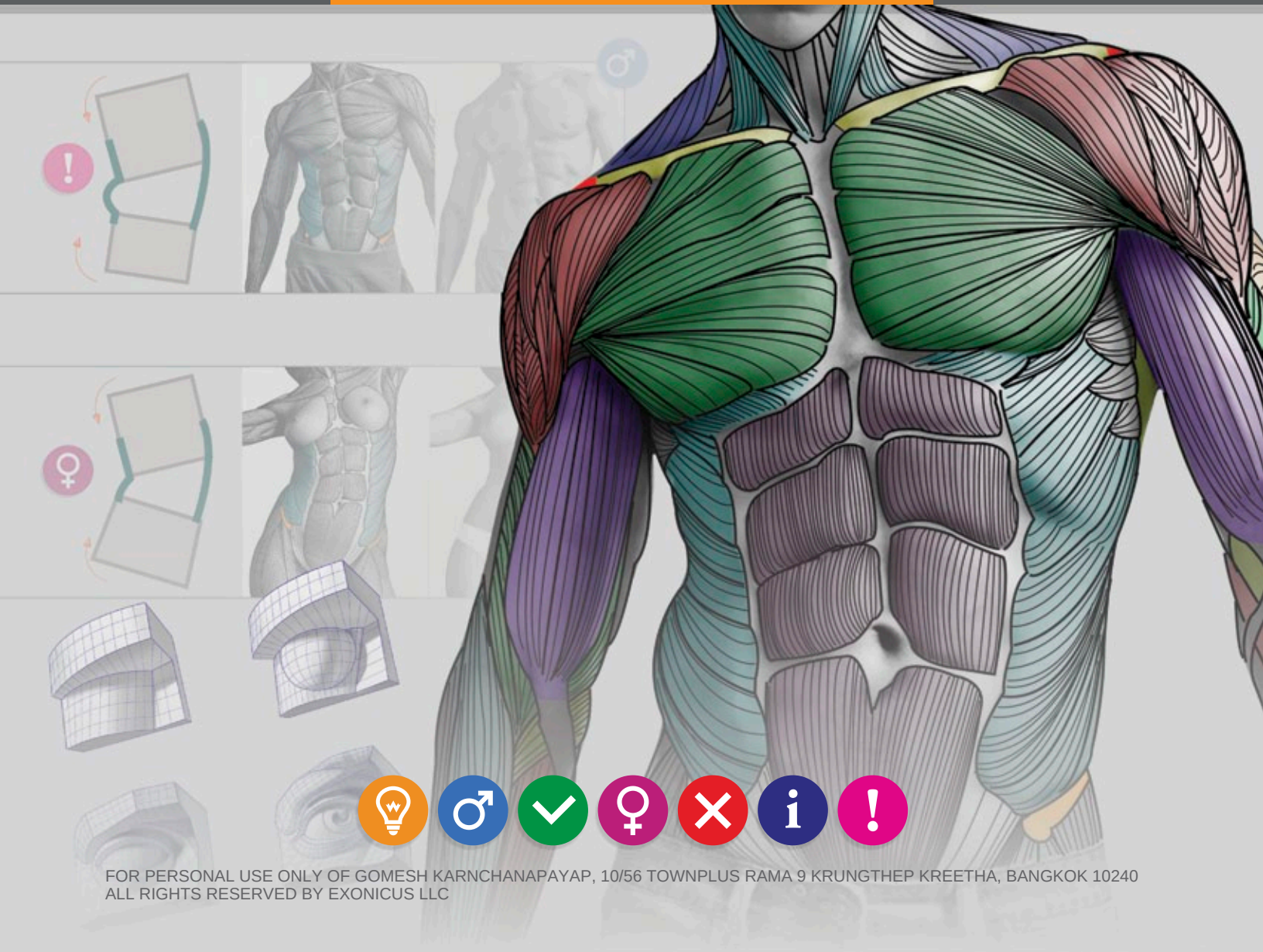


ULDIS ZARINS
WITH
SANDIS KONDRATS

ANATOMY FOR SCULPTORS

UNDERSTANDING THE HUMAN FIGURE



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UNDERSTANDING THE HUMAN FIGURE

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 Makslas 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 Vegners, 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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Electric Geisha LLC
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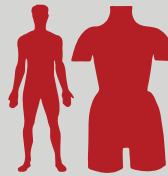
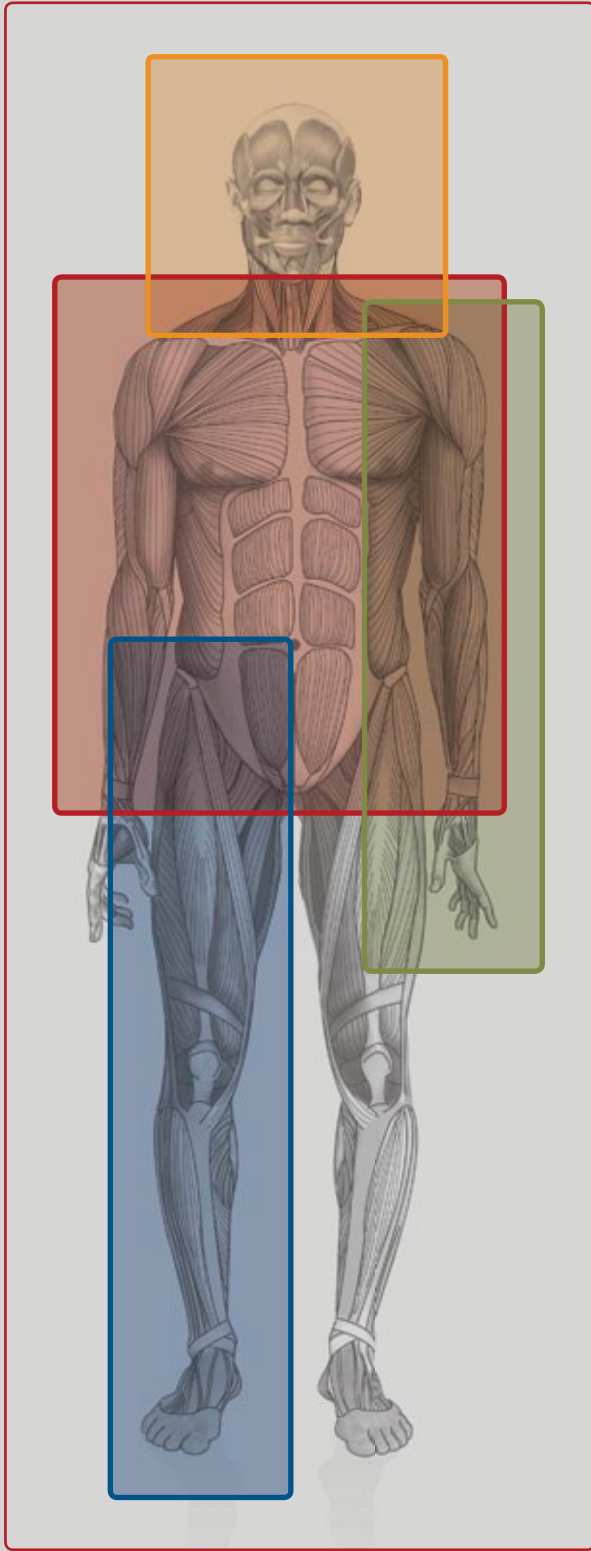


FIGURE & TORSO

7



HEAD & NECK

93



UPPER LIMB

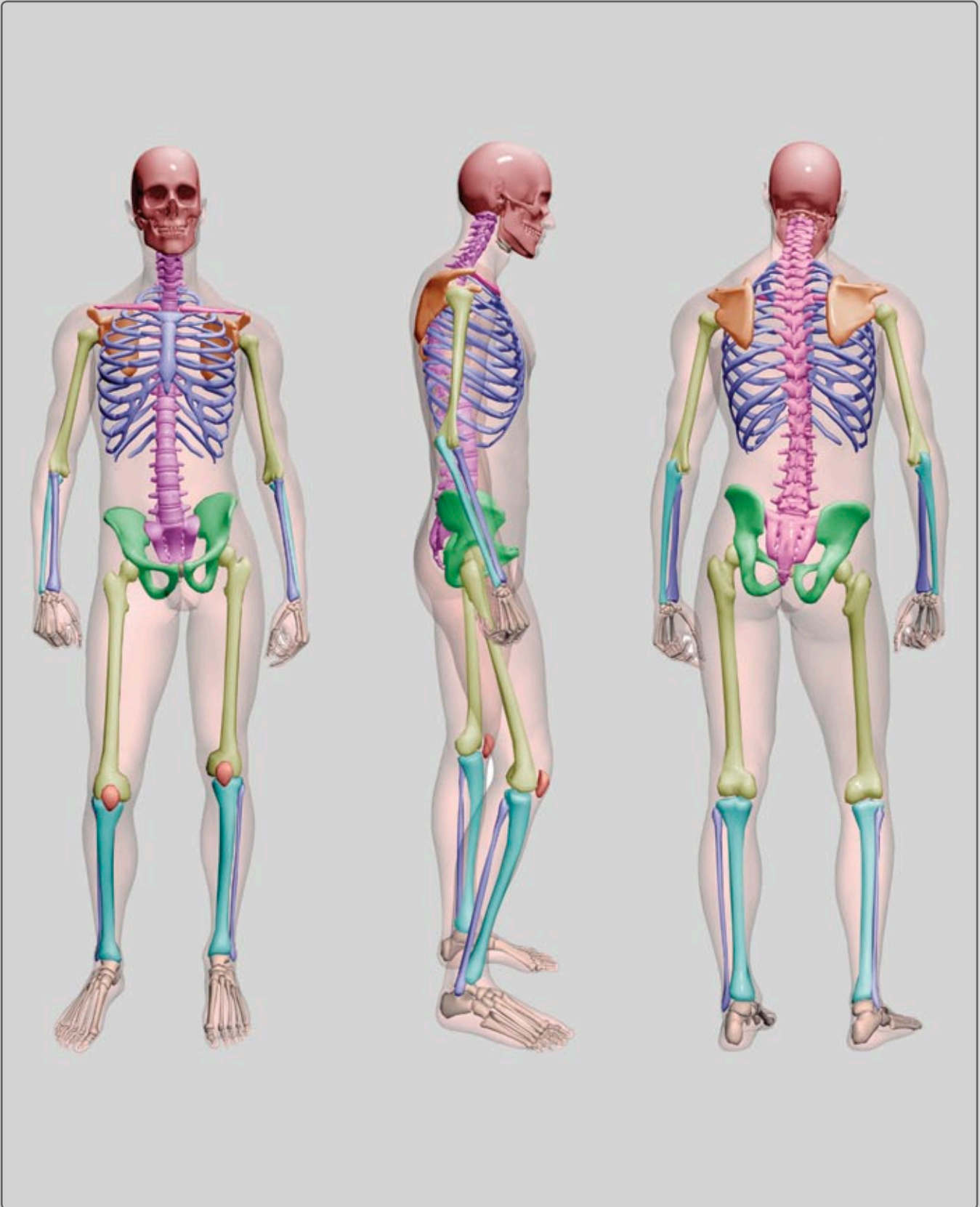
143



LOWER LIMB

185

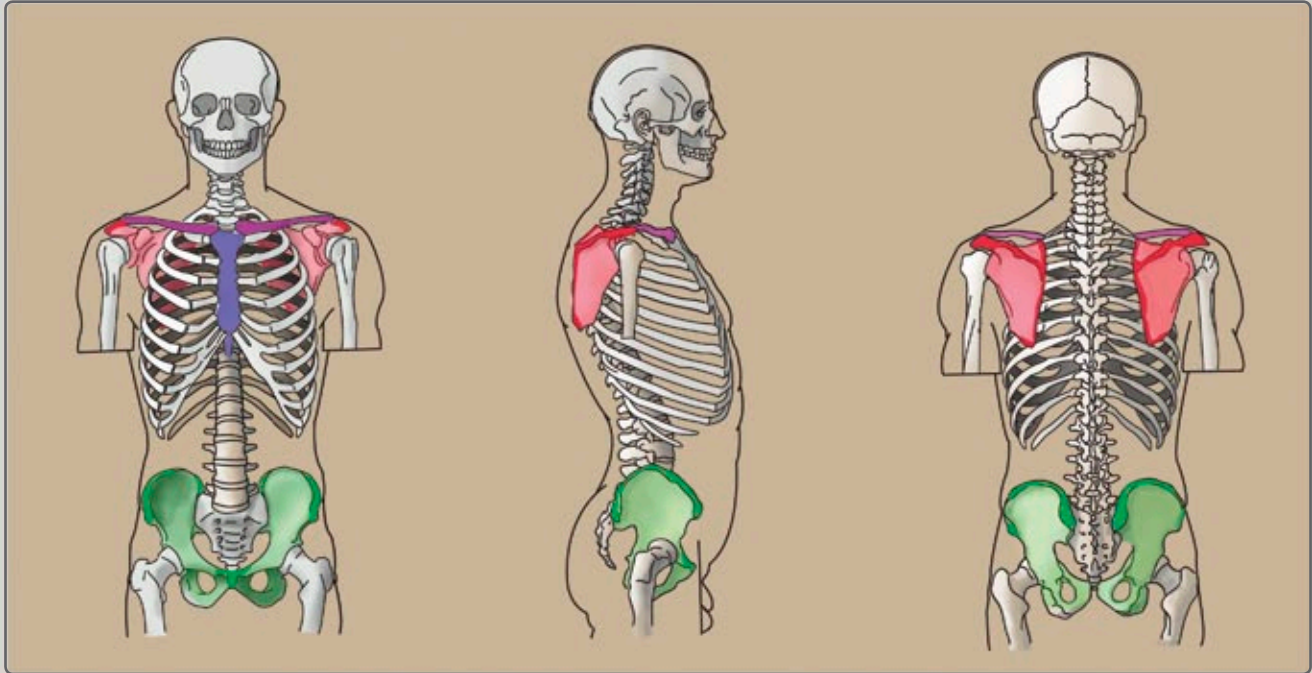
HUMAN SKELETON



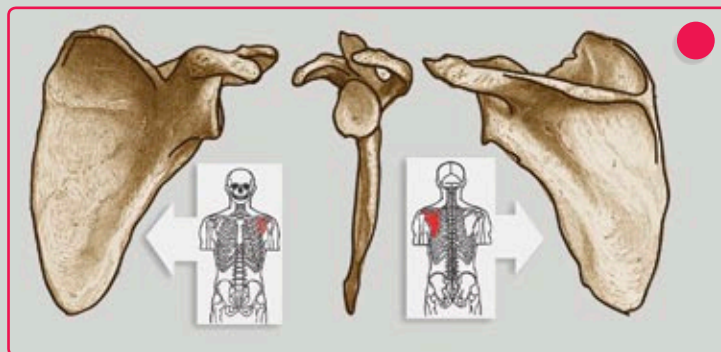
IMPORTANT LANDMARKS OF TORSO

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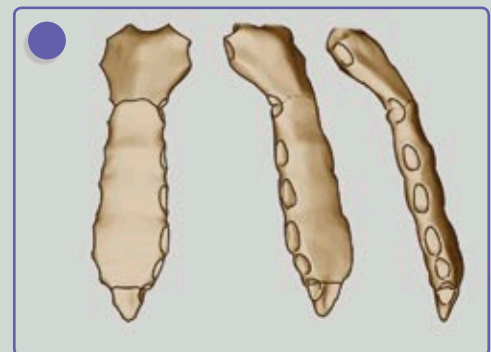
PROMINENT SUBCUTANEOUS PROTRUSIONS – GENERALLY POINTS OF BONE, THOUGH SOMETIMES FORMED BY ENTIRE BONES, ARE CALLED BONY LANDMARKS OR SIMPLY LANDMARKS. THEY MAY SERVE AS IMPORTANT PROPORTIONAL MEASURING POINTS OF THE BODY. LANDMARKS ARE THE KEY TO UNDERSTANDING THE EXACT POSITION OF THE ENTIRE SKELETON,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



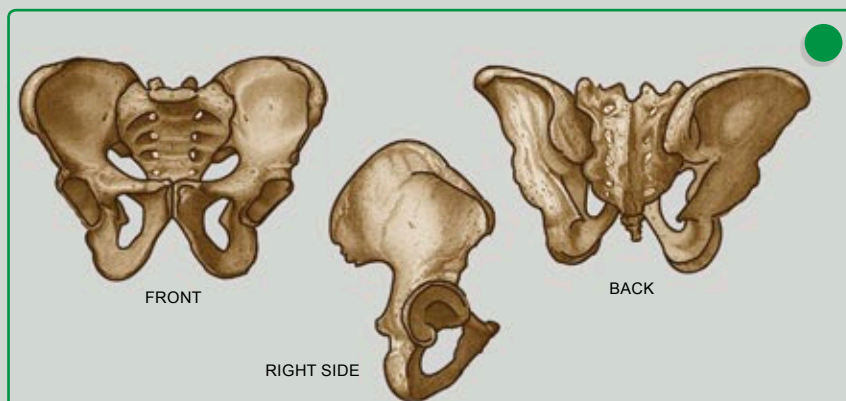
SHOULDER BLADE (SCAPULA)



CHEST BONE (STERNUM)



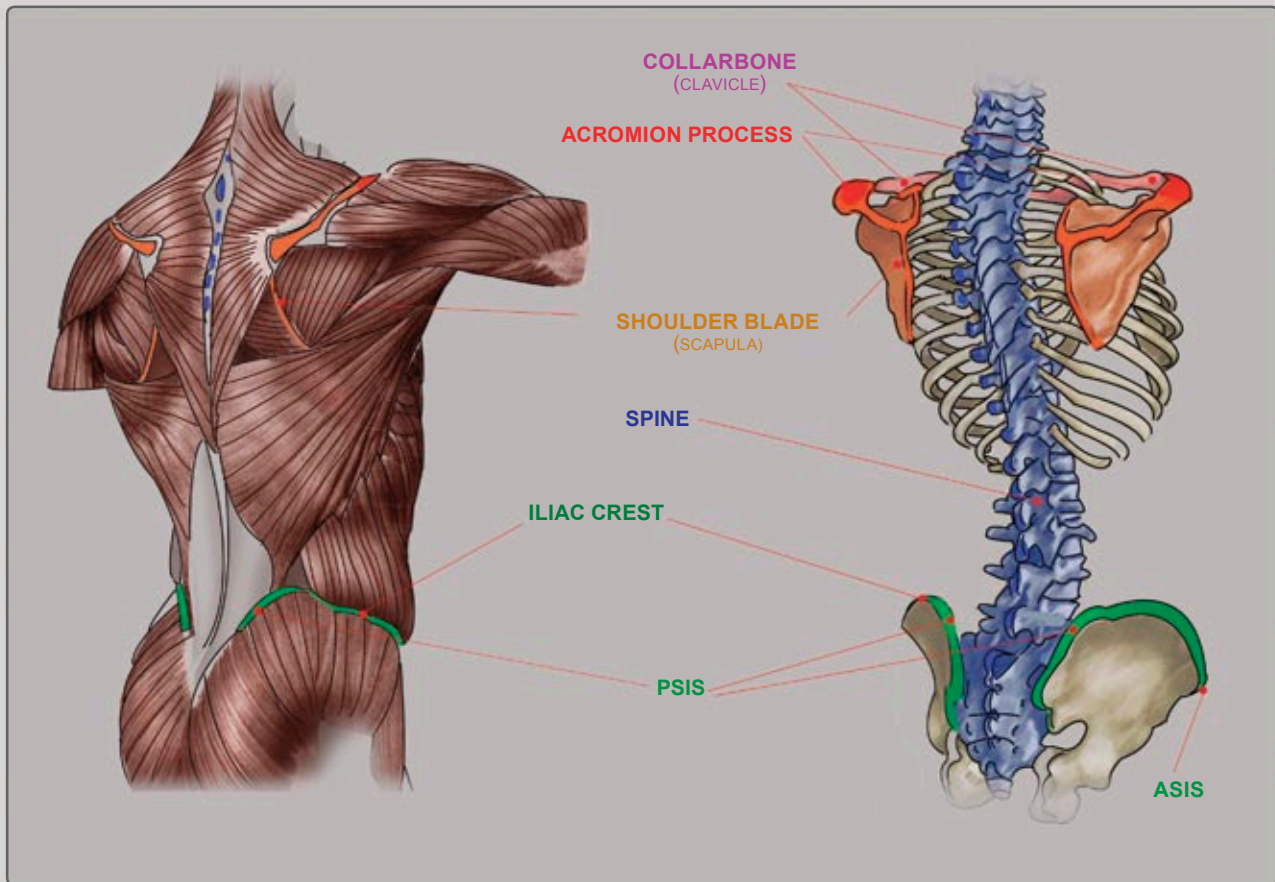
PELVIS



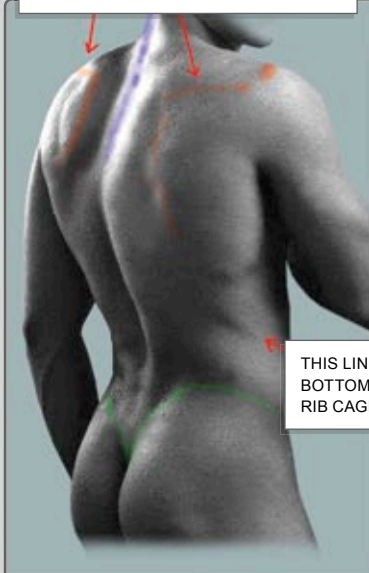
CLAVICLE



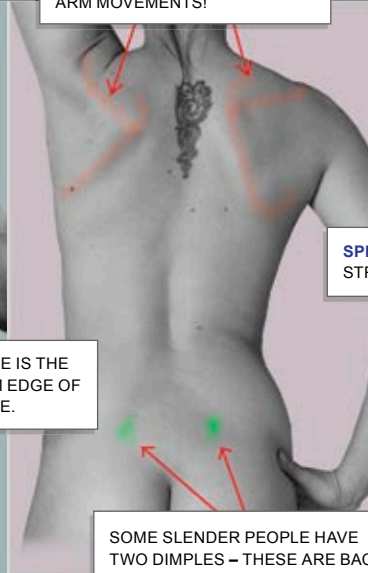
MAIN LANDMARKS OF BACK OF THE TORSO



THE MALE'S **SHOULDER BLADE** IS COVERED BY A THICK LAYER OF MUSCLES AND IS HARDER TO LOCATE THAN A FEMALE'S.



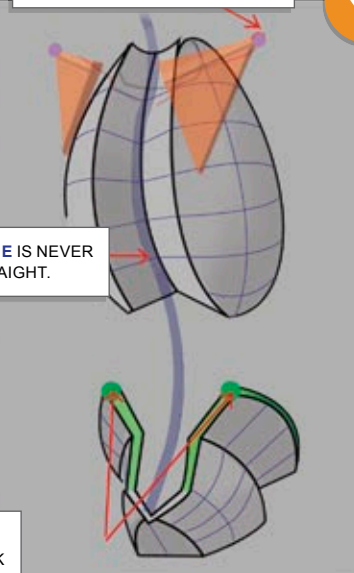
PAY ATTENTION TO POSITION OF **SHOULDER BLADE** DURING ARM MOVEMENTS!



THIS LINE IS THE BOTTOM EDGE OF RIB CAGE.

SOME SLENDER PEOPLE HAVE TWO DIMPLES – THESE ARE BACK CORNERS OF **ILIAC CREST** (PSIS).

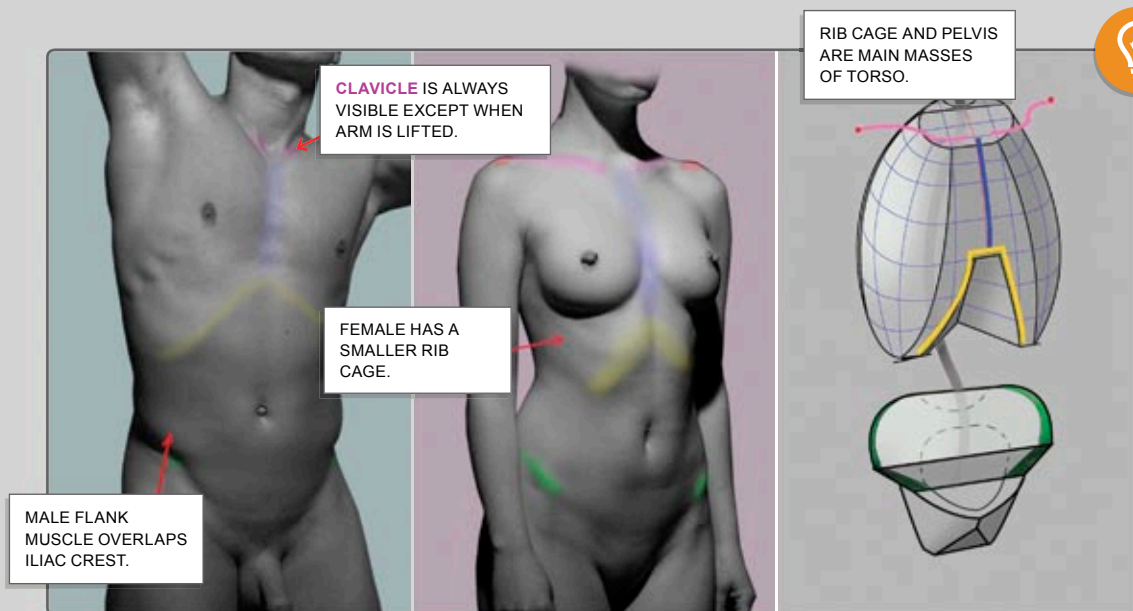
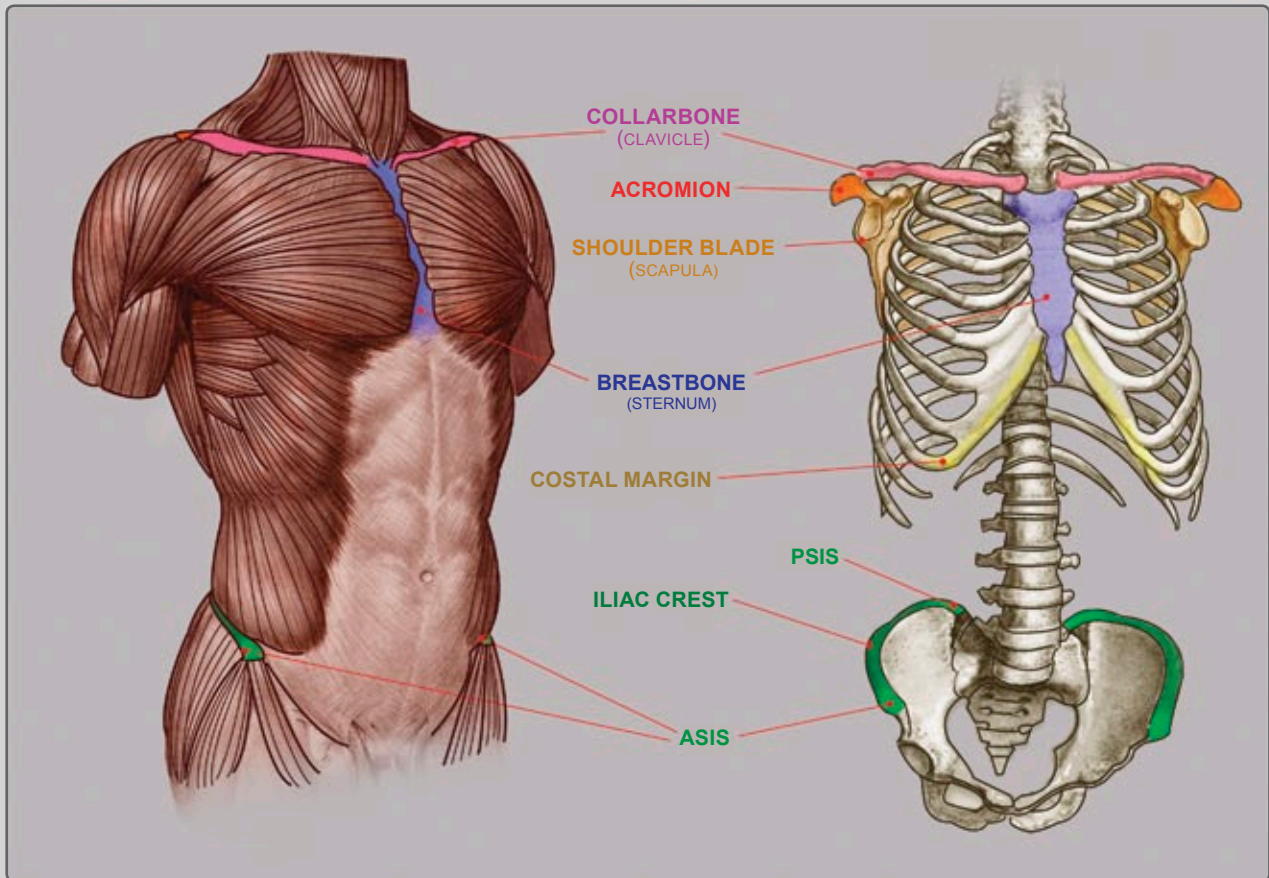
AC JOINT IS WHERE **CLAVICLE** MEETS **ACROMION**.



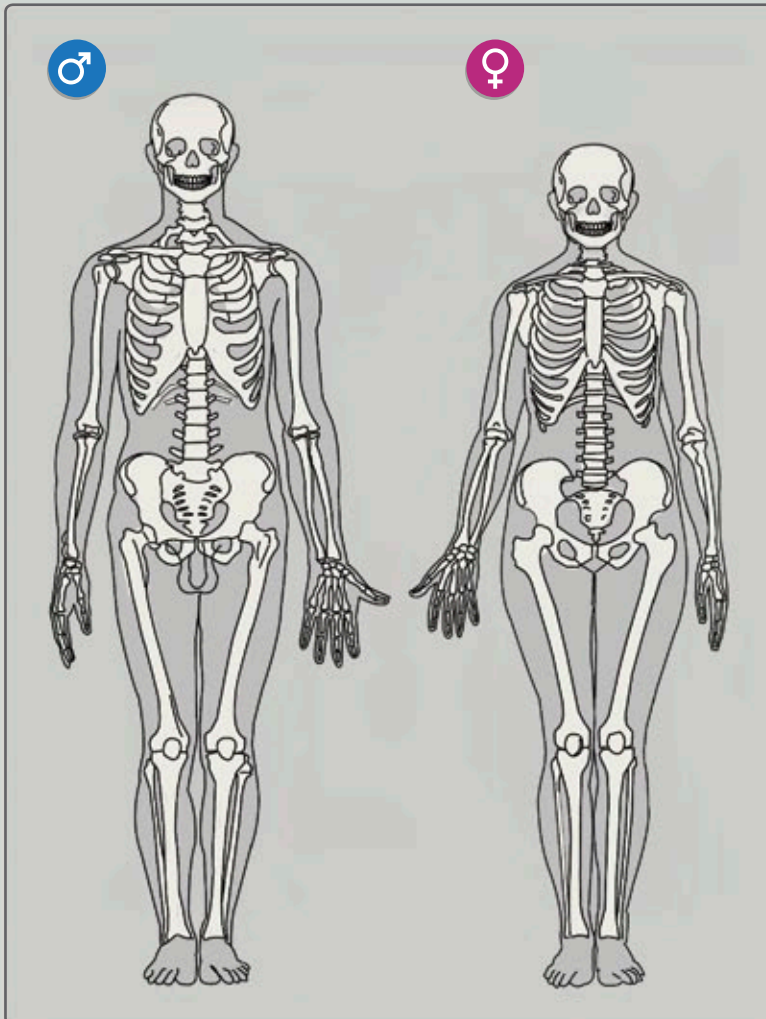
SPINE IS NEVER STRAIGHT.



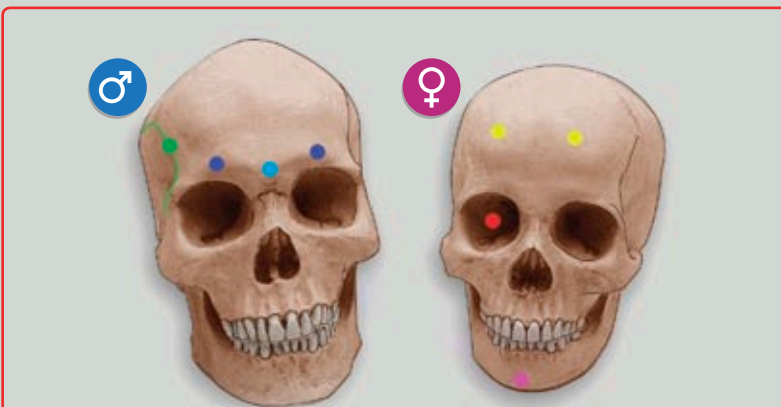
MAIN LANDMARKS OF FRONTAL TORSO



MAIN DIFFERENCES BETWEEN MALE AND FEMALE SKELETONS

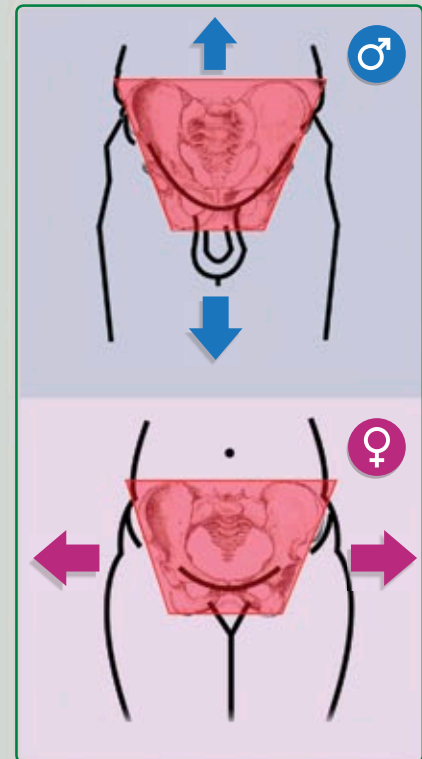


SKULL

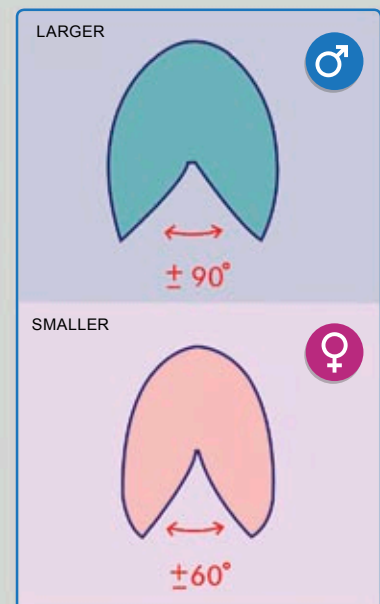


FOREHEAD: MALE SKULLS HAVE MORE PROMINENT **GLABELLA** AND **SUPRAORBITAL RIDGES**
TEMPLE: MALE SKULLS HAVE MORE PROMINENT **TEMPORAL LINES**
EYE ORBITS: FEMALE SKULLS HAVE ROUNDER **ORBITS**
JAWS: FEMALE **JAWS** ARE NARROWER AND ROUNDER
FRONTAL: FEMALE SKULLS HAVE LARGER **FRONTAL EMINENCES**

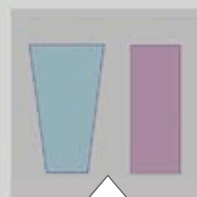
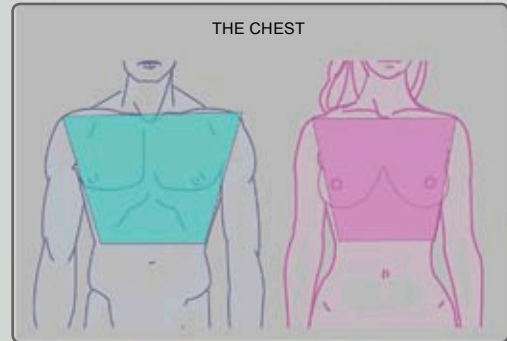
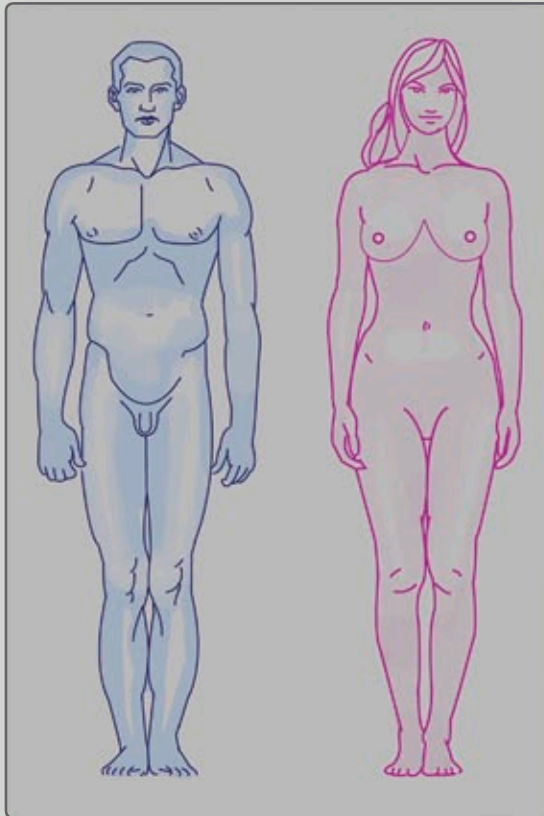
PELVIS



RIB CAGE

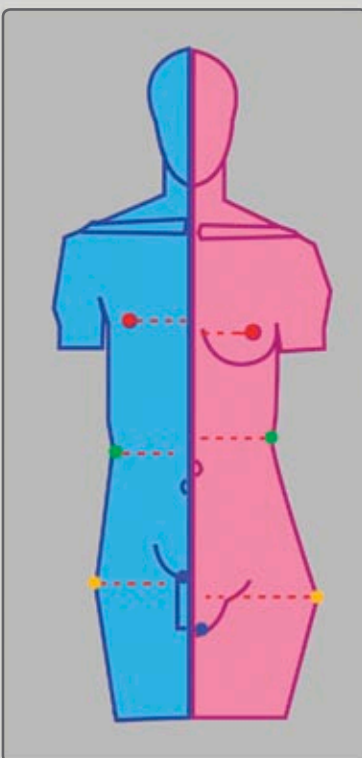
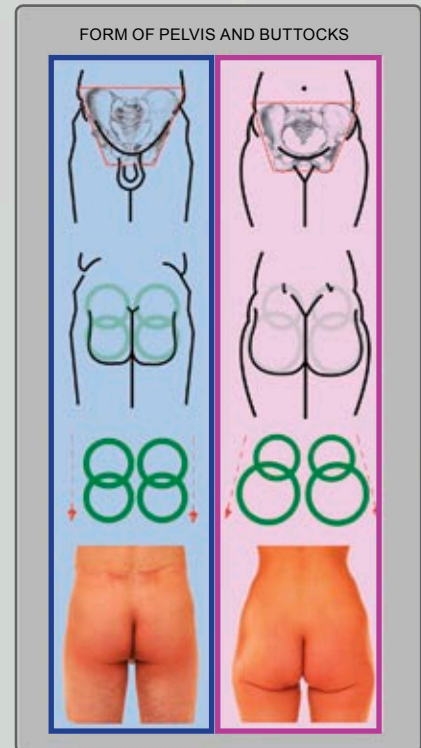


MOST IMPORTANT DIFFERENCES BETWEEN MALE AND FEMALE BODY SHAPES



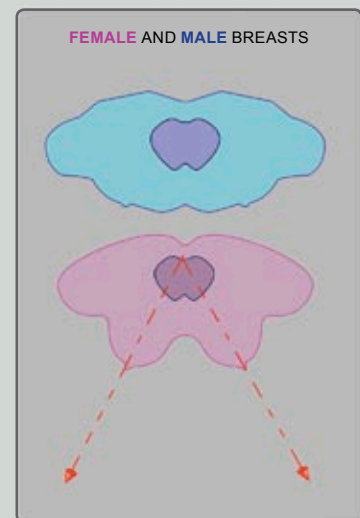
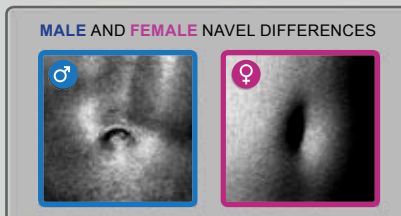
NOTE:

DIFFERENCE IN SILHOUETTE AT SHOULDERS AND HIPS.

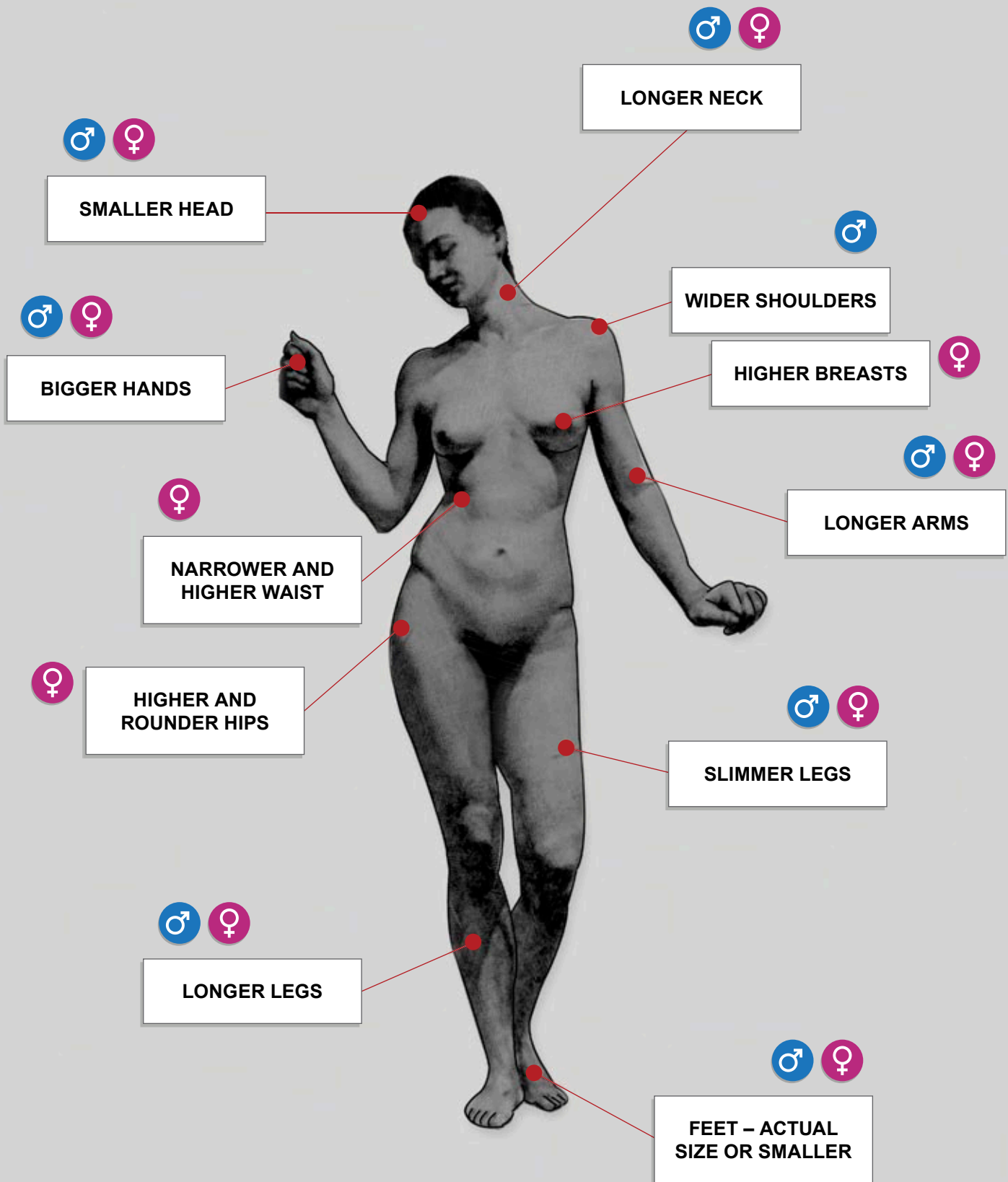


FEMALE FORMS ARE SOFTER AND CURVILINEAR. MALE FORMS ARE MORE ANGULAR.

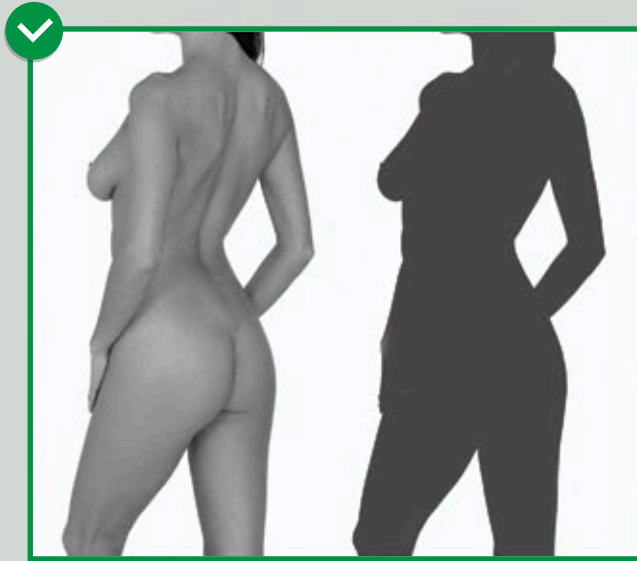
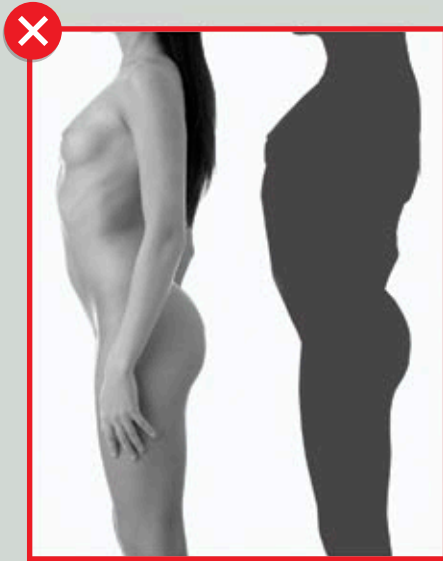
FEMALE HAS SLIGHTLY THICKER SUBCUTANEOUS FAT THAN MALE.



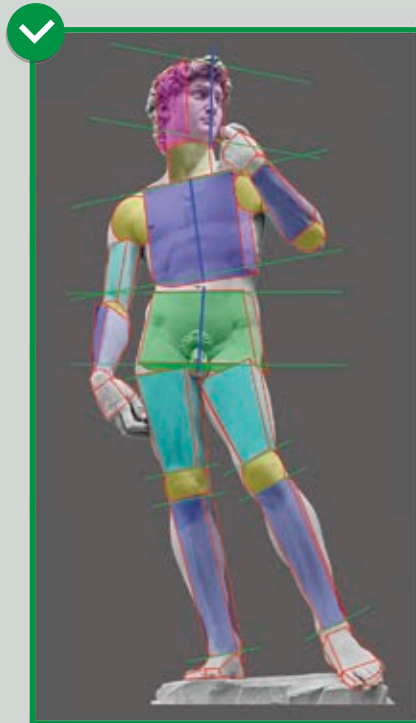
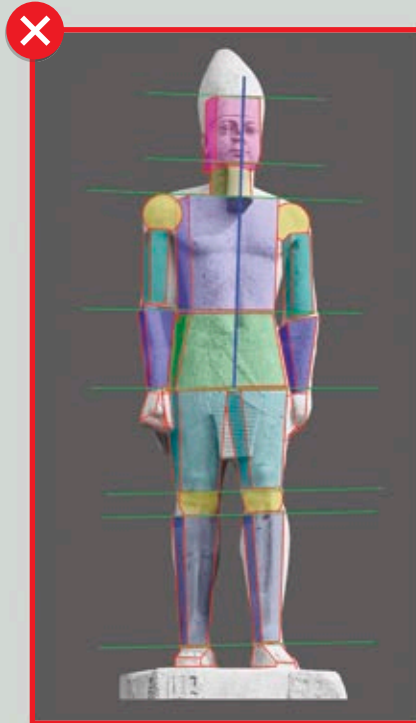
HOW TO MAKE A FIGURE MORE ATTRACTIVE



SILENT KILLER



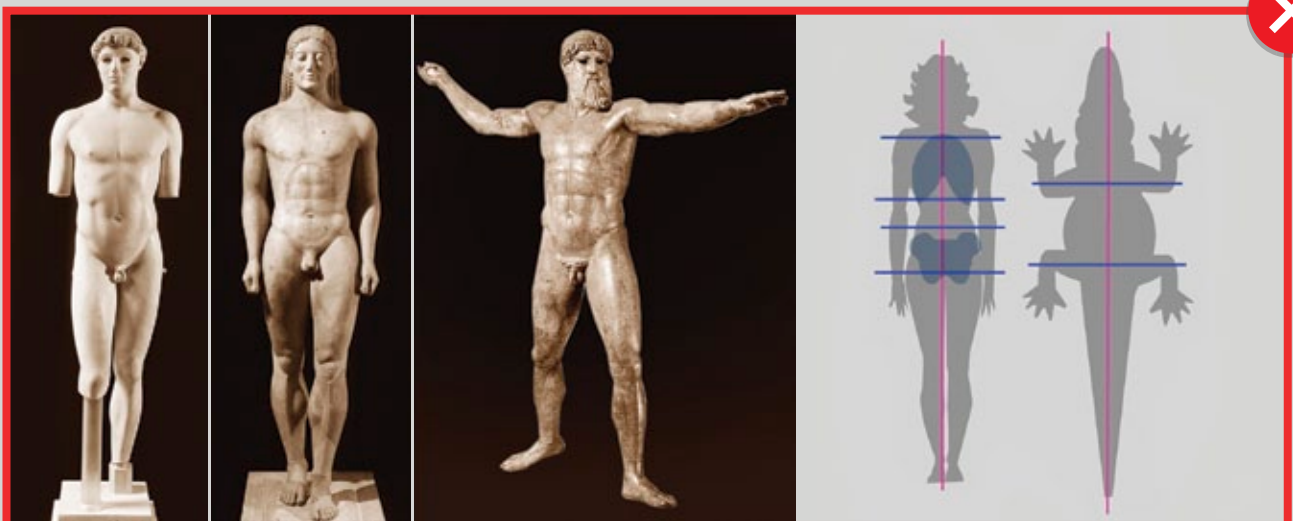
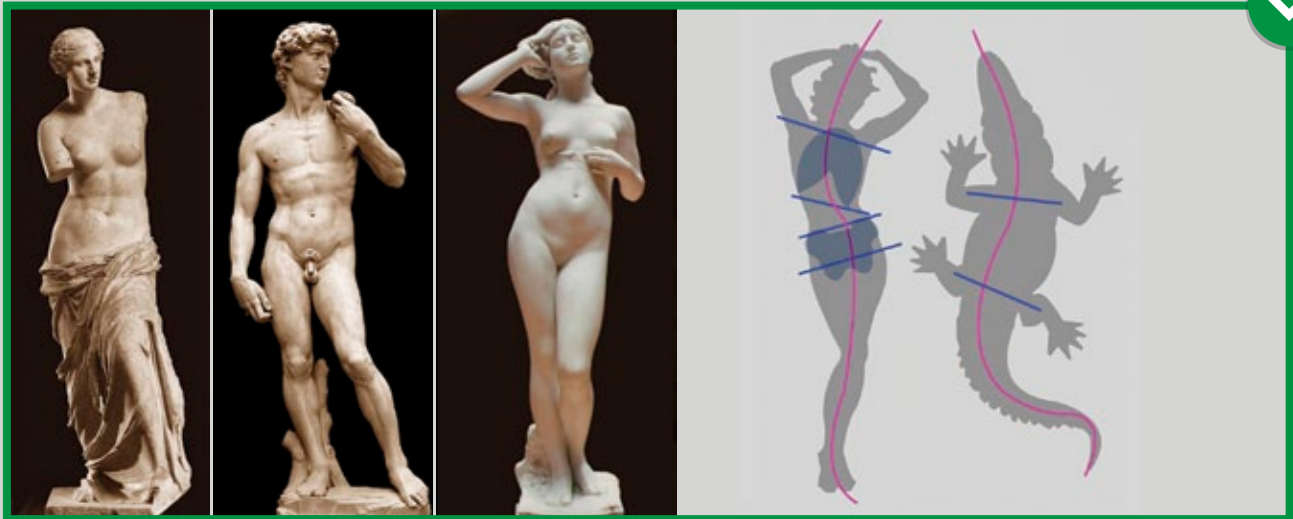
THE MOST ESSENTIAL ELEMENTS IN FIGURE SCULPTURE NEED TO BE FAR ENOUGH FROM THE BODY. IF YOU CAN'T EASILY DISTINGUISH YOUR CHARACTER BY SILHOUETTE ALONE, THEN RECONSIDER THE COMPOSITION! AN UNCLEAR SILHOUETTE IS THE "SILENT KILLER" OF DESIGN!



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

CONTRAPPOSTO

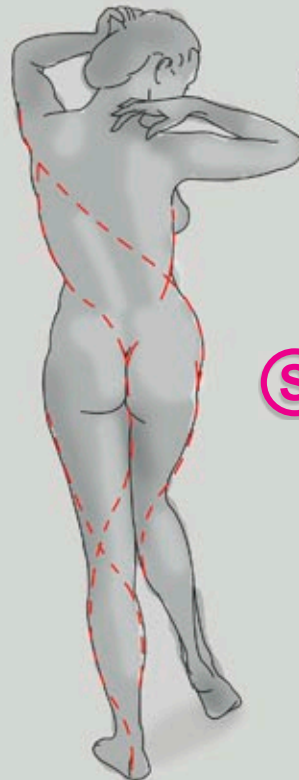
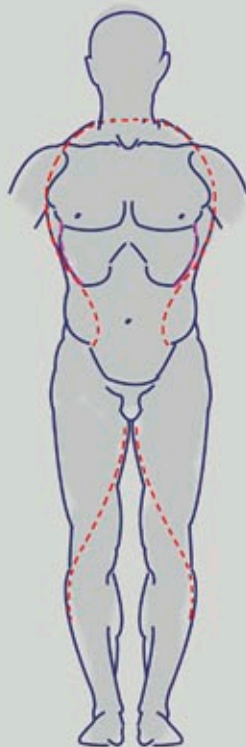
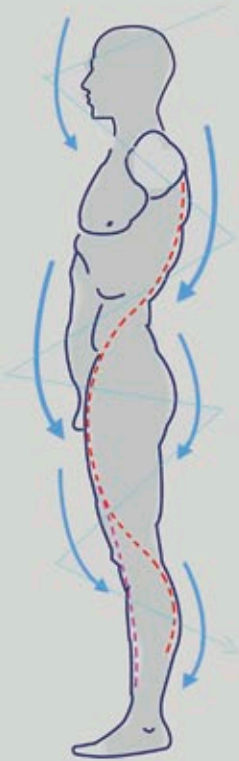
THIS TERM DESCRIBES THE POSITION OF A FIGURE IN WHICH THE HIPS AND LEGS ARE TURNED IN A DIFFERENT DIRECTION FROM THAT OF THE SHOULDERS AND HEAD; THE FIGURE TWISTS ON ITS OWN VERTICAL AXIS. THE FIGURE'S BODY AND POSTURE IS DEPICTED AS A SINUOUS OR SERPENTINE "S" SHAPE.



LAZY "S"



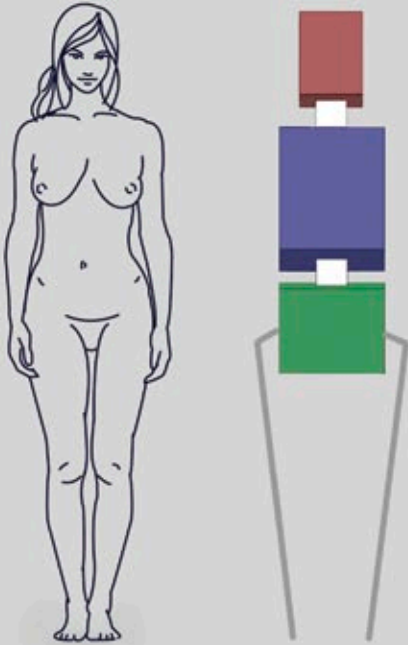
DRAW IMAGINARY S-SHAPED LINES AND BY FOLLOWING THEM, YOU CAN EASILY CONSTRUCT THE CURVES OF THE BODY.



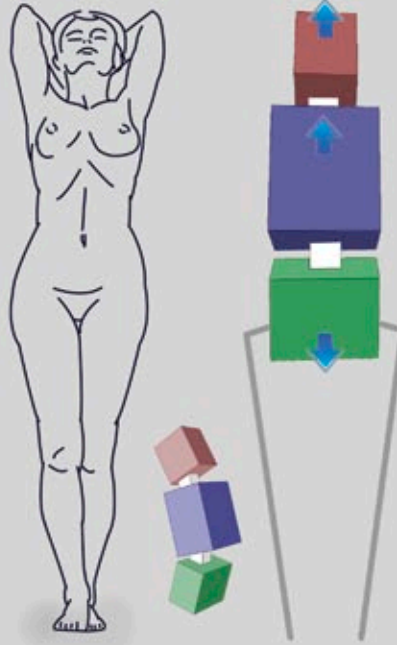
5 POSITION COMBINATIONS OF MOVABLE MASSES

i

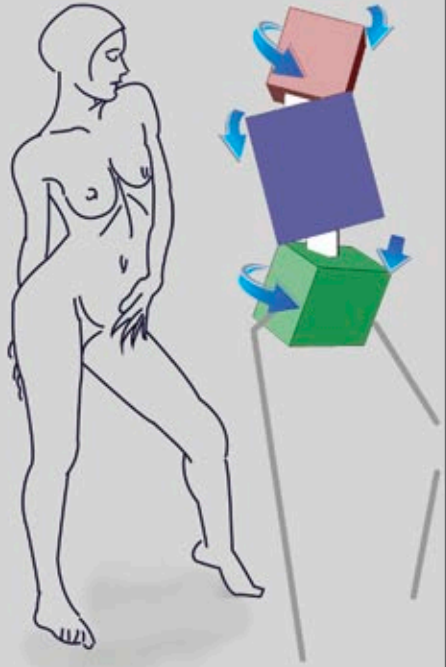
ERECT



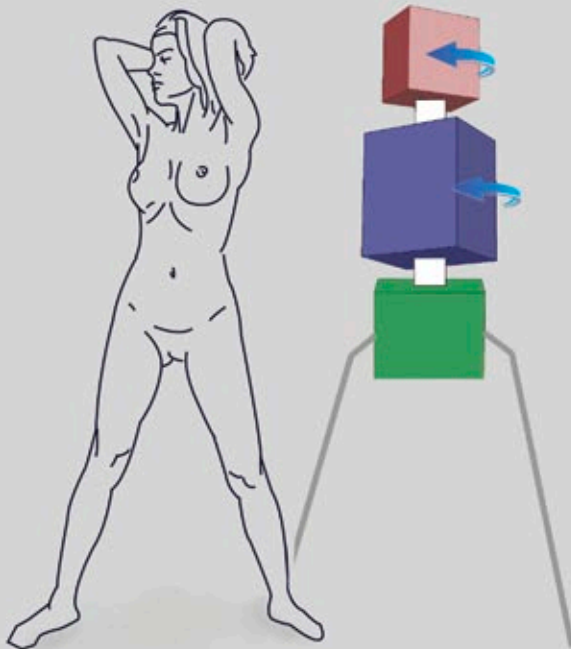
TIPPED BACK



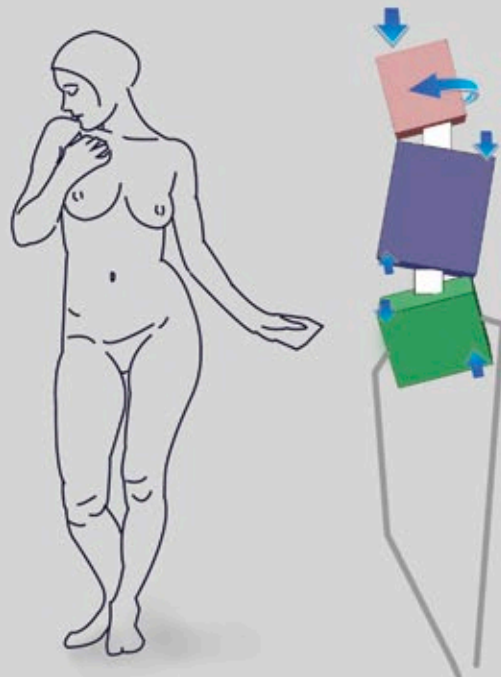
COMBINATION



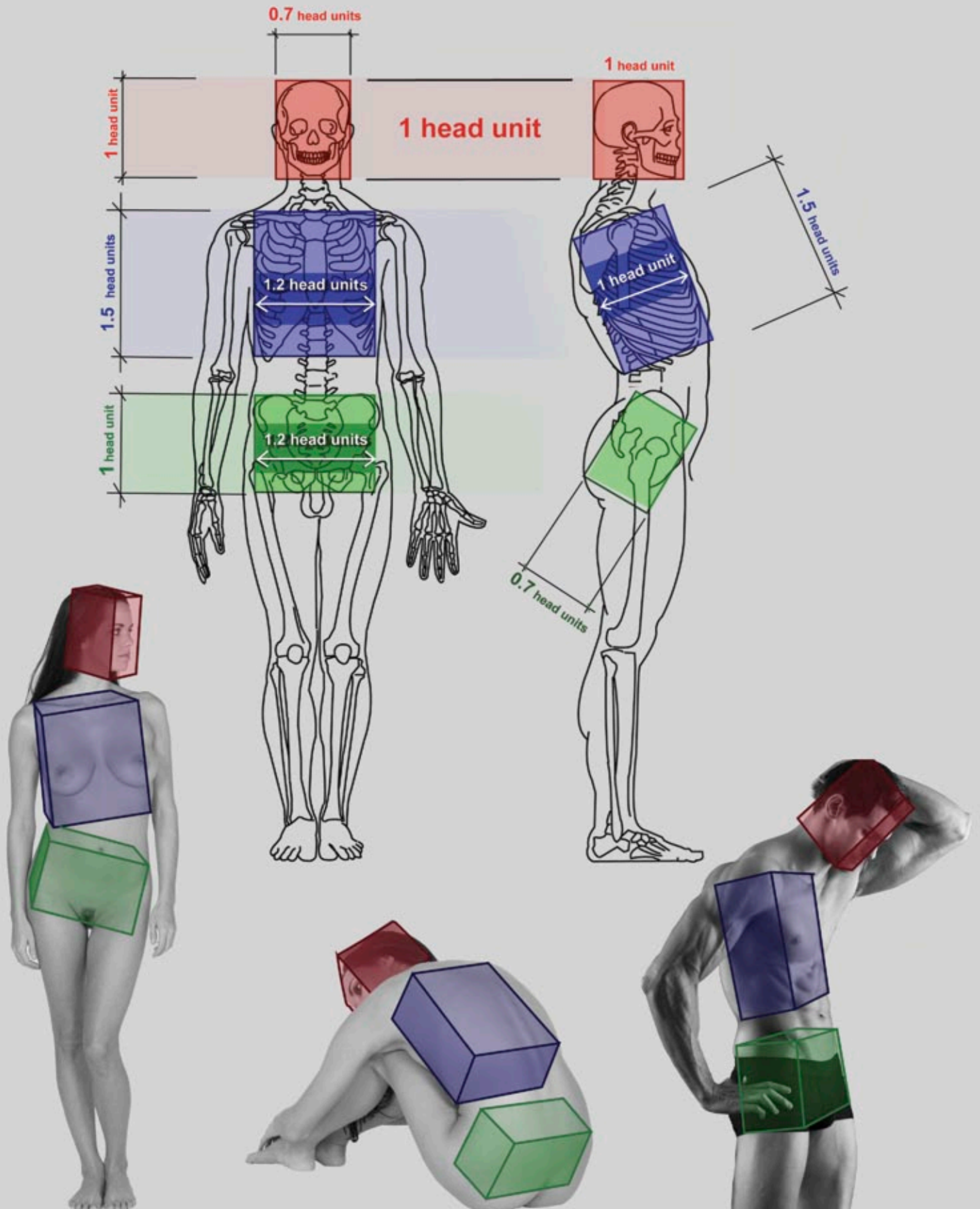
ROTATED



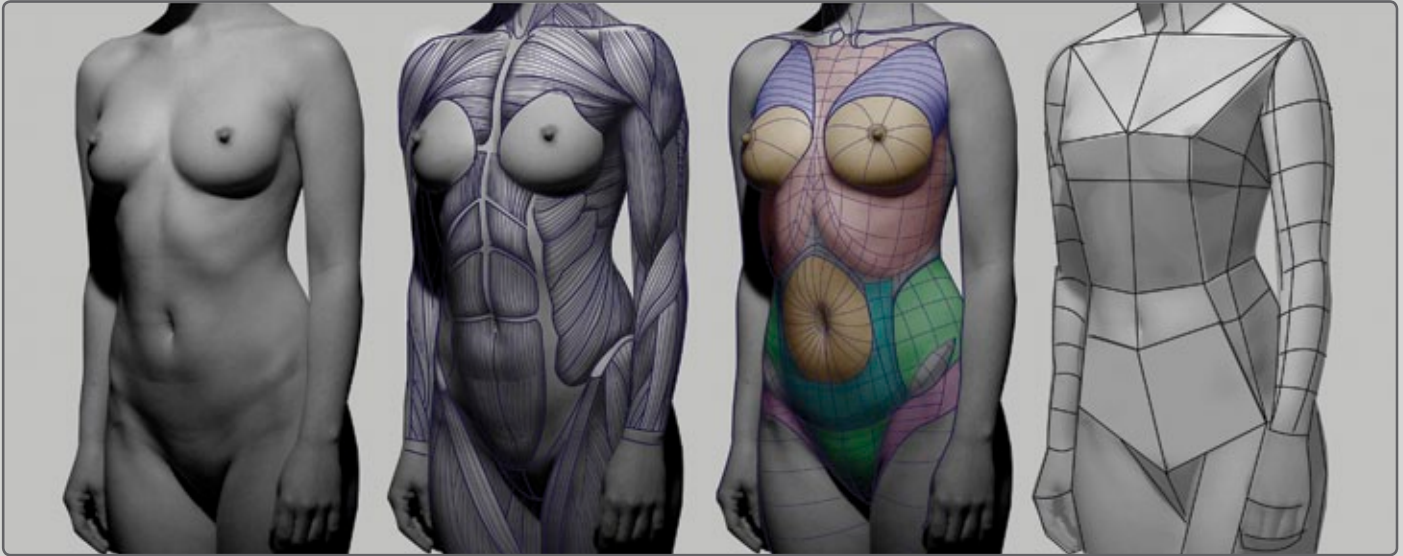
TILTED



PROPORTIONS IN HEAD UNITS OF MOVABLE MASSES



FEMALE TORSO FROM REALISTIC TO SIMPLIFIED

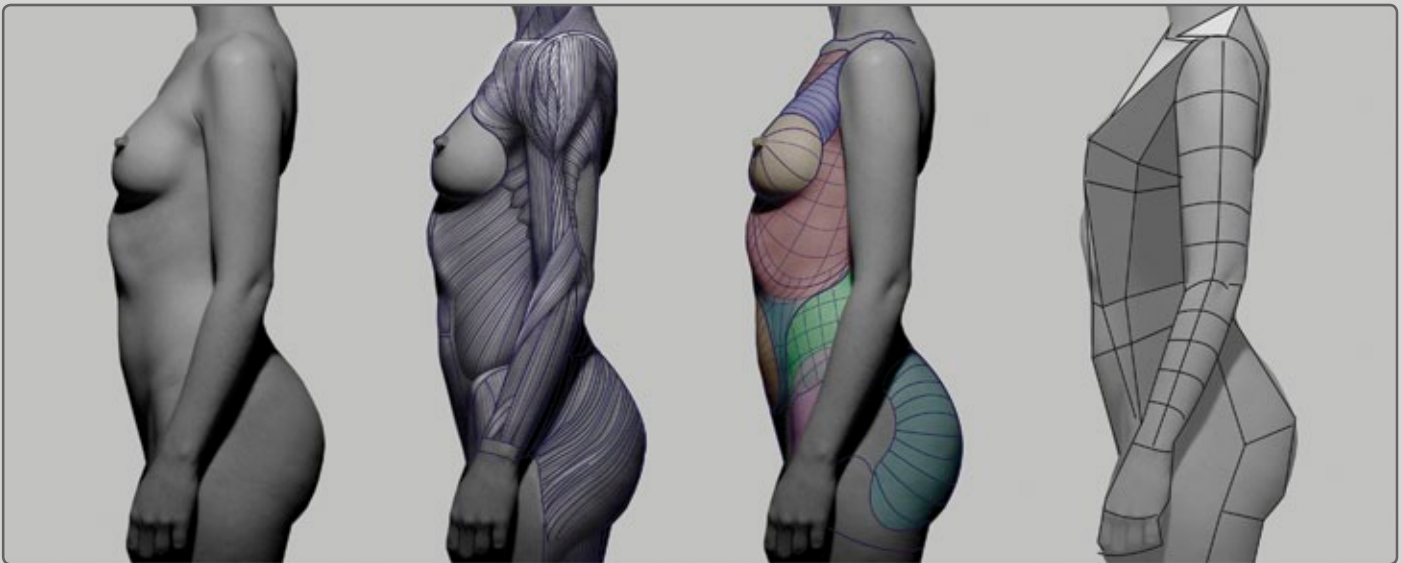


REAL

MUSCLES

SHAPES

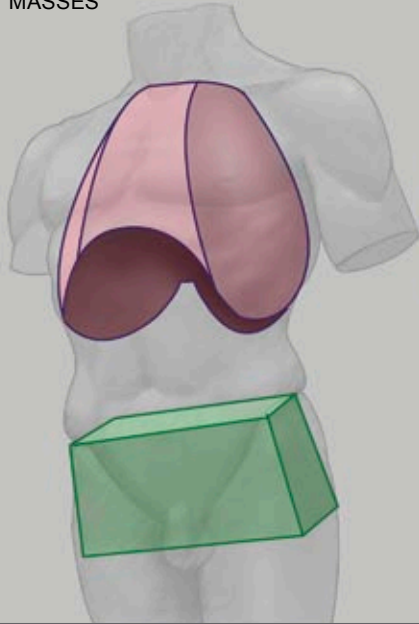
BLOCK-OUT



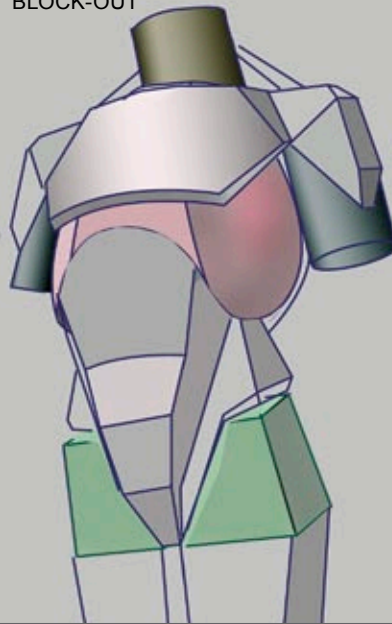
MALE TORSO FROM REALISTIC TO SIMPLIFIED



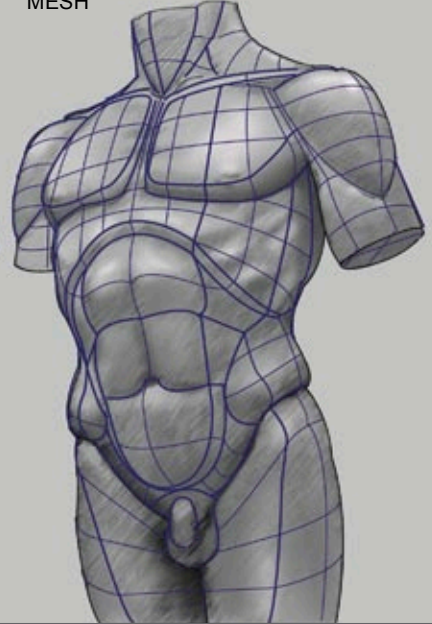
MASSSES



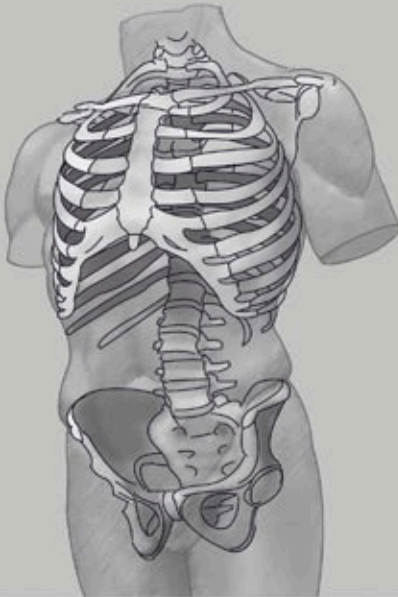
BLOCK-OUT



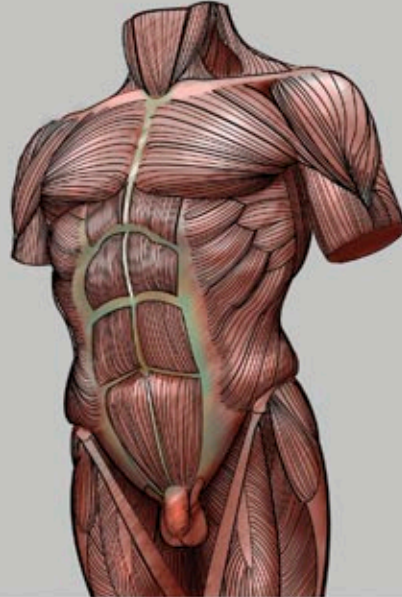
MESH



BONES



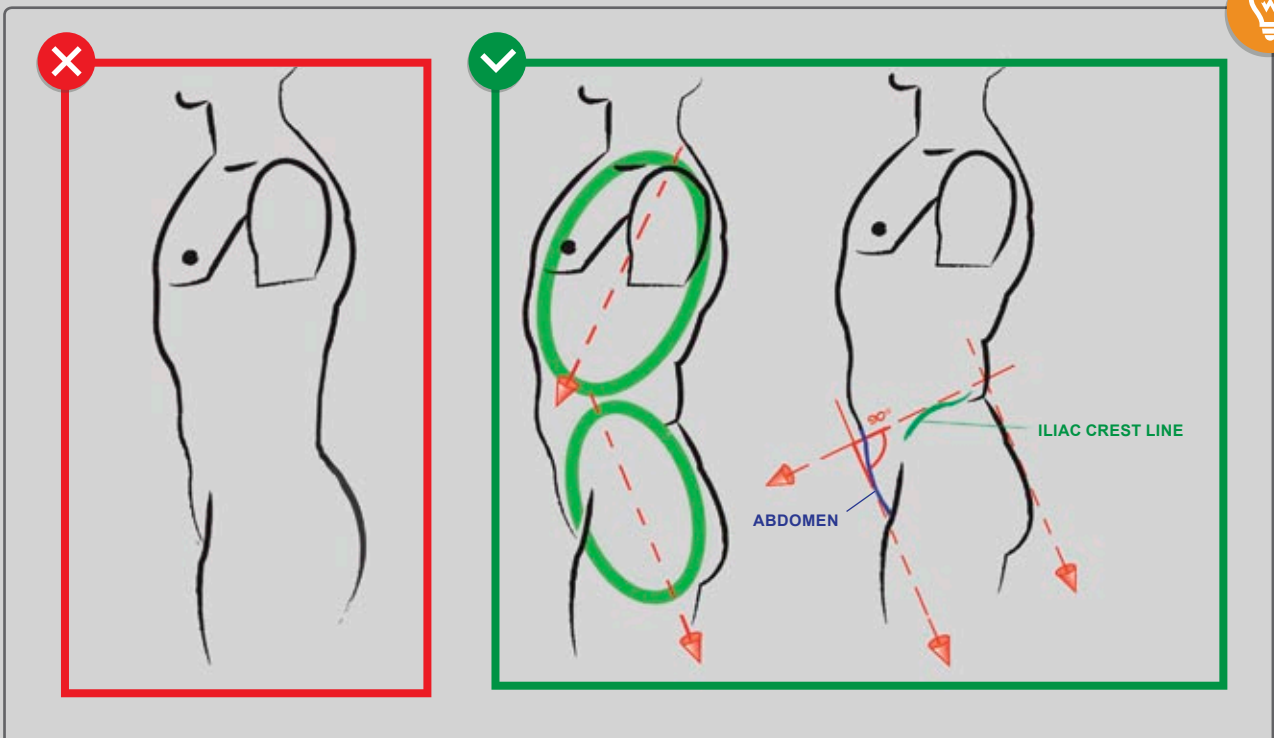
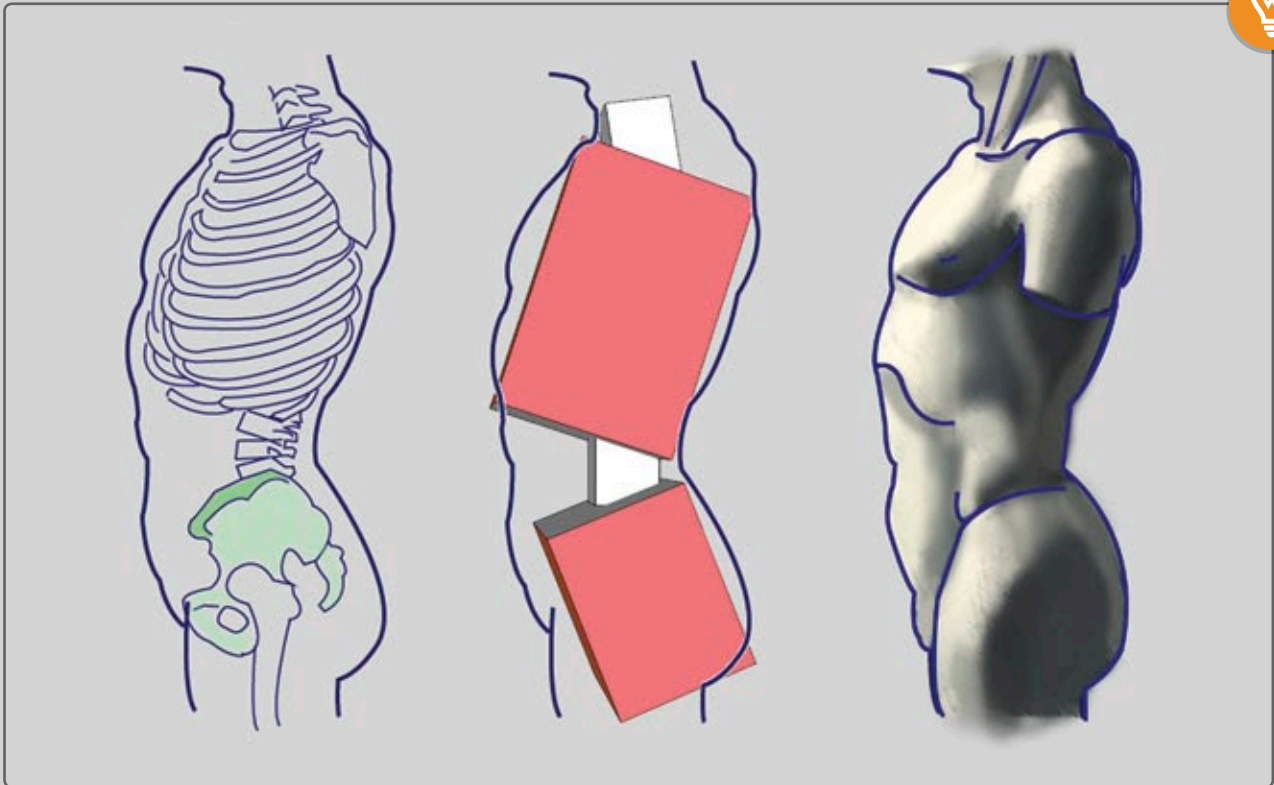
MUSCLES



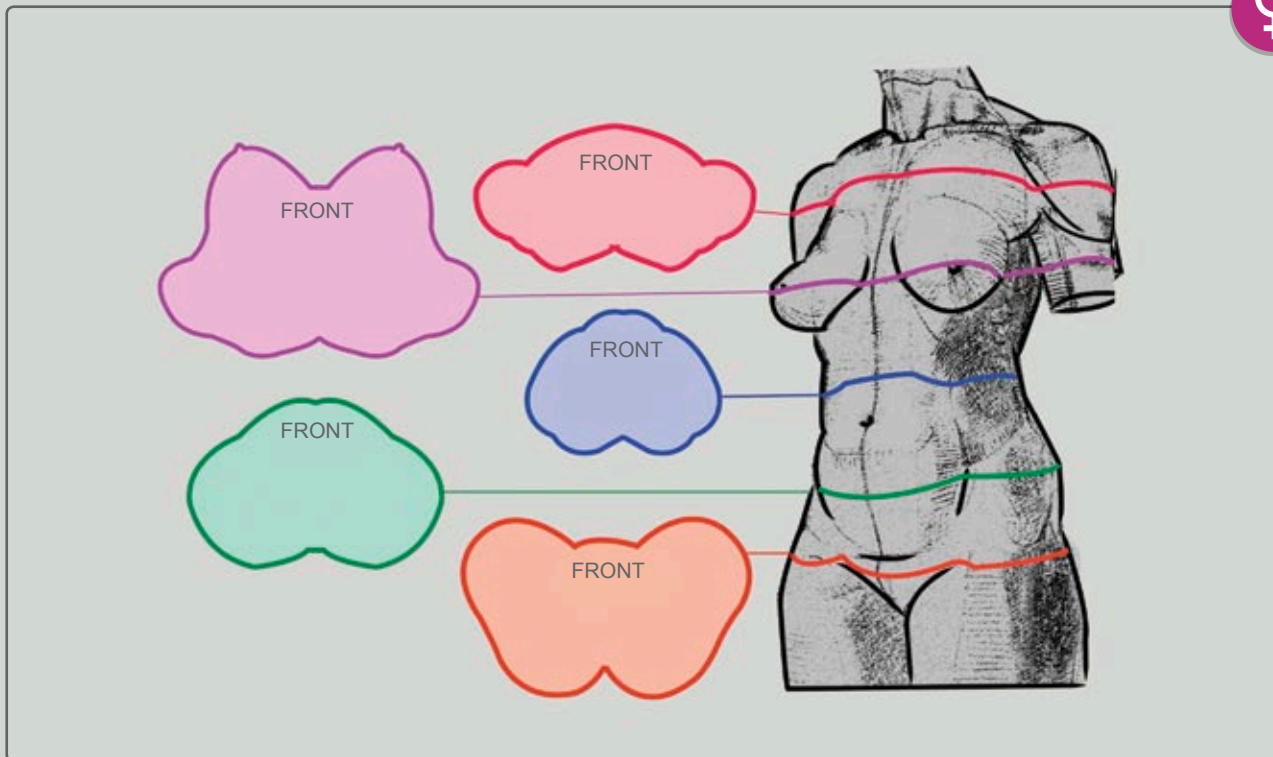
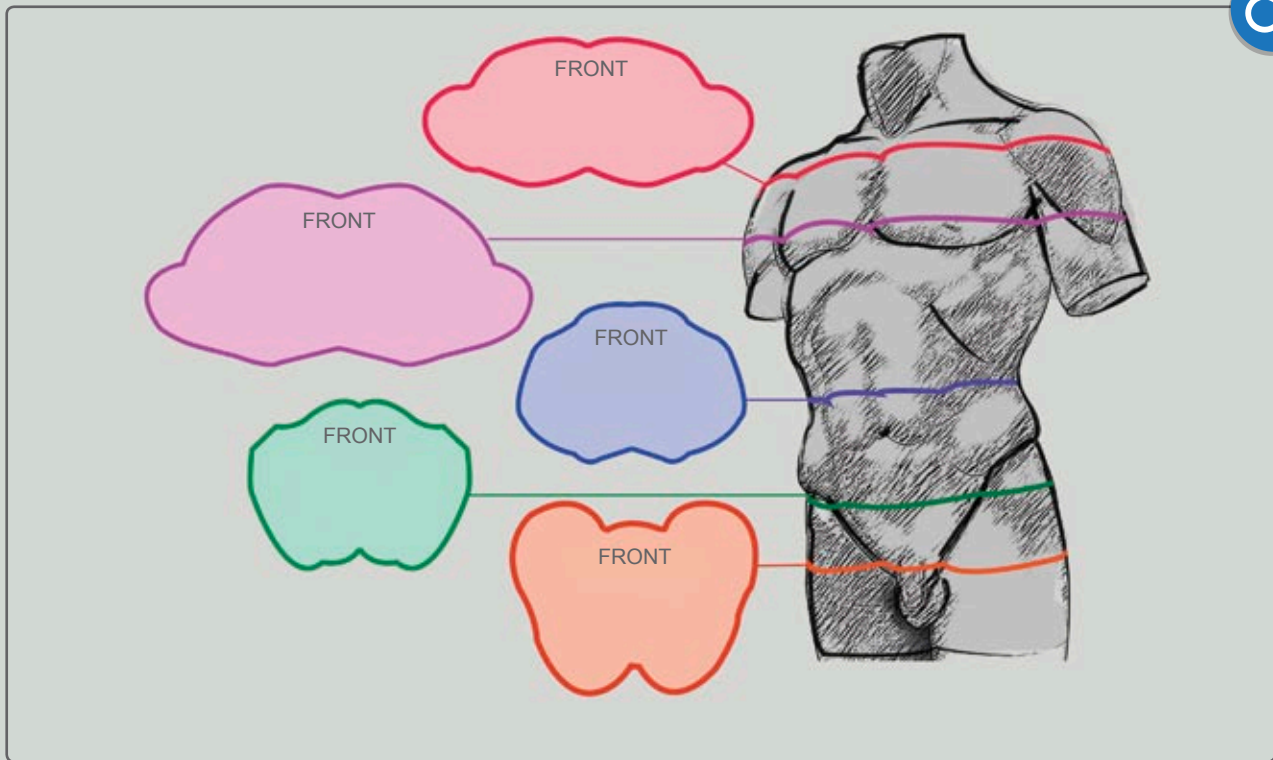
REALISTIC



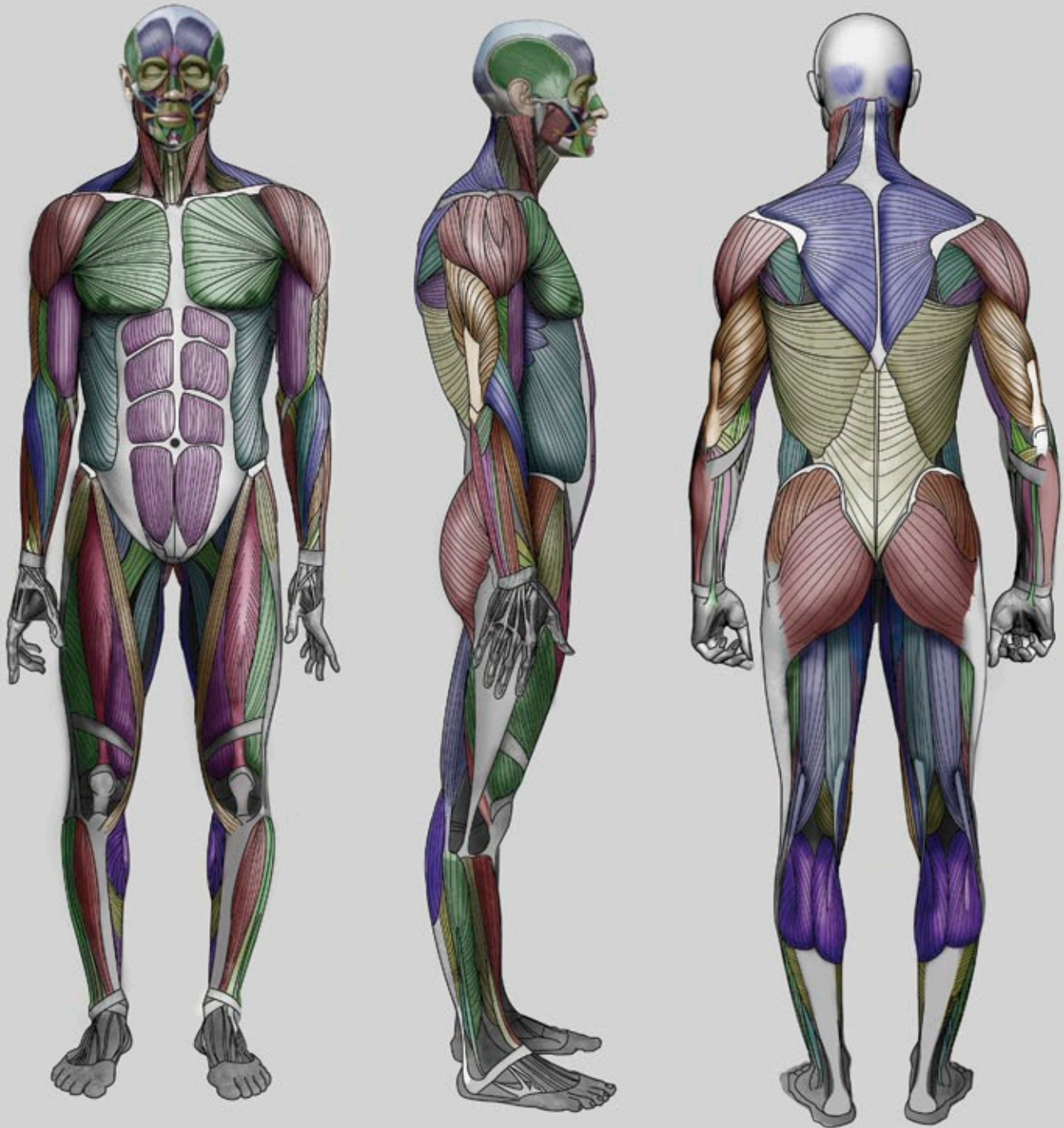
ANGULAR RELATIONSHIP OF MOVABLE MASSES OF TORSO



HORIZONTAL CROSS SECTIONS OF TORSO



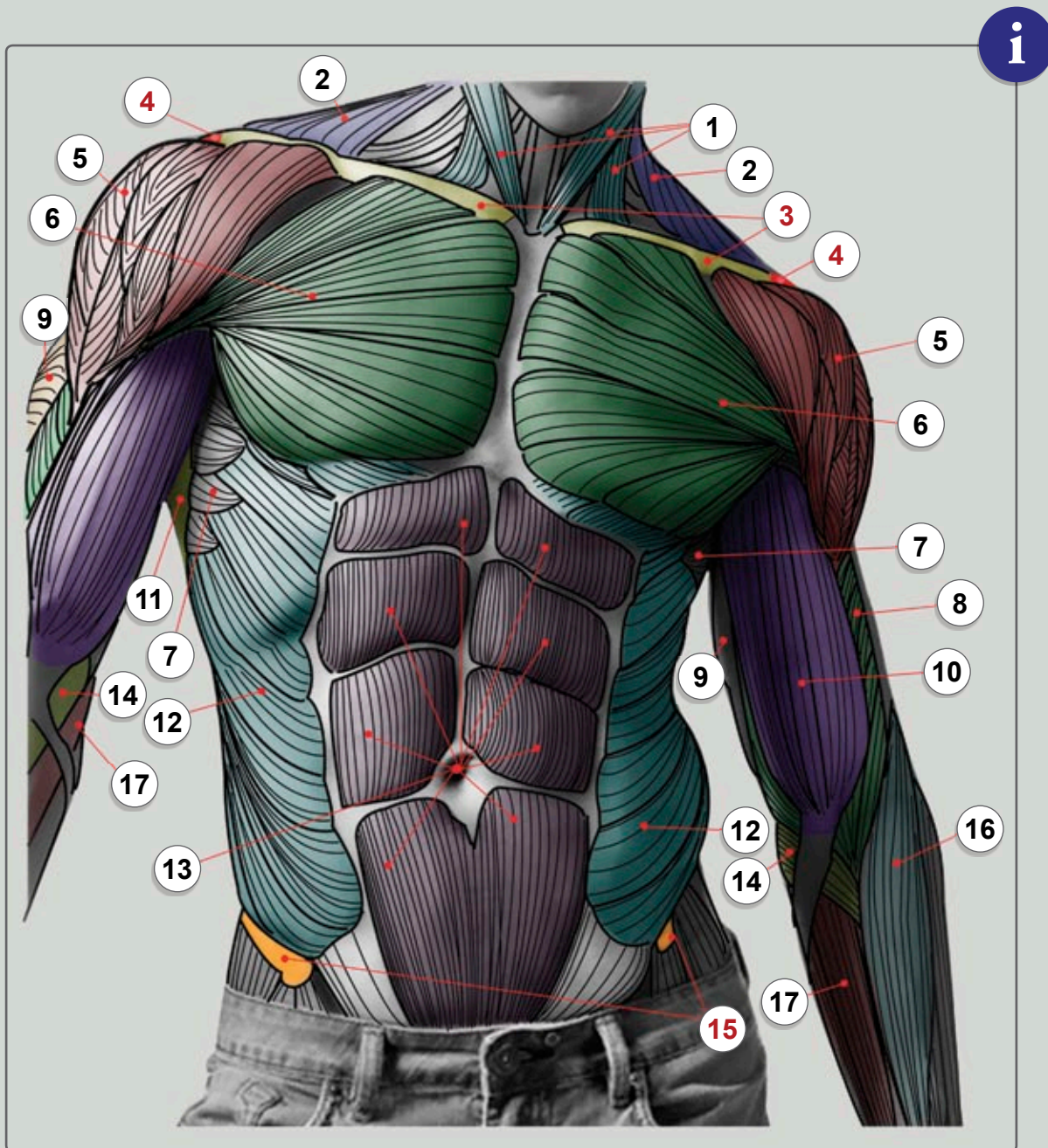
ÉCORCHÉ



MALE FIGURE



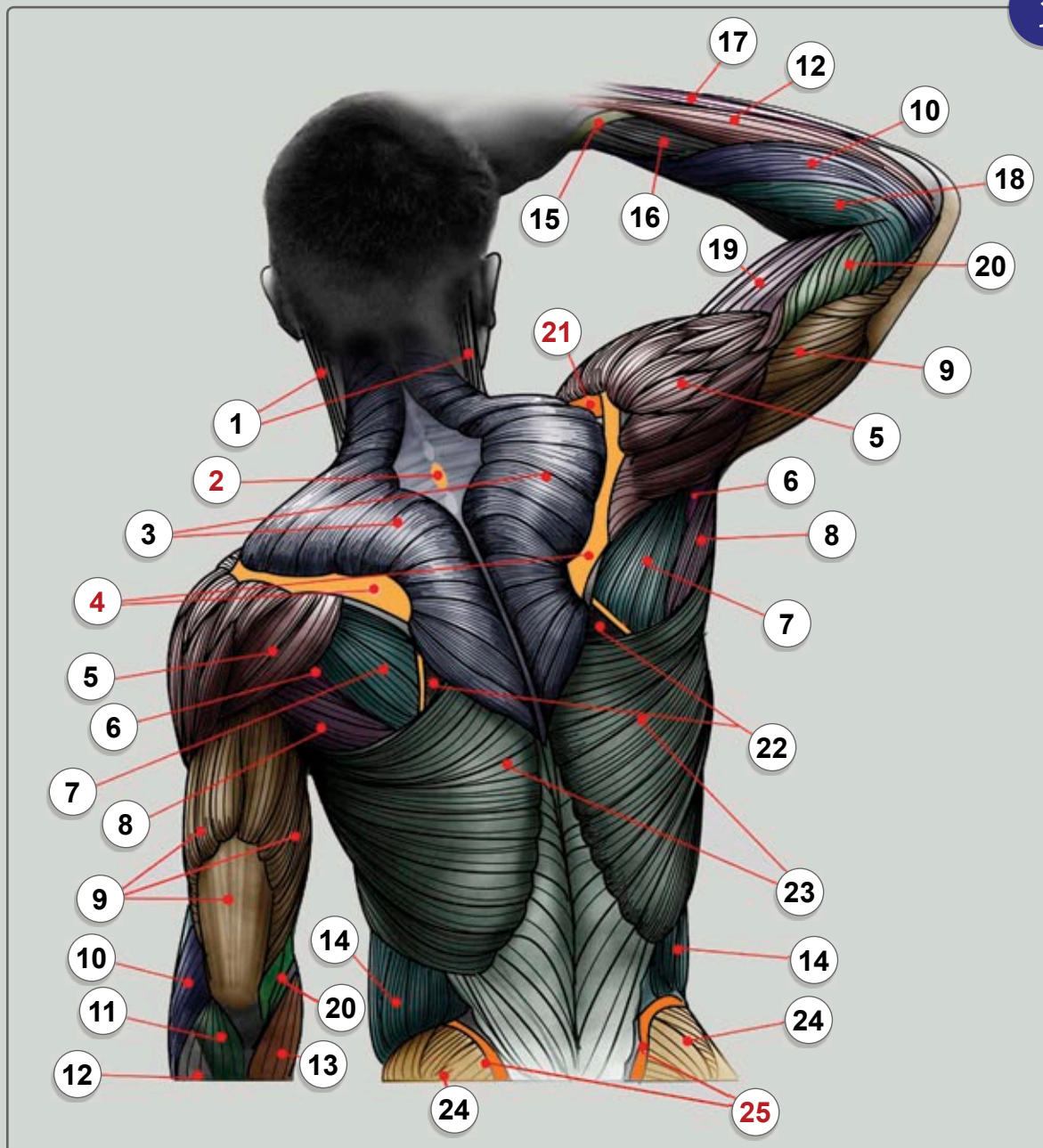
MAIN MUSCLES AND LANDMARK POINTS OF FRONTAL TORSO



- | | | |
|-----------------------|---------------------|----------------------------------|
| 1 STERNOCLEIDOMASTOID | 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 | |

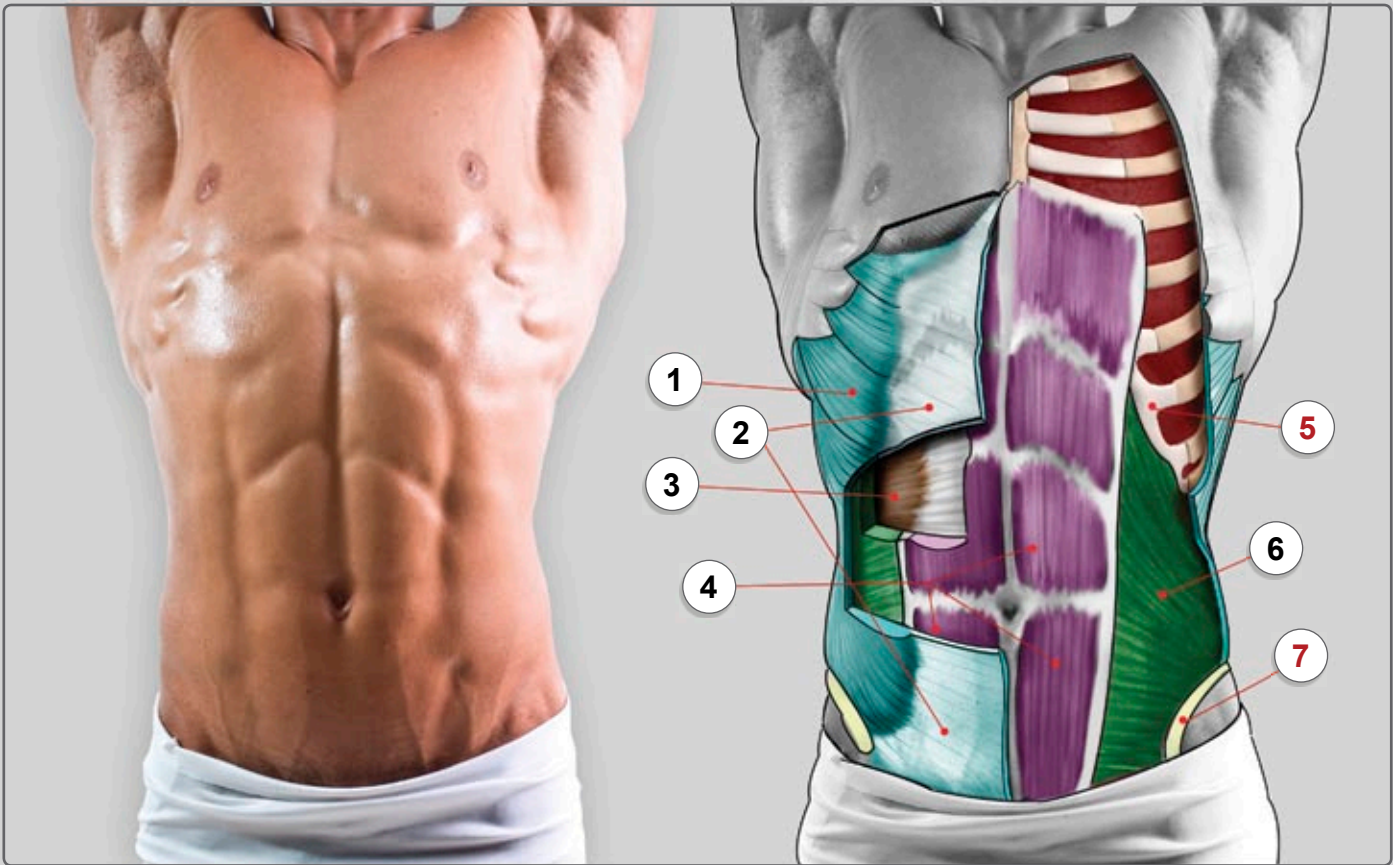
MAIN MUSCLES AND BONES OF THE BACK

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- | | | |
|-----------------------|-----------------------------------|-----------------------------------|
| 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 | |

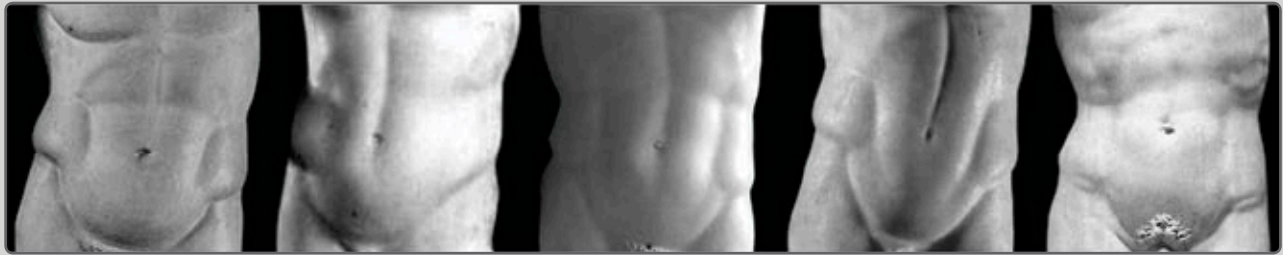
ABDOMINAL MUSCLES



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- 1** **EXTERNAL OBLIQUE:** LOCATED ON SIDE AND FRONT OF ABDOMEN
- 2** **APONEUROSIS 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”?



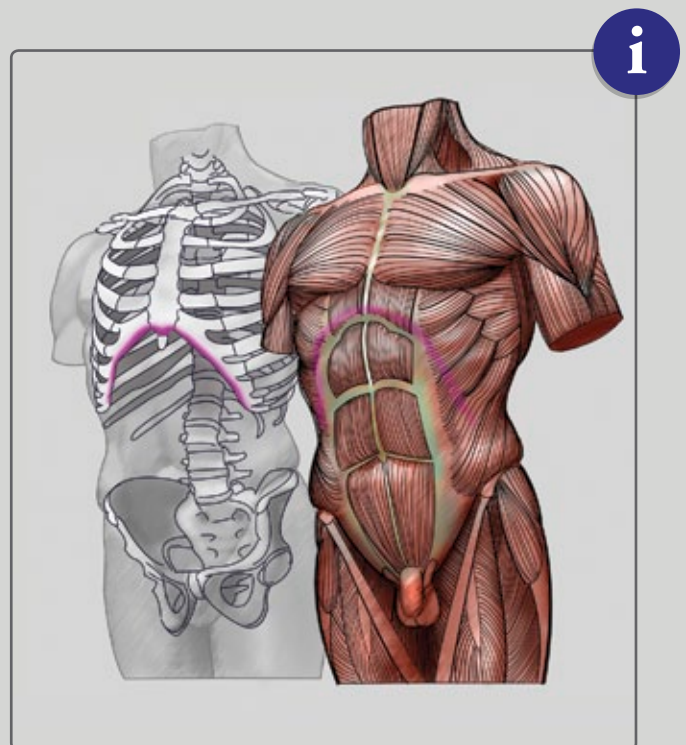
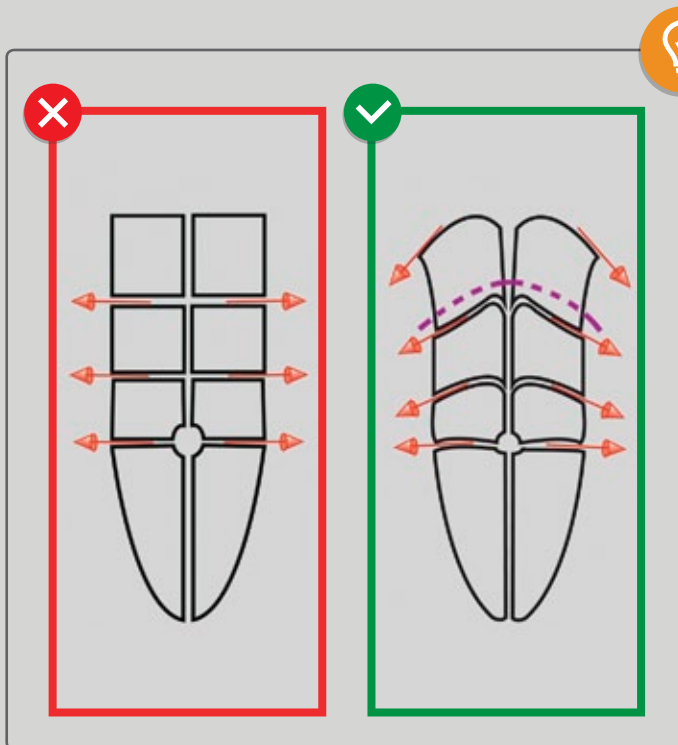
CLASSIC SCULPTURE



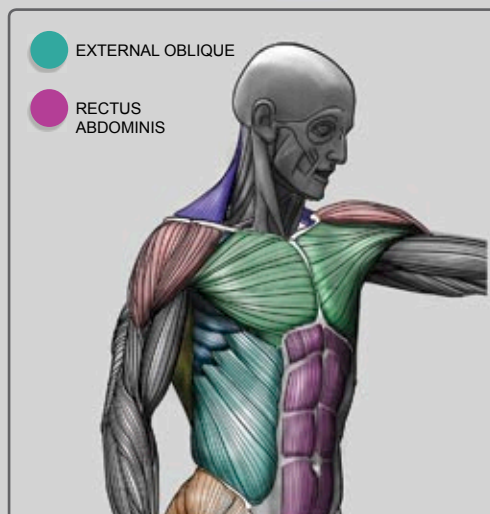
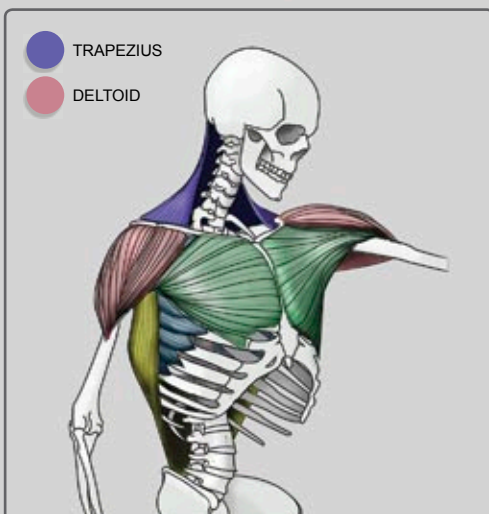
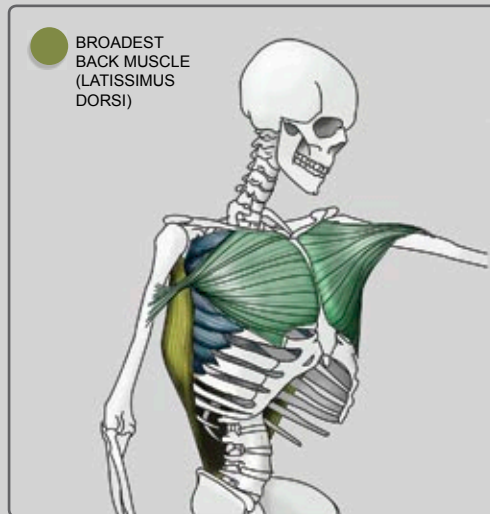
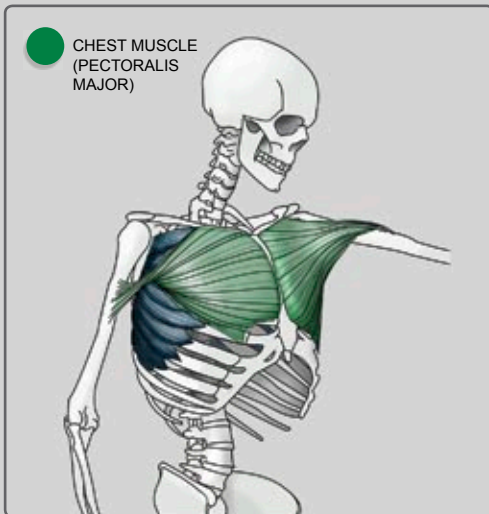
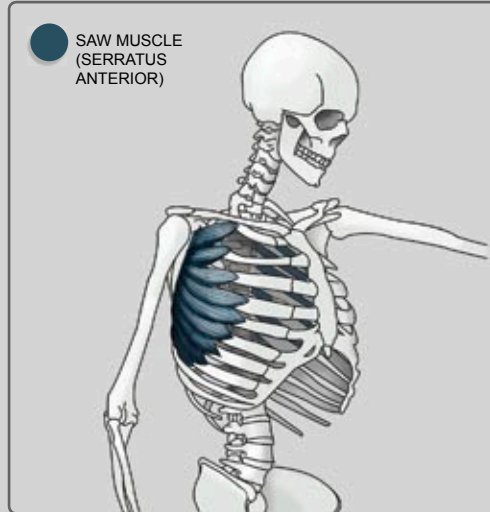
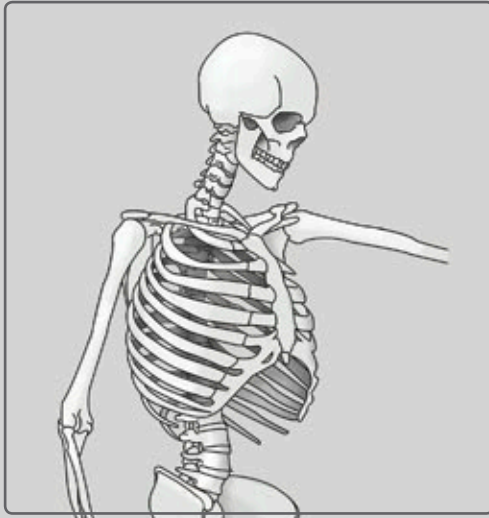
FITNESS



SKINLESS

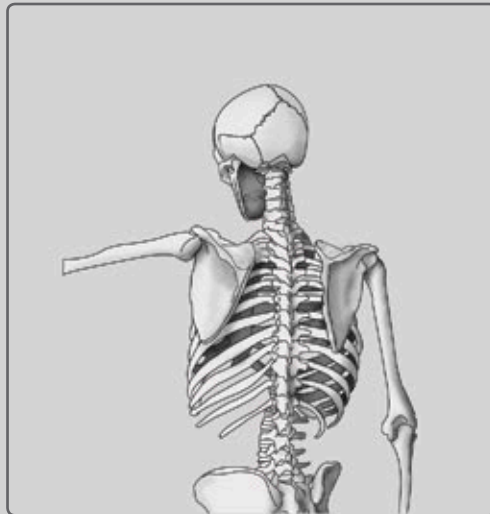


MOST IMPORTANT MUSCLES OF FRONTAL TORSO (LAYER BY LAYER)



MOST IMPORTANT BACK MUSCLES (LAYER BY LAYER)

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SAW MUSCLE
(SERRATUS ANTERIOR)

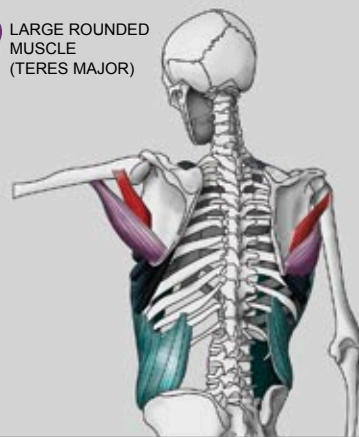


EXTERNAL OBLIQUE

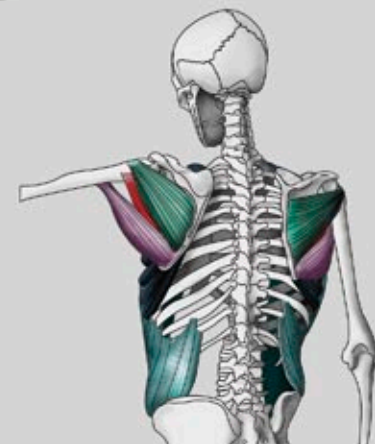


SMALL ROUNDED
MUSCLE (TERES MINOR)

LARGE ROUNDED
MUSCLE (TERES MAJOR)

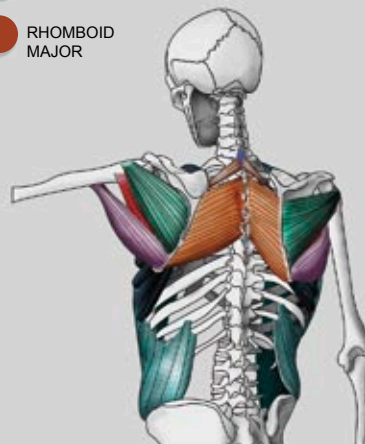


INFRASPINATUS



RHOMBOID MINOR

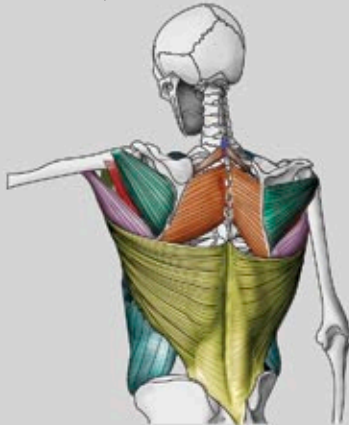
RHOMBOID
MAJOR



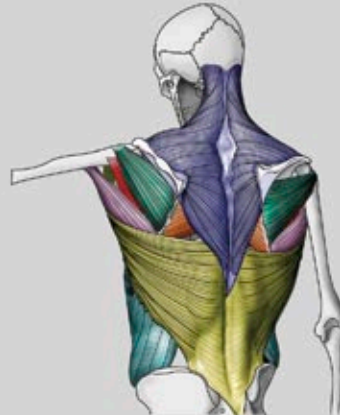
MOST IMPORTANT BACK MUSCLES (LAYER BY LAYER)



**BROADEST
BACK MUSCLE
(LATISSIMUS DORSI)**



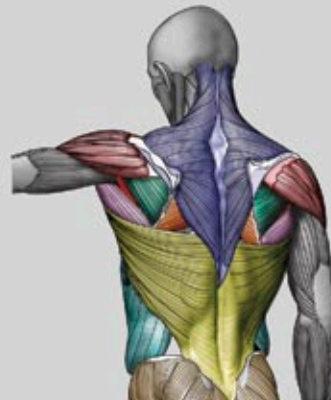
TRAPEZIUS



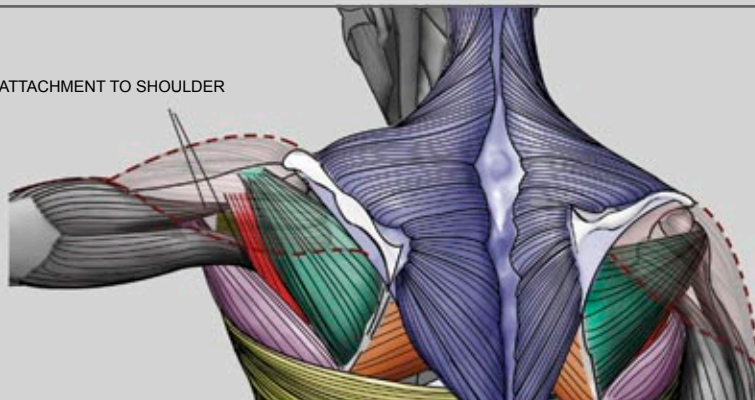
DELTOID



**BUTTOCKS
(GLUTEUS MAXIMUS)**

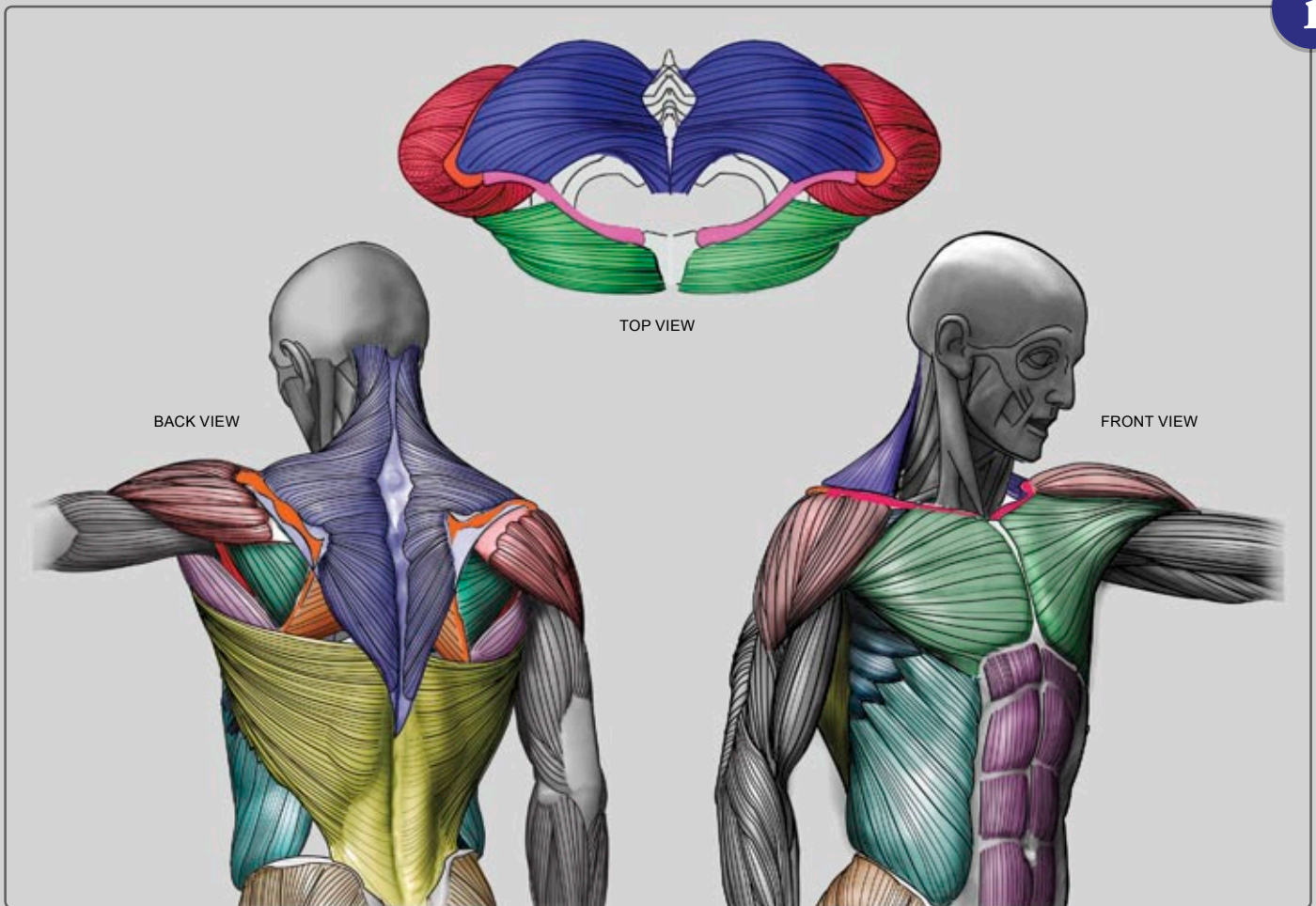


TRICEPS ATTACHMENT TO SHOULDER

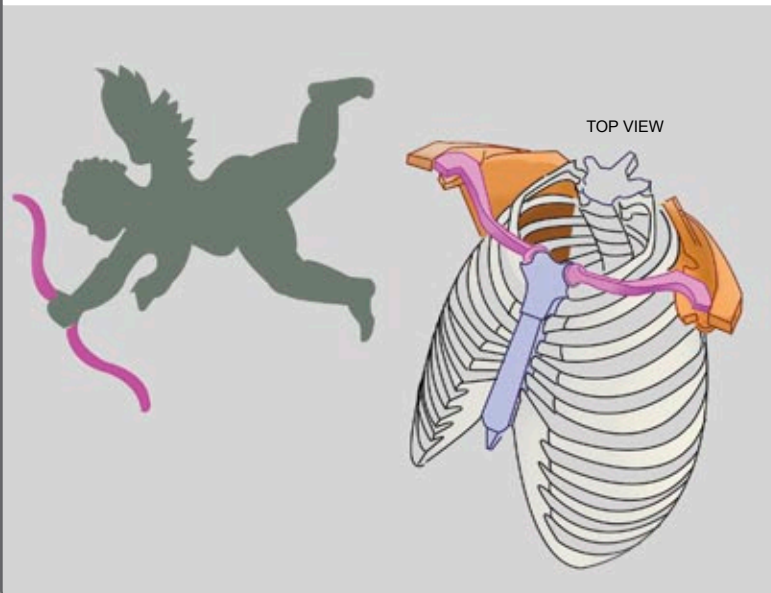


CLAVICLE – SHAPE AND CONNECTIONS

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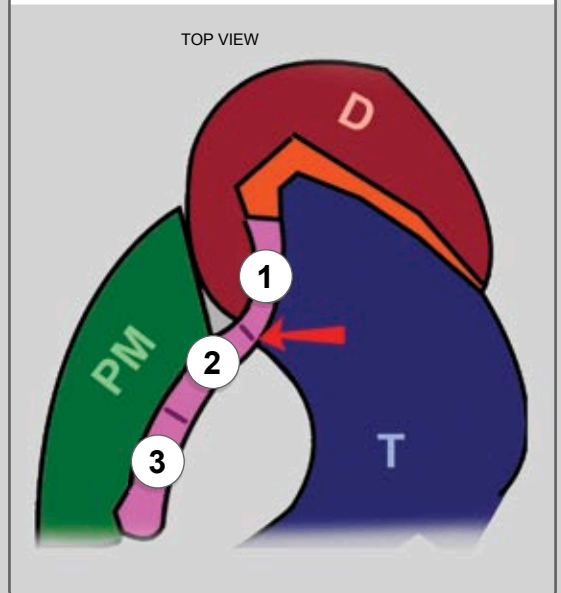


IF YOU LOOK AT THE **CLAVICLE** FROM ABOVE, YOU CAN SEE IT'S AN "S" SHAPE.

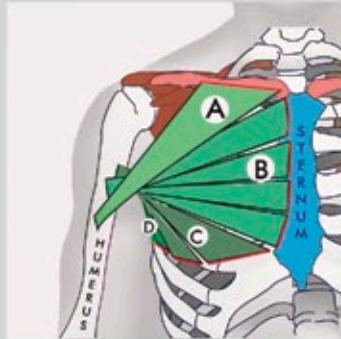


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BOTH, (D) AND (T) CONNECT ON THE LATERAL THIRD OF THE **CLAVICLE**.



GREAT CHEST MUSCLE (PECTORALIS MAJOR)



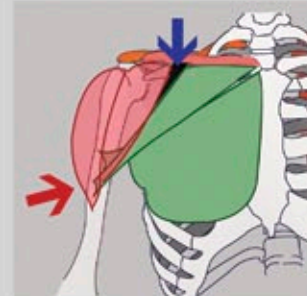
ONE END OF **PM** IS CONNECTED TO THE HUMERUS AND OTHER END CONNECTS:

- 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**.

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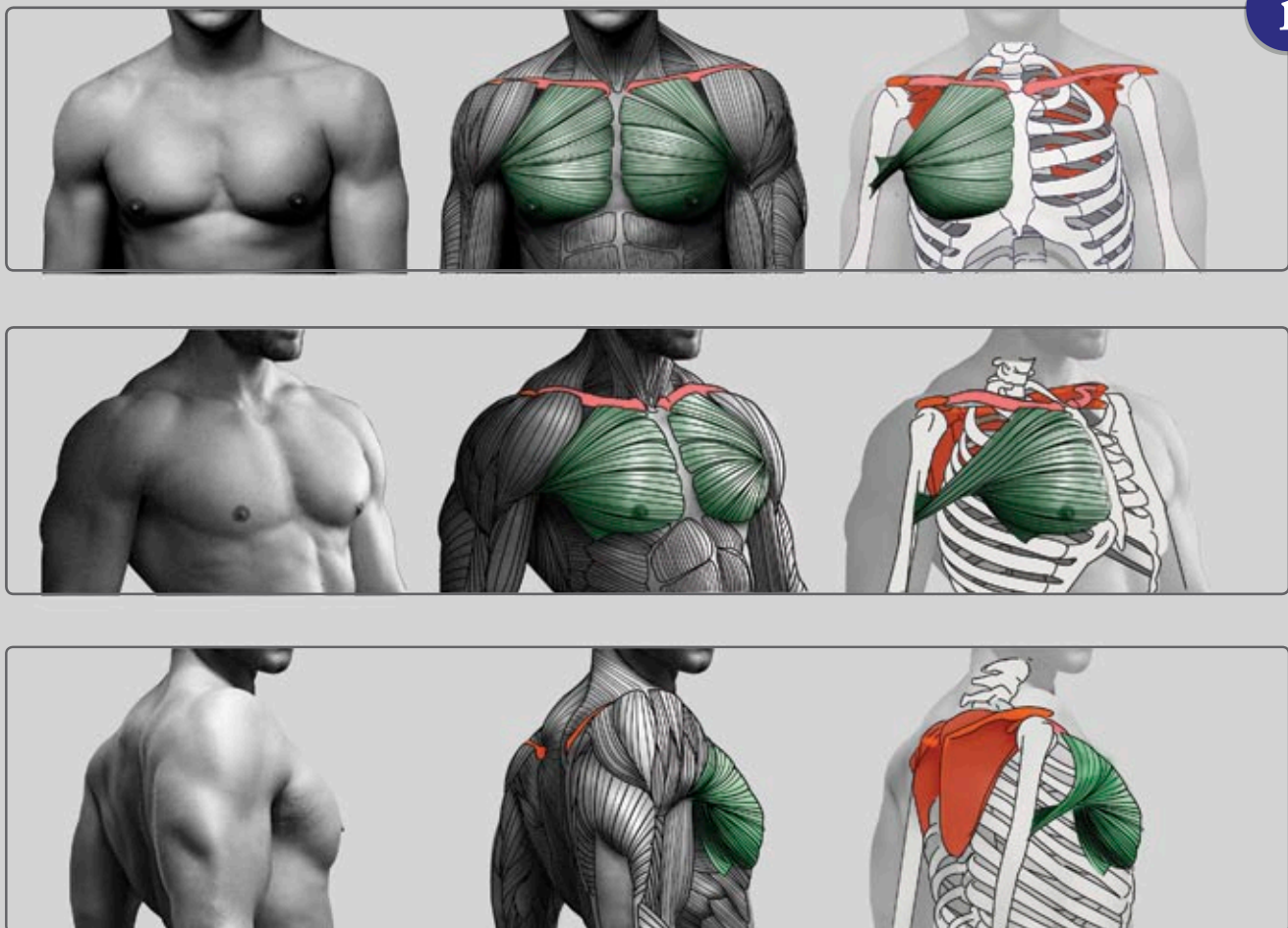
HOLLOW AREA BETWEEN **PM AND **DELTOID** IS ALWAYS VISIBLE!**



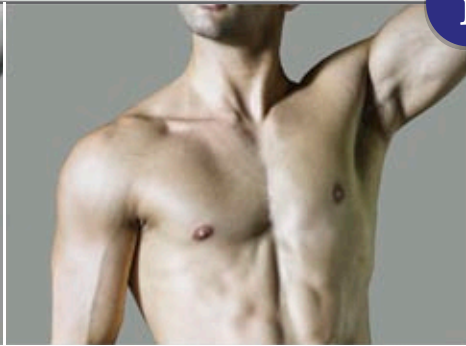
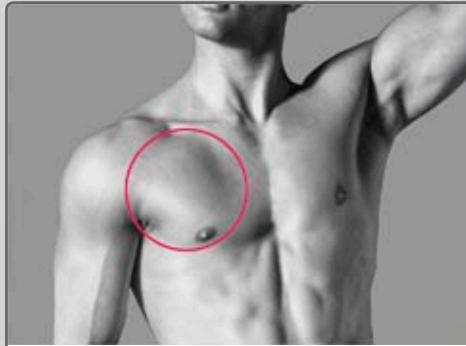
PM IS PARTIALLY COVERED BY **DELTOID MUSCLE.**

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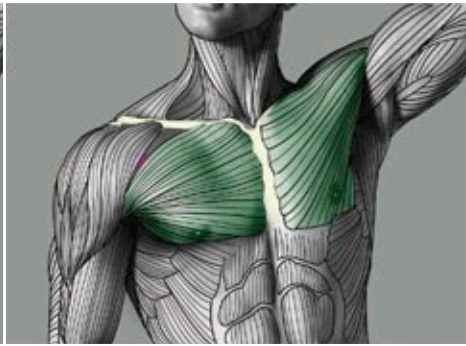
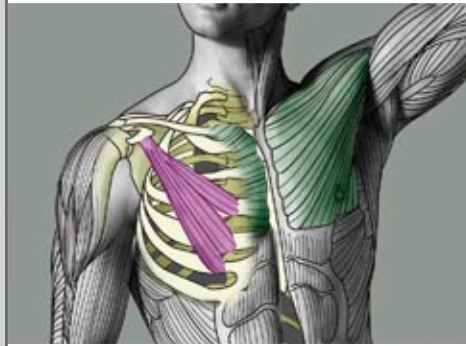


WHAT IS THIS BULGE?



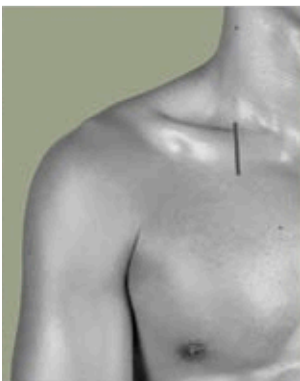
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THE **PECTORALIS MINOR** MUSCLE PUSHING **PECTORALIS MAJOR** OUTWARD FROM UNDERNEATH.



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

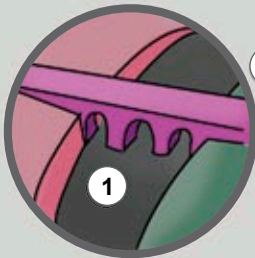
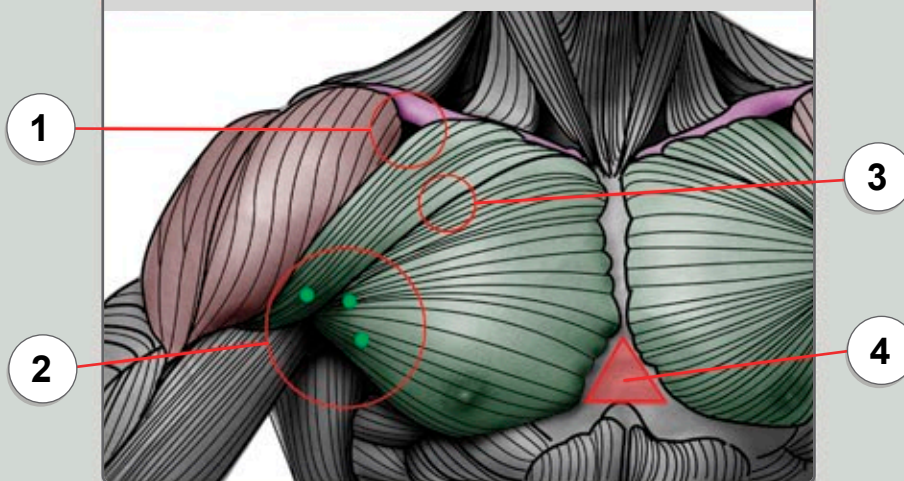
AS **CHEST MUSCLES** BECOME MORE DEVELOPED, LESS **COLLAR BONE (CLAVICLE)** IS VISIBLE.



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

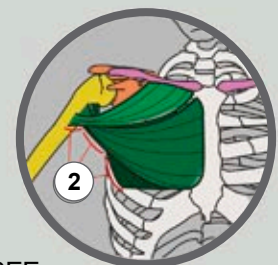


CHEST AND SHOULDER FEATURES



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

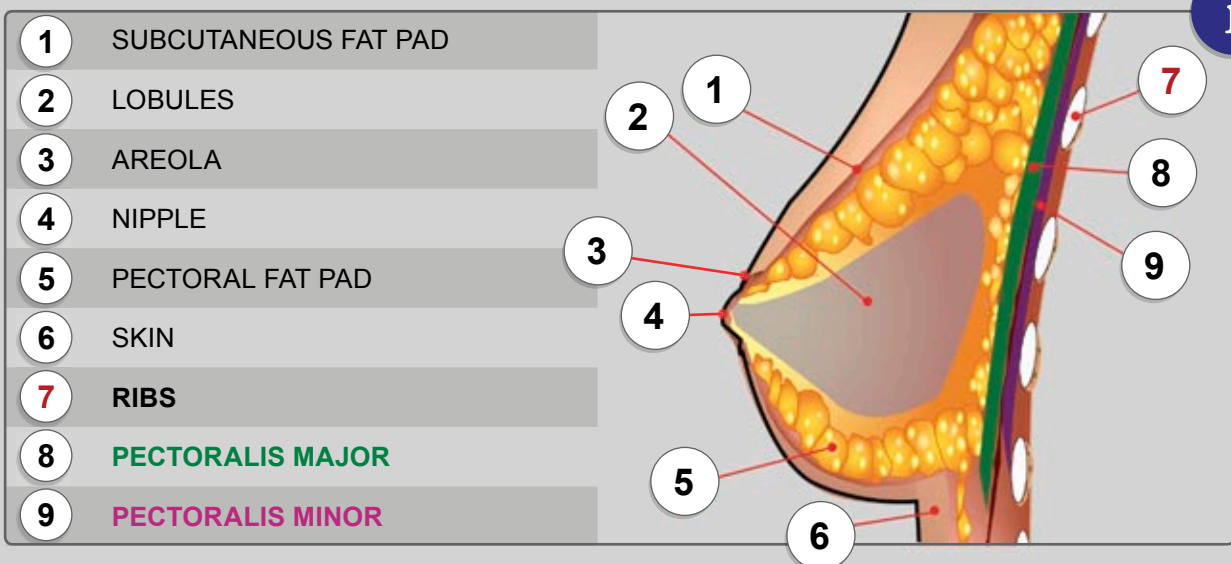
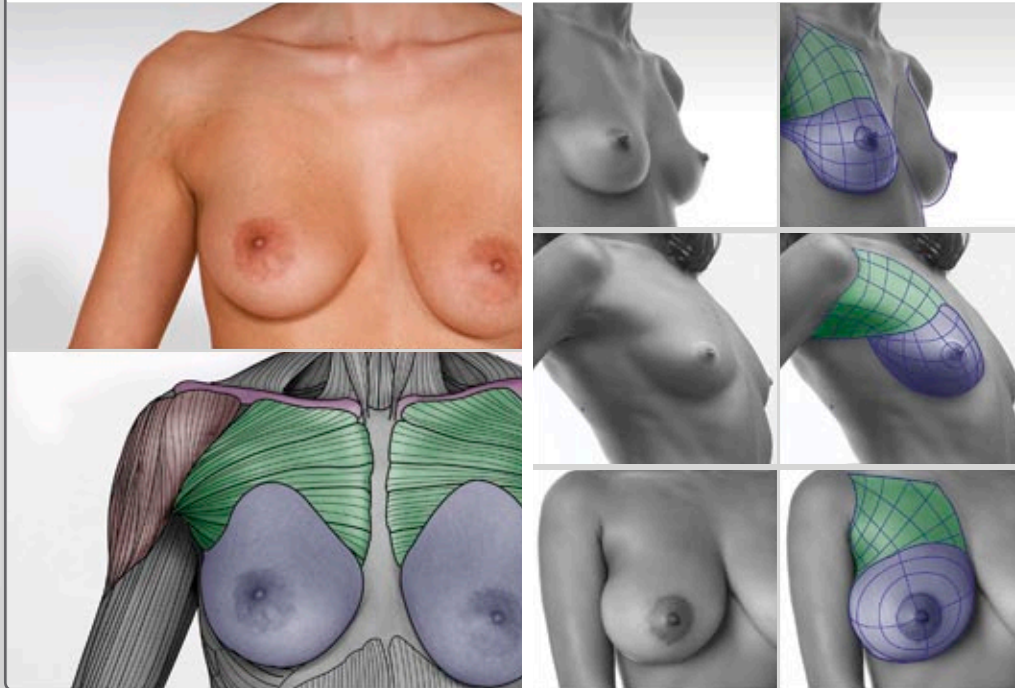


- 3 SOMETIMES IN VERY MUSCULAR INDIVIDUALS, YOU CAN SEE A SEPARATION BETWEEN THE **CLAVICULAR SECTION** AND **STERNAL SECTION** OF THE **CHEST MUSCLE (PECTORALIS MAJOR)**.
- 4 **BONY TRIANGLE** BETWEEN **CHEST MUSCLES** AND **ABDOMINAL SIX-PACK**.

FEMALE BREAST

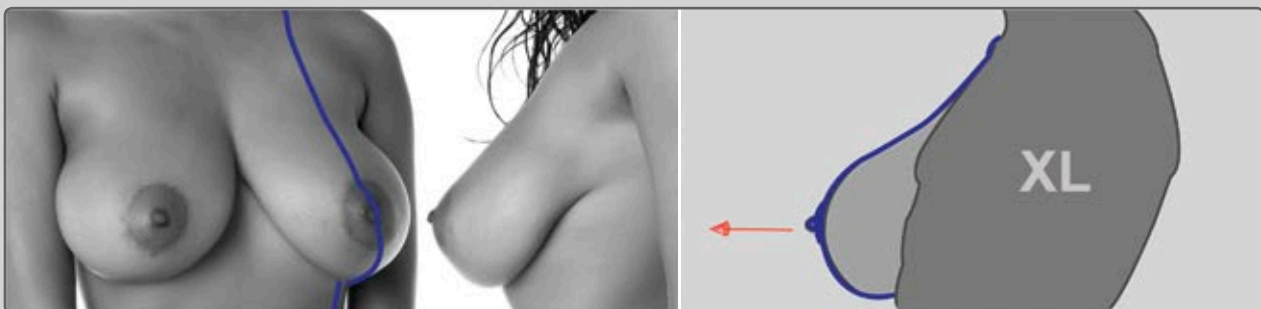
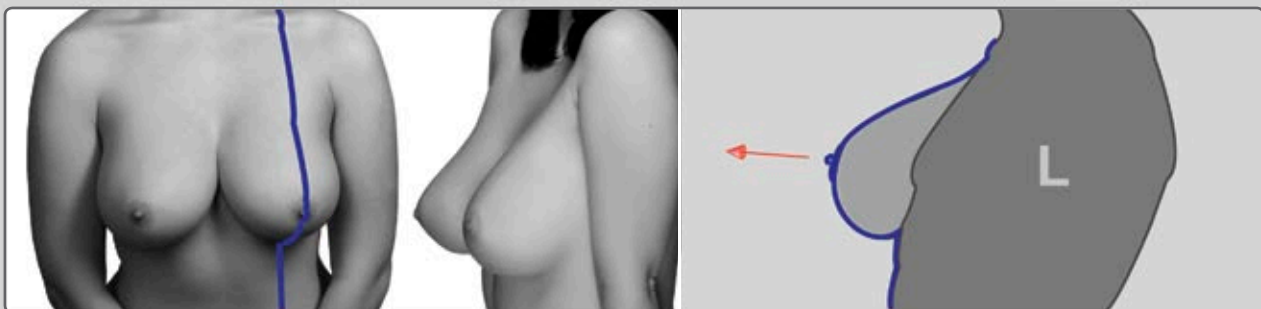
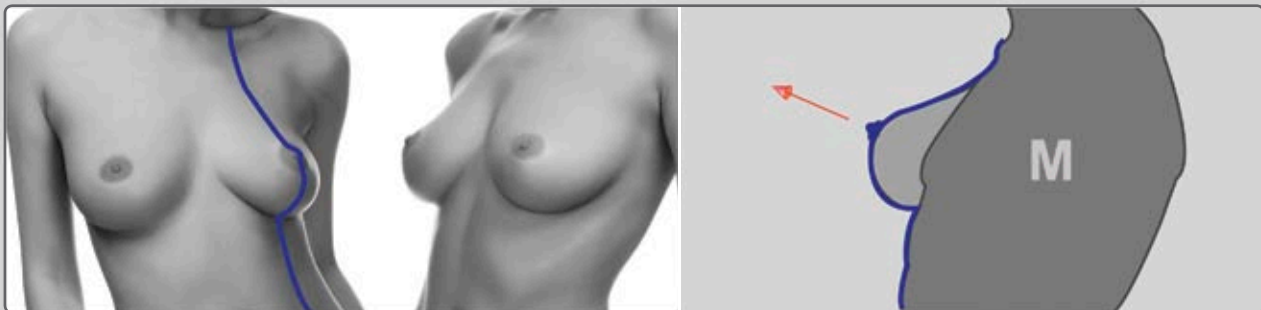


IMAGINING THE SEPARATION BETWEEN **BREASTS** AND **PECTORAL MUSCLES** MAY HELP YOU SCULPT THEM CORRECTLY.



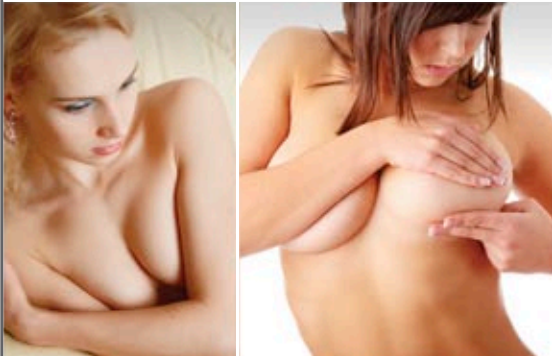
FEMALE BREAST ANGLES VARY DEPENDING ON SHAPE AND SIZE

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BREAST VOLUME AND POSITIONING

ALTHOUGH THE SHAPE CHANGES,
VOLUME REMAINS CONSTANT.



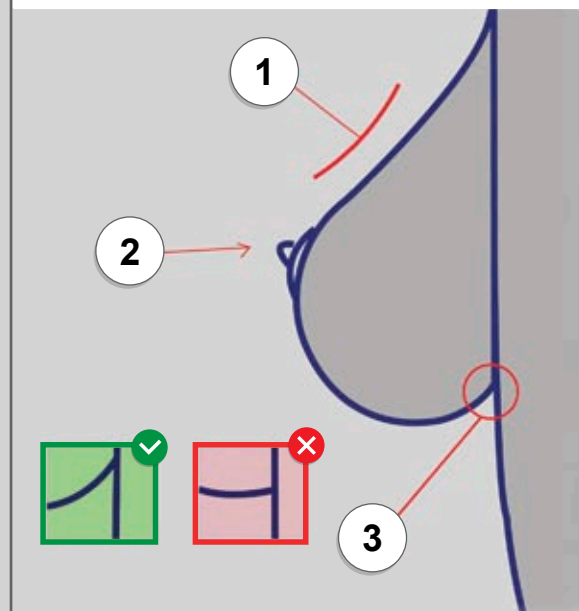
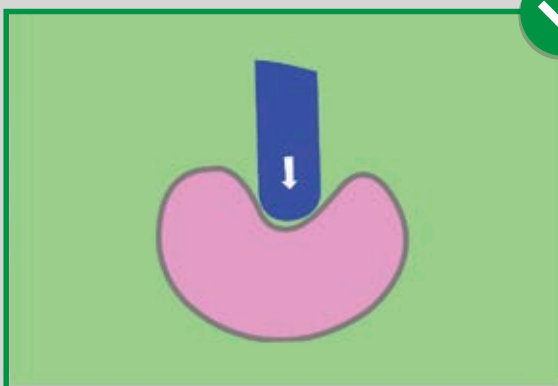
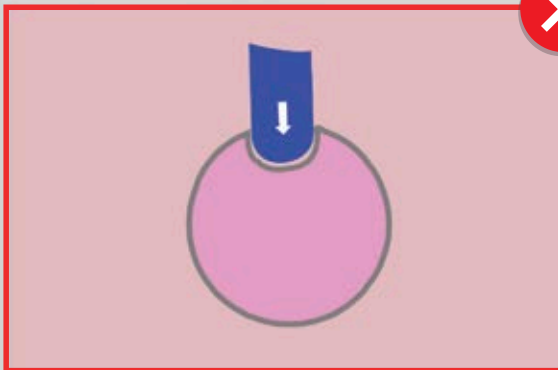
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THE LARGER THE BREASTS, THE MORE
THEY ARE SHAPED BY GRAVITY WHEN A
WOMAN IS LYING ON HER BACK.

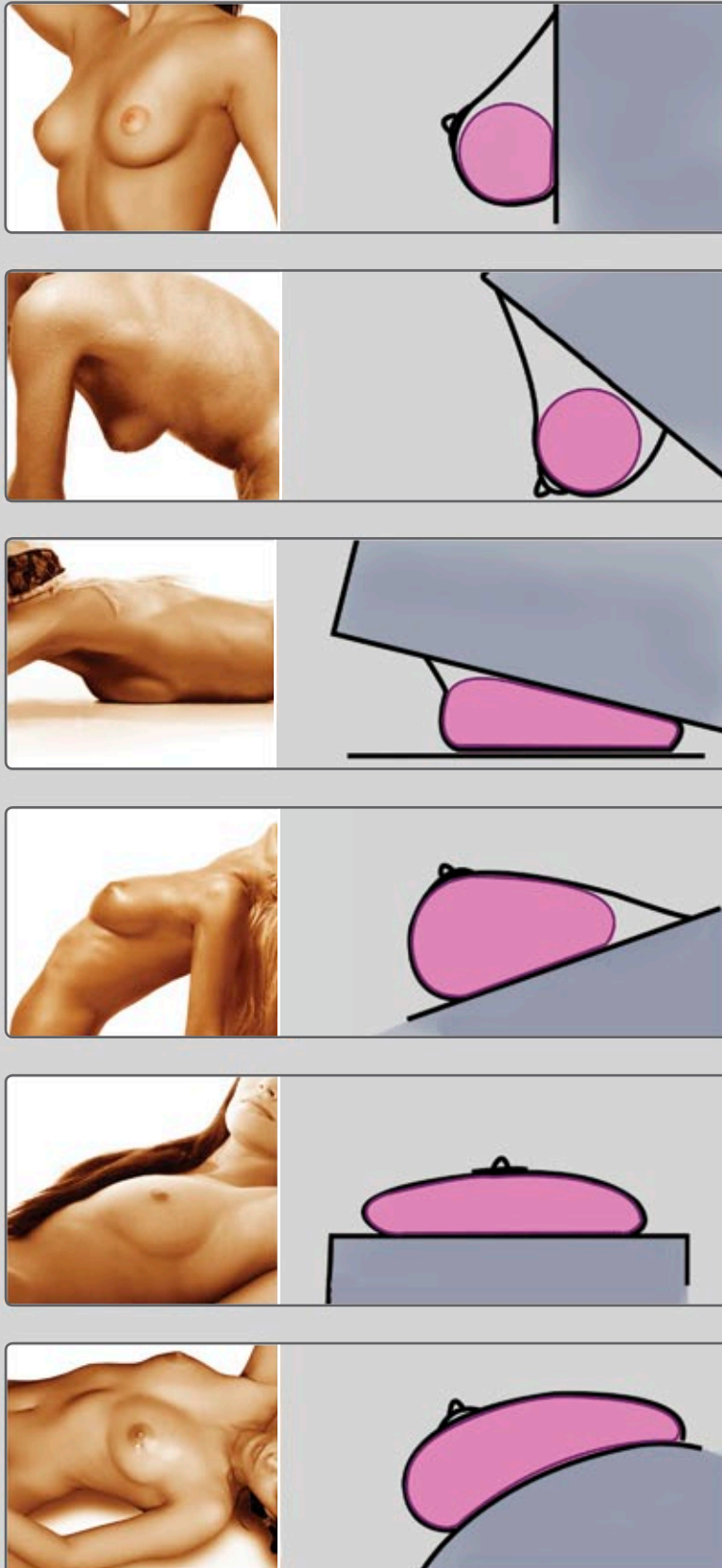


3 TIPS ON HOW TO MAKE FEMALE
BREASTS LOOK YOUTHFUL.

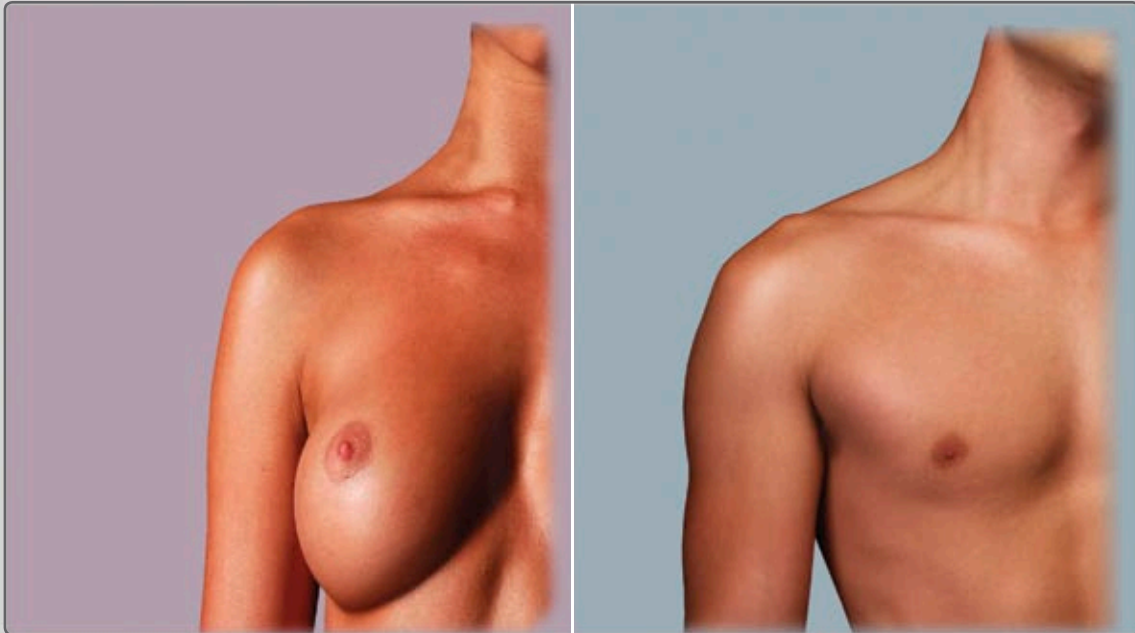


- 1 TOP SIDE: STRAIGHT OR CONCAVE, BUT NEVER CONVEX
- 2 NIPPLE POINTS UPWARD
- 3 LIFT LOWER BORDER WHERE BREAST CONNECTS TO CHEST WALL

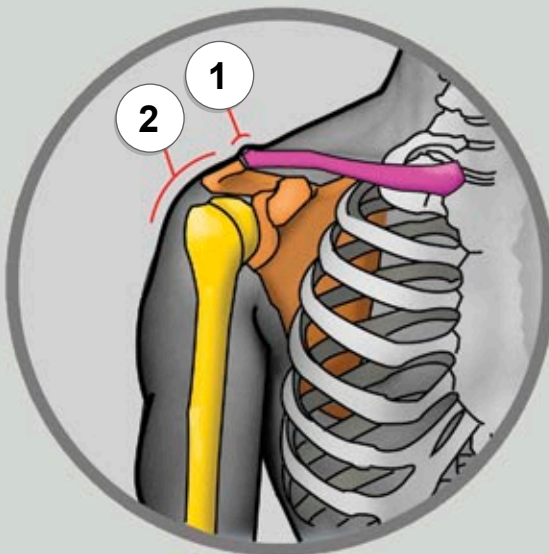
WEIGHT AND MASS DISTRIBUTION OF FEMALE BREAST



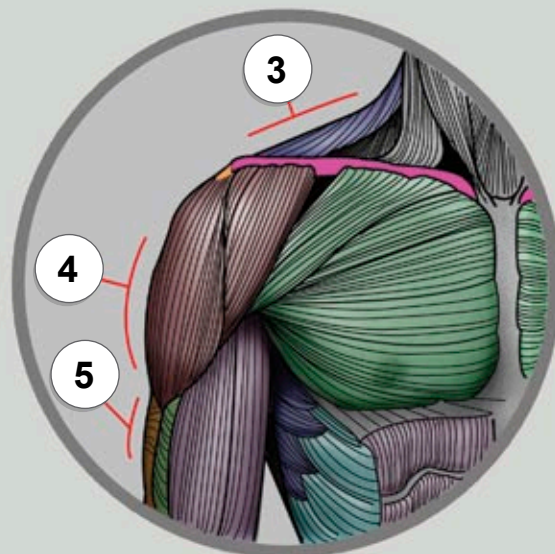
WHAT CREATES A SHOULDER'S SILHOUETTE?



BONES

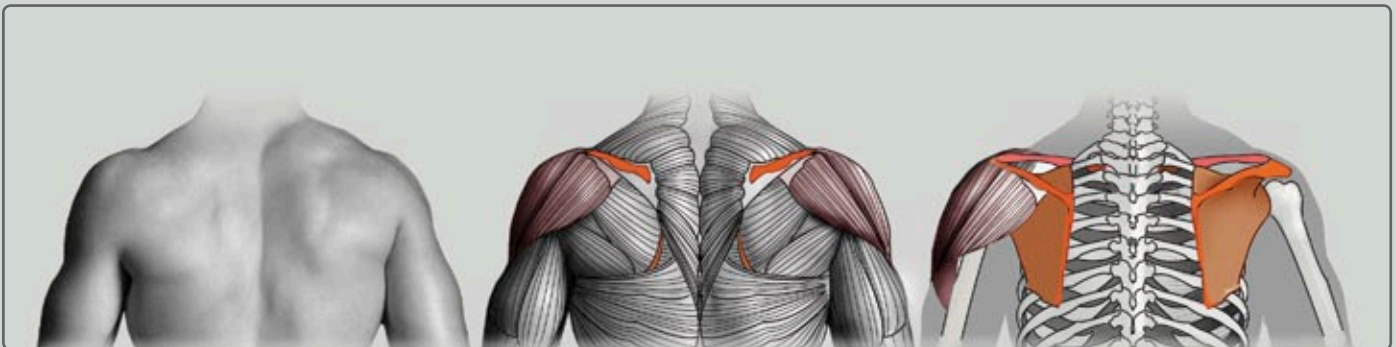
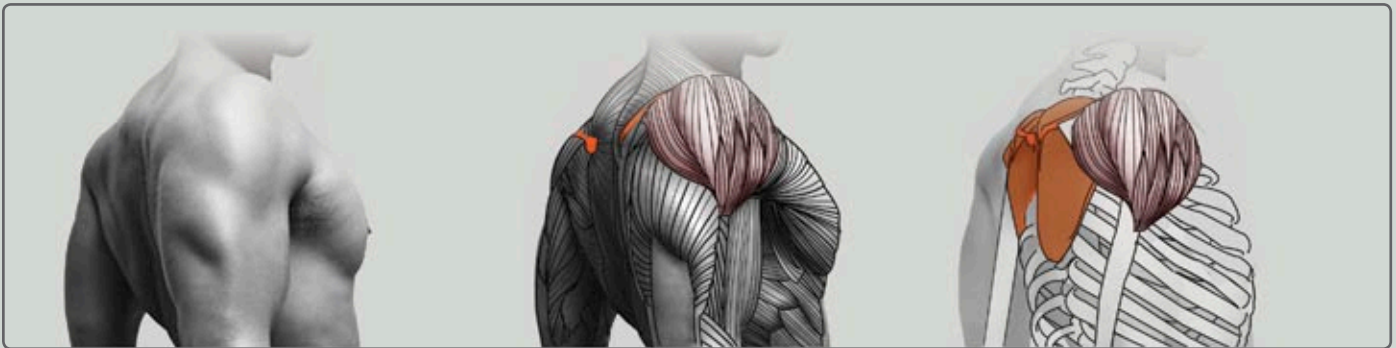
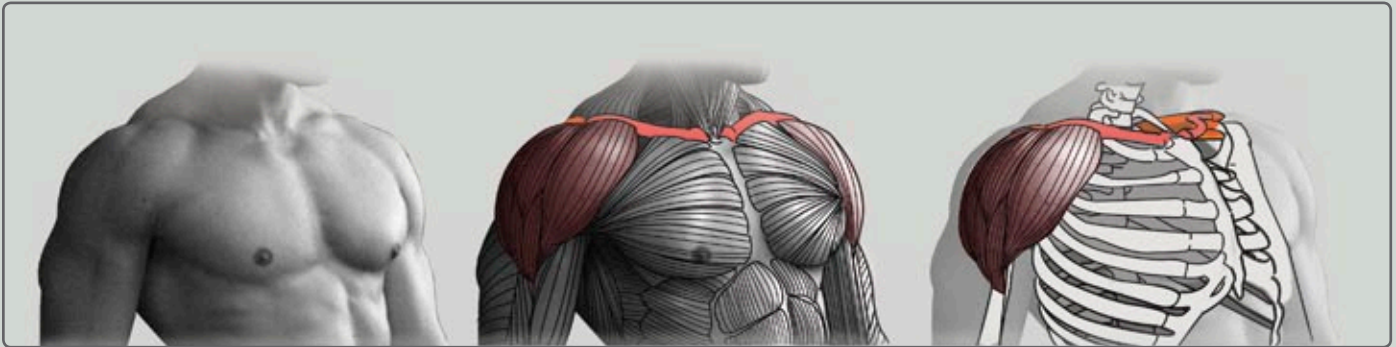
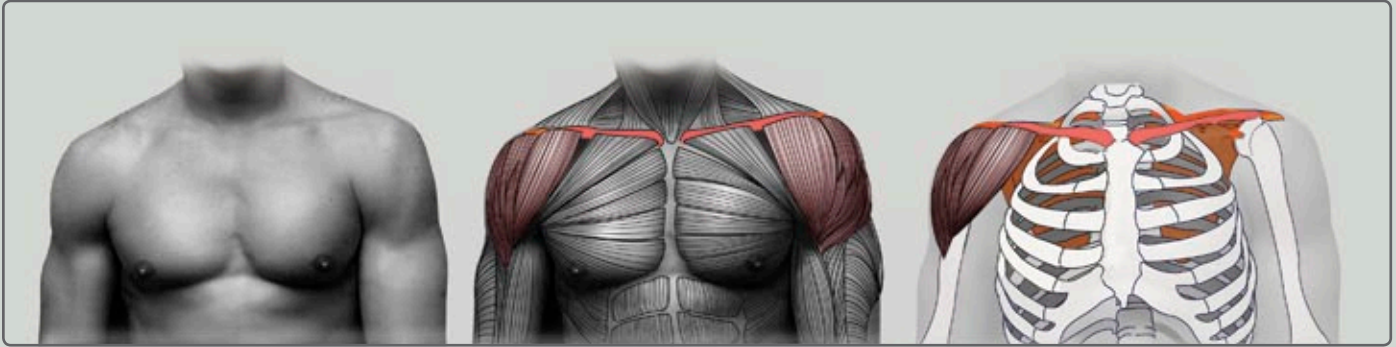


MUSCLES



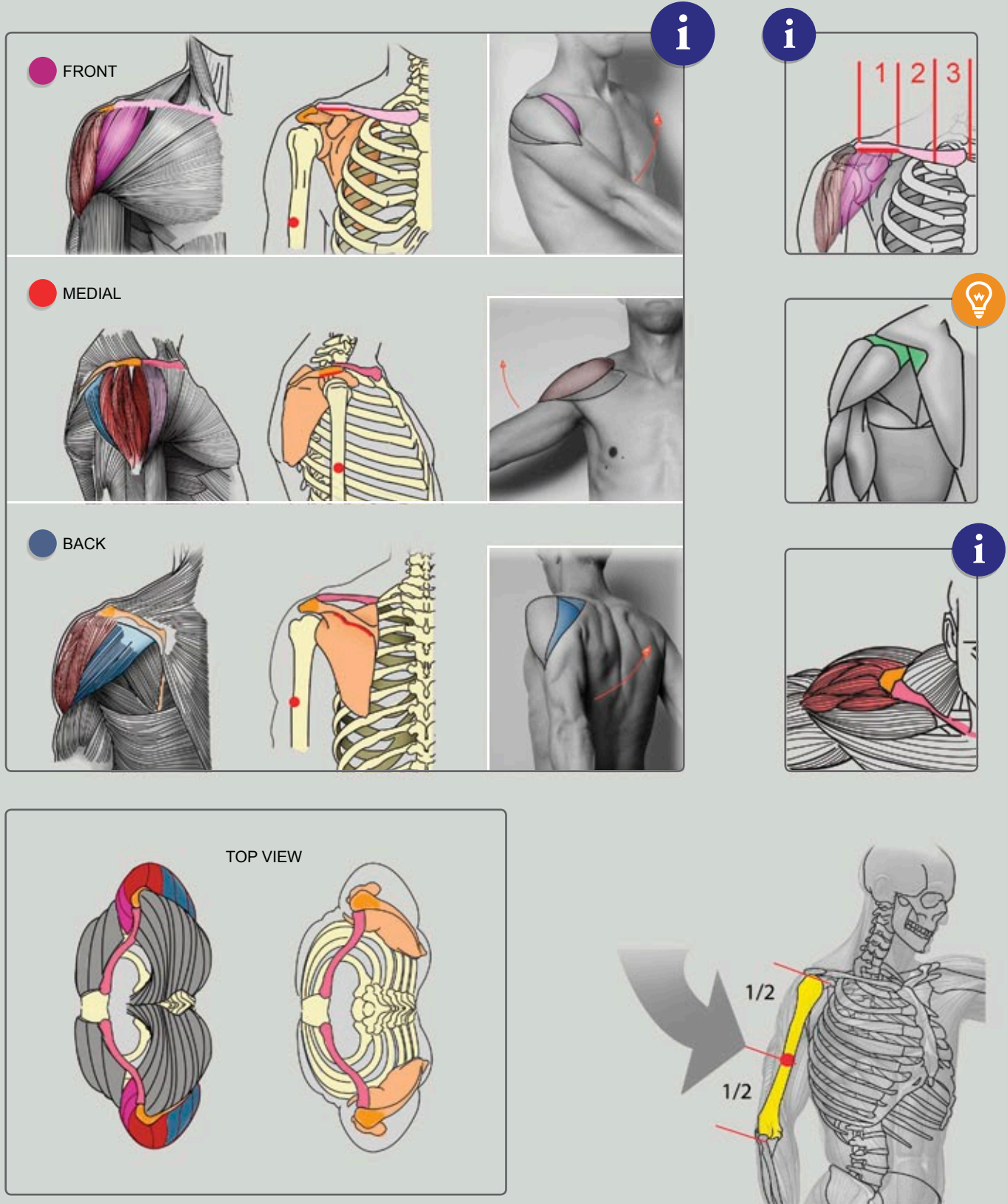
- ① LATERAL END OF **CLAVICLE**
- ② HEAD OF **HUMERUS** PUSHES **SHOULDER MUSCLE (DELTOID)** OUTWARD.
- ③ **TRAPEZIUS**
- ④ LATERAL HEAD OF **SHOULDER MUSCLE (DELTOID)**
- ⑤ LATERAL HEAD OF **TRICEPS**

SHOULDER MUSCLE (DELTOID)

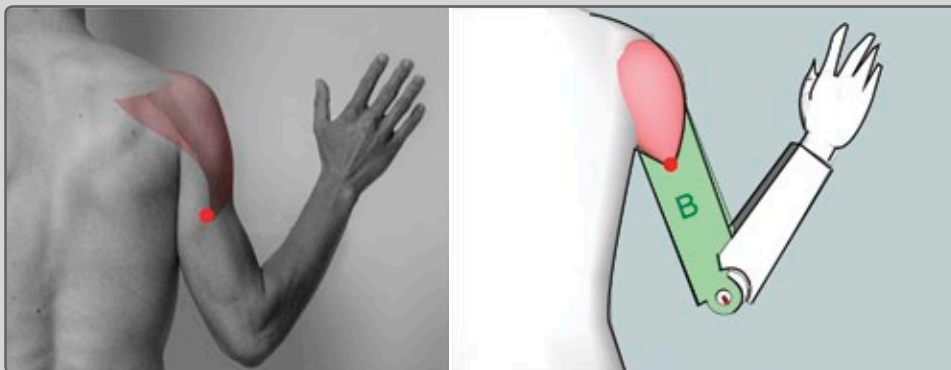
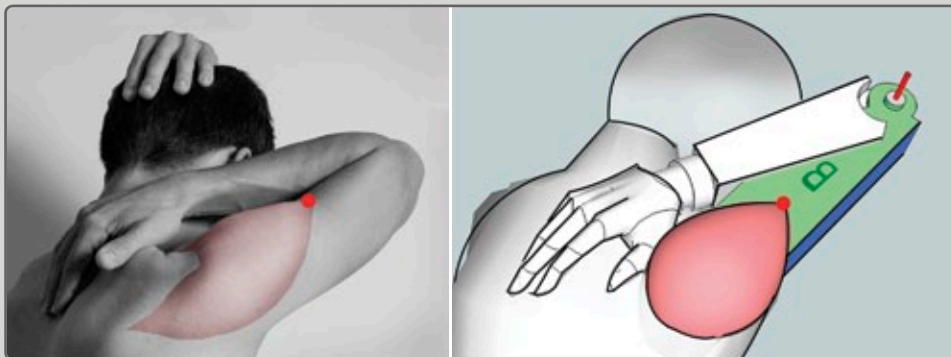
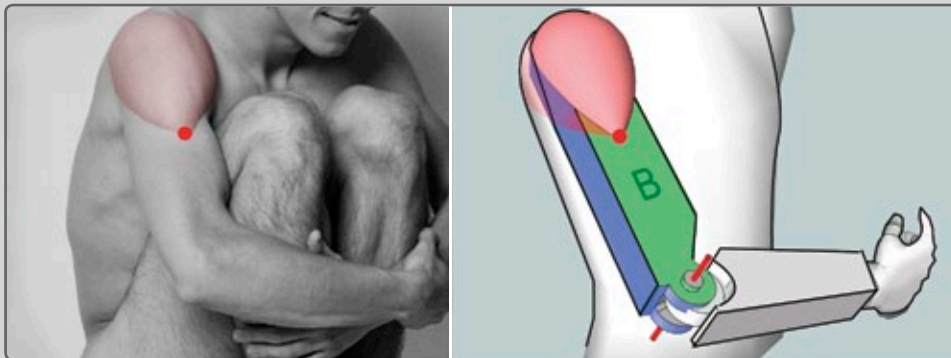
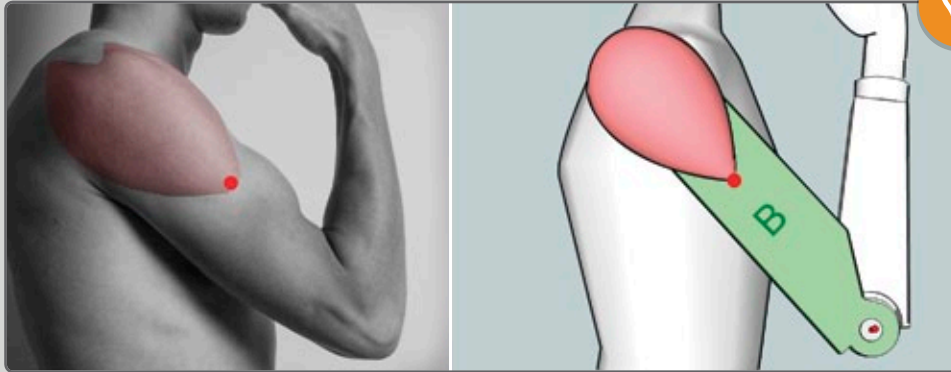


SHOULDER MUSCLE (DELTOID) HAS 3 SECTIONS:

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!**

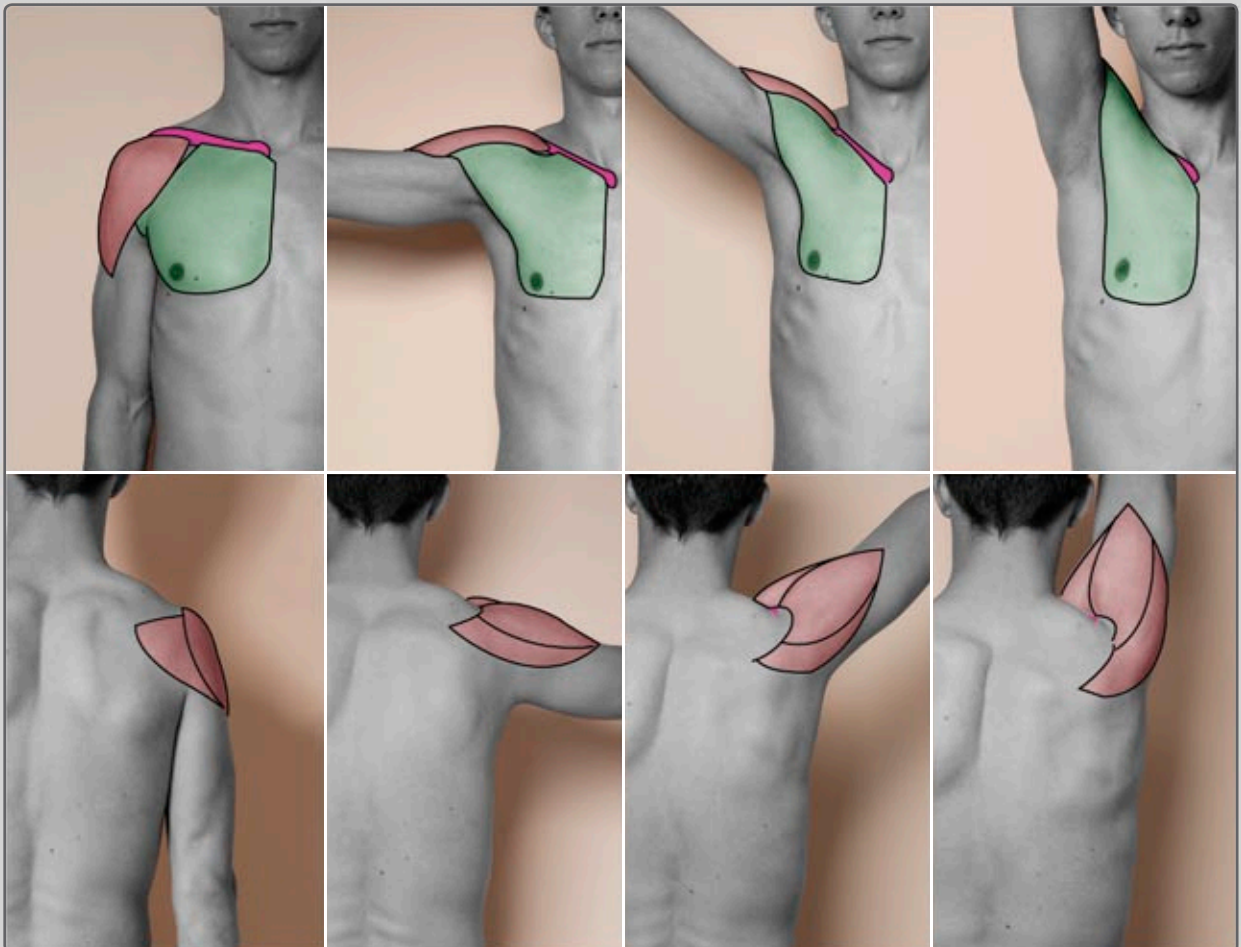
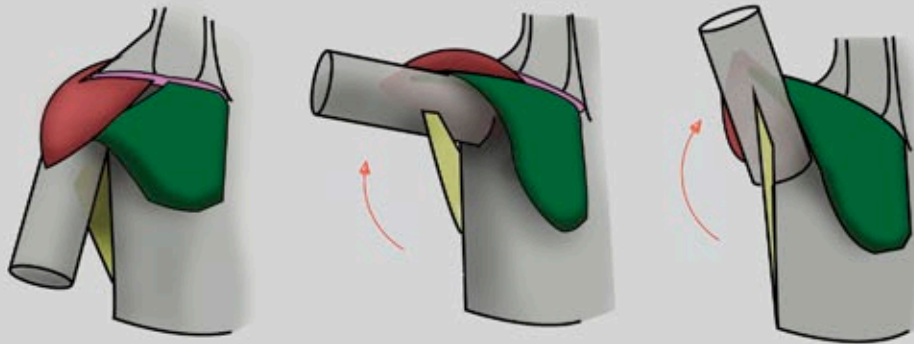


WHERE DOES IT GO?



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

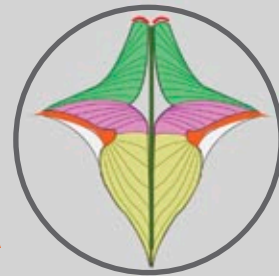
INSERTION: LATERAL CLAVICLE, ACROMION AND SPINE OF SCAPULA

ACTIONS:

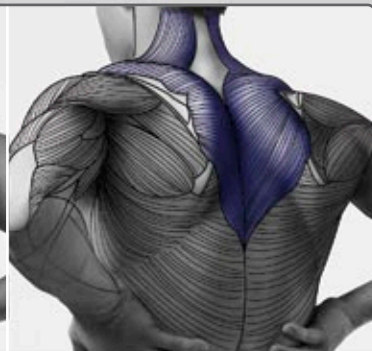
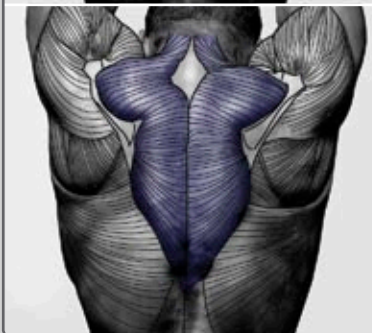
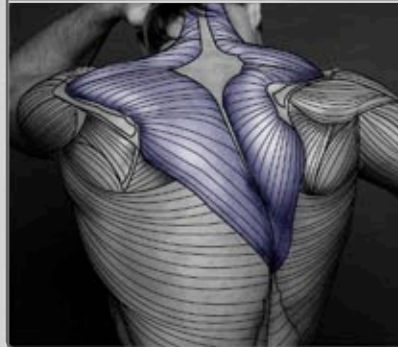
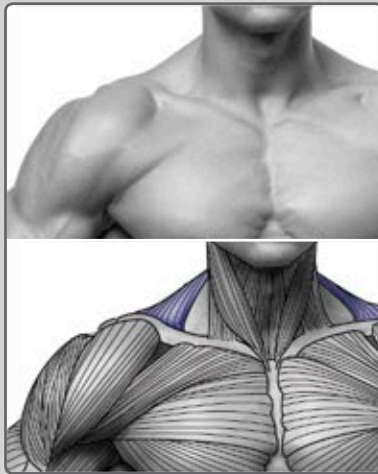
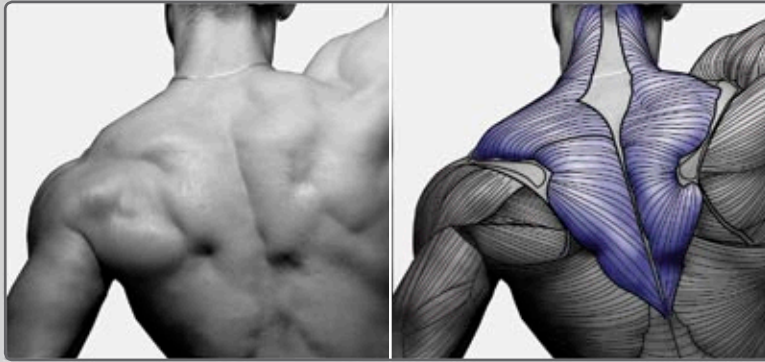
UPPER FIBERS: ELEVATE AND UPWARDLY ROTATE SCAPULA; EXTEND NECK

MIDDLE FIBERS: ADDUCT (RETRACT) SCAPULA

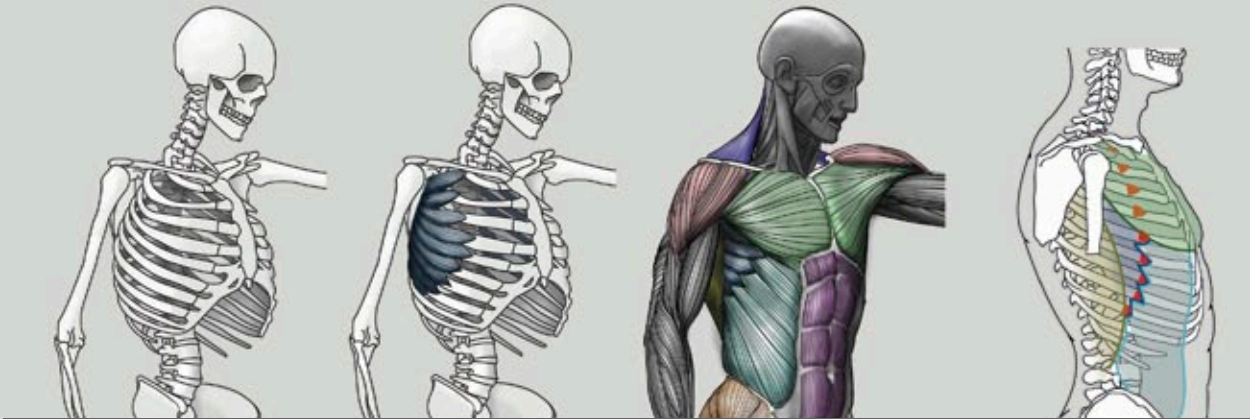
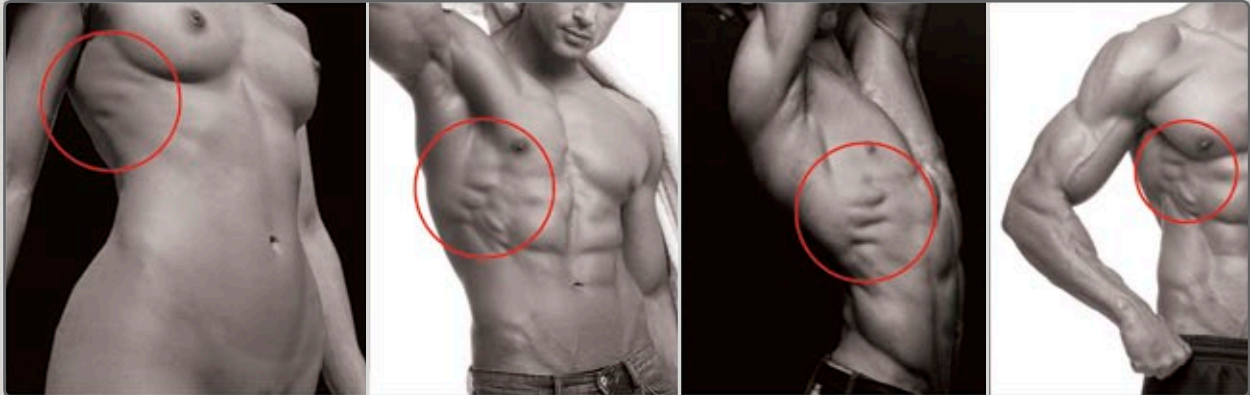
LOWER FIBERS: DEPRESS AND HELP UPPER FIBERS UPWARDLY ROTATE SCAPULA



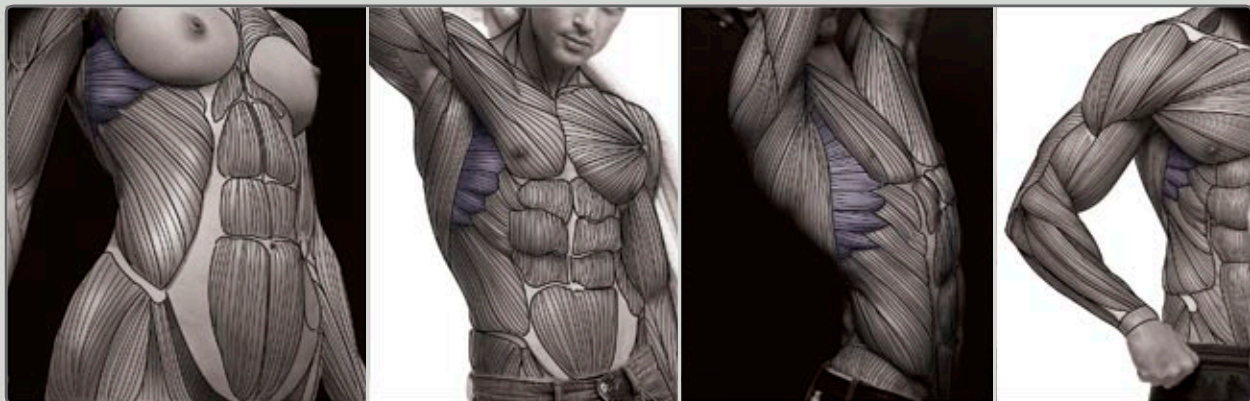
TRAPEZIUS MUSCLE



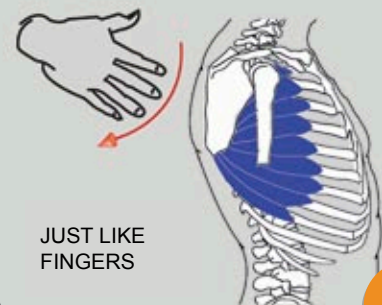
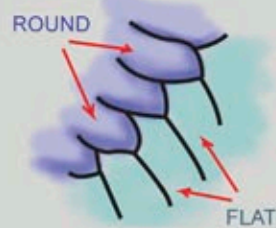
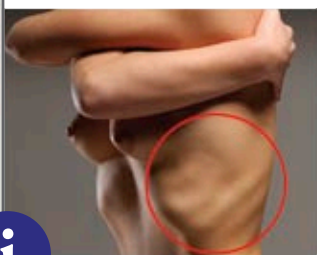
ARE THESE RIBS?



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

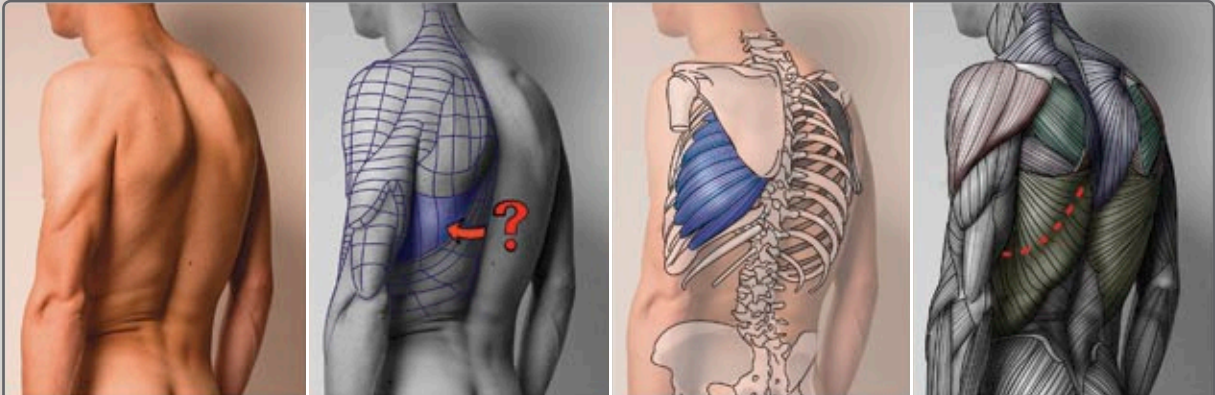


IF PERSON IS SKINNY,
THEN **SERRATUS** IS TOO
FLAT TO BE VISIBLE.



JUST LIKE
FINGERS

WHAT IS THIS BULGE UNDER THE SHOULDER BLADE?

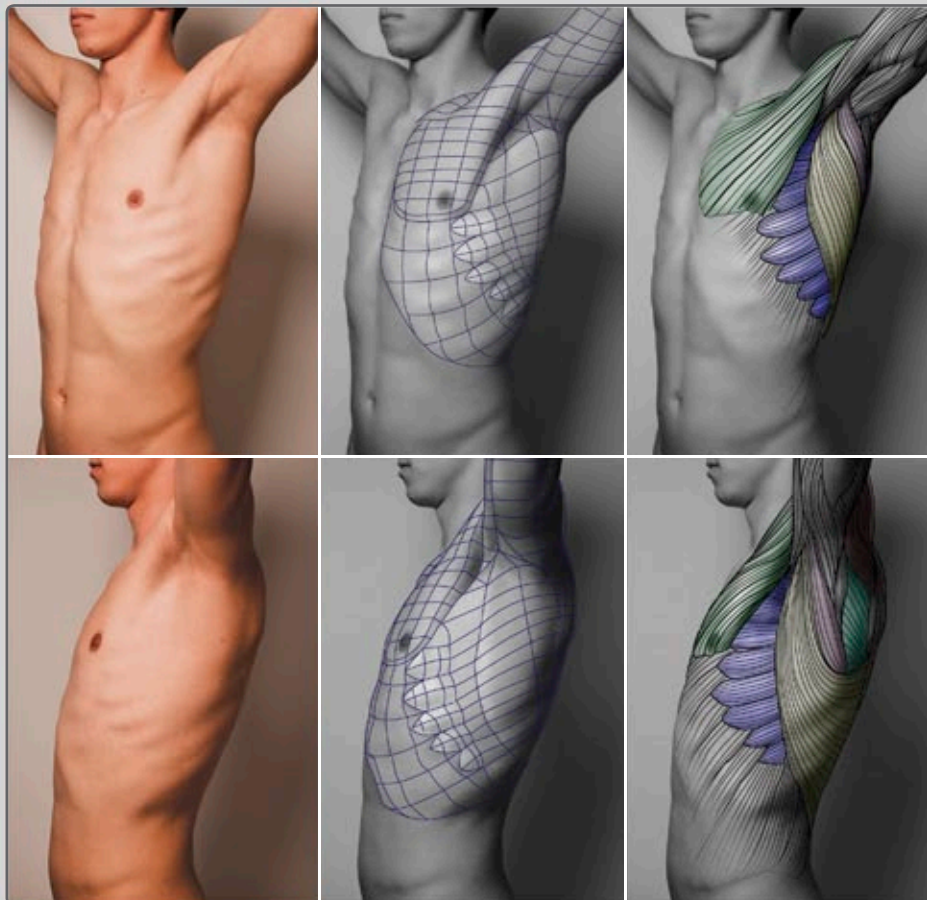


IT IS **THE SERRATUS ANTERIOR** MUSCLE, PUSHING THE **LATISSIMUS DORSI** OUTWARD FROM BENEATH.

i

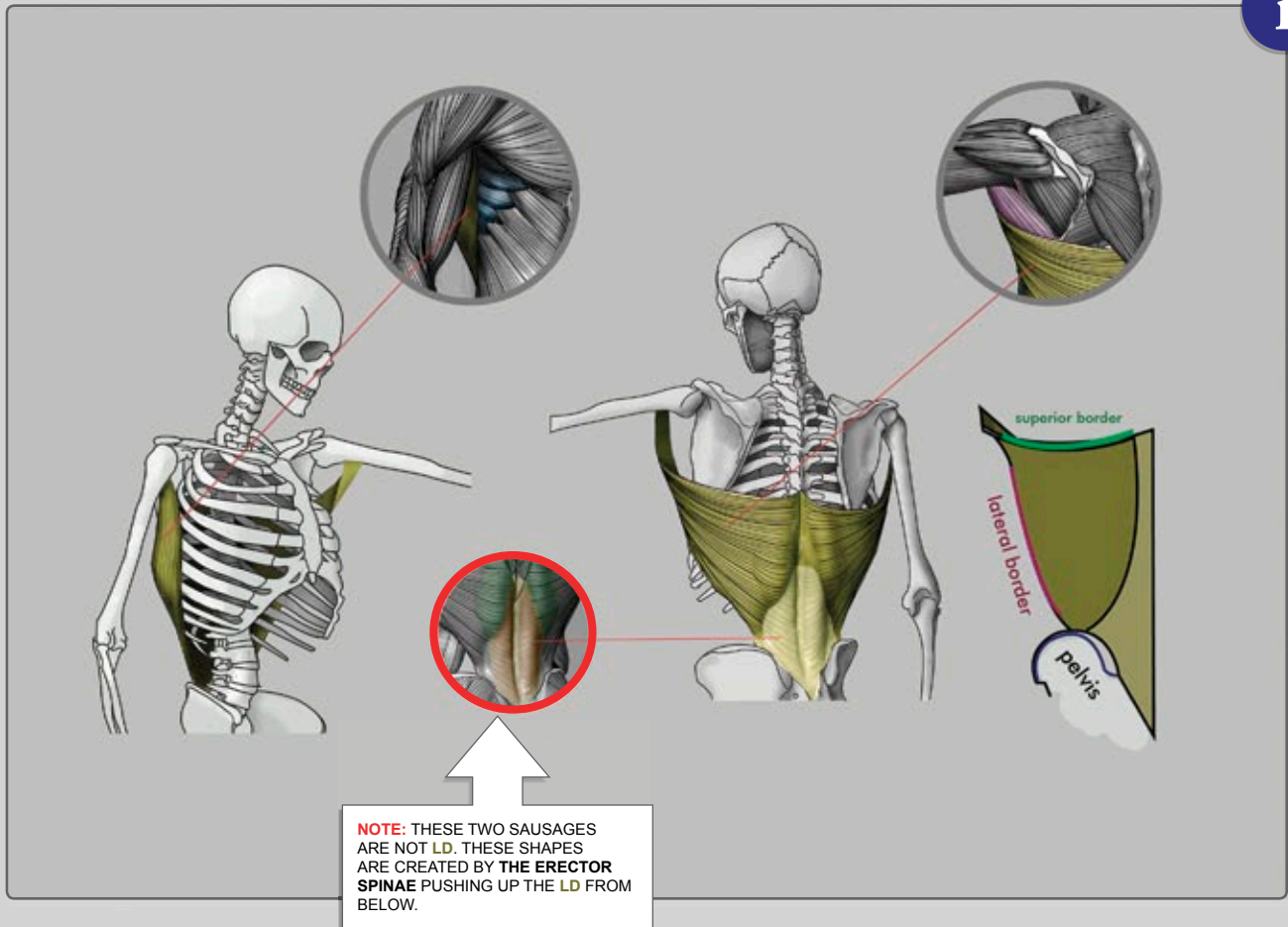
SERRATUS ANTERIOR IS A MUSCLE THAT ORIGINATES ON THE SURFACES OF THE **1ST** TO **8TH** RIBS ON THE LATERAL CHEST AND INSERTS ALONG THE ENTIRE ANTERIOR LENGTH OF THE MEDIAL BORDER OF THE SCAPULA.

1/4 AND SIDE VIEW



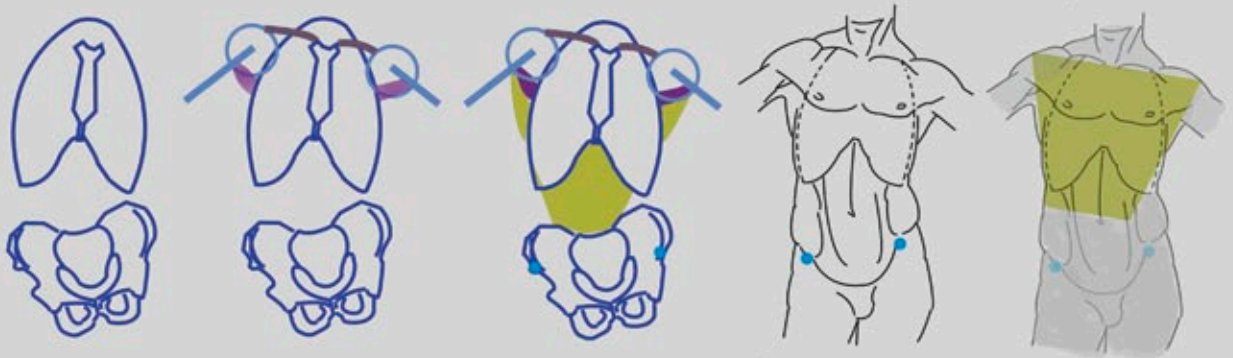
BROADEST MUSCLE OF THE BACK (LATISSIMUS DORSI – LD)

i

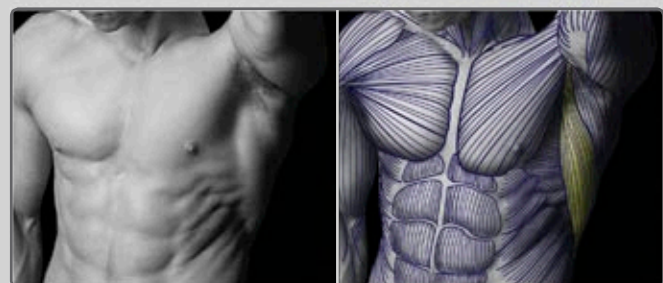
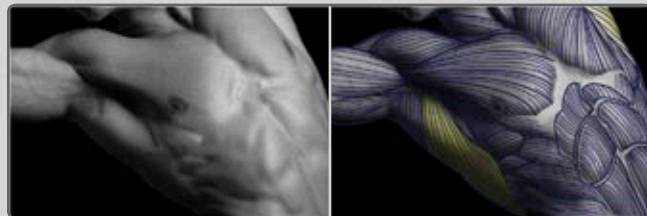
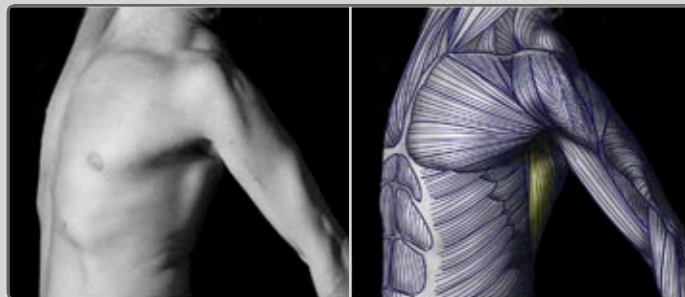
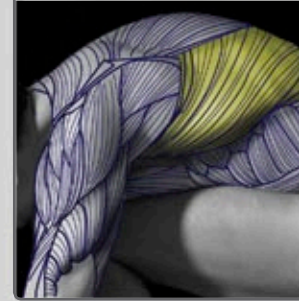
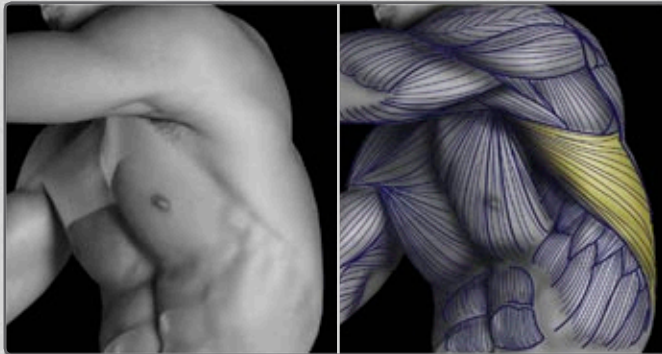


💡

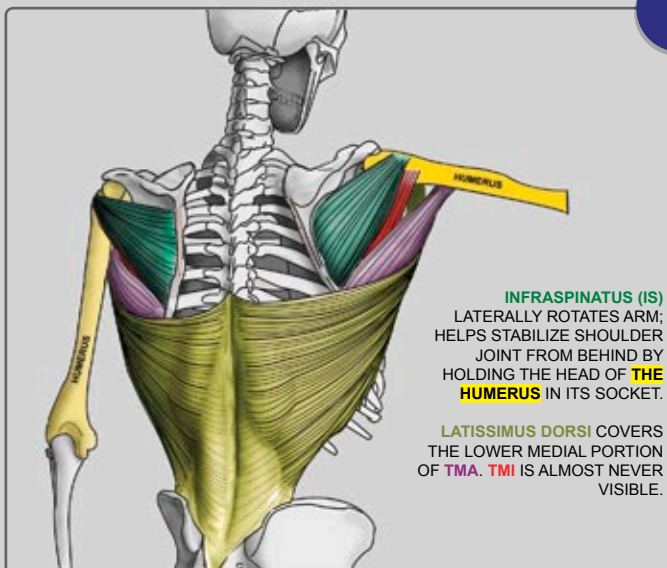
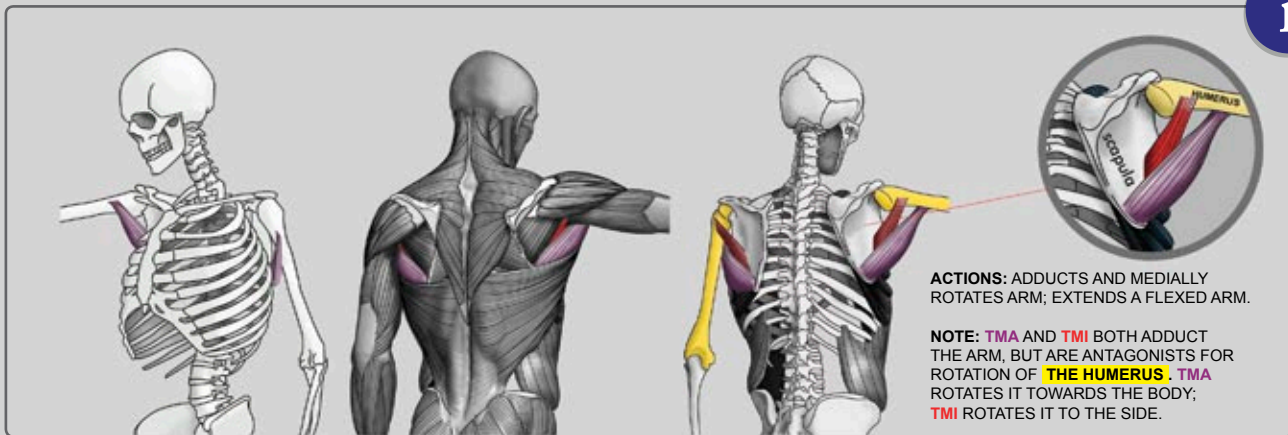
TERES MAJOR COVERED WITH **LATISSIMUS DORSI** CREATES THE TRIANGULAR SHAPE OF A MALE TORSO.



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



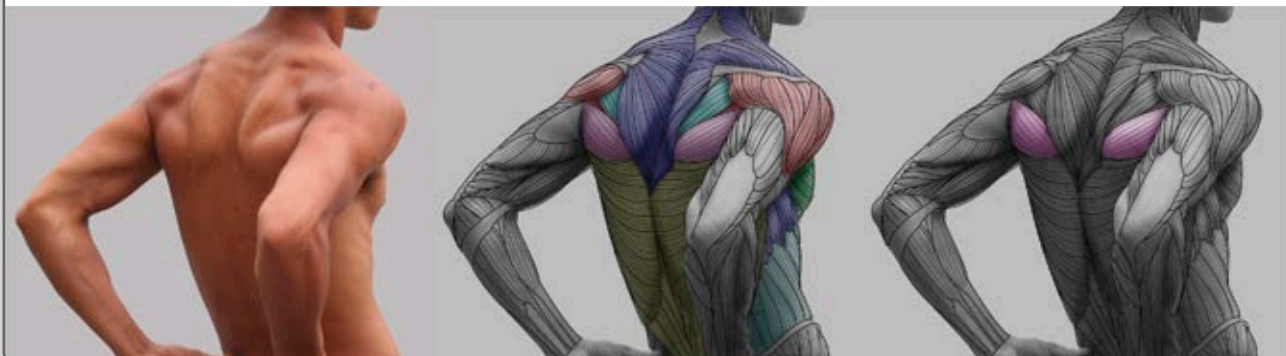
GREAT ROUND MUSCLE (TERES MAJOR TMA), LITTLE ROUND MUSCLE (TERES MINOR TMI) AND INFRASPINATUS MUSCLE (IS)



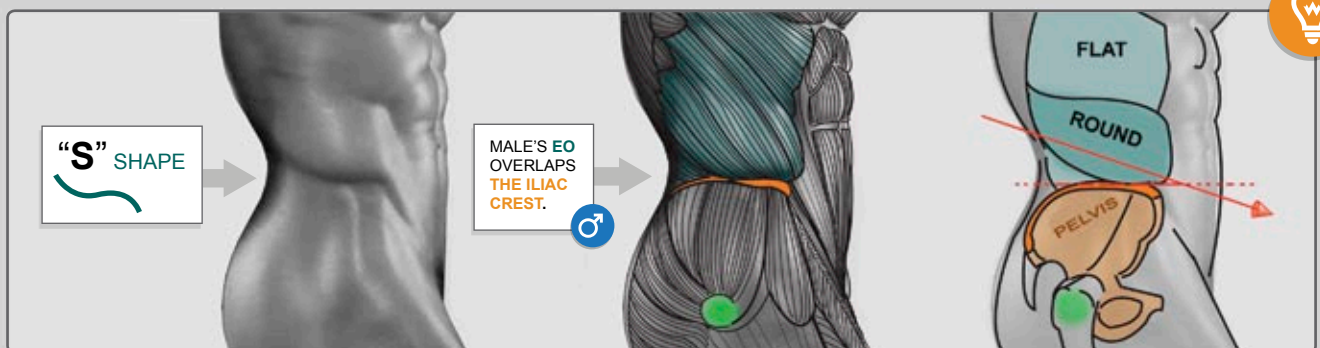
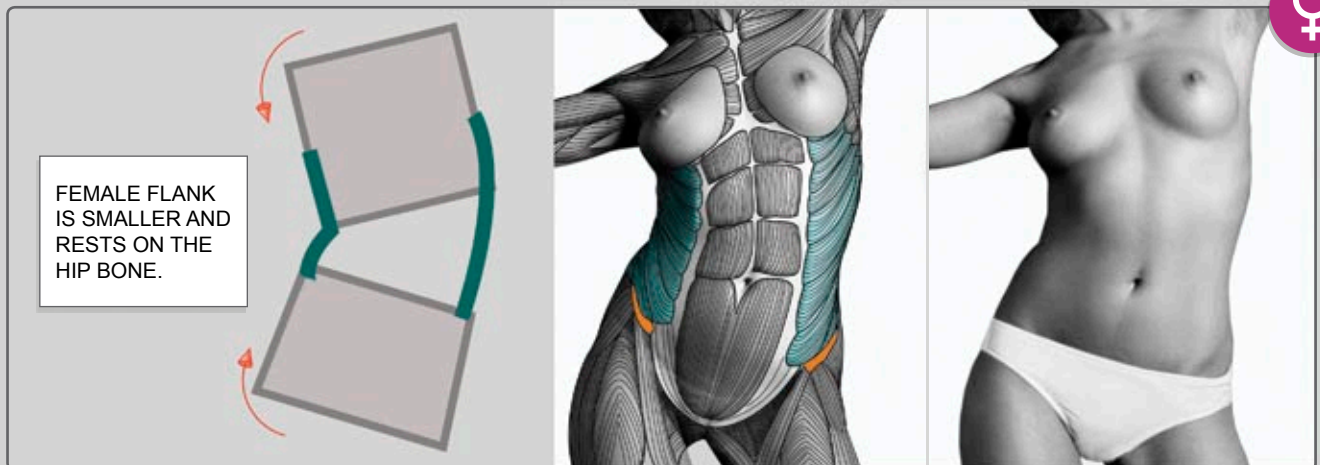
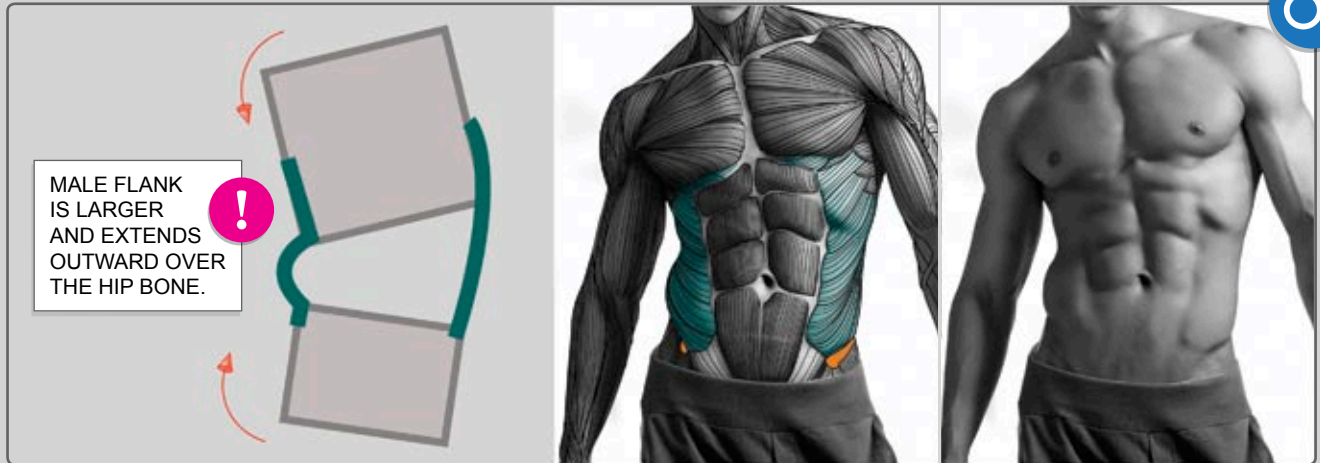
TMI IS ALMOST NEVER VISIBLE.



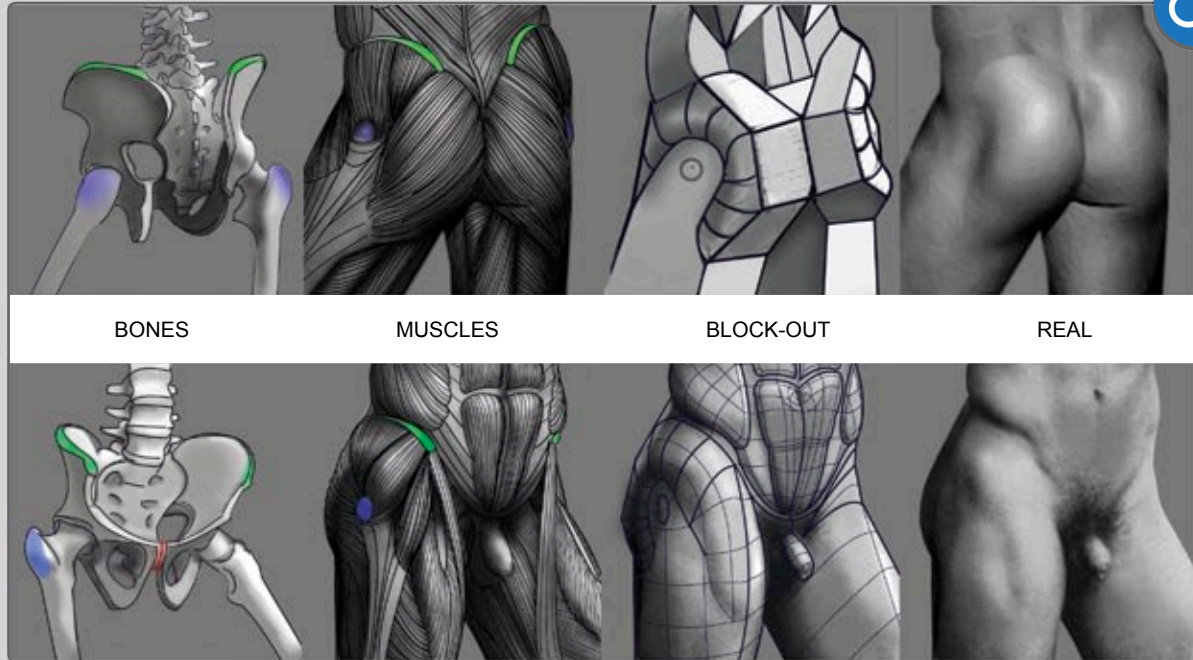
GREAT ROUND MUSCLE (TERES MAJOR) BECOMES PRONOUNCED WHEN ARMS ARE HELD BEHIND THE TORSO.



ABDOMINAL EXTERNAL OBLIQUE MUSCLE (EO)



MALE AND FEMALE HIPs



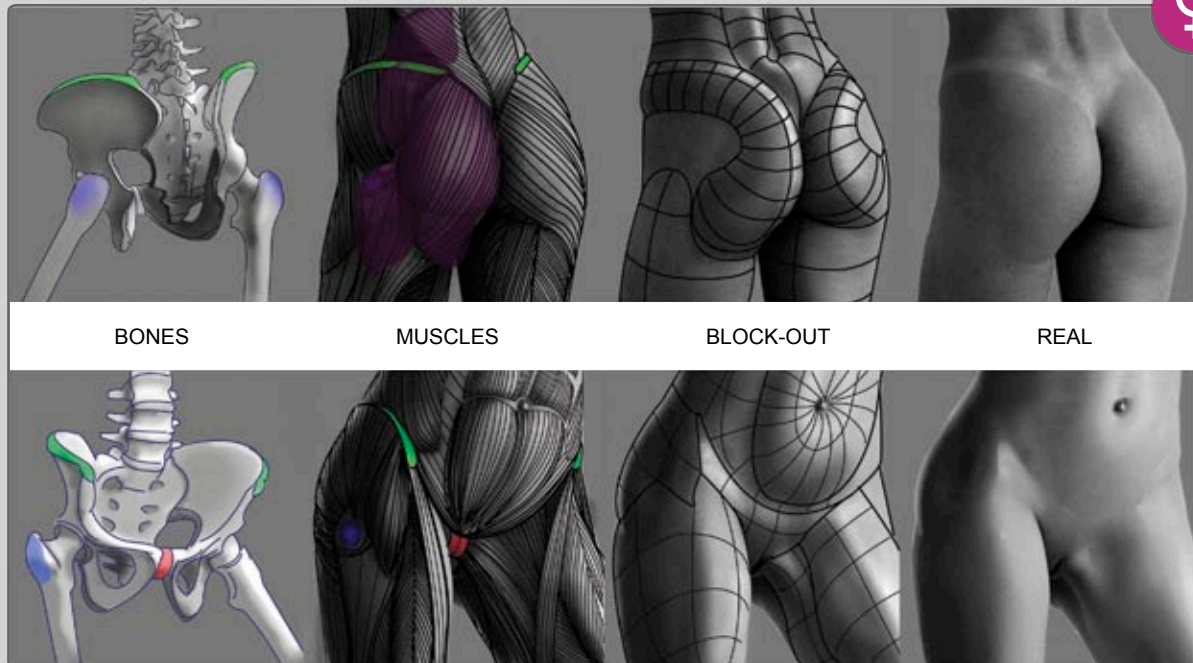
GREATER TROCHANTER



ILIAC CREST

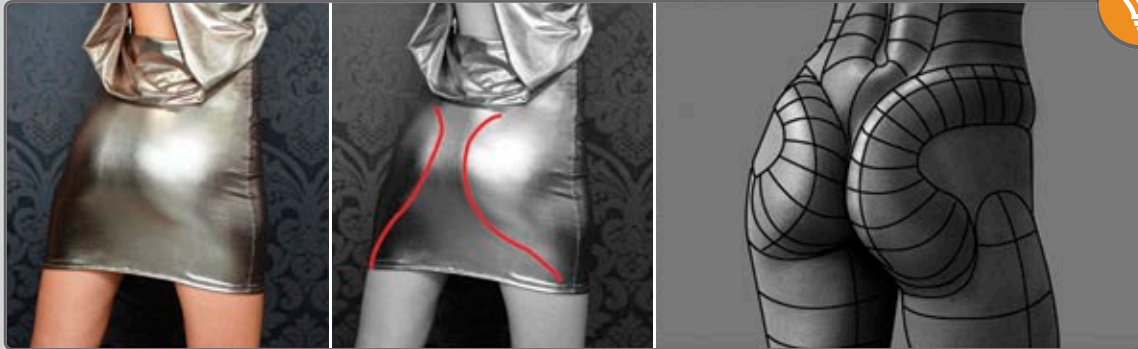


PUBIC SYMPHYSIS

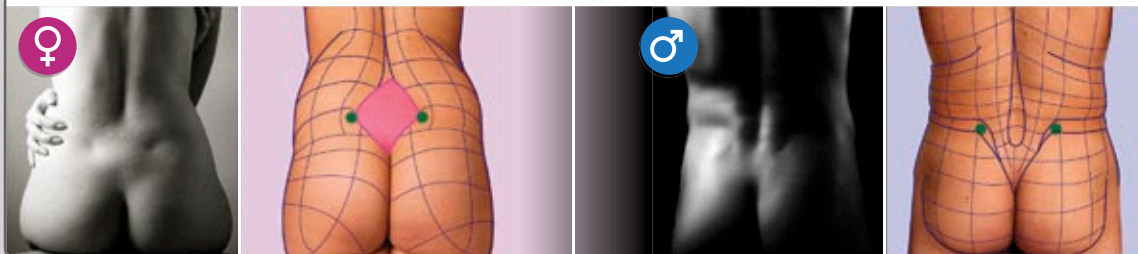


SUBCUTANEOUS **FAT PADS** UNDER THE SKIN GIVE FEMALE HIPs THEIR CURVY SHAPE.

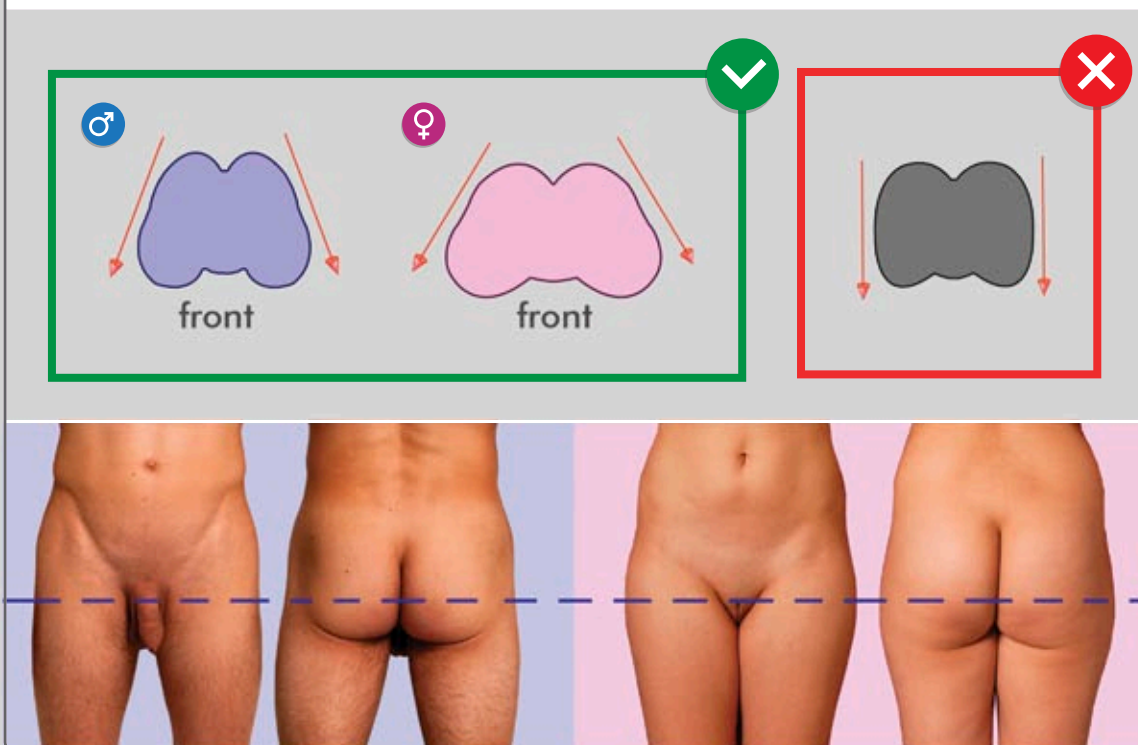
ALL ABOUT “BACKSIDES”



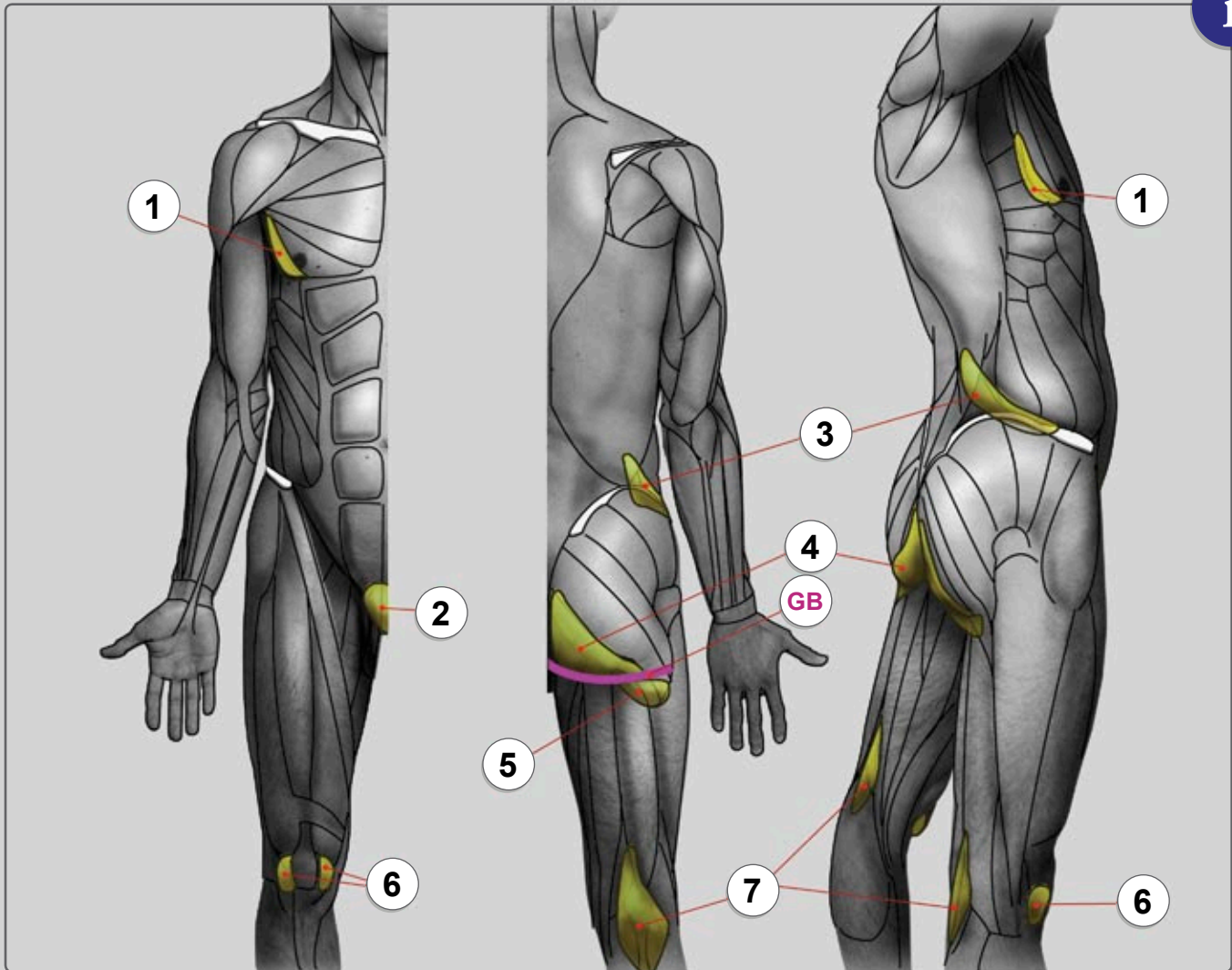
THE “RHOMBUS OF MICHAELIS” IS A FAT PAD THAT IS SOMETIMES VISIBLE ON THE LOWER BACK OF FEMALES.



HORIZONTAL CROSS SECTIONS OF MALE AND FEMALE PELVIS.



MALE SUBCUTANEOUS FAT PADS



1 PECTORAL FAT PAD

2 PUBIC FAT PAD

3 FLANK FAT PAD

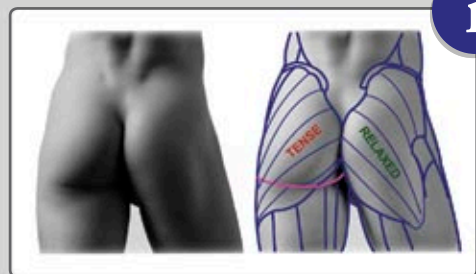
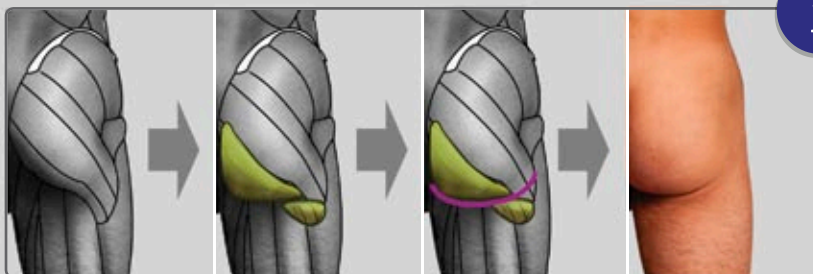
4 LATERAL GLUTEAL FAT PAD

5 INFERIOR GLUTEAL FAT EXTENSION

6 INFRAPATELLAR FAT PAD

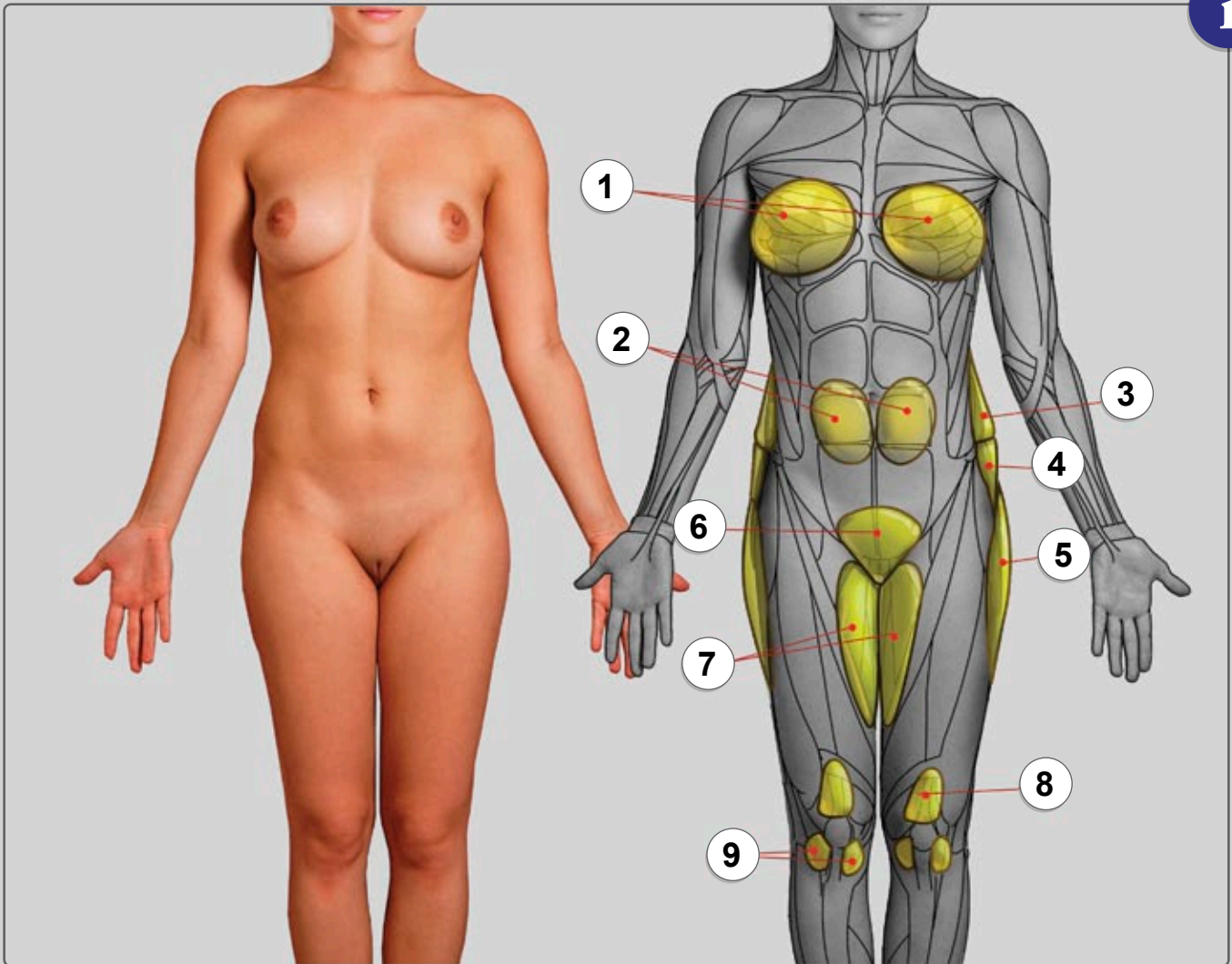
7 POPLITEAL FAT PAD

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

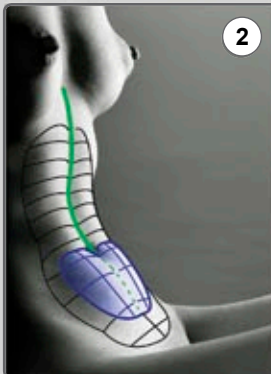


FEMALE SUBCUTANEOUS FAT PADS (FRONT VIEW)

i

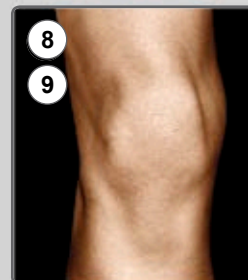


- | | | |
|--------------------------|---------------------------|--------------------------------|
| 1 BREAST FAT | 4 LATERAL GLUTEAL FAT PAD | 6 PUBIC FAT PAD |
| 2 ABDOMINAL WALL FAT PAD | 5 OUTER THIGH FAT PAD | 7 INNER THIGH FAT PAD |
| 3 FLANK FAT PAD | | 8 LOWER ANTERIOR THIGH FAT PAD |
| | | 9 INFRAPATELLAR FAT PAD |



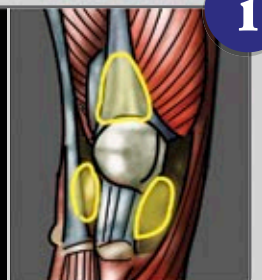
2

AS **ABDOMINAL WALL FAT PADS (AWFP)** GET LARGER, THAT PART OF **THE LINEA ALBA** WHICH CONTINUES UNDER THE NAVEL, WILL BE LESS PRONOUNCED, BECAUSE ARE COVERED BY A THICKER LAYER OF FAT. WHEN THERE IS SOME EXCESS BELLY FAT, **THE AWFP** APPEARS "APPLE" SHAPED.



8

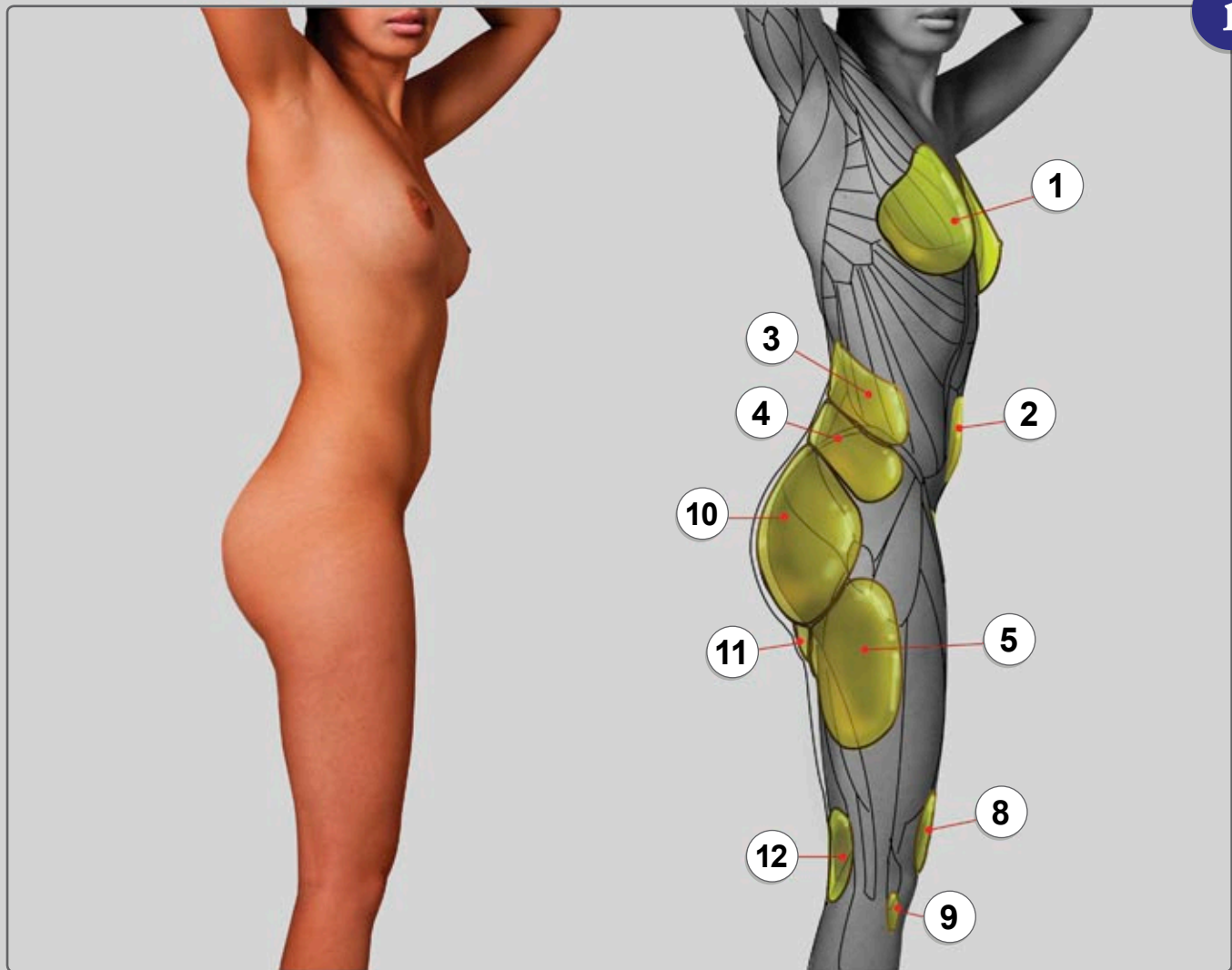
9



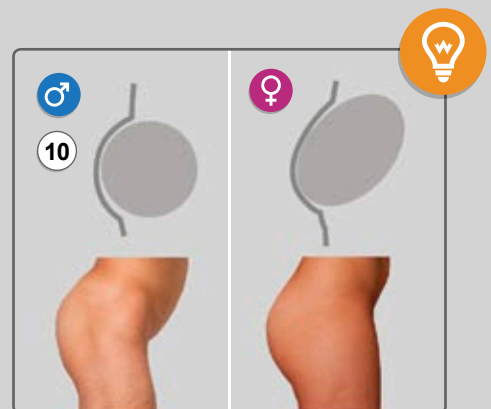
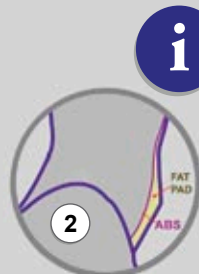
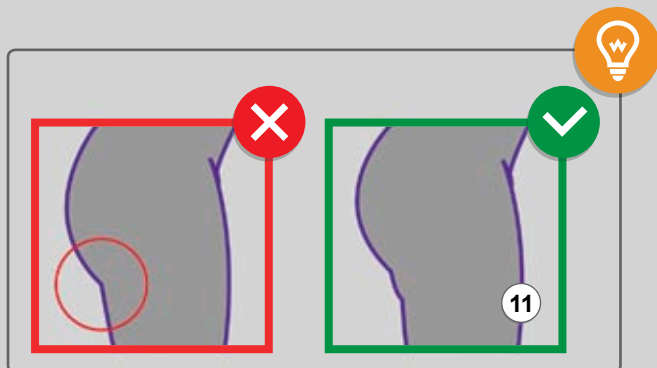
RIGHT KNEE

i

FEMALE SUBCUTANEOUS FAT PADS (SIDE VIEW)

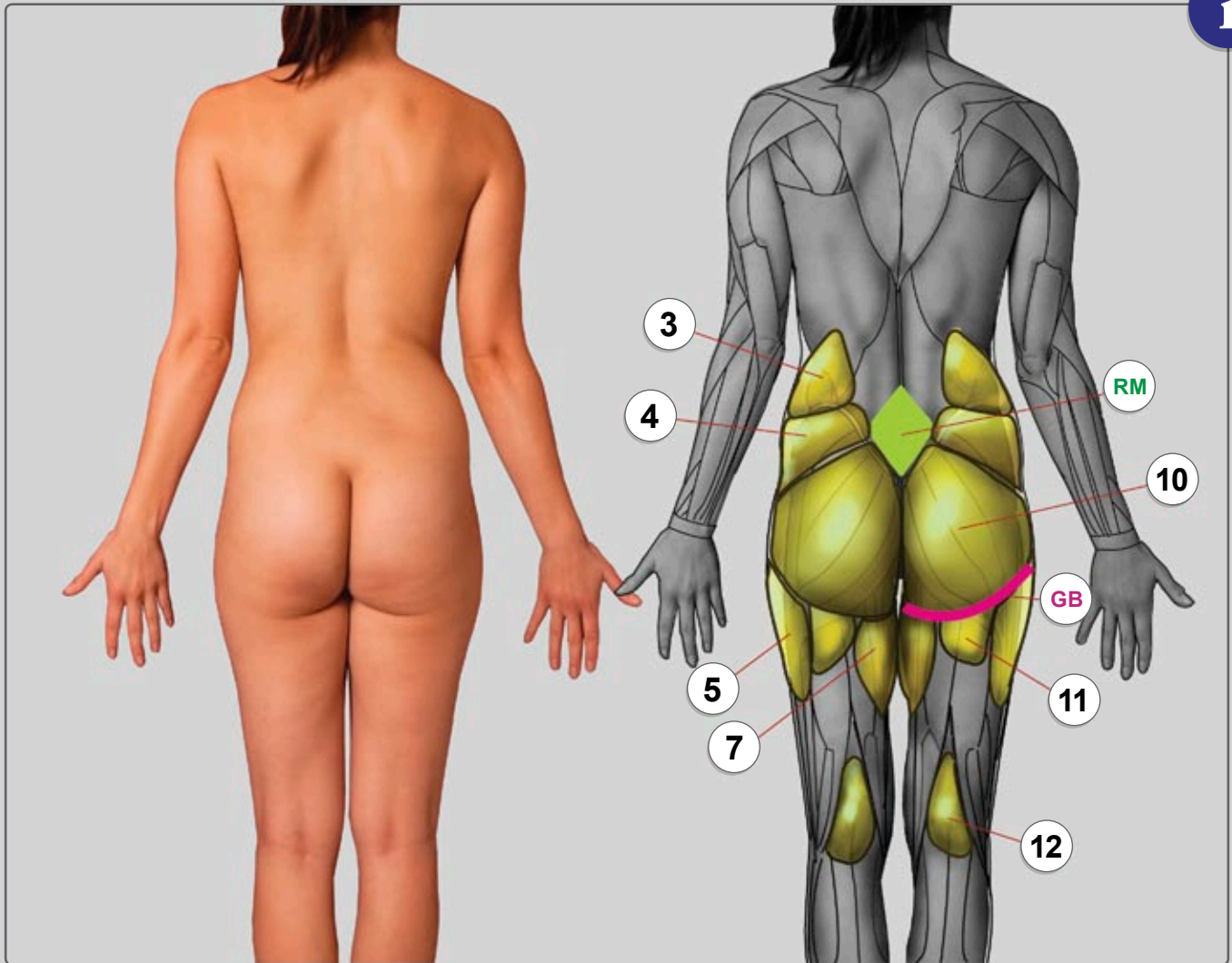


- | | | |
|---------------------------|--------------------------------|-----------------------------------|
| 1 BREAST FAT | 5 OUTER THIGH FAT PAD | 11 INFERIOR GLUTEAL FAT EXTENSION |
| 2 ABDOMINAL FAT PAD | 8 LOWER ANTERIOR THIGH FAT PAD | 12 POPLITEAL FAT PAD |
| 3 FLANK FAT PAD | 9 INFRAPATELLAR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



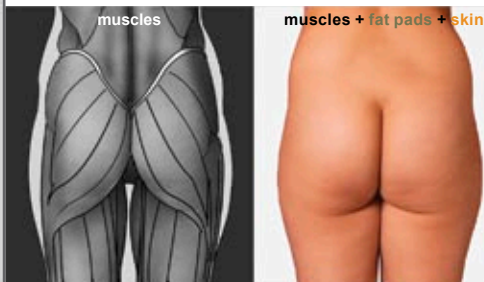
FEMALE SUBCUTANEOUS FAT PADS (BACK VIEW)

i



- | | | |
|---------------------------|---------------------------|--|
| 3 FLANK FAT PAD | 5 OUTER THIGH FAT PAD | 10 POSTERIOR GLUTEAL FAT PAD |
| 4 LATERAL GLUTEAL FAT PAD | 7 INNER THIGH FAT PAD | 11 INFERIOR GLUTEAL FAT EXTENSION |
| 12 POPLITEAL FAT PAD | RM "RHOMBUS OF MICHAELIS" | GB GLUTEAL BAND – CREATES SKIN FOLD. WHEN THE THIGH IS FLEXED, GLUTEAL FOLD DISAPPEARS |

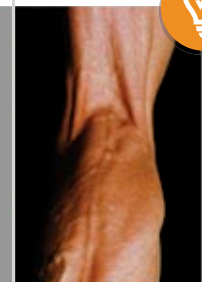
FEMALES HAVE MORE AND MUCH THICKER SUBCUTANEOUS FAT PADS THAN MALES. THIS IS WHY "TYPICAL FEMALE CURVES" APPEAR.



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

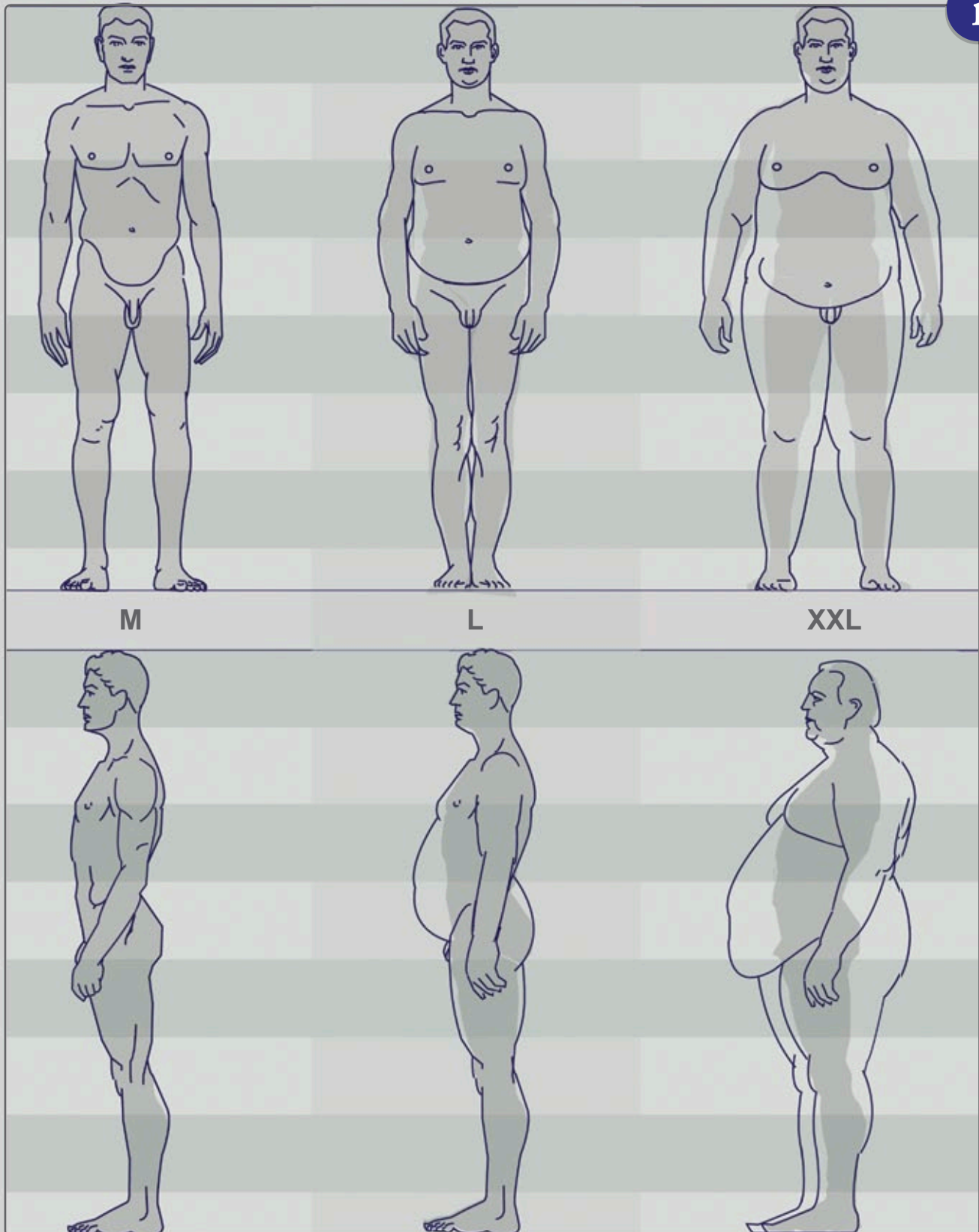


EXTREMELY FATLESS (DRY) BODY CASE.



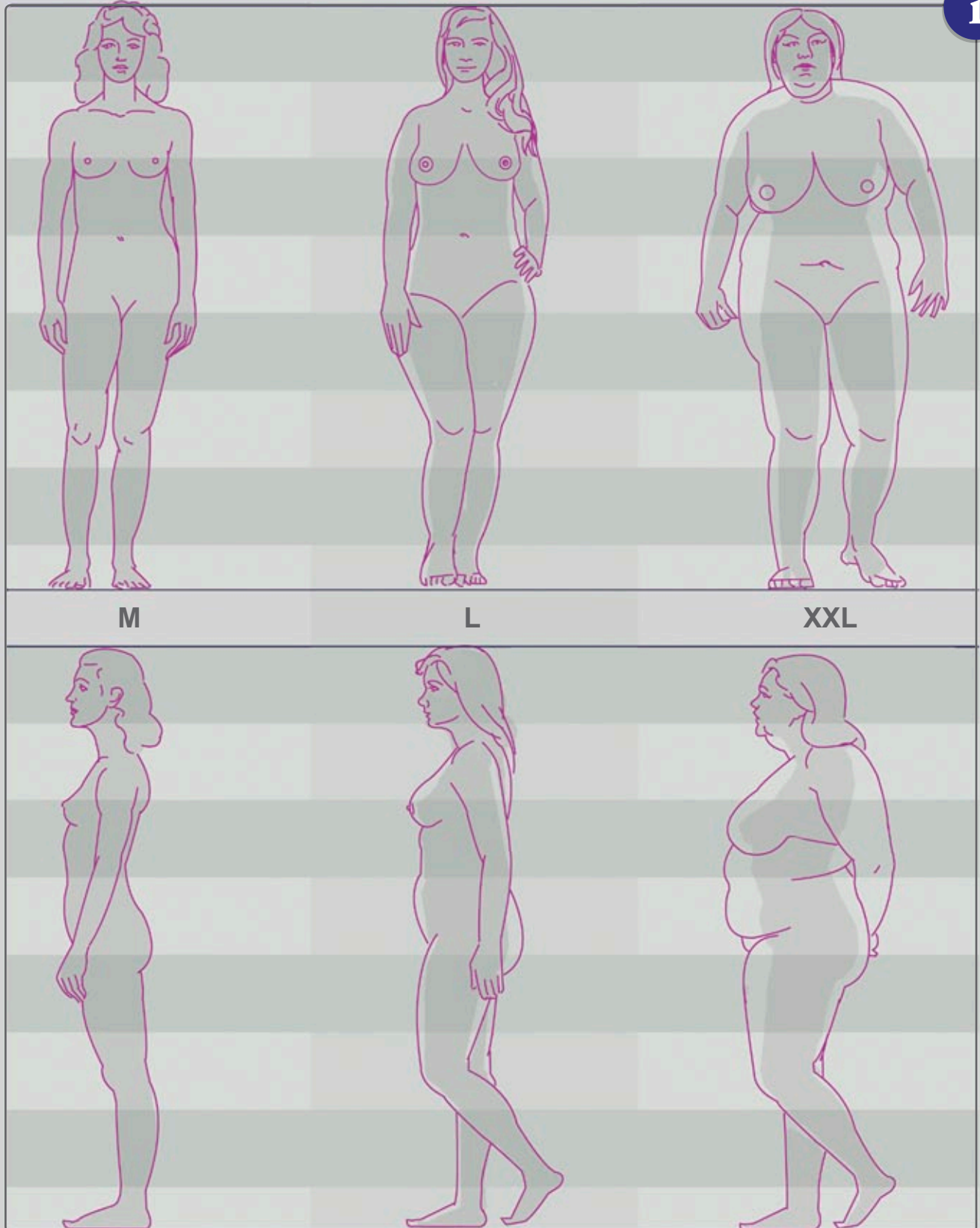
PROPORTIONAL CHANGES OF AN OBESE MALE: 7.5 HEAD UNITS

i

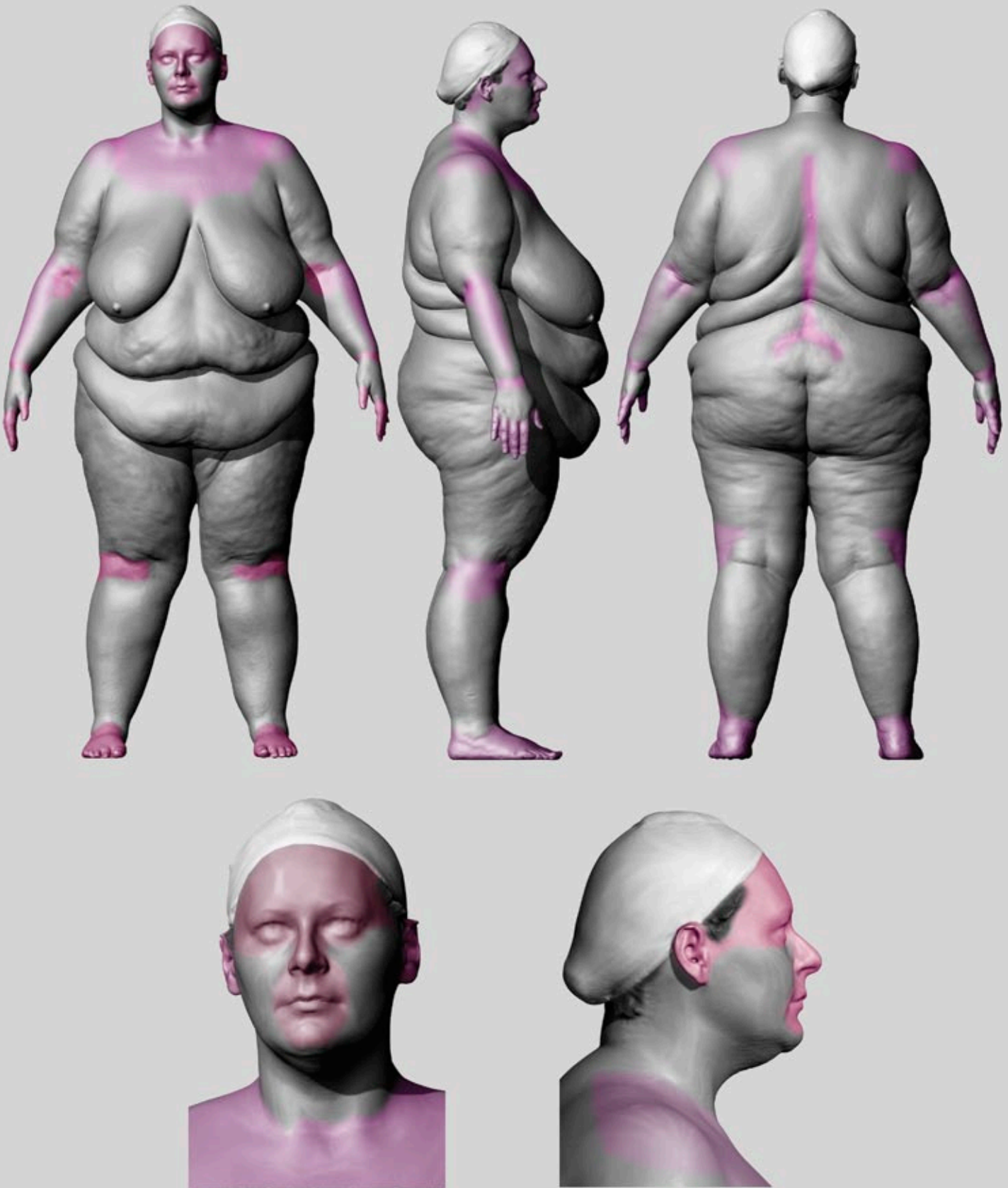


PROPORTIONAL CHANGES OF AN OBESE FEMALE: 7.5 HEAD UNITS

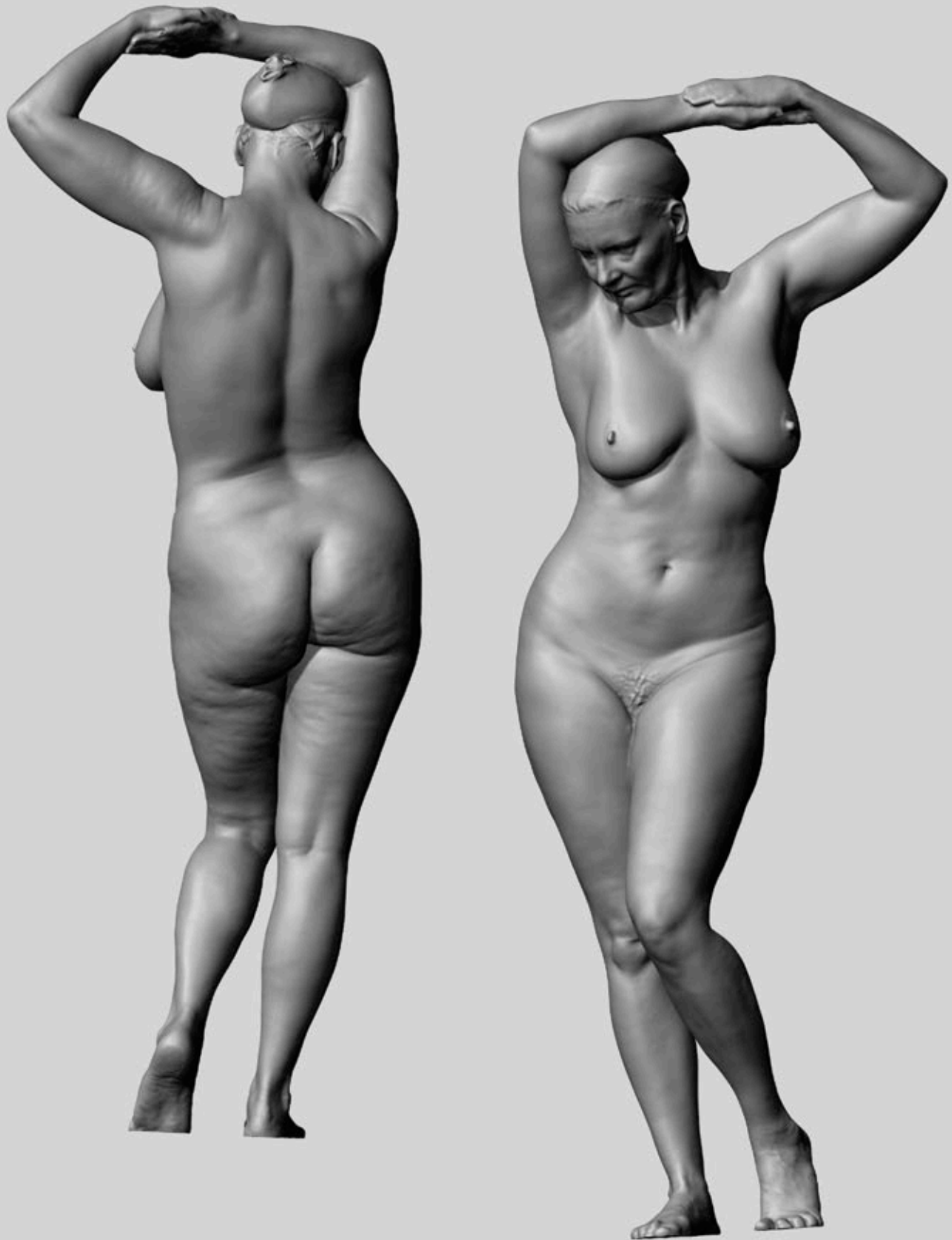
i



AREAS OF THE BODY THAT ARE LESS AFFECTED BY FAT ACCUMULATION



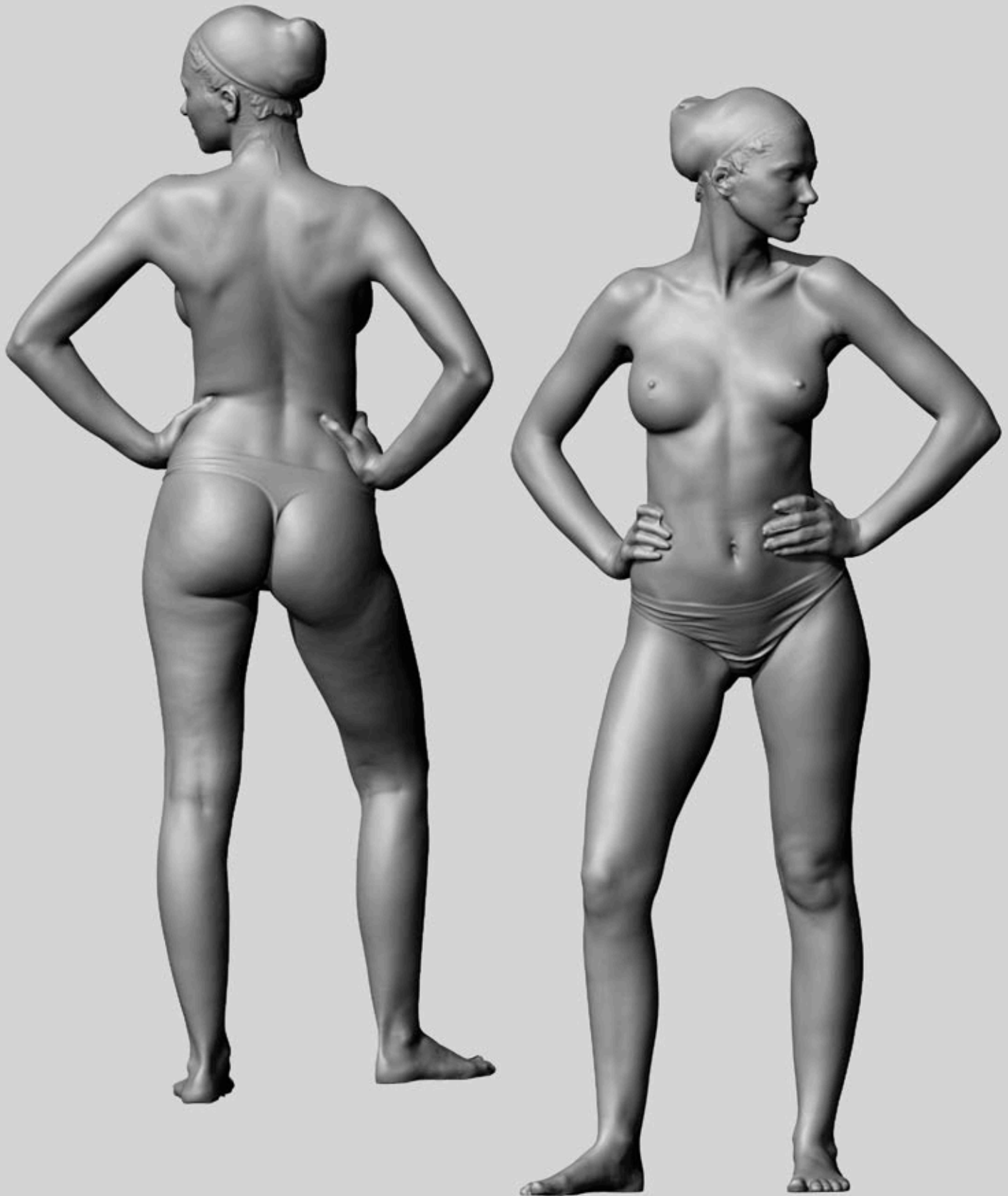
3D SCAN OF MIDDLE-AGED WOMAN



3D SCAN OF YOUNG FEMALE



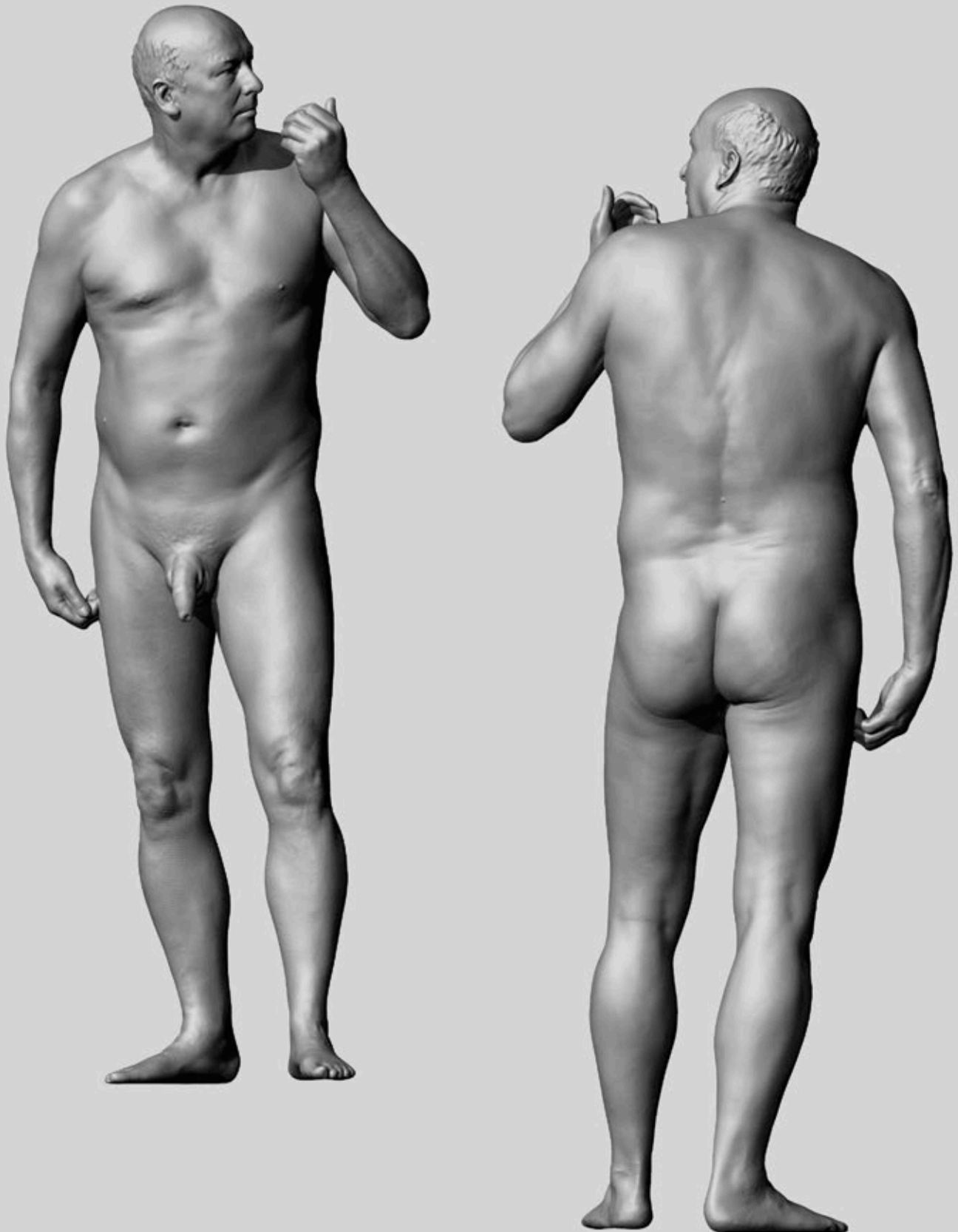
3D SCAN OF YOUNG FEMALE



3D SCAN OF YOUNG MAN



3D SCAN OF MIDDLE-AGED MAN



ARMS REACHING BEHIND BODY



3/4



RIGHT SIDE



3/4



FRONT



BACK



LEFT SIDE

ARMS AT SIDES



3/4



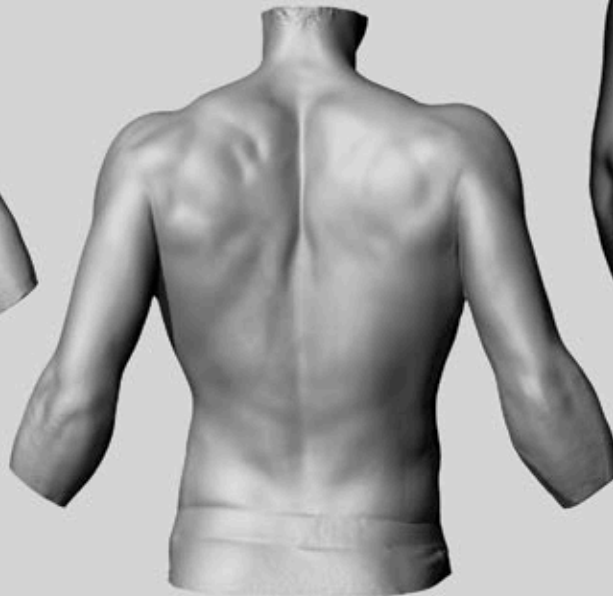
LEFT SIDE



3/4



FRONT



BACK



RIGHT SIDE

ARMS HELD STRAIGHT OUT TO SIDES



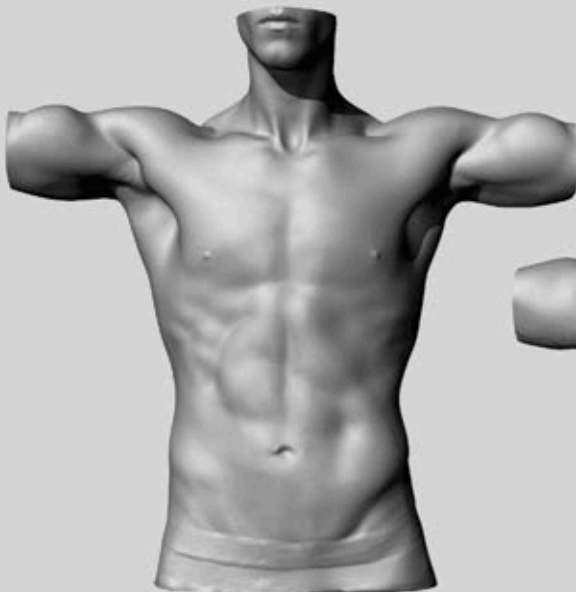
3/4



LEFT SIDE



3/4



FRONT



BACK



RIGHT SIDE

ARMS IN A “Y” POSITION



3/4



LEFT SIDE



3/4



FRONT

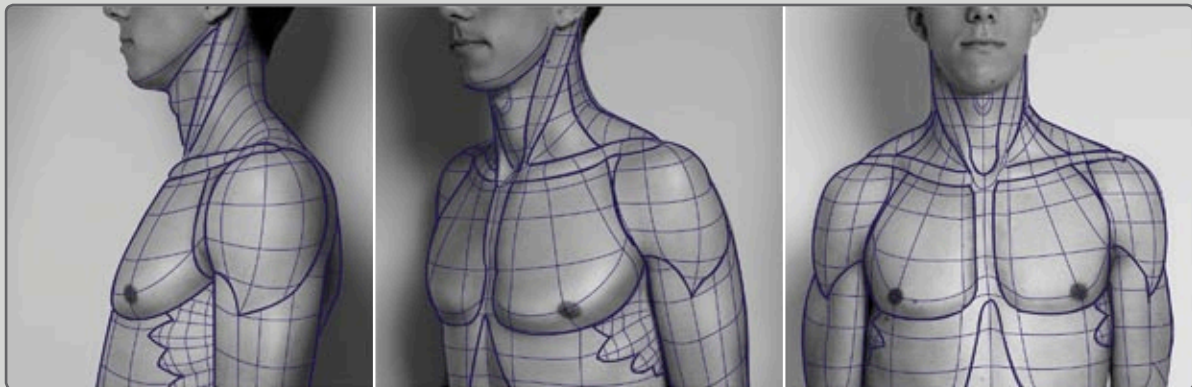
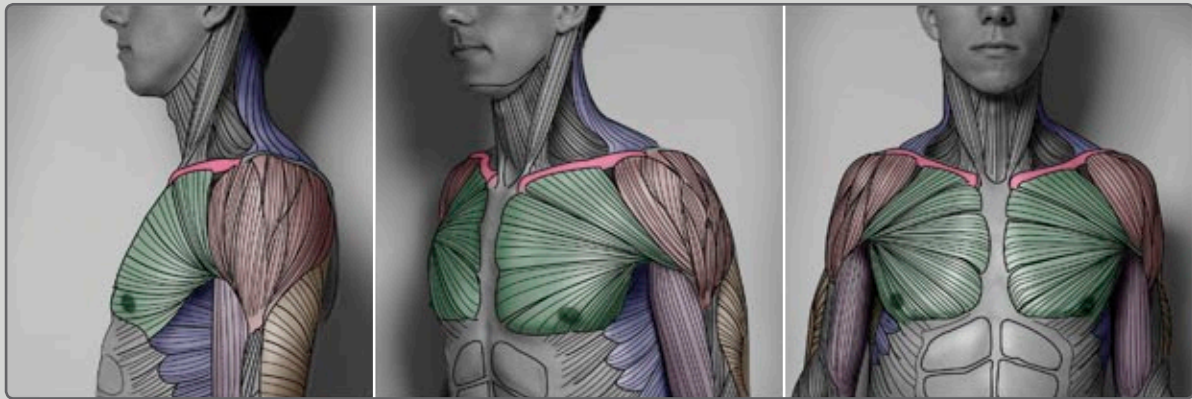
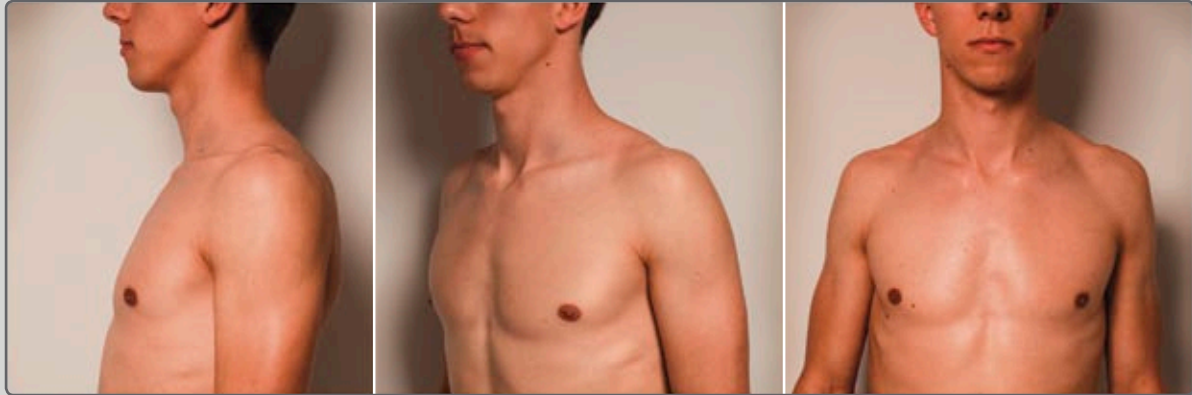


BACK

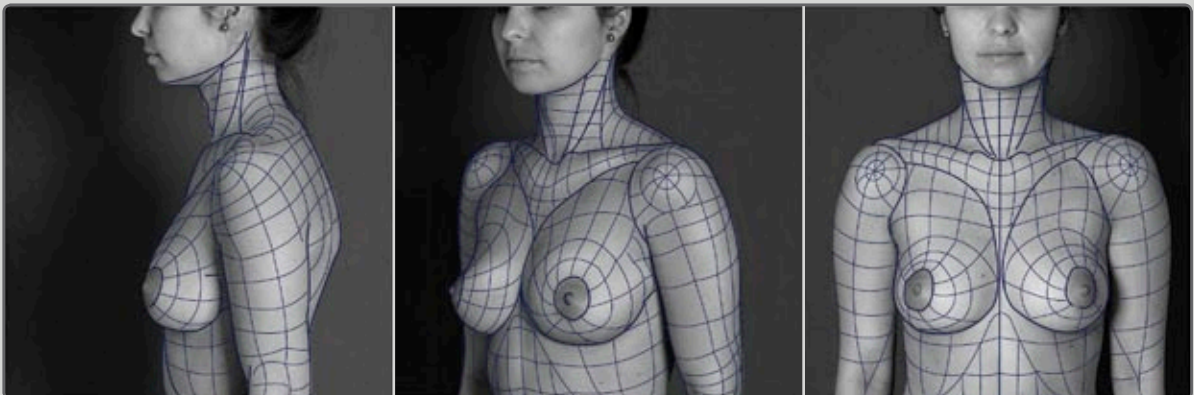
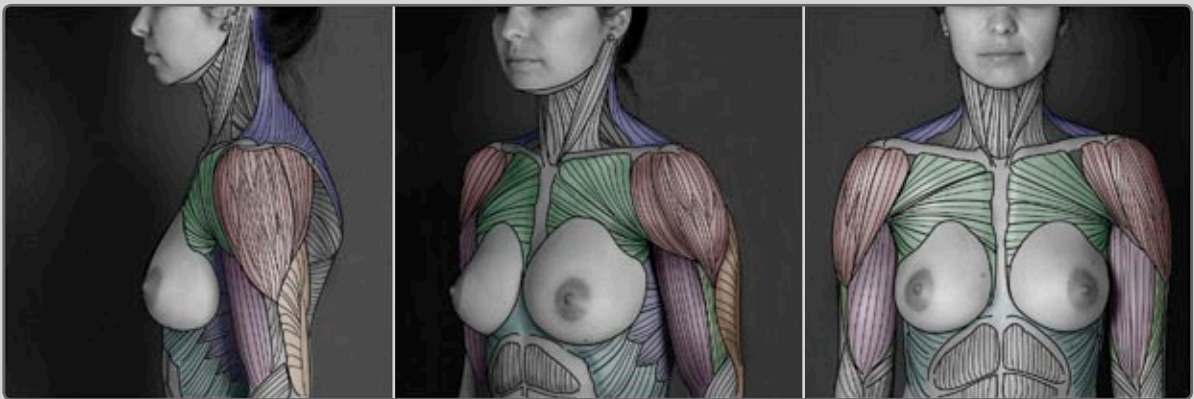
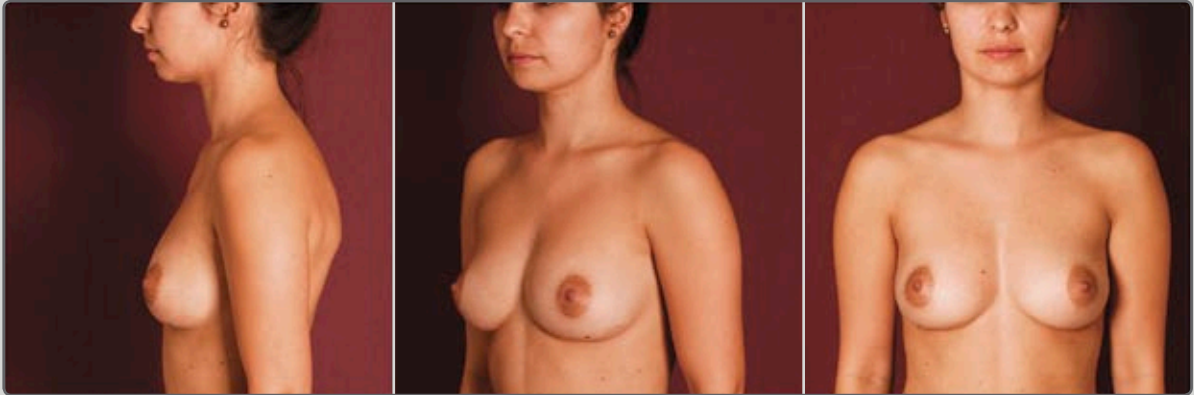


RIGHT SIDE

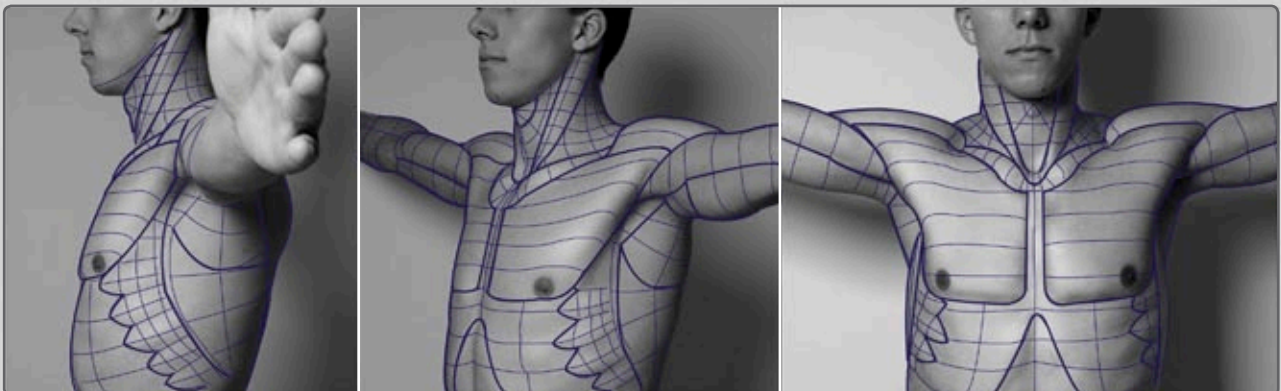
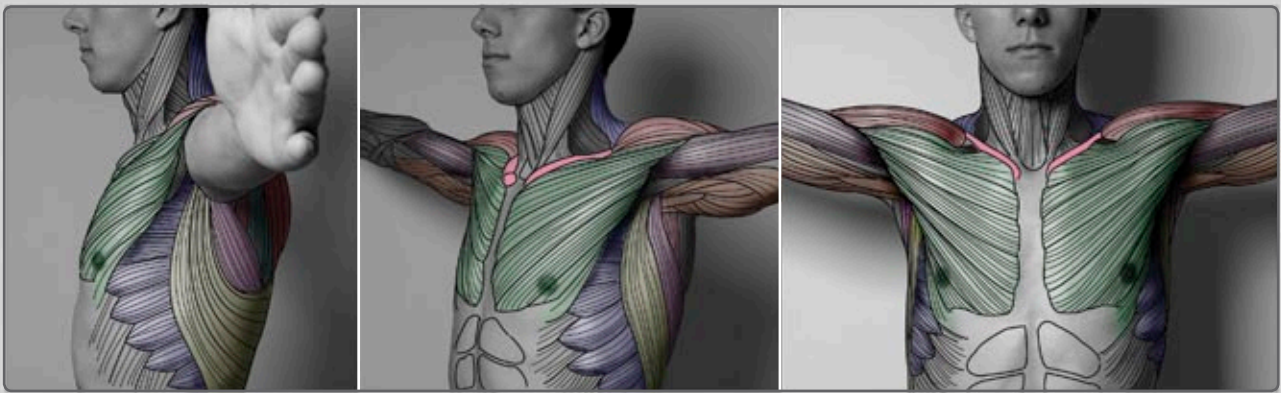
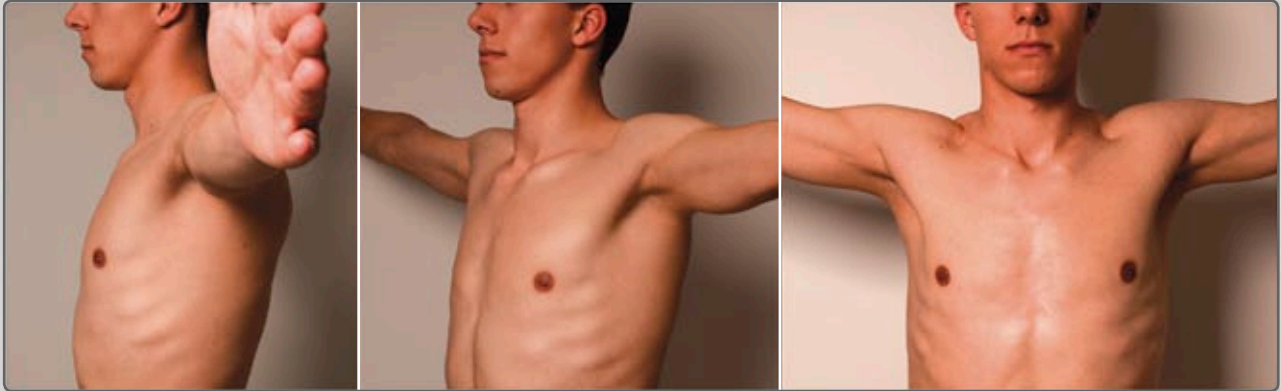
ARMS HANGING NATURALLY – MALE



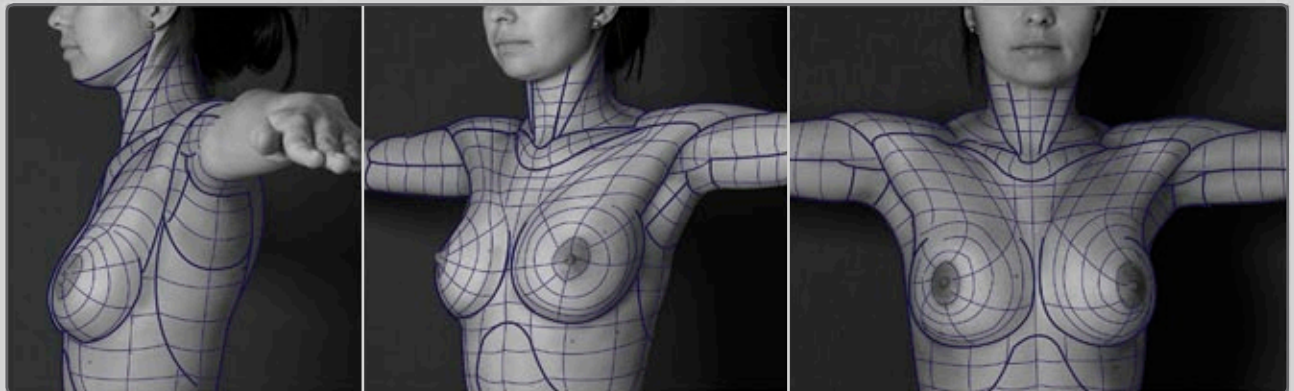
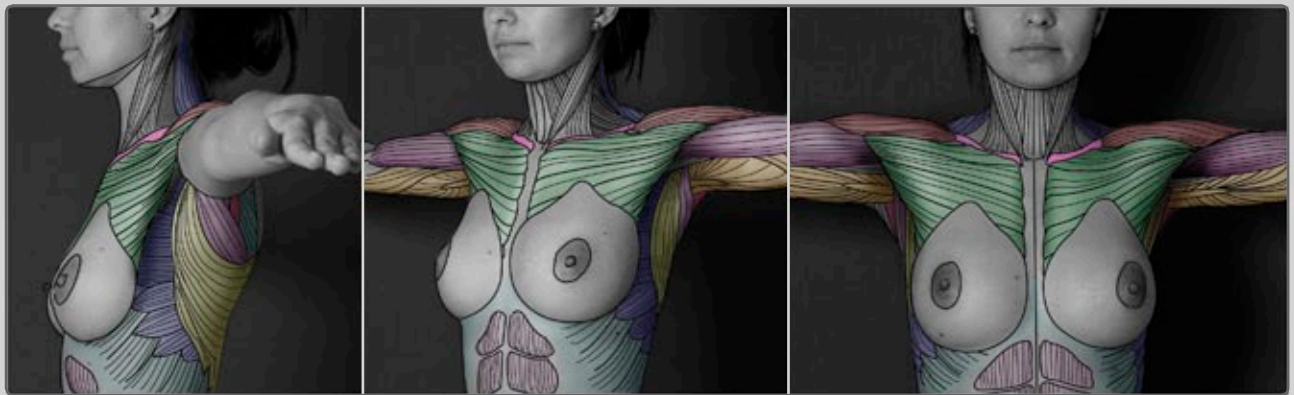
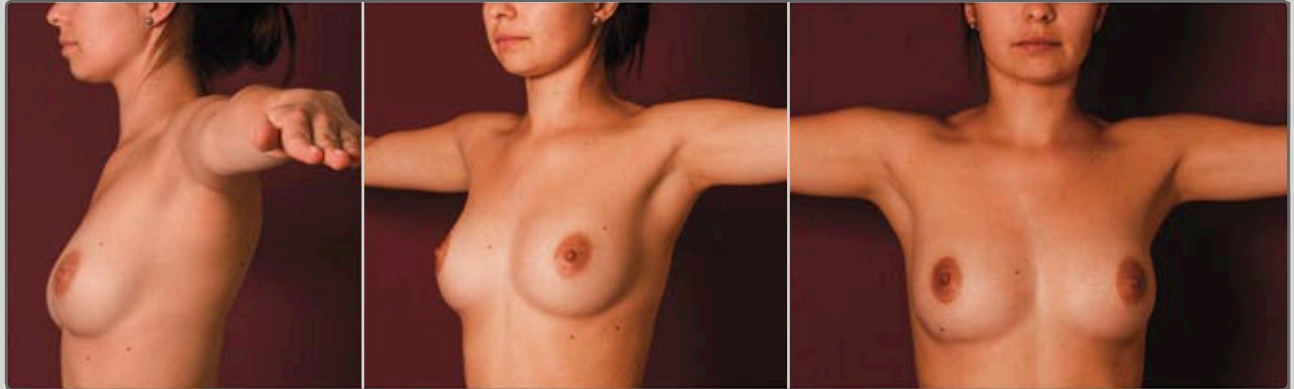
ARMS HANGING NATURALLY – FEMALE



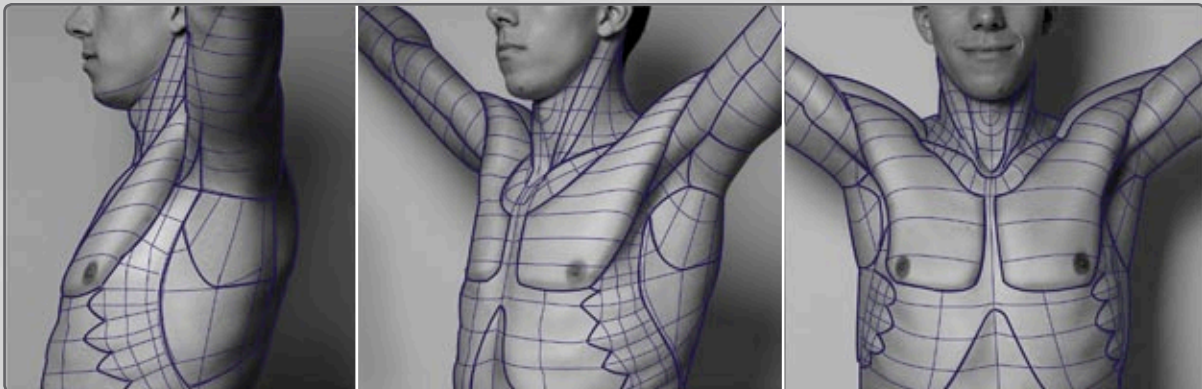
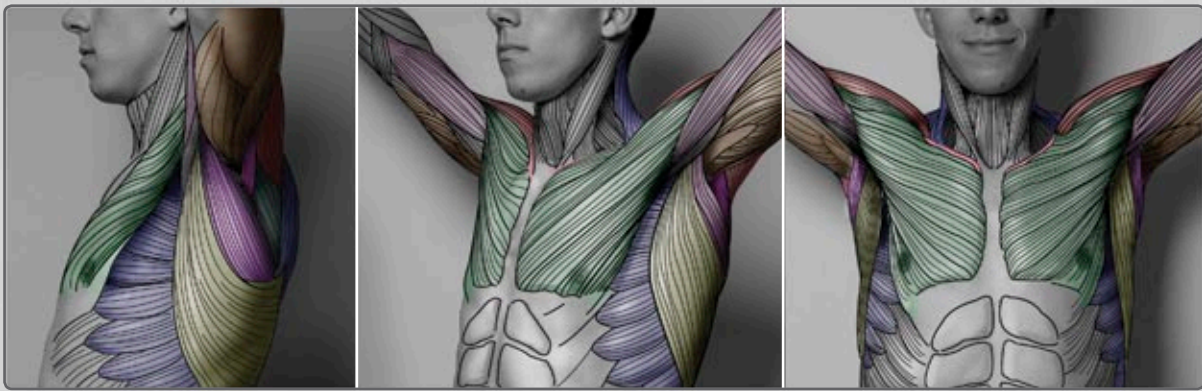
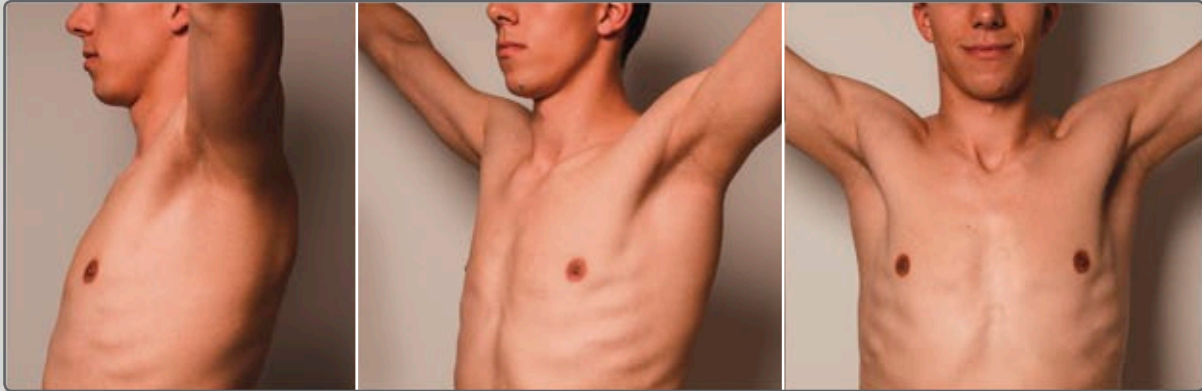
ARMS HELD STRAIGHT OUT TO SIDES – MALE



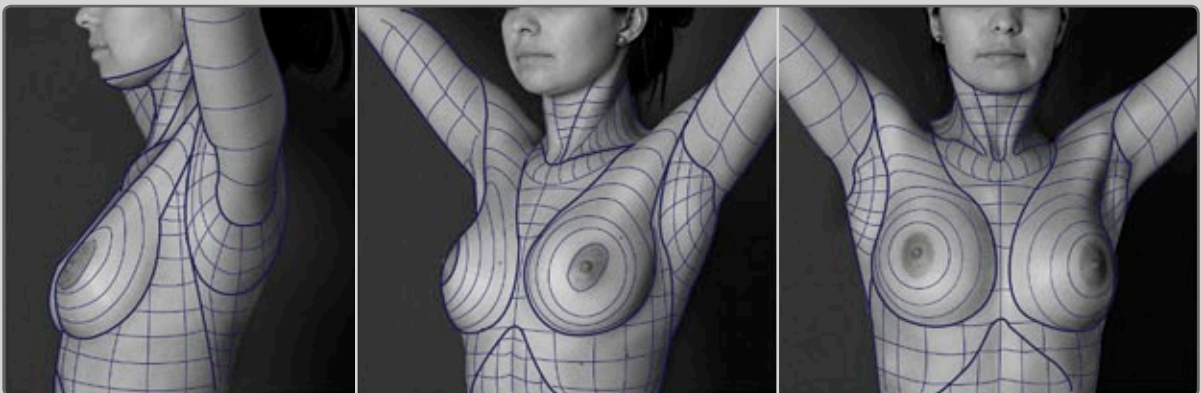
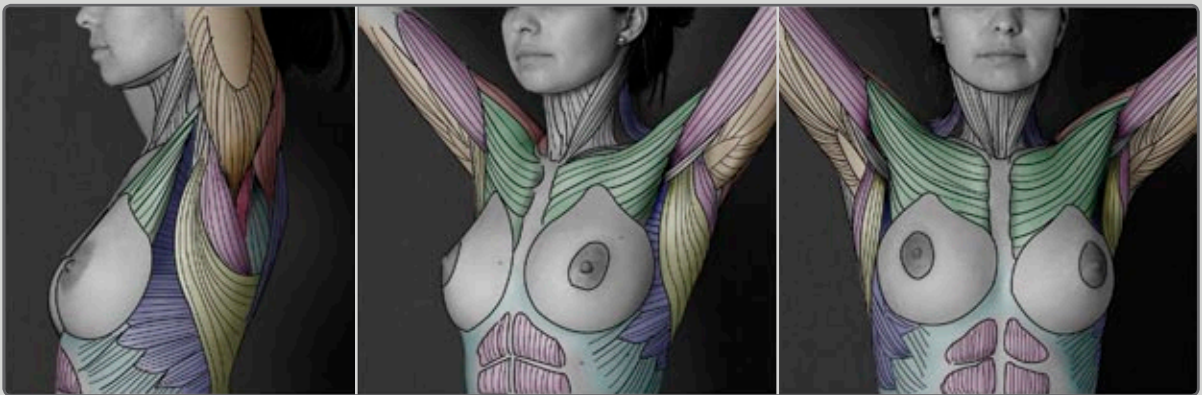
ARMS HELD STRAIGHT OUT TO SIDES – FEMALE



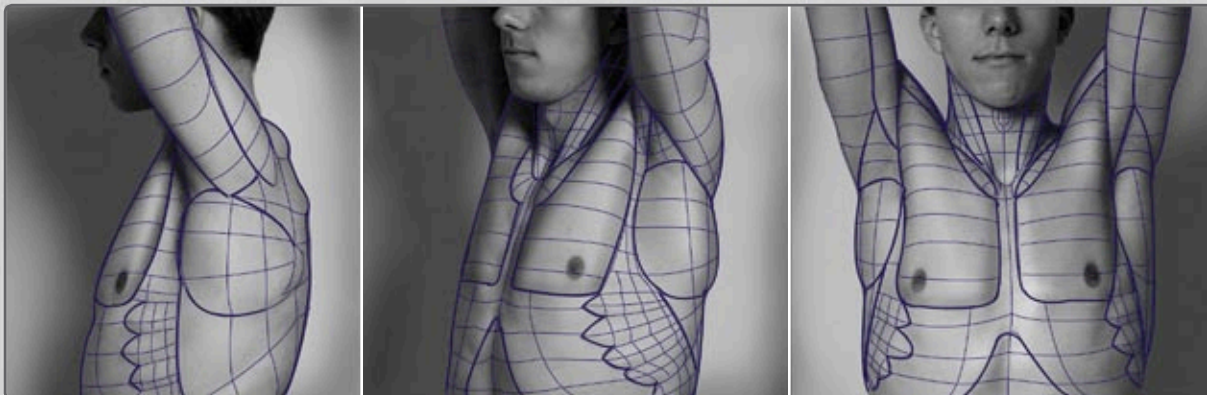
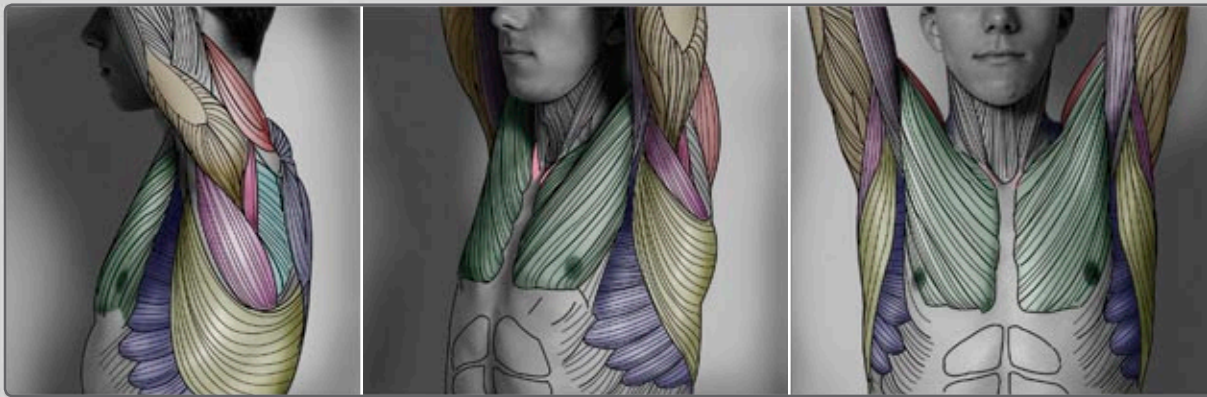
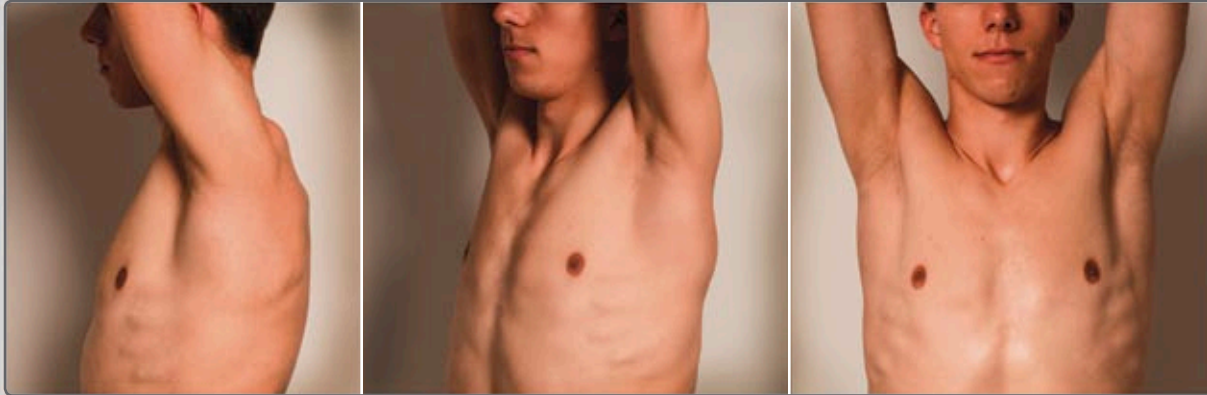
ARMS IN A “Y” POSITION – MALE



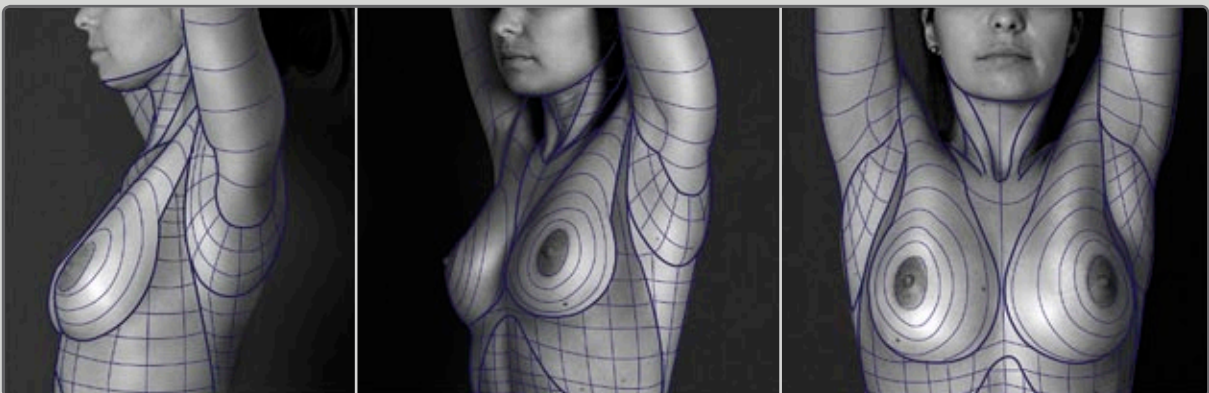
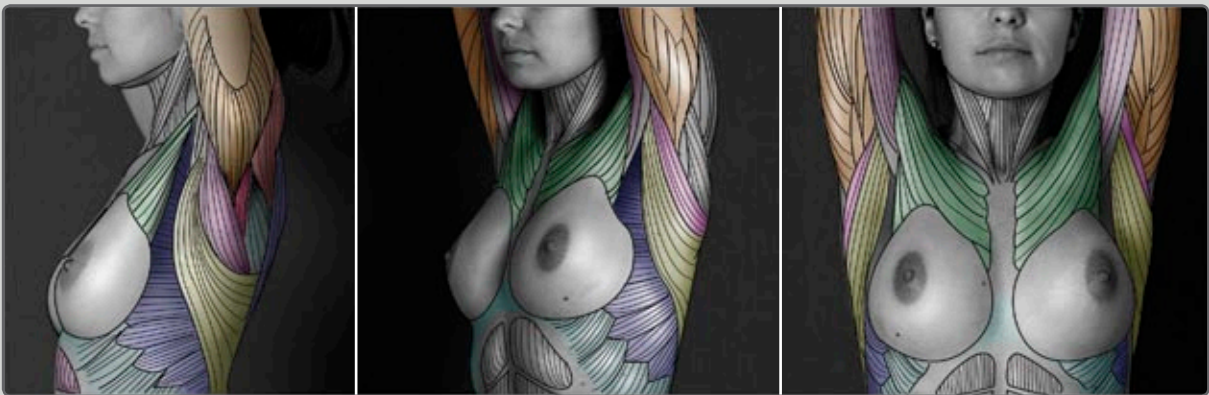
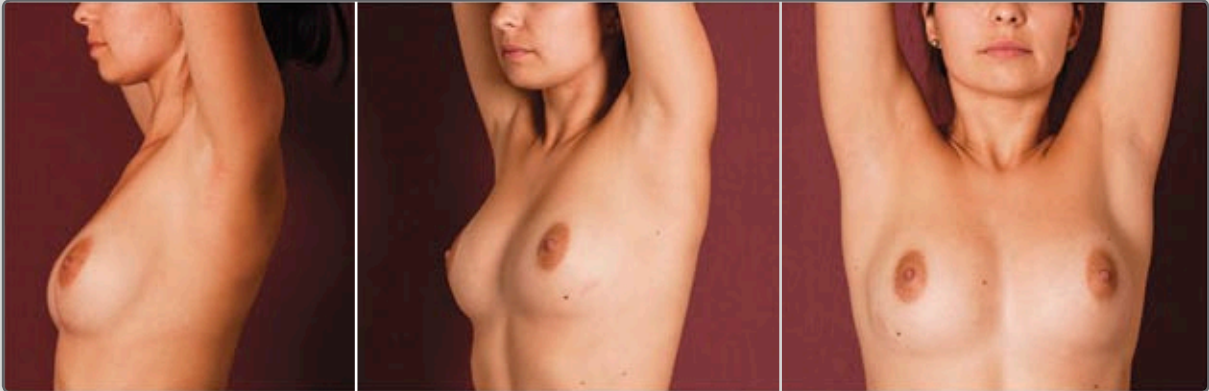
ARMS IN A “Y” POSITION – FEMALE



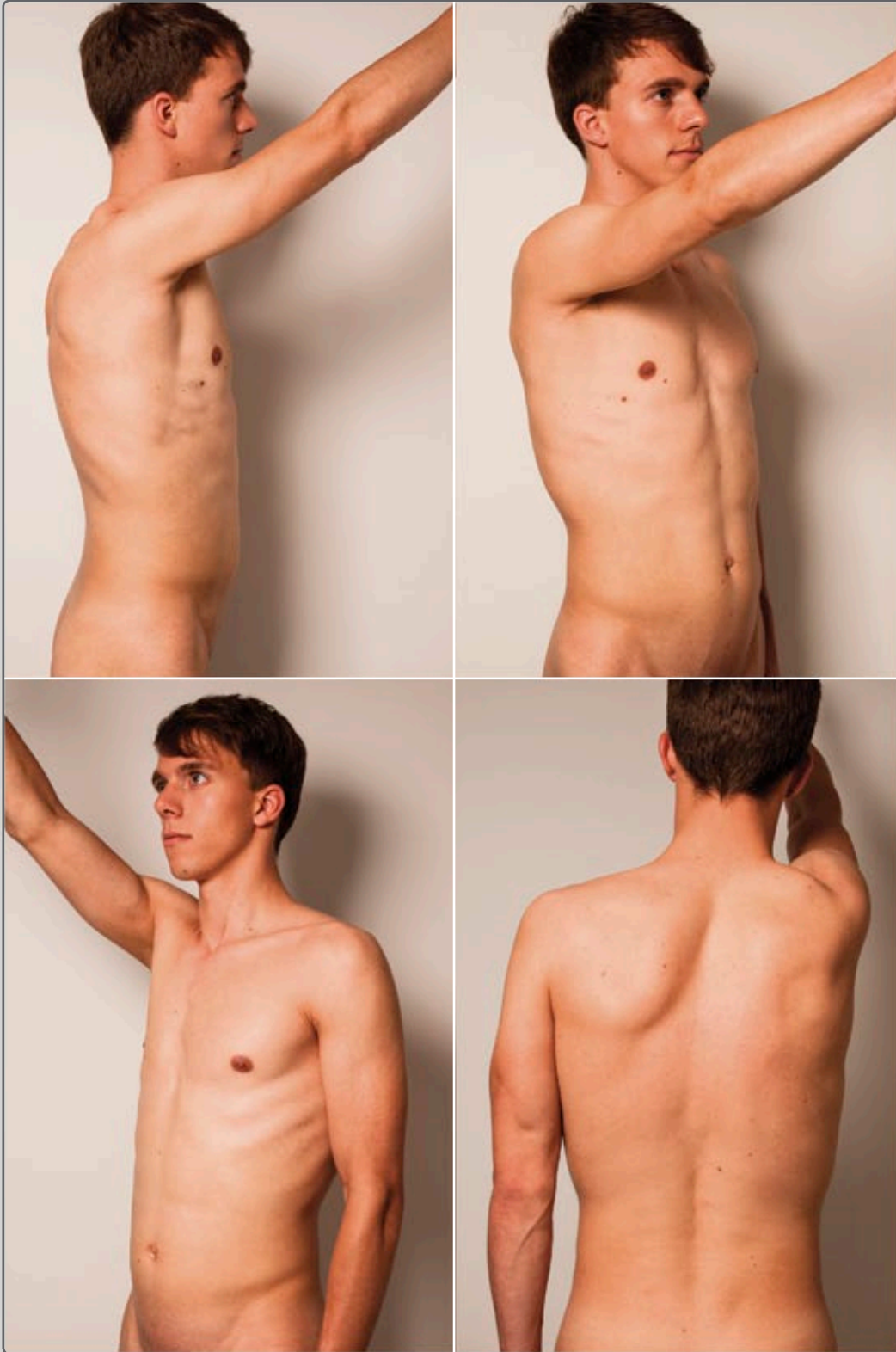
ARMS STRAIGHT UP – MALE



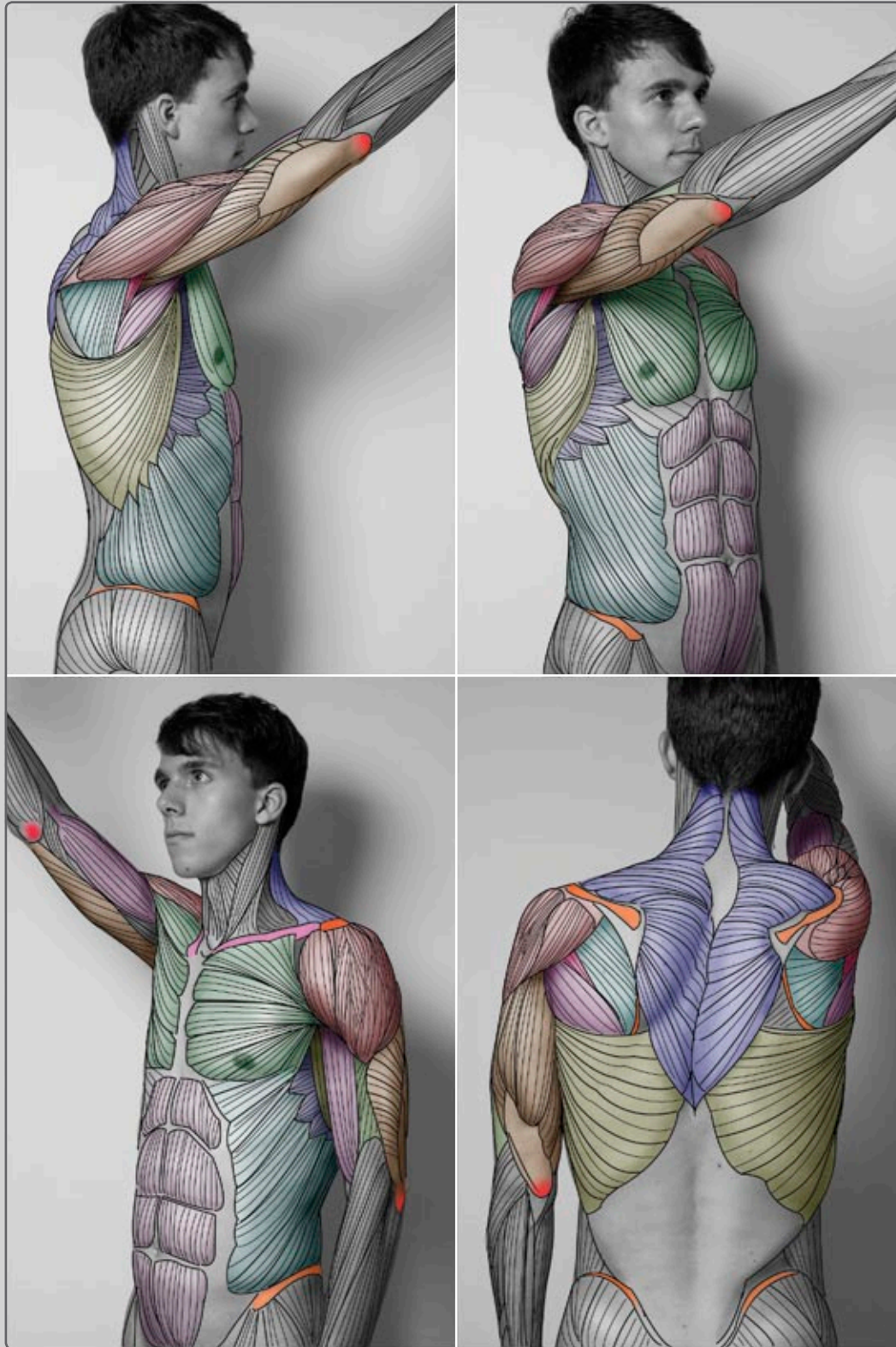
ARMS STRAIGHT UP – FEMALE



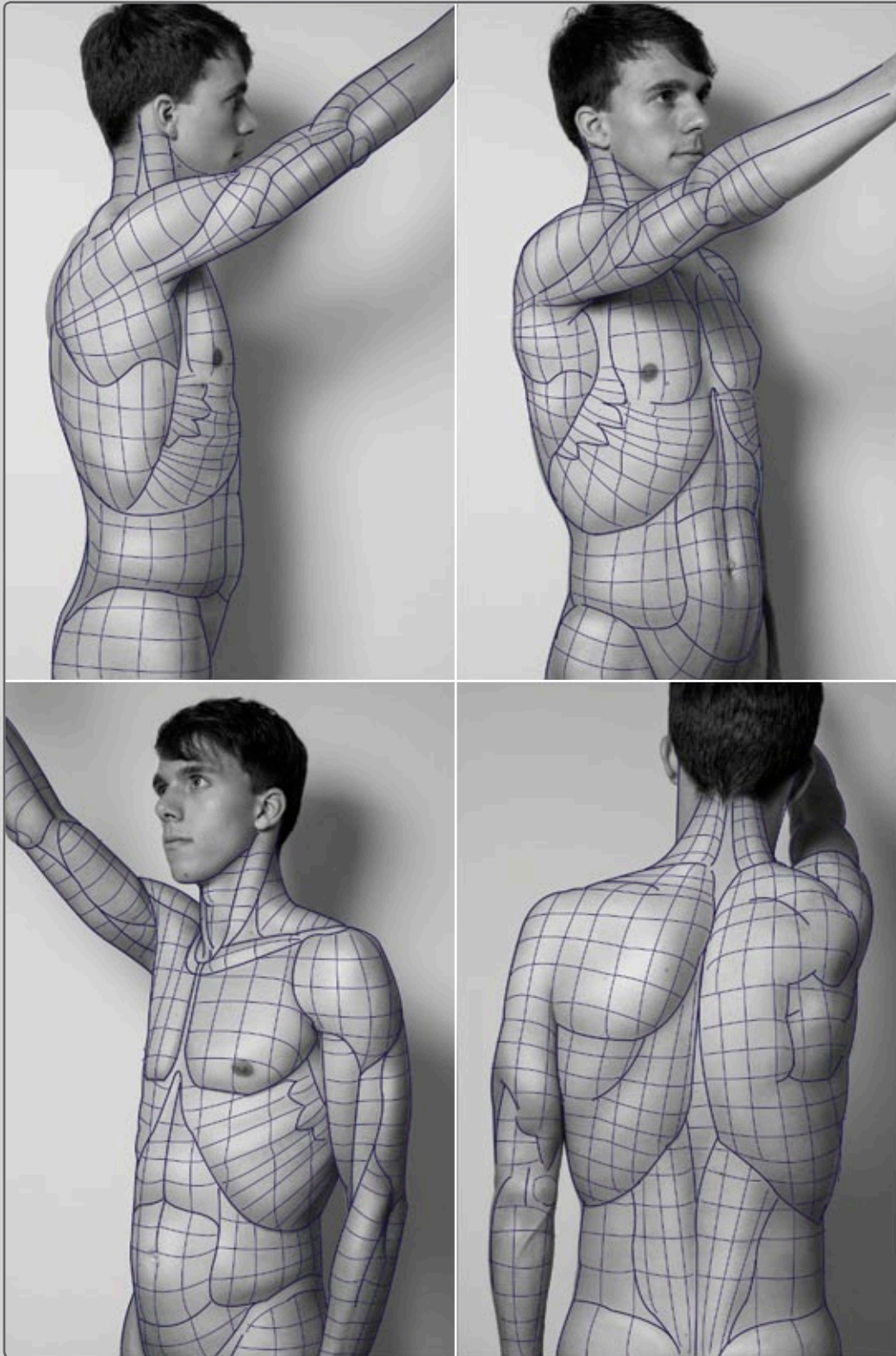
ARM REACHING UP AND FORWARD



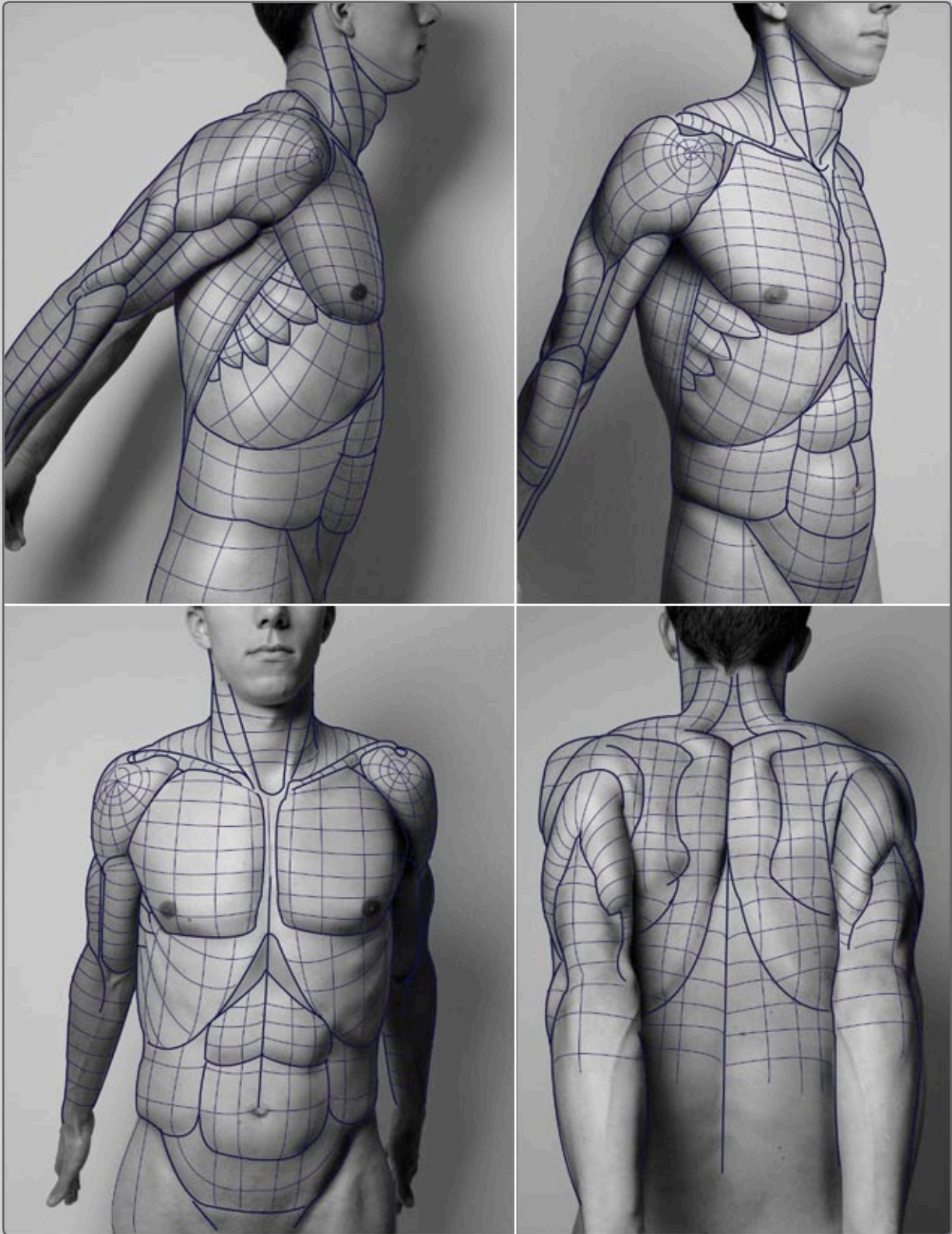
ARM REACHING UP AND FORWARD



ARM REACHING UP AND FORWARD



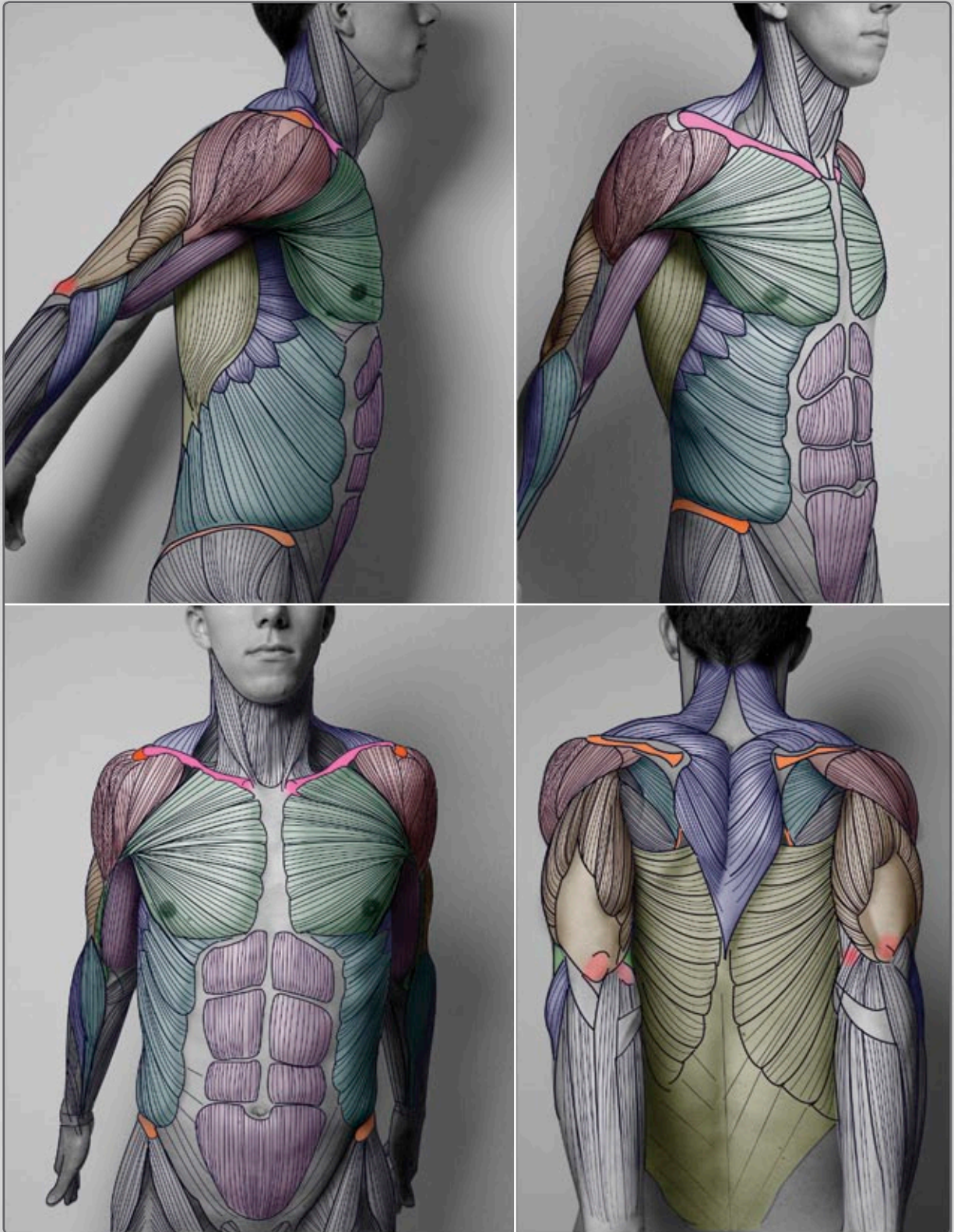
REACHING BACK



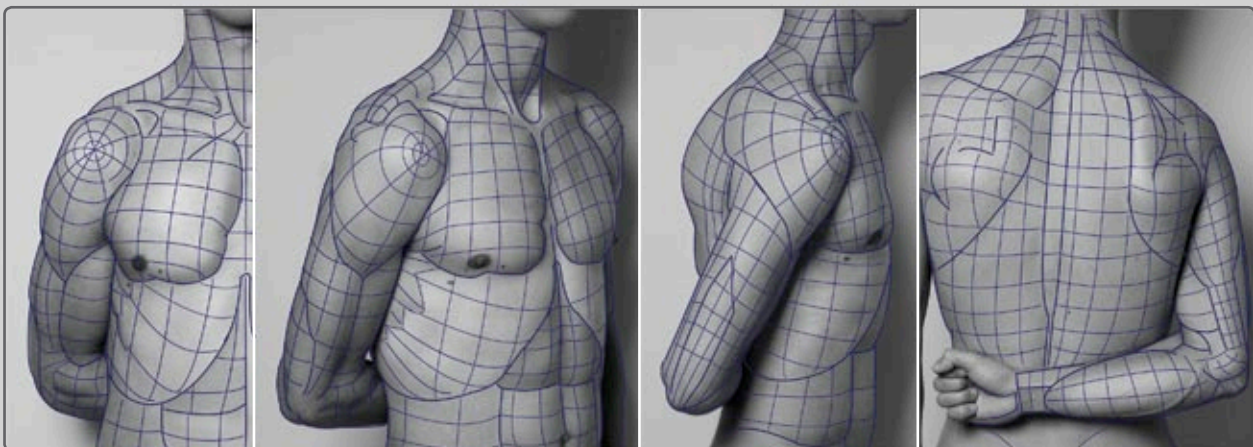
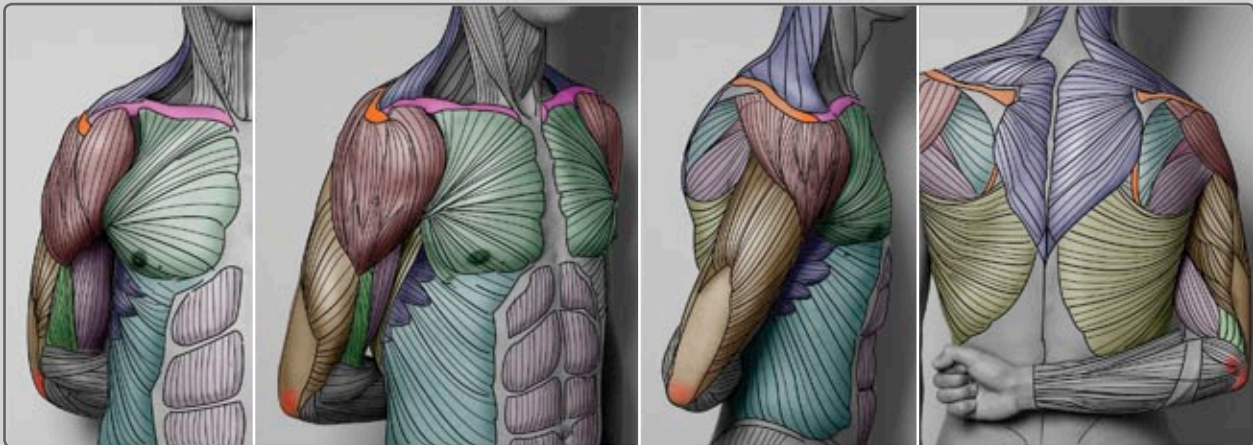
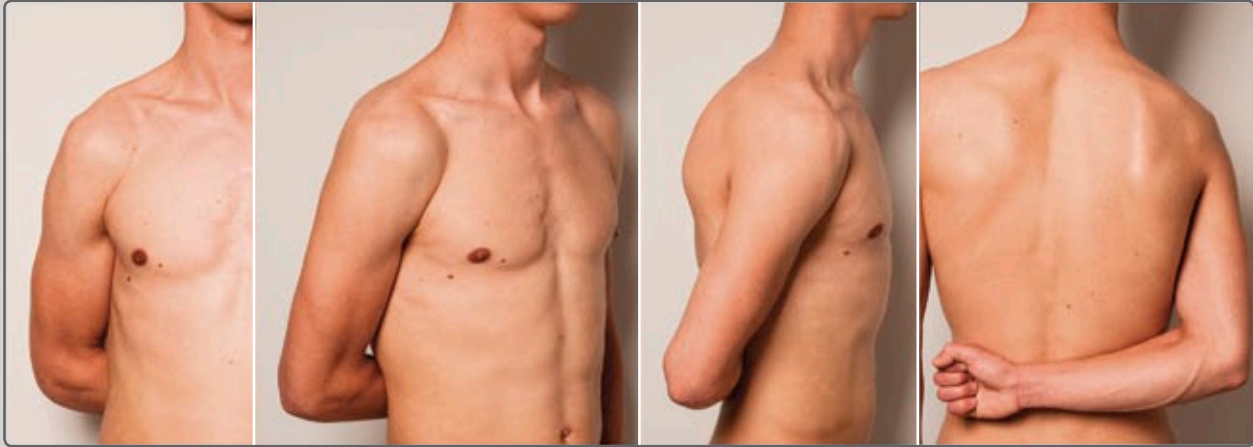
REACHING BACK



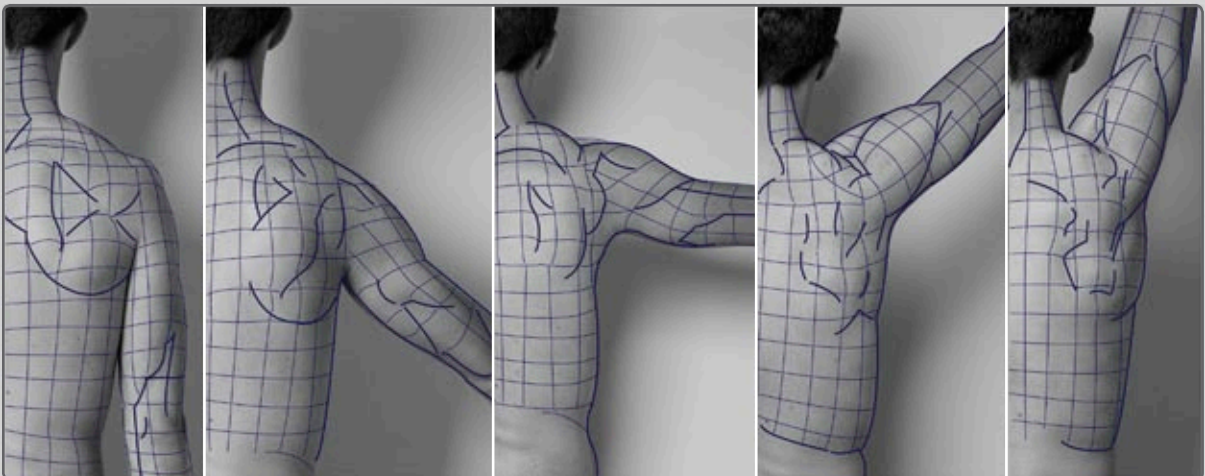
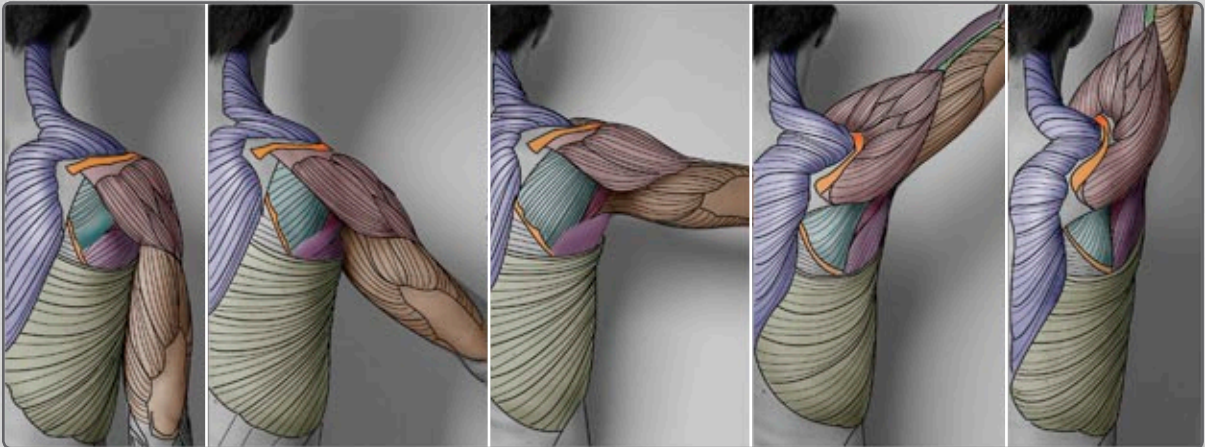
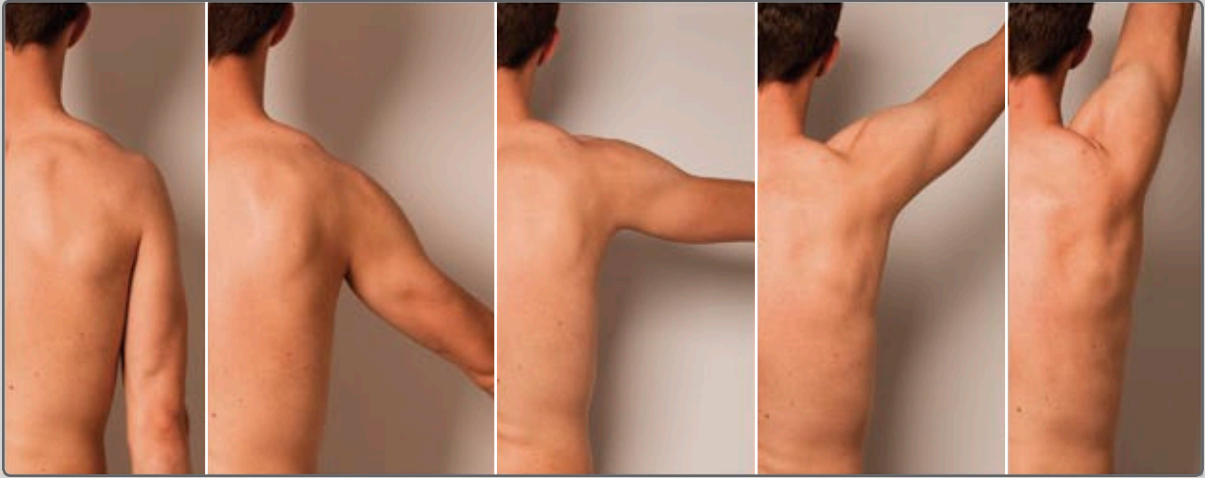
REACHING BACK



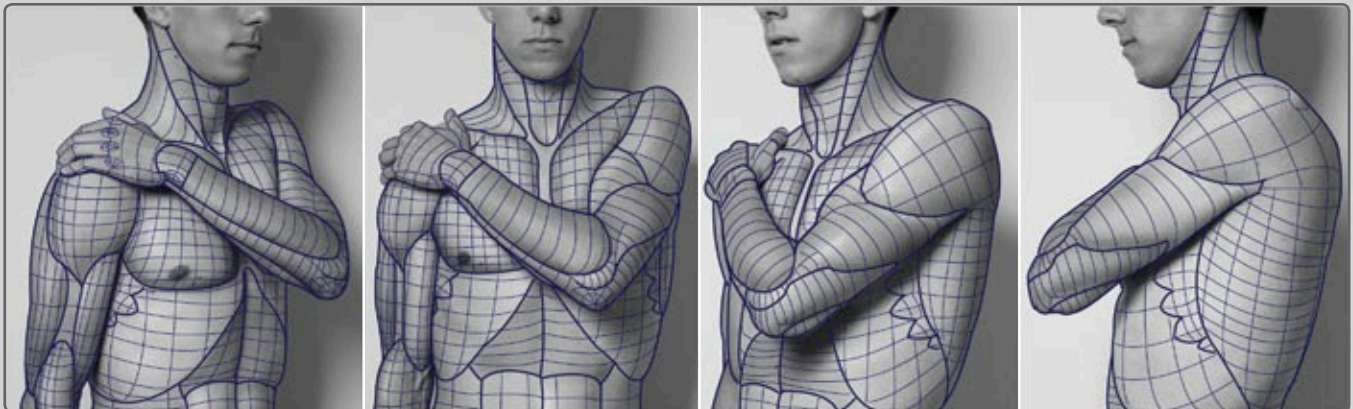
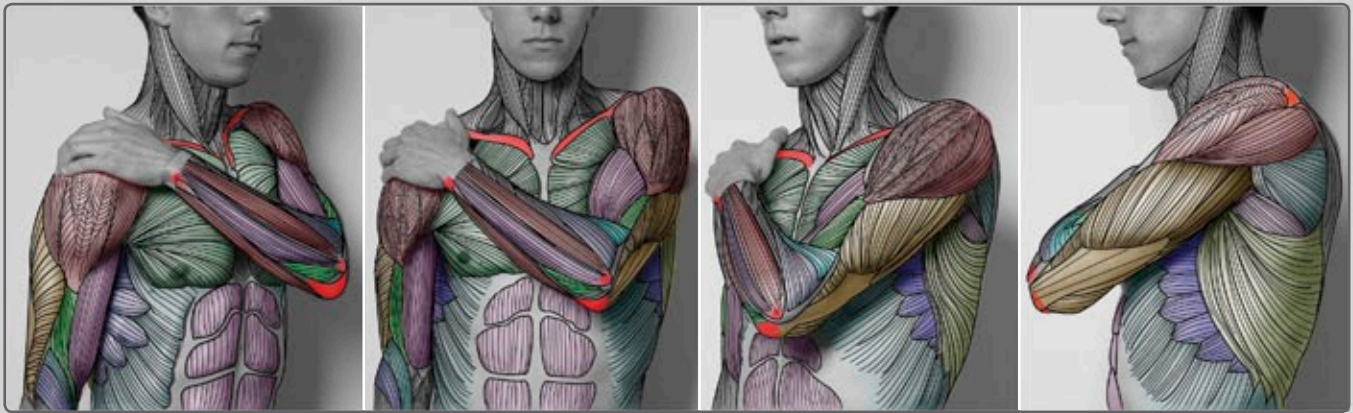
ONE ARM BEHIND BACK



LIFTING ARM HIGHER AND HIGHER



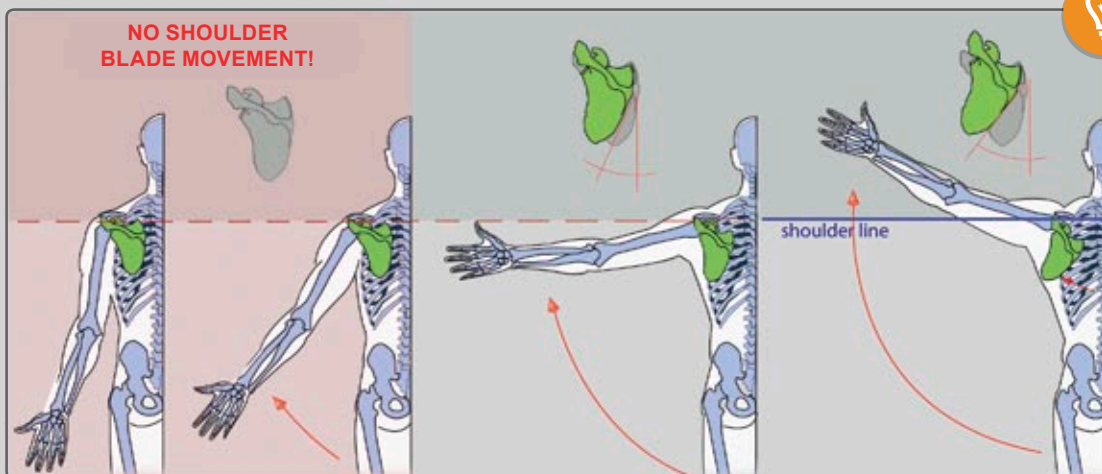
HAND HOLDING OPPOSITE SHOULDER



LET'S FIND SHOULDER BLADES (SCAPULA)!

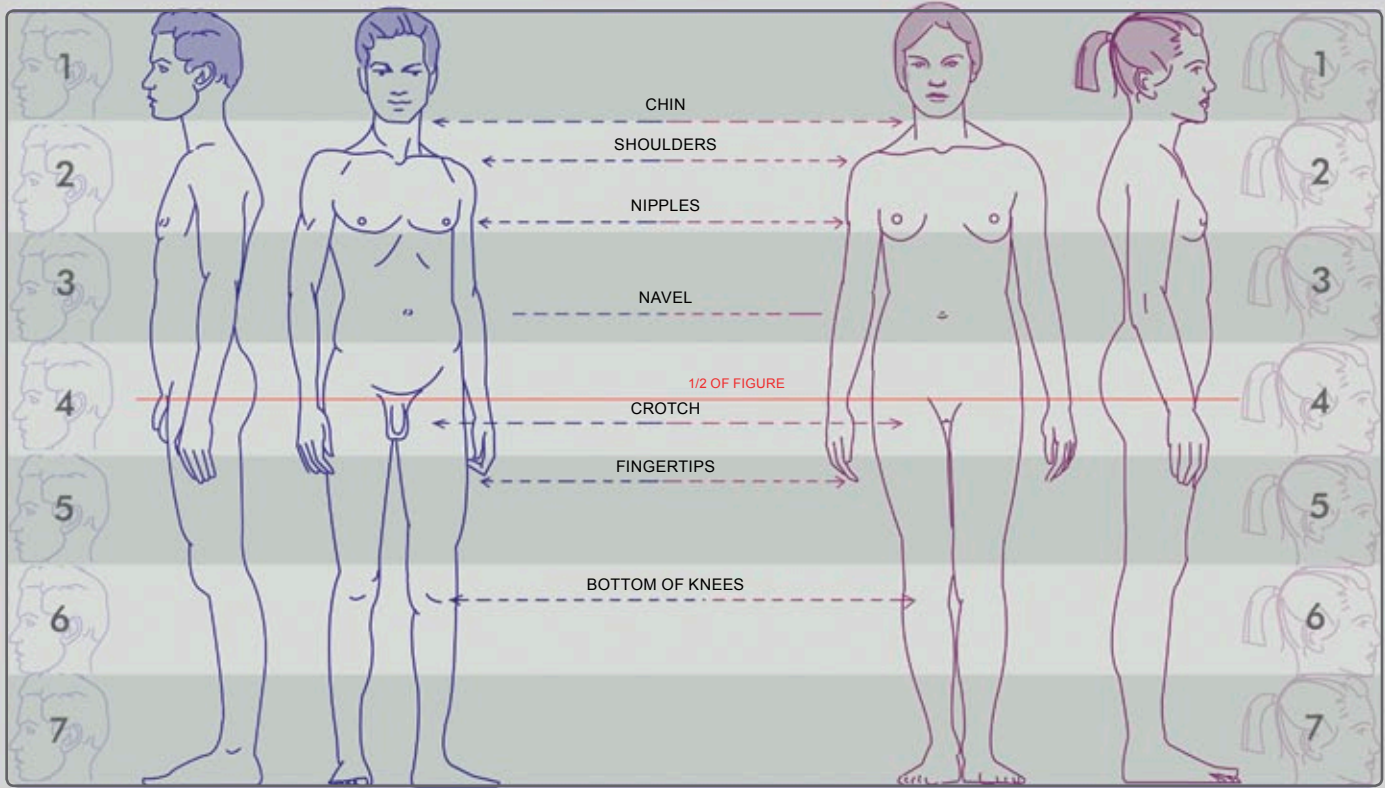


ROTATION OF THE SHOULDER BLADE

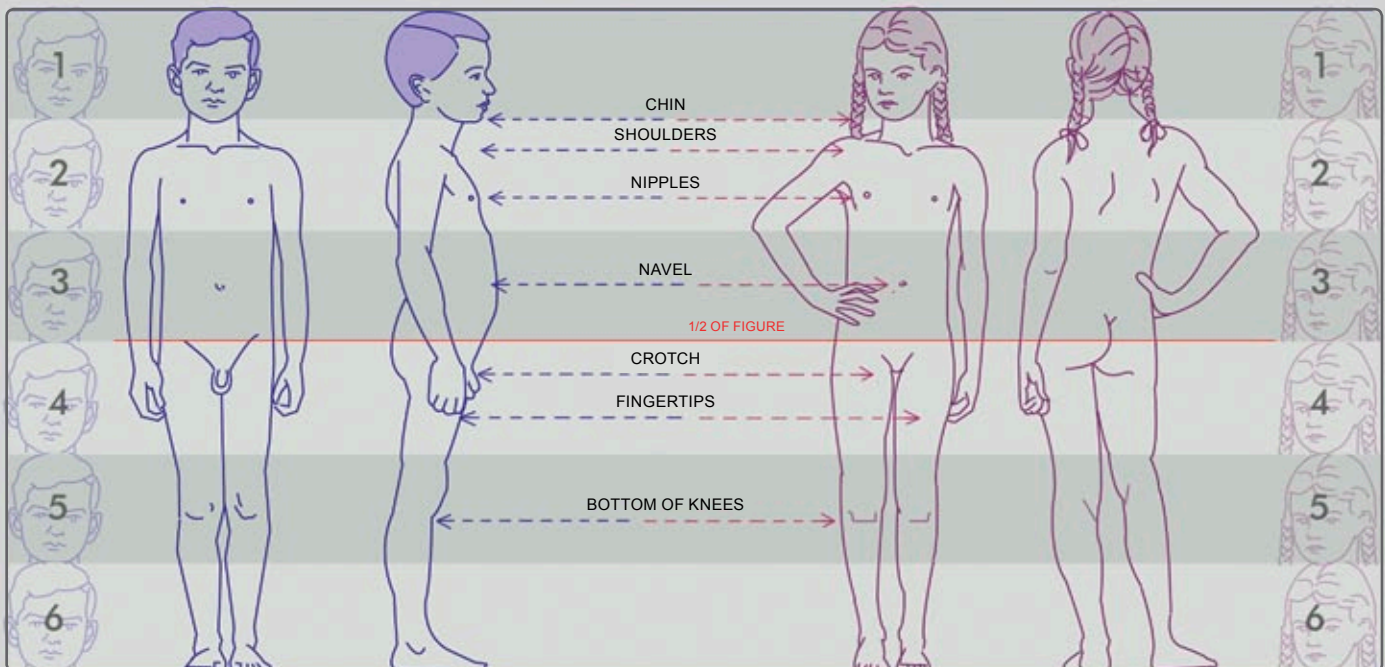


PROPORTIONS OF TEENAGER AND CHILD

TEENAGER PROPORTIONS - 7 HEAD UNITS

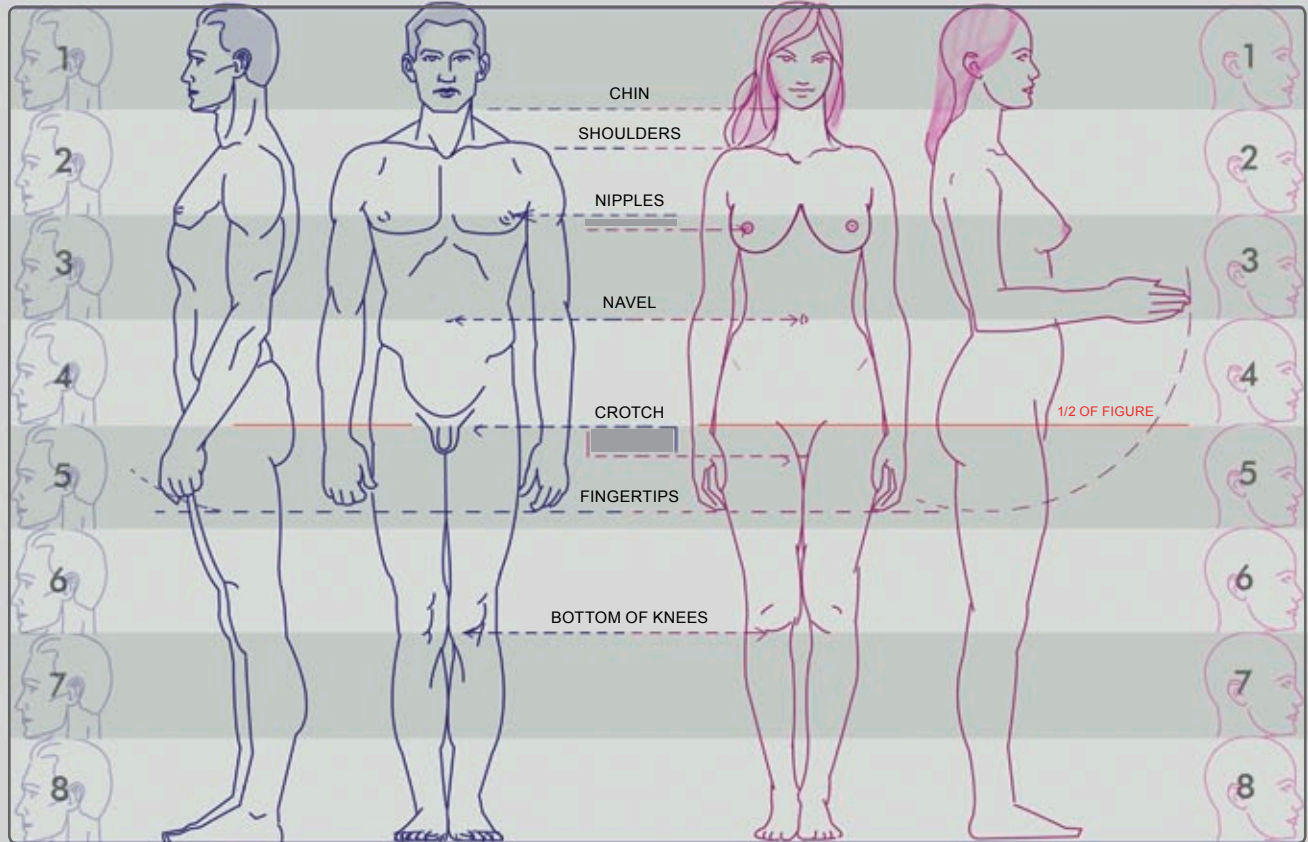


CHILD PROPORTIONS (AGES 8 - 12) - 6 HEAD UNITS

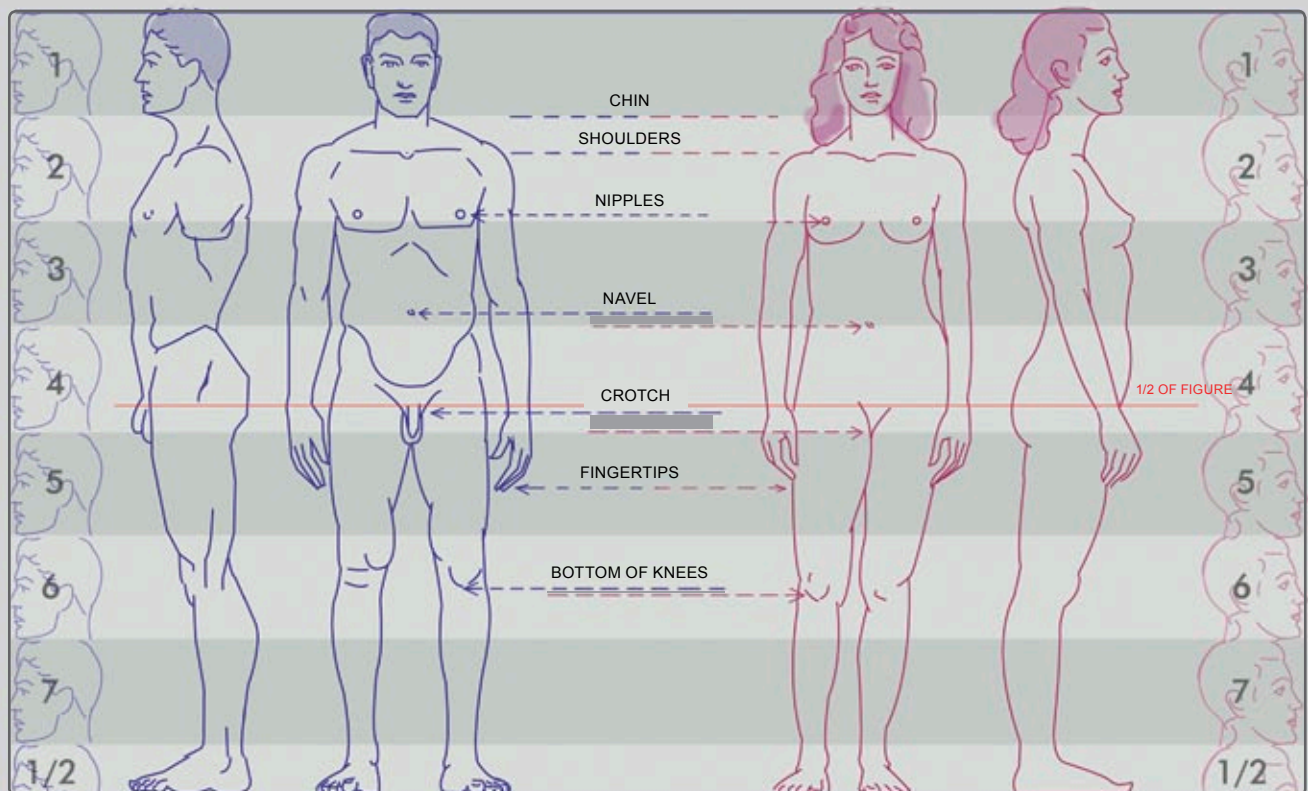


PROPORTIONS OF ADULT MALE AND FEMALE

IDEALIZED ADULT PROPORTIONS - 8 HEAD UNITS

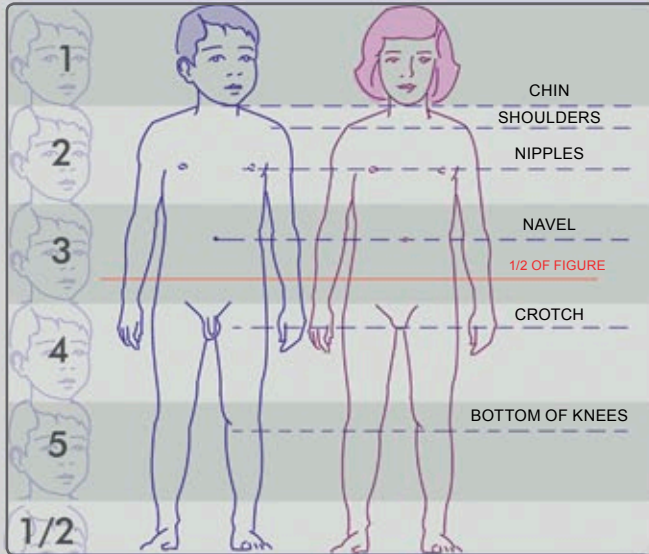


REALISTIC ADULT PROPORTIONS - 7.5 HEAD UNITS

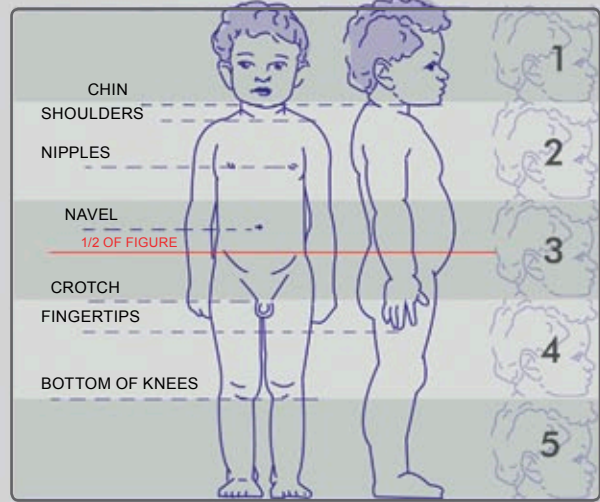


PROPORTIONS OF CHILD, TODDLER, NEWBORN AND SENIOR

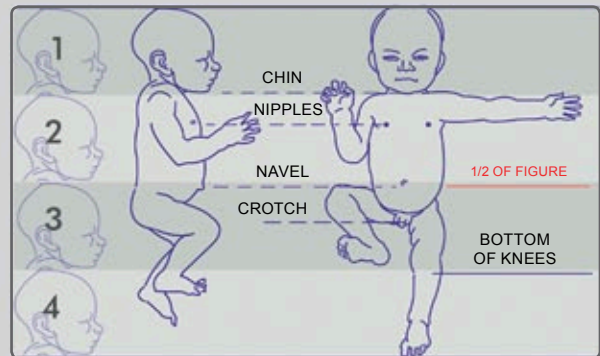
CHILD: **5.5 HEAD UNITS**



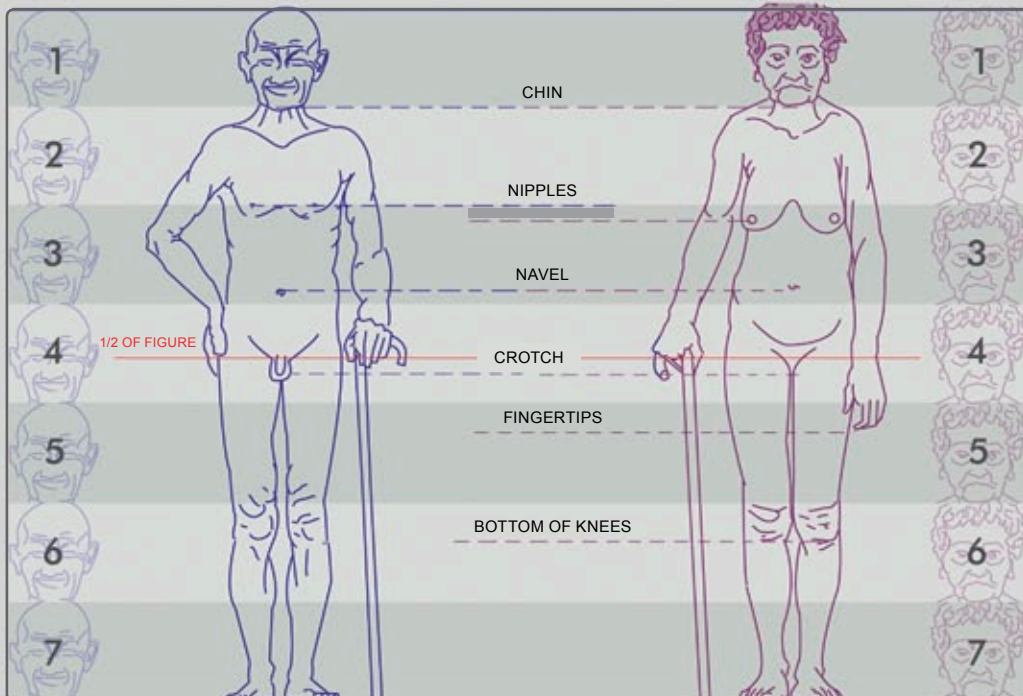
TODDLER: **5 HEAD UNITS**



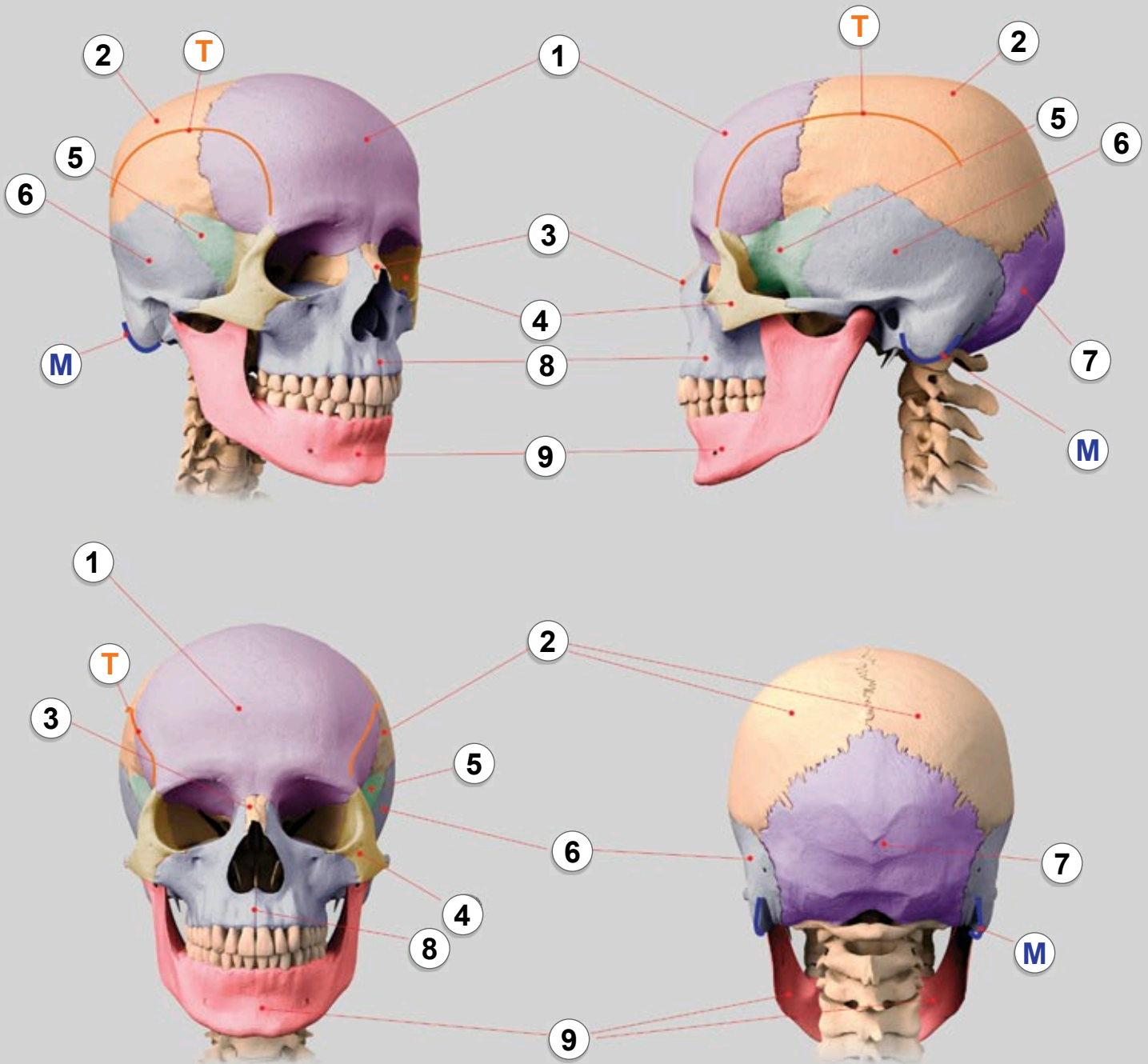
NEWBORN: **4 HEAD UNITS**



SENIOR: **7 HEAD UNITS**

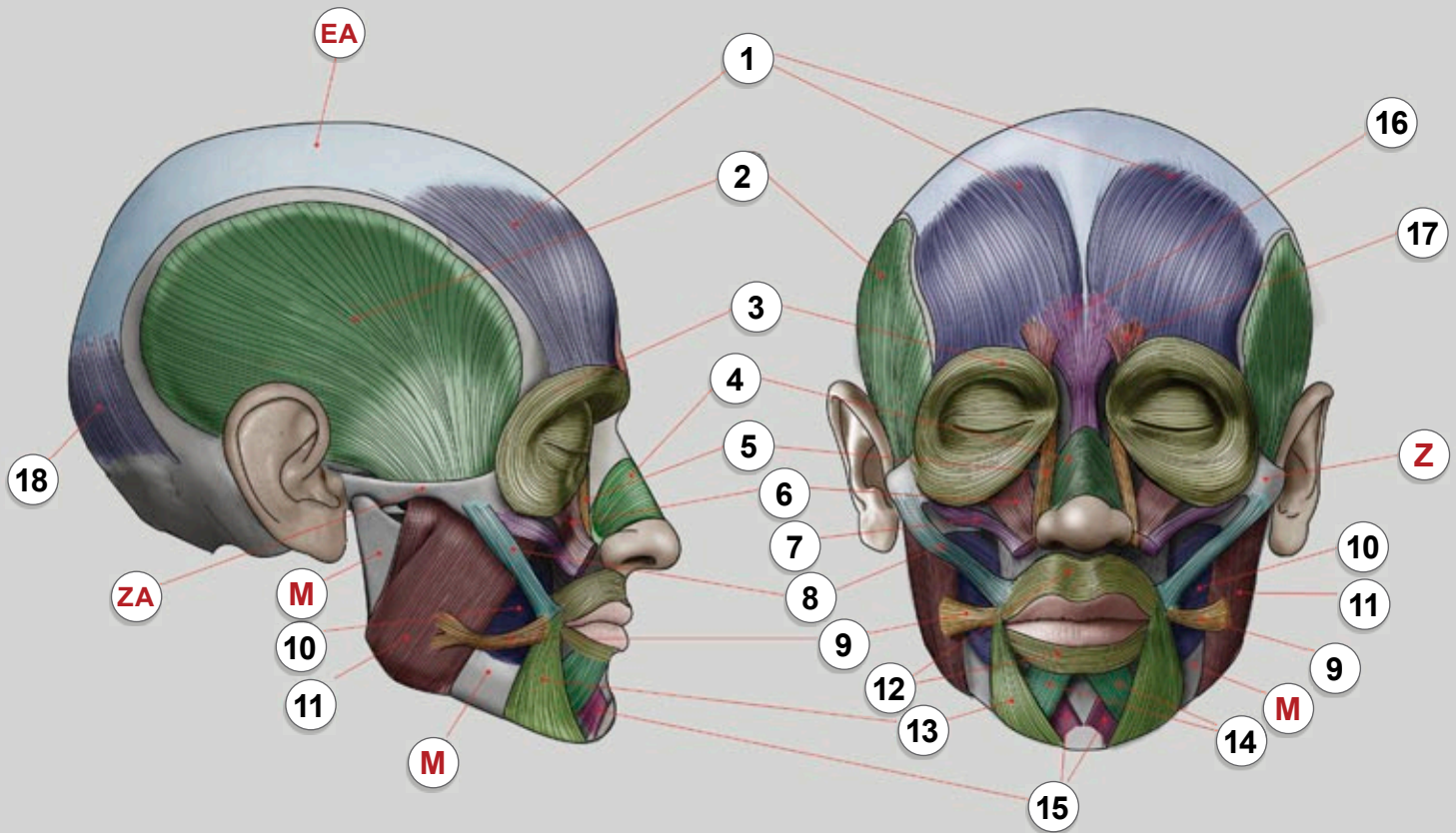


MAJOR SKULL BONES



- | | | |
|------------------------|--------------------------|-------------------------|
| 1 FRONTAL BONE | 4 ZYGOMATIC BONE | 7 OCCIPITAL BONE |
| 2 PARIETAL BONE | 5 SPHENOID BONE | 8 MAXILLA BONE |
| 3 NASAL BONE | 6 TEMPORAL BONE | 9 MANDIBLE BONE |
| T TEMPORAL LINE | M MASTOID PROCESS | |

MAJOR HEAD MUSCLES



1 FRONTALIS MUSCLE

2 TEMPORAL MUSCLE

3 ORBICULARIS OCULI MUSCLE

4 NASALIS MUSCLE

5 OTTO'S MUSCLE

6 LEVATOR LABII SUPERIORIS MUSCLE

7 ZYGOMATICUS MINOR MUSCLE

8 ZYGOMATICUS MAJOR MUSCLE

9 RISORIIUS MUSCLE

10 BUCCINATOR MUSCLE

M MANDIBLE (LOWER JAW)

11 MASSETER MUSCLE

12 ORBICULARIS ORIS MUSCLE

13 DEPRESSOR ANGULI ORIS MUSCLE

14 DEPRESSOR LABII INFERIORIS MUSCLE

15 MENTALIS MUSCLE

16 PROCERUS MUSCLE

17 CORRUGATOR MUSCLE

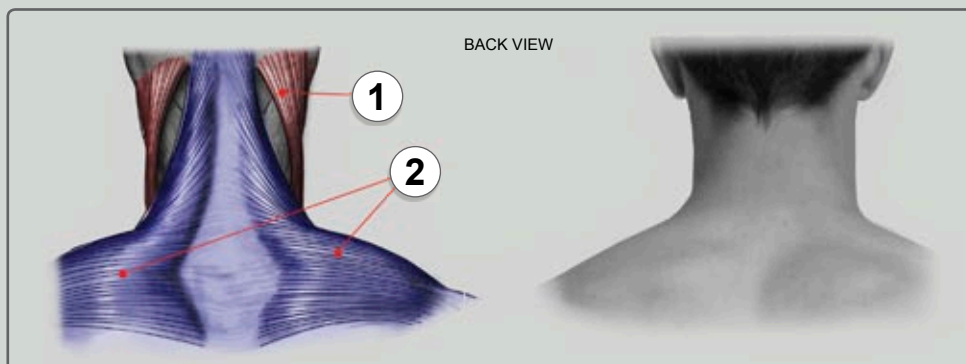
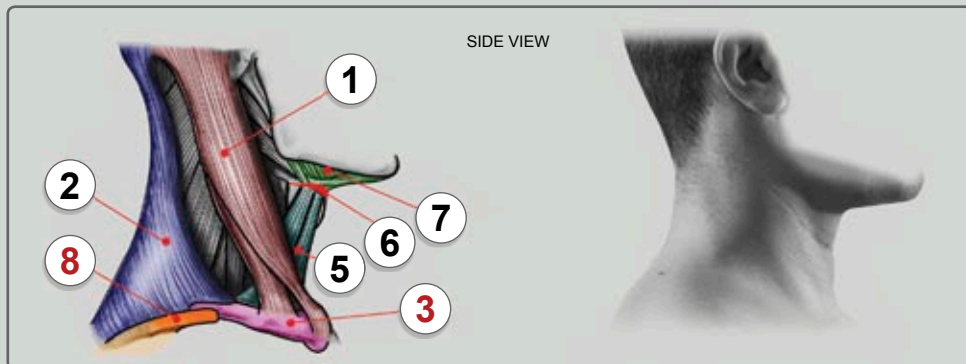
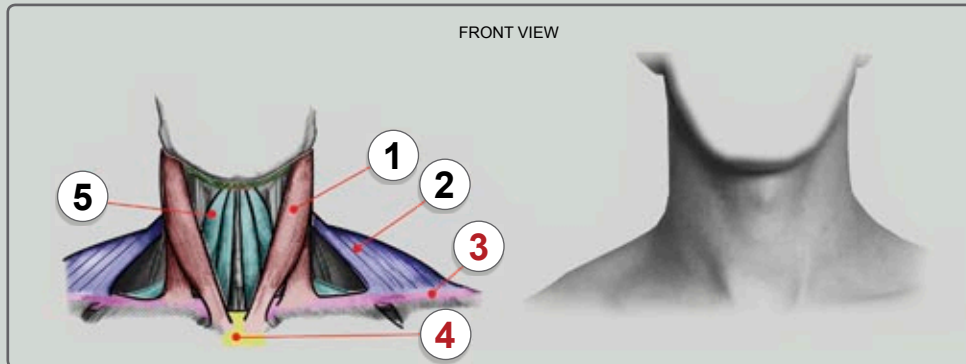
18 OCCIPITALIS MUSCLE

Z ZYGOMATIC BONE

ZA ZYGOMATIC ARCH

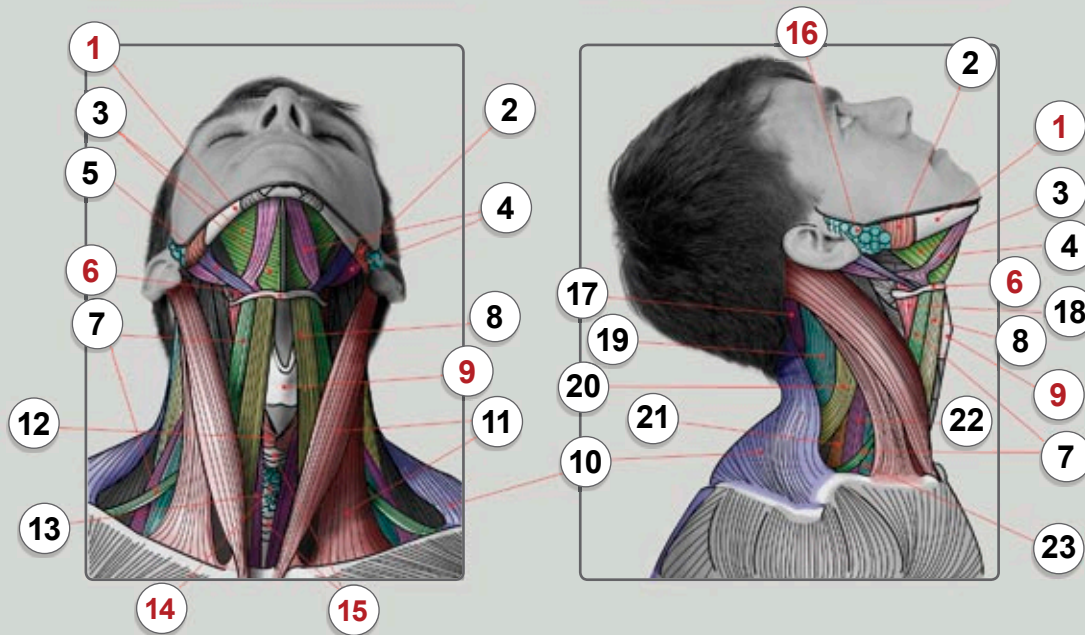
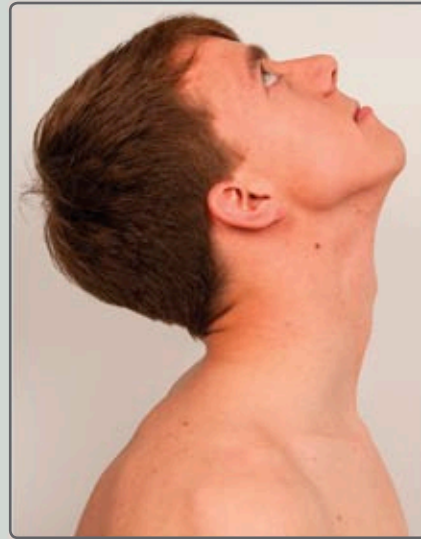
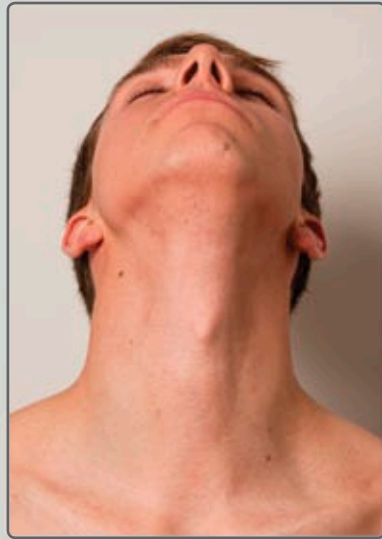
EA EPICRANIAL APONEUROSIS

MAIN NECK MUSCLES



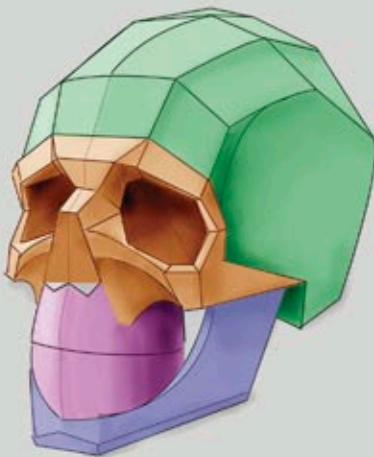
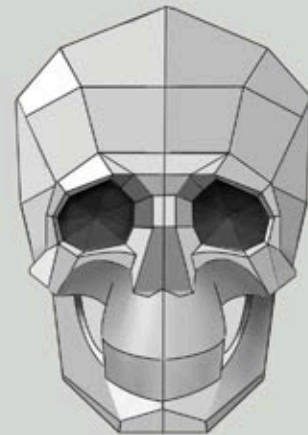
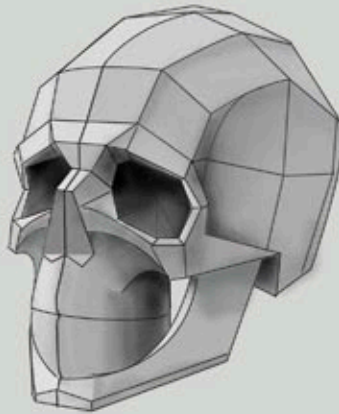
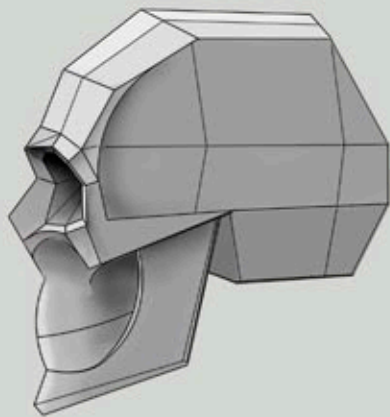
- | | | |
|---------------------------------|-------------------------------|-----------------------------------|
| 1 STERNOCLEIDOMASTOID | 4 CHEST BONE (STERNUM) | 7 SUPRAHYOID MUSCLES |
| 2 TRAPEZIUS | 5 INFRAHYOID MUSCLES | 8 SHOULDER BLADE (SCAPULA) |
| 3 COLLAR BONE (CLAVICLE) | 6 HYOID BONE | |

MAIN NECK MUSCLES

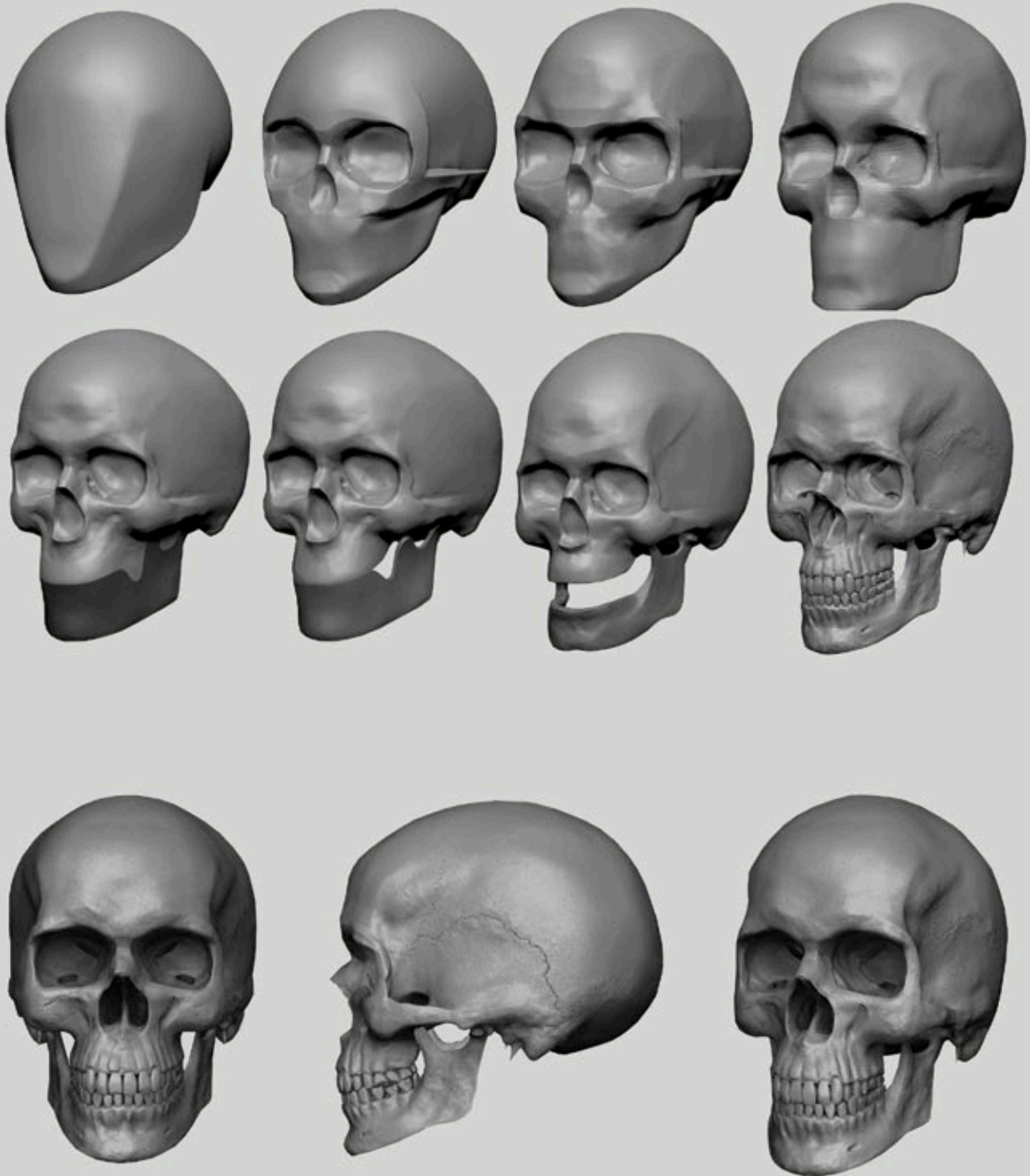


- | | | |
|-------------------------------|--|--------------------------------|
| 1 LOWER JAW (MANDIBLE) | 9 ADAM'S APPLE (LARYNGEAL PROMINENCE) | 17 SEMISPINALIS CAPITIS |
| 2 MASSETER | 10 TRAPEZIUS | 18 HYOGLOSSUS |
| 3 MYLOHYOID | 11 STERNOCLEIDOMASTOID | 19 SPLENIUS CAPITIS |
| 4 DIGASTRIC | 12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

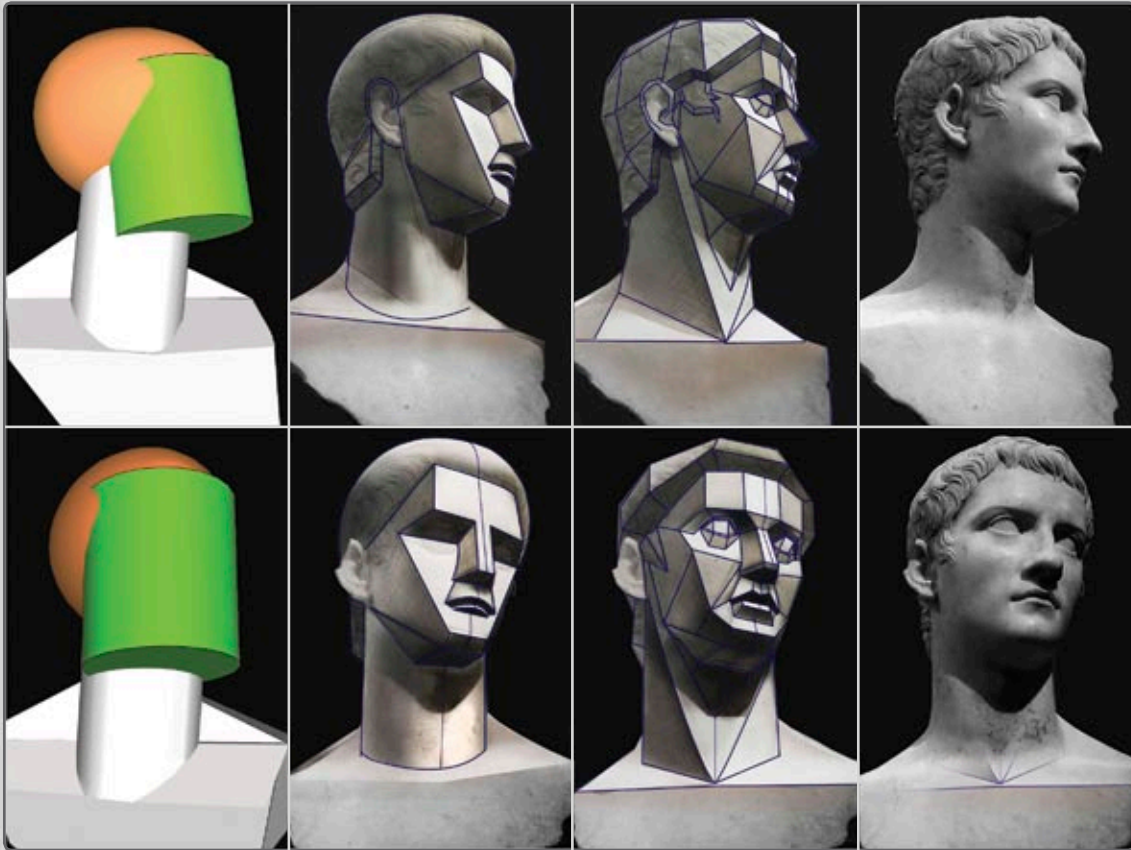
SHAPES THAT FORM A SKULL



MODELING A 3D SKULL

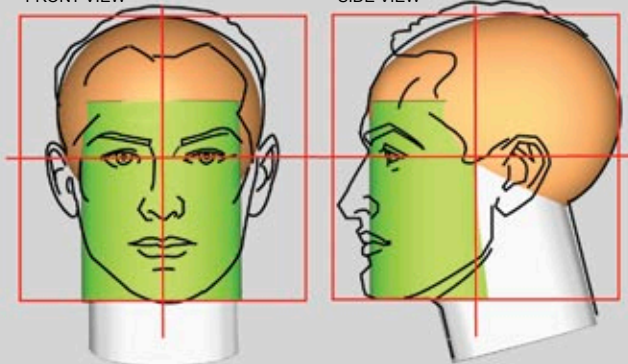


HEAD SHAPE AND MASSES

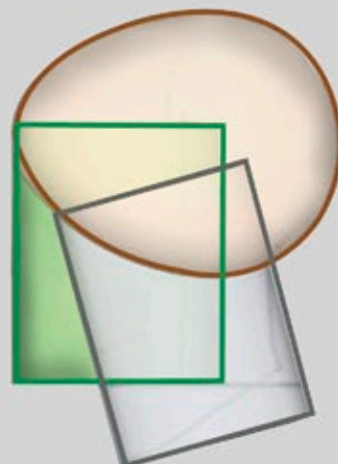
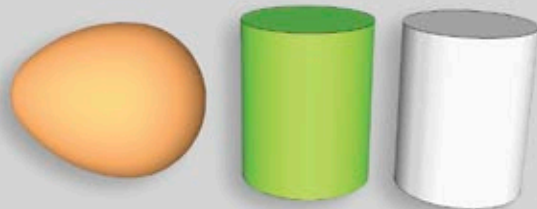
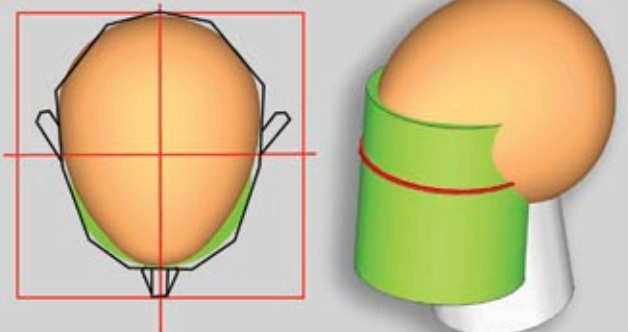


FRONT VIEW

SIDE VIEW



TOP VIEW

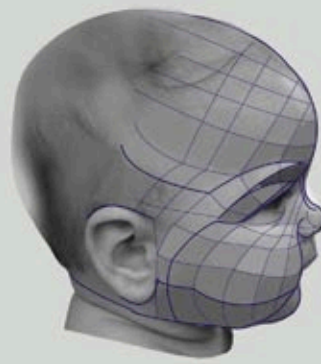
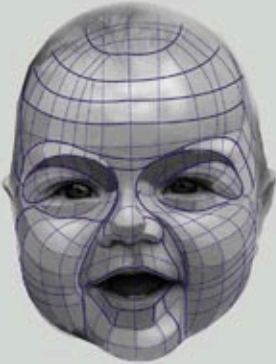


BABY HEAD

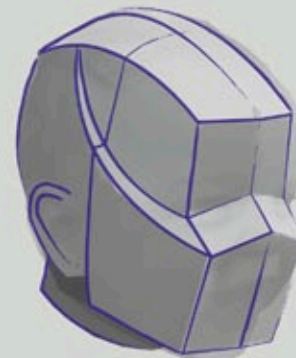
REAL



MESH



BLOCK-OUT

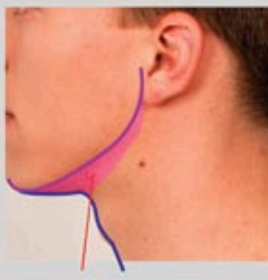
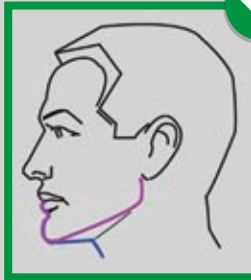
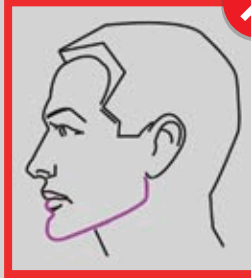
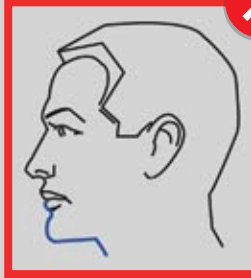


MASSES



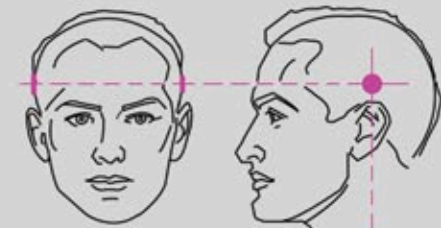
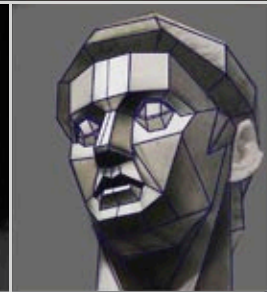
THE HEAD SHAPE

CONTOUR OF THE CHIN
IS NOT THE SAME AS **JAWLINE**.

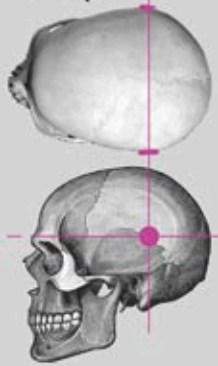


SUPRAHYOID MUSCLES

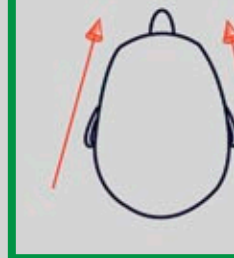
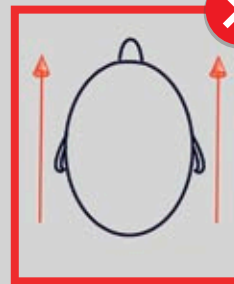
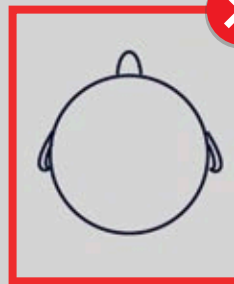
TEMPORAL LINE (THE EDGE BETWEEN
TEMPORAL BONE AND FOREHEAD PLANE).



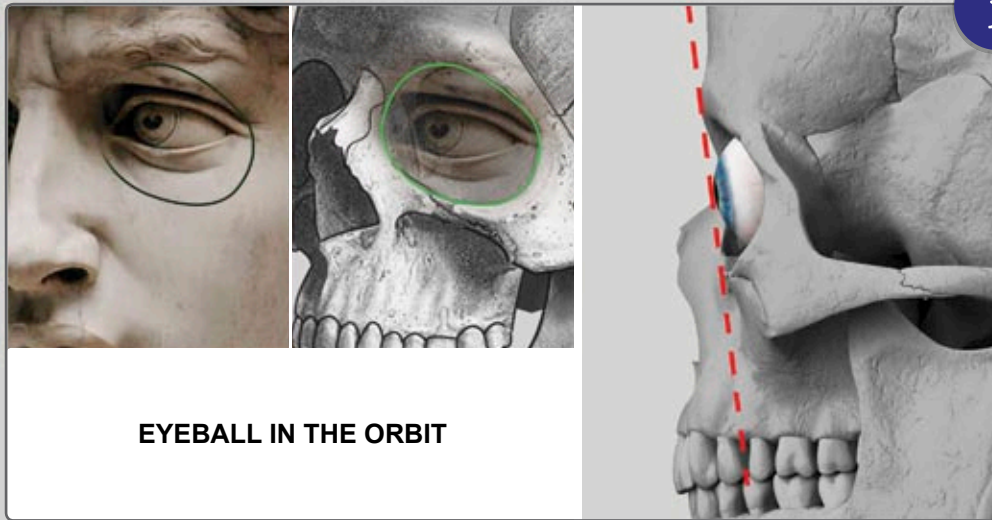
WIDEST POINT
OF HEAD



HEAD IS NOT ROUND.



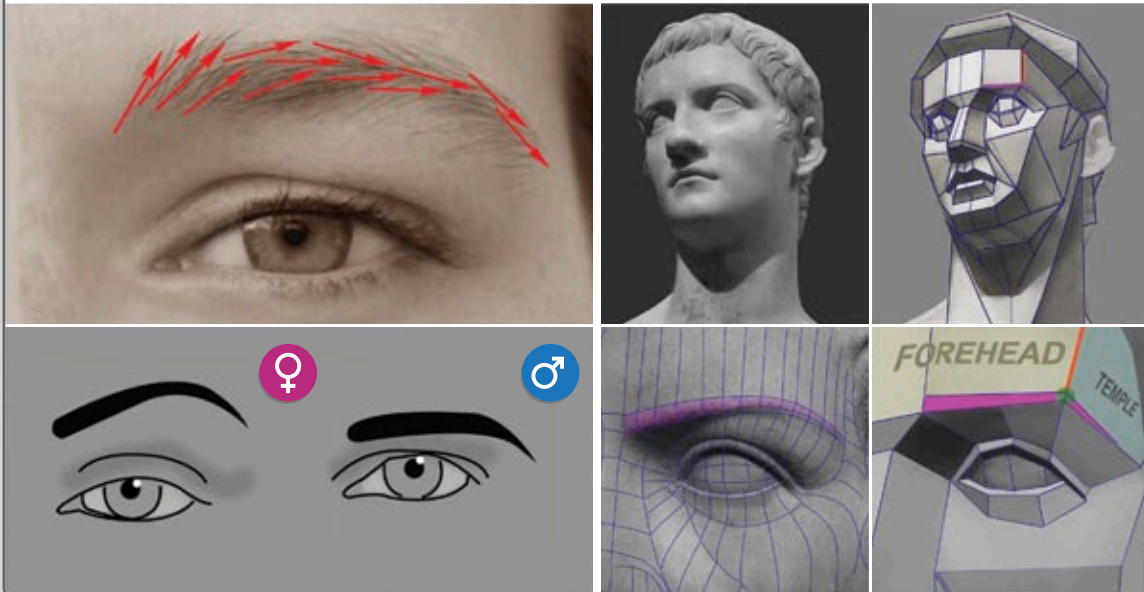
FRAMING THE EYES



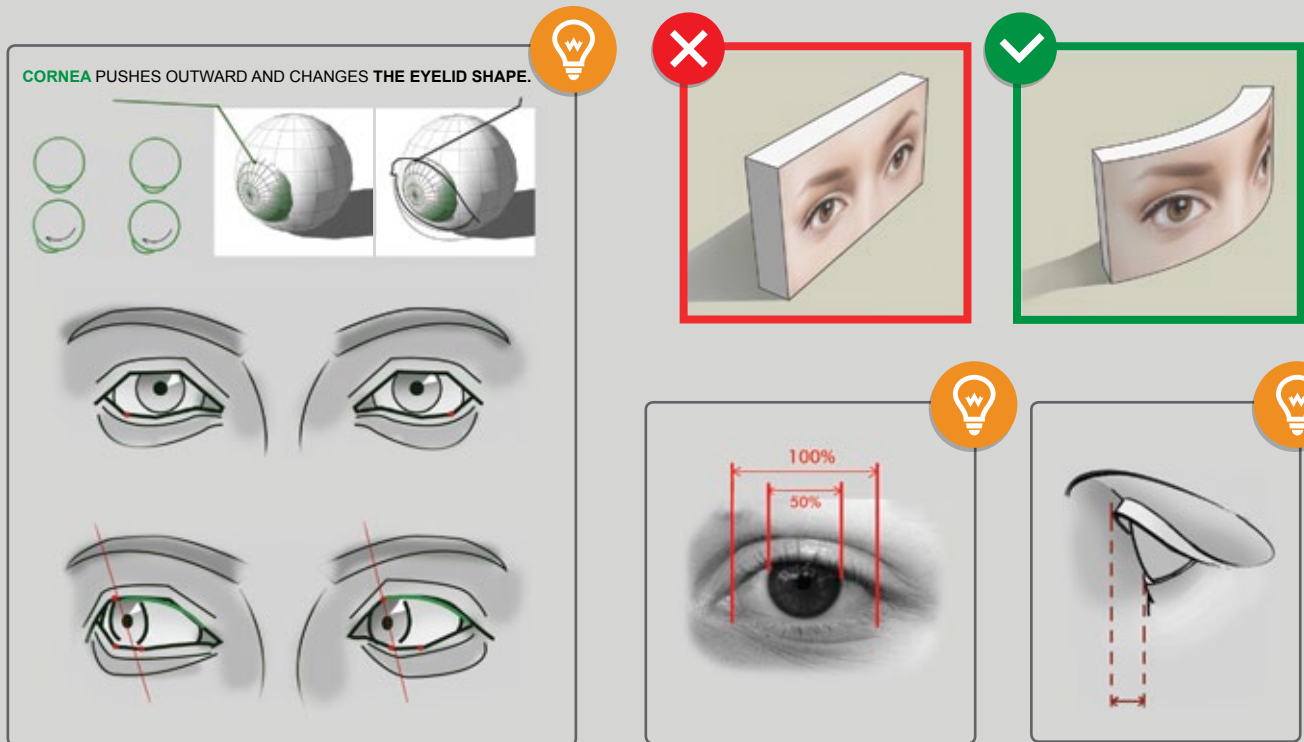
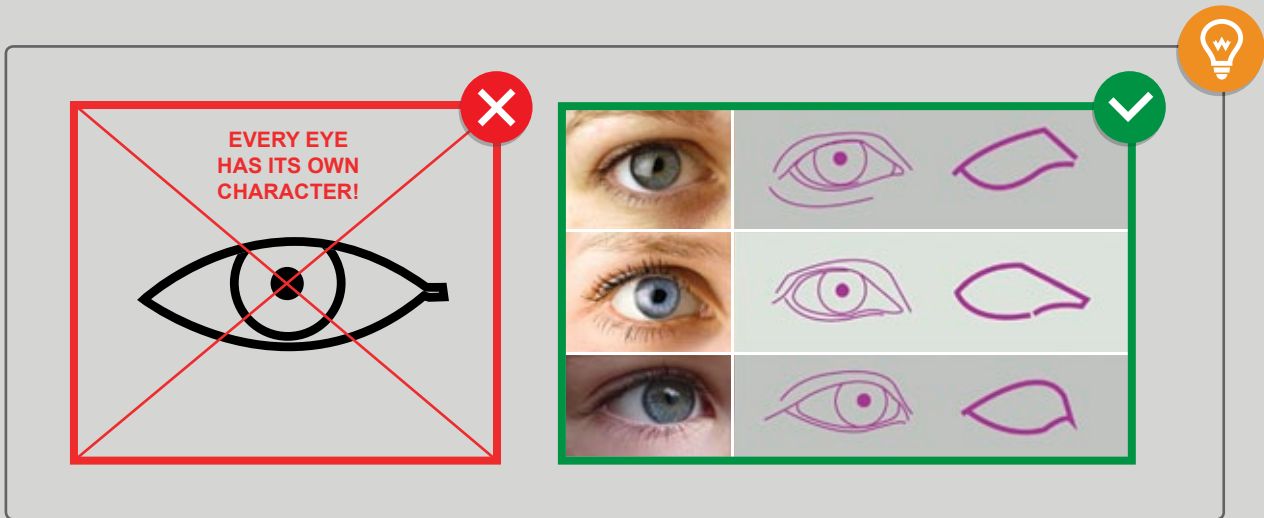
EYEBROWS



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

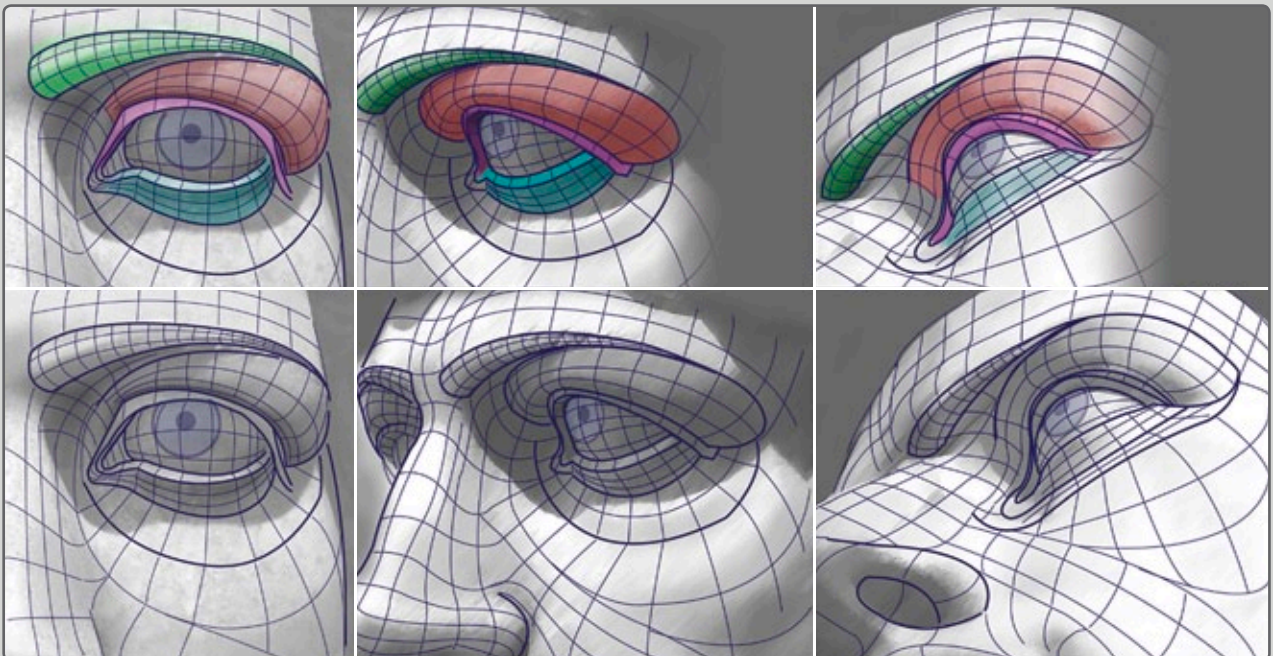
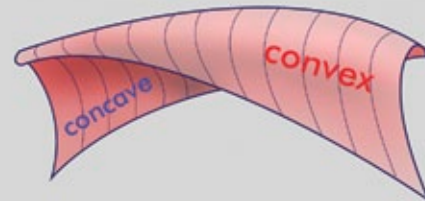
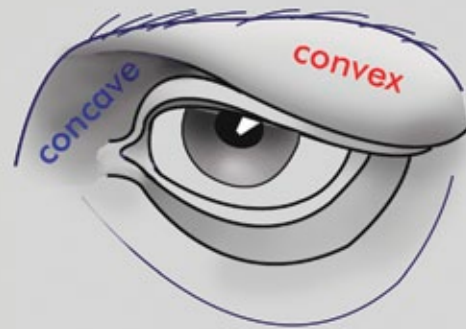
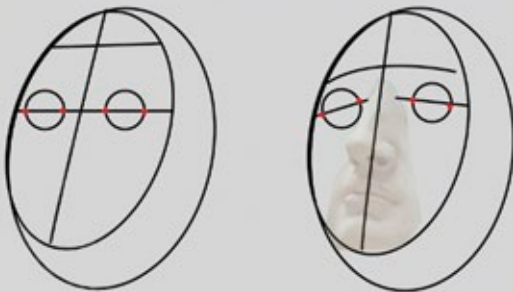


ALL ABOUT EYES



EYE

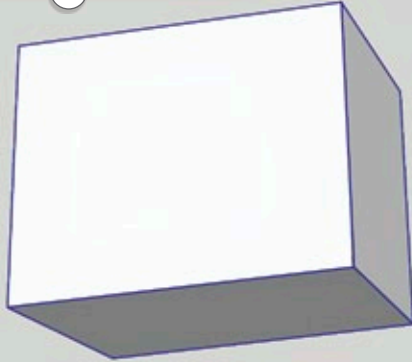
WHAT MAKES A FACE LOOK FLAT?



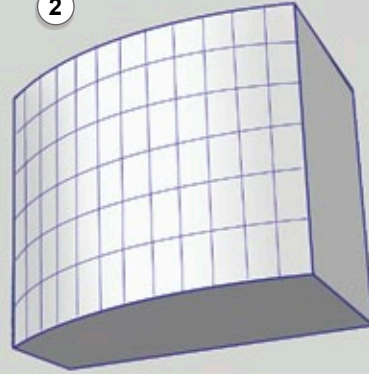
BLOCKING-OUT A CLASSICAL EYE (STEP-BY-STEP)



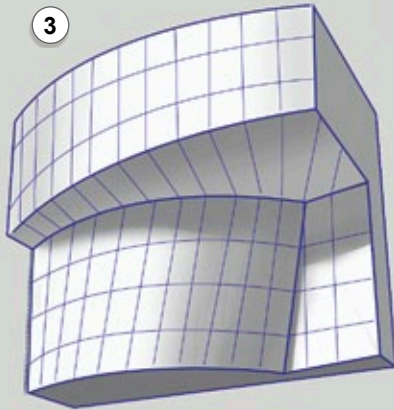
1



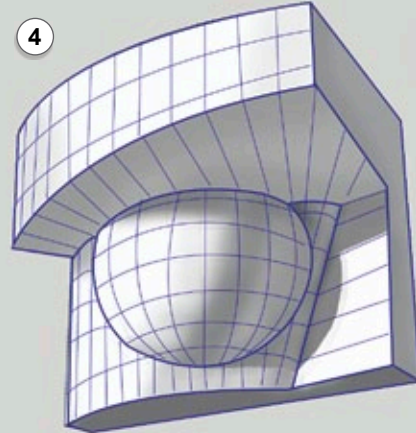
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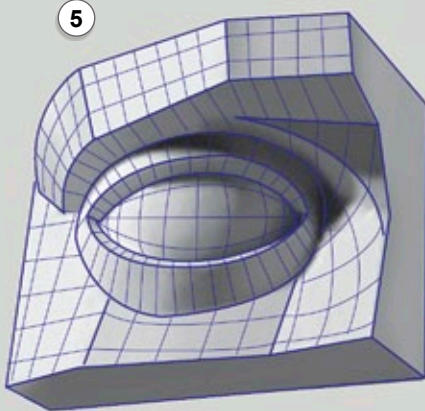
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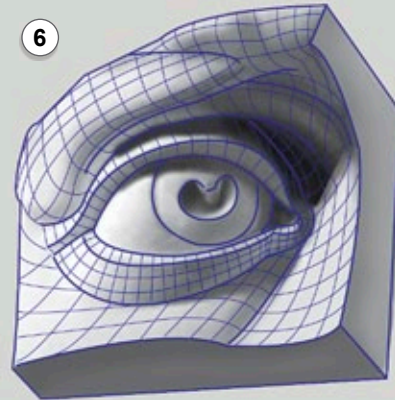
4



5



6



EYES COME IN A VARIETY OF SHAPES

ADULT FEMALE



ADULT MALE



BABY



CHILD



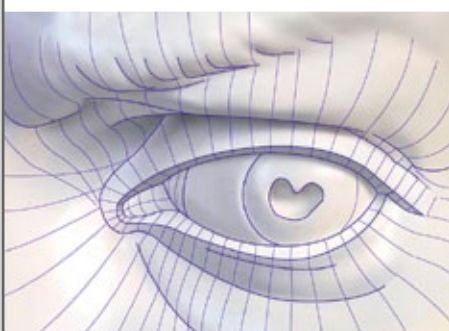
ASIAN



BLACK



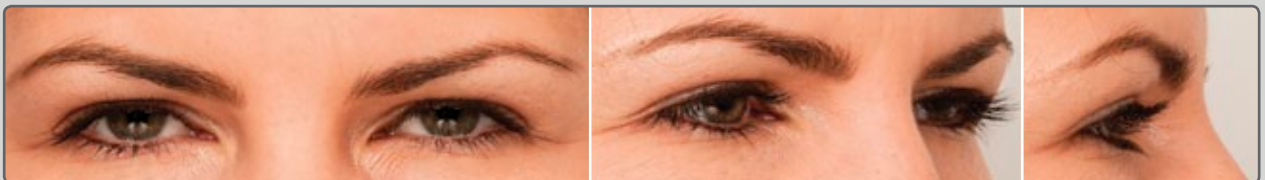
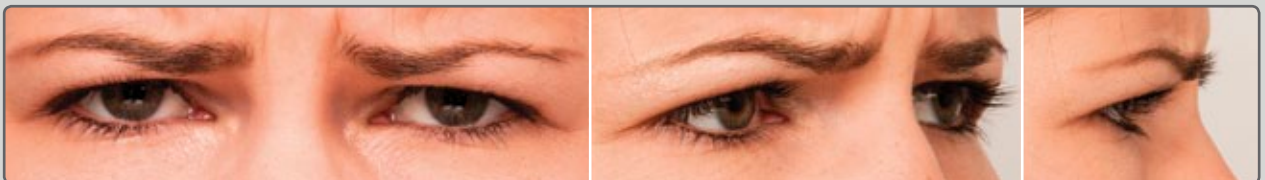
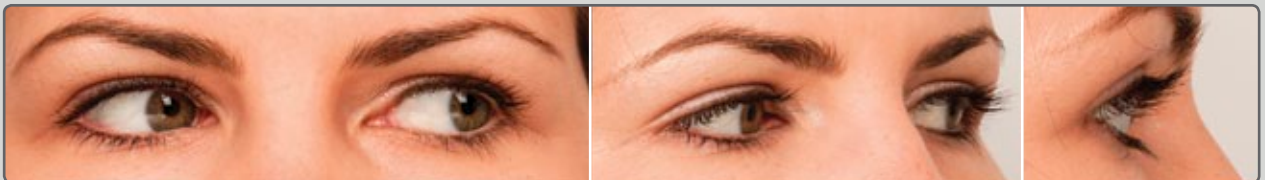
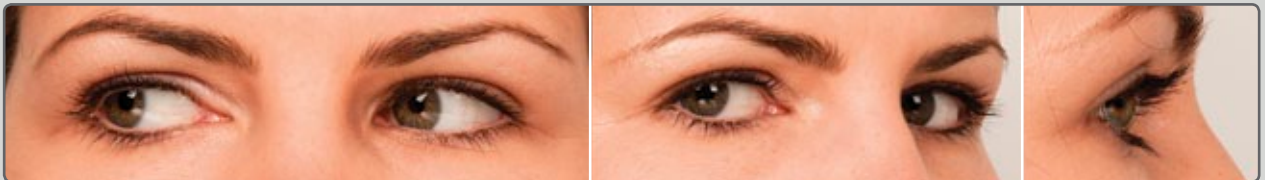
CLASSICAL SCULPTURE



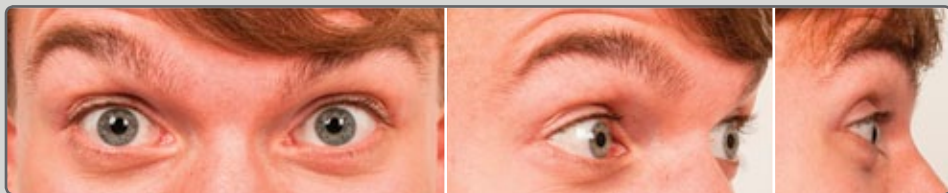
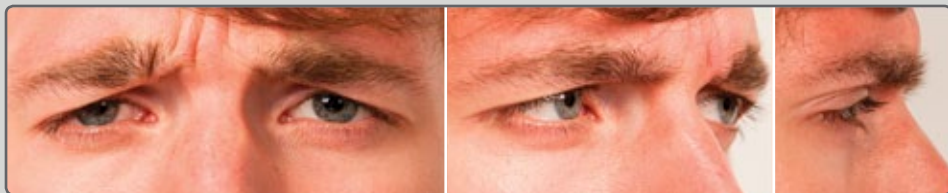
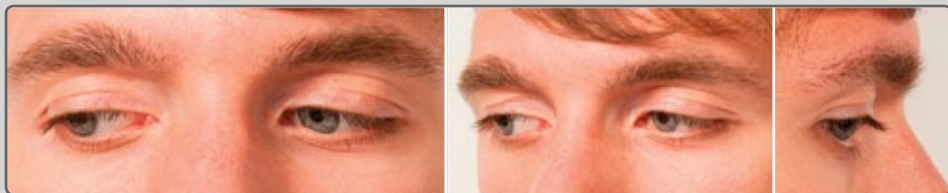
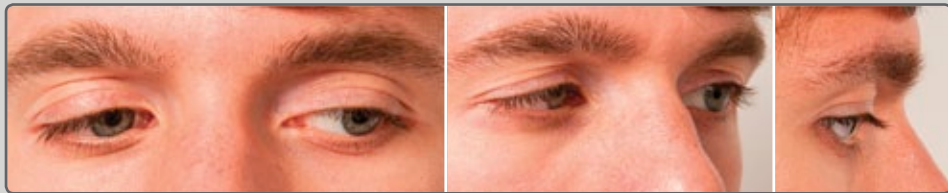
SENIOR



EYE MOVEMENTS (EXPRESSIONS)

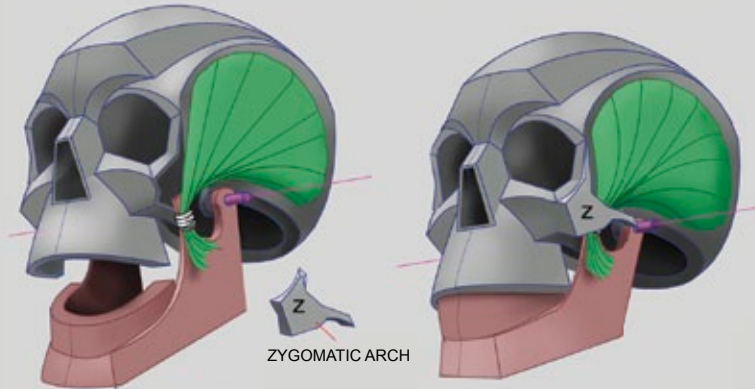


EYE MOVEMENTS (EXPRESSIONS)



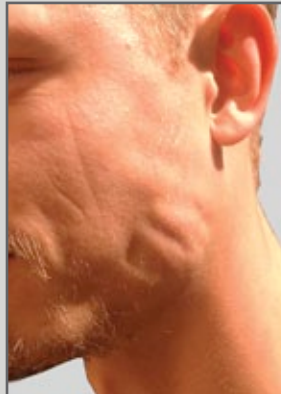
WHAT STRONG JAWS YOU HAVE!

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



i

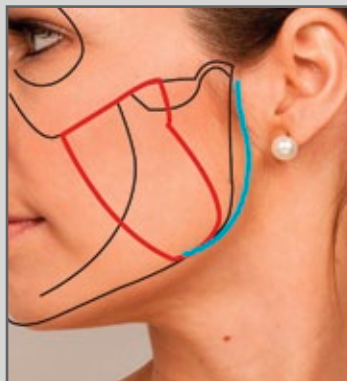
THE CHEWING MUSCLE (MASSETER MUSCLE).



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.

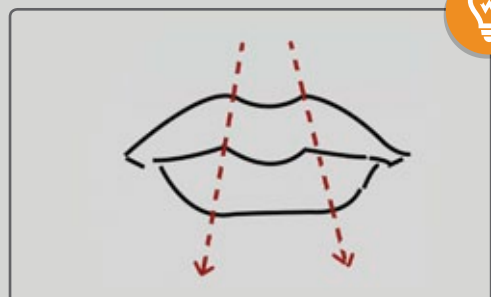
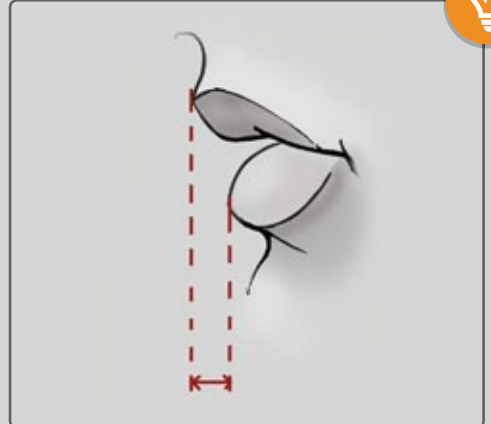
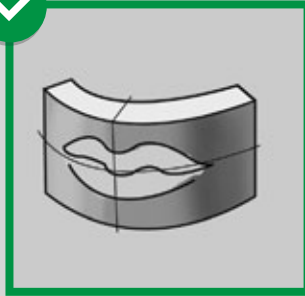
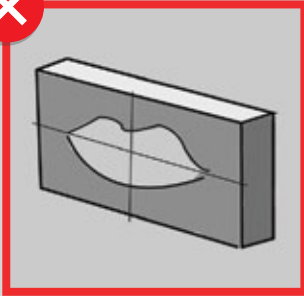
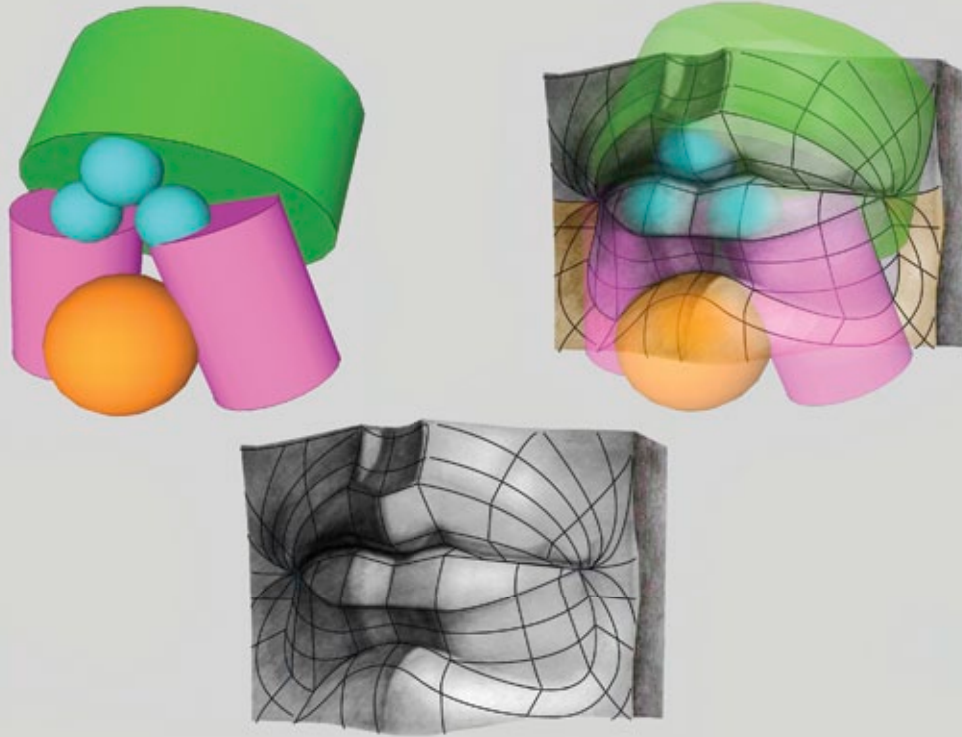
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PAROTID GLAND (SALIVARY GLAND) ALSO PLAYS IMPORTANT ROLE IN SHAPING THE JAWLINE AND FACE.



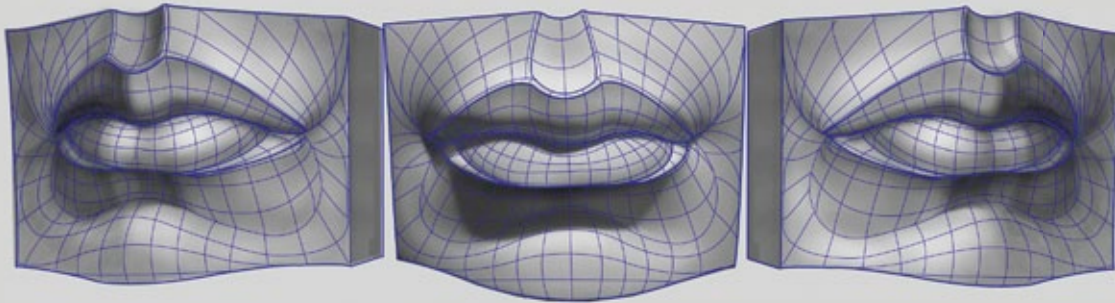
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UNDERSTANDING MOUTH CURVATURE

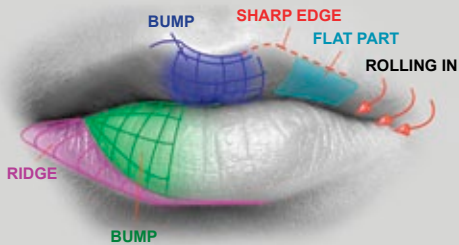


SHAPE OF STILL LIPS

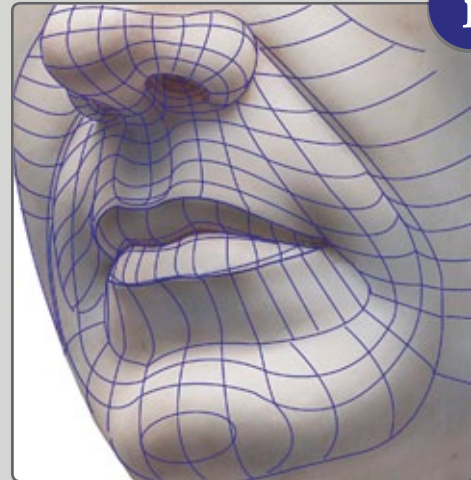
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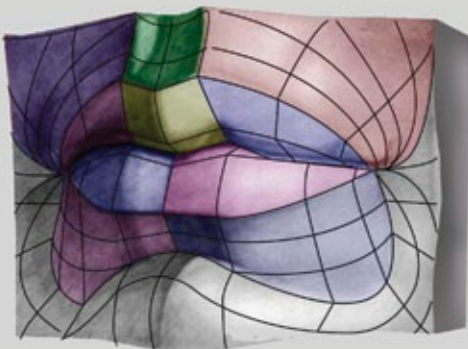
i



i



i



i



MOUTH

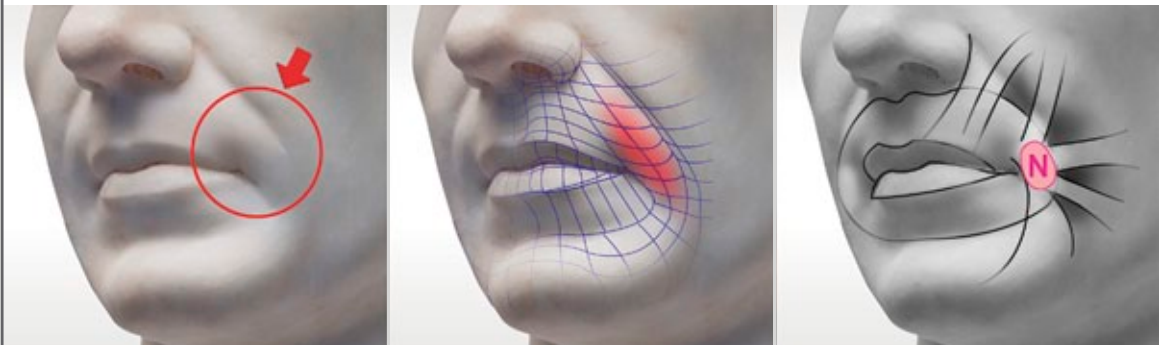
i

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



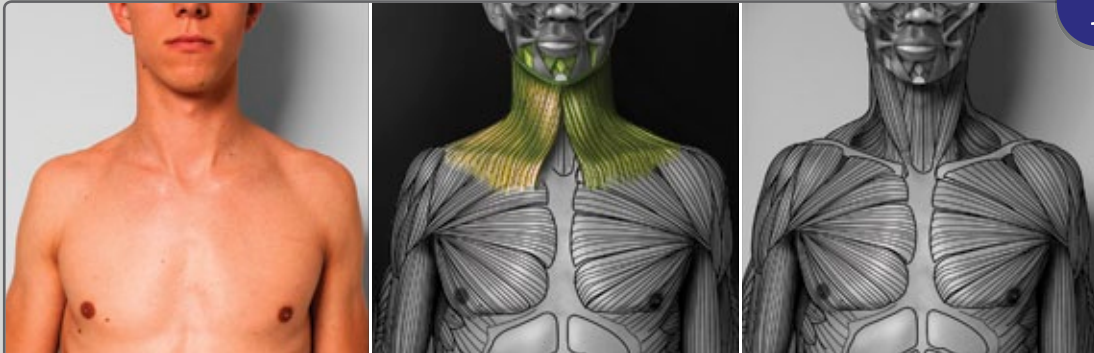
MORE MOUTH EXPRESSIONS



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).

STERNOCLEIDOMASTOID MUSCLE IN ACTION

i



HEAD UP (BN) ABOVE (BE)

BOTTOM OF NOSE (BN)
BOTTOM OF EAR (BE)



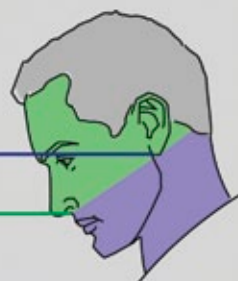
HEAD STRAIGHT (BN) LINED UP WITH (BE)

(BN) = (BE)



HEAD DOWN (BE) ABOVE (BN)

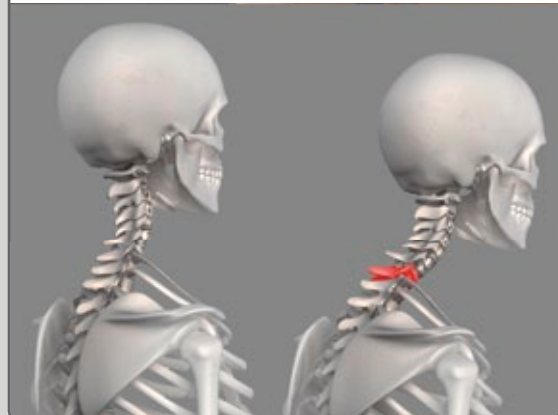
BOTTOM OF EAR (BE)
BOTTOM OF NOSE (BN)



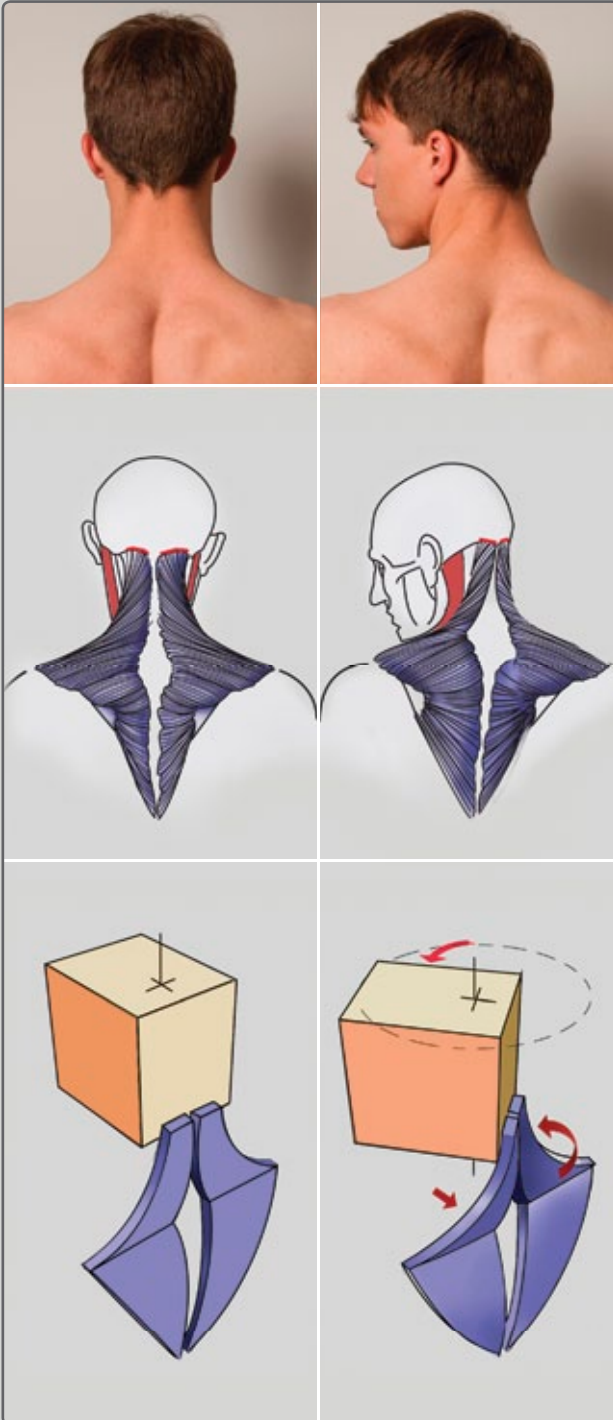
i

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

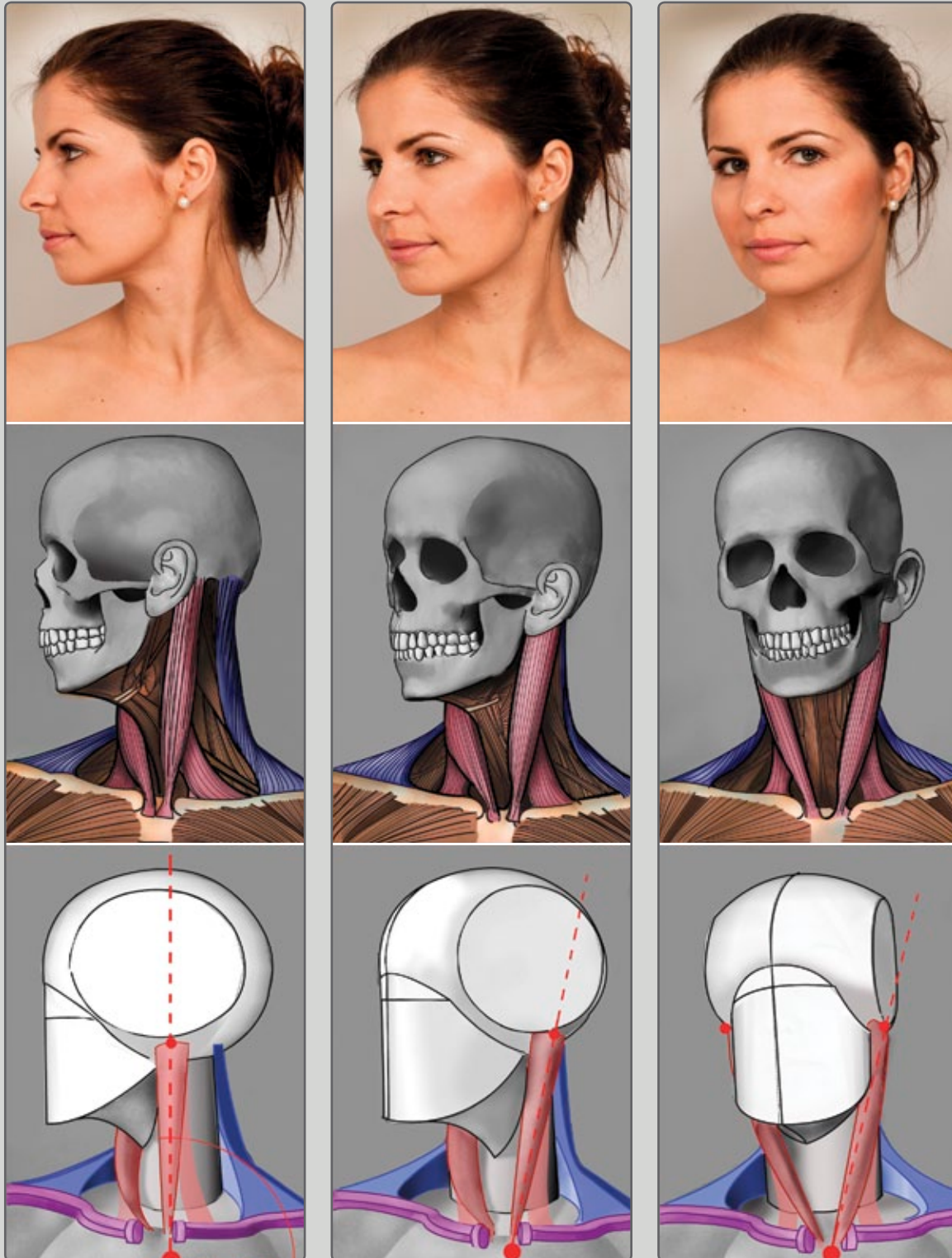
WHEN HEAD IS BENT FORWARD, YOU CAN SEE PROMINENT VERTEBRA AT THE TOP OF THE SPINE PROTRUDING OUTWARD SLIGHTLY.



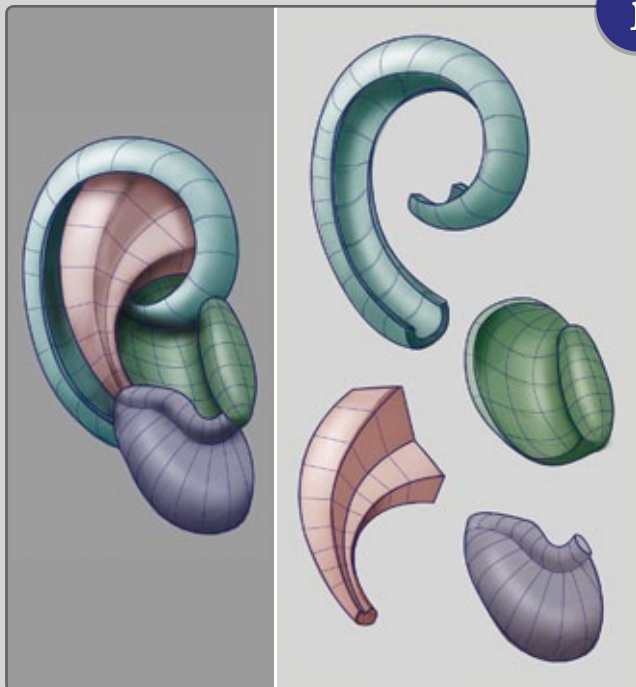
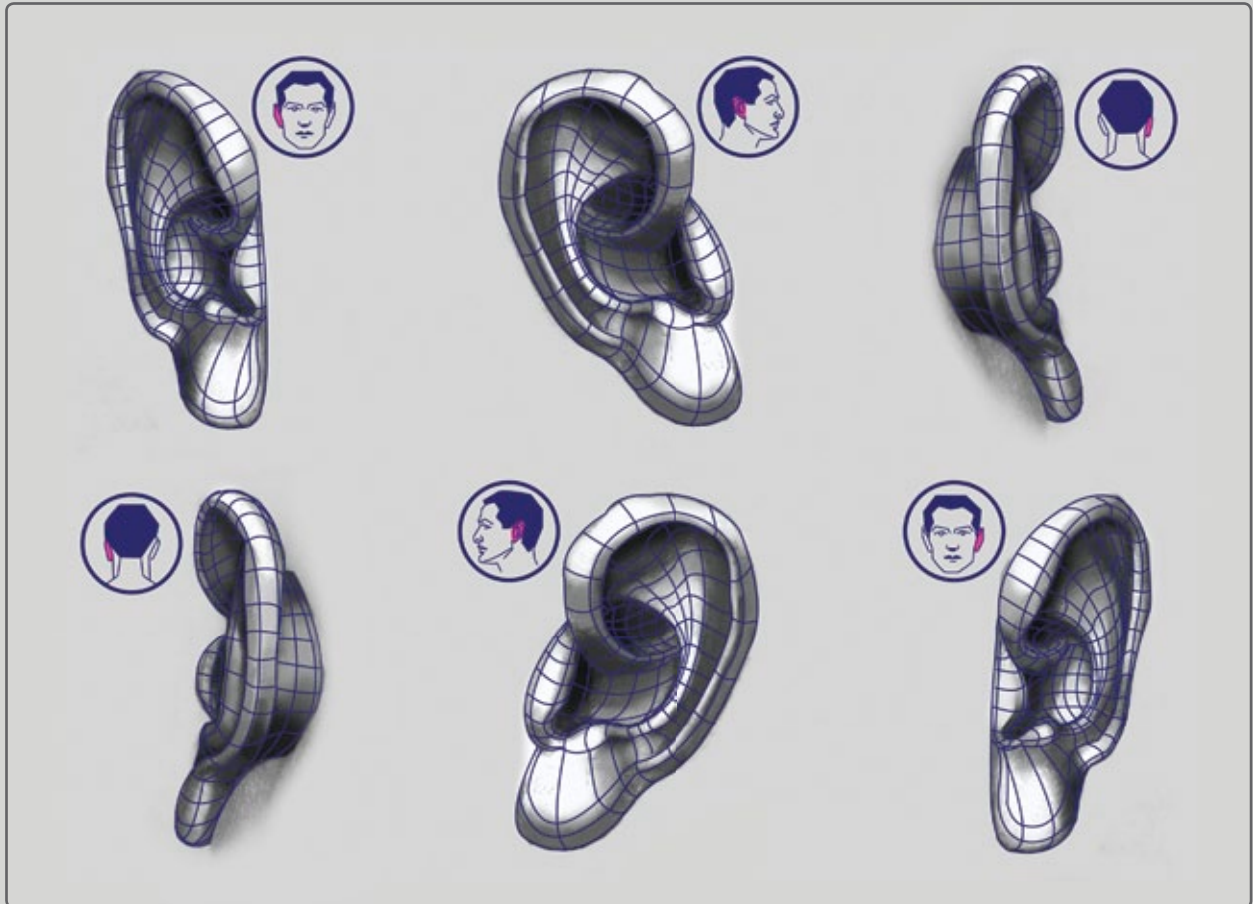
TRAPEZIUS MUSCLE, STERNOCLEIDOMASTOID MUSCLE



MAJOR NECK MUSCLES (**TRAPETZIUS** AND **STERNOCLEIDOMASTOID**)



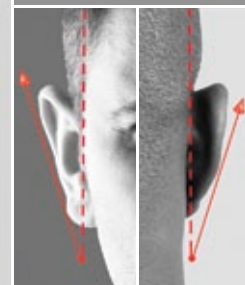
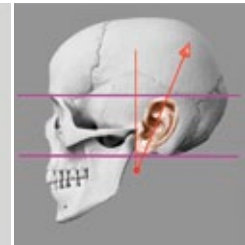
EAR



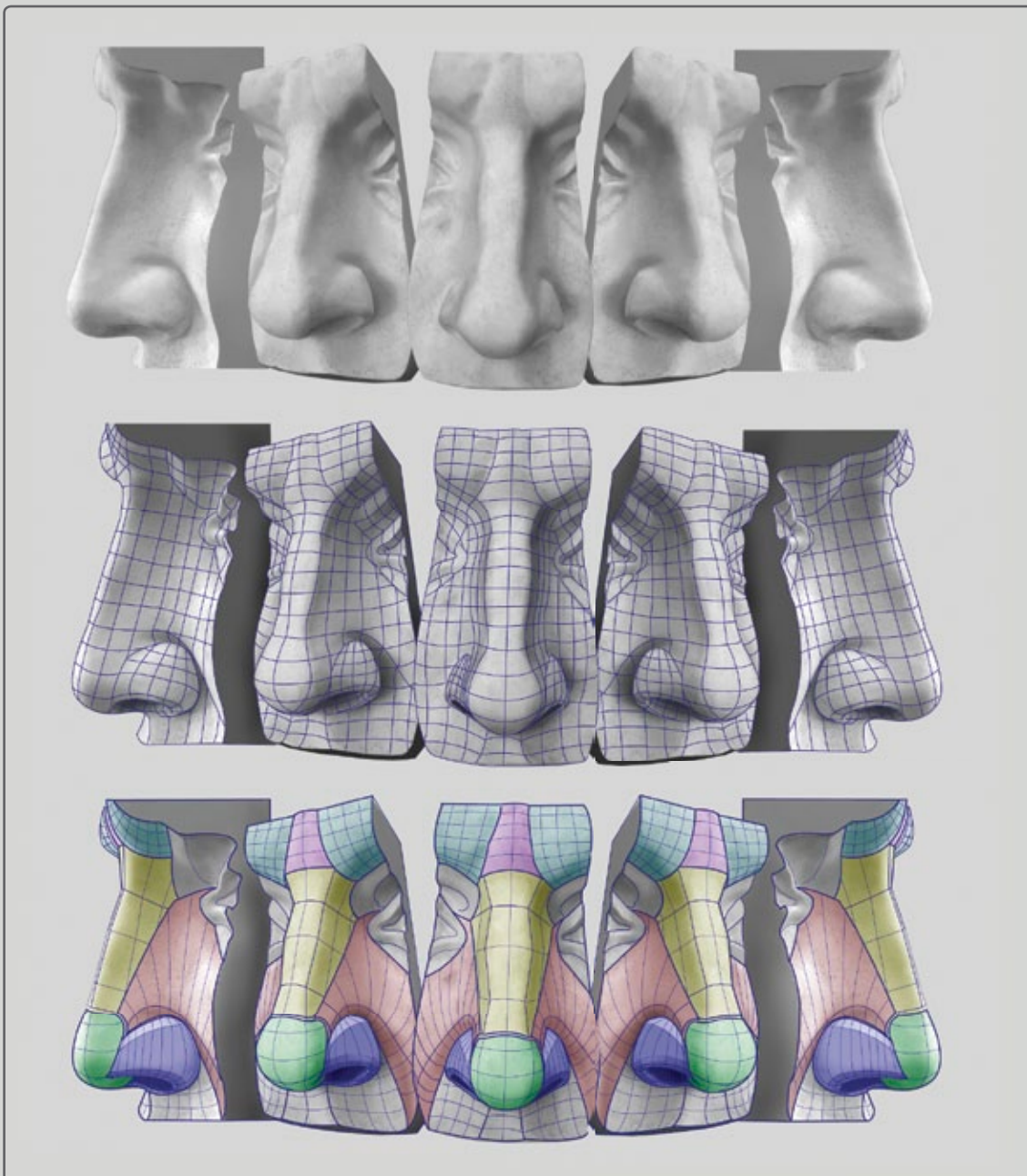
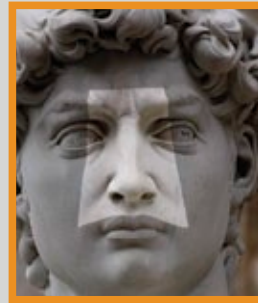
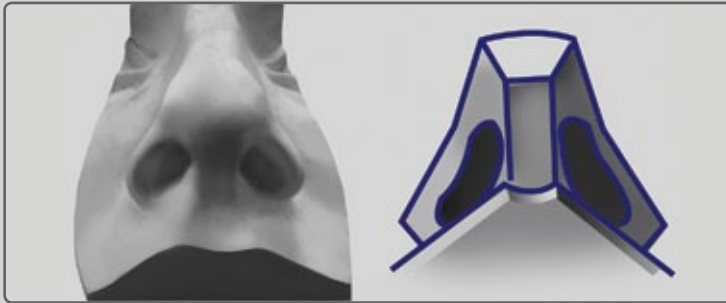
i

LOCATION & ORIENTATION

i

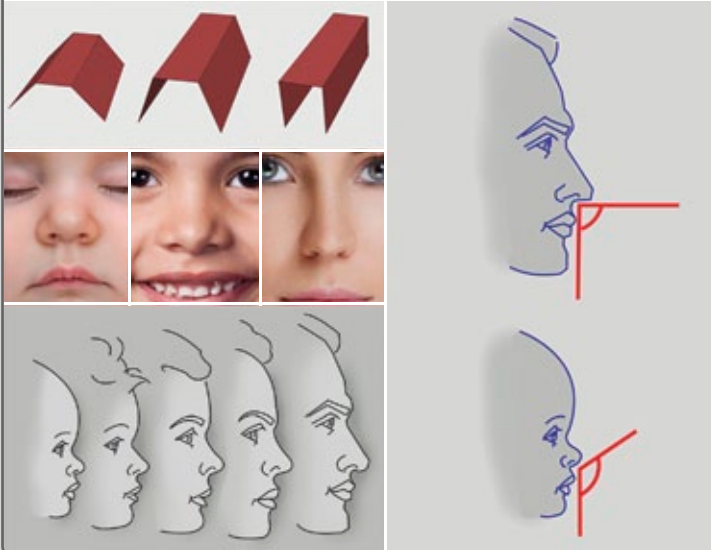


CLASSICAL NOSE

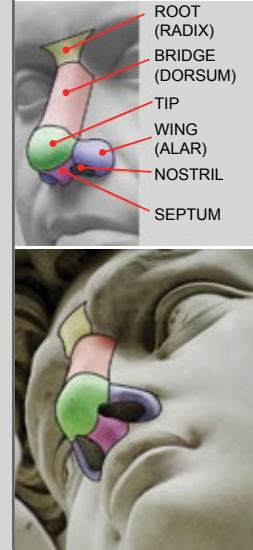


ALL ABOUT NOSES

NOSES CHANGE WITH AGE



PARTS OF A NOSE



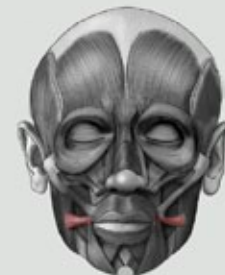
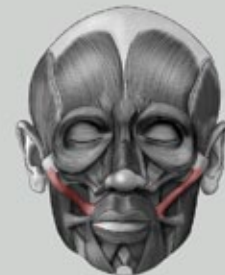
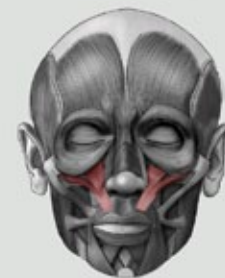
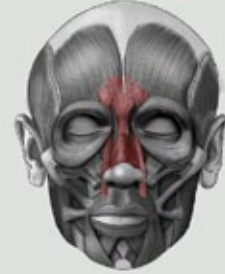
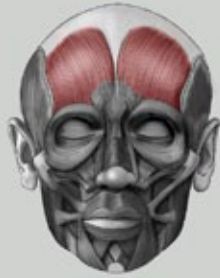
FEMALE VS. MALE NOSE

IDEALISTIC NOSE



TIPPING UP THE POINT OF THE NOSE WILL MAKE IT LOOK CHILD-LIKE. GIVING IT A CONCAVE OR THIN BRIDGE WILL MAKE IT LOOK MORE FEMININE!

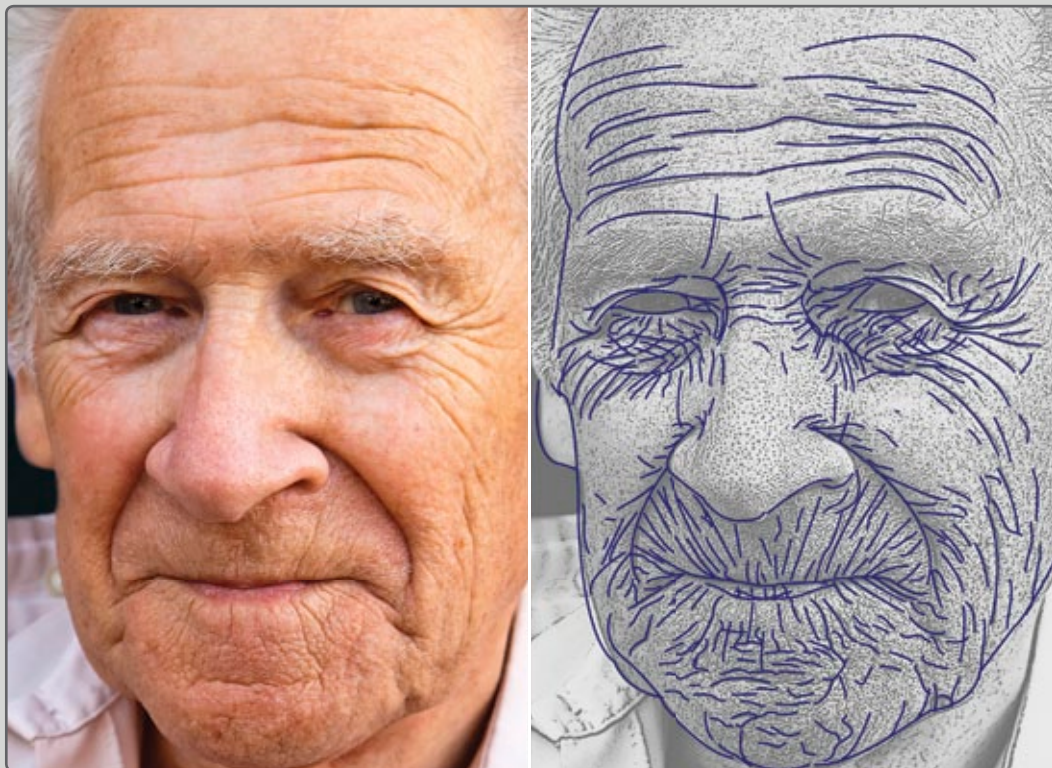
FUNCTIONS OF FACIAL MUSCLES



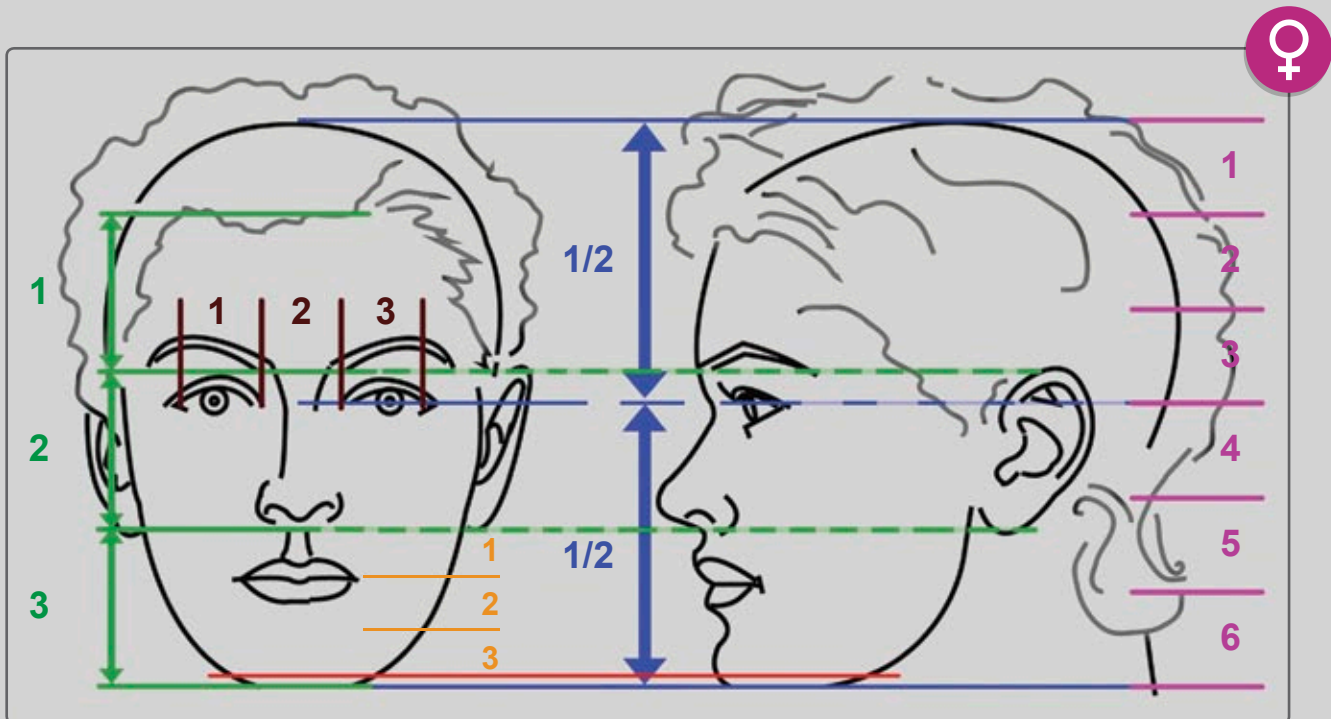
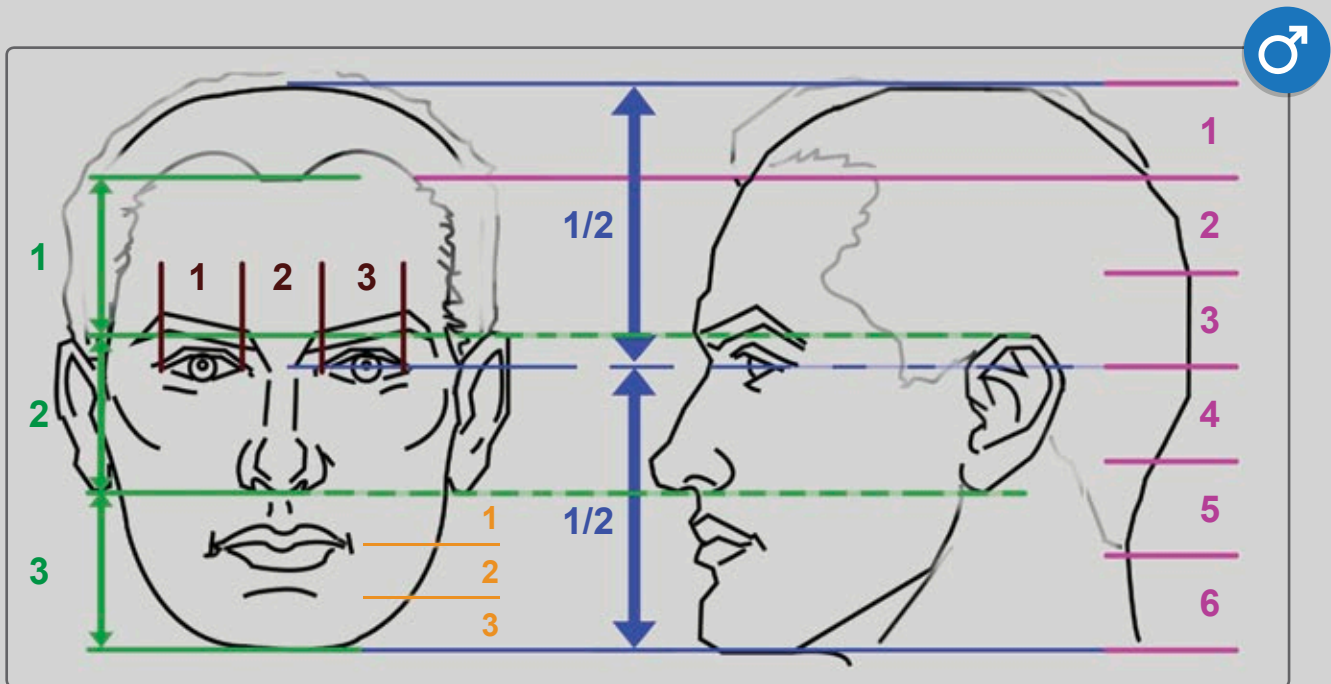
DYNAMIC WRINKLES



AGING WRINKLES

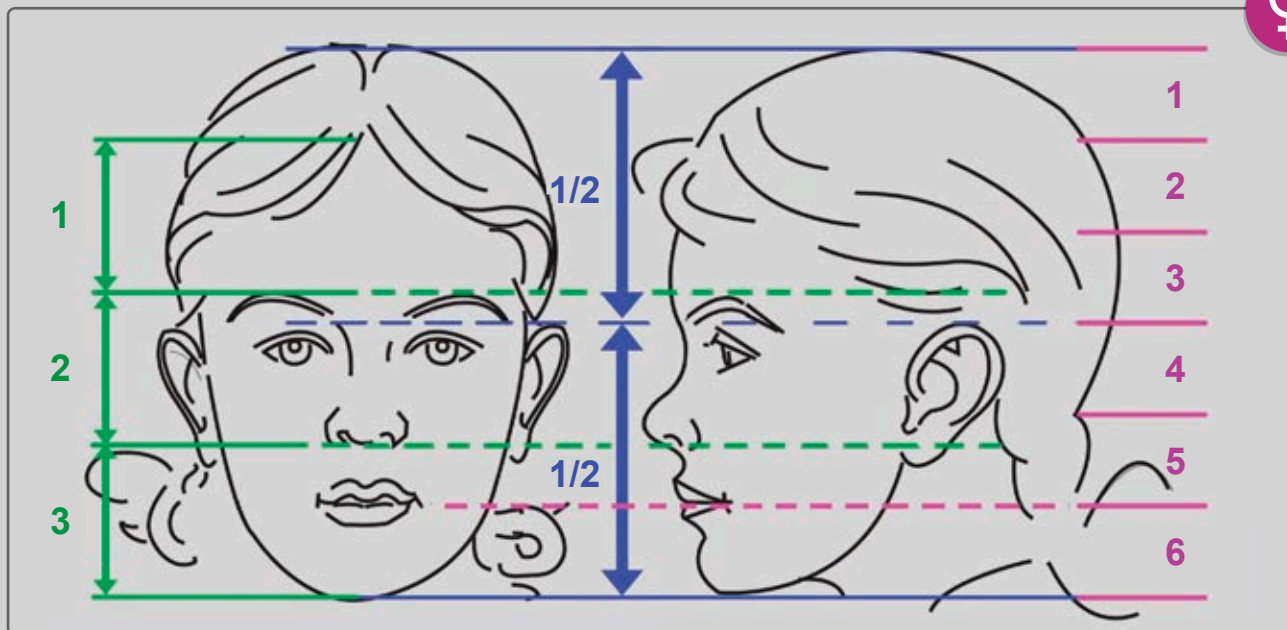
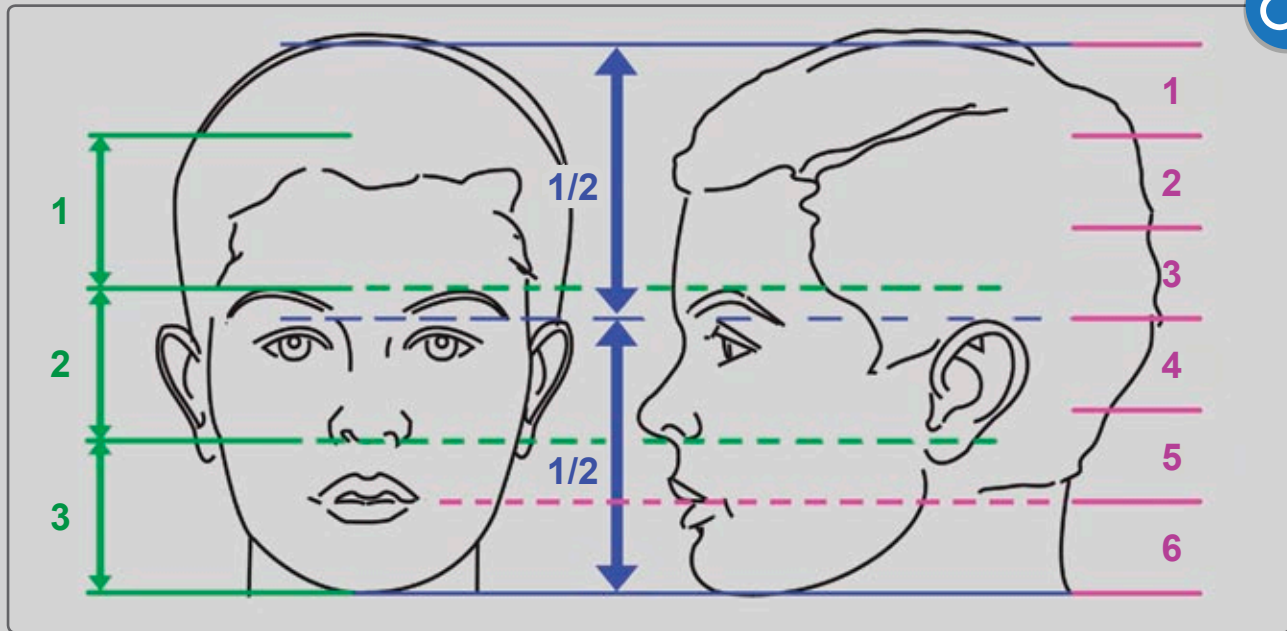


IDEALIZED PROPORTIONS OF ADULT HEADS

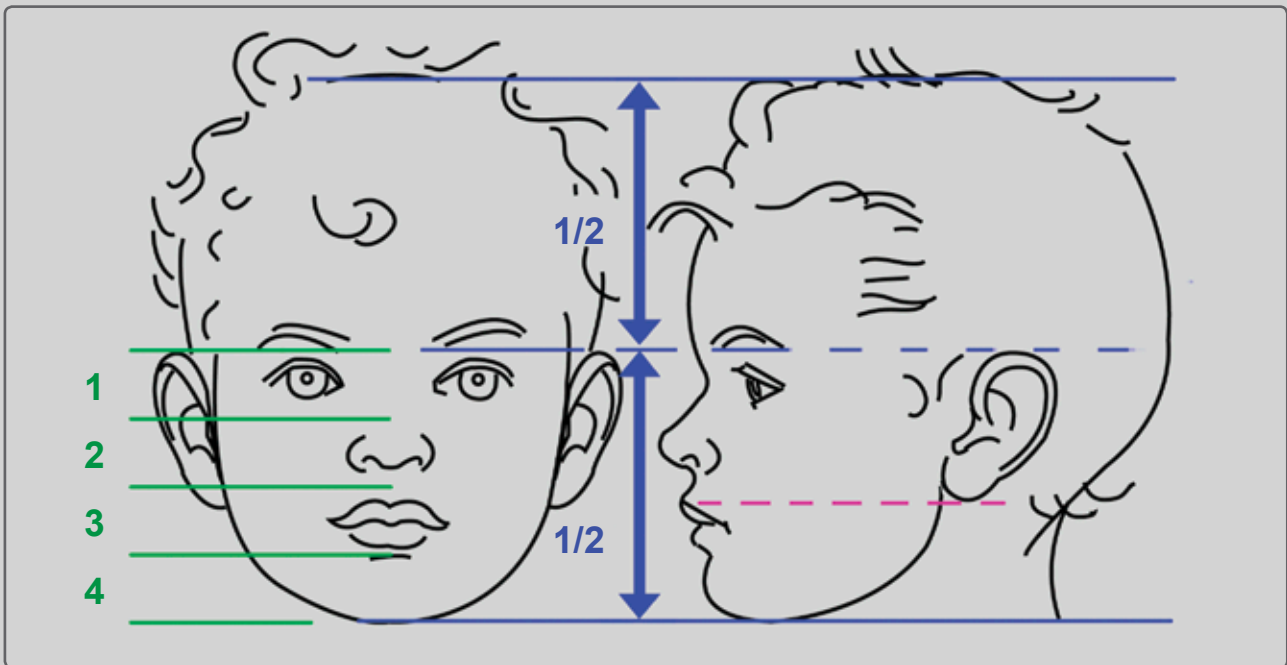
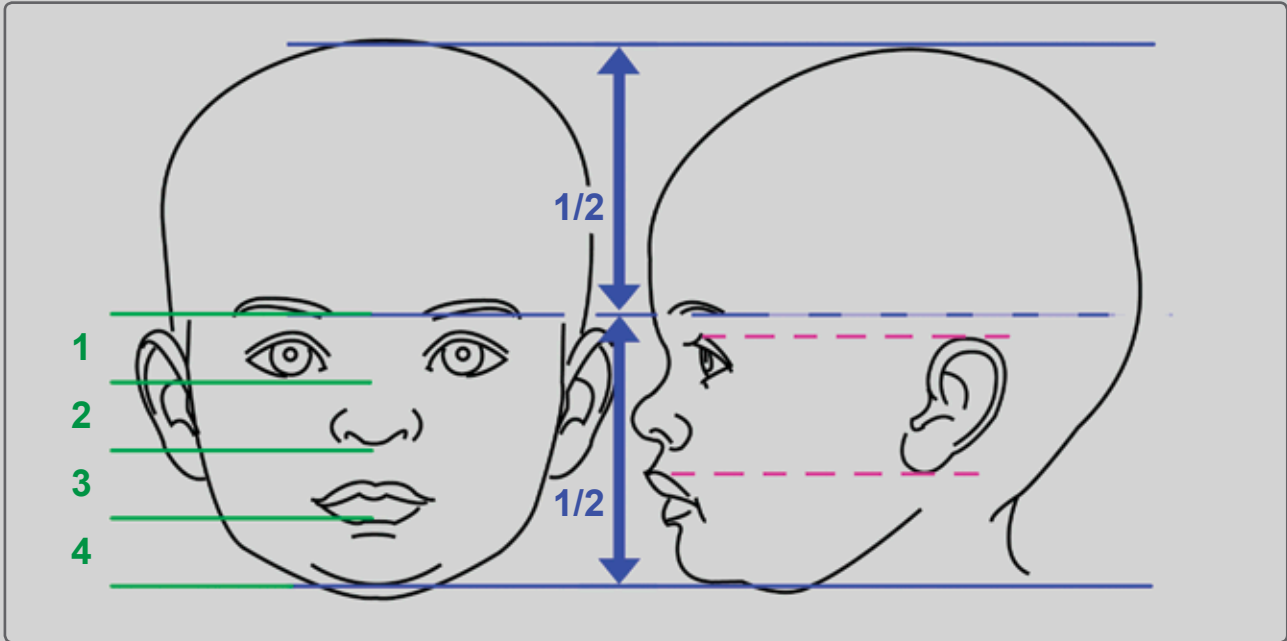


FEMALES HAVE A SLIGHTLY THINNER CHIN AND JAW.

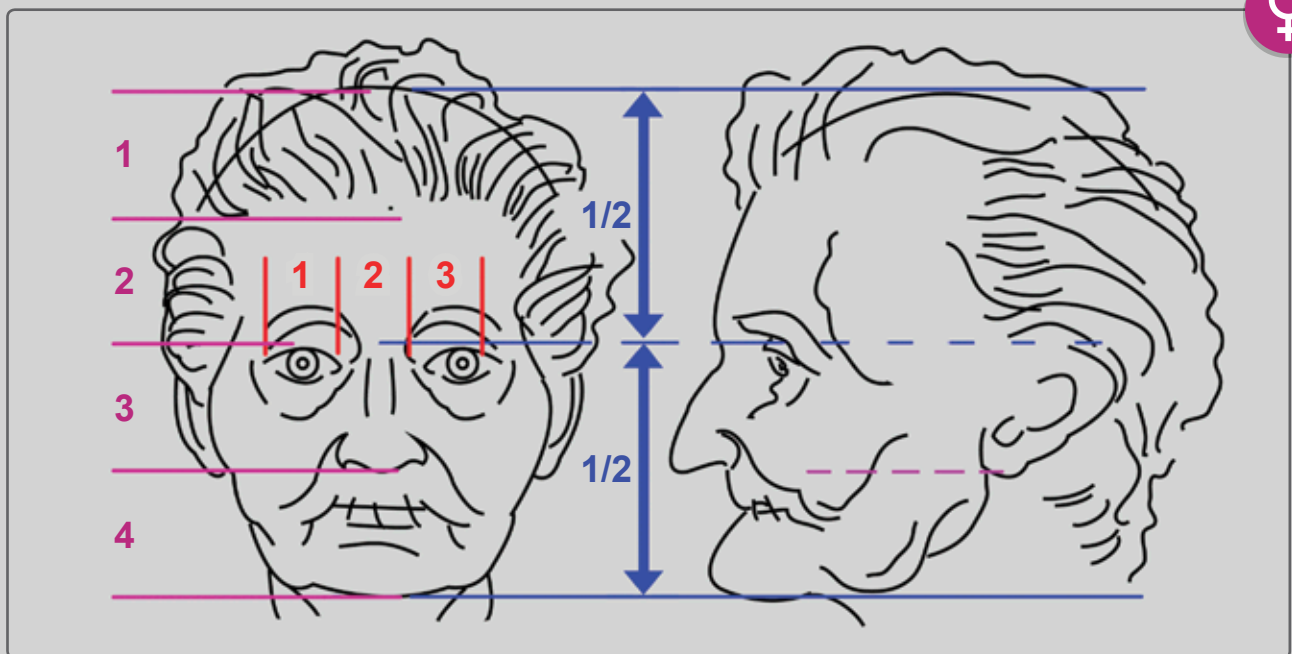
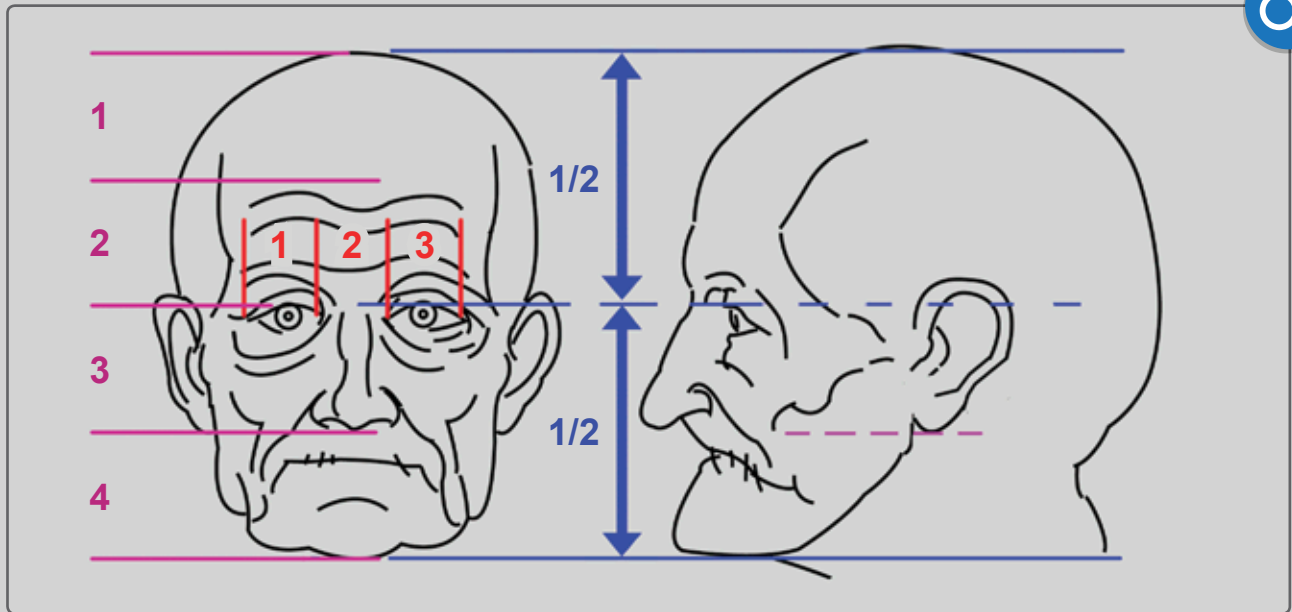
PROPORTIONS OF CHILDREN'S HEADS



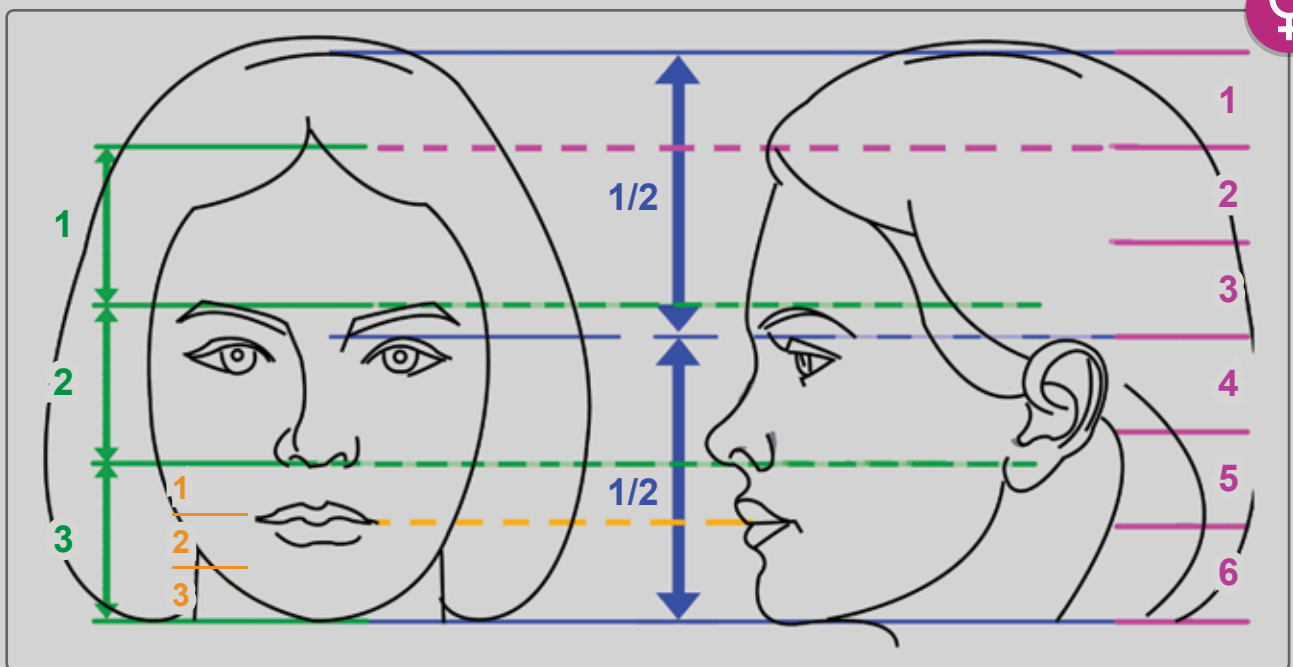
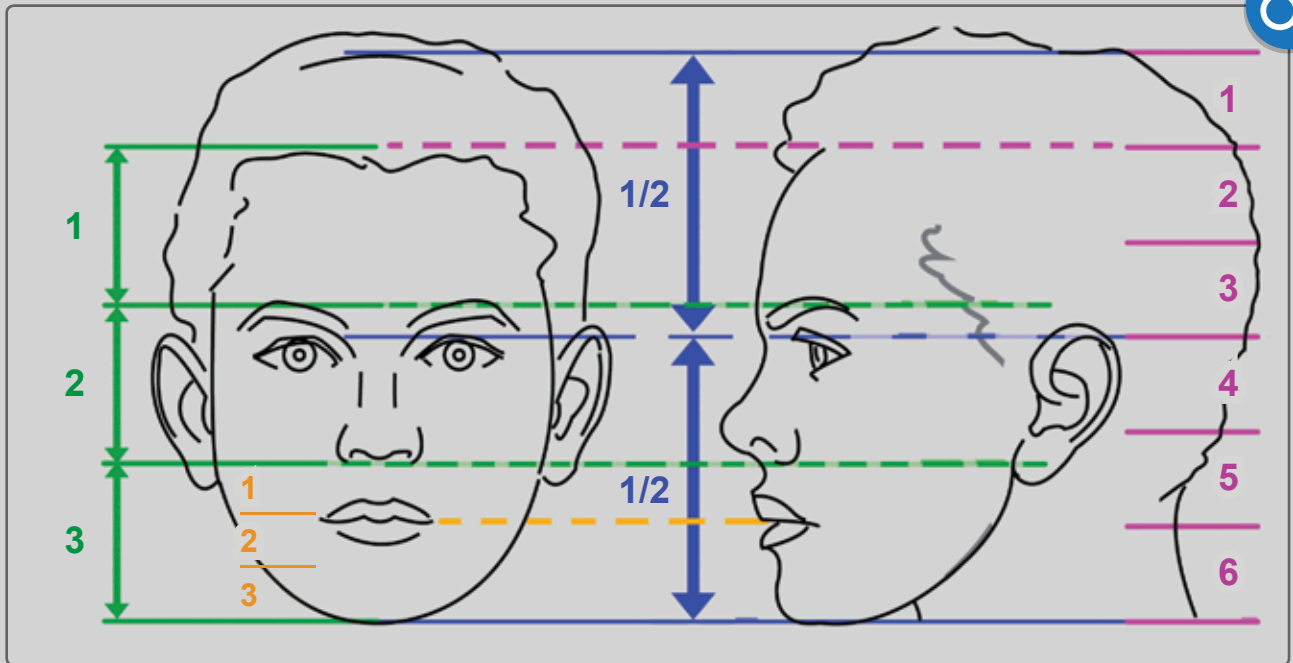
PROPORTIONS OF BABY AND TODDLER HEADS



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
- TIP 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
- **TIP 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

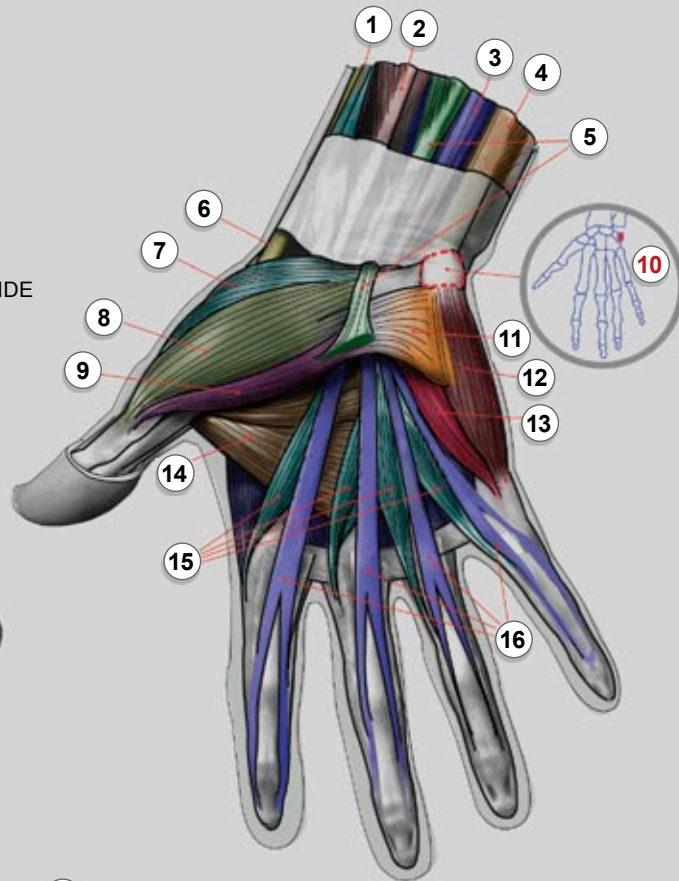




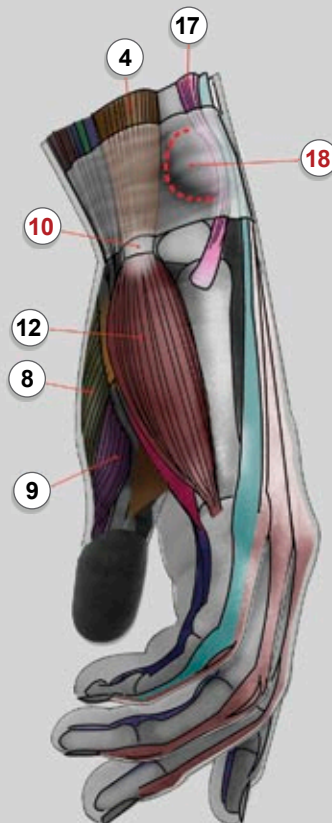
HAND AND WRIST MUSCLES



PALM SIDE



LITTLE
FINGER
SIDE



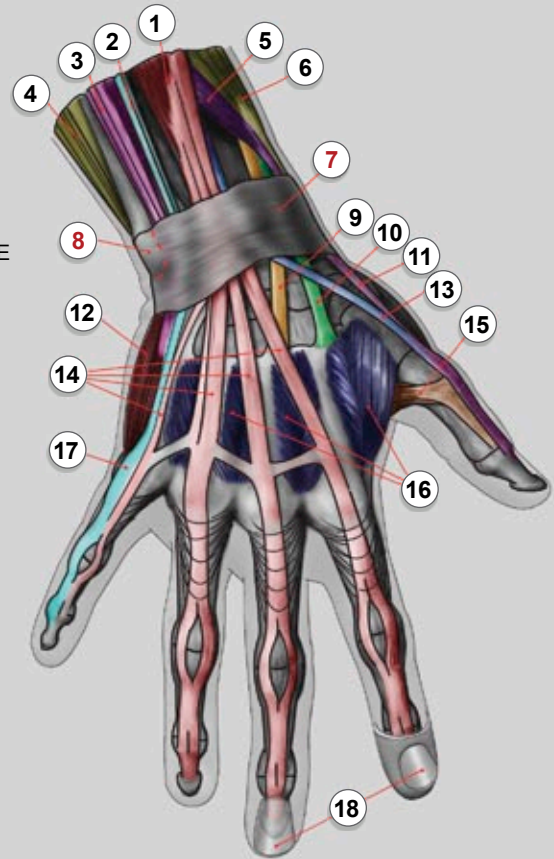
- 1 BRACHIORADIALIS
- 2 FLEXOR CARPI RADIALIS
- 3 f.d.s.*
- 4 FLEXOR CARPI ULNARIS
- 5 PALMARIS LONGUS
- 6 ABDUCTOR POLLICIS LONGUS
- 7 OPPONENS POLLICIS
- 8 ABDUCTOR POLLICIS BREVIS
- 9 FLEXOR POLLICIS BREVIS
- 10 PISIFORM BONE
- 11 PALMARIS BREVIS
- 12 ABDUCTOR DIGITI MINIMI
- 13 FLEXOR DIGITI MINIMI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

flexor digitorum superficialis *

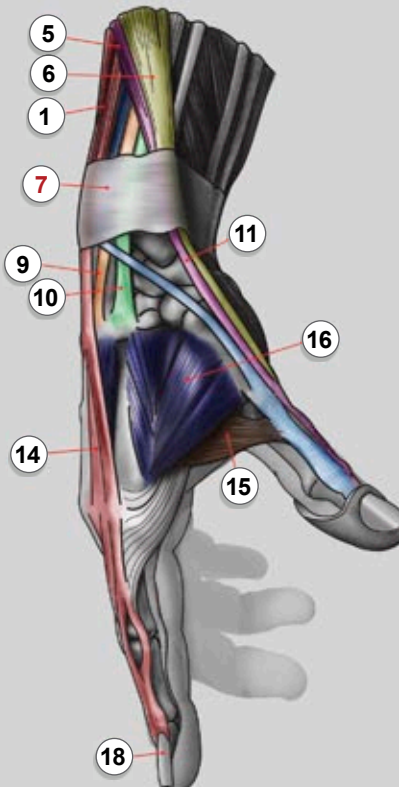
HAND AND WRIST MUSCLES



DORSAL SIDE



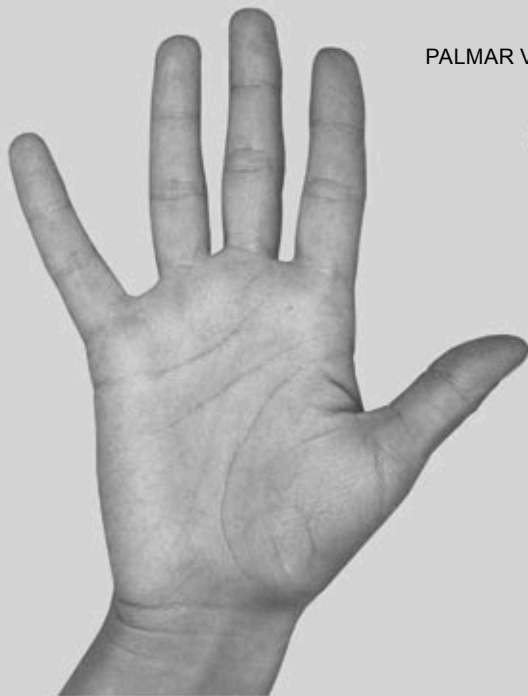
THUMB SIDE



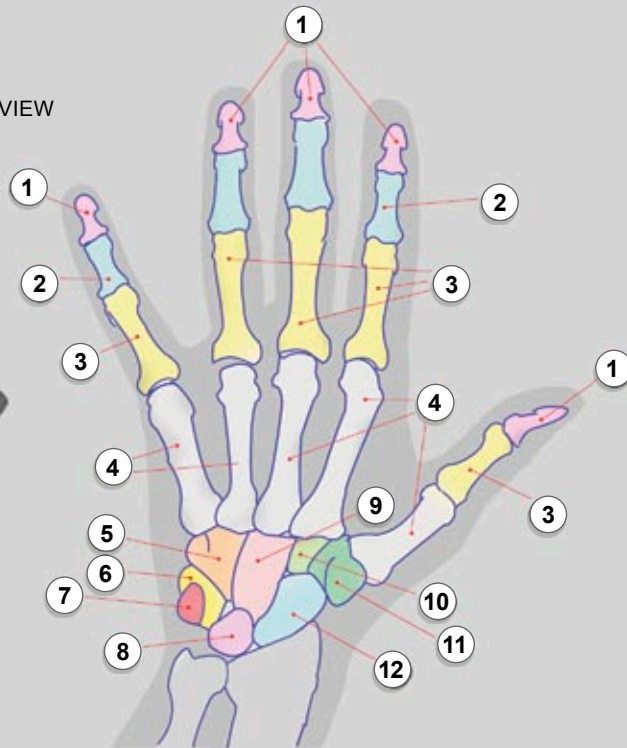
- 1 EXTENSOR DIGITORUM
- 2 EXTENSOR DIGITI MINIMI
- 3 EXTENSOR CARPI ULNARIS
- 4 FLEXOR CARPI ULNARIS
- 5 EXTENSOR POLLICIS BREVIS
- 6 ABDUCTOR POLLICIS LONGUS
- 7 EXTENSOR RETINACULUM
- 8 THE HEAD OF THE ULNA BONE
- 9 TENDON OF e.c.r.b.*
- 10 TENDON OF e.c.r.l.**
- 11 TENDON OF e.p.b.***
- 12 ABDUCTOR DIGITI MINIMI
- 13 TENDON OF e.p.l.****
- 14 TENDONS OF e.d.*****
- 15 ADDUCTOR POLLICIS
- 16 DORSAL INTEROSSEI MUSCLES
- 17 EXTENSOR OF e.d.m.*****
- 18 NAIL

extensor carpi radialis brevis *
extensor carpi radialis longus **
extensor pollicis brevis ****
extensor pollicis longus *****
extensor digitorum *****
extensor digiti minimi *****

HAND AND WRIST BONES



PALMAR VIEW

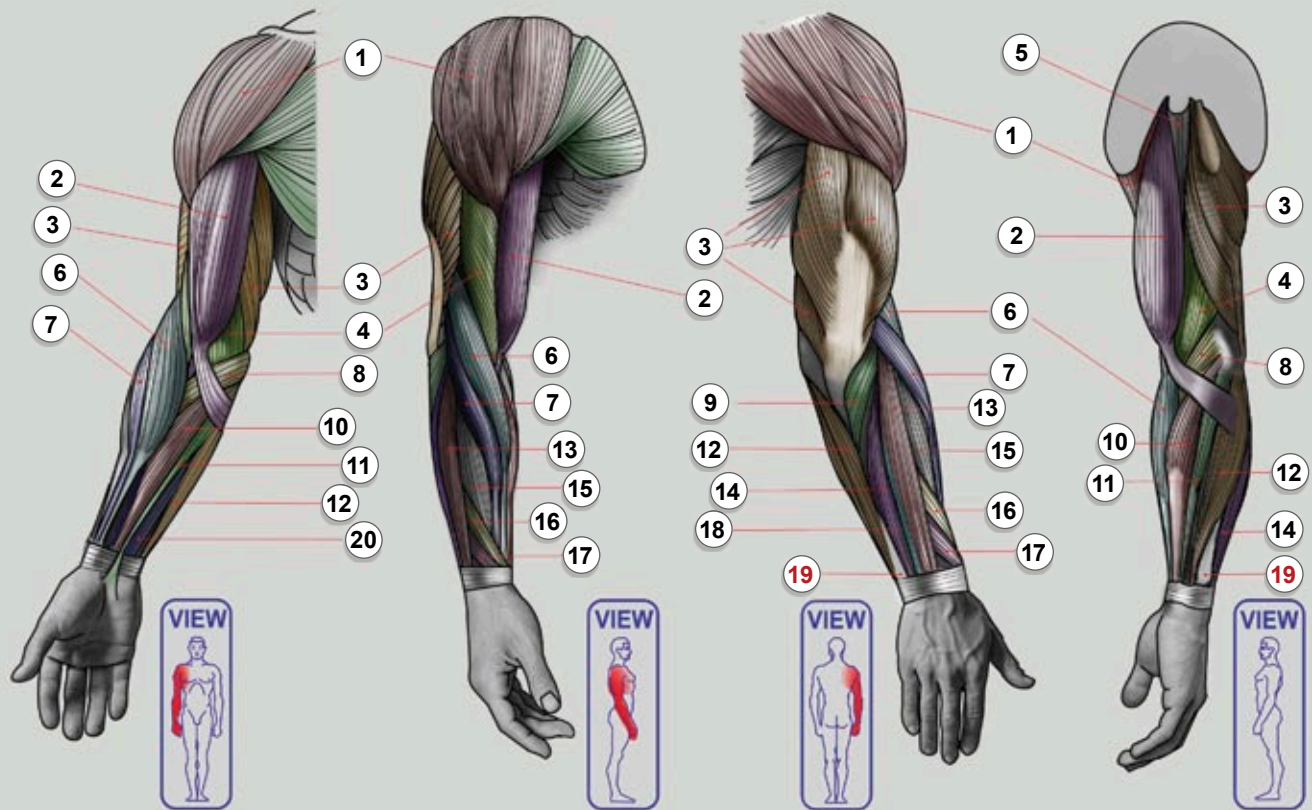


DORSAL VIEW



1 DISTAL PHALANXES	4 METACARPALS	7 PISIFORM	10 TRAPEZOID
2 MIDDLE PHALANXES	5 HAMATE	8 LUNATE	11 TRAPEZIUM
3 PROXIMAL PHALANXES	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 ULNA 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.

SUPINATION – LIKE YOU'RE A WAITER CARRYING SOUP.

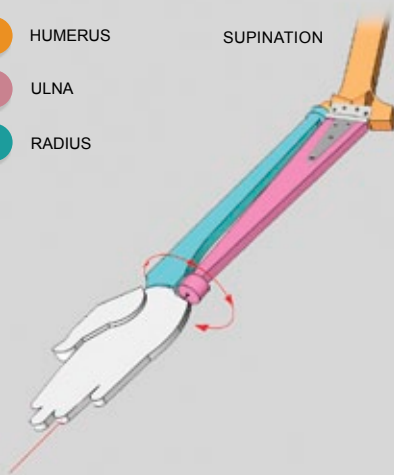


PRONATION – LIKE YOU'RE A PRO BASKETBALL PLAYER.

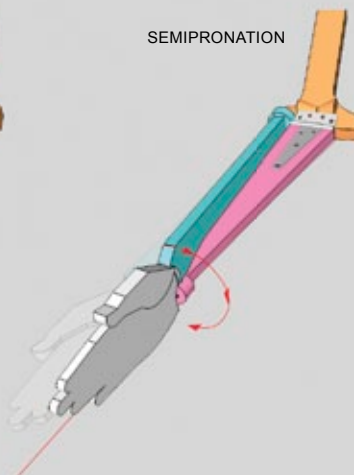


NOTE THAT PRONATION OF THE FOREARM DOES NOT INVOLVE ROTATION OF THE UPPER-ARM FROM THE SHOULDER JOINT!

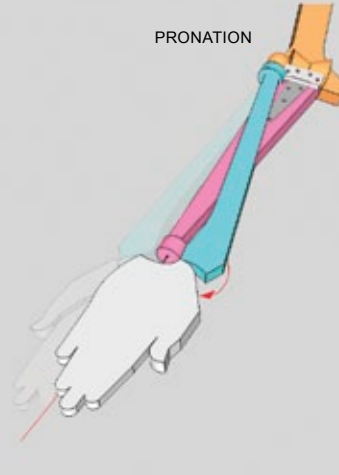
- HUMERUS
- ULNA
- RADIUS



SUPINATION



SEMI PRONATION

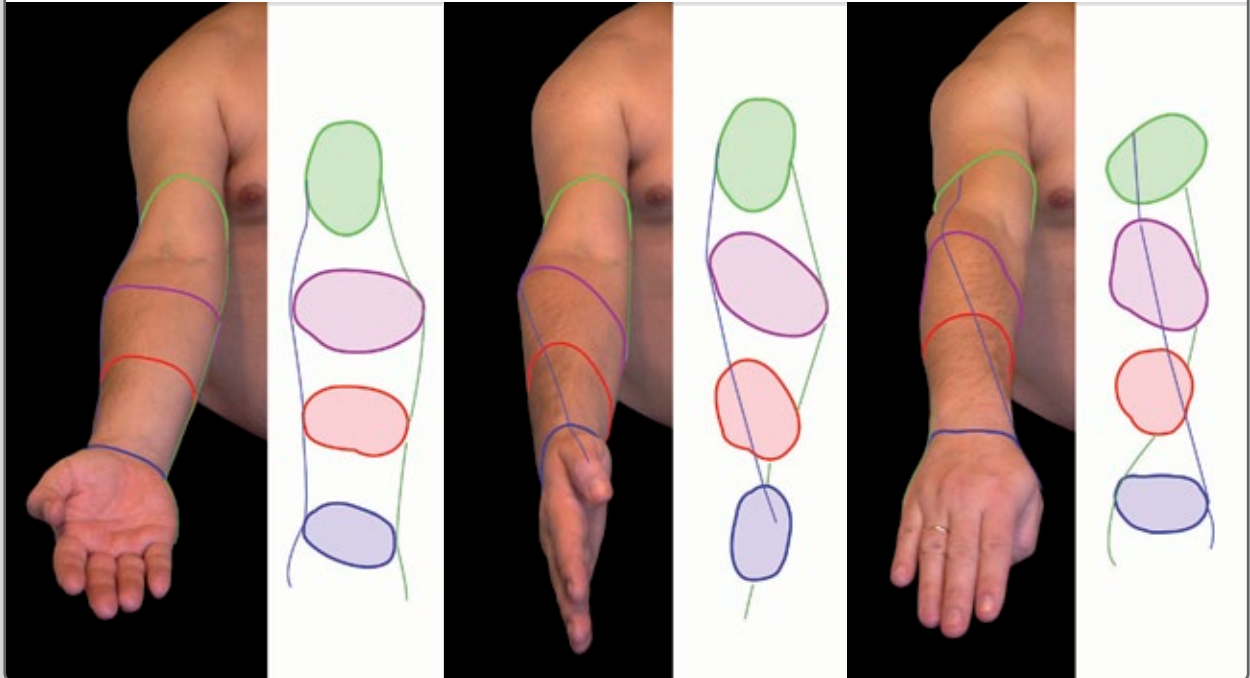


PRONATION

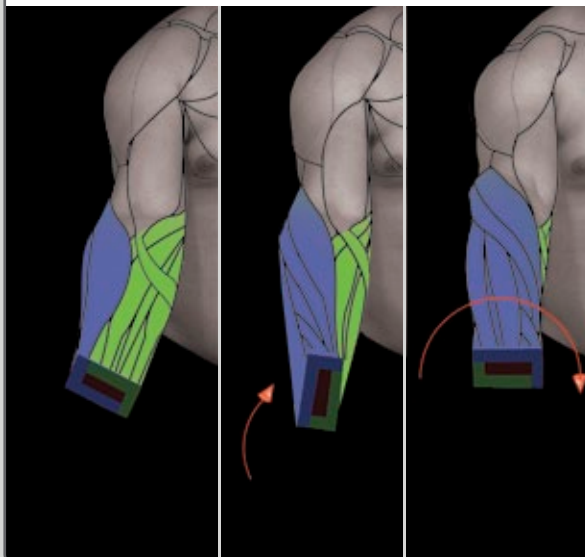
DURING **PRONATION**, **RADIUS** ROLLS AROUND **THE ULNA**

PRONATION AND FORM CHANGES

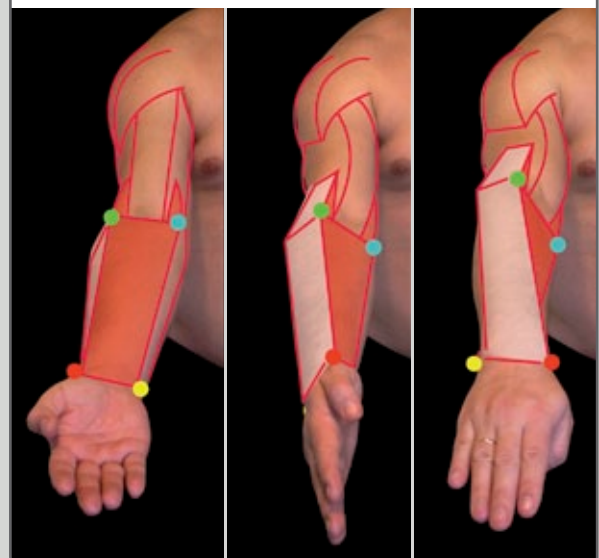
CROSS SECTIONS OF ARM DURING PRONATION



FLEXORS AND EXTENSORS



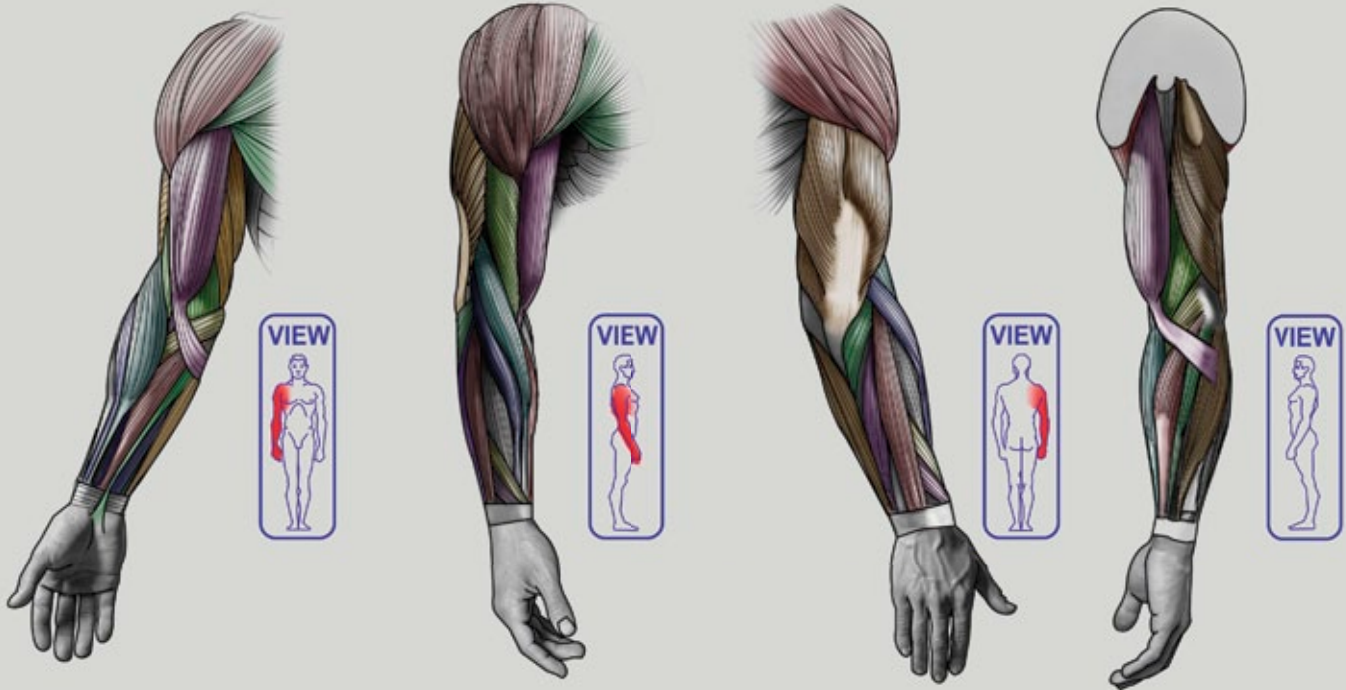
THIS IS AN EXAMPLE OF HOW IMPORTANT IT IS TO KNOW THE ORIGIN AND INSERTION POINTS OF MUSCLES.



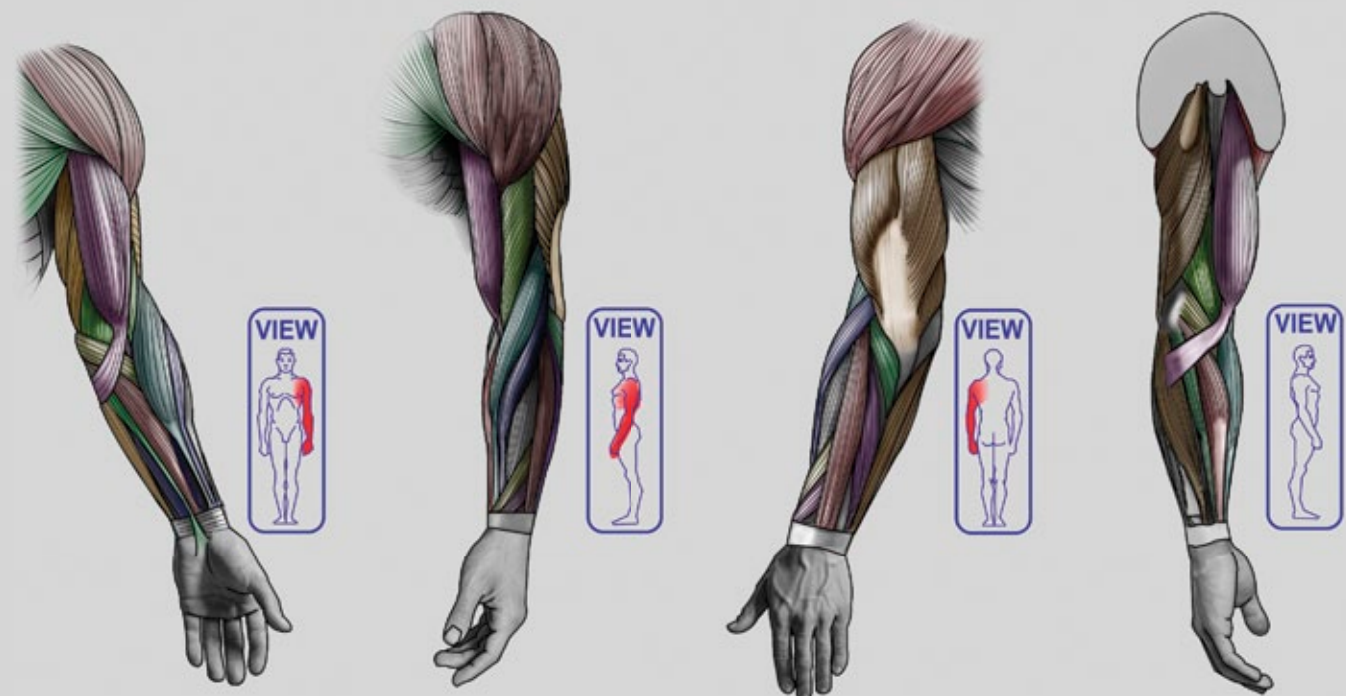
SUPINATED UPPER LIMB

(WHEN THE FOREARM OR PALM FACES TOWARD THE FRONT)

RIGHT

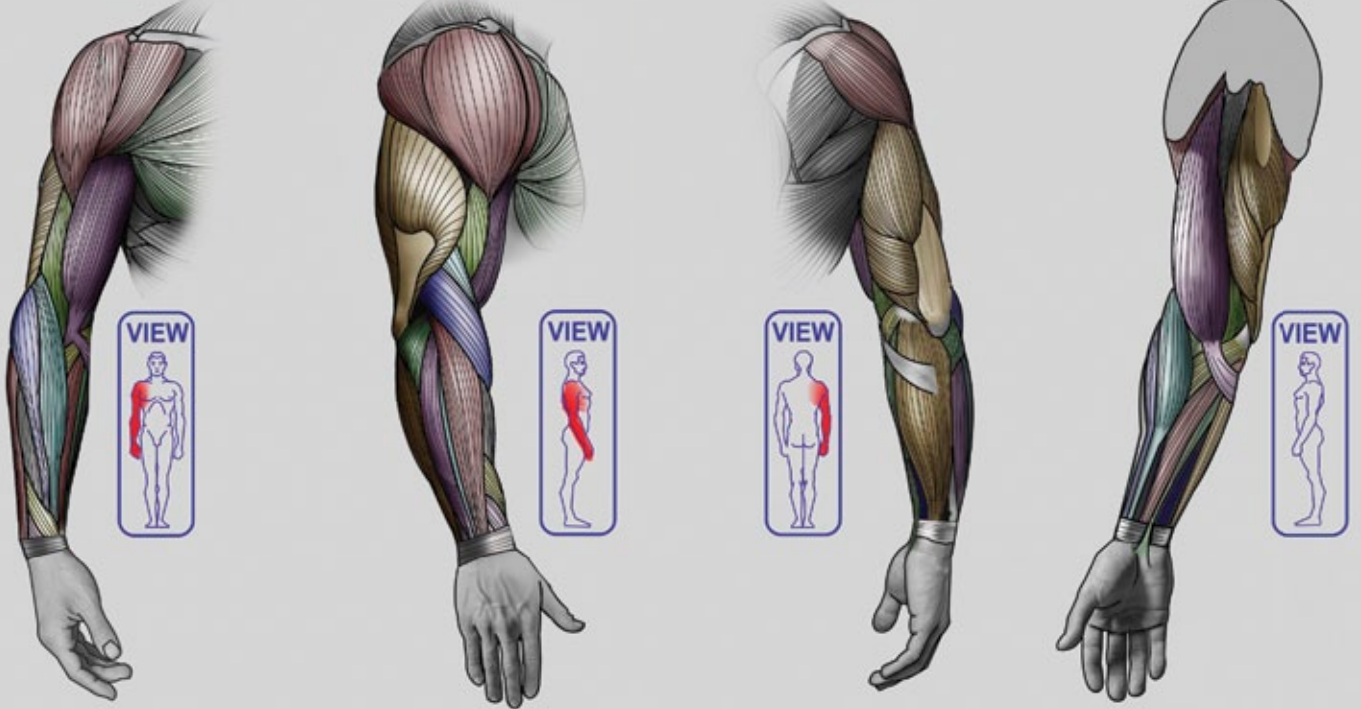


LEFT

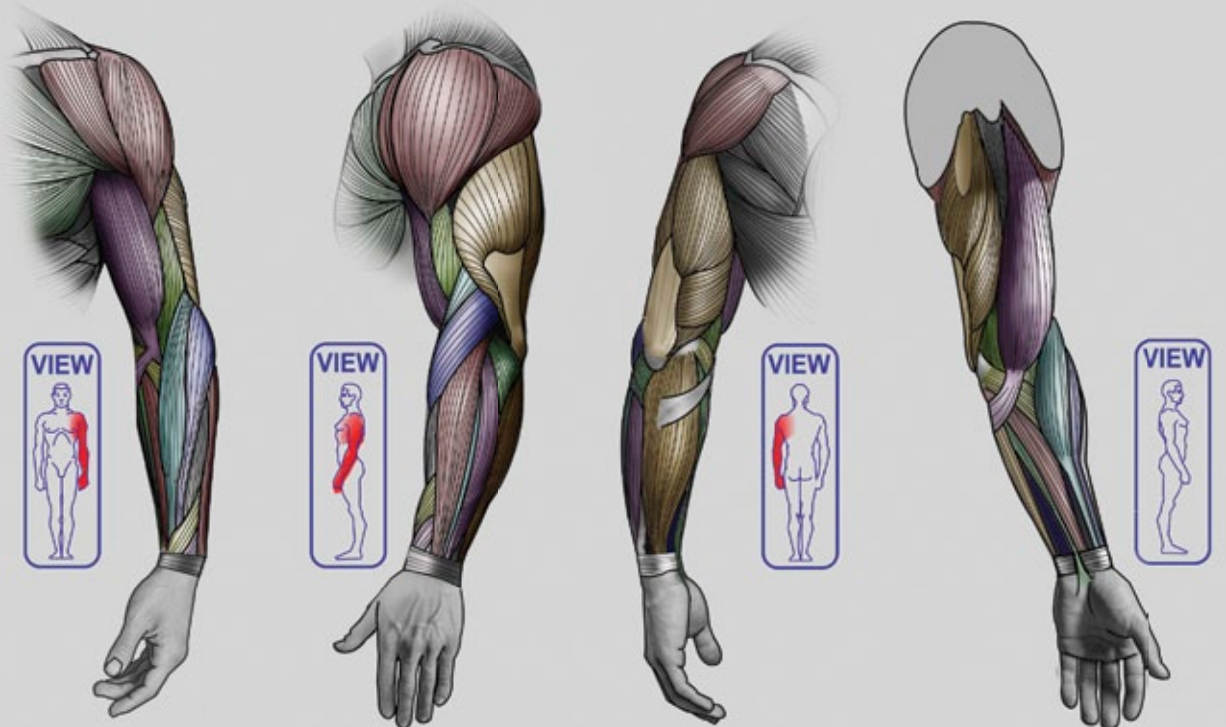


SEMI-PRONATED UPPER LIMB (WHEN THE FOREARM OR PALM FACES TOWARD THE TRUNK)

RIGHT



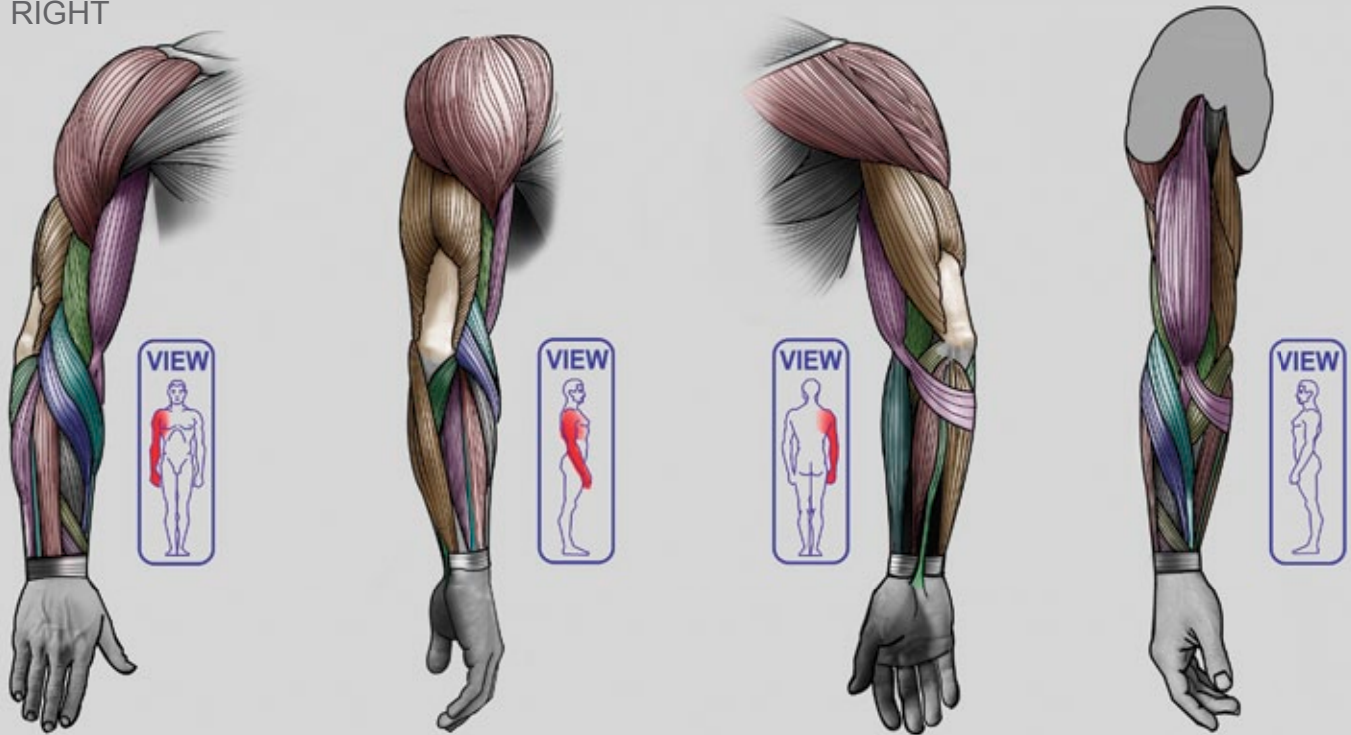
LEFT



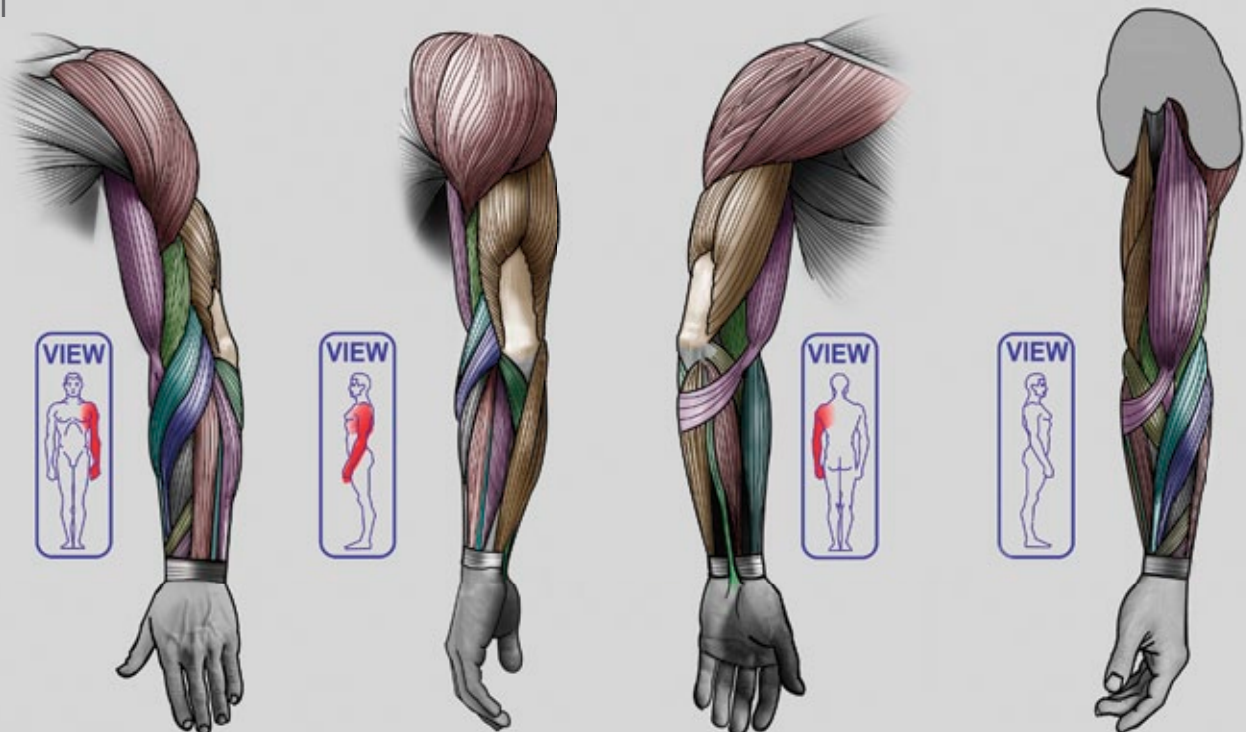
PRONATED UPPER LIMB

(WHEN FOREARM OR PALM FACES TOWARD THE BACK)

RIGHT

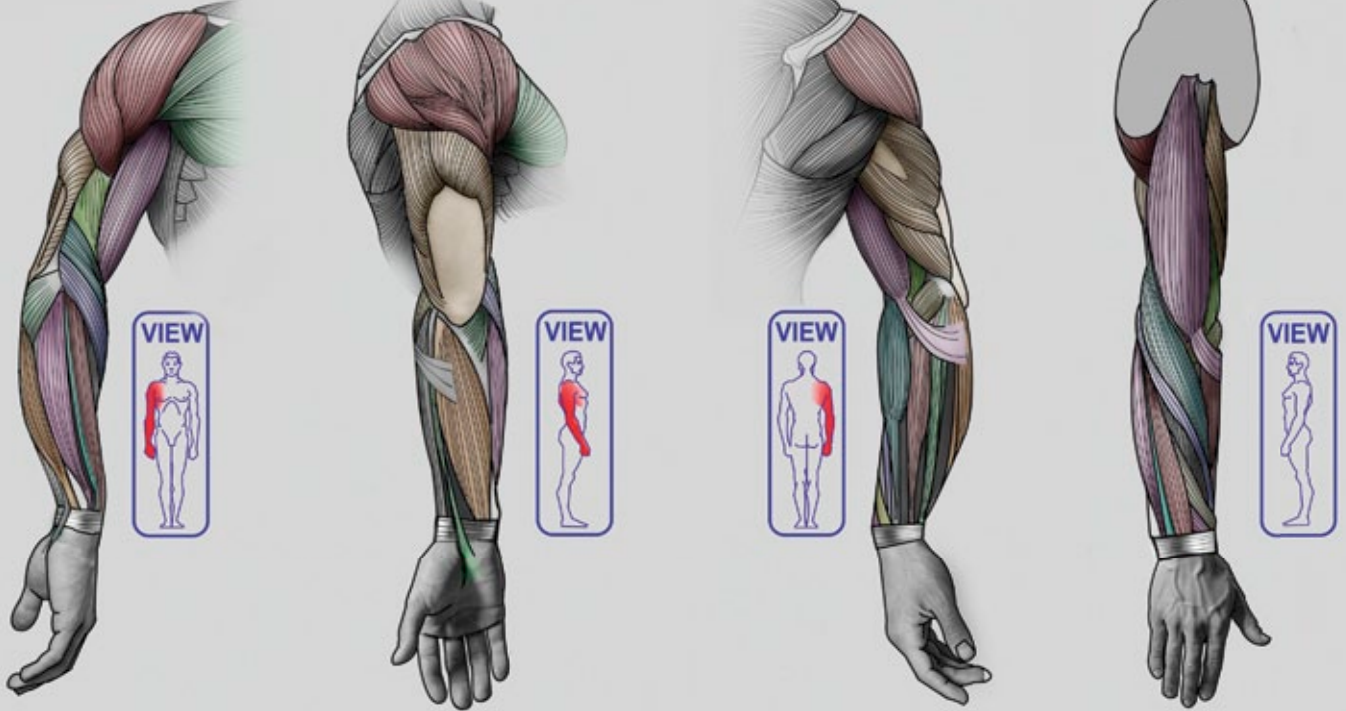


LEFT

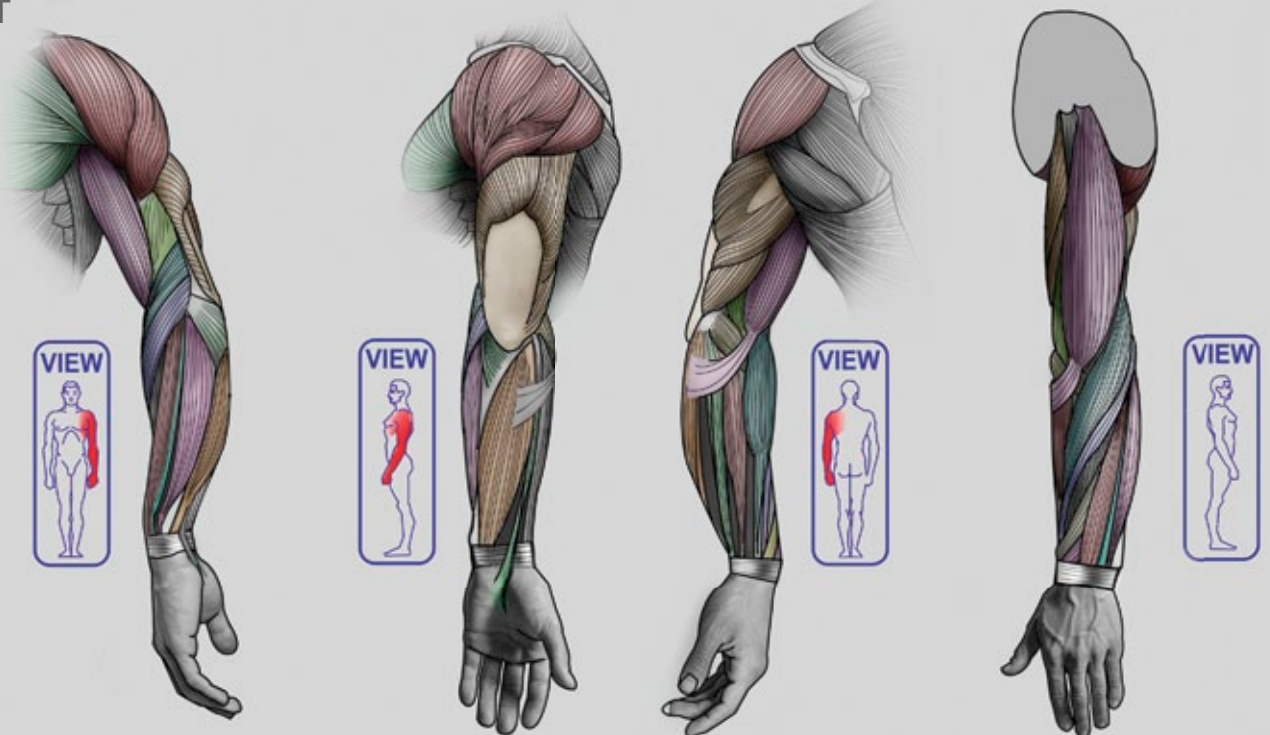


FORCED PRONATION OF THE UPPER LIMB (WHEN THE FOREARM OR PALM FACES AWAY FROM THE TRUNK)

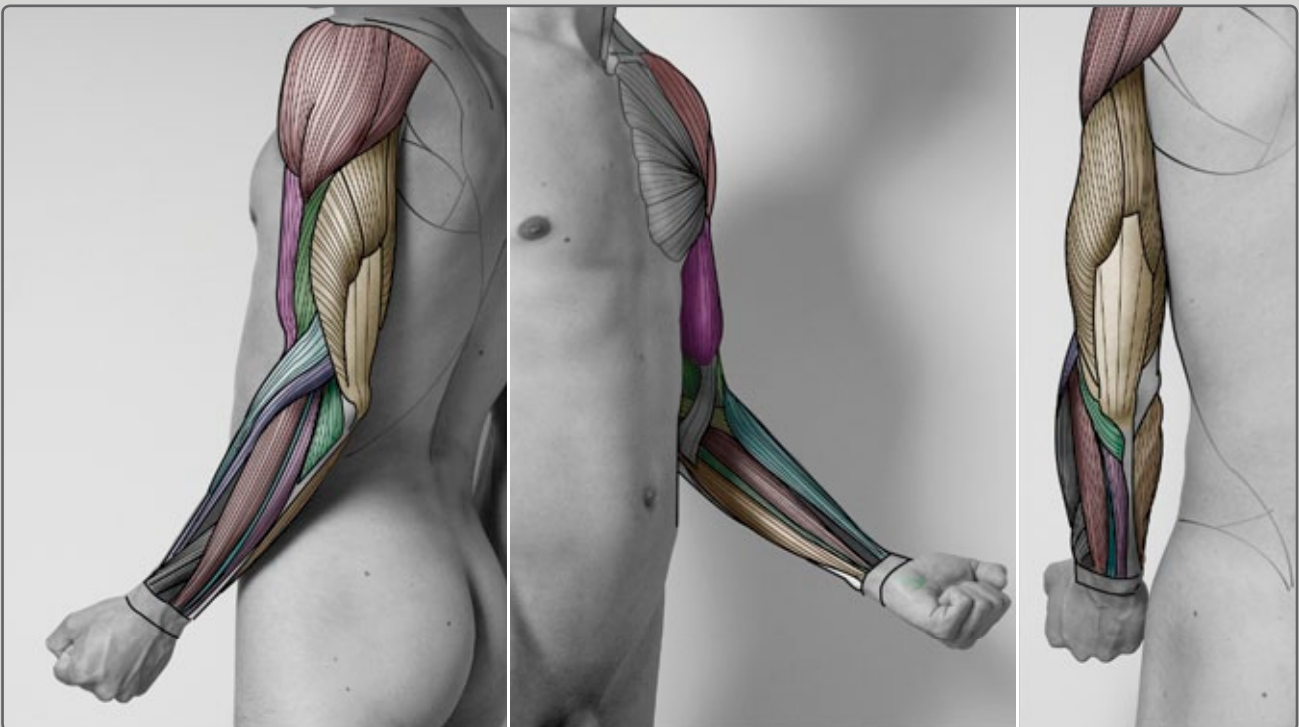
RIGHT



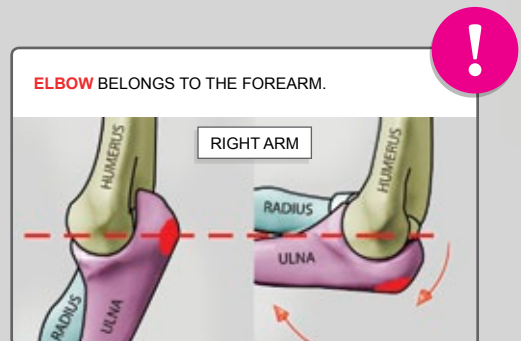
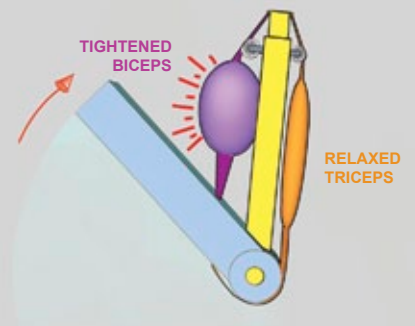
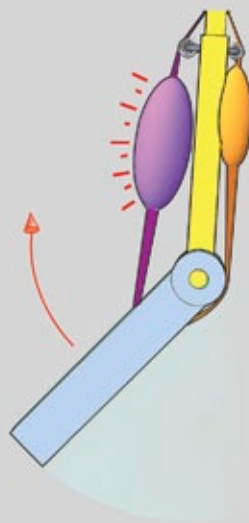
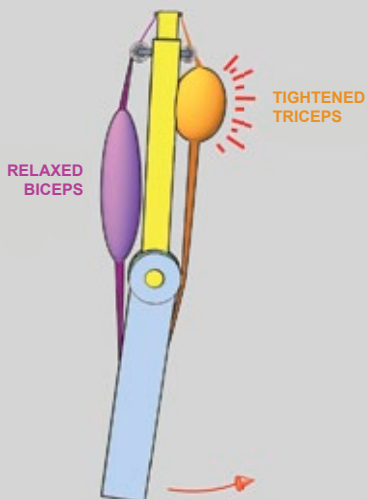
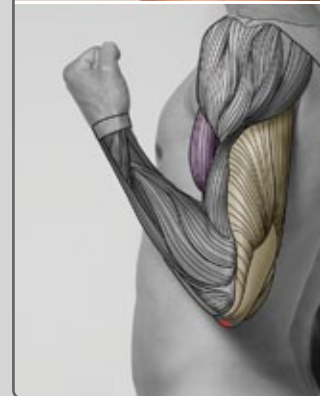
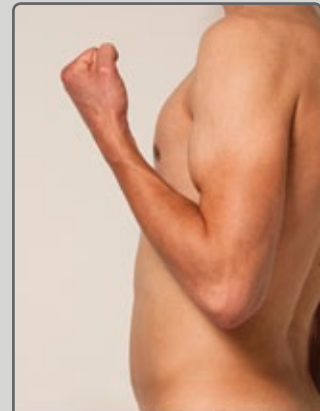
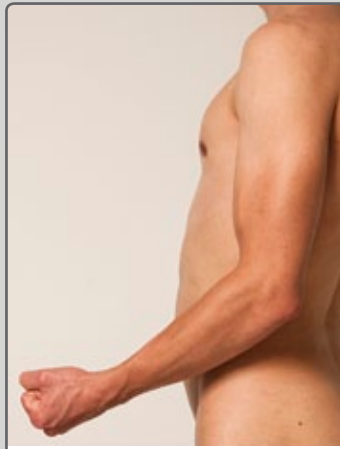
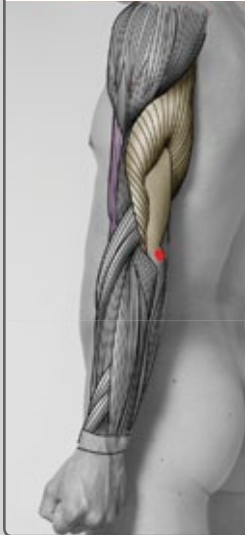
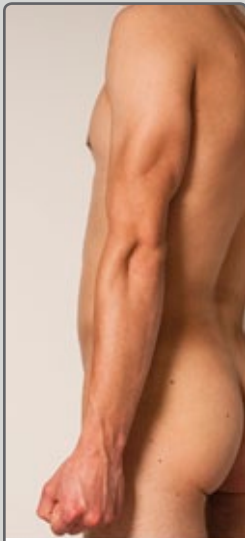
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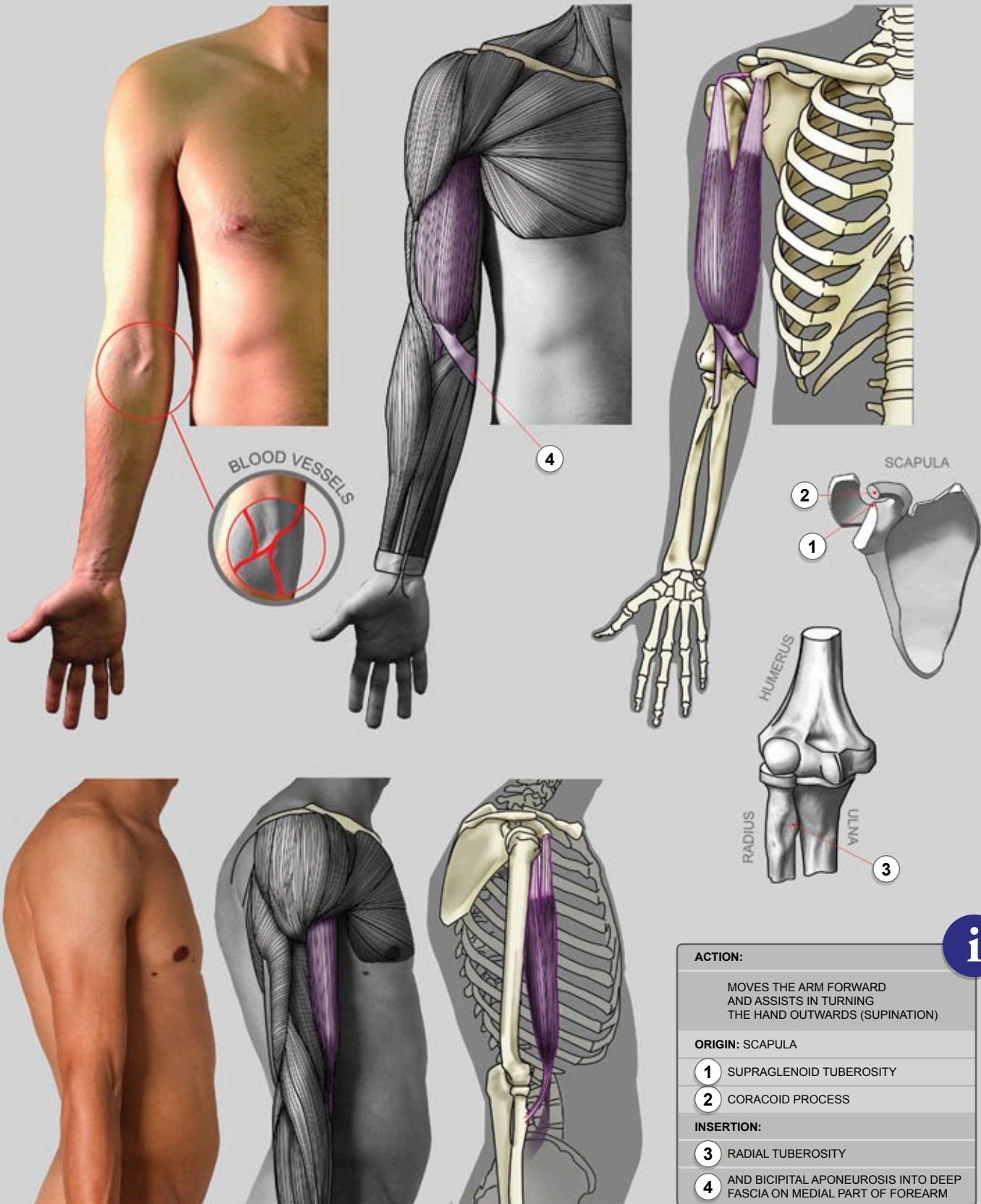
PARTIALLY FLEXED ARM (AS IF HOLDING AN OBJECT)



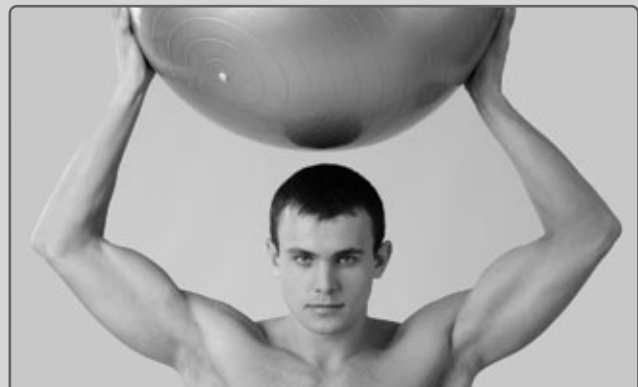
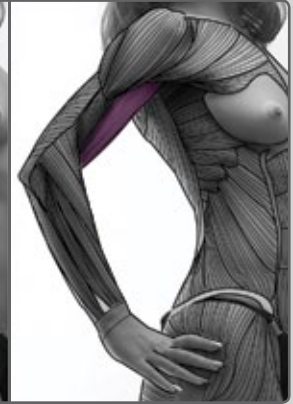
BICEPS AND TRICEPS IN ACTION



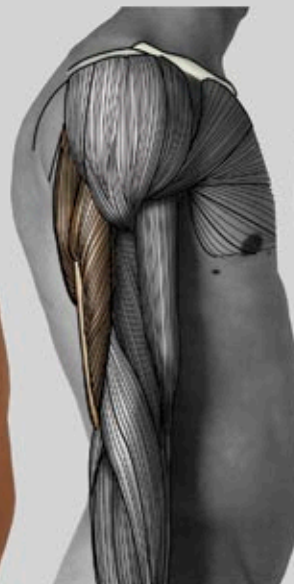
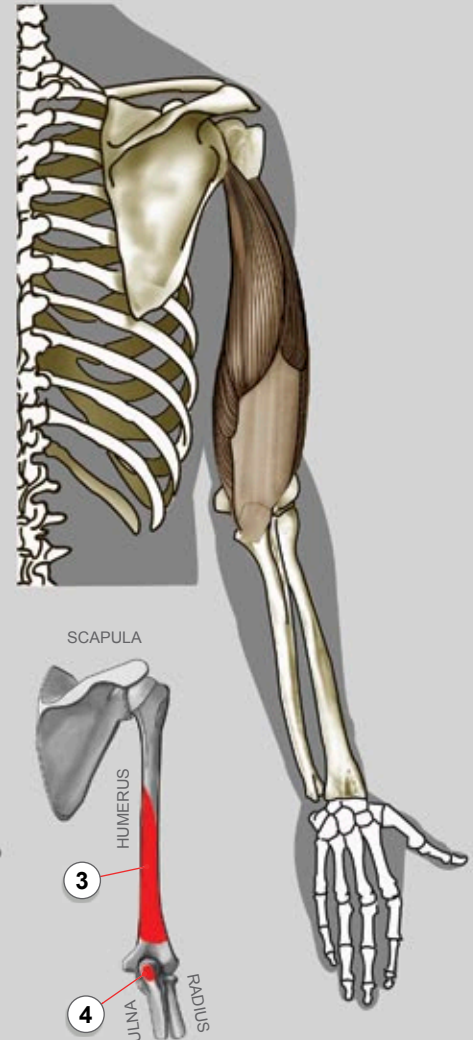
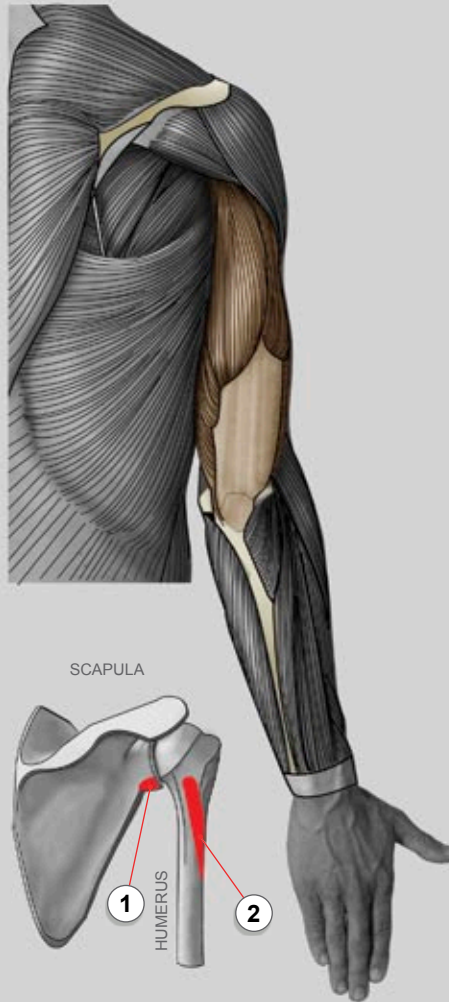
BICEPS BRACHII MUSCLE



BICEPS BRACHII MUSCLE



TRICEPS BRACHII MUSCLE



ACTION:

EXTENDS FOREARM
LONG HEAD EXTENDS SHOULDER

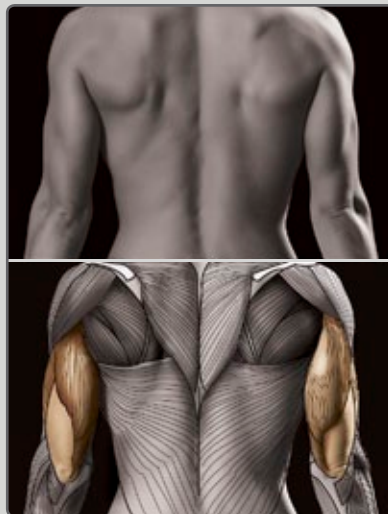
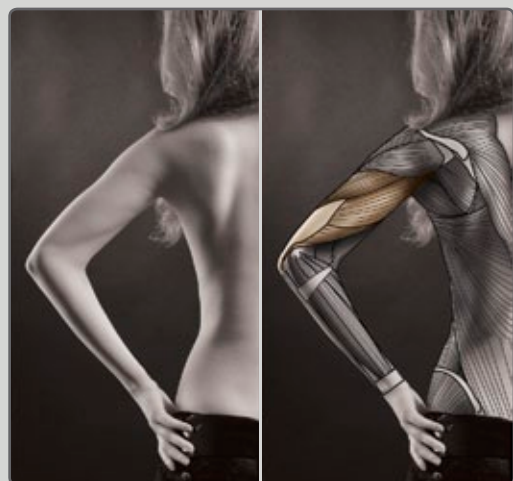
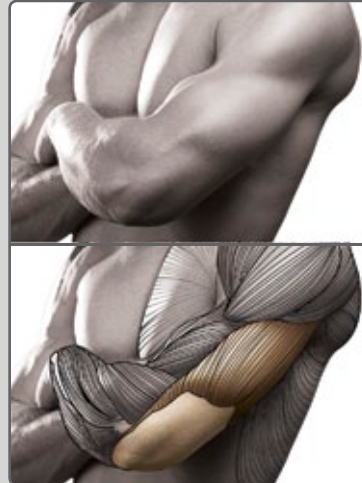
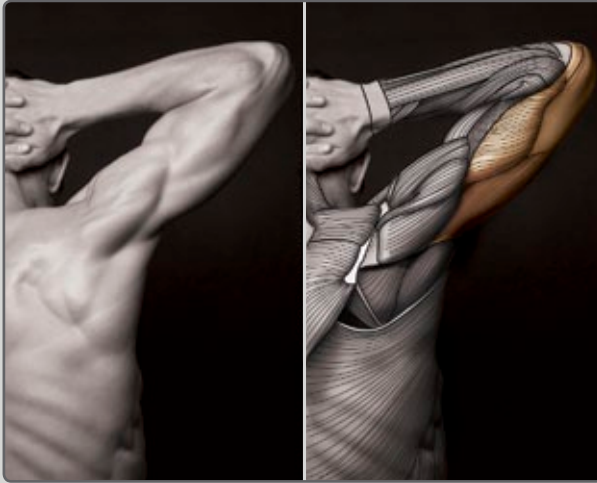
ORIGIN:

- 1 **LONG HEAD:**
INFRAGLENOID TUBERCLE OF SCAPULA
- 2 **LATERAL HEAD:**
ABOVE THE RADIAL SULCUS
- 3 **MEDIAL HEAD:**
BELOW THE RADIAL SULCUS

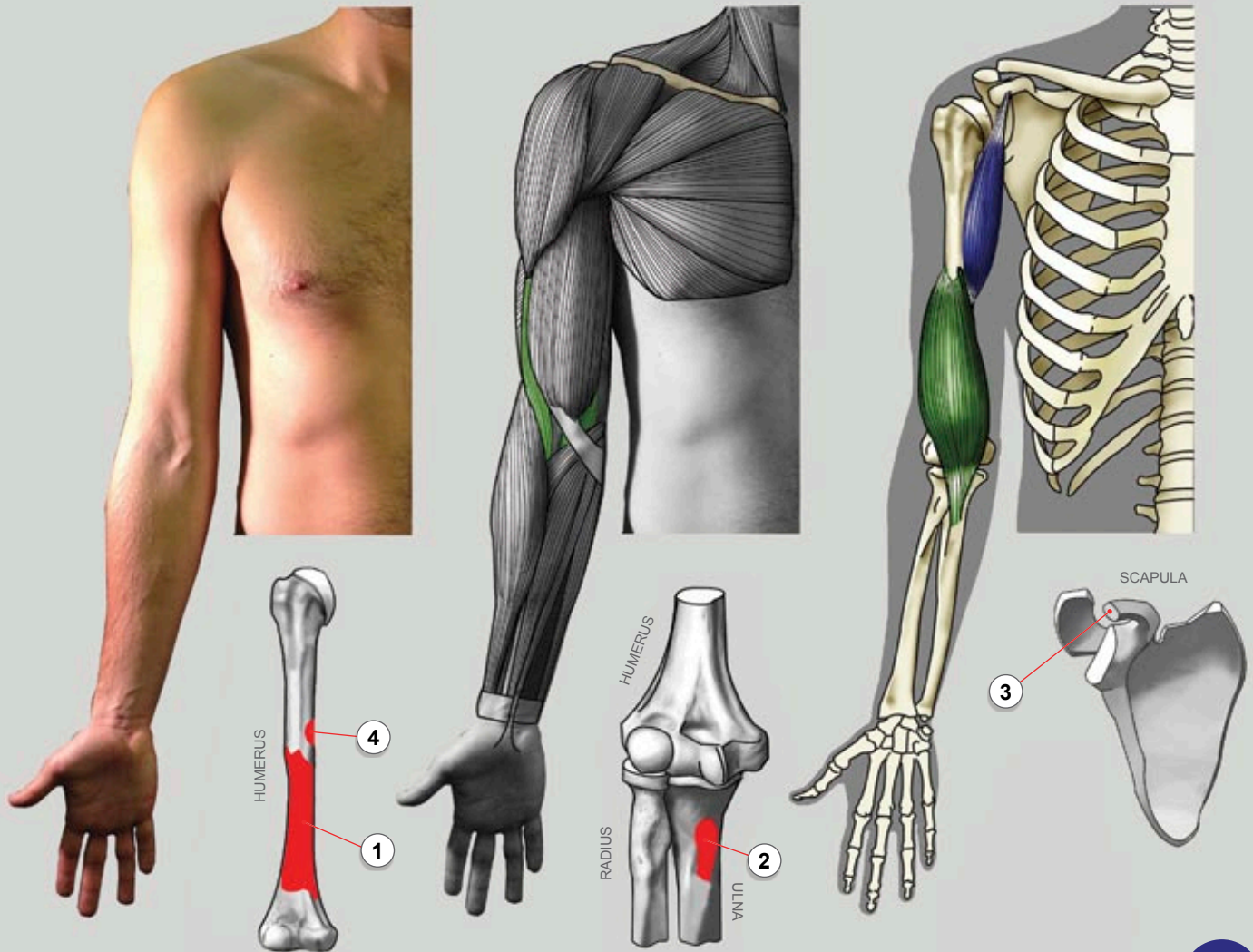
INSERTION:

- 4 **OLECRANON PROCESS OF ULNA**

TRICEPS BRACHII MUSCLE



BRACHIALIS AND CORACOBrachialis MUSCLES



BRACHIALIS

ACTION:

FLEXION AT ELBOW JOINT

ORIGIN:

1 ANTERIOR SURFACE OF THE HUMERUS

INSERTION:

2 CORONOID PROCESS AND THE TUBEROSITY OF THE ULNA

CORACOBACHIALIS

ACTION:

ADDUCTS HUMERUS, FLEXES THE ARM AT GLENOHUMERAL JOINT

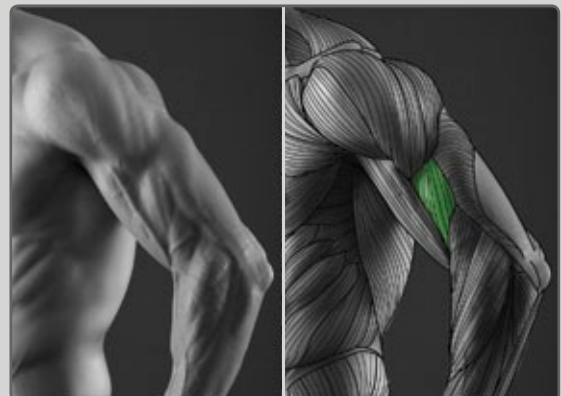
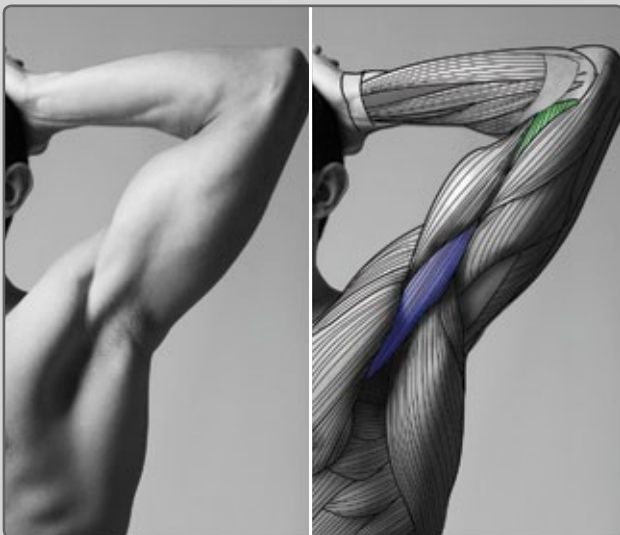
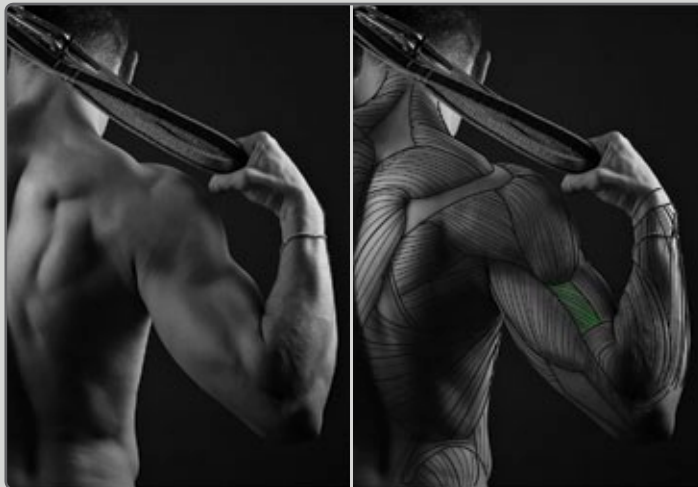
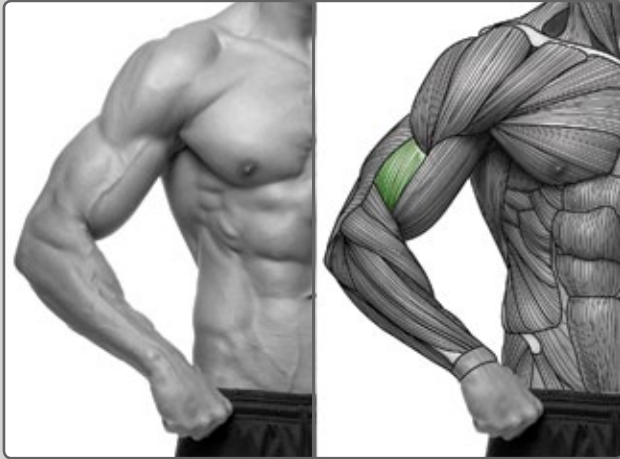
ORIGIN:

3 CORACOID PROCESS OF SCAPULA

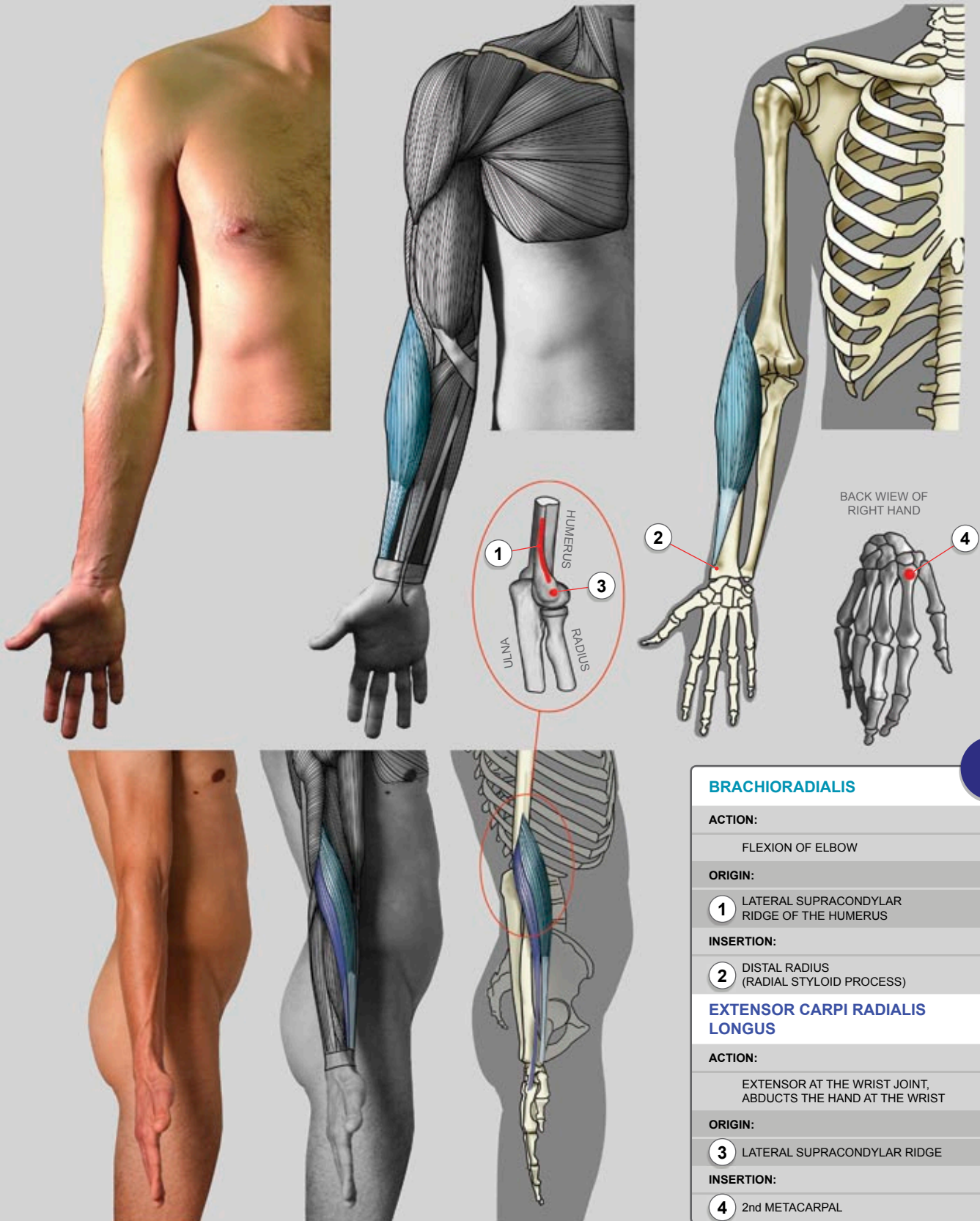
INSERTION:

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

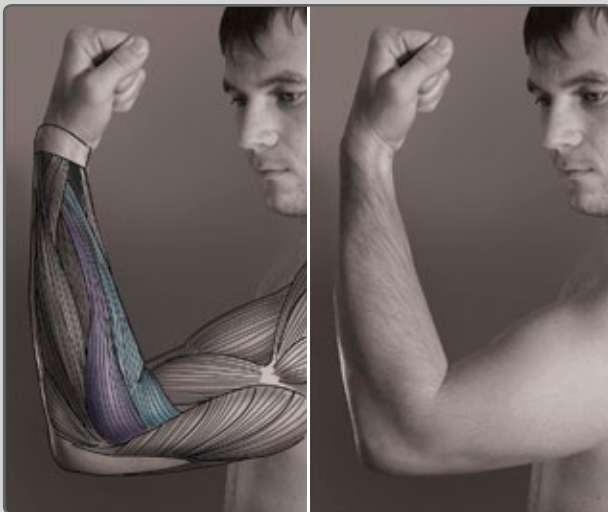
ORIGIN:

3 LATERAL SUPRACONDYLAR RIDGE

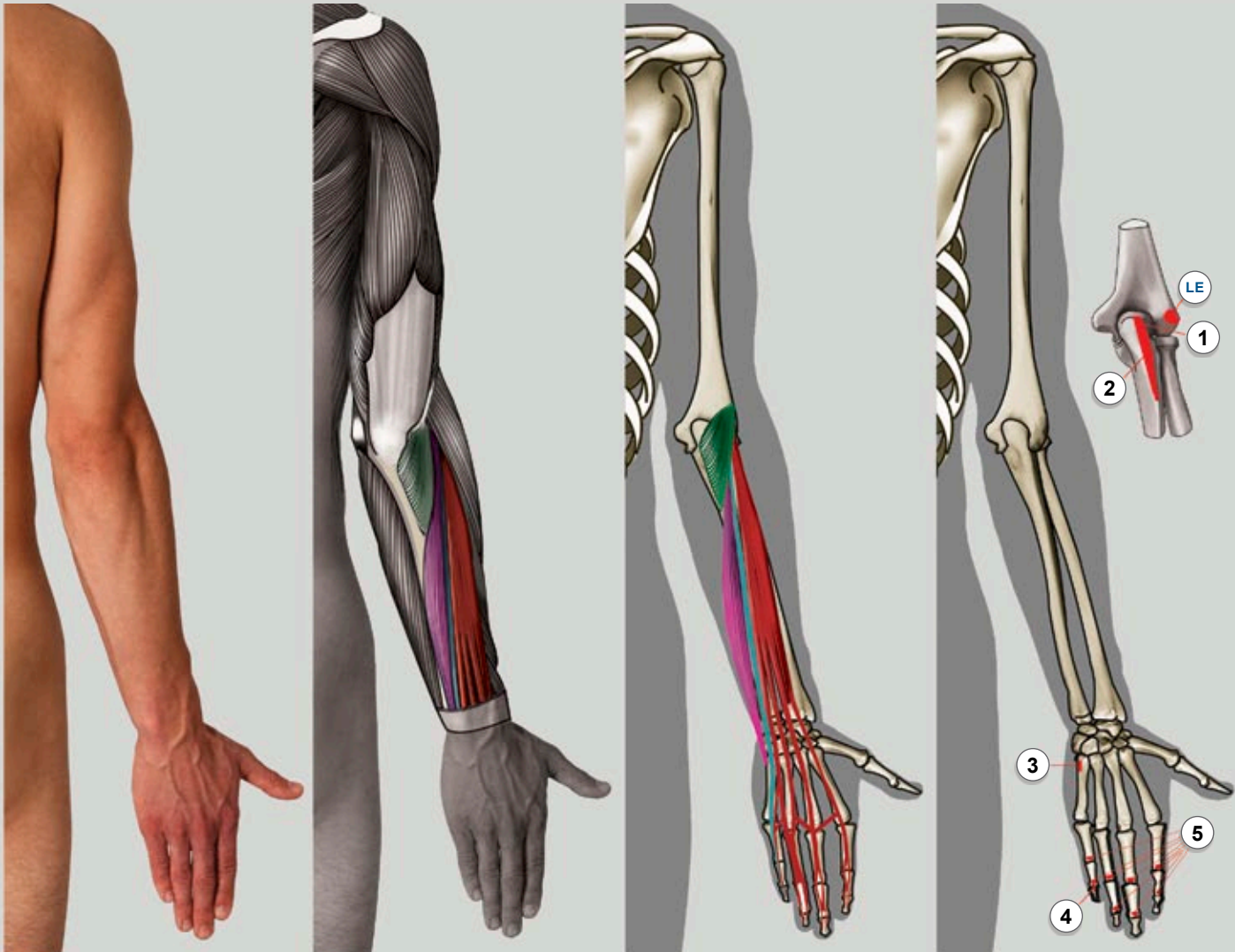
INSERTION:

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 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 CARPI ULNARIS

ACTION:

EXTENDS AND ADDUCTS THE WRIST

ORIGIN:

LE LATERAL EPICONDYLE OF THE HUMERUS, ULNA

INSERTION:

- 3** 5th METACARPAL

EXTENSOR DIGITORUM

ACTION:

EXTENDS HAND, WRIST AND FINGERS

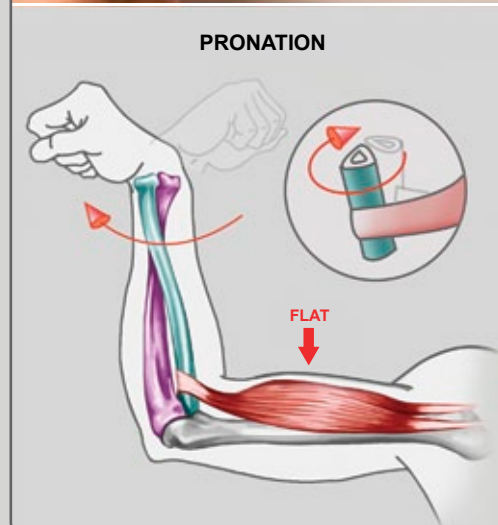
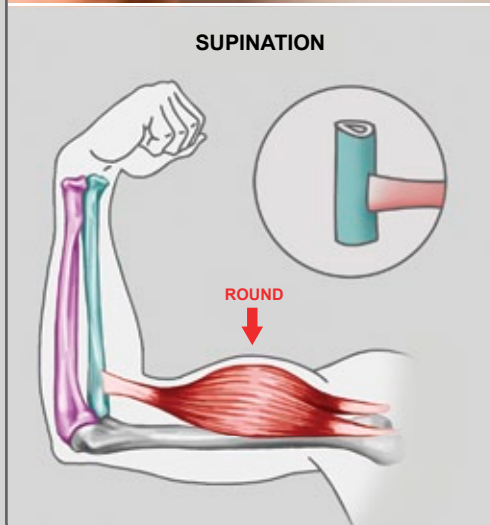
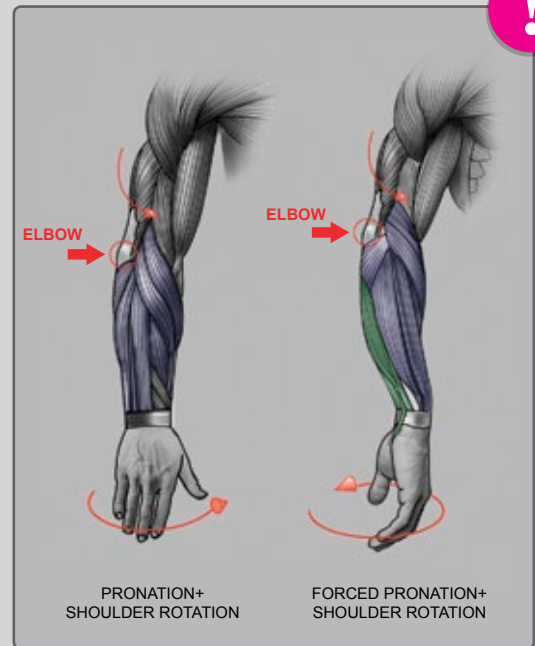
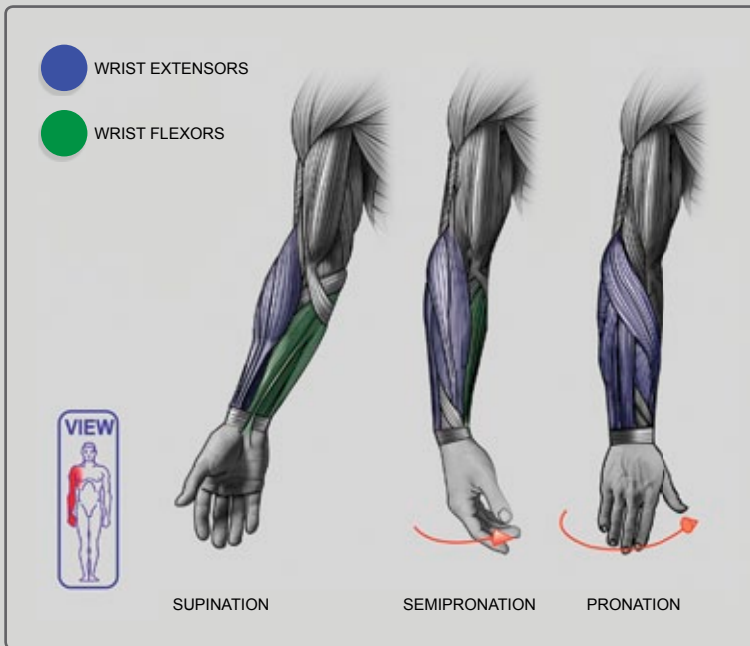
ORIGIN:

LE LATERAL EPICONDYLE OF THE HUMERUS

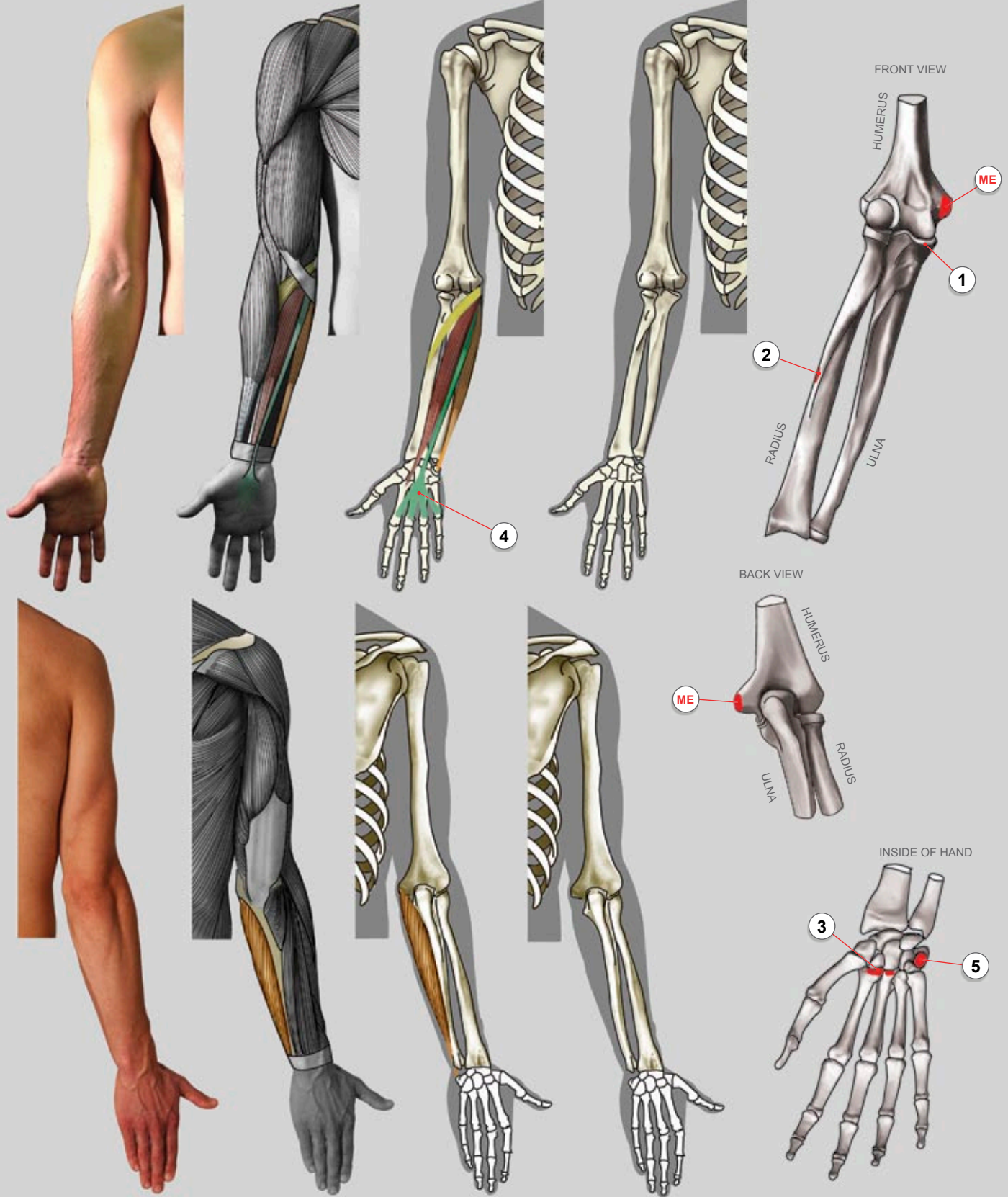
INSERTION:

- 5** EXTENSOR EXPANSION OF MIDDLE AND DISTAL PHALANGES OF THE 2nd, 3rd, 4th AND 5th FINGERS

SUPINATION AND PRONATION



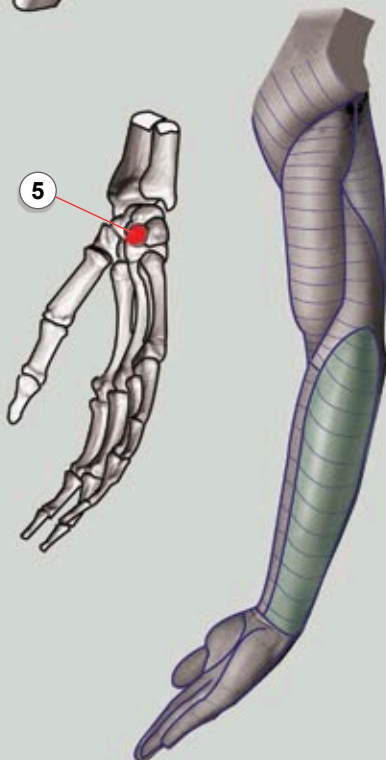
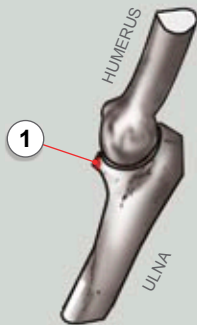
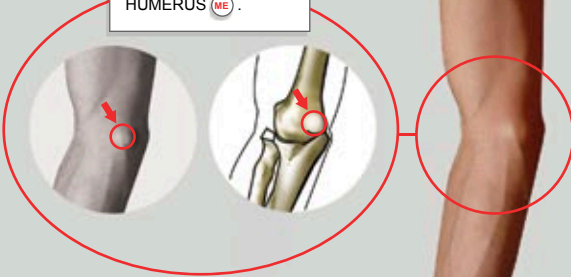
FLEXOR MUSCLES



FLEXOR MUSCLES (FROM INNER SIDE)



ALL FLEXORS ARISE FROM THE **MEDIAL EPICONDYLE OF THE HUMERUS** (ME).



PRONATOR TERES

ACTION:

PRONATION OF FOREARM, FLEXES ELBOW

ORIGIN:

ME MEDIAL EPICONDYLE OF HUMERUS (COMMON FLEXOR TENDON)

1 ULNAR HEAD: CORONOID PROCESS OF ULNA

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 APONEUROSIS

FLEXOR CARPI ULNARIS

ACTION:

FLEXION AND ABDUCTION AT WRIST

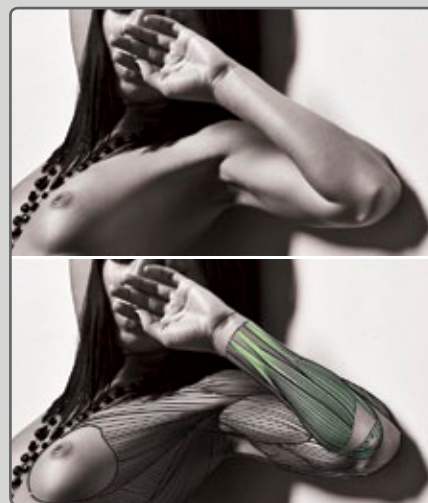
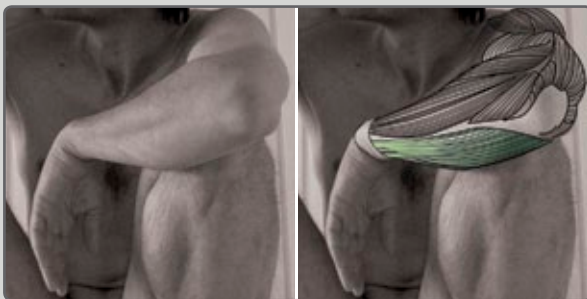
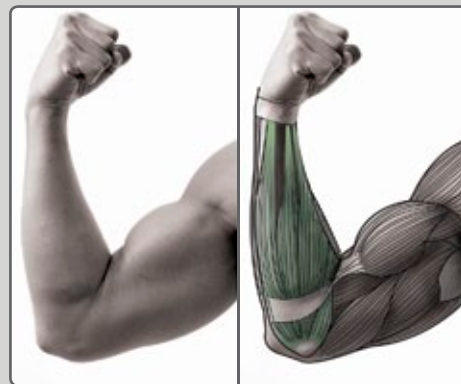
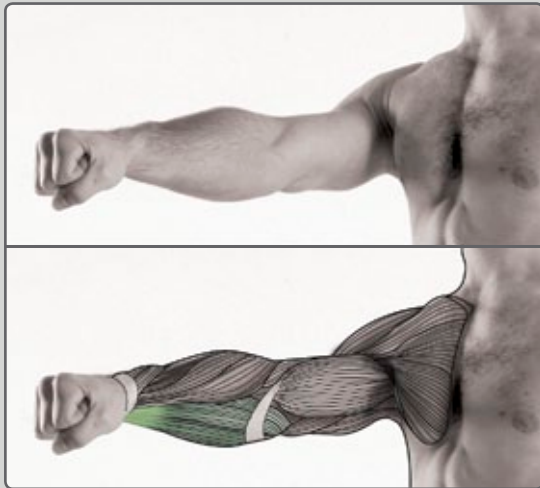
ORIGIN:

ME MEDIAL EPICONDYLE OF HUMERUS (COMMON FLEXOR TENDON)

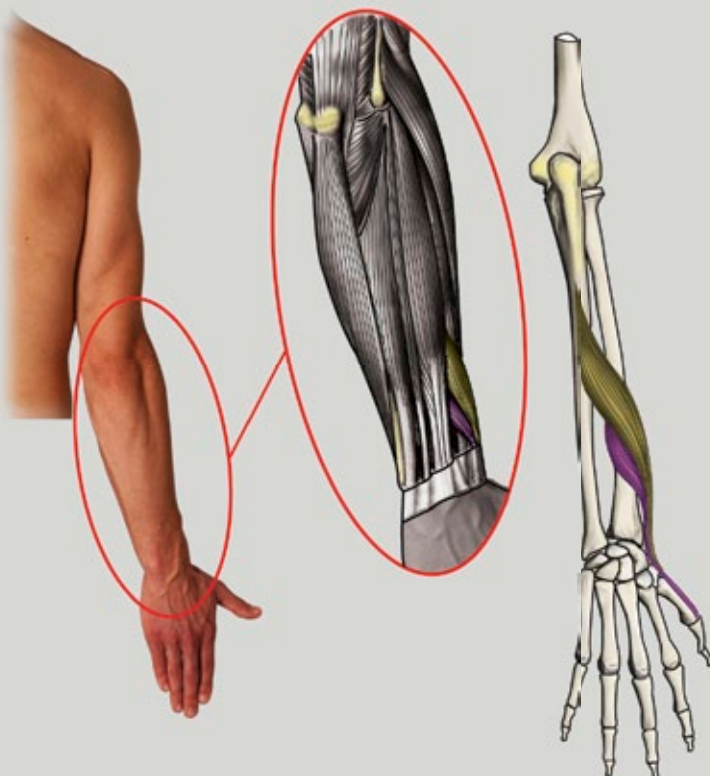
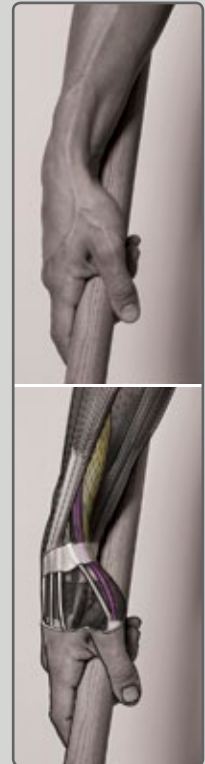
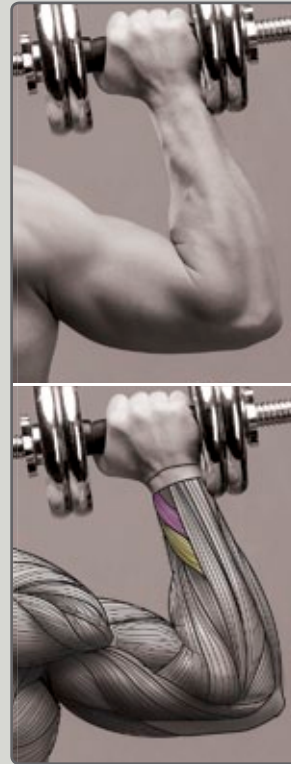
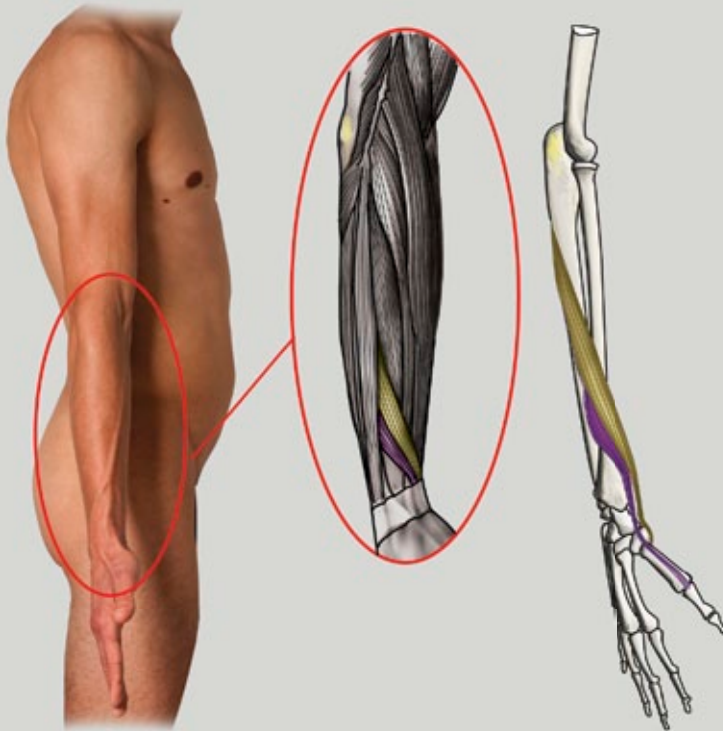
INSERTION:

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

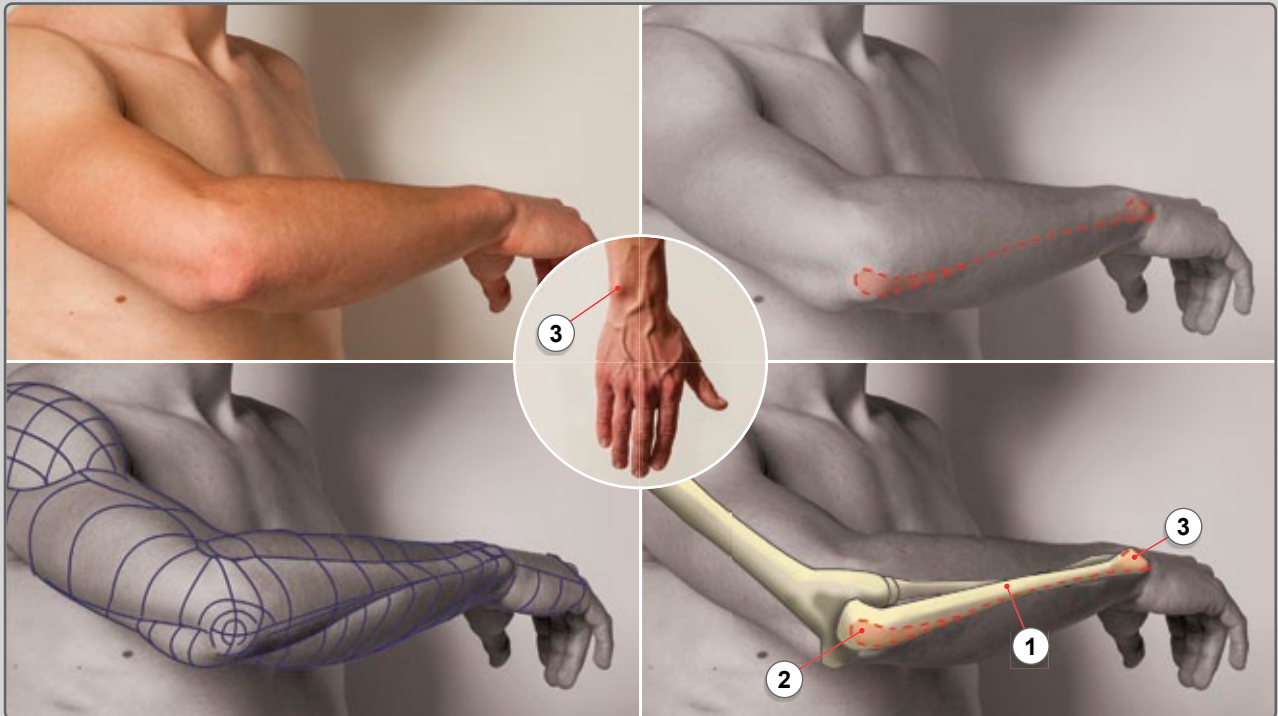
ORIGIN:

RADIUS AND THE INTEROSSEOUS MEMBRANE

INSERTION:

THUMB, PROXIMAL PHALANX

THE BODY OF THE ULNA

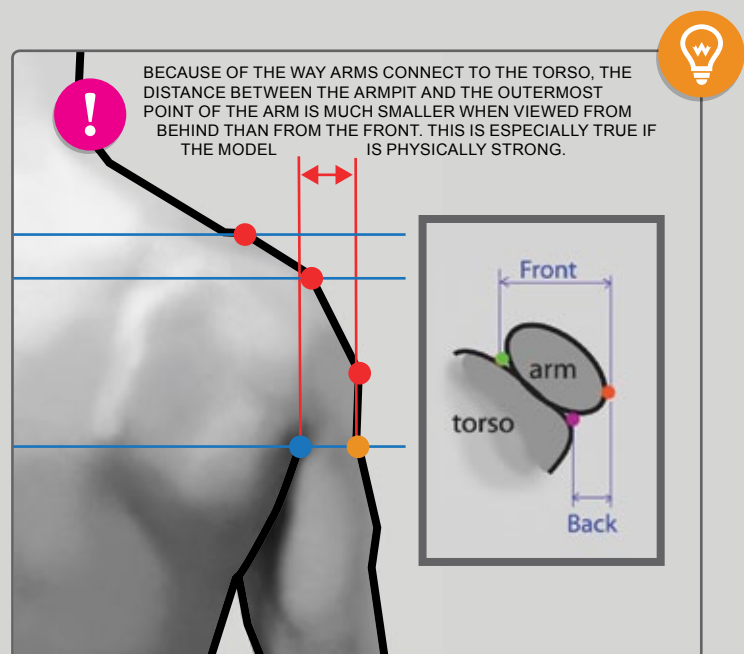
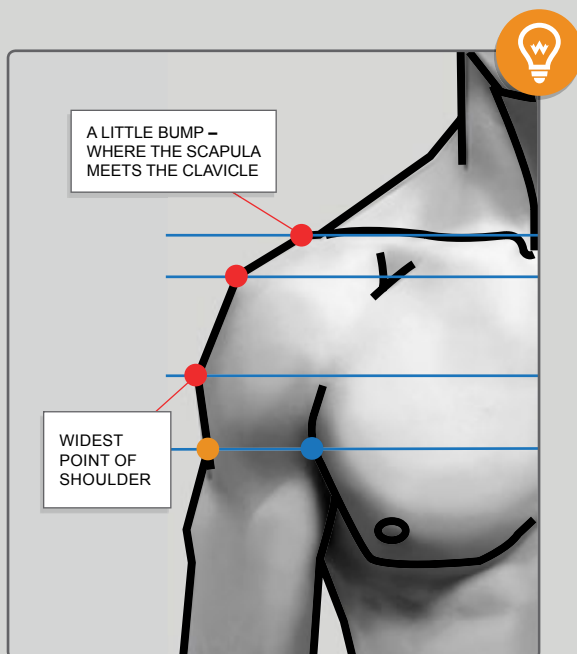
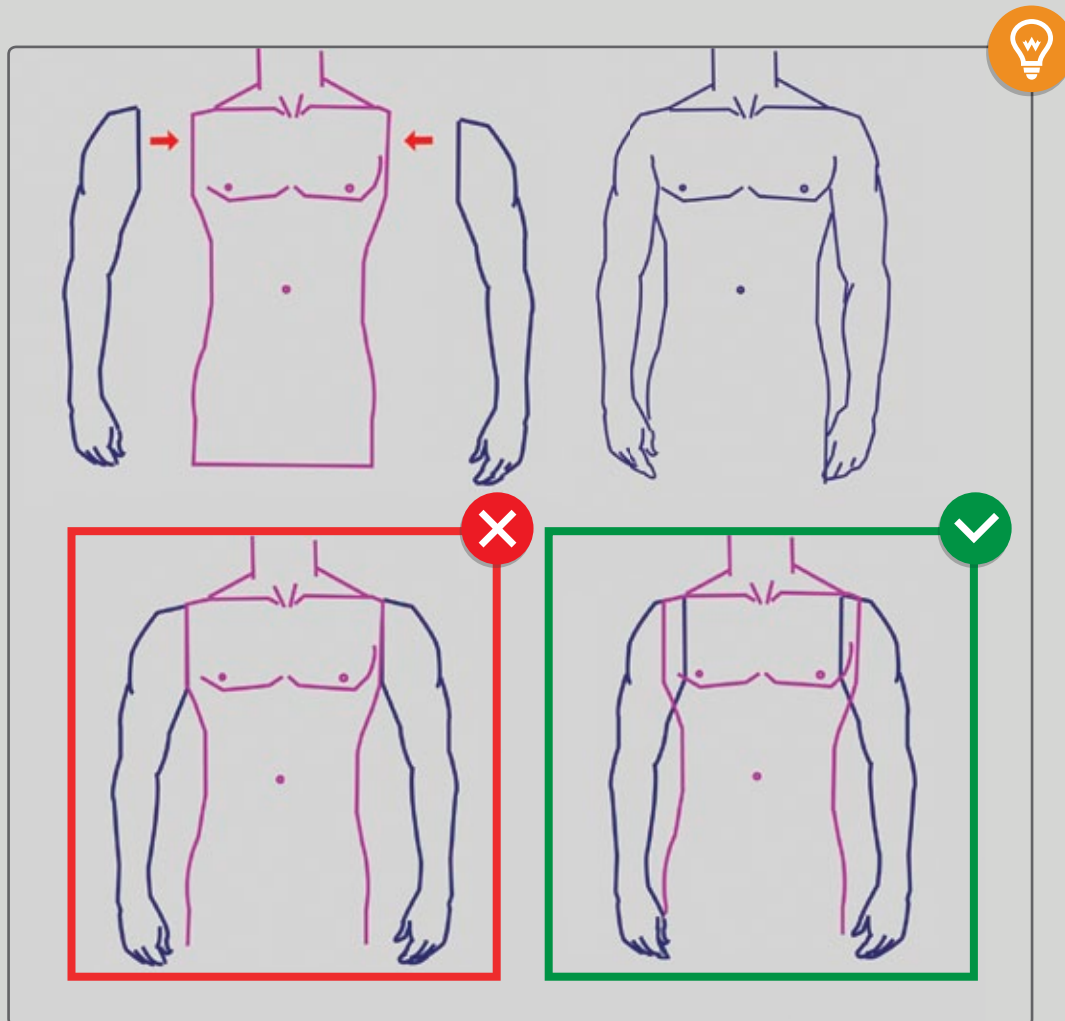


THE BODY OF **THE ULNA** ① IS AN IMPORTANT LANDMARK. WHEREVER YOU TURN THE HAND, THE ULNA ALWAYS EXTENDS FROM **THE ELBOW** ② TO LITTLE FINGER SIDE OF THE HAND, WHERE IT IS VISIBLE AS **A BUMP** ③ IT IS ALWAYS VISIBLE AS A RIDGE OR FURROW. BOTH ENDS OF THE BONE ARE NOT COVERED BY MUSCLES, ONLY BY THIN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

i



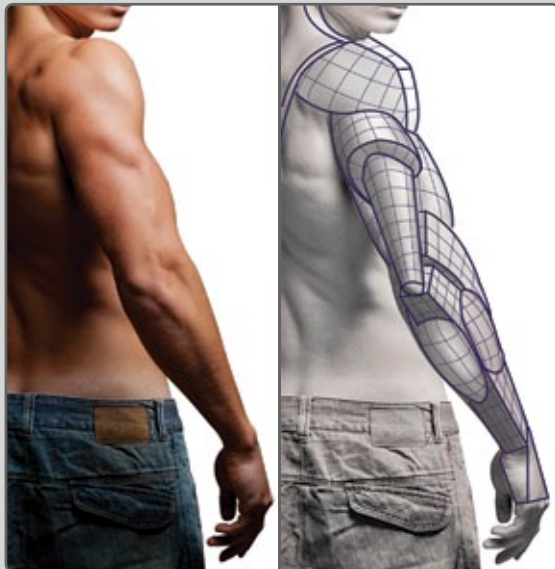
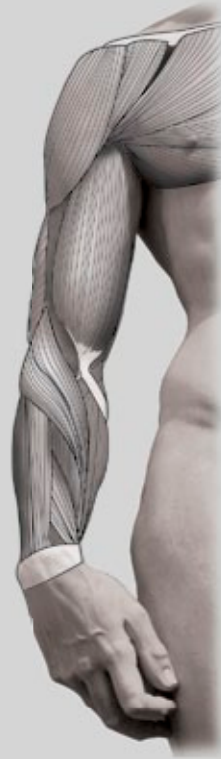
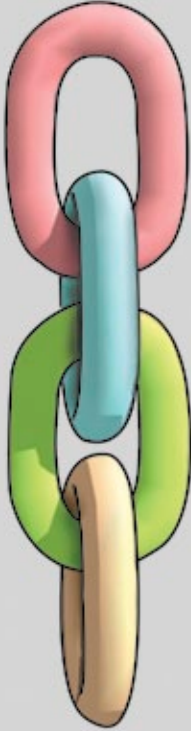
HOW ARMS CONNECT TO THE BODY



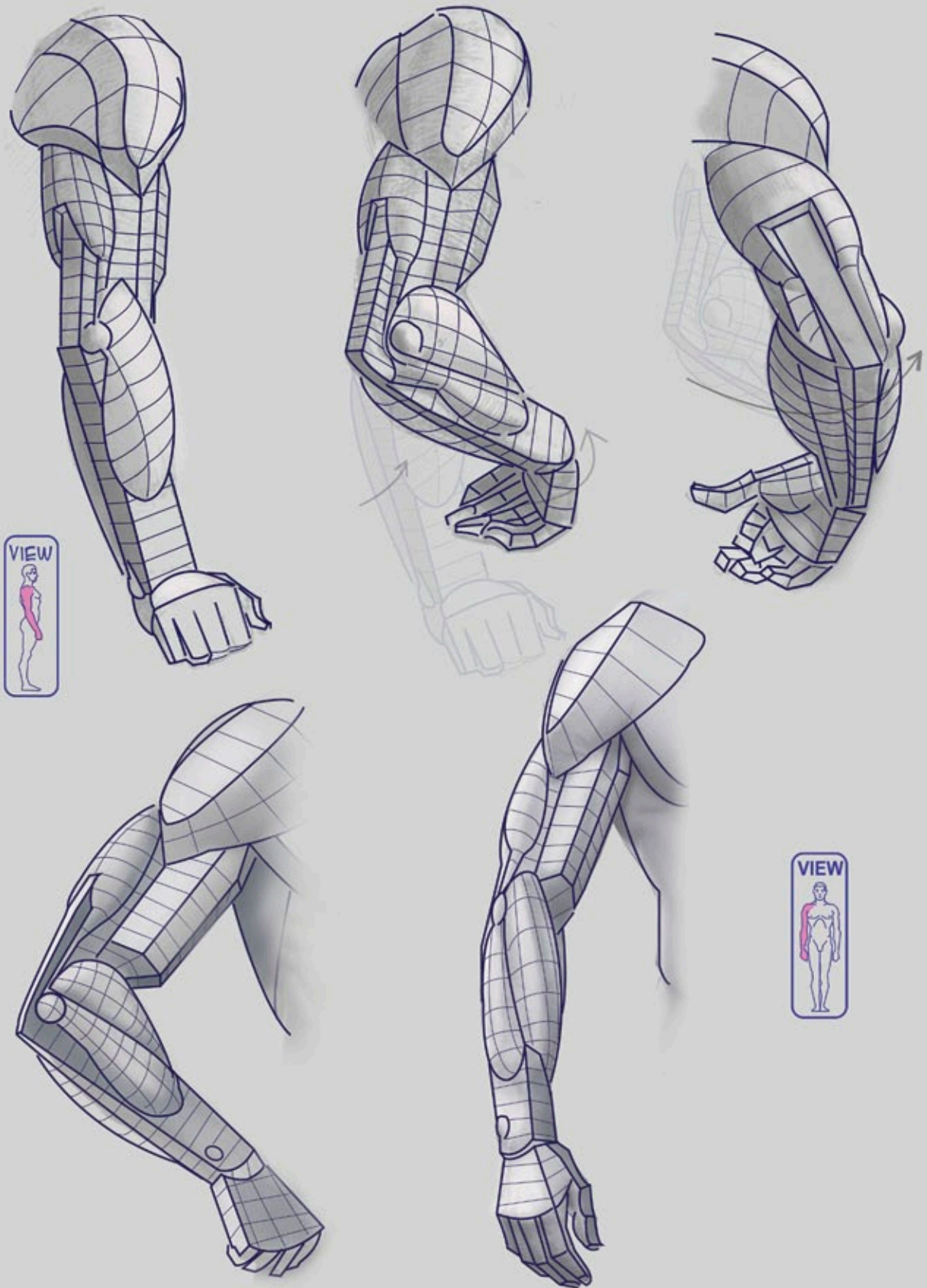
BLOCKING OUT A SEMIPRONATED ARM



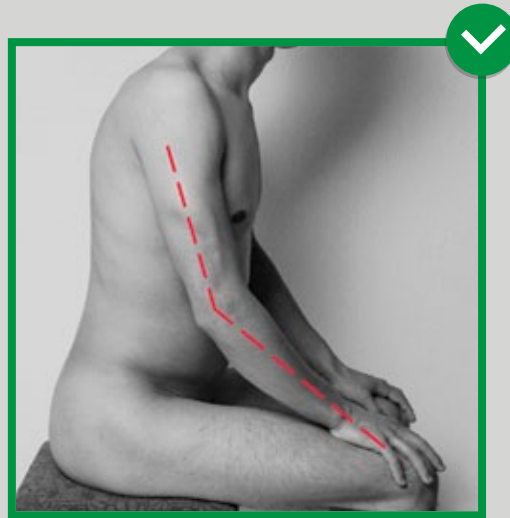
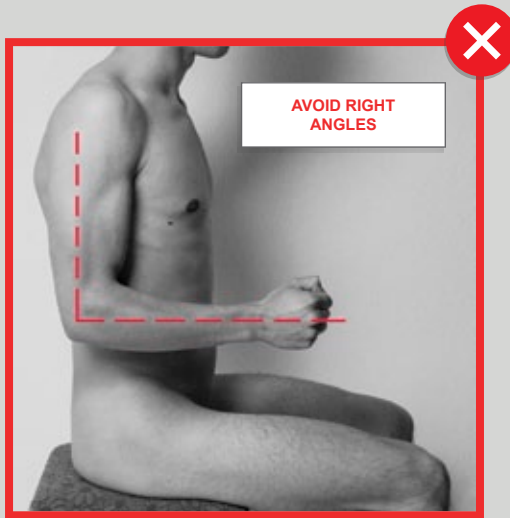
JUST LIKE A CHAIN



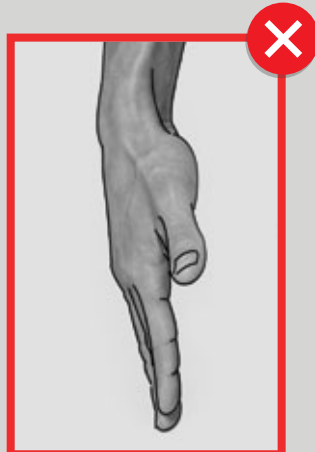
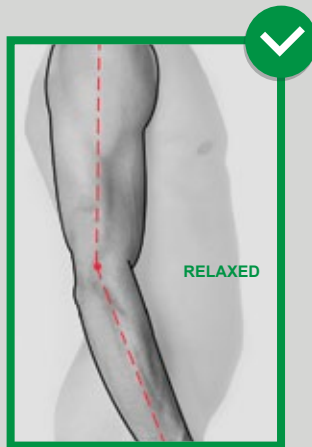
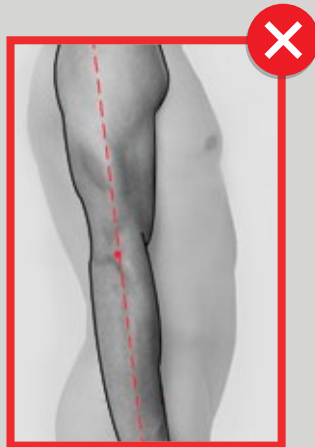
BLOCKING OUT AN ARM



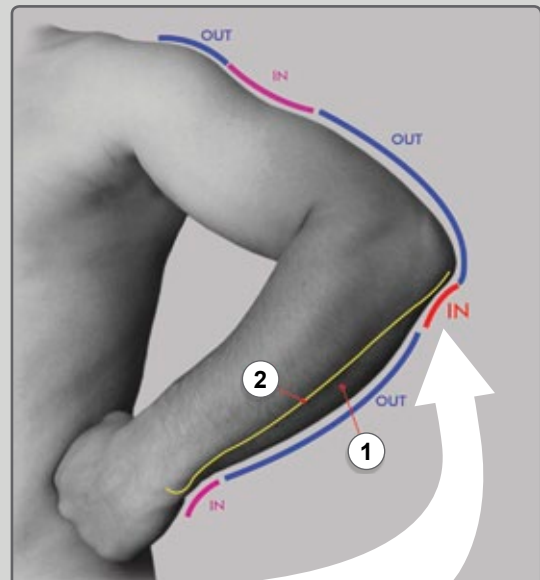
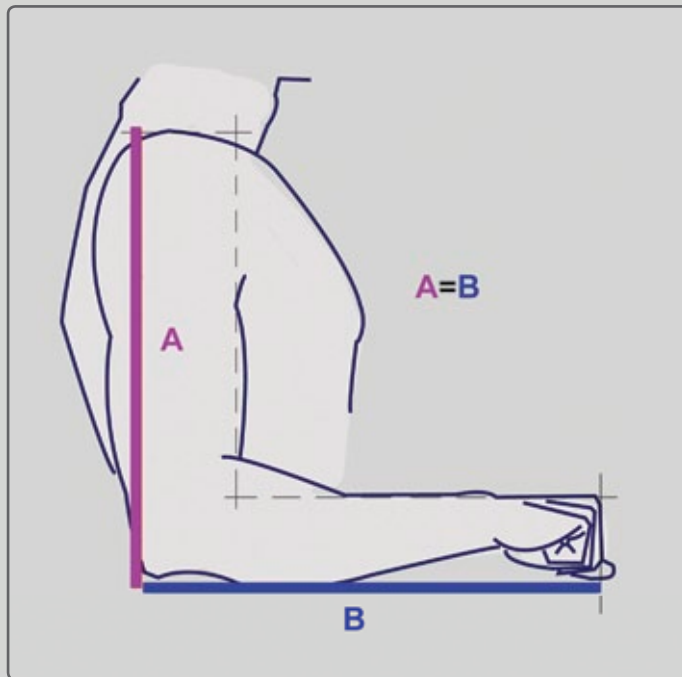
HOW DO YOU MAKE ARMS AND HANDS LOOK LESS STIFF?



DON'T MAKE ARMS OR HANDS STRAIGHT WITHOUT SPECIAL REASON.

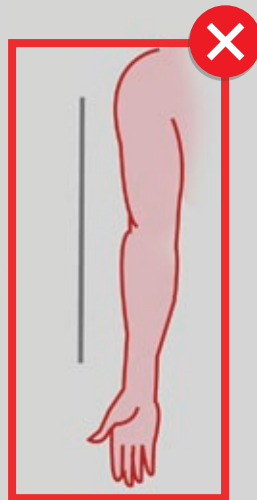


HANDY TIPS



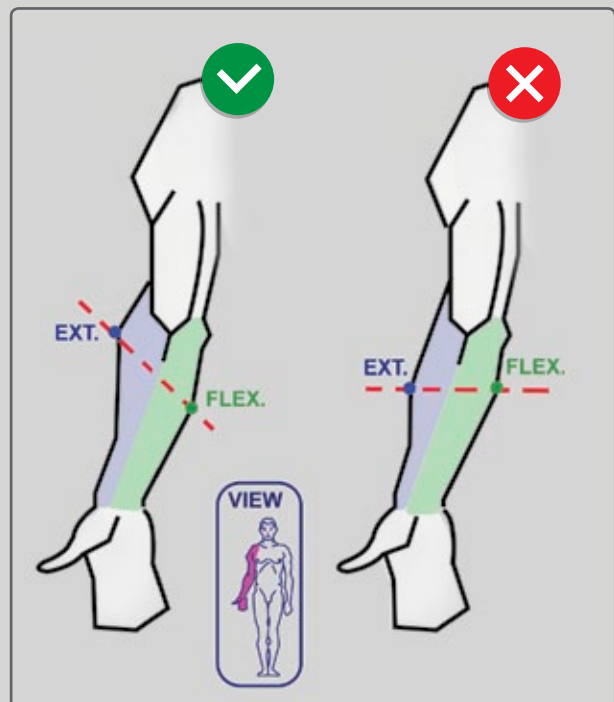
BODY SILHOUETTE APPEARS TO BEND **INWARD** RIGHT BELOW THE ELBOW DUE TO THE FLEXOR CARPI ULNARIS MUSCLE **①** POPPING **OUTWARD**.

ULNA BONE **②** REMAINS STRAIGHT.



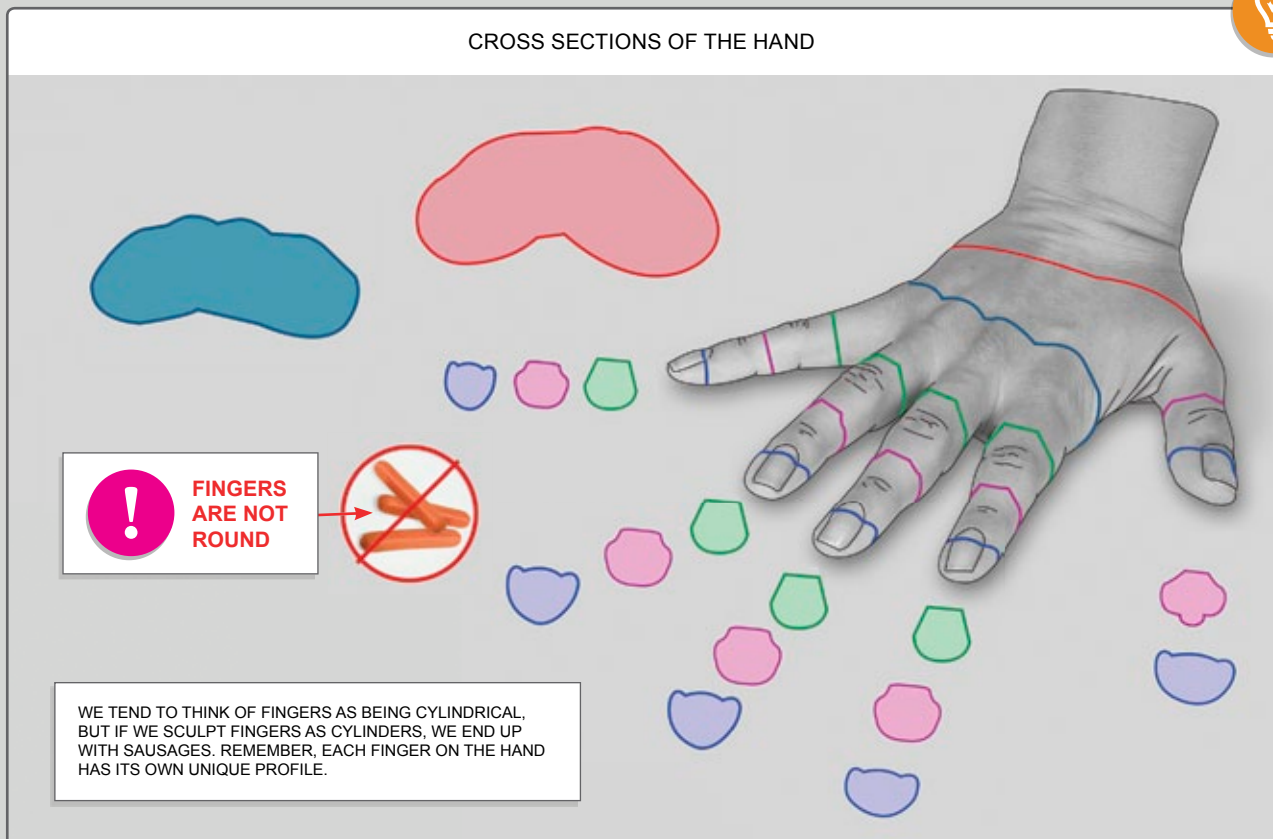
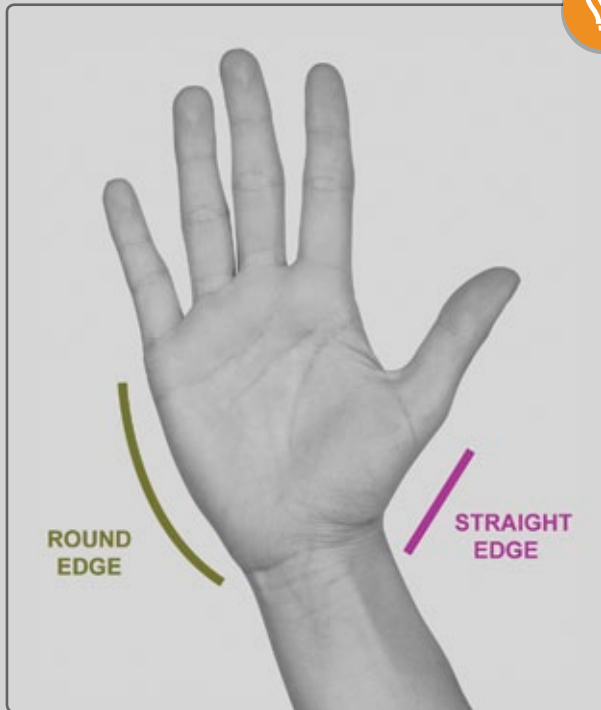
WHEN ARMS ARE HELD OUT AT THE SIDES WITH PALMS FACING FORWARD (SUPINATION), FOREARM AND HAND ARE ABOUT 5 TO 15 DEGREES AWAY FROM THE BODY. THIS IS CALLED "THE CARRYING ANGLE".

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

SIZE OF AN ADULT'S HAND



MAKE SURE YOU ARE MODELING THE HAND LARGE ENOUGH.

IDEALLY, HAND IS THE SAME SIZE AS FACE (FROM TIP OF CHIN TO HAIRLINE).

BABY

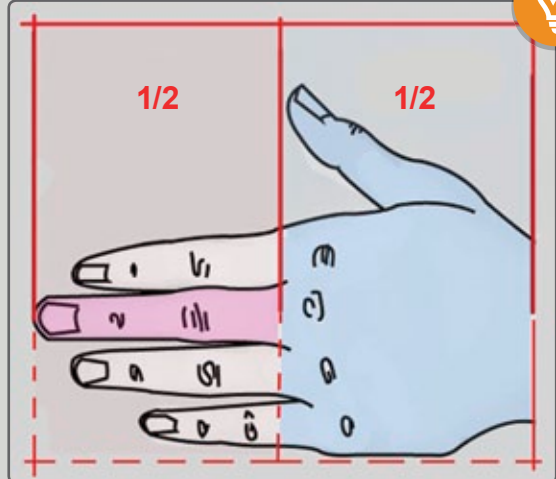


LENGTH OF HAND IS THE DISTANCE FROM CHIN TO EYEBROW LINE.

TEEN

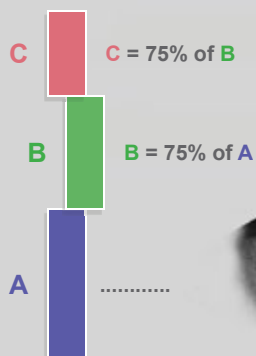


LENGTH OF HAND IS THE DISTANCE FROM CHIN TO THE MIDDLE OF FOREHEAD.

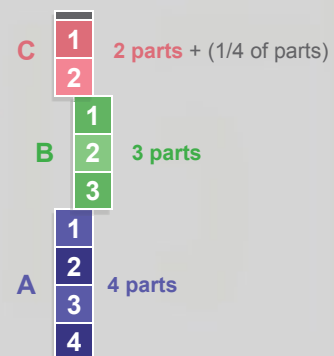


THERE ARE TWO METHODS YOU CAN USE TO CALCULATE FINGER LENGTH.

1st METHOD



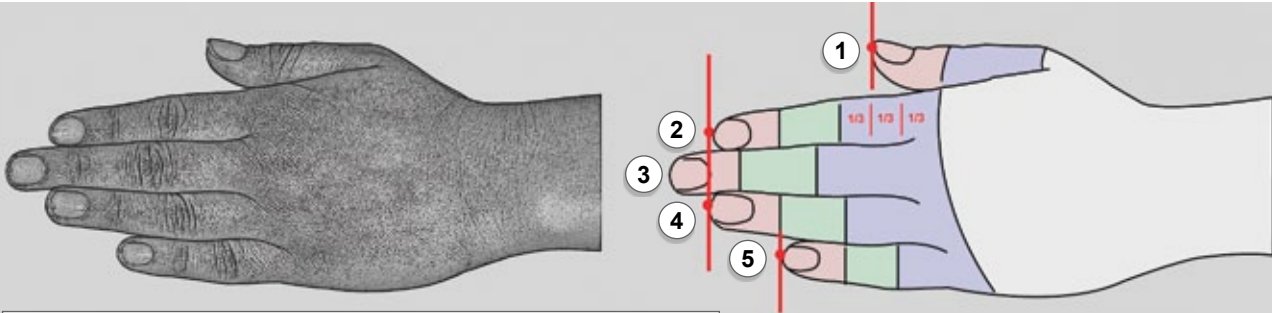
2nd METHOD (9+1/4 parts)



HAND

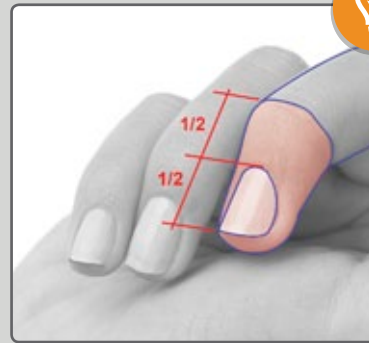
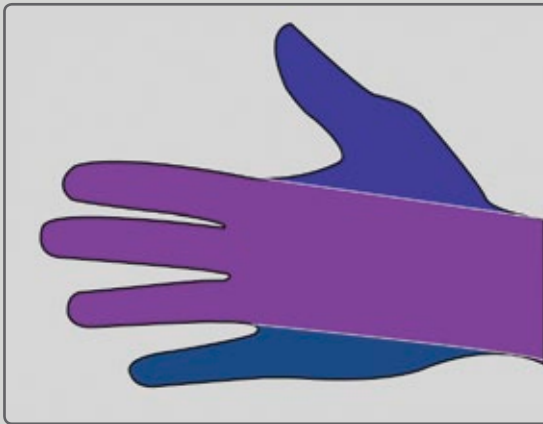
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FINGER LENGTHS OF AN IDEALIZED HAND

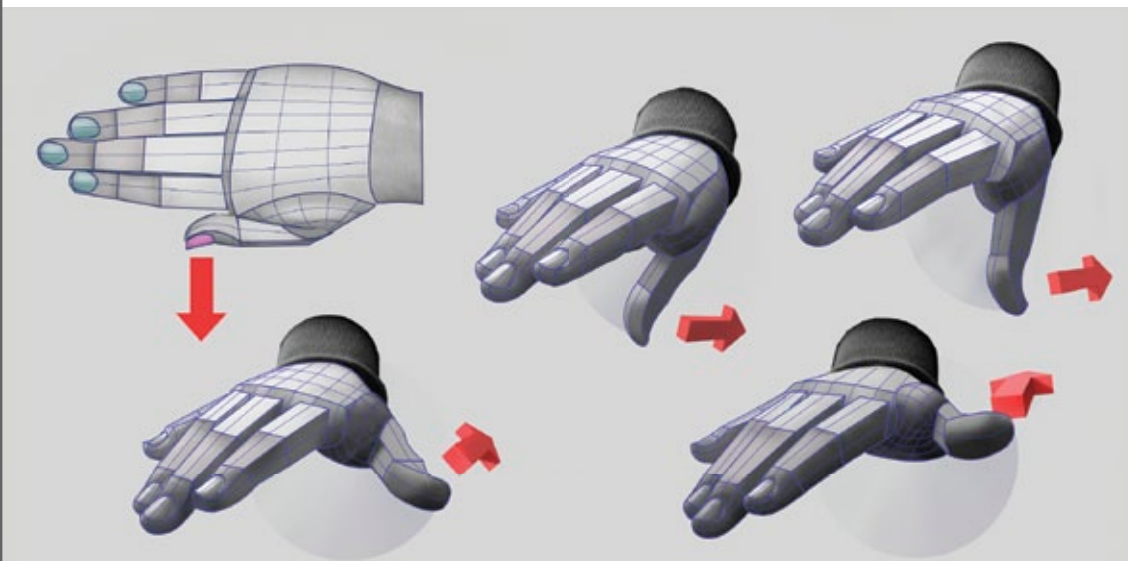


- ① THUMB DOES NOT POSSESS A MIDDLE (INTERMEDIATE) PHALANX!
- ② ③ ④ ⑤ FINGERS CONSIST OF 3 PHALANGES: PROXIMAL, MIDDLE AND DISTAL.

2 = 4

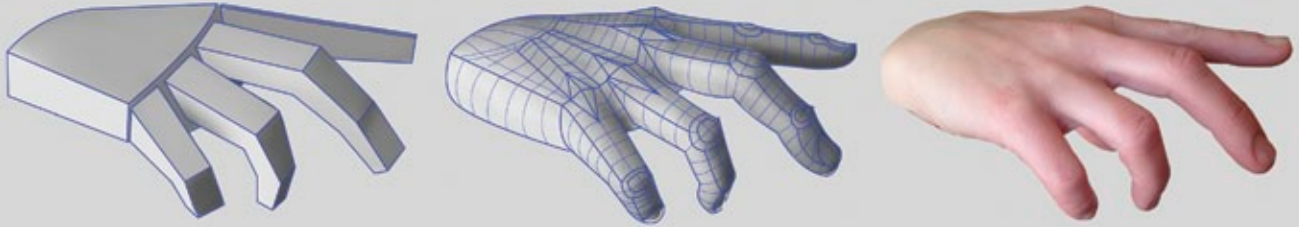


THUMB NAIL FACES A DIFFERENT DIRECTION THAN OTHER NAILS.

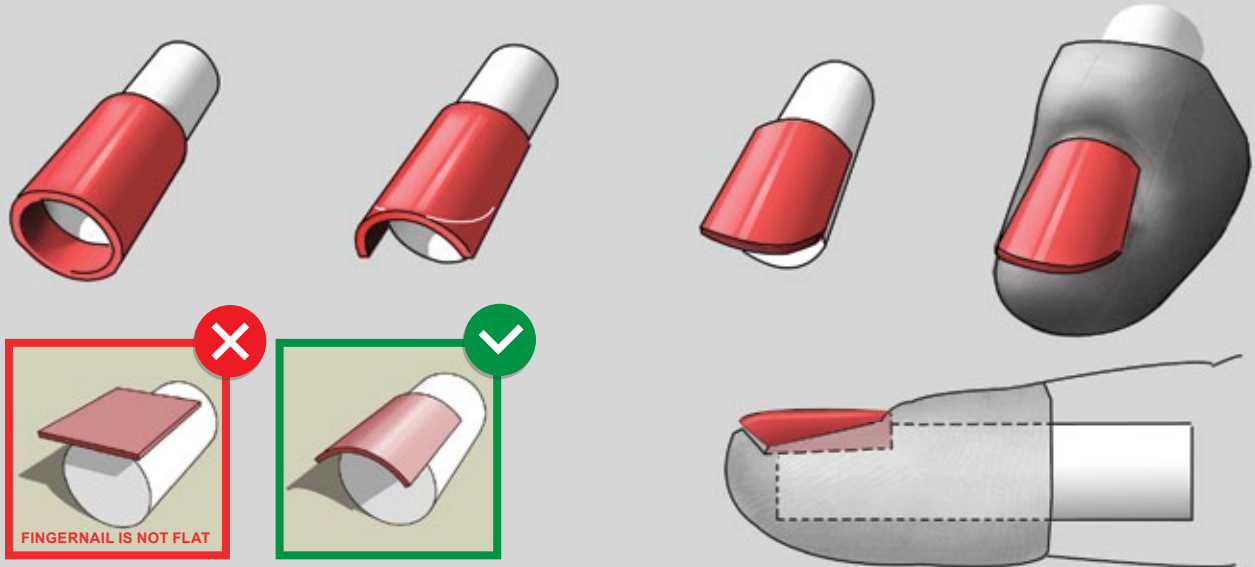


SHAPING HAND AND FINGERS

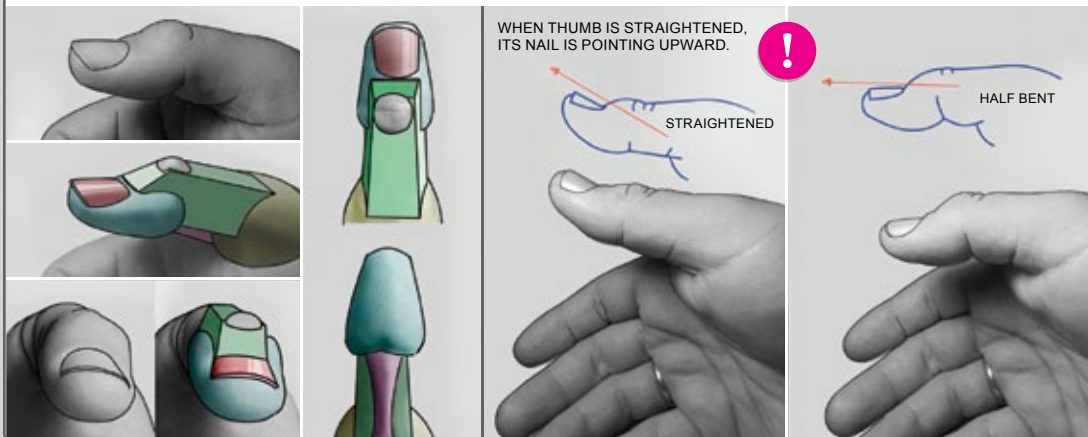
IT IS MUCH EASIER TO BEGIN MODELING FINGERS FROM SIMPLE SQUARE FORMS.



FINGERNAIL

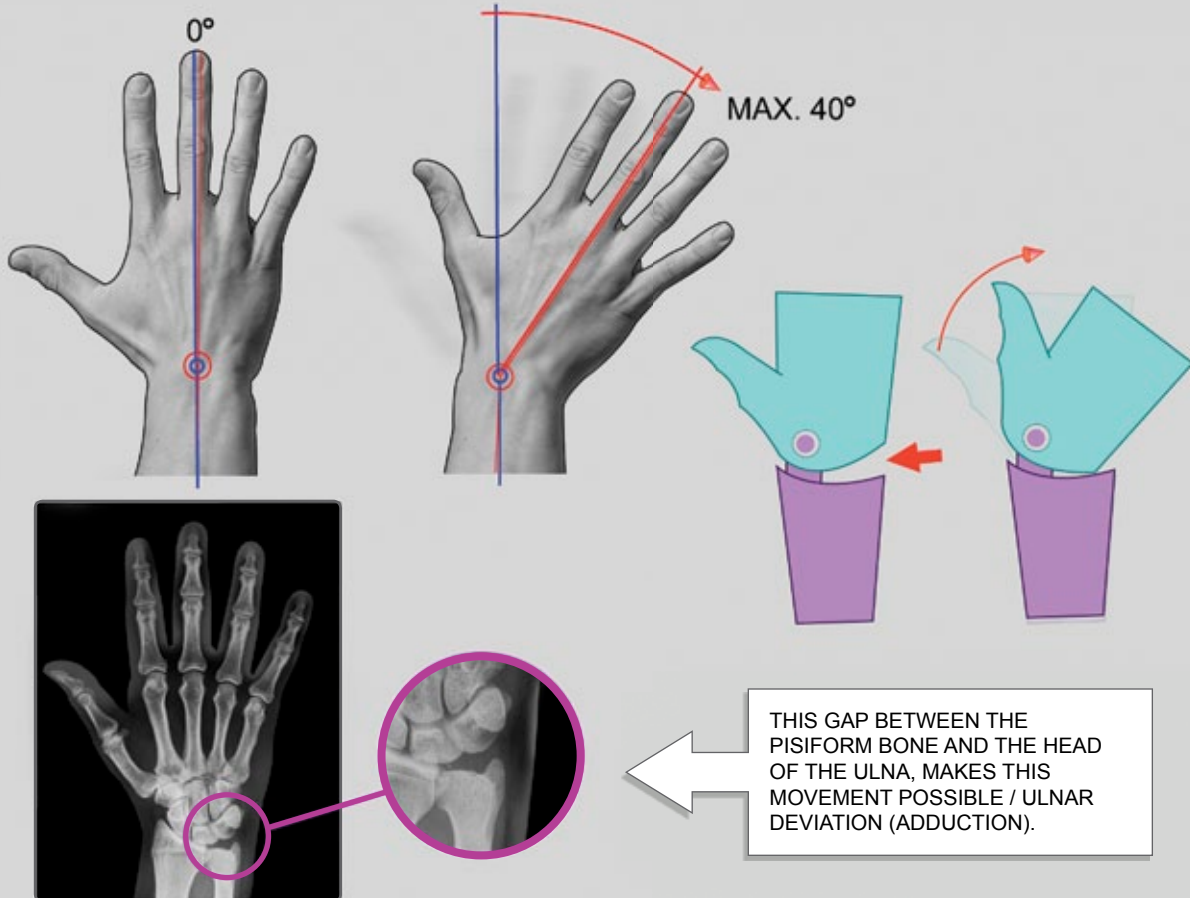


THUMB IS SHAPED DIFFERENTLY THAN OTHER FINGERS.

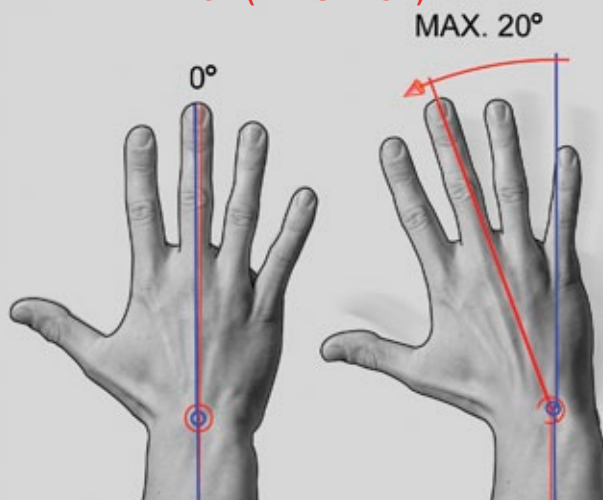


HAND MOVEMENTS

ULNAR DEVIATION (ADDUCTION)

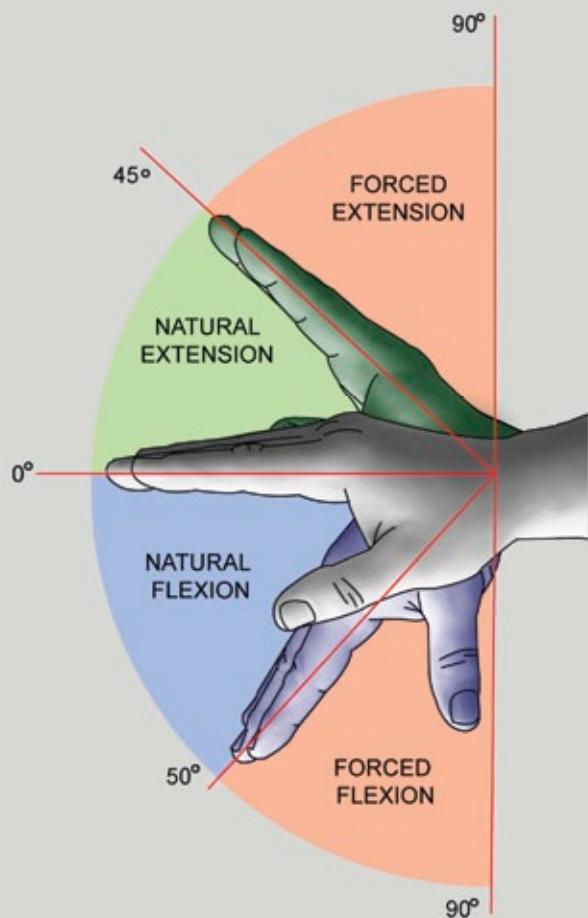
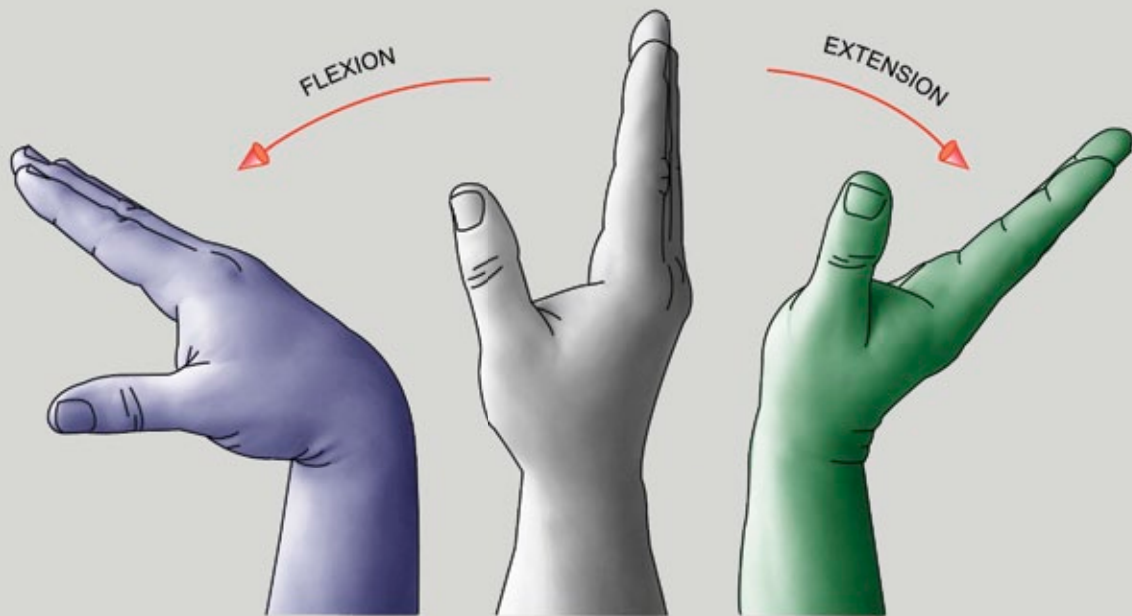


RADIAL DEVIATION (ABDUCTION)



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!

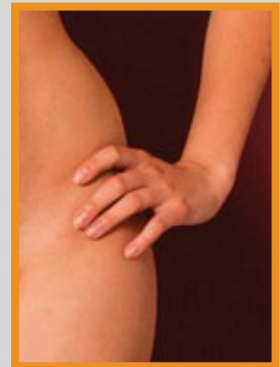
WRIST POSITIONS



EXTENSION



FORCED EXTENSION



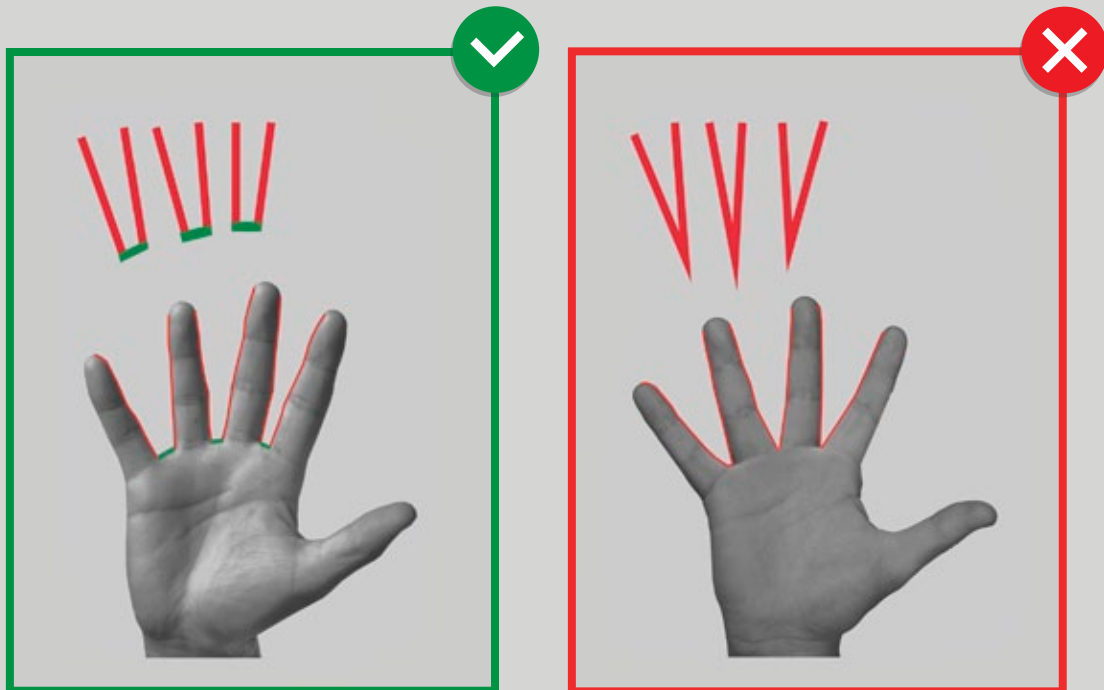
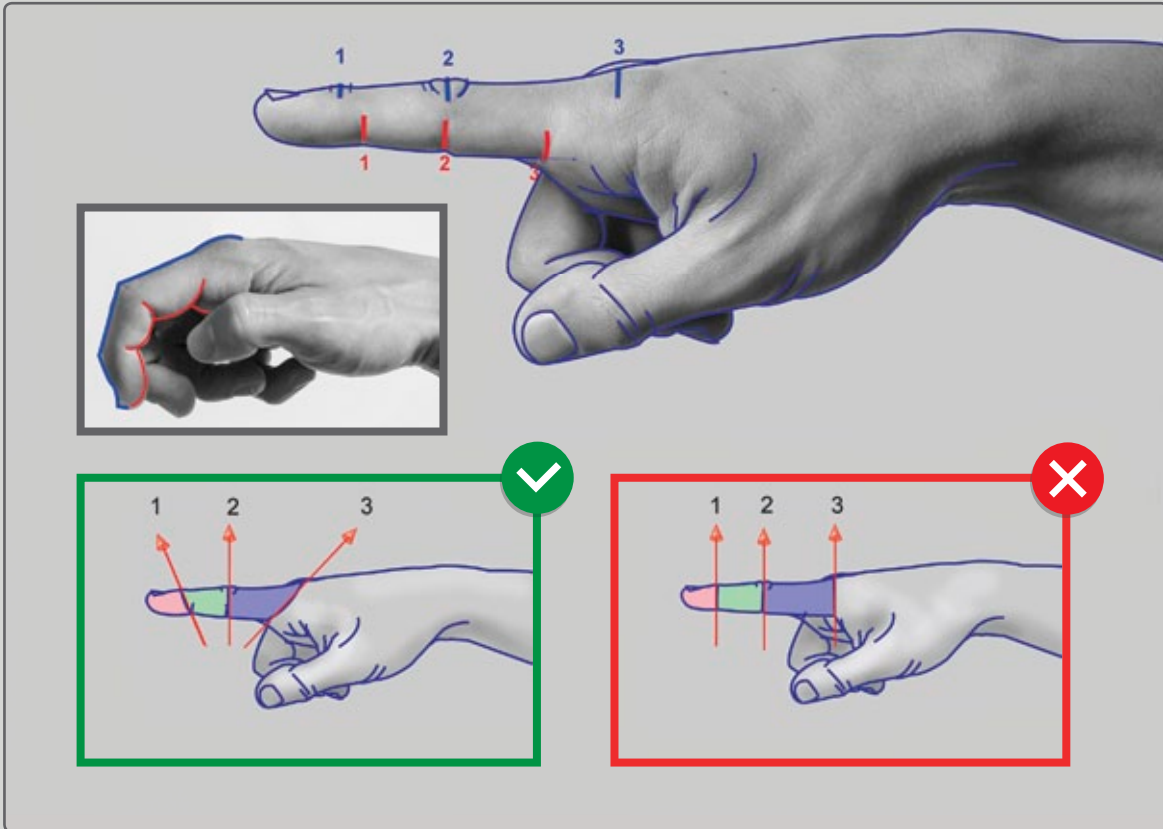
FLEXION



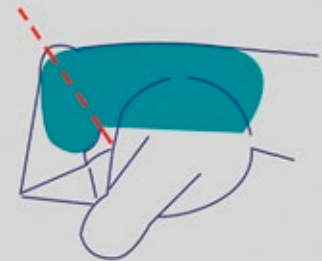
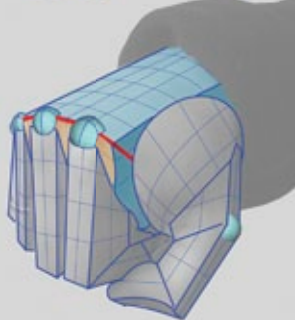
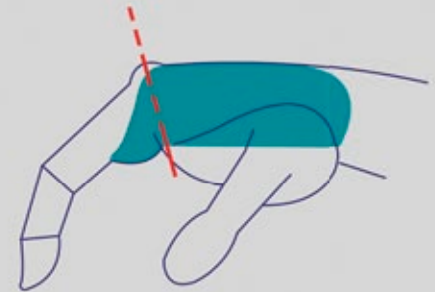
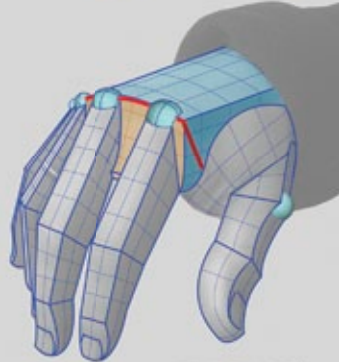
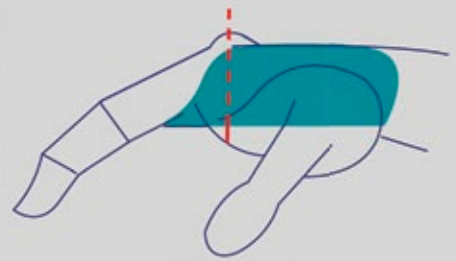
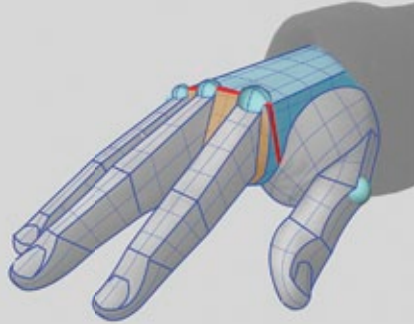
FORCED FLEXION



CREASES AND GAPS OF FINGERS

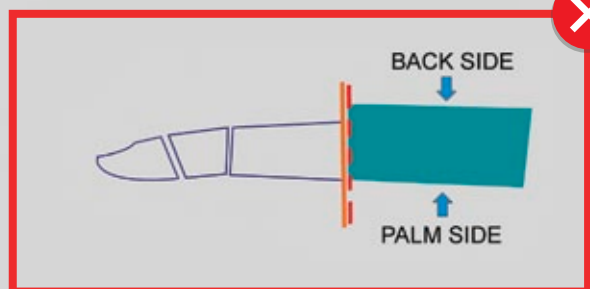
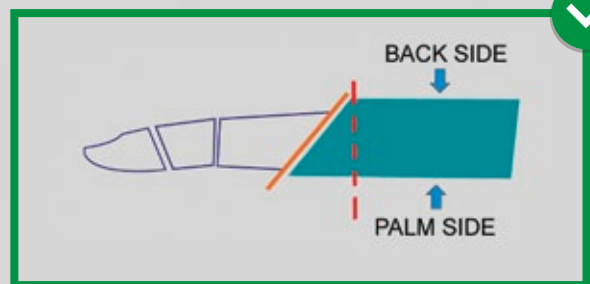
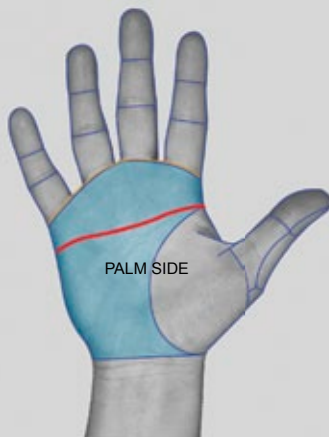
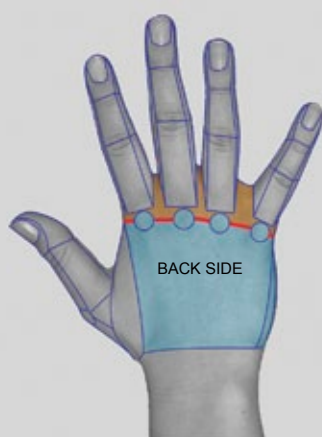


BENDING AND CONNECTION LINE OF FINGERS

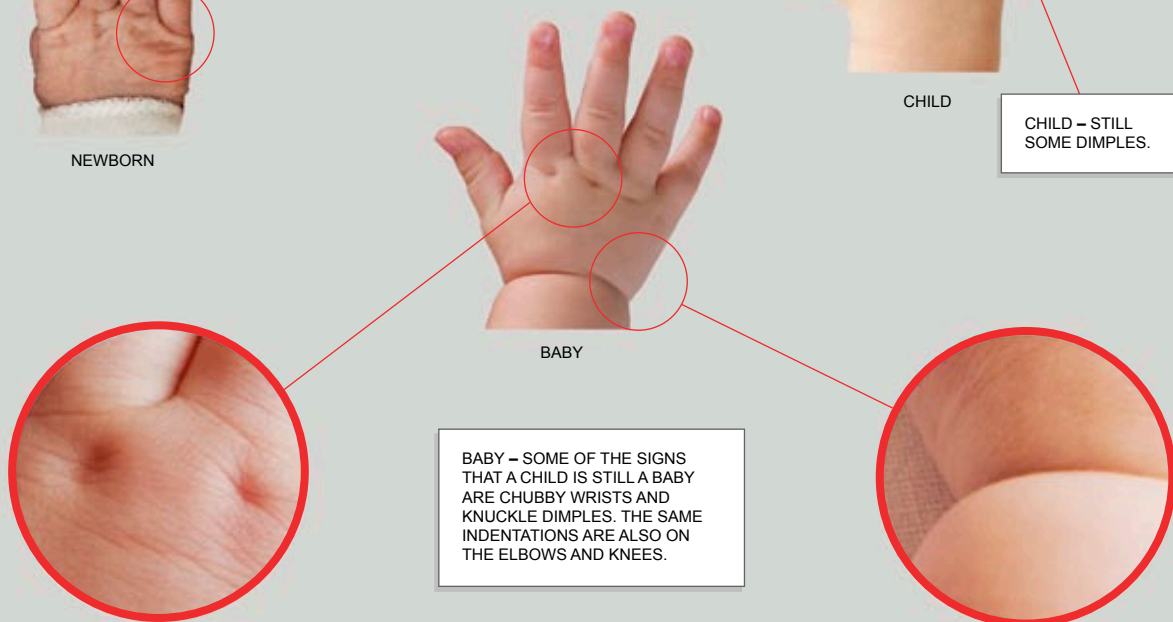
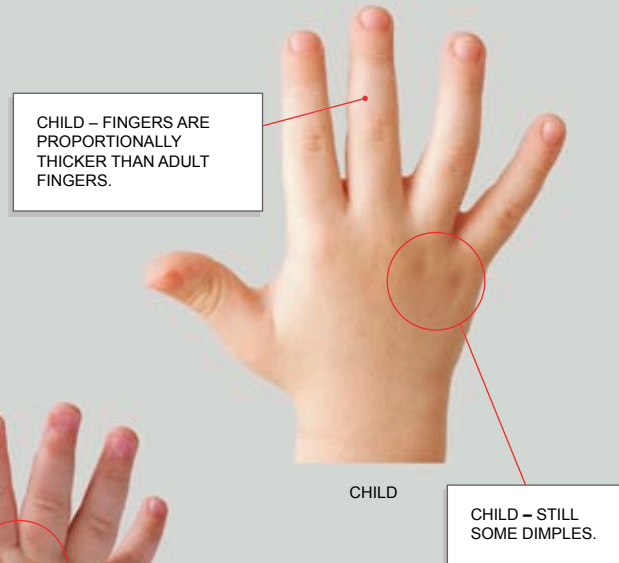


FINGERS ARE SHORTER FROM PALM SIDE OF THE HAND.

CREASE LINE ON THE PALM DOES NOT MATCH UP WITH **CONNECTION LINE** WHERE FINGERS JOIN **THE BODY OF THE HAND**.

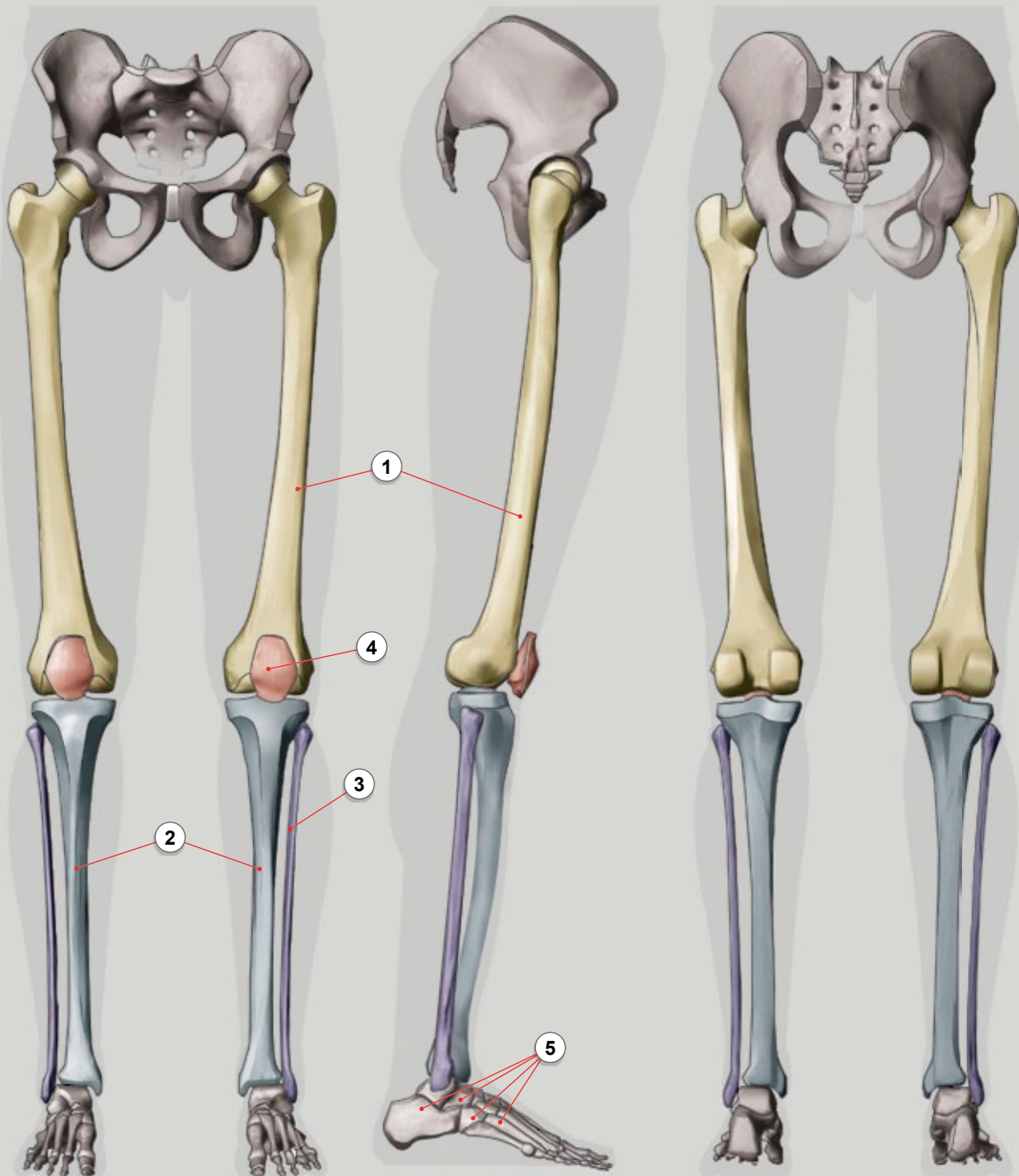


HOW HANDS AGE





BONES OF LOWER LIMB

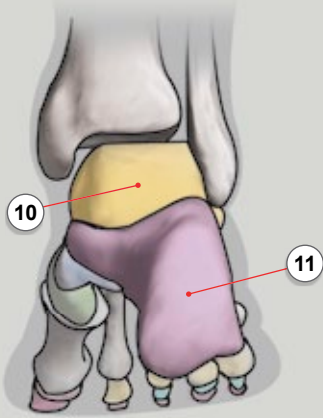


- | | | |
|----------------------|---------------------|----------|
| 1 FEMUR | 2 TIBIA | 3 FIBULA |
| 4 KNEE CAP (patella) | 5 BONES OF THE FOOT | |

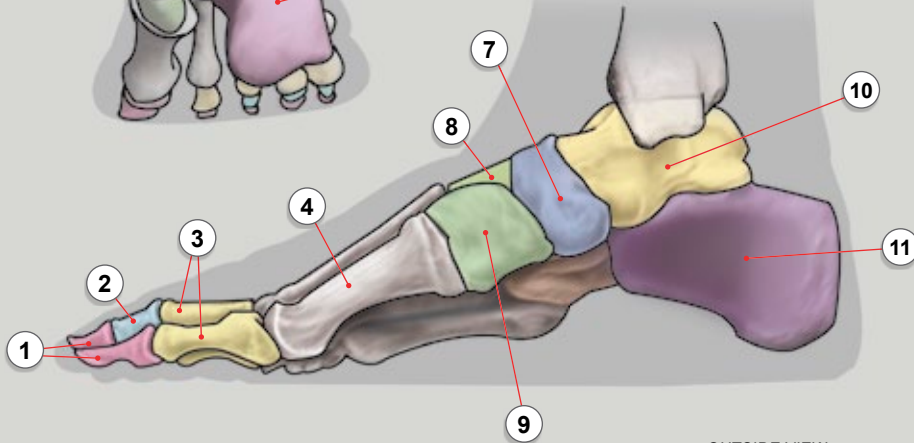
BONES OF THE FOOT



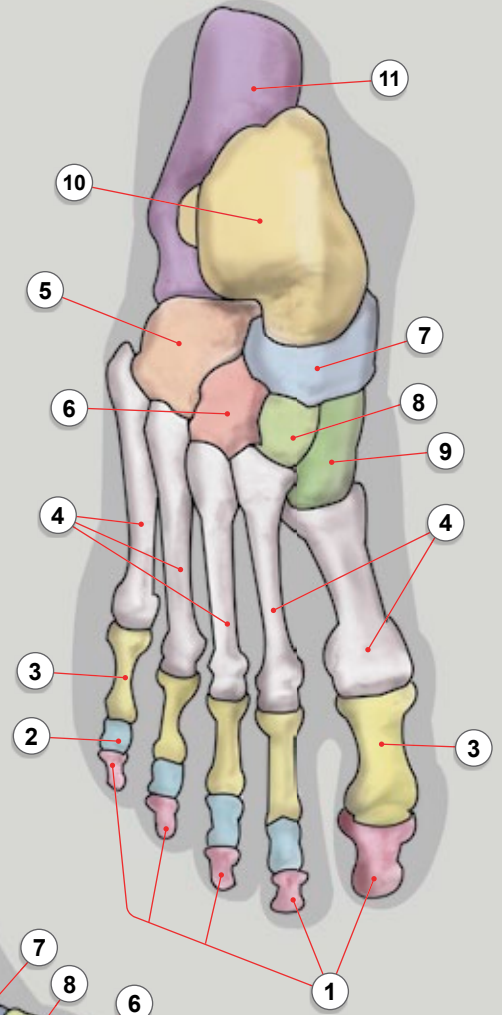
BACK VIEW



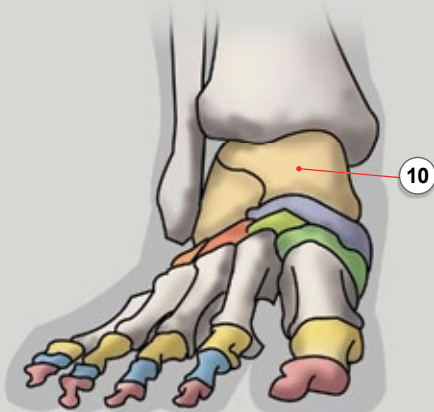
INSIDE VIEW



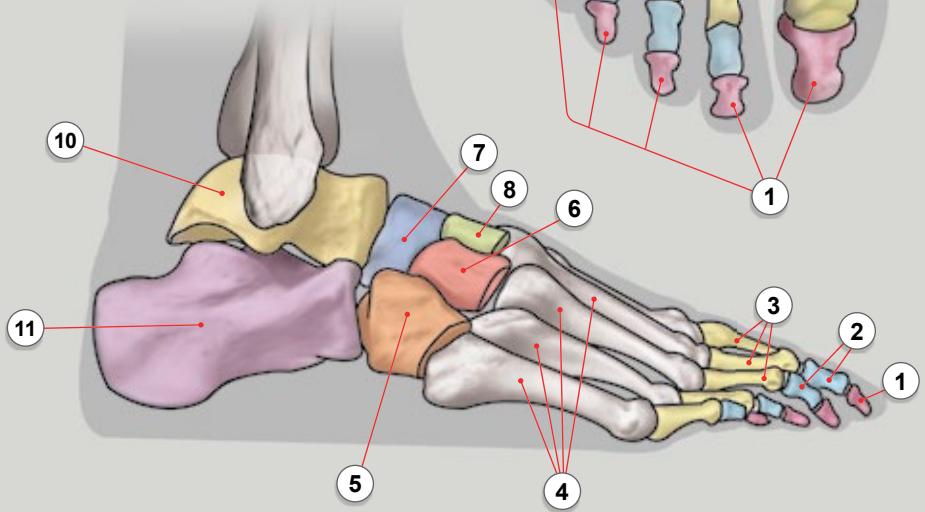
TOP VIEW



FRONT VIEW

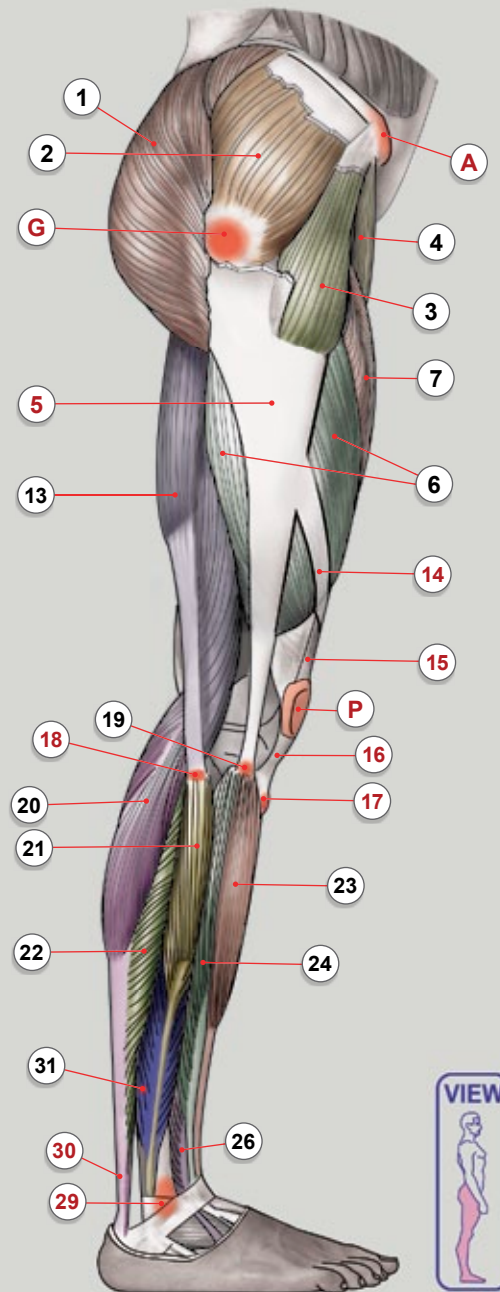
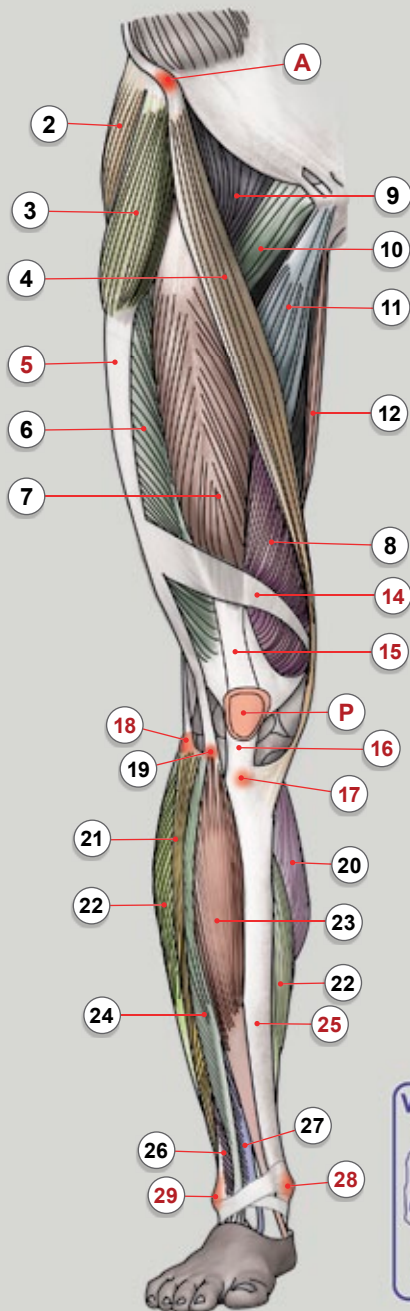


OUTSIDE VIEW



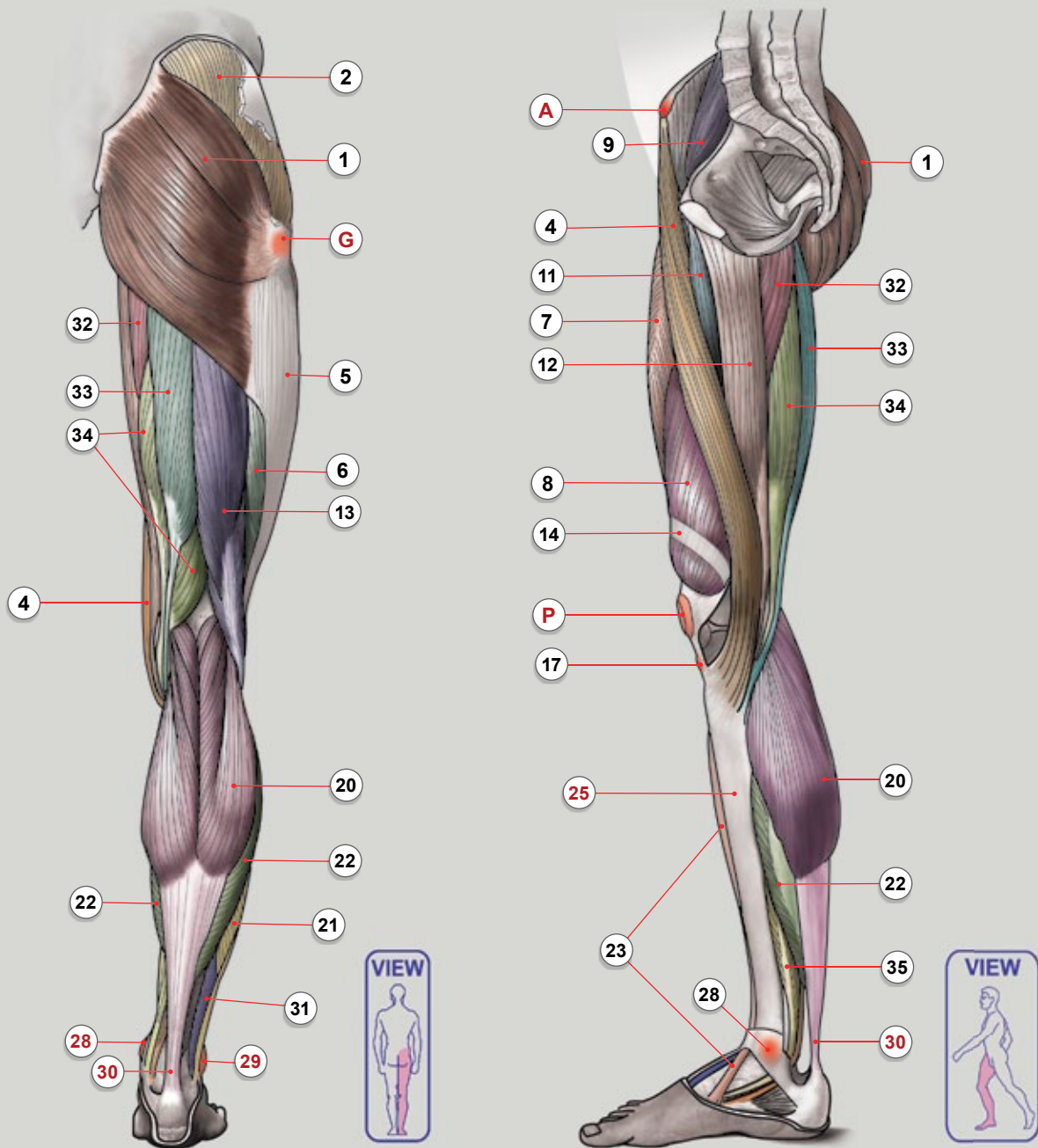
- | | | |
|----------------------|--------------------------|--------------------------|
| 1 DISTAL PHALANGES | 5 CUBOID | 9 MEDIAL CUNEIFORM |
| 2 MIDDLE PHALANGES | 6 LATERAL CUNEIFORM | 10 TALUS |
| 3 PROXIMAL PHALANGES | 7 NAVICULAR | 11 HEEL BONE (calcaneus) |
| 4 METATARSAL BONES | 8 INTERMEDIATE CUNEIFORM | |

MUSCLES OF LOWER LIMB



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

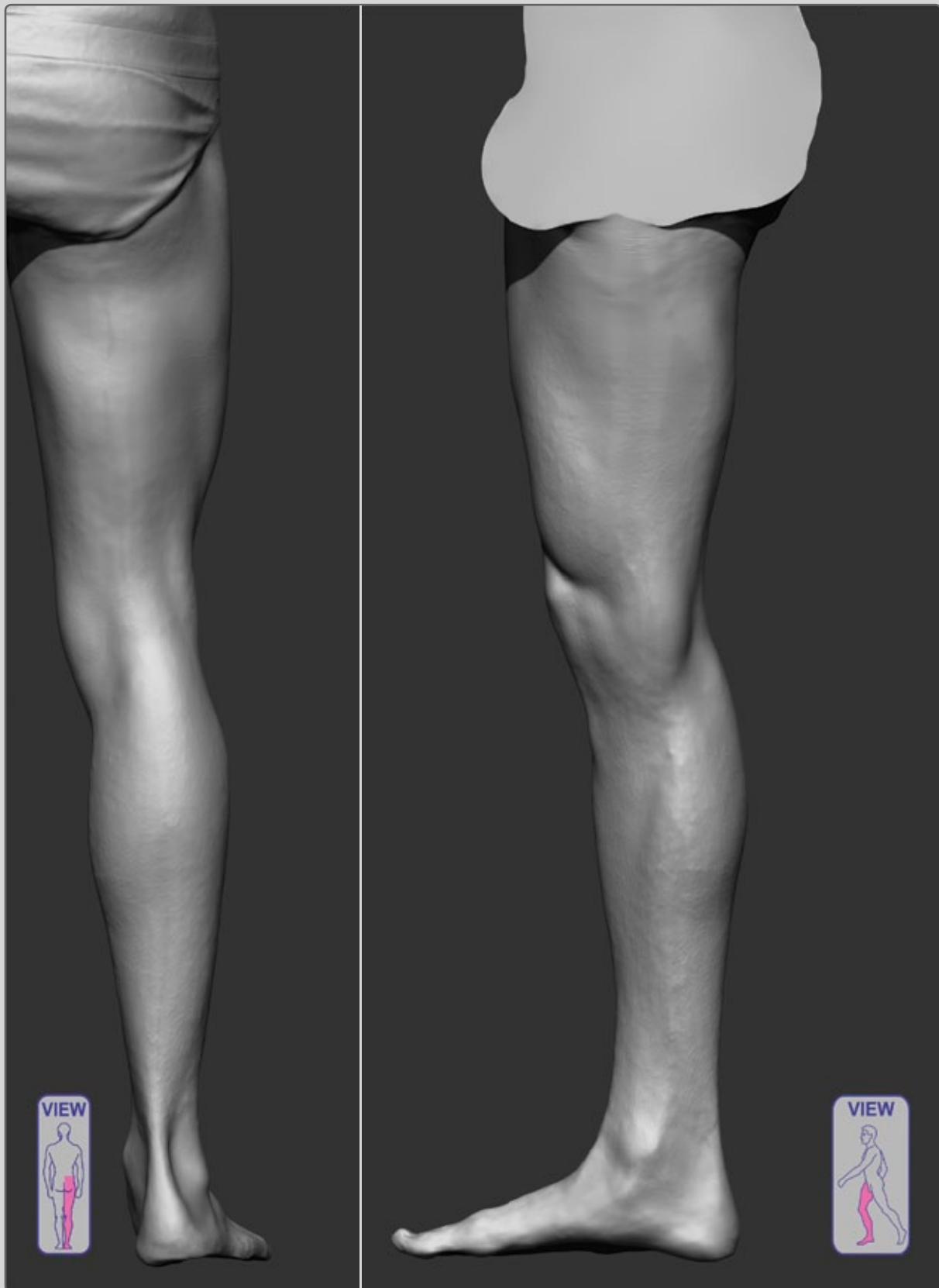


- | | | |
|------------------------------|---------------------------------|----------------------------|
| 19 LATERAL TIBIAL CONDYLE | 25 MEDIAL SURFACE OF TIBIA | 31 PERONEUS BREVIS |
| 20 GASTROCNEMIUS | 26 PERONEUS TERTIUS | 32 ADDUCTOR MAGNUS |
| 21 PERONEUS LONGUS | 27 EXTENSOR HALLUCIS LONGUS | 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 | |

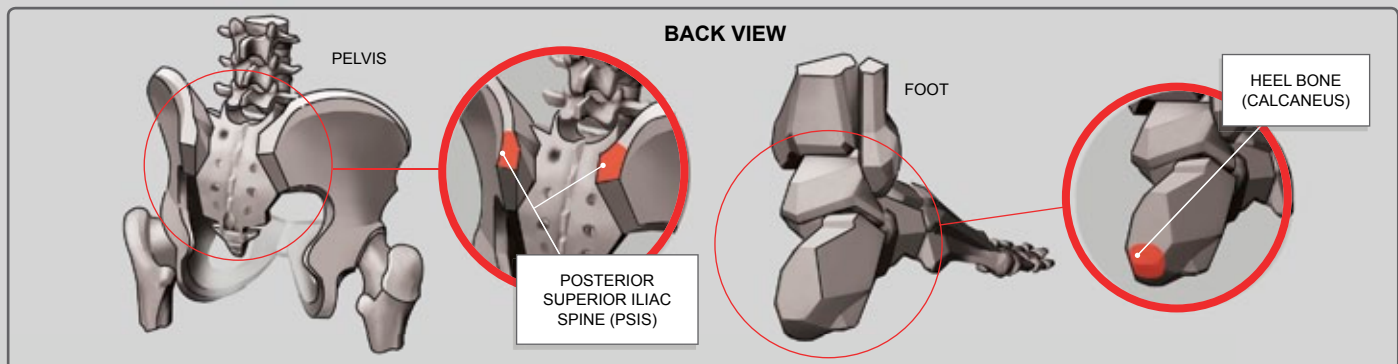
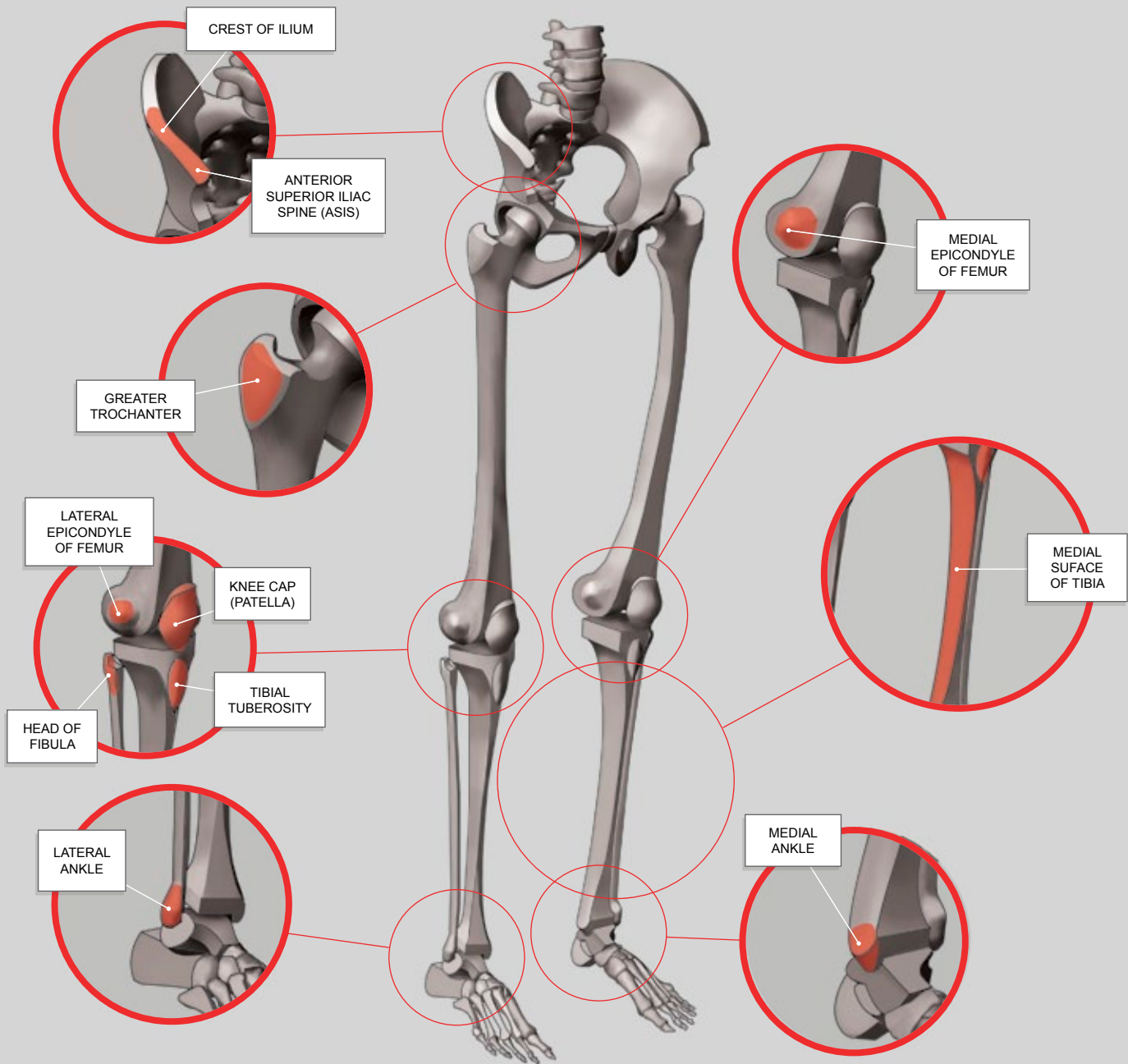
3D SCAN OF RIGHT LEG



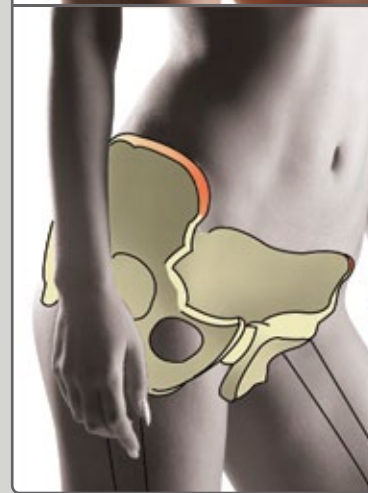
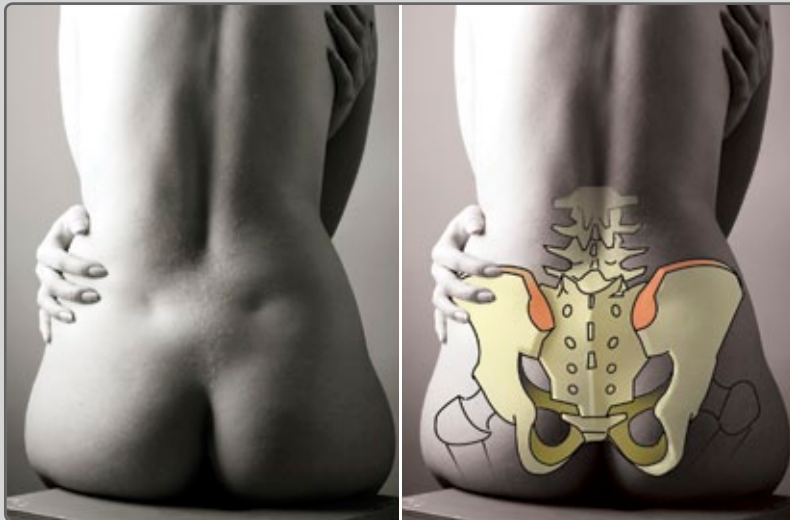
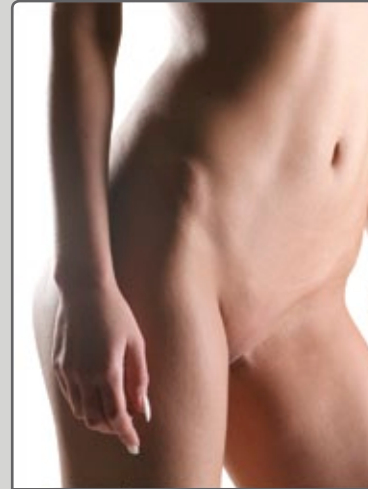
3D SCAN OF RIGHT LEG



BONY LANDMARKS OF LOWER LIMB

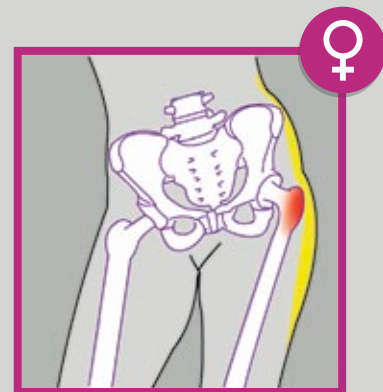
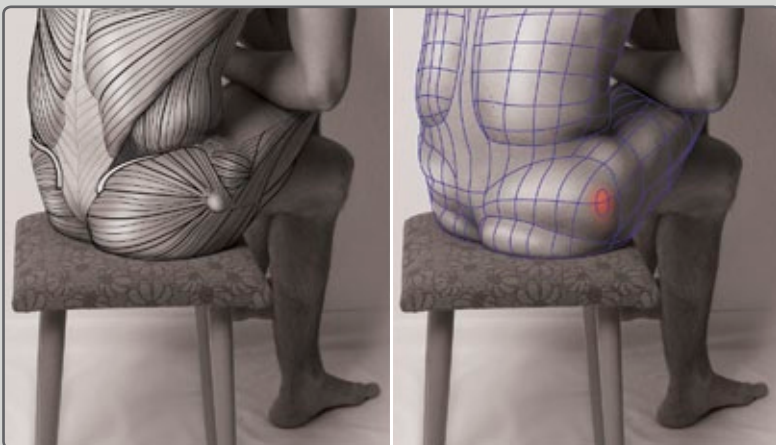
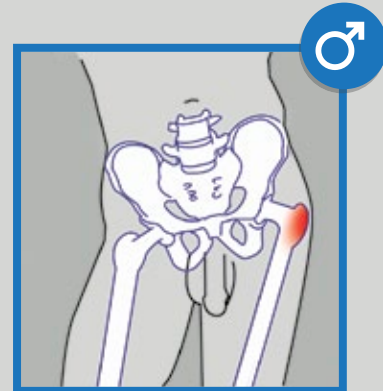
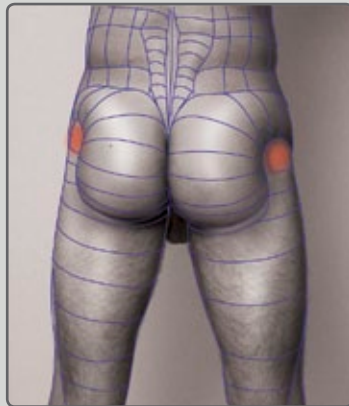
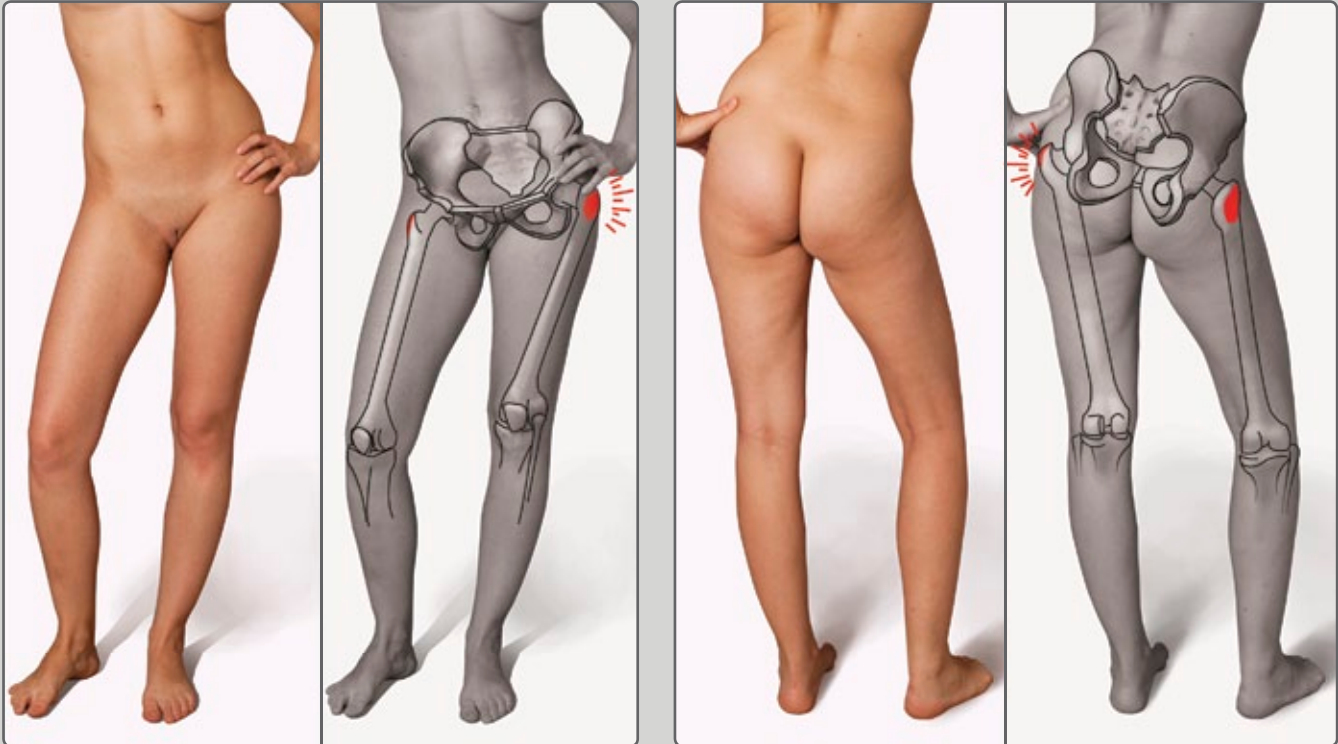


BONY LANDMARKS OF PELVIS



BONY LANDMARKS OF LOWER LIMB

GREATER TROCHANTER



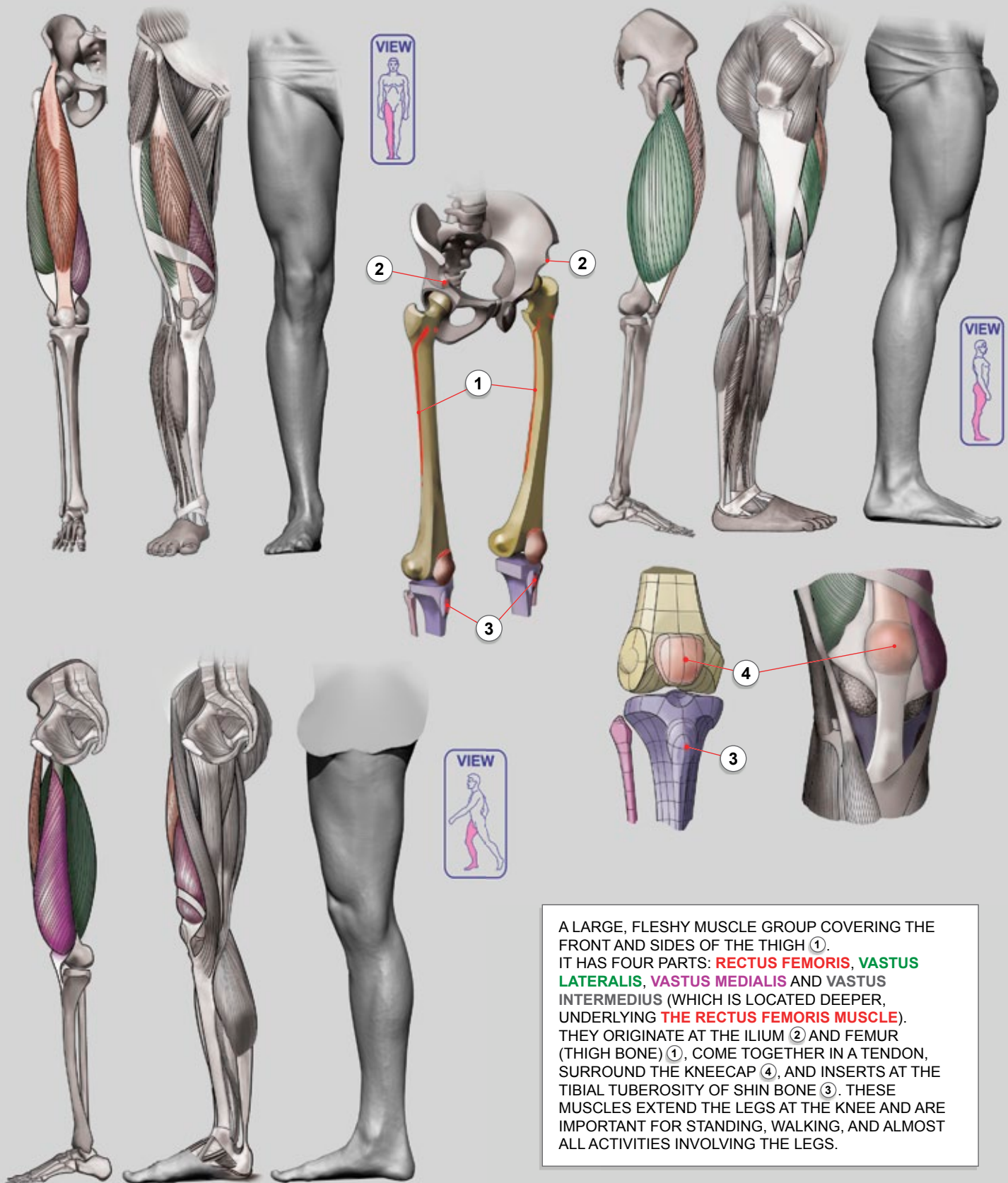
IN FEMALE HIPs, **SUBCUTANEOUS FAT** COVERS **GT** AT THE TOP OF FEMUR AND THEREFORE MAKES IT LESS PROMINENT.

MALE LEG SHAPES



QUADS

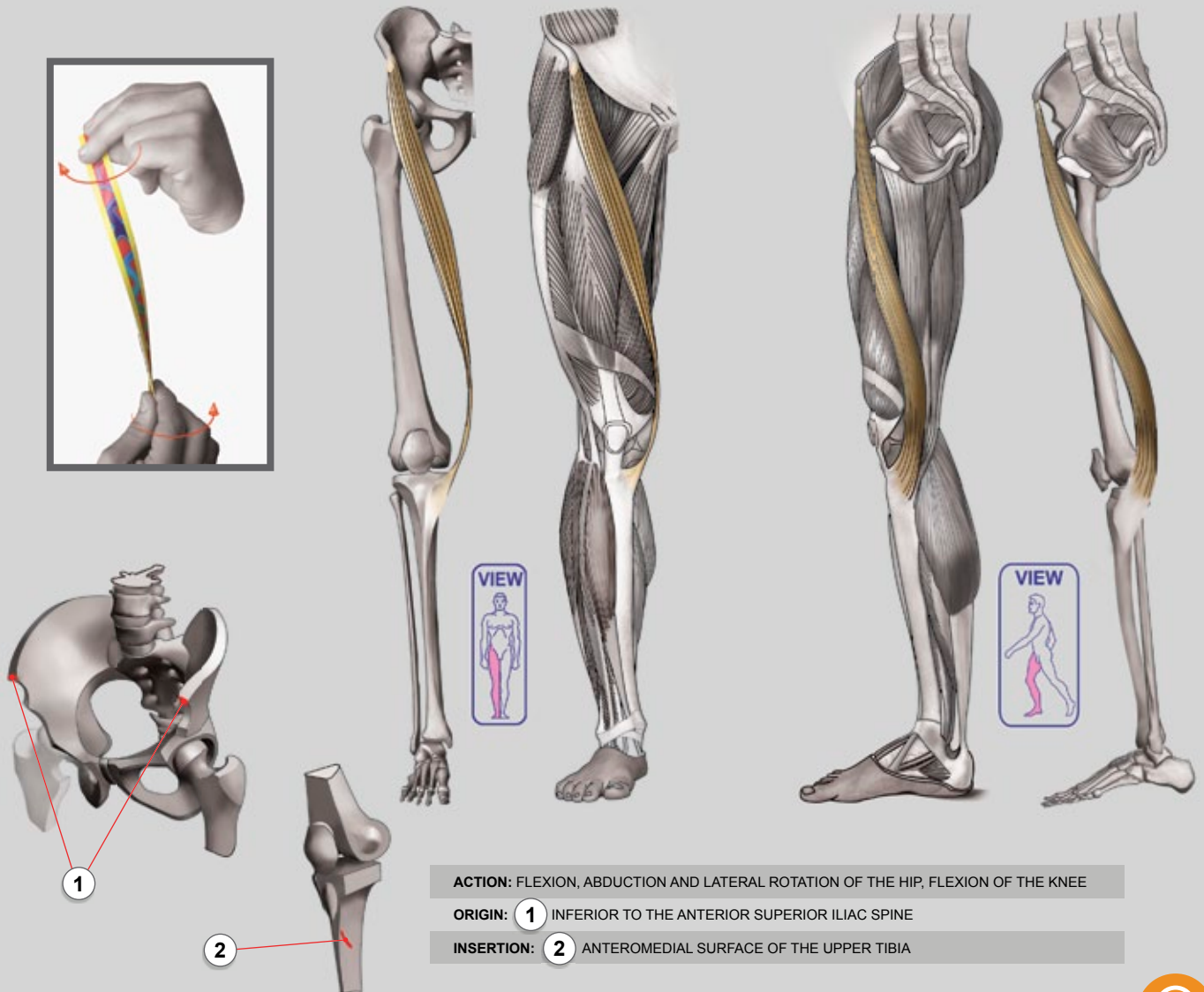
(QUADRICEPS FEMORIS MUSCLE)



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

i

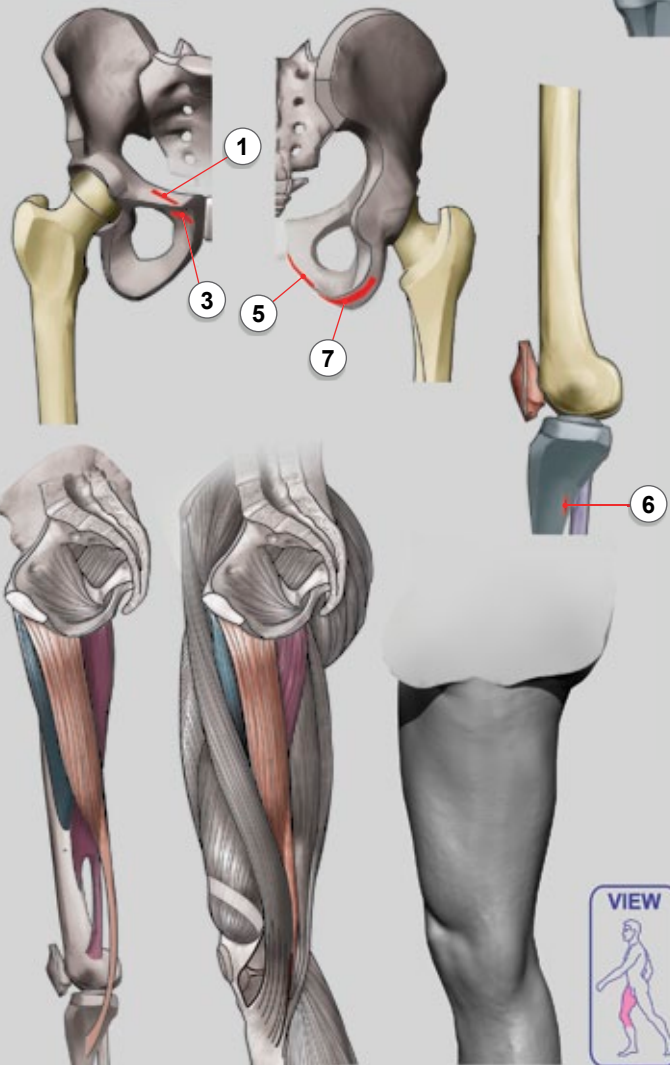
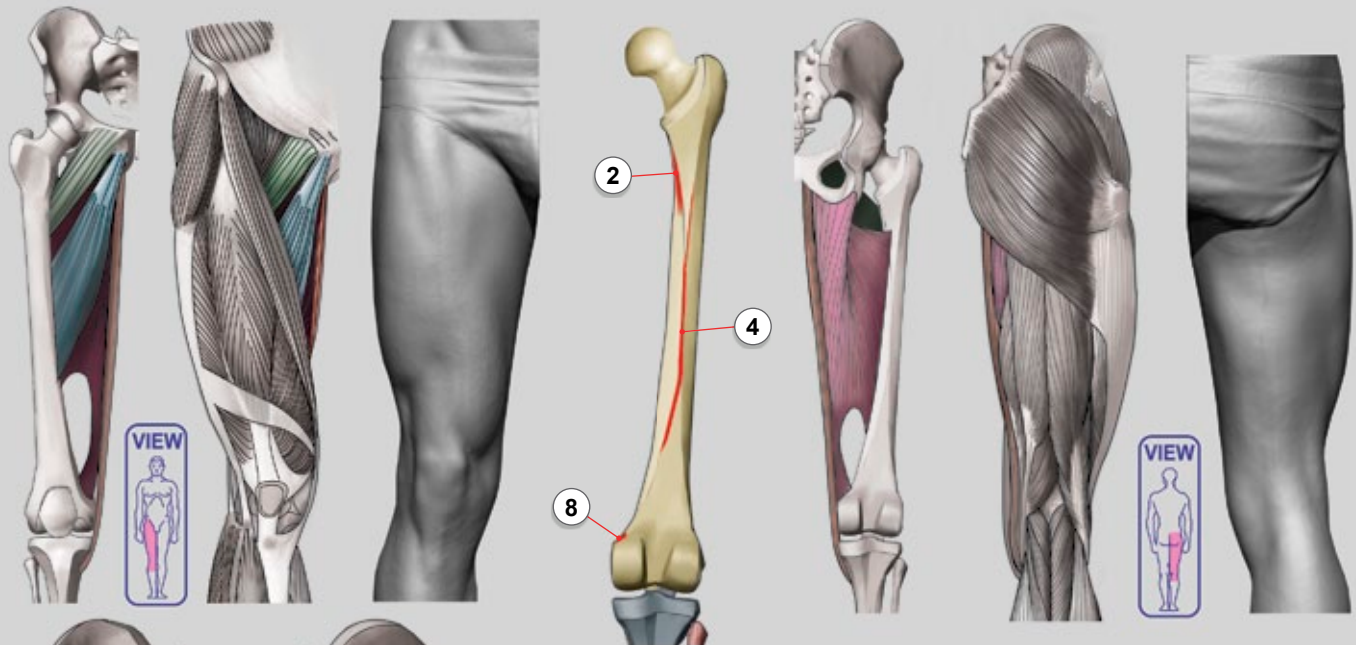


SARTORIUS MUSCLE DIVIDES THIGH INTO TWO PLANES



PECTINEUS, ADDUCTOR LONGUS, GRACILIS, AND ADDUCTOR MAGNUS

(ADDUCTOR MUSCLES OF THE HIP)



i

PECTINEUS

ACTION: THIGH FLEXION, ADDUCTION

ORIGIN: 1 PECTINEAL LINE OF THE PUBIC BONE

INSERTION: 2 PECTINEAL LINE OF THE FEMUR

ADDUCTOR LONGUS

ACTION: ADDUCTION OF HIP, FLEXION OF HIP JOINT

ORIGIN: 3 PUBIC BODY JUST BELOW THE PUBIC CREST

INSERTION: 4 MIDDLE THIRD OF LINEA ASPERA

GRACILIS

ACTION: FLEXES, MEDIALLY ROTATES, AND ADDUCTS THE HIP, FLEXES THE KNEE

ORIGIN: 5 ISCHIO-PUBIC RAMUS

INSERTION: 6 PES ANSERINUS

ADDUCTOR MAGNUS

ACTION: ADDUCTION, FLEXION AND EXTENSION OF HIP

ORIGIN: 7 PUBIS, TUBEROSITY OF THE ISCHIUM

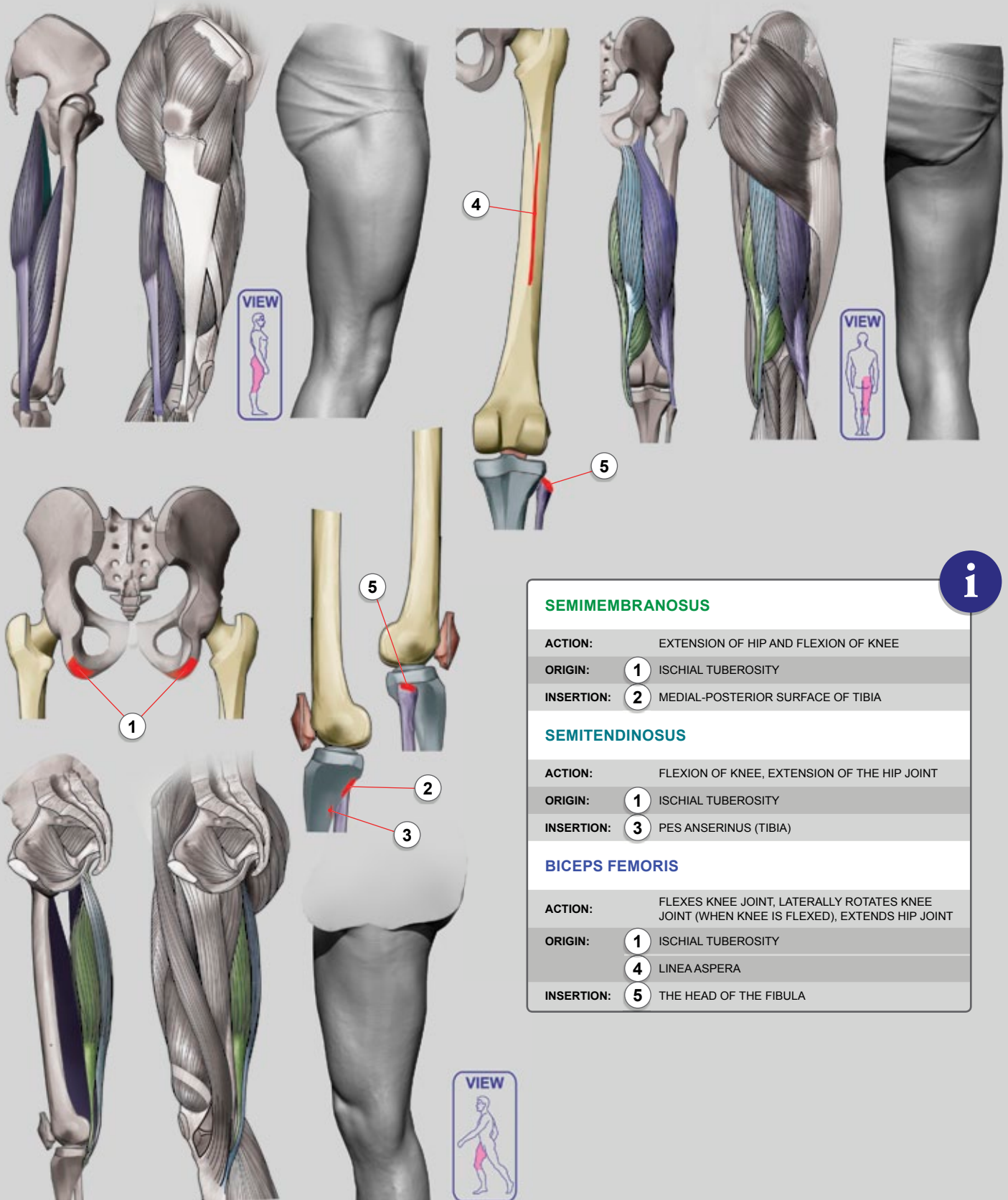
INSERTION: 4 LINEA ASPERA

8 ADDUCTOR TUBERCLE OF FEMUR

HAMSTRINGS

(FLEXORS OF THE THIGH)

SEMITENDINOSUS, SEMIMEMBRANOSUS AND BICEPS FEMORIS MUSCLES



i

SEMIMEMBRANOSUS

ACTION: EXTENSION OF HIP AND FLEXION OF KNEE

ORIGIN: 1 ISCHIAL TUBEROSITY

INSERTION: 2 MEDIAL-POSTERIOR SURFACE OF TIBIA

SEMITENDINOSUS

ACTION: FLEXION OF KNEE, EXTENSION OF THE HIP JOINT

ORIGIN: 1 ISCHIAL TUBEROSITY

INSERTION: 3 PES ANSERINUS (TIBIA)

BICEPS FEMORIS

ACTION: FLEXES KNEE JOINT, LATERALLY ROTATES KNEE JOINT (WHEN KNEE IS FLEXED), EXTENDS HIP JOINT

ORIGIN: 1 ISCHIAL TUBEROSITY

4 LINEA ASPERA

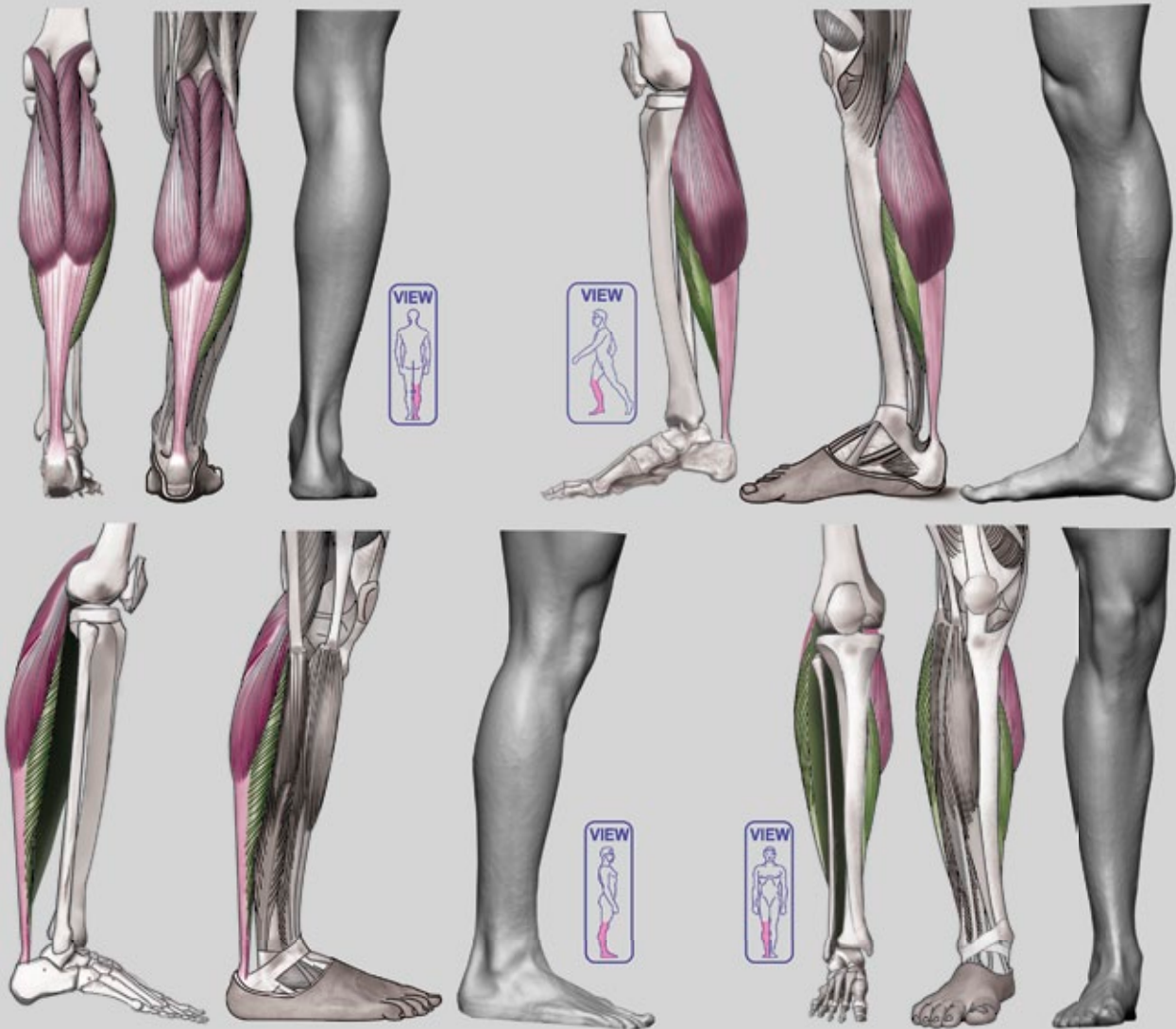
INSERTION: 5 THE HEAD OF THE FIBULA

CALVES



THE CALF

(GASTROCNEMIUS AND SOLEUS MUSCLES)

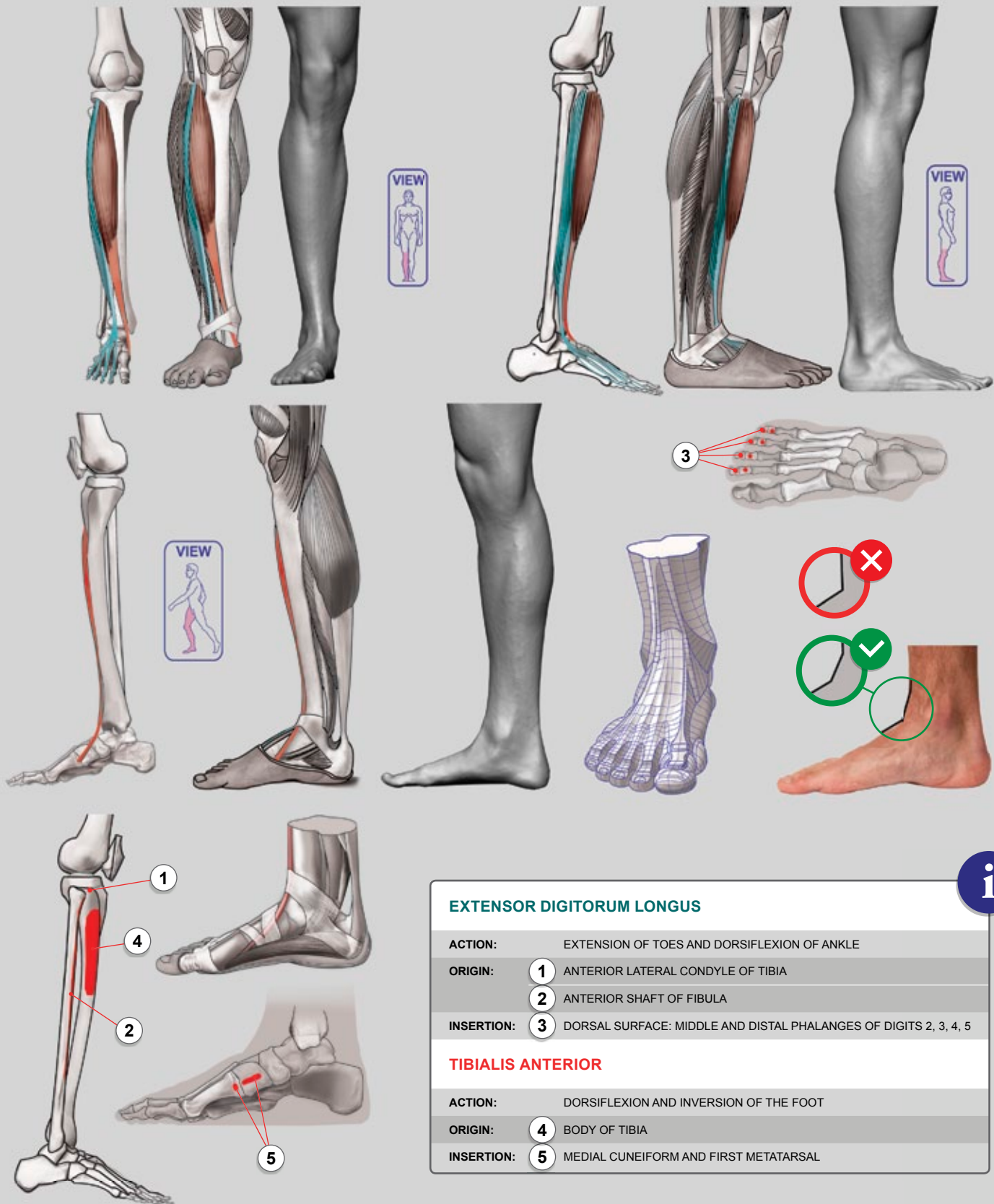


i

GASTROCNEMIUS MUSCLE IS THE LARGER CALF MUSCLE, FORMING A BULGE VISIBLE BENEATH 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).



EXTENSOR DIGITORUM LONGUS AND **TIBIALIS ANTERIOR** MUSCLES



EXTENSOR DIGITORUM LONGUS

ACTION: EXTENSION OF TOES AND DORSIFLEXION OF ANKLE

ORIGIN: 1 ANTERIOR LATERAL CONDYLE OF TIBIA

2 ANTERIOR SHAFT OF FIBULA

INSERTION: 3 DORSAL SURFACE: MIDDLE AND DISTAL PHALANXES OF DIGITS 2, 3, 4, 5

TIBIALIS ANTERIOR

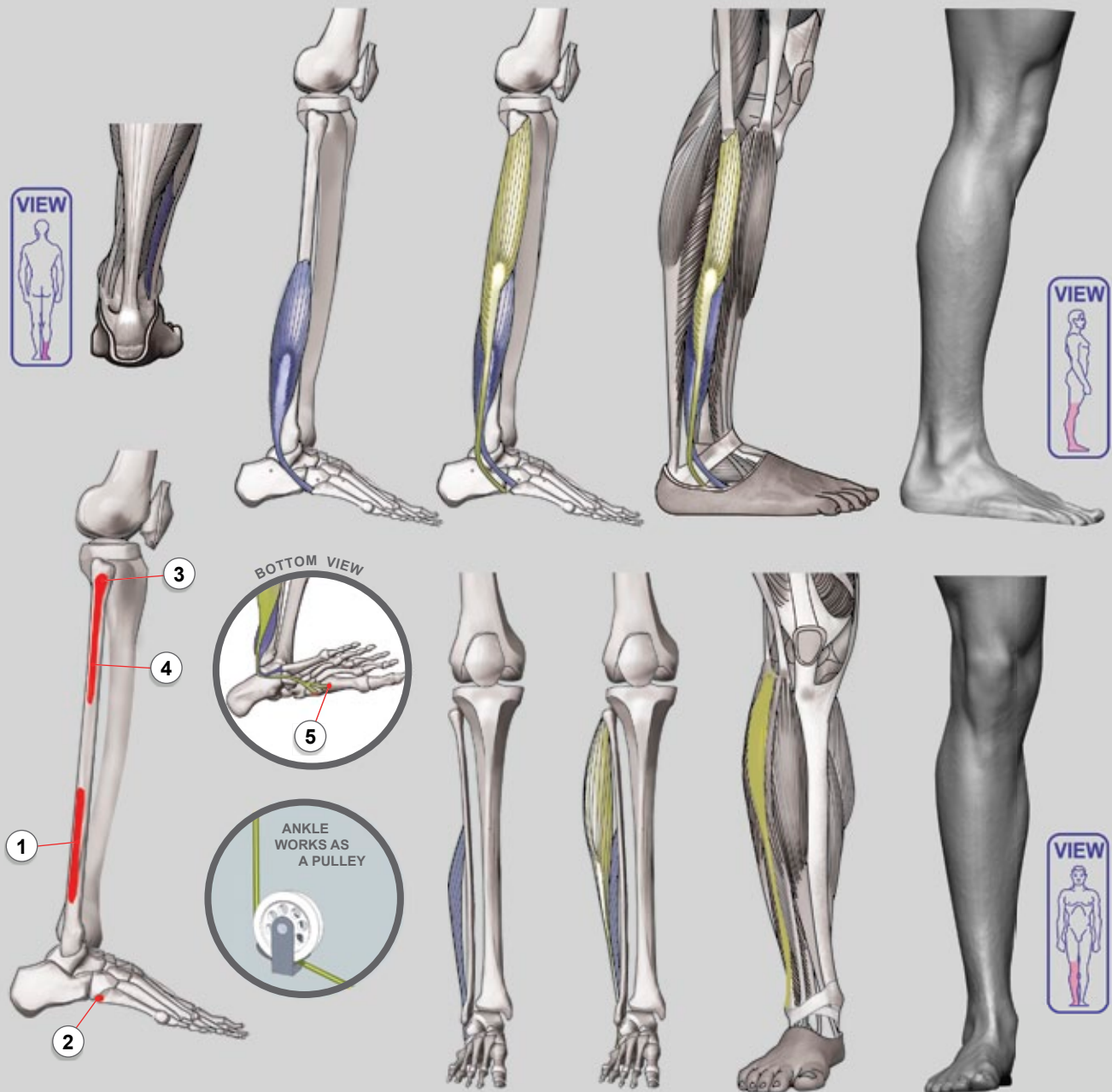
ACTION: DORSIFLEXION AND INVERSION OF THE FOOT

ORIGIN: 4 BODY OF TIBIA

INSERTION: 5 MEDIAL CUNEIFORM AND FIRST METATARSAL

i

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

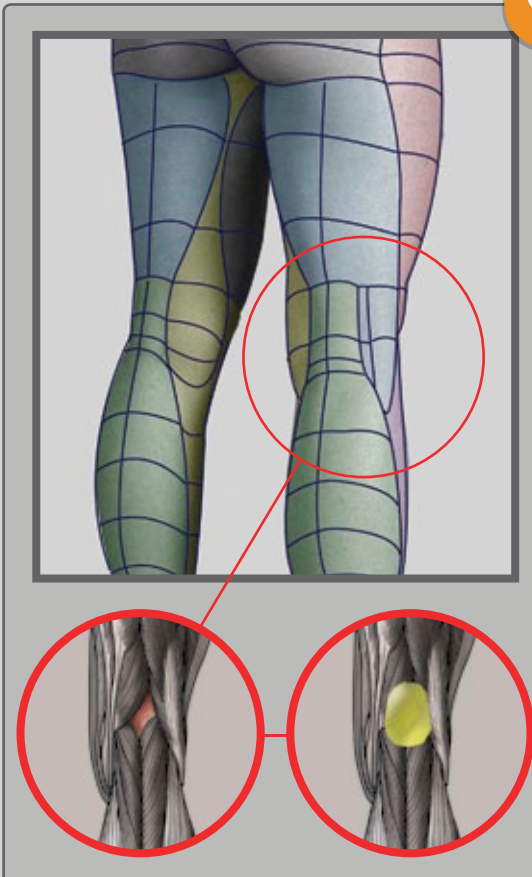
PERONEUS LONGUS

ACTIONS:	EVERTS AND PLANTAR FLEXES THE FOOT, MAINTAINS THE ARCH OF THE FOOT
ORIGIN:	3 HEAD OF FIBULA
	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

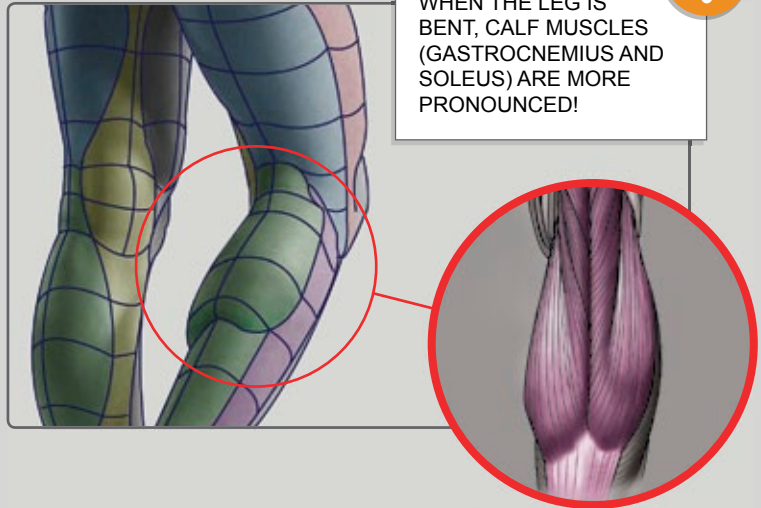
TIPS FOR BACKSIDE OF LEGS



WHEN THE LEG IS BENT, CALF MUSCLES (GASTROCNEMIUS AND SOLEUS) ARE MORE PRONOUNCED!



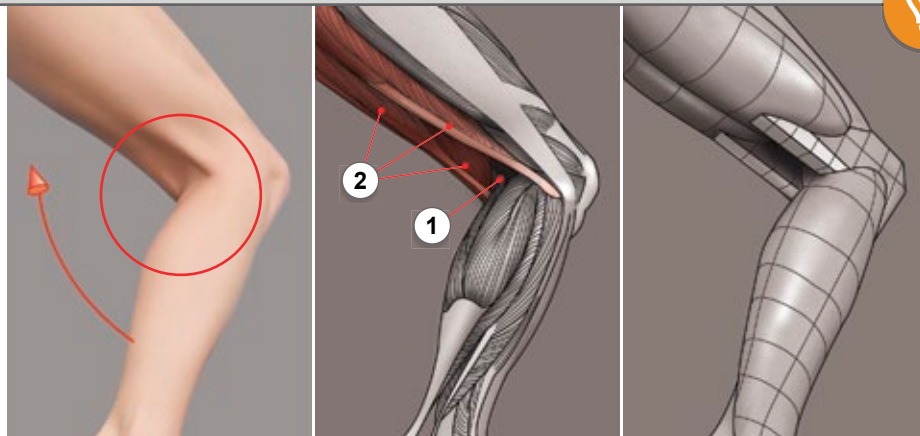
HERE, IN THE MUSCLE VIEW, THE BACK OF THE KNEE IS A SHALLOW DEPRESSION. BUT IN REAL LIFE, WHEN THE LEG IS STRAIGHT, THIS AREA POPS OUTWARD. THIS IS BECAUSE OF A FAT PAD LOCATED RIGHT ON TOP OF THE POPLITEAL FOSSA.



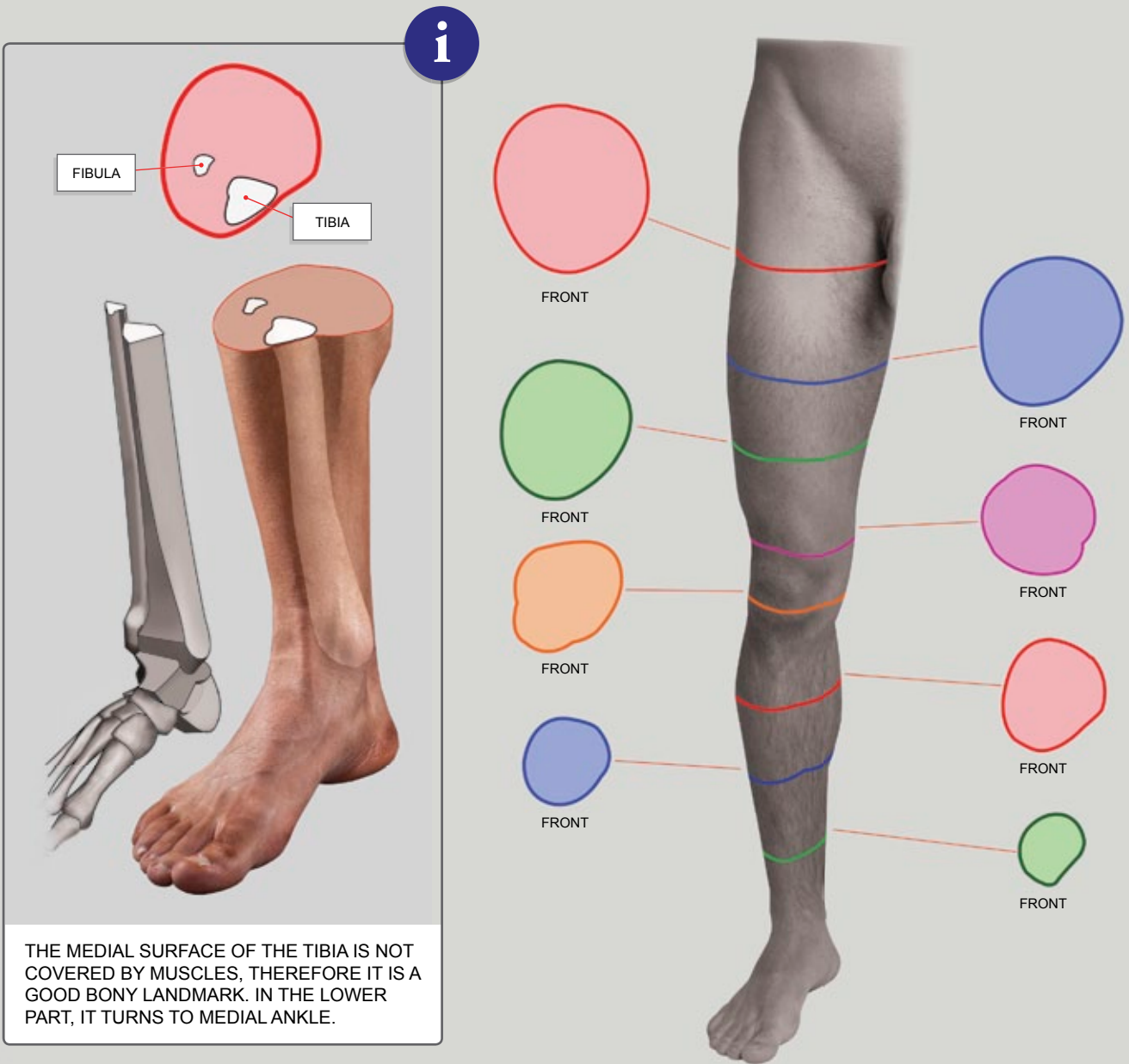
AS THE LEG IS BENT FURTHER, THE DEPRESSION, CALLED THE POPLITEAL FOSSA (THE KNEE PIT), BECOMES DEEPER.

1 FOSSA (THE KNEE PIT) BECOMES PROMINENT

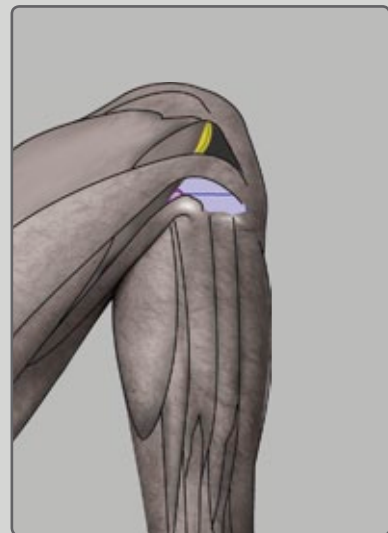
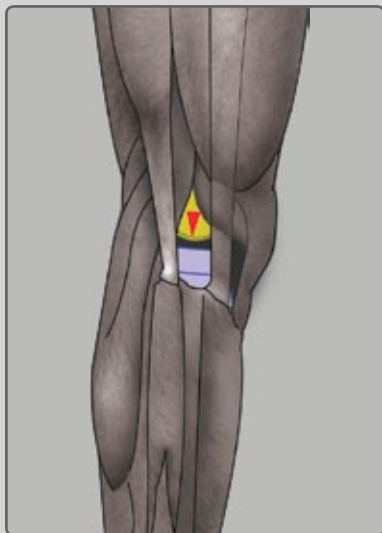
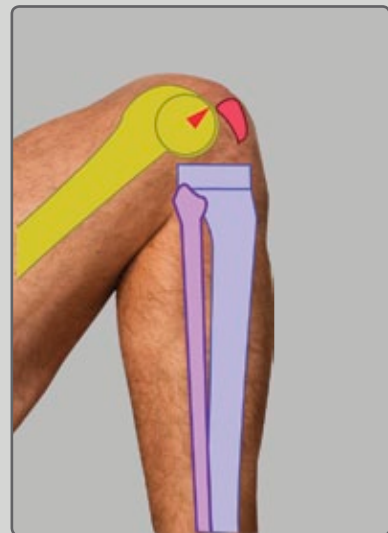
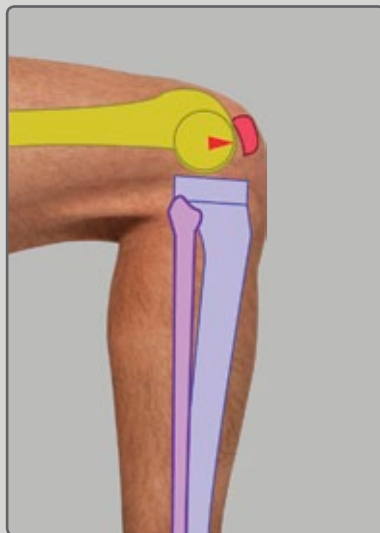
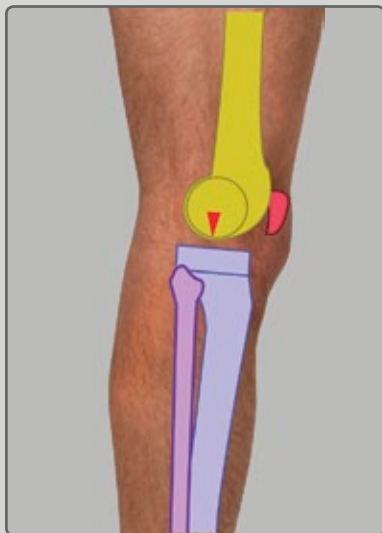
2 **HAMSTRING MUSCLES**



CROSS SECTION OF THE LOWER LIMB

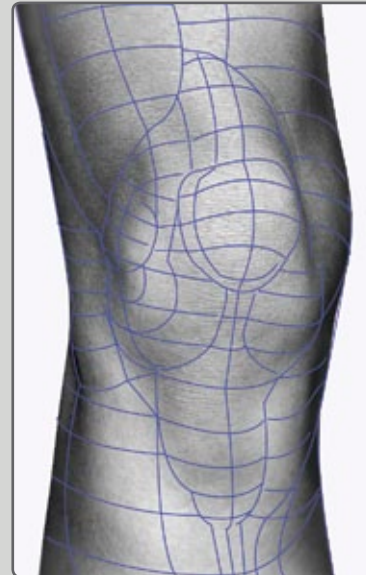
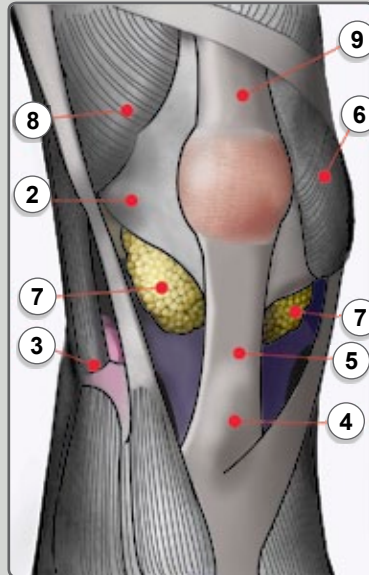
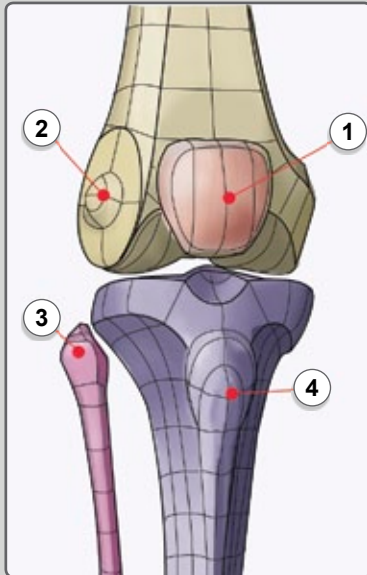


KNEE MECHANICS



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

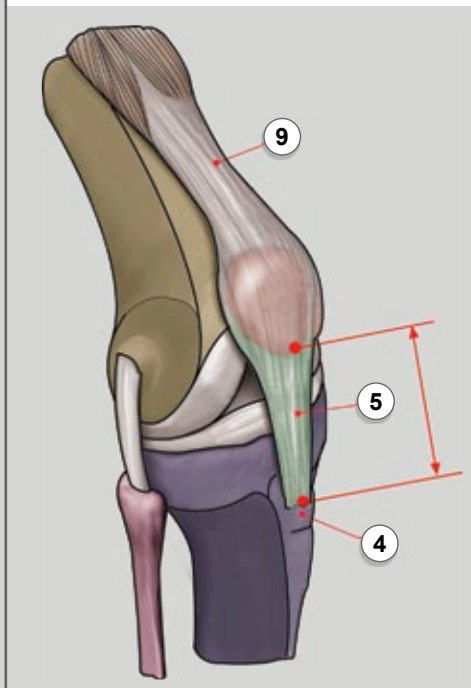
6 VASTUS MEDIALIS

7 INFRAPATELLAR FAT PAD

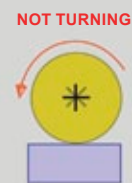
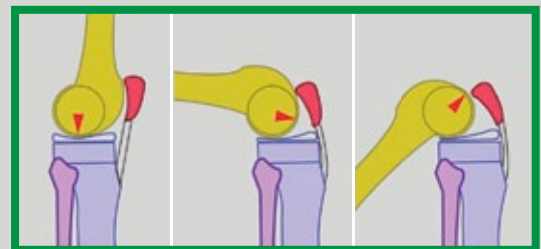
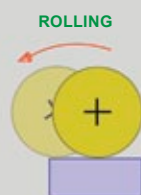
8 VASTUS LATERALIS

9 QUADRICEPS TENDON

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

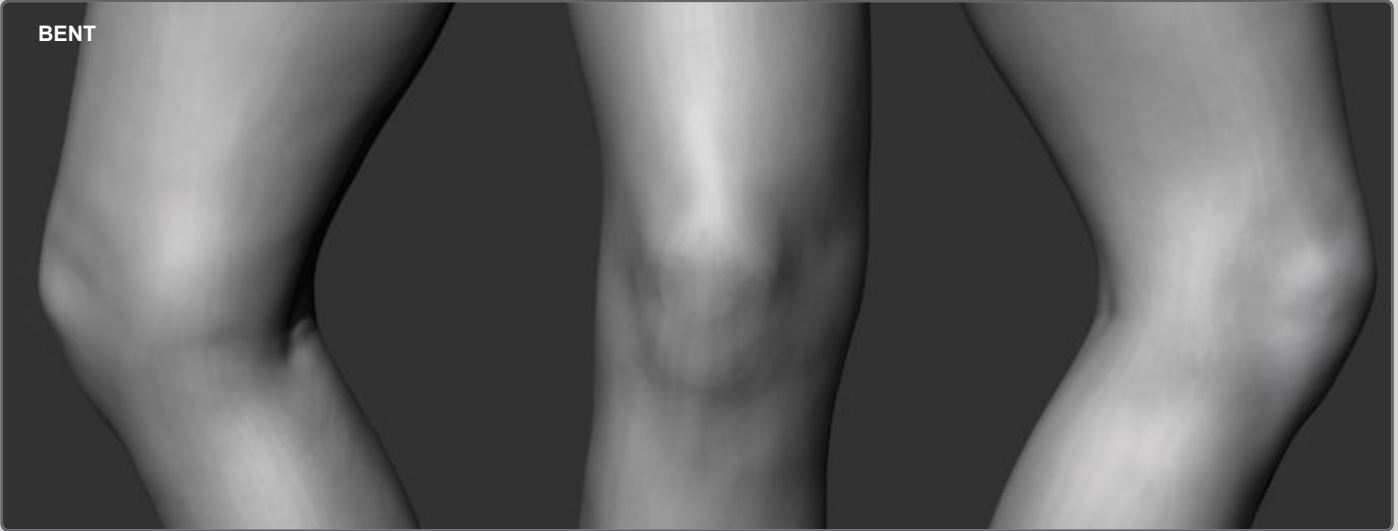


THE HEAD OF THE **FEMUR** IS **ROLLING** OVER THE TOP OF THE **TIBIA**, **NOT TURNING**.

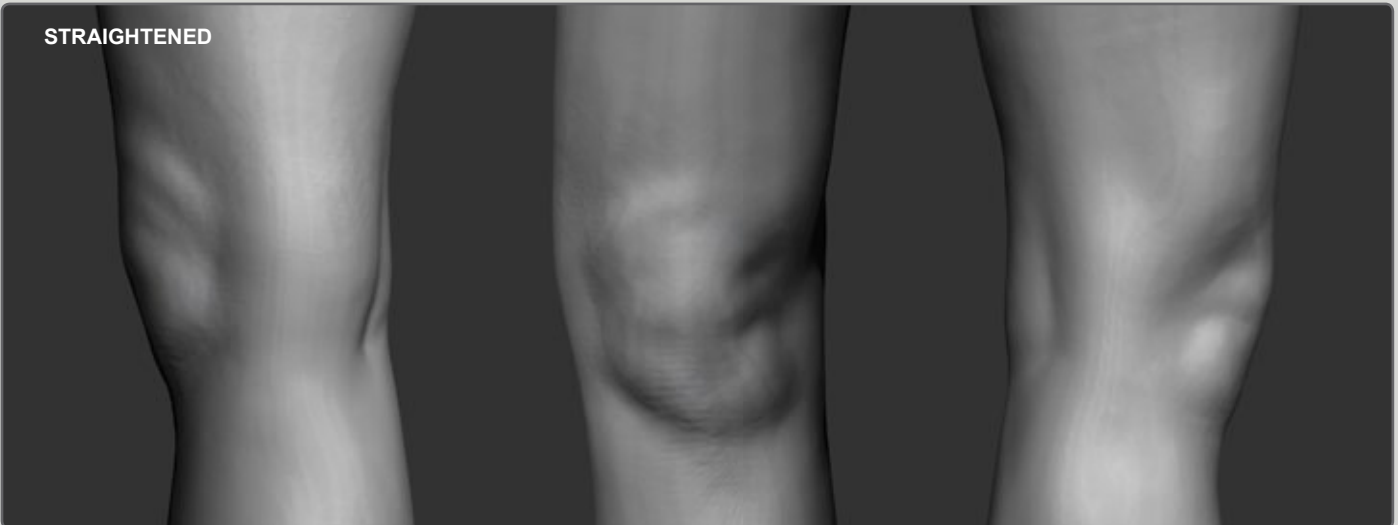


3D SCAN OF RIGHT KNEE

BENT

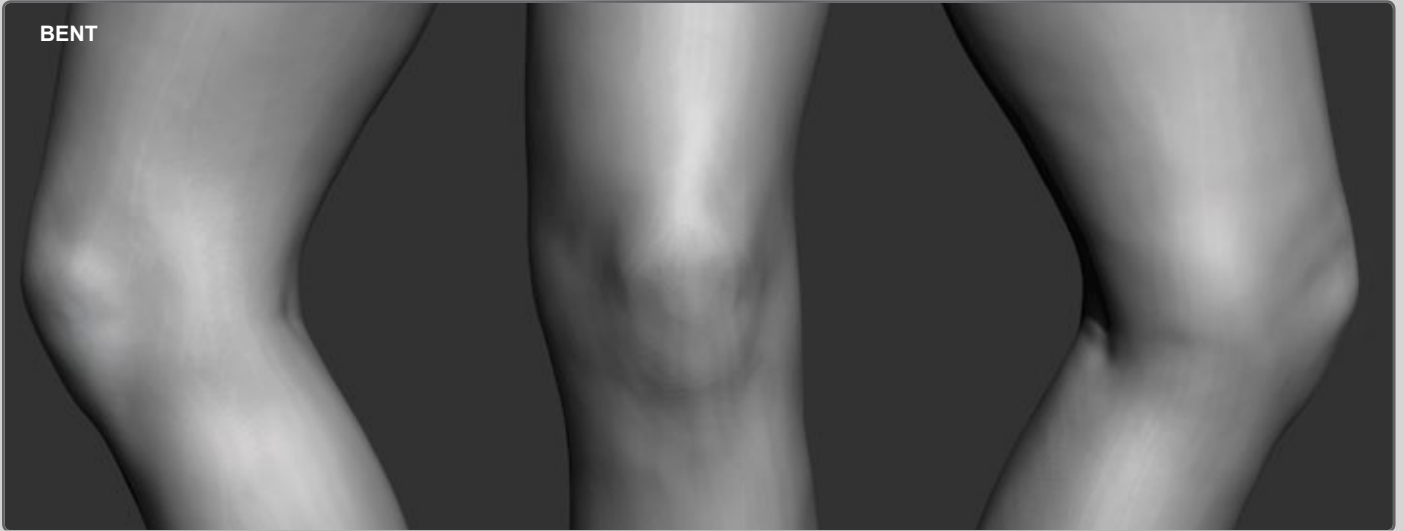


STRAIGHTENED

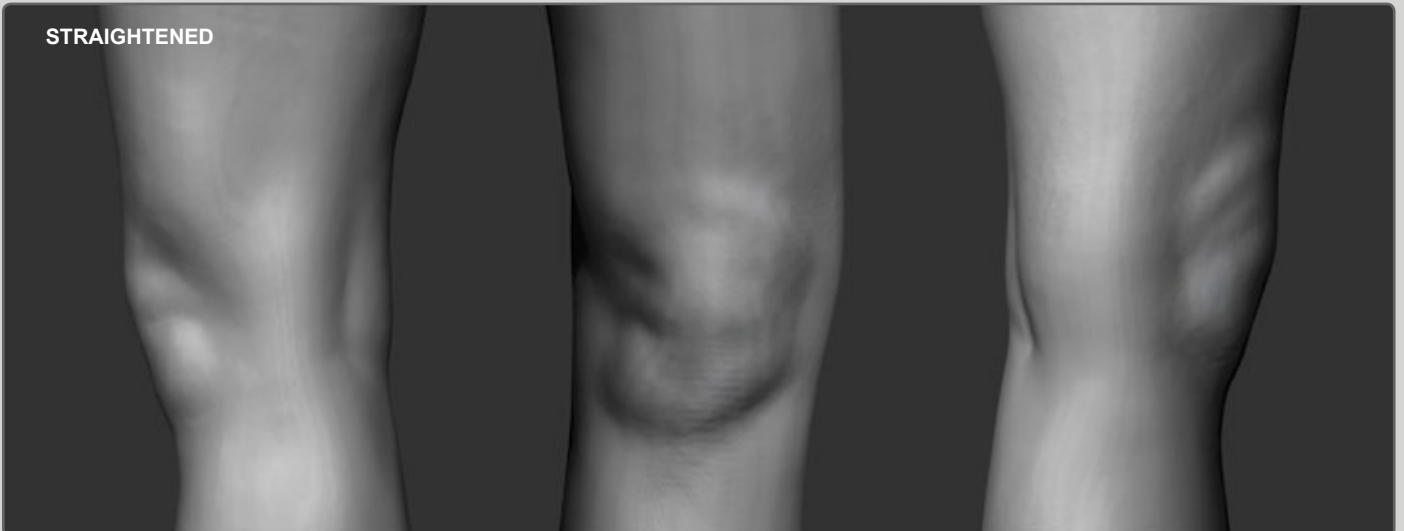


3D SCAN OF LEFT KNEE

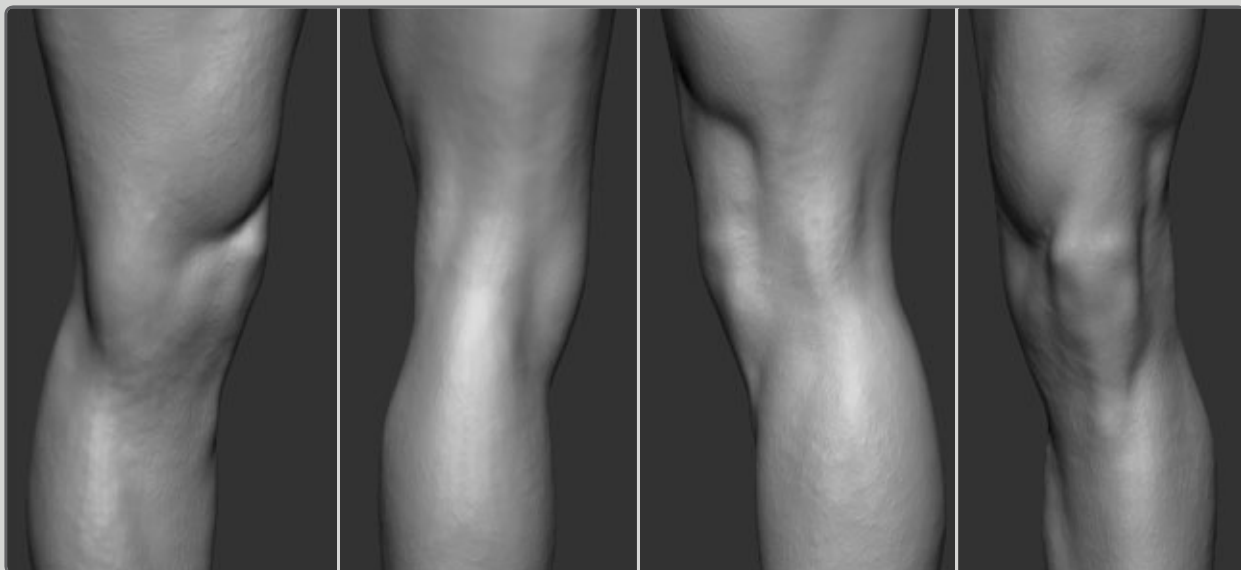
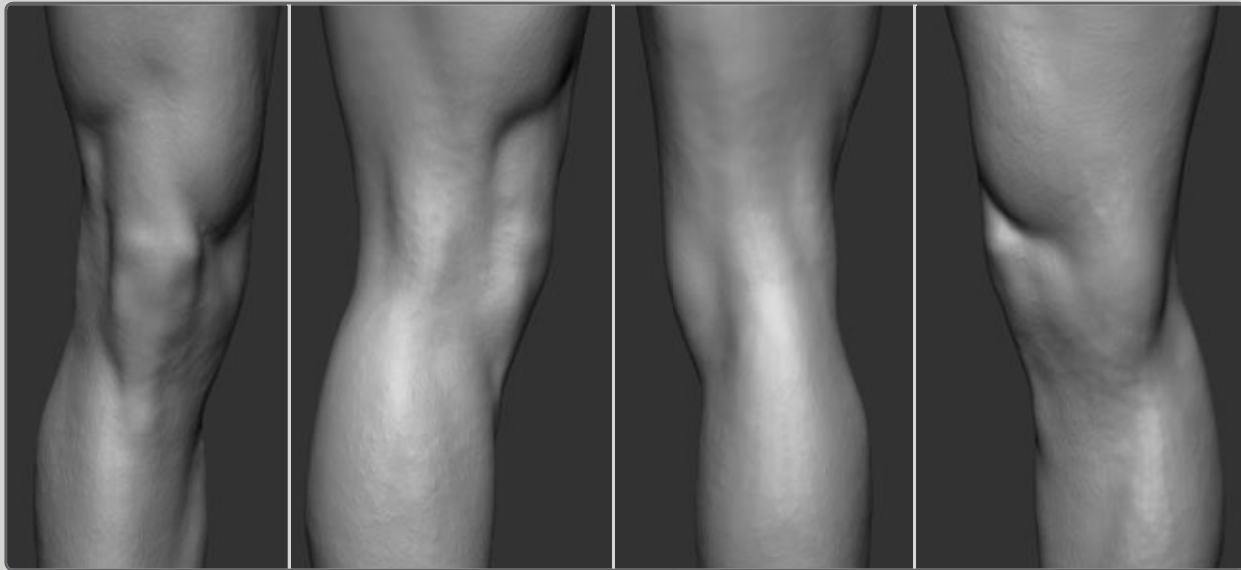
BENT



STRAIGHTENED



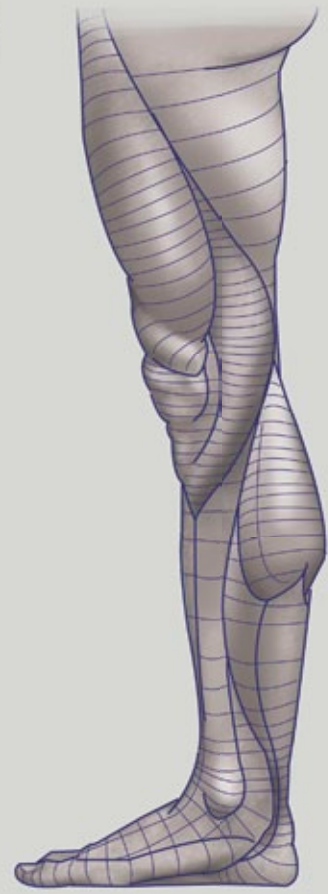
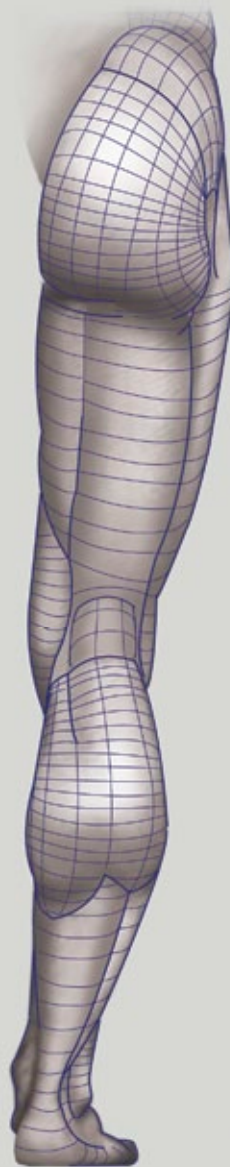
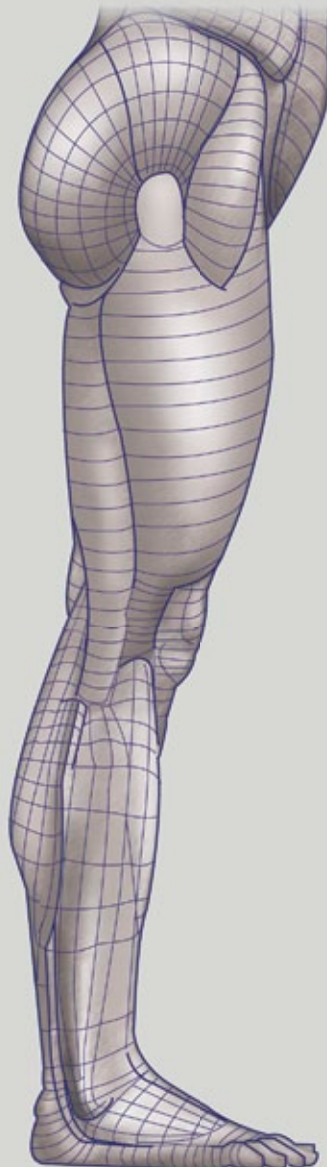
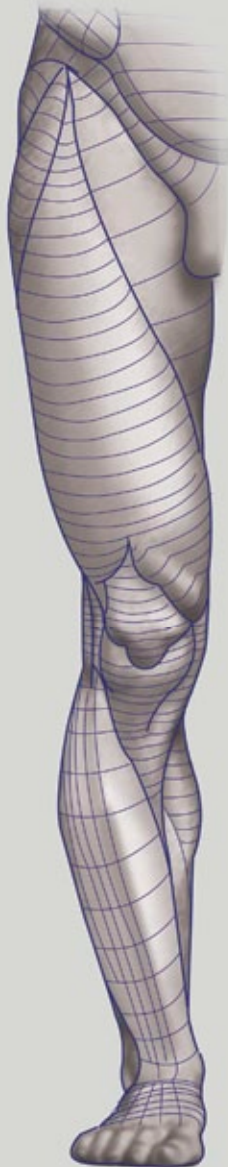
3D SCAN OF LEFT AND RIGHT KNEES



FEMALE LEGS



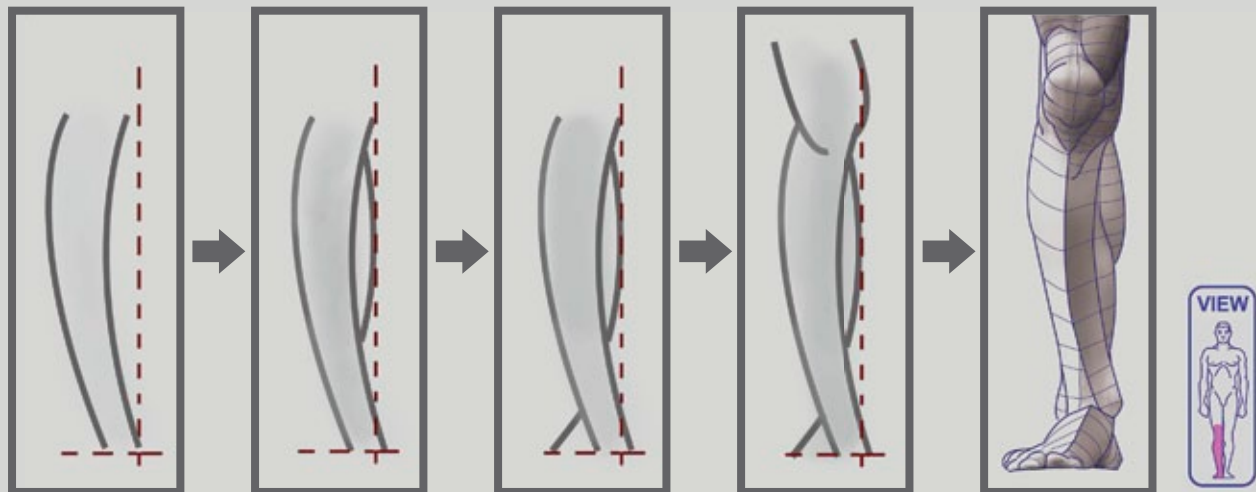
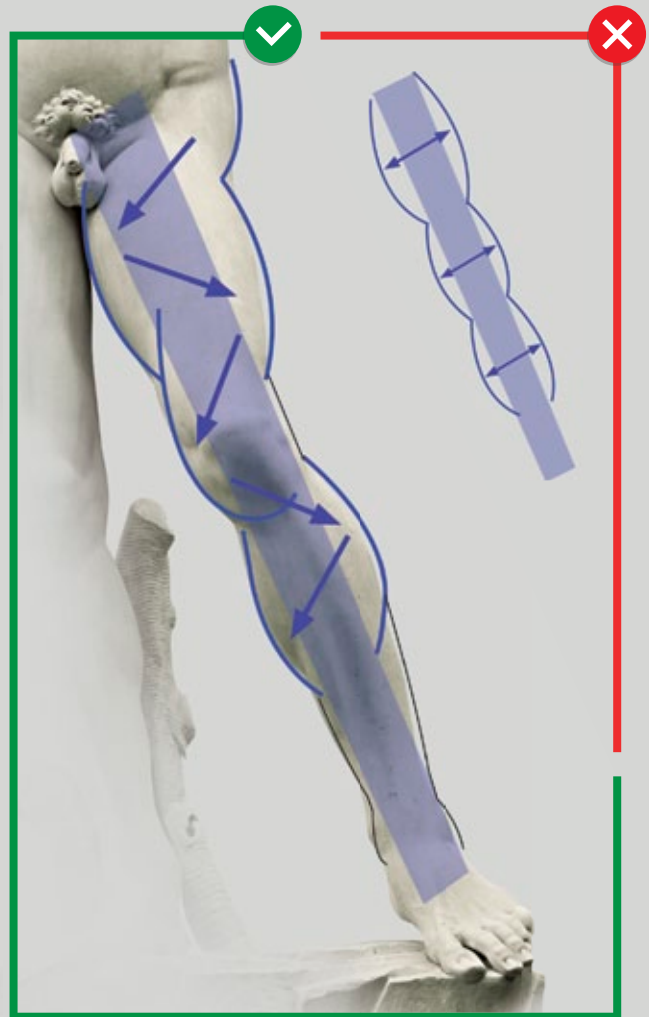
LEG SHAPES VIEWED FROM ALL SIDES



3D SCAN OF LOWER LIMB

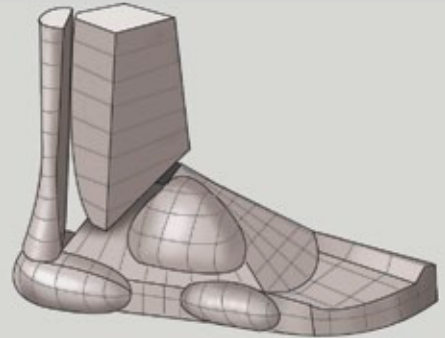


MUSCLES TRAVERSING DOWN THE LOWER LIMB

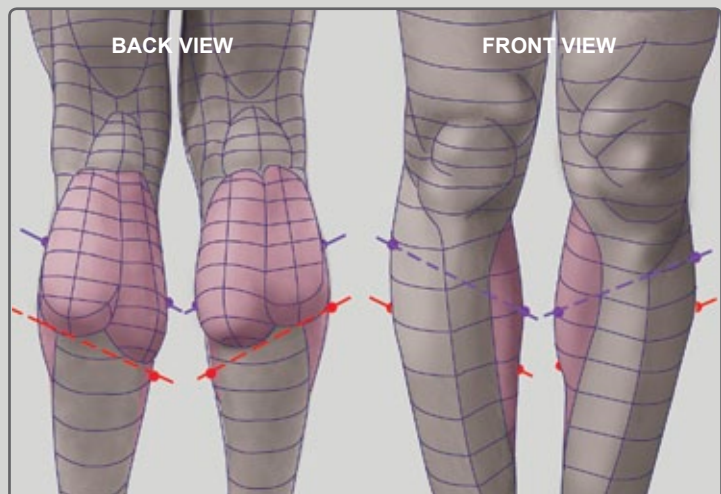


ADDITIONAL SHAPES OF THE LEG AND FOOT

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



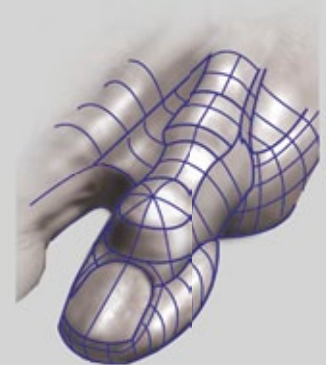
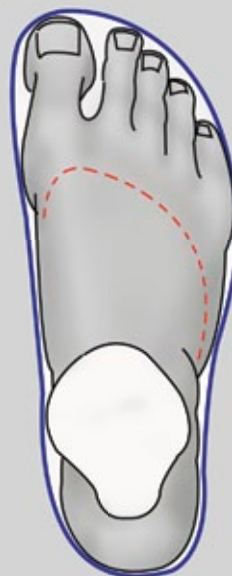
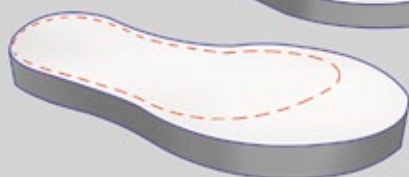
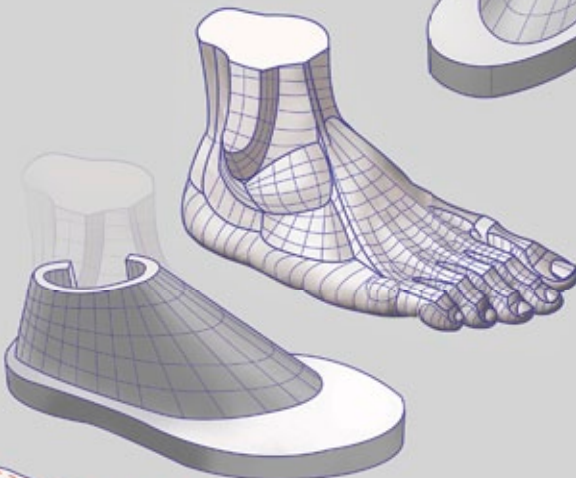
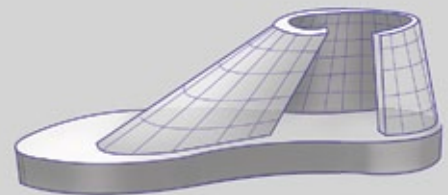
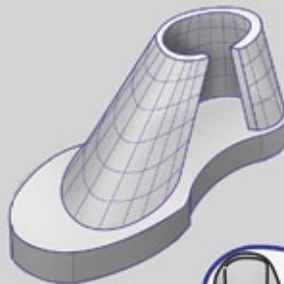
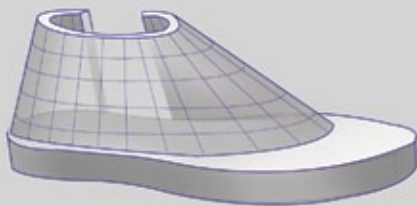
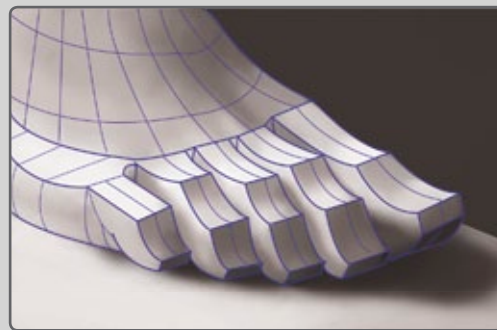
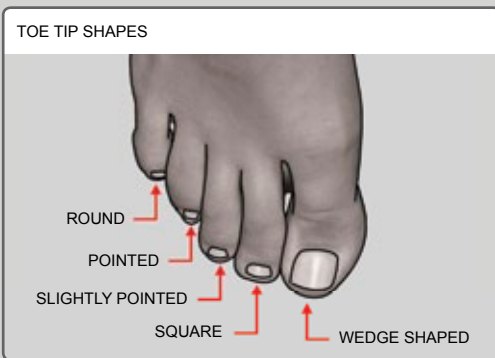
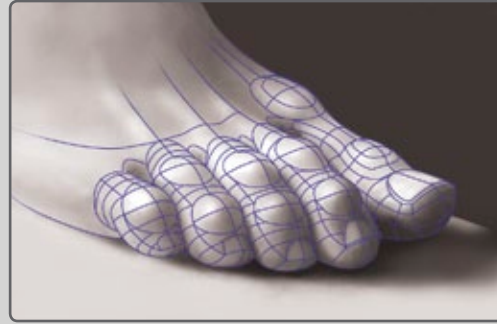
1 PERONEUS LONGUS	8 EXTENSOR HALLUCIS LONGUS	15 SOLEUS
2 PERONEUS BREVIS	9 EXTENSOR HALLUCIS BREVIS	16 FAT PAD
3 EXTENSOR DIGITORUM LONGUS	10 EXTENSOR DIGITORUM BREVIS	17 TIBIALIS POSTERIOR
4 TIBIALIS ANTERIOR	11 PERONEUS TERTIUS	18 FLEXOR DIGITORUM LONGUS
5 MEDIAL SURFACE OF TIBIA BONE	12 ABDUCTOR DIGITI MINIMI	19 ABDUCTOR HALLUCIS
6 MEDIAL ANKLE (M. MALLEOLUS)	13 FLEXOR HALLUCIS LONGUS	20 ACHILLES TENDON
7 LATERAL ANKLE (L. MALLEOLUS)	14 GASTROCNEMIUS	21 CALCANEUS BONE

FOOT SHAPES

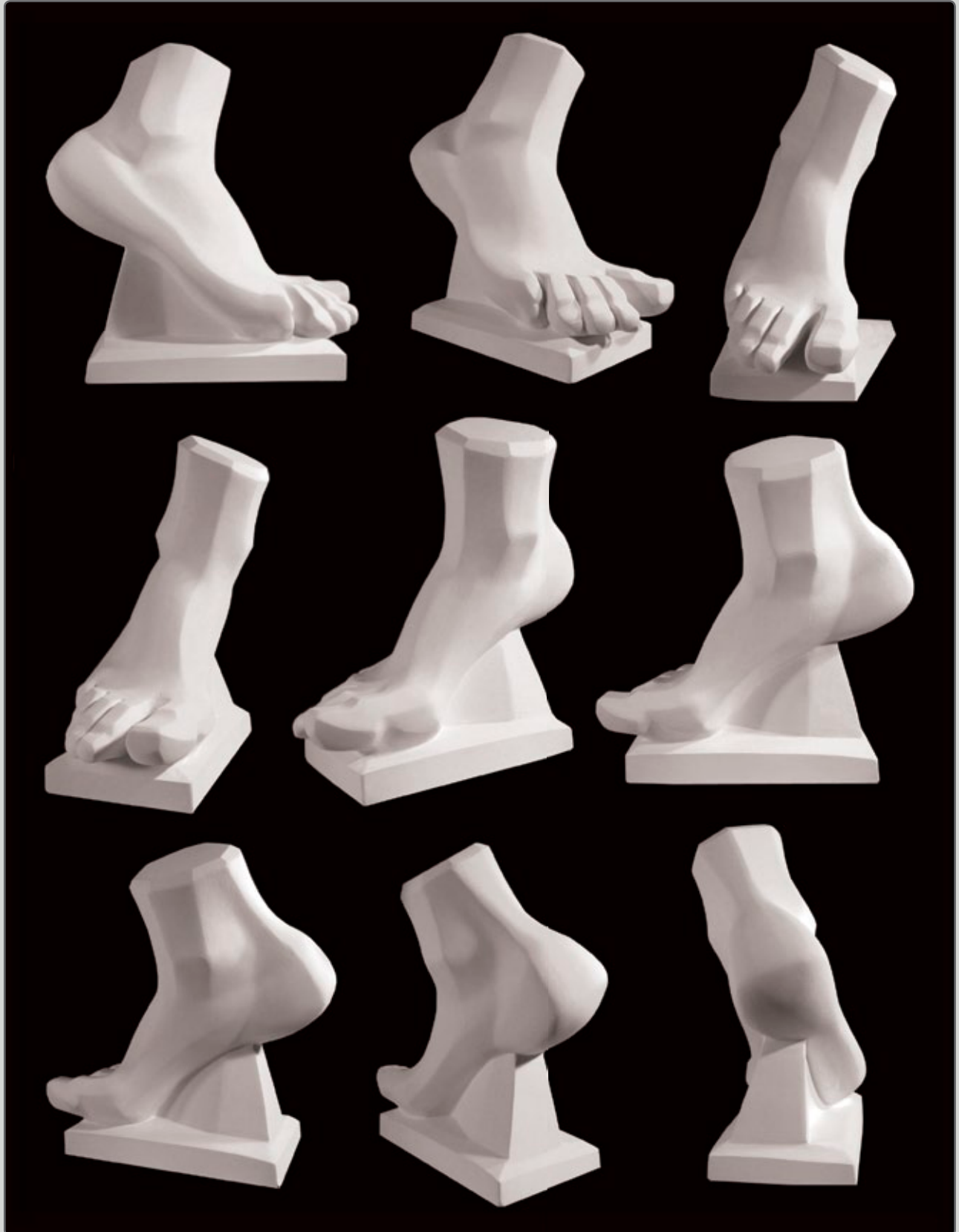


RIGHT FOOT

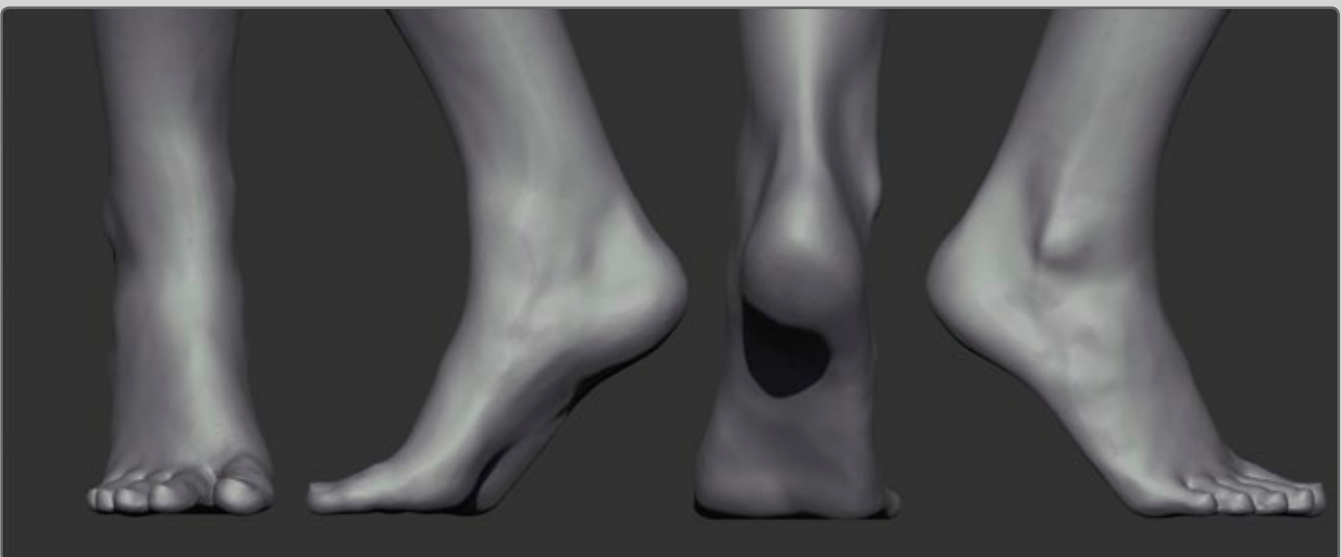
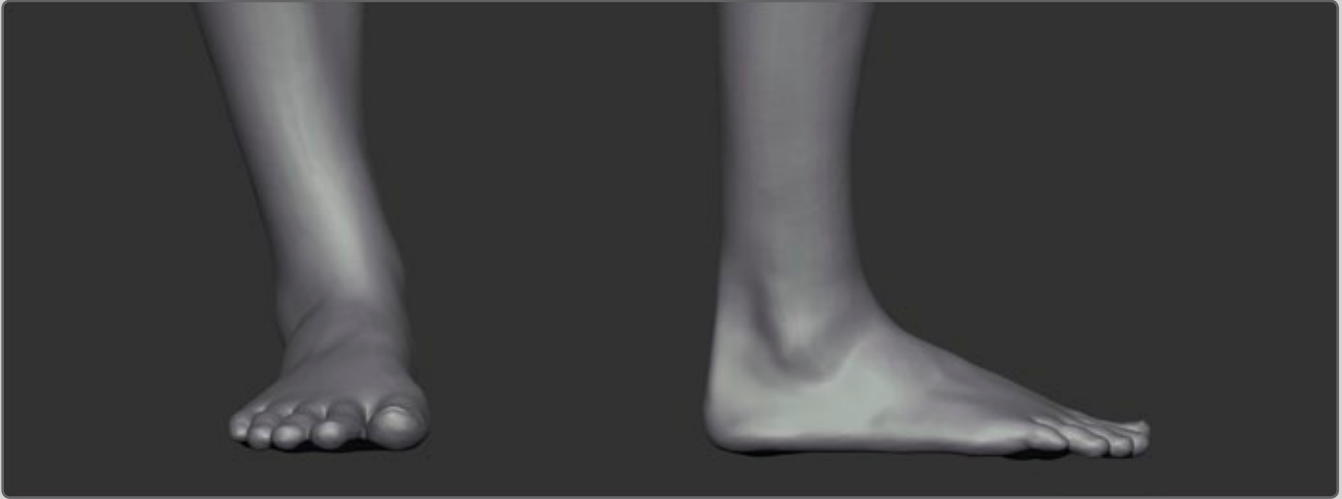
FOOT SHAPES AND FORMING A FOOT



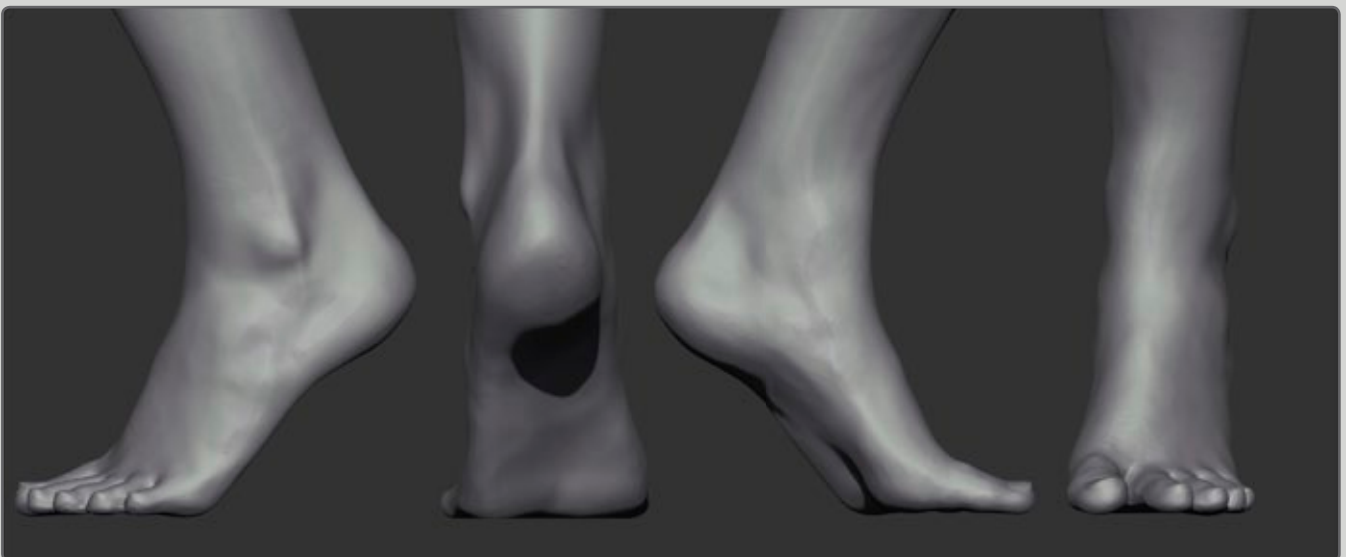
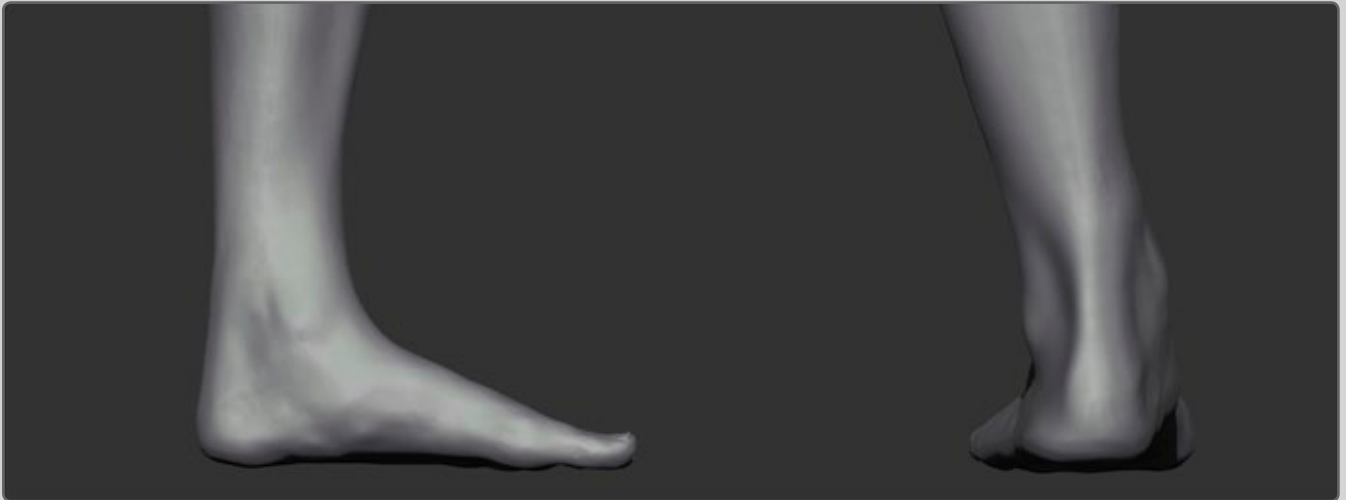
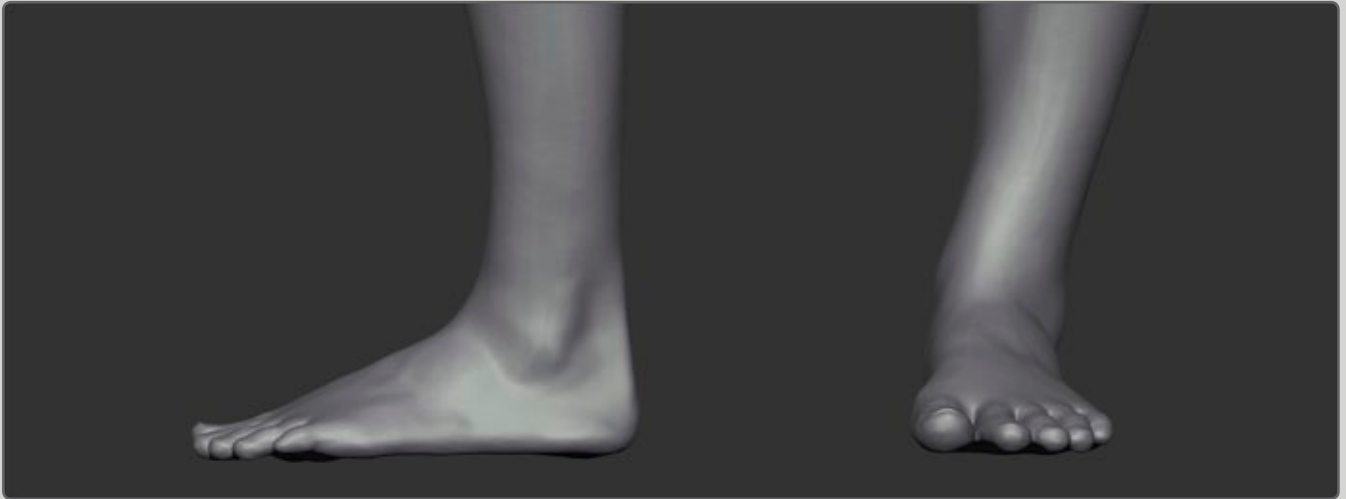
BLOCKING OUT A FOOT



3D SCAN OF RIGHT FOOT



3D SCAN OF LEFT FOOT



BABY FEET



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