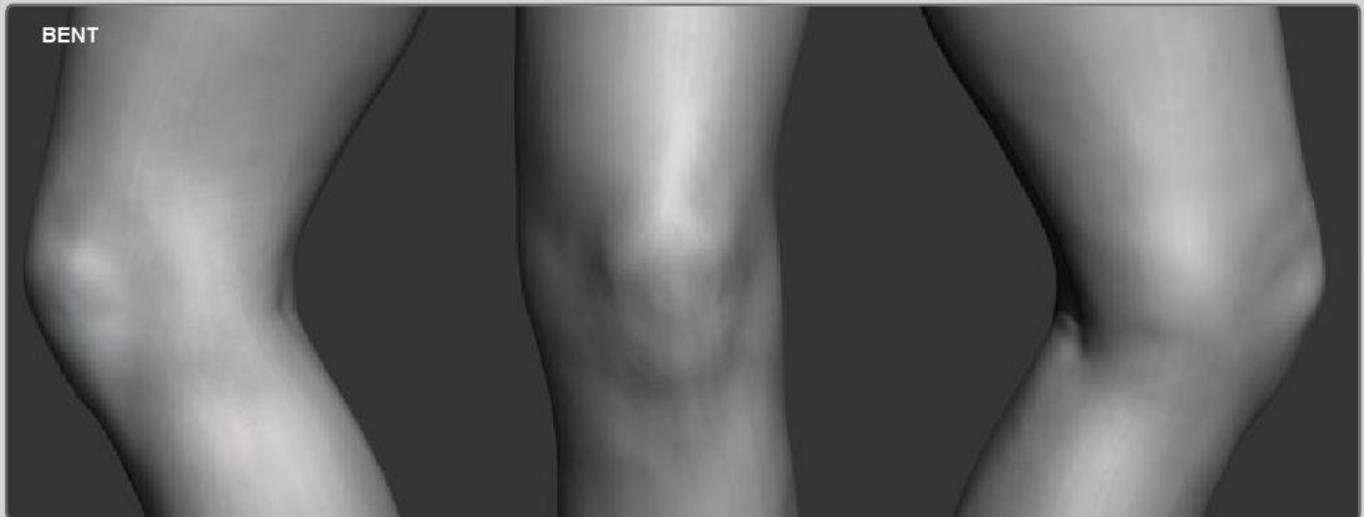


STRAIGHTENED



3D SCAN OF LEFT KNEE

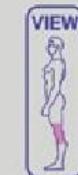
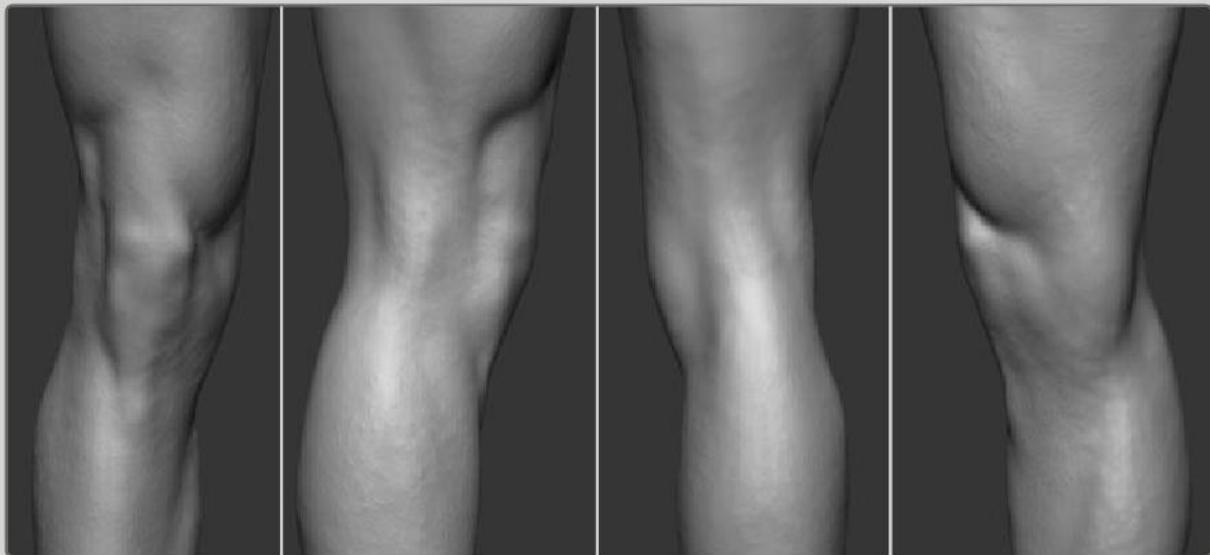
BENT



STRAIGHTENED



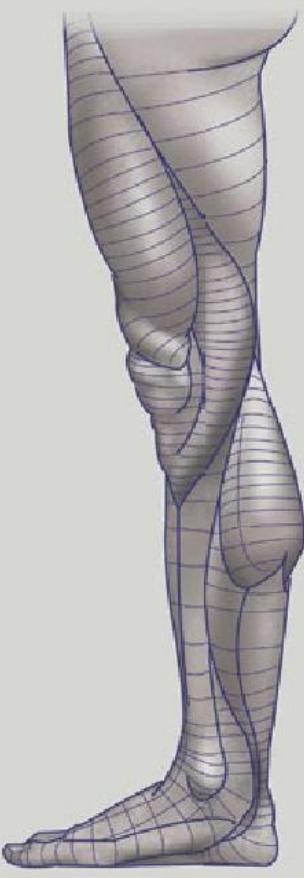
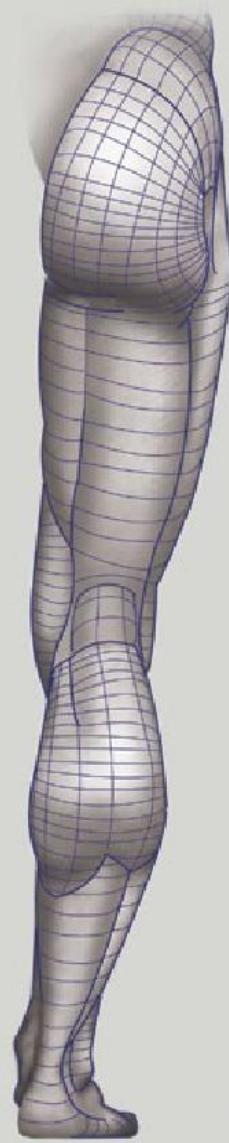
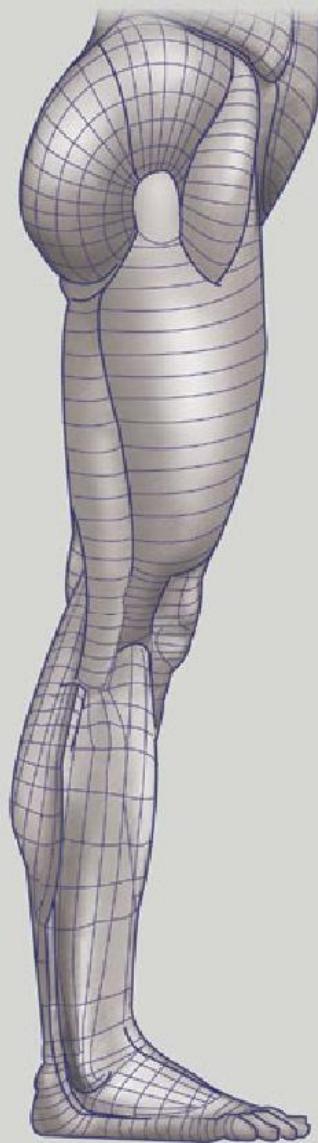
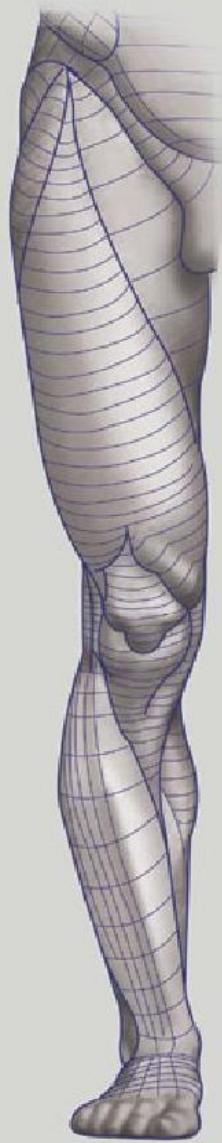
3D SCAN OF LEFT AND RIGHT KNEES



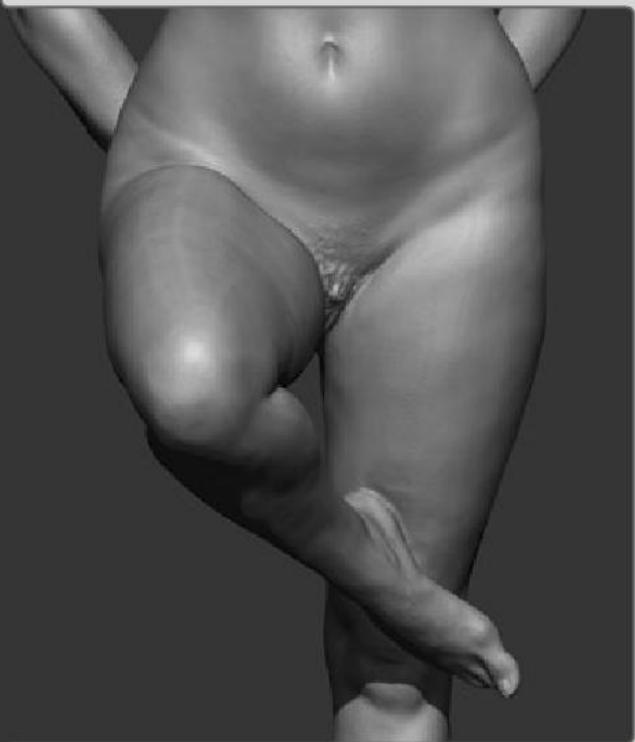
FEMALE LEGS



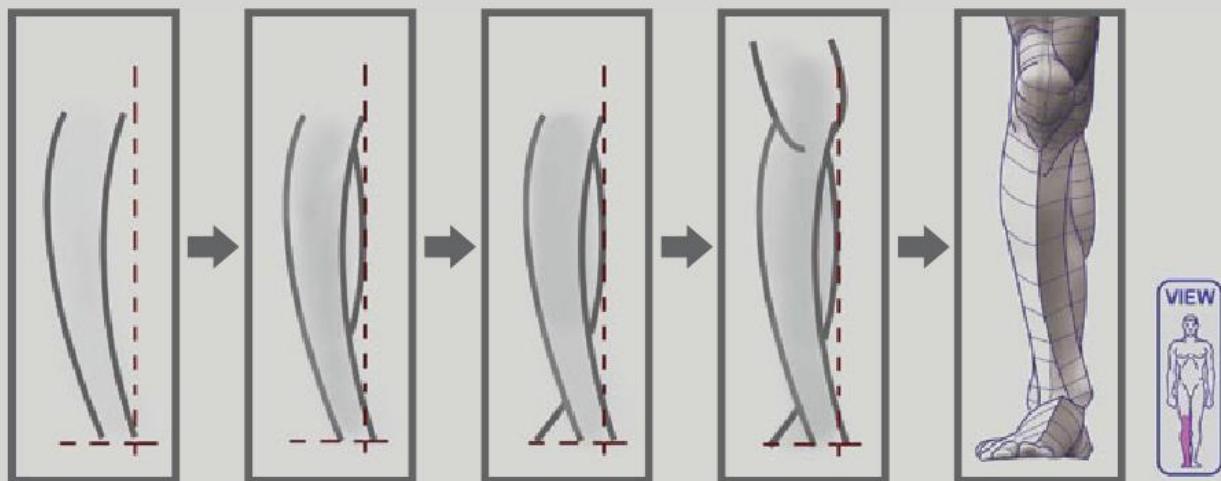
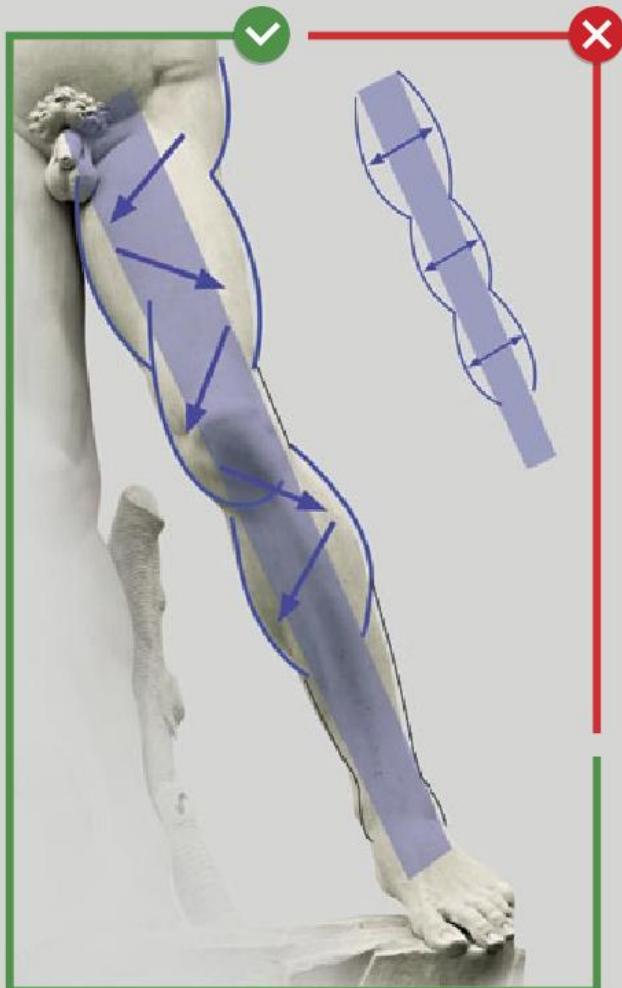
LEG SHAPES VIEWED FROM ALL SIDES



3D SCAN OF LOWER LIMB

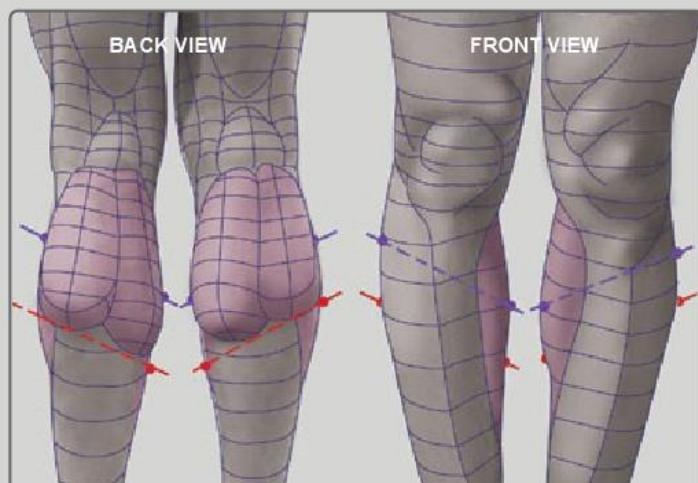
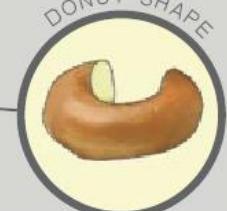
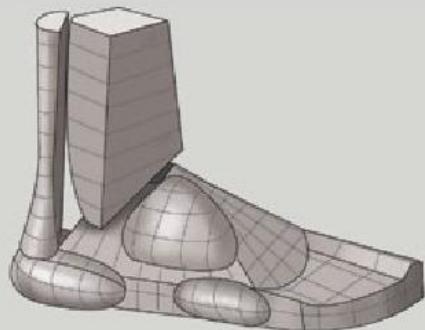


MUSCLES TRAVERSING DOWN THE LOWER LIMB



ADDITIONAL SHAPES OF THE LEG AND FOOT

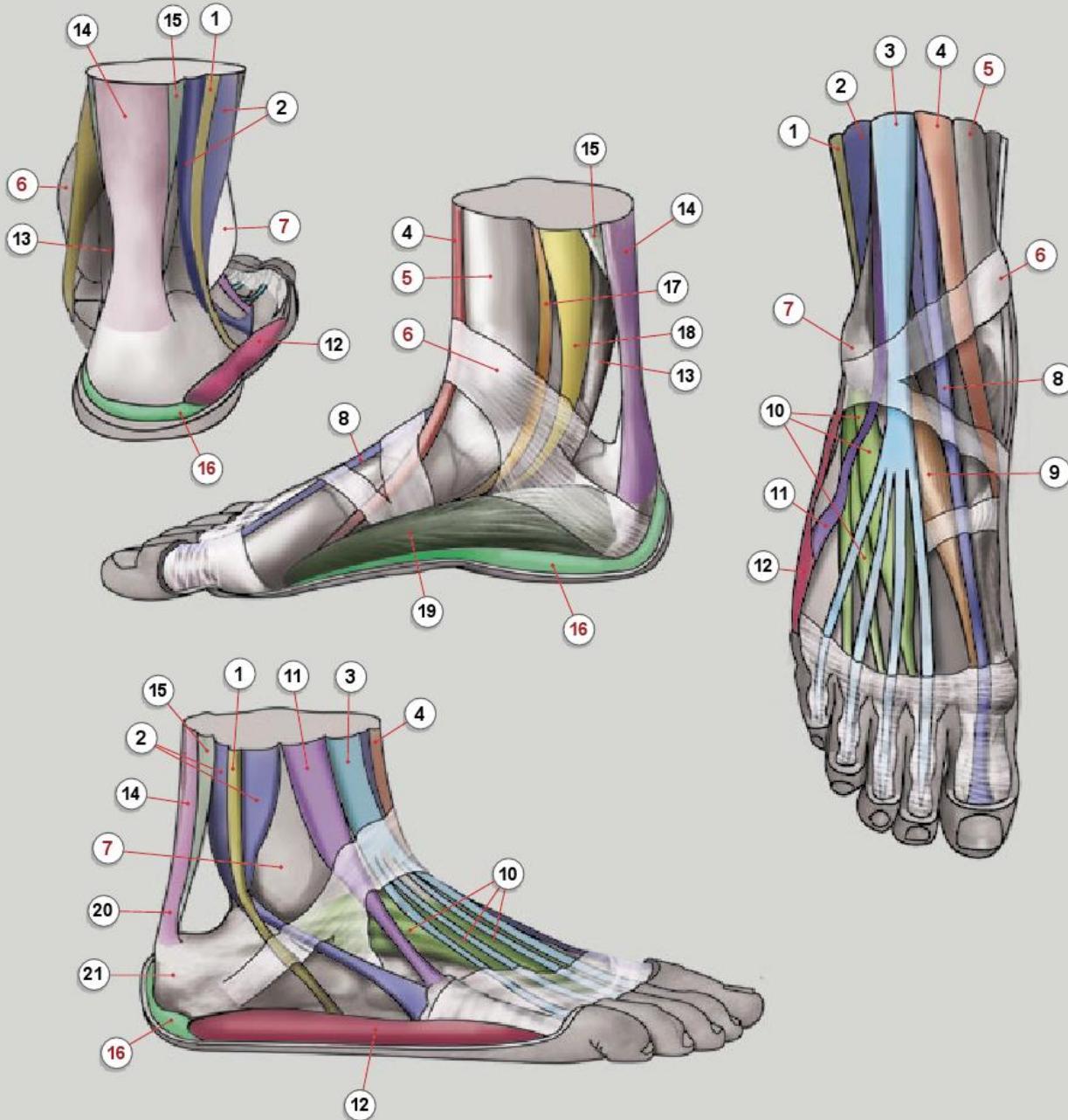
HEEL IS MOSTLY SHAPED BY **FAT PAD**



THE INNER ANKLE CURVE IS HIGHER THAN THE OUTER ANKLE CURVE.

INNER PORTIONS OF THE CALF MUSCLES ARE LOCATED LOWER AND SHAPES ARE MORE ROUND AND MASSIVE THAN THE OUTER PORTION.

FOOT MUSCLES



- 1 PERONEUS LONGUS
- 2 PERONEUS BREVIS
- 3 EXTENSOR DIGITORUM LONGUS
- 4 TIBIALIS ANTERIOR
- 5 MEDIAL SURFACE OF TIBIA BONE
- 6 MEDIAL ANKLE (M. MALLEOLUS)
- 7 LATERAL ANKLE (L. MALLEOLUS)

- 8 EXTENSOR HALLUCIS LONGUS
- 9 EXTENSOR HALLUCIS BREVIS
- 10 EXTENSOR DIGITORUM BREVIS
- 11 PERONEUS TERTIUS
- 12 ABDUCTOR DIGITI MINIMI
- 13 FLEXOR HALLUCIS LONGUS
- 14 GASTROCNEMIUS

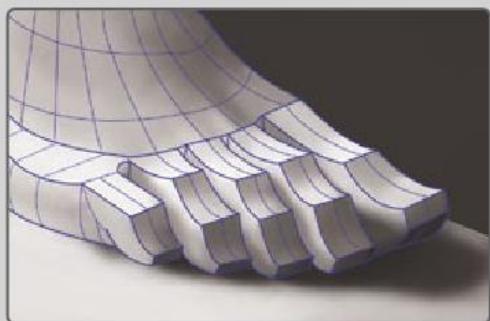
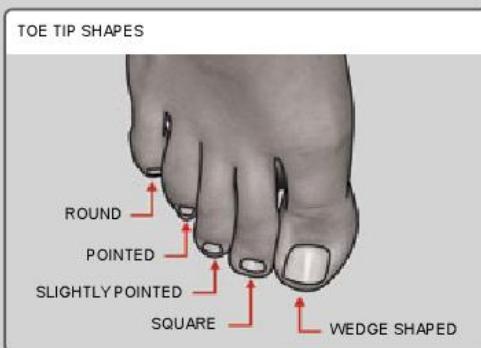
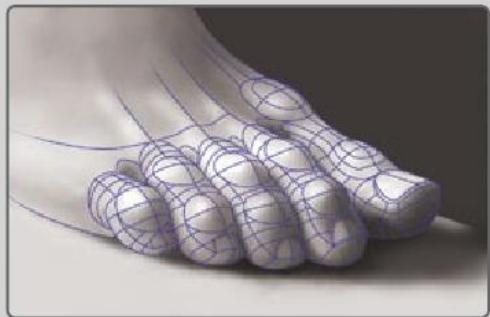
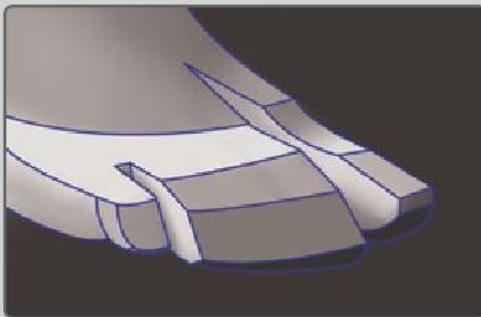
- 15 SOLEUS
- 16 FAT PAD
- 17 TIBIALIS POSTERIOR
- 18 FLEXOR DIGITORUM LONGUS
- 19 ABDUCTOR HALLUCIS
- 20 ACHILLES TENDON
- 21 CALCANEUS BONE

FOOT SHAPES



RIGHT FOOT

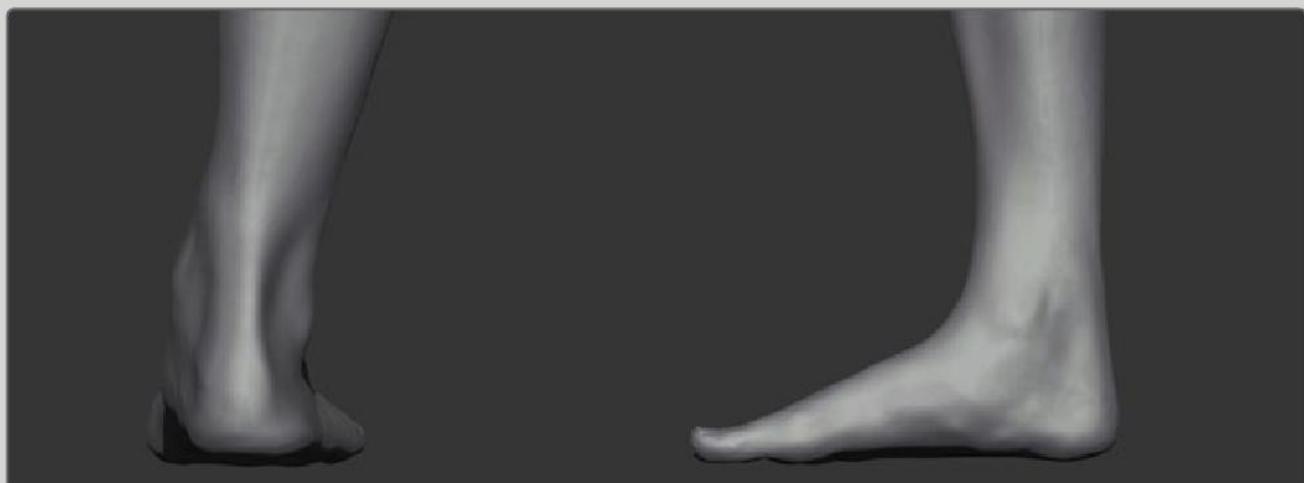
FOOT SHAPES AND FORMING A FOOT



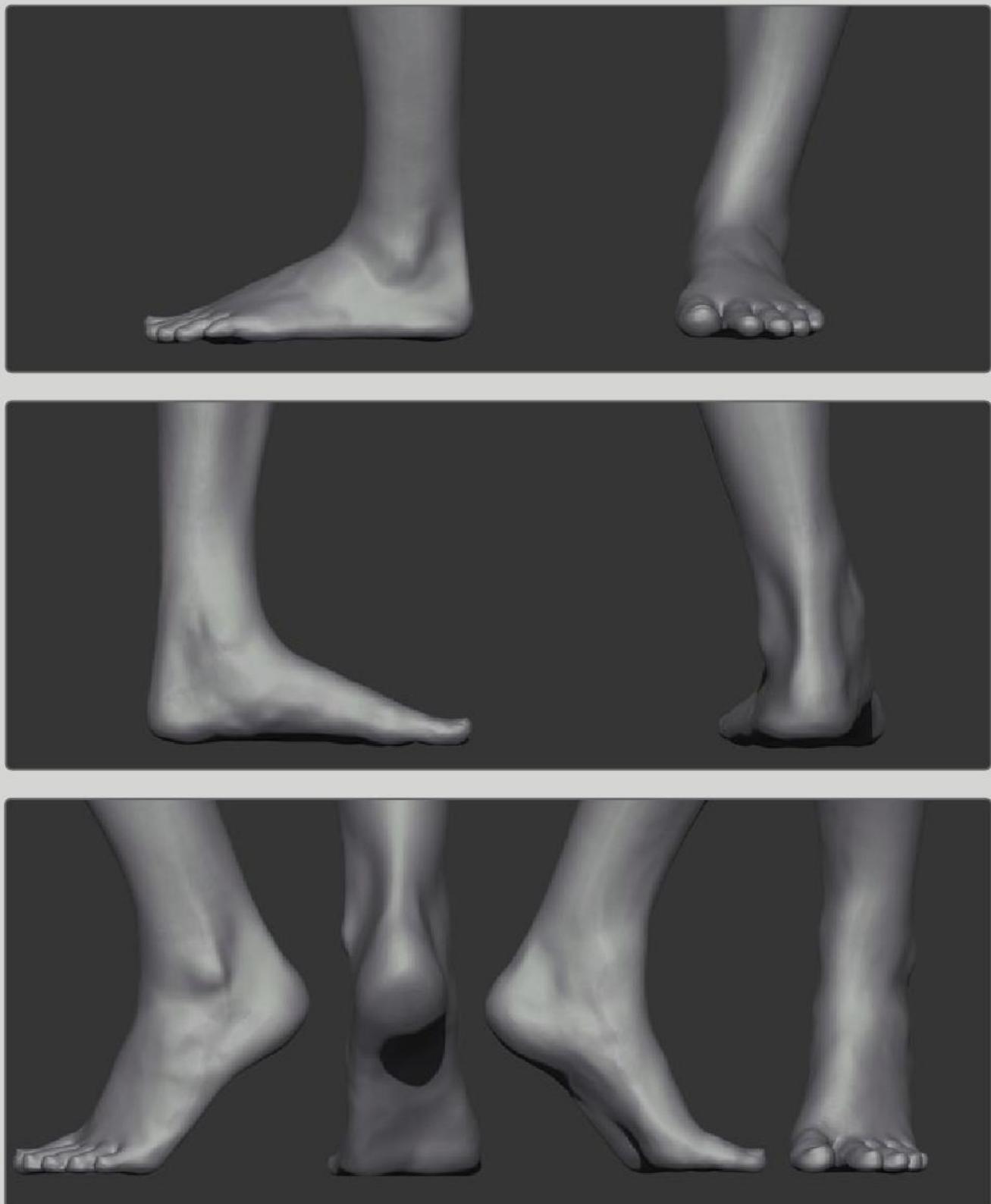
BLOCKING OUT A FOOT



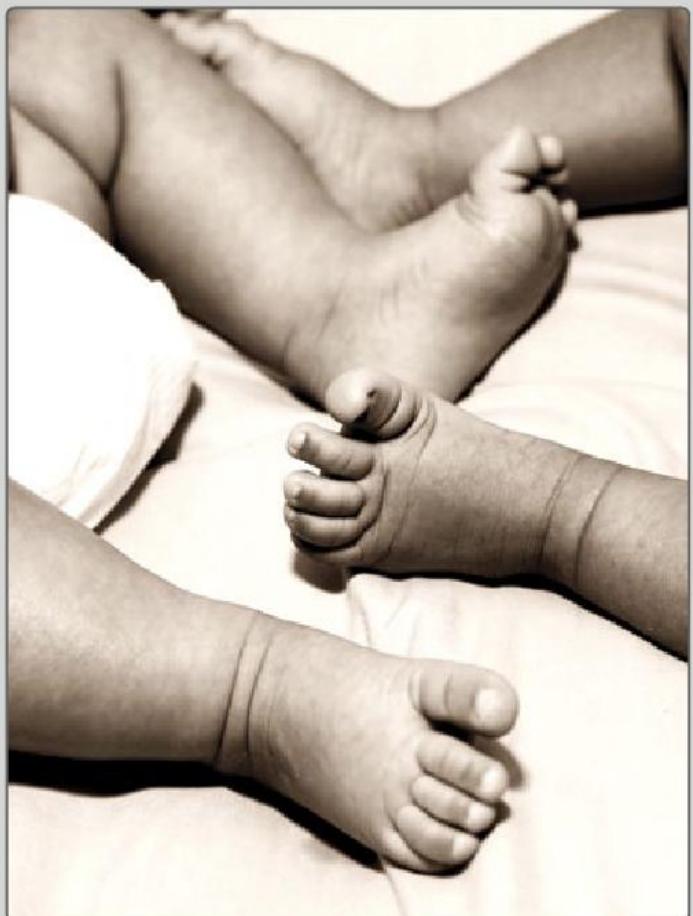
3D SCAN OF RIGHT FOOT



3D SCAN OF LEFT FOOT



BABY FEET



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